



SIEMENS



Operating instructions

SINAMICS/SIMOTICS

Servo drive system
SINAMICS S210

SINAMICS S210 converter
SIMOTICS S-1FK2 servomotor

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SINAMICS/SIMOTICS

SINAMICS S210 servo drive system

Operating Instructions

Firmware V5.1

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

| |
|--|
| DANGER |
| indicates that death or severe personal injury will result if proper precautions are not taken. |
| WARNING |
| indicates that death or severe personal injury may result if proper precautions are not taken. |
| CAUTION |
| indicates that minor personal injury can result if proper precautions are not taken. |
| NOTICE |
| indicates that property damage can result if proper precautions are not taken. |

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

| |
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| WARNING |
| Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed. |

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

Keeping the documentation safe

This documentation should be kept in a location where it can be easily accessed. Make the documentation available to the personnel responsible.

Target group

These operating instructions are intended for persons who perform different tasks in the drive environment, e.g. for:

- Planning engineers
- Project engineers
- Machine manufacturers
- Commissioning engineers
- Electricians
- Installation personnel
- Service technician
- Warehouse personnel

More information

Information on the following topics is available at:

- Ordering documentation / overview of documentation
- Additional links to download documents
- Using documentation online (find and search in manuals / information)

Additional information on drive technology (<https://support.industry.siemens.com/cs/de/en/ps/13204>)

If you have any questions relating to the technical documentation (e.g. suggestions, corrections) then please email them to the following address: Email (<mailto:docu.motioncontrol@siemens.com>)

My support

The following link provides information on how to create your own individual documentation based on Siemens content, and adapt it for your own machine documentation:

My support (<https://support.industry.siemens.com/My/de/en/documentation>)

Note

If you want to use this function, you must first register.

Later, you can log on with your login data.

Technical Support

Country-specific telephone numbers for technical support are provided on the Internet under Contact:

Technical Support (<https://support.industry.siemens.com>)

Websites of third parties

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Use of OpenSSL

This product contains software (<https://www.openssl.org/>) that has been developed by the OpenSSL project for use in the OpenSSL toolkit.

This product contains cryptographic software (<mailto:eay@cryptsoft.com>) created by Eric Young.

This product contains software (<mailto:eay@cryptsoft.com>) developed by Eric Young.

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Fundamental safety instructions

1.1 General safety instructions



WARNING

Electric shock and danger to life due to other energy sources

Touching live components can result in death or severe injury.

- Only work on electrical devices when you are qualified for this job.
- Always observe the country-specific safety rules.

Generally, the following six steps apply when establishing safety:

1. Prepare for disconnection. Notify all those who will be affected by the procedure.
2. Isolate the drive system from the power supply and take measures to prevent it being switched back on again.
3. Wait until the discharge time specified on the warning labels has elapsed.
4. Check that there is no voltage between any of the power connections, and between any of the power connections and the protective conductor connection.
5. Check whether the existing auxiliary supply circuits are de-energized.
6. Ensure that the motors cannot move.
7. Identify all other dangerous energy sources, e.g. compressed air, hydraulic systems, or water. Switch the energy sources to a safe state.
8. Check that the correct drive system is completely locked.

After you have completed the work, restore the operational readiness in the inverse sequence.



WARNING

Electric shock due to connection to an unsuitable power supply

When equipment is connected to an unsuitable power supply, exposed components may carry a hazardous voltage that might result in serious injury or death.

- Only use power supplies that provide SELV (Safety Extra Low Voltage) or PELV- (Protective Extra Low Voltage) output voltages for all connections and terminals of the electronics modules.



| |
|--|
| WARNING |
| Electric shock due to damaged motors or devices |
| Improper handling of motors or devices can damage them. |
| Hazardous voltages can be present at the enclosure or at exposed components on damaged motors or devices. |
| <ul style="list-style-type: none">• Ensure compliance with the limit values specified in the technical data during transport, storage and operation.• Do not use any damaged motors or devices. |



| |
|---|
| WARNING |
| Electric shock due to unconnected cable shields |
| Hazardous touch voltages can occur through capacitive cross-coupling due to unconnected cable shields. |
| <ul style="list-style-type: none">• As a minimum, connect cable shields and the cores of cables that are not used at one end at the grounded housing potential. |



| |
|--|
| WARNING |
| Electric shock if there is no ground connection |
| For missing or incorrectly implemented protective conductor connection for devices with protection class I, high voltages can be present at open, exposed parts, which when touched, can result in death or severe injury. |
| <ul style="list-style-type: none">• Ground the device in compliance with the applicable regulations. |



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|--|
| WARNING |
| Arcing when a plug connection is opened during operation |
| Opening a plug connection when a system is operation can result in arcing that may cause serious injury or death. |
| <ul style="list-style-type: none">• Only open plug connections when the equipment is in a voltage-free state, unless it has been explicitly stated that they can be opened in operation. |



| |
|--|
| WARNING |
| Electric shock due to residual charges in power components |
| Because of the capacitors, a hazardous voltage is present for up to 5 minutes after the power supply has been switched off. Contact with live parts can result in death or serious injury. |
| <ul style="list-style-type: none">• Wait for 5 minutes before you check that the unit really is in a no-voltage condition and start work. |

WARNING**Spread of fire from built-in devices**

In the event of fire outbreak, the enclosures of built-in devices cannot prevent the escape of fire and smoke. This can result in serious personal injury or property damage.

- Install built-in units in a suitable metal cabinet in such a way that personnel are protected against fire and smoke, or take other appropriate measures to protect personnel.
- Ensure that smoke can only escape via controlled and monitored paths.

WARNING**Failure of pacemakers or implant malfunctions due to electromagnetic fields**

Electromagnetic fields (EMF) are generated by the operation of electrical power equipment, such as transformers, converters, or motors. People with pacemakers or implants in the immediate vicinity of this equipment are at particular risk.

- If you have a heart pacemaker or implant, maintain a minimum distance of 2 m from electrical power equipment.

**WARNING****Failure of pacemakers or implant malfunctions due to permanent magnetic fields**

Even when switched off, electric motors with permanent magnets represent a potential risk for persons with heart pacemakers or implants if they are close to converters/motors.

- If you have a heart pacemaker or implant, maintain the minimum distance specified in the Chapter "Technical data".
- When transporting or storing permanent-magnet motors always use the original packing materials with the warning labels attached.
- Clearly mark the storage locations with the appropriate warning labels.
- IATA regulations must be observed when transported by air.

WARNING**Unexpected movement of machines caused by radio devices or mobile phones**

When radio devices or mobile phones with a transmission power > 1 W are used in the immediate vicinity of components, they may cause the equipment to malfunction. Malfunctions may impair the functional safety of machines and can therefore put people in danger or lead to property damage.

- If you come closer than around 2 m to such components, switch off any radios or mobile phones.
- Use the "SIEMENS Industry Online Support App" only on equipment that has already been switched off.

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|---|
| WARNING |
| Motor fire in the event of insulation overload |
| There is higher stress on the motor insulation through a ground fault in an IT system. If the insulation fails, it is possible that death or severe injury can occur as a result of smoke and fire. |
| <ul style="list-style-type: none">• Use a monitoring device that signals an insulation fault.• Correct the fault as quickly as possible so the motor insulation is not overloaded. |

| |
|---|
| WARNING |
| Fire due to inadequate ventilation clearances |
| Inadequate ventilation clearances can cause overheating of components with subsequent fire and smoke. This can cause severe injury or even death. This can also result in increased downtime and reduced service lives for devices/systems. |
| <ul style="list-style-type: none">• Ensure compliance with the specified minimum clearance as ventilation clearance for the respective component. |

| |
|---|
| WARNING |
| Unrecognized dangers due to missing or illegible warning labels |
| Dangers might not be recognized if warning labels are missing or illegible. Unrecognized dangers may cause accidents resulting in serious injury or death. |
| <ul style="list-style-type: none">• Check that the warning labels are complete based on the documentation.• Attach any missing warning labels to the components, where necessary in the national language.• Replace illegible warning labels. |

| |
|--|
| NOTICE |
| Device damage caused by incorrect voltage/insulation tests |
| Incorrect voltage/insulation tests can damage the device. |
| <ul style="list-style-type: none">• Before carrying out a voltage/insulation check of the system/machine, disconnect the devices as all converters and motors have been subject to a high voltage test by the manufacturer, and therefore it is not necessary to perform an additional test within the system/machine. |

WARNING**Unexpected movement of machines caused by inactive safety functions**

Inactive or non-adapted safety functions can trigger unexpected machine movements that may result in serious injury or death.

- Observe the information in the appropriate product documentation before commissioning.
- Carry out a safety inspection for functions relevant to safety on the entire system, including all safety-related components.
- Ensure that the safety functions used in your drives and automation tasks are adjusted and activated through appropriate parameterizing.
- Perform a function test.
- Only put your plant into live operation once you have guaranteed that the functions relevant to safety are running correctly.

Note**Important safety notices for Safety Integrated functions**

If you want to use Safety Integrated functions, you must observe the safety notices in the Safety Integrated manuals.

WARNING**Malfunctions of the machine as a result of incorrect or changed parameter settings**

As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect the parameterization (parameter assignments) against unauthorized access.
- Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.

WARNING**Injury caused by moving or ejected parts**

Contact with moving motor parts or drive output elements and the ejection of loose motor parts (e.g. feather keys) out of the motor enclosure can result in severe injury or death.

- Remove any loose parts or secure them so that they cannot be flung out.
- Do not touch any moving parts.
- Safeguard all moving parts using the appropriate safety guards.

| |
|---|
| WARNING |
| Fire due to inadequate cooling Inadequate cooling can cause the motor to overheat, resulting in death or severe injury as a result of smoke and fire. This can also result in increased failures and reduced service lives of motors. <ul style="list-style-type: none">• Comply with the specified cooling requirements for the motor. |

| |
|---|
| WARNING |
| Fire due to incorrect operation of the motor When incorrectly operated and in the case of a fault, the motor can overheat resulting in fire and smoke. This can result in severe injury or death. Further, excessively high temperatures destroy motor components and result in increased failures as well as shorter service lives of motors. <ul style="list-style-type: none">• Operate the motor according to the relevant specifications.• Only operate the motors in conjunction with effective temperature monitoring.• Immediately switch off the motor if excessively high temperatures occur. |



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|---|
| CAUTION |
| Burn injuries caused by hot surfaces In operation, the motor can reach high temperatures, which can cause burns if touched. <ul style="list-style-type: none">• Mount the motor so that it is not accessible in operation. Measures when maintenance is required: <ul style="list-style-type: none">• Allow the motor to cool down before starting any work.• Use the appropriate personnel protection equipment, e.g. gloves. |

1.2 Equipment damage due to electric fields or electrostatic discharge

Electrostatic sensitive devices (ESD) are individual components, integrated circuits, modules or devices that may be damaged by either electric fields or electrostatic discharge.



NOTICE

Equipment damage due to electric fields or electrostatic discharge

Electric fields or electrostatic discharge can cause malfunctions through damaged individual components, integrated circuits, modules or devices.

- Only pack, store, transport and send electronic components, modules or devices in their original packaging or in other suitable materials, e.g. conductive foam rubber or aluminum foil.
- Only touch components, modules and devices when you are grounded by one of the following methods:
 - Wearing an ESD wrist strap
 - Wearing ESD shoes or ESD grounding straps in ESD areas with conductive flooring
- Only place electronic components, modules or devices on conductive surfaces (table with ESD surface, conductive ESD foam, ESD packaging, ESD transport container).

1.3 Warranty and liability for application examples

The application examples are not binding and do not claim to be complete regarding configuration, equipment or any eventuality which may arise. The application examples do not represent specific customer solutions, but are only intended to provide support for typical tasks. You are responsible for the proper operation of the described products. These application examples do not relieve you of your responsibility for safe handling when using, installing, operating and maintaining the equipment.

1.4 Industrial security

Note

Industrial security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

The customer is responsible for preventing unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit:

Industrial security (<http://www.siemens.com/industrialsecurity>).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed at:

Industrial security (<http://www.siemens.com/industrialsecurity>).

WARNING

Unsafe operating states resulting from software manipulation

Software manipulations (e.g. viruses, trojans, malware or worms) can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
- Make sure that you include all installed products into the holistic industrial security concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.

1.5 Residual risks of power drive systems

When assessing the machine- or system-related risk in accordance with the respective local regulations (e.g., EC Machinery Directive), the machine manufacturer or system installer must take into account the following residual risks emanating from the control and drive components of a drive system:

1. Unintentional movements of driven machine or system components during commissioning, operation, maintenance, and repairs caused by, for example,
 - Hardware and/or software errors in the sensors, control system, actuators, and cables and connections
 - Response times of the control system and of the drive
 - Operation and/or environmental conditions outside the specification
 - Condensation/conductive contamination
 - Parameterization, programming, cabling, and installation errors
 - Use of wireless devices/mobile phones in the immediate vicinity of electronic components
 - External influences/damage
 - X-ray, ionizing radiation and cosmic radiation
2. Unusually high temperatures, including open flames, as well as emissions of light, noise, particles, gases, etc., can occur inside and outside the components under fault conditions caused by, for example:
 - Component failure
 - Software errors
 - Operation and/or environmental conditions outside the specification
 - External influences/damage
3. Hazardous shock voltages caused by, for example:
 - Component failure
 - Influence during electrostatic charging
 - Induction of voltages in moving motors
 - Operation and/or environmental conditions outside the specification
 - Condensation/conductive contamination
 - External influences/damage
4. Electrical, magnetic and electromagnetic fields generated in operation that can pose a risk to people with a pacemaker, implants or metal replacement joints, etc., if they are too close
5. Release of environmental pollutants or emissions as a result of improper operation of the system and/or failure to dispose of components safely and correctly
6. Influence of network-connected communication systems, e.g. ripple-control transmitters or data communication via the network

For more information about the residual risks of the drive system components, see the relevant sections in the technical user documentation.

Description

The components described in this manual – motor, converter and associated connection cables – are optimally tailored to one another and thereby facilitate the installation and commissioning in a few steps.

The commissioning and diagnostics are performed with a PC or notebook (commissioning device) via the web server integrated in the converter. A separate commissioning program or diagnostics tool is not required.

Correct usage

The components are intended for industrial and commercial use in industrial networks.

The motor is only approved for operation with a converter.

For system-specific setting options, refer to the following Chapter:



Commissioning and diagnostics in the Web server (Page 105).

Typical applications

- Robots and handling systems
- Packaging, plastics and textile machines
- Wood, glass, ceramics and stone working machines
- Printing machines

2.1 System overview

The drive system comprises the following system components tailored to one another:

- SINAMICS S210 converter
- SIMOTICS S-1FK2 motor
- OCC MOTION-CONNECT cable

The converter and the motor are optimally tailored to one another and are intended for use with a higher-level controller (PLC). Connection to the controller is via PROFINET:

Prefabricated MOTION-CONNECT cables in various lengths are available to simply connect the motor to the converter and to ensure safe and reliable operation.

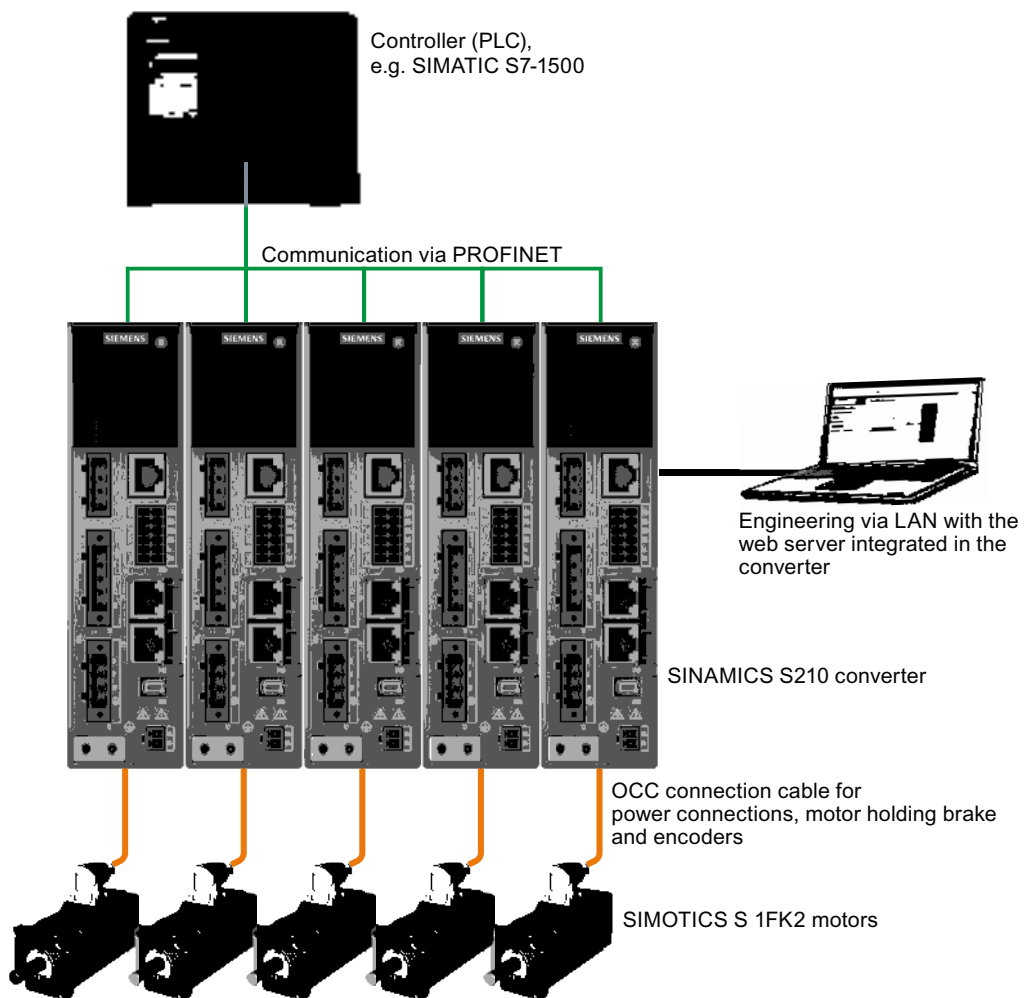
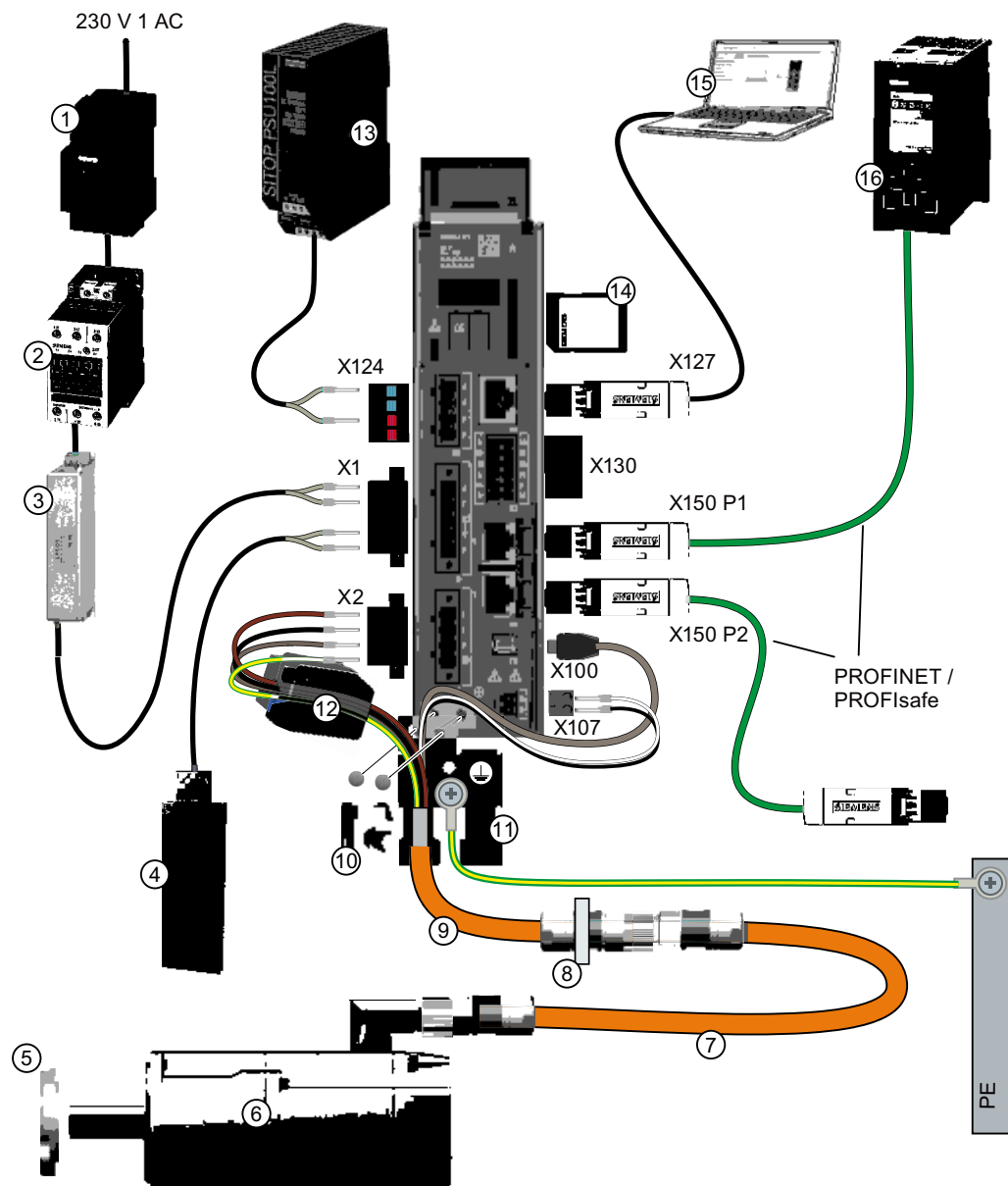


Figure 2-1 System



- | | |
|--|---|
| ① Fuse or circuit breaker | ⑨ OCC connection cable for motor, motor holding brake and encoder |
| ② Line contactor (optional) | ⑩ Shield clamp |
| ③ Line filter (optional) | ⑪ Shield plate |
| ④ External braking resistor (optional) | ⑫ Ferrite core (for frame size FSB) |
| ⑤ Shaft sealing ring for IP65 (optional) | ⑬ 24 V power supply |
| ⑥ 1FK2 servomotor | ⑭ SD memory card (optional) |
| ⑦ OCC extension cable (optional) | ⑮ Commissioning device |
| ⑧ Mounting flange for control cabinet bushing (optional) | ⑯ Controller, e.g. SIMATIC S7-1500 |

Figure 2-2 System components and accessories

2.2 The scope of supply for the system components

You must order the components individually.

Motor

The motor scope of delivery includes:

- A "Safety instructions" sheet
- A sheet referencing links to product information

Converter


The converter scope of delivery includes:

- The Quick Installation Guide (English)
- Shield plate
- A warning label for affixing in the control cabinet
- For FSB a ferrite core for EMC category C2
- The following connectors:
 - X1: Line connection and external braking resistor (jumper for internal braking resistor is enclosed.)
 - X2: Motor connection
 - X107: Motor holding brake
 - X124: 24 V DC supply voltage
 - X130: Connector for digital inputs

MOTION-CONNECT cable (OCC cable)

The scope of supply for the prefabricated MOTION-CONNECT cables includes:

- The MOTION-CONNECT cable with assembled connectors for connecting to motors and encoders
- A shield clamp for the connection of the shield to the shield plate of the converter
- A safety data sheet

Details on the OCC MOTION-CONNECT cables can be found in the following Section:
 Connection cables between the motor and the converter (Page 217).

2.3 Motor

The SIMOTICS S-1FK2, called "1FK2" in the following, is a permanent-magnet compact synchronous motor with an integrated encoder and a high degree of protection.

The 1FK2 meets the requirements of standards EN 60034 and EN 60204-1 - and complies with the Low-Voltage Directive 2014/35/EU.

| |
|---|
| WARNING |
| <p>Failure of pacemakers or implant malfunctions due to electromagnetic fields</p> <p>Electromagnetic fields (EMF) are generated by the operation of electrical power equipment, such as converters or motors. People with pacemakers or implants in the immediate vicinity of this equipment are at particular risk.</p> <p>Deviating from the notes in Section "General safety instructions (Page 11), applies to the 1FK2 motors:</p> <ul style="list-style-type: none"> • If you are affected, stay at a minimum distance of 30 cm from the motors. |

Dynamic versions

- 1FK21 "High Dynamic" with low moment of inertia for a maximum acceleration capability in applications with low load moments of inertia
- 1FK22 "Compact" with average moment of inertia and precise positioning and synchronous operation characteristics for applications with a high and variable load moment of inertia


Power range

0.05 kW ... 0.75 kW for a line supply voltage of 230 V 1 AC

Degree of protection

- IP64
- IP65 with a radial shaft sealing ring to protect against spray water

For additional information on the degree of protection, see Chapter:

 "Degree of protection (Page 180)"


Cooling


The 1FK2 is a non-ventilated motor.

The motor thermal losses are dissipated by thermal conduction, thermal radiation and natural convection.

If the ambient temperature exceeds 40 °C (104 °F) or the installation altitude 1000 meters above sea level, you must reduce torque and power of the motor (derating).

Information on derating can be found in Chapter:

 "Derating factors (Page 180)"


When mounting the motor, carefully observe the specifications in Chapter:
 "Cooling (Page 178)"

Bearing version

The motors have deep groove ball bearings with life-long lubrication.


The average bearing service life is designed for 25000 operating hours.

The motors have spring-loaded bearings in the NDE direction. For version with holding brake, the NDE bearing is a locating bearing.

The permissible axial and radial forces can be found in the technical data in Chapter:
 "Permissible radial and axial forces (Page 185)"

Shaft extension (IEC 60072-1)

- Cylindrical shaft without feather key
- Cylindrical shaft with feather key (half-key balancing)
- Optional for SH30 (1FK2□03): Cylindrical shaft without feather key, diameter x length: 11 mm x 23 mm


For additional information, see Chapter:
 "Shaft extension (Page 183)"

Encoder

The motor encoder resolution is 20 bit (1,048,576) per revolution (singleturn). An optional multiturn encoder is available that is equipped with an additional 12-bit revolution counter (traversing range of 4096 revolutions).

The names of these two encoders are as follows:

- AS20DQC: Absolute encoder, singleturn, 20 bit
- AM20DQC: Absolute encoder, 20 bit + 12 bit multiturn

For additional information, see Chapter:
 "Available encoders (Page 185)"

Holding brake

The 1FK2 servomotor is available with integrated holding brake. The holding brake is used to clamp the motor shaft when the motor is at a standstill.

The holding brake closes in the current-free state and locks the motor shaft. It opens as soon as current is flowing.

SINAMICS S210 controls the holding brake without any additional devices.

The torsional backlash of the holding brake is less than 1°.

The holding brake is not a working brake for braking the rotating motor. However, limited emergency stop operation is permissible.

The brake data can be found in Chapter:

 "Brake data (Page 185)"

Rating plate

The rating plate contains the Article No. and the technical information of the motor.

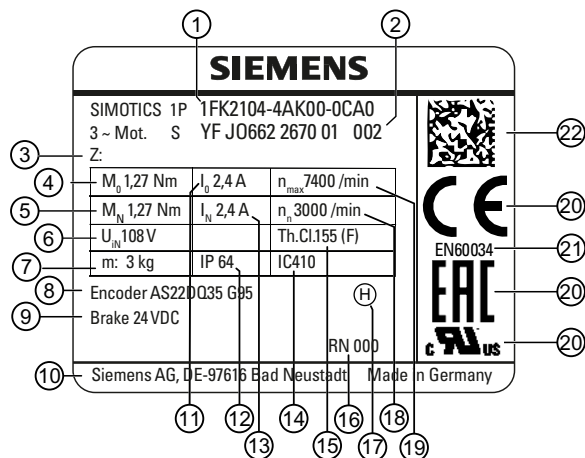


Figure 2-3 Rating plate

| Position | Description / technical specifications | Position | Description / technical specifications |
|----------|--|----------|--|
| 1 | Article number | 12 | Degree of protection |
| 2 | ID No., serial number | 13 | Rated current I_{rated} / A |
| 3 | Additional options specified as a supplement to the article number | 14 | Cooling mode according to EN 60034-6 |
| 4 | Static torque M_0 / Nm | 15 | Thermal class of the insulation system |
| 5 | Rated torque M_{rated} / Nm | 16 | Revision |
| 6 | Induced voltage at rated speed V_{IN} / V | 17 | Type of balancing (only for motors with feather key) |
| 7 | Motor weight m / kg | 18 | Rated speed n_{rated} / rpm |
| 8 | Marking of encoder type | 19 | Maximum speed n_{max} / rpm |
| 9 | Data of the holding brake | 20 | Certifications |
| 10 | Manufacturer's address | 21 | Standard for all rotating electrical machines |
| 11 | Stall current I_0 / A | 22 | Data matrix code |

2.4 Converter

The converter is a single-axis device (complete converter with integrated infeed). It is characterized by a compact design, side-by-side installation and high overload capability.

It is intended for use with 1FK2 motors.

- Supply voltage 200 V ... 240 V 1 AC \pm 10%
- Power range 100 W ... 750 W

Control mode

Servo control, optimized for 1FK2 motors

Integrated safety functions

With firmware version 5.1, the converter provides the following Safety Integrated Basic Functions:


- STO - Safe Torque Off
- SS1 - Safe Stop 1, time-controlled
- SBC - Safe Brake Control


 Safety functions integrated in the drive (Page 57)

Integrated braking resistor

In order to absorb the regenerative load of the motor, converters have an internal braking resistor (exception: 100 W device).

If the internal braking resistor is not sufficient, you have the option of connecting an external braking resistor.

 Configuring the external braking resistor (Page 52)

 Connections at the converter (Page 95)

Communicating with the controller via PROFINET

The converter supports the following functions:

- RT (real time)
- IRT (isochronous real time)
- MRP (media redundancy) with RT
- MRPD (seamless media redundancy) with IRT
- Shared device
- PROFIsafe
- PROFIenergy
- Automatic telegram selection

Commissioning, diagnostics and data backup

The commissioning, diagnostics and data backup are performed using a PC or notebook (commissioning device) via the web server integrated in the converter.

The converter is connected to the commissioning device via the service interface (X127).

Functions of the web server integrated into the converter:

- Commissioning
- Diagnostics of the drive
- Data backup and restore
- Restoring factory settings

Rating plate and information plate

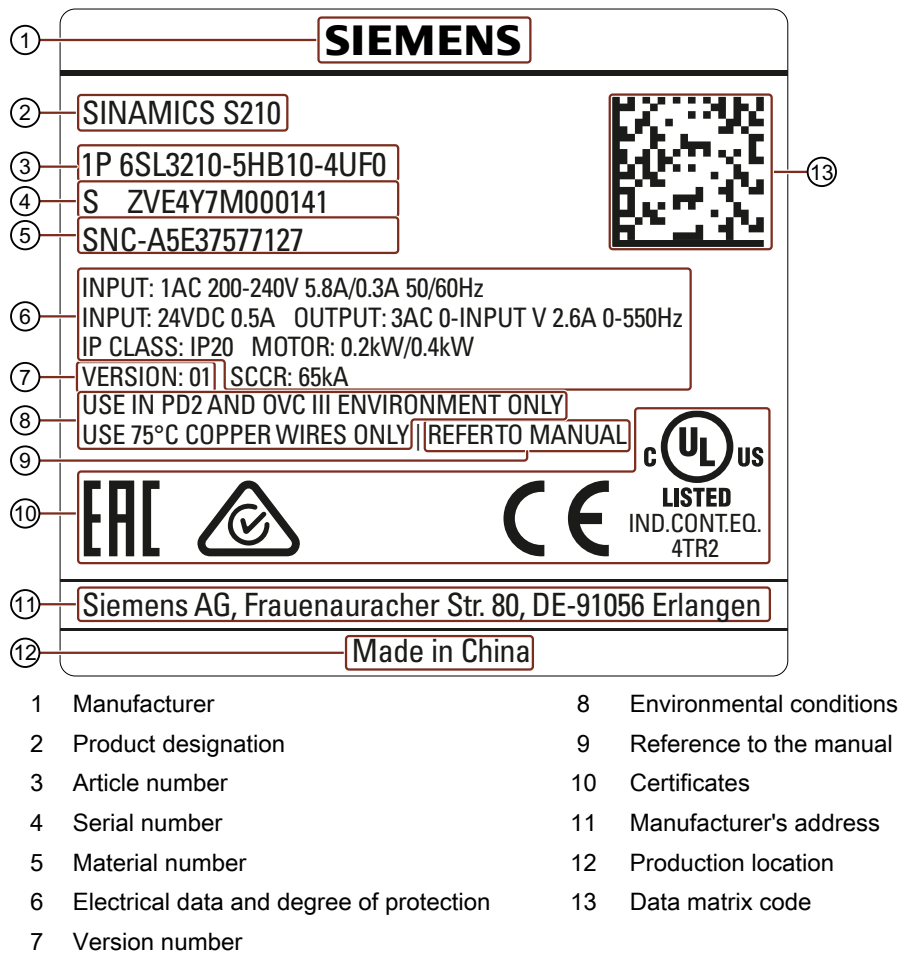
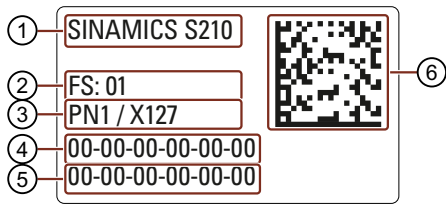


Figure 2-4 Rating plate of the converter

2.4 Converter



- 1 Product designation
- 2 Function release
- 3 PROFINET interface / service interface
- 4 MAC address of the PROFINET interface
- 5 MAC address of the service interface
- 6 Data matrix code

Figure 2-5 Information plate of the converter

2.5 Connection systems

The motor is connected to the converter by a MOTION-CONNECT cable.

The cable is in one cable connection technology and called "OCC cable" in the following.

As a result of its flexibility and low diameter, it permits very tight bending radii.


The OCC cables are available in the following variants:

- MOTION-CONNECT 500
 - Cost-effective solution for mainly fixed installation
 - Suitable for low mechanical loading
- MOTION-CONNECT 800PLUS
 - Meets requirements for use in cable carriers
 - tested for horizontal movement distances up to 50 m
 - not self-supporting
 - Suitable for high mechanical loading
 - Oil-resistant

The OCC cables can be supplied in lengths by the decimeter.

Extensions and cabinet bushings are available for the OCC cables.

For additional information, see Chapter:

 "Technical data and properties of the connection system (Page 204)"

2.6 Motor-converter combinations

The following table contains possible combinations of motors, converters and the associated connecting cables.

| Motor | | | Converter | | | | OCC cable | |
|-------------------|--------------------------------|-------------------|----------------------------------|---------|---------|---------|------------------------------|--------------|
| Shaft height [mm] | Article number digits 1 ... 10 | Torque M_0 / Nm | 100 W | 200 W | 400 W | 750 W | M12 | M17 |
| | | | Article number 6SL3210-5HB10-... | | | | Article number 6FX . 002-... | |
| | | | ...1UF0 | ...2UF0 | ...4UF0 | ...8UF0 | ...8QN04-... | ...8QN08-... |
| High Dynamic | | | | | | | | |
| 20 | 1FK2102-0AG... | 0.16 | x | | | | x | |
| 20 | 1FK2102-1AG... | 0.32 | x | | | | x | |
| 30 | 1FK2103-2AG... | 0.64 | | x | | | x | |
| 30 | 1FK2103-4AG... | 1.27 | | | x | | x | |
| 40 | 1FK2104-4AK... | 1.27 | | | x | | | x |
| 40 | 1FK2104-5AK... | 2.4 | | | | x | | x |
| Compact | | | | | | | | |
| 30 | 1FK2203-2AG... | 0.64 | | x | | | x | |
| 30 | 1FK2203-4AG... | 1.27 | | | x | | x | |

2.7 Optional accessories

The following accessories are optionally available for the drive:

- Memory card for the converter for data backup, series commissioning and for firmware updates
- Line filter
- Extension cable
- Components for customers to fabricate the connecting cable
 - Shield clamp
 - Connectors and cut-to-length cables (probably available from spring 2018)
- Mounting flange for control cabinet bushing
- Degree of protection kit: Shaft sealing ring for IP65 degree of protection for the motor



Ordering data (Page 215)

Configuring

3.1 EMC-compliant installation of a machine or system

The converter is designed for operation in industrial environments.

Reliable and disturbance-free operation is only guaranteed for EMC-compliant installation.

Further information



Additional information about EMC-compliant installation is available in the Internet:

EMC installation guideline (<http://support.automation.siemens.com/WW/view/en/60612658>)

3.1.1 Control cabinet

Control cabinet assembly

- Install a shield support for shielded cables that are routed out of the control cabinet.
- Connect the PE bar and the shield support to the control cabinet frame through a large surface area to establish a good electrical connection.
- Mount the converter, the 24 V DC power supply and the optional line filter on a bare metal mounting plate.
- Connect the mounting plate to the control cabinet frame and PE bar and shield support through a large surface area to establish a good electrical connection.

3.1.2 Cables

Cables with a high level of interference and cables with a low level of interference are connected to the converter.

Note

Cables with a high level of interference must be shielded.

- Cables with a high level of interference:
 - Cable between the line filter and converter
 - Motor cable
 - Cable between the converter and external braking resistor
- Cables with a low level of interference:
 - Cable between the line and line filter
 - Signal and data cables

Cable routing inside the cabinet

- Route the cables with a high level of interference so that there is the largest possible clearance to cables with a low level of interference.
- Cables with a high level of interference and cables with a low level of interference may only cross over at right angles:
- Keep all of the cables as short as possible.
- Route all of the cables close to the mounting plates or cabinet frames.
- Route signal and data cables - as well as the associated equipotential bonding cables - parallel and close to one another.
- Twist incoming and outgoing unshielded individual conductors.
Alternatively, you can route incoming and outgoing conductors in parallel, but close to one another.
- Ground any unused conductors of signal and data cables at both ends.
- Signal and data cables must only enter the cabinet from one side, e.g. from below.
- Use shielded cables for the following connections:
 - Cable between the converter and line filter
 - Cable between the converter and motor
 - Cable between the converter and external braking resistor

Routing converter cables inside and outside a control cabinet

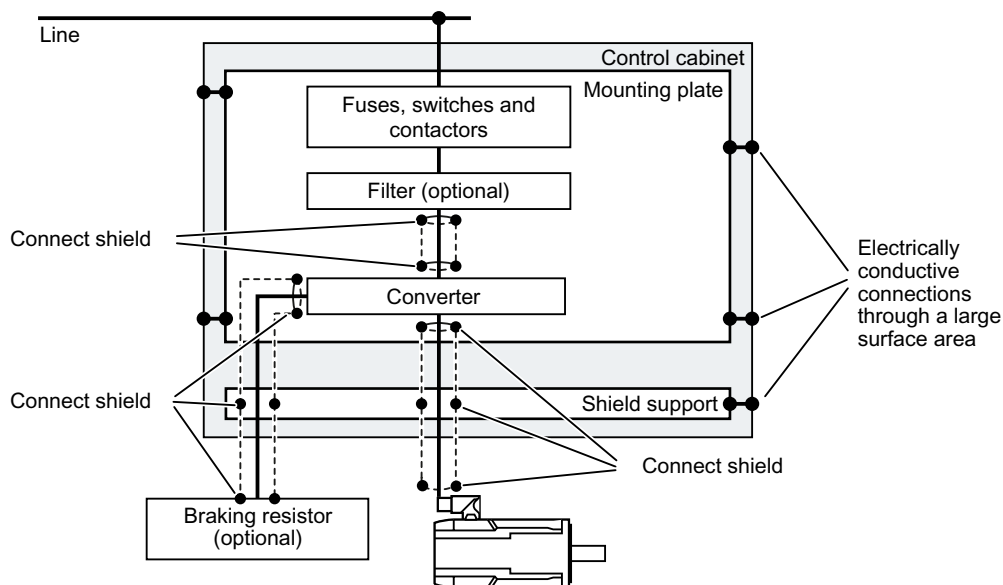


Figure 3-1 Routing converter cables inside and outside a control cabinet

Routing cables outside the control cabinet

- Maintain a minimum clearance of 25 cm between cables with a high level of interference and cables with a low level of interference.
- Use shielded cables for the following connections:
 - Converter motor cable
 - Cable between the converter and braking resistor
 - Signal and data cables

Requirements relating to shielded cables

- Use cables with finely-stranded, braided shields.
- Connect the shield at both ends of the cable.

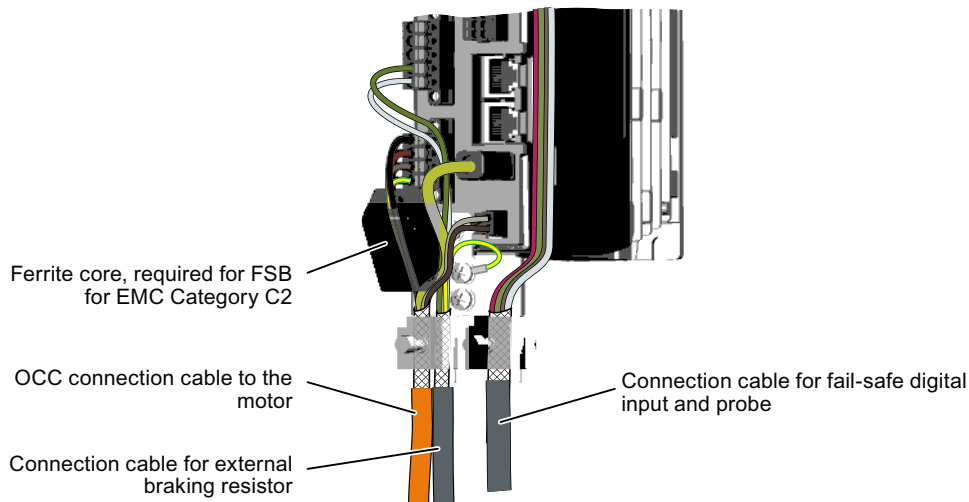


Figure 3-2 Shield support with the shield terminal from the scope of supply of the MOTION-CONNECT OCC cable.

- Connect the shield to the shield support.
- Do not interrupt the shield.

3.1.3 Electromechanical components

Surge voltage protection circuit

- Connect surge voltage protection circuits to the following components:
 - Coils of contactors
 - Relays
 - Solenoid valves
- Connect the surge voltage protection circuit directly at the coil.
- Use RC elements or varistors for AC-operated coils and freewheeling diodes or varistors for DC-operated coils.

3.2 Permissible line supplies and connection options

The converter is designed for the following line supplies according to IEC 60364-1 (2005).

- TN system
- TT system
- IT system

Converter operated on an IT system

You must move the grounding screw when operating the converter on an IT line system. As a consequence, you remove the grounding of the integrated EMC filter.

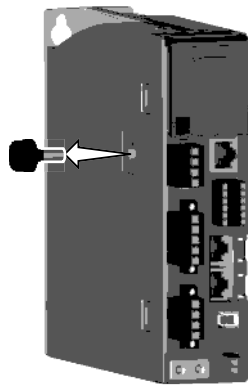


Figure 3-3 Screw for grounding at the converter

3.2.1 Connection options, 230 V devices

Basic connection options

You have the following options to supply the converter with an input voltage of 230 V.

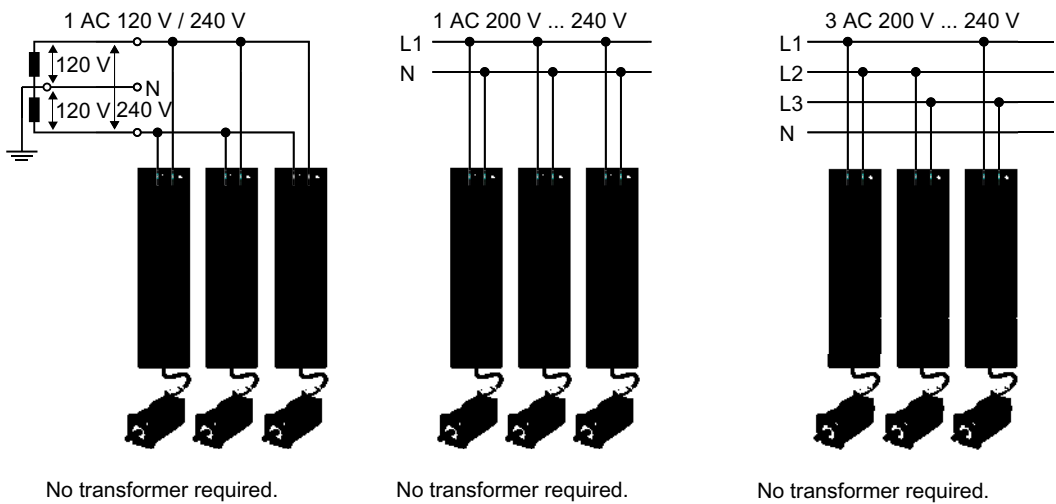
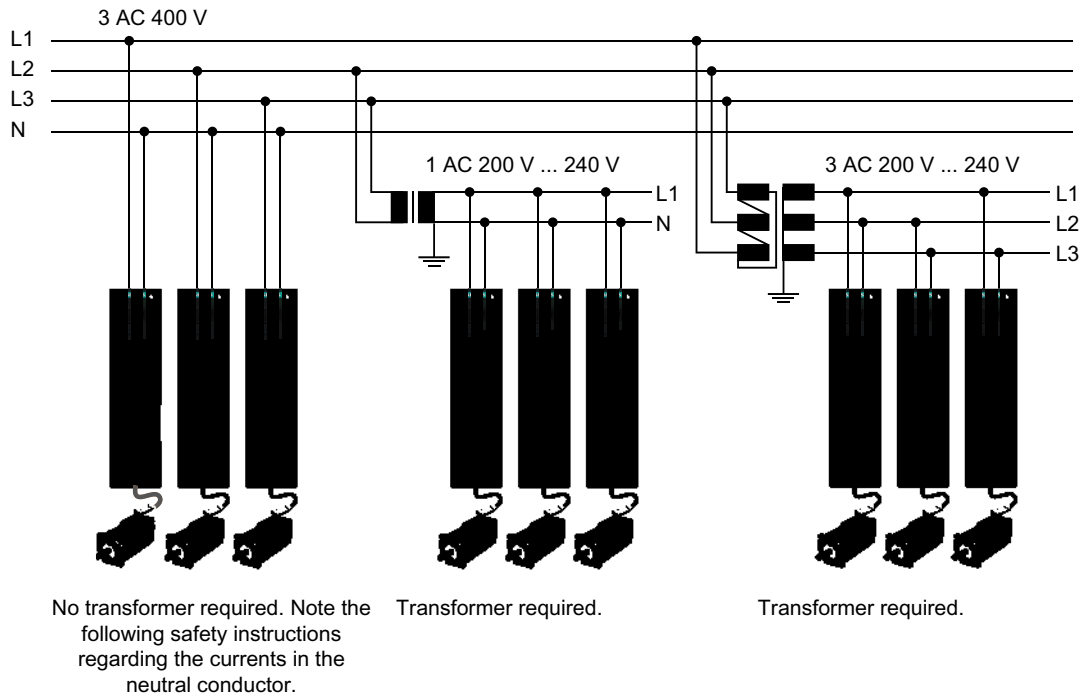


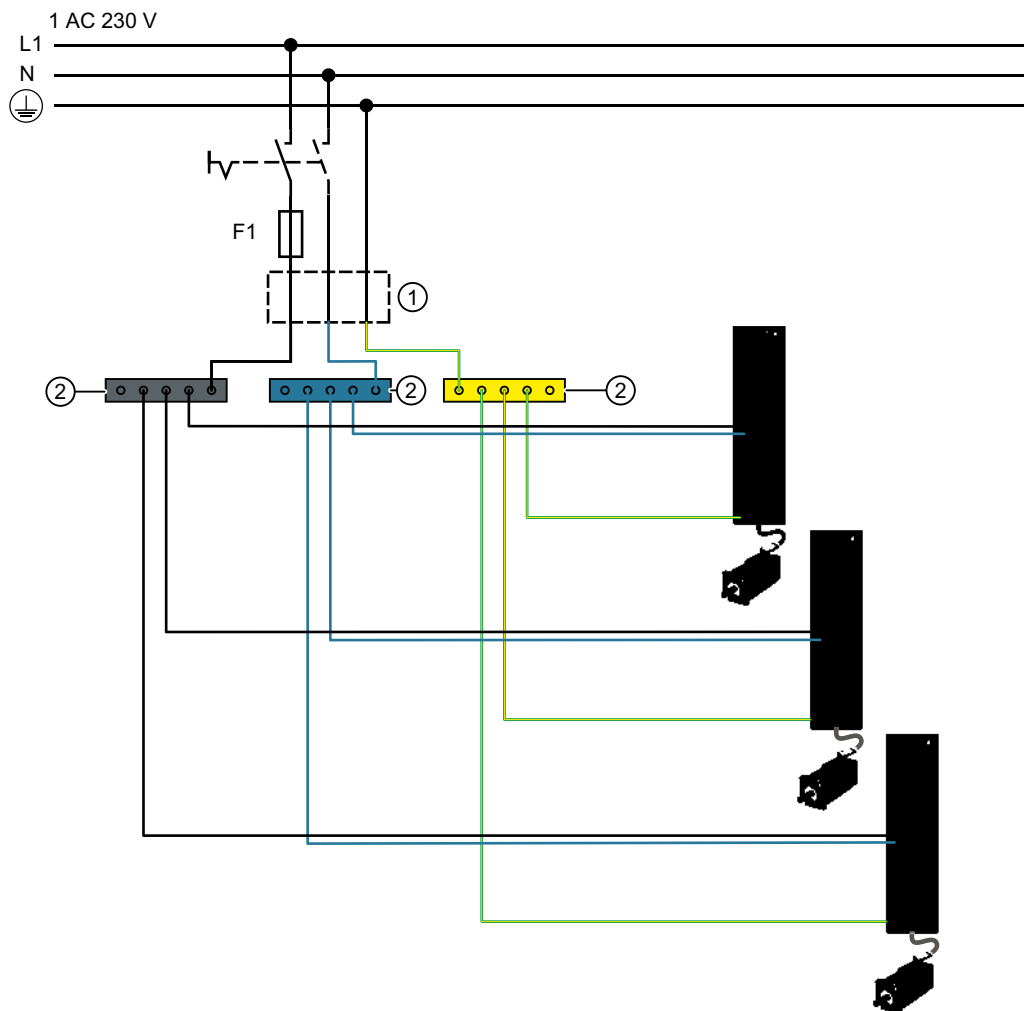
Figure 3-4 Connection options

WARNING**Neutral conductor fire caused by high currents**

If you connect the converter without an isolation transformer to a supply system with 400 V 3 AC between the N-conductor and a line conductor (L1, L2 or L3), the harmonic currents in the N-conductor can add up to values that are greater than the currents in the line conductors. This heats up the N-conductor and can cause a fire.

- Take the harmonic currents into account when dimensioning the power supply cables.

Connection examples and cable cross-sections

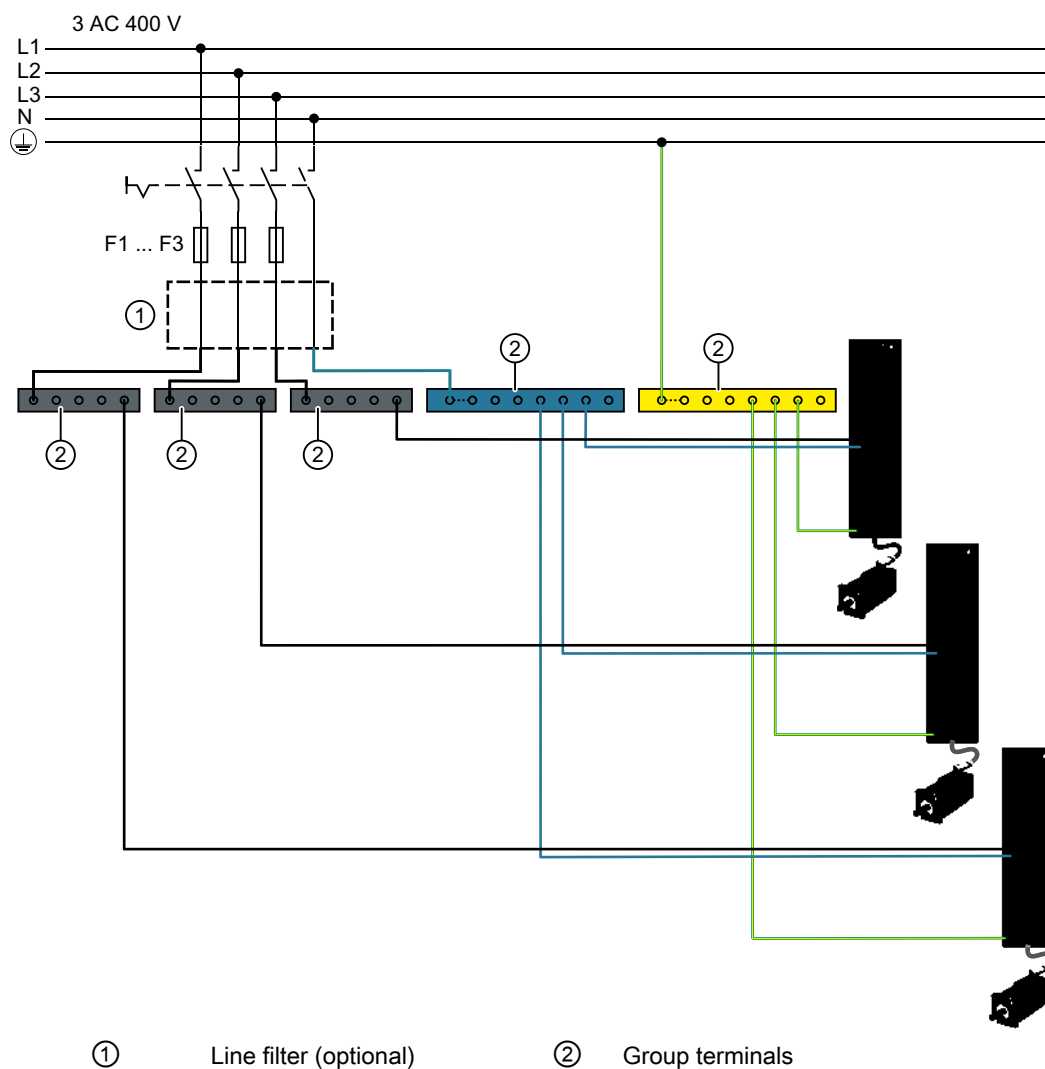


① Line filter (optional) ② Group terminals

Sum of the input currents of all converters ≤ 24 A

- Fuses:
3NA3812 or class J 30 A for UL/CSA
- Cables for the line connection up to the terminal box
4 mm², dimensioned for $I_{rms} \geq 32$ A_{rms} at 50 °C
- Cables for the connection from the terminal box to the converter
2.5 mm², dimensioned for $I_{rms} \geq 18.5$ A at 50 °C

Figure 3-5 Connection example for 230 V 1 AC



① Line filter (optional) ② Group terminals

Sum of the input currents of all converters per phase ≤ 24 A

- Fuses, F1 ... F3
3NA3812 or class J 30 A for UL/CSA
- Cables for the connection from the terminal box to the converter
4 mm², dimensioned for $I_{rms} \geq 32$ A at 50 °C
- Cables for the line connection up to the terminal box
2.5 mm², dimensioned for $I_{rms} \geq 18.5$ A at 50 °C

Figure 3-6 Connection example for 400 V 3 AC

3.3 Configuring the motor

3.3.1 Configuration sequence

Motion control

Drives are optimized for motion control applications. They execute linear or rotary movements within a defined movement cycle. All movements should be optimized in terms of time.

As a result, drives must meet the following requirements:

- High dynamic response, i.e. short rise times
- Capable of overload, i.e. a high reserve for accelerating
- Wide control range, i.e. high resolution for precise positioning.

The following table "Configuring procedure" is valid for synchronous and induction motors.

General configuring procedure

The function description of the machine provides the basis when configuring the drive application. The definition of the components is based on physical interdependencies and is usually carried out as follows:

Table 3-1 Configuring procedure

| step | Description of the configuring activity | |
|------|---|---------------------------|
| 1. | Clarification of the type of drive | Refer to the next chapter |
| 2. | Definition of supplementary conditions and integration into an automation system | |
| 3. | Definition of the load, calculation of the maximum load torque and selection of the motor | |

| step | Description of the configuring activity | |
|------|--|------------------|
| 4. | Selection of the SINAMICS Motor Module | Refer to catalog |
| 5. | Steps 3 and 4 are repeated for additional axes | |
| 6. | Calculation of the required DC link power and selection of the SINAMICS Line Module | |
| 7. | Selection of the line-side options (main switch, fuses, line filters, etc.) | |
| 8. | Specification of the required control performance and selection of the Control Unit, definition of component cabling | |
| 9. | Definition of other system components (e.g. braking resistors) | |
| 10. | Calculation of the current demand of the 24 V DC supply for the components and specification of the power supplies (SITOP devices, Control Supply Modules) | |
| 11. | Selection of the components for the connection system | |
| 12. | Configuration of the drive line-up components | |
| 13. | Calculation of the required cable cross sections for power supply and motor connections | |
| 14. | Inclusion of mandatory installation clearances | |

3.3.1.1 Clarification of type of drive

Select the motor on the basis of the required torque (load torque), which is defined by the application, e.g. traveling drives, hoisting drives, test stands, centrifuges, paper and rolling mill drives, feed drives or main spindle drives.

Gearboxes to convert motion or to adapt the motor speed and motor torque to the load conditions must also be taken into account when selecting the motor.

You must know the following mechanical data in order to determine the torque to be supplied by the motor:

- The load torque specified by the application
- Masses to be moved
- Diameter of the drive wheel
- Leadscrew pitch, gear ratios
- Frictional resistance data
- Mechanical efficiency
- Traversing distances
- Maximum velocity
- Maximum acceleration and maximum deceleration
- Cycle time

3.3.1.2 Specification of the supplementary conditions and integration into the automation system

Take the following into account during the configuration:

- The line system configuration when using specific motor types and/or line filters
- The utilization of the motor rated values for winding overtemperatures of 60 K or 100 K (for synchronous motors)
- The ambient temperatures and the installation altitude of the motors and drive components
- The heat dissipation from the motors through natural ventilation, forced ventilation or water cooling

Other conditions apply when integrating the drives into an automation environment such as SINUMERIK or SIMOTION.

For motion control and technology functions (e.g. positioning), as well as for synchronous operation functions, the corresponding automation system, e.g. SIMATIC S7-1500 or SIMOTION D is used.

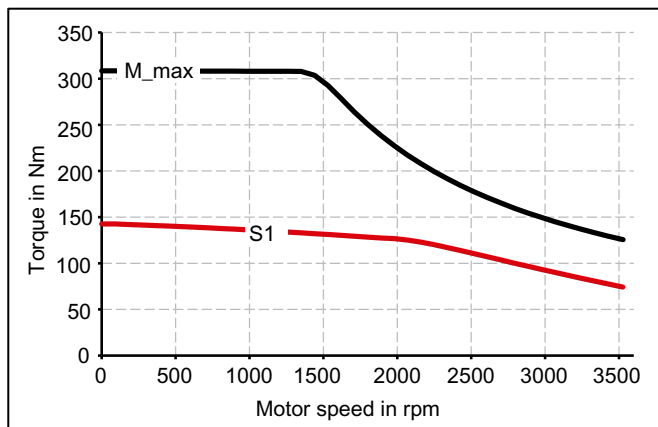
3.3.1.3 Definition of the load, calculation of the maximum load torque and determination of the motor

The motors are defined bases on the motor type-specific limiting characteristic curves.

The limiting characteristic curves describe the torque or power curve over the speed.

The limiting characteristic curves take the limits of the motor into account on the basis of the DC-link voltage. The DC-link voltage is dependent on the line voltage.

In the case of torque drive the DC-link voltage is dependent on the type of Line Module and the type of infeed module or infeed/regenerative feedback module.



M_max Curve of the maximum torque

S1 S1 characteristic

Figure 3-7 Limiting characteristic for synchronous motors 1FK2

Procedure

1. Determine the load which is specified by the application.
Use different characteristics for the different loads.
The following operating scenarios have been defined:
 - Duty cycle with constant ON duration
 - Free duty cycle
2. Determine the characteristic torque and speed operating points of the motor for the defined load.
3. Calculate the acceleration torque of the motor.
Add the load torque and the acceleration torque to obtain the maximum required torque.
4. Verify the maximum motor torque with the limiting characteristic curves of the motors.
The following criteria must be taken into account when selecting the motor:
 - Adherence to the dynamic limits
All speed-torque points of the load event must lie below the relevant limiting characteristic curve.
 - Adherence to the thermal limits
At average motor speed, the effective motor torque must be below the S1 characteristic (continuous operation) during the load.



You have specified a motor.

Duty cycles with constant ON duration

For duty cycles with constant ON duration, there are specific requirements for the torque characteristic curve as a function of the speed, for example:

$M = \text{constant}$, $M \sim n^2$, $M \sim n$ or $P = \text{constant}$.

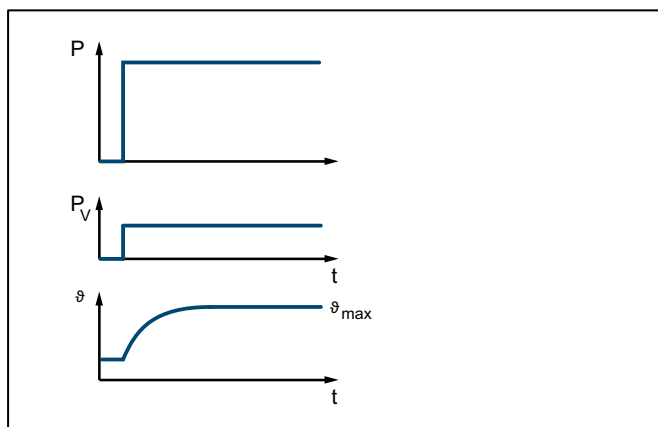
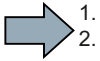


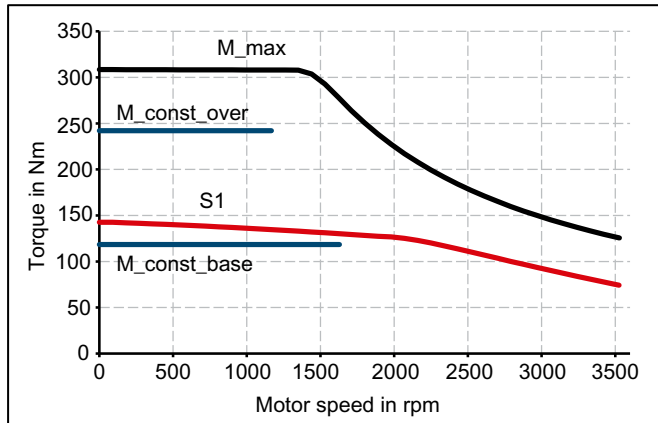
Figure 3-8 S1 duty (continuous operation)

The drives with this load cycle typically operate at a stationary operating point.

Procedure



1. Configure a base load for the stationary operating point. The base load torque must lie below the S1 characteristic.
2. In the event of transient overloads (e.g. during acceleration), configure an overload. Calculate the overload current in relation to the required overload torque. The overload torque must lie below the M_max characteristic.
In summary, the motor is configured as follows:



| | | | |
|-------|-----------------------------|------------|-------------------------------|
| M_max | Curve of the maximum torque | M_const_ov | Curve of the overload torque |
| S1 | S1 characteristic | M_const_b | Curve of the base load torque |
| | | ase | |

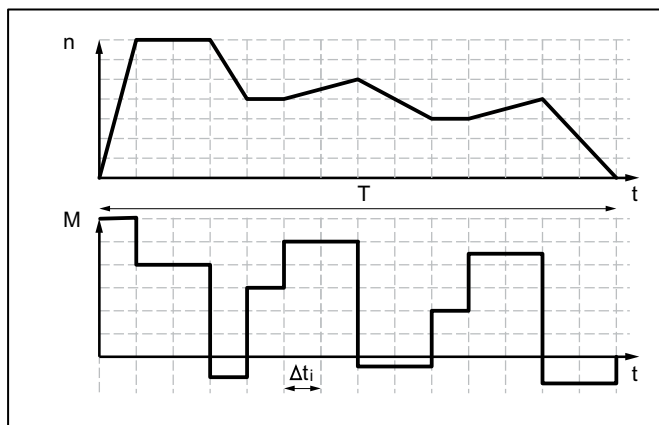
Figure 3-9 Motor selection for a duty cycle with constant switch-on duration



3. Select a motor that satisfies the requirements of S1 duty.

Free duty cycle

A free duty cycle defines the curve of the motor speed and the torque over time.



n Speed T Cycle time
M Torque Δt_i Time interval
t Time

Figure 3-10 Example of free duty cycle

Procedure

Determine the required motor torque as follows:

- Define a load torque for each time slice. Also take the average load moment of inertia and motor moment of inertia into account for acceleration operations. If required, take a frictional torque into account that opposes the direction of motion.
- With mounted gearbox:
Determine the load torque and the acceleration torque that must be supplied by the motor. Take the gear ratio and gear efficiency into account.

Note

A higher gear ratio increases positioning accuracy in terms of encoder resolution. For any given motor encoder resolution, as the gear ratio increases, so does the resolution of the machine position to be detected.

The following formulas can be used for duty cycles outside the field weakening range.

For the motor torque in a time slice Δt_i the following applies:

$$M_{Mot, i} = (J_M + J_G) \cdot \frac{2\pi}{60} \cdot \frac{\Delta n_{Last, i}}{\Delta t_i} \cdot i + (J_{Last} \cdot \frac{2\pi}{60} \cdot \frac{\Delta n_{Last, i}}{\Delta t_i} + M_{Last, i} + M_R) \cdot \frac{1}{i \cdot \eta_G}$$

The motor speed is:

$$n_{Mot, i} = n_{Last, i} \cdot i$$

The effective torque is obtained as follows:

$$M_{Mot, eff} = \sqrt{\frac{\sum M_{Mot, i}^2 \cdot \Delta t_i}{T}}$$

The average motor speed is calculated as follows:

$$n_{Mot, mittel} = \frac{\sum n_{Mot, i, A} + n_{Mot, i, E} \cdot \Delta t_i}{T}$$

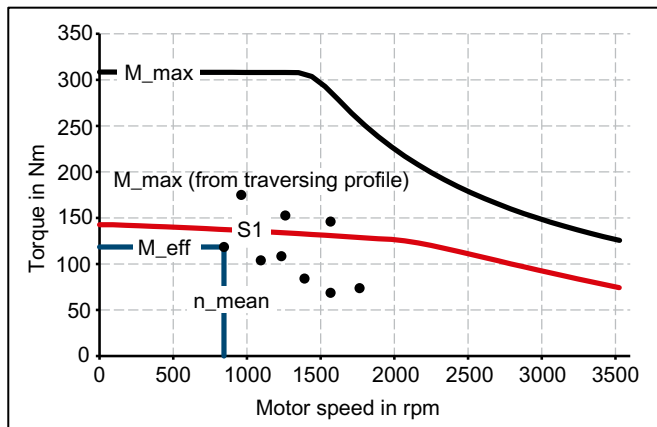


3.3 Configuring the motor

- J_M Motor moment of inertia
- J_G Gearbox moment of inertia
- J_{load} Load moment of inertia
- n_{load} Load speed
- i Gear ratio
- η_G Gearbox efficiency
- M_{load} Load torque
- M_R Frictional torque
- T Cycle time
- A; E Initial value, final value in time slice Δt_i
- t_e ON duration
- Δt_i Time interval

The effective torque M_{eff} must lie below the S1 characteristic.

The maximum torque M_{max} is produced during the acceleration operation. M_{max} must lie below the voltage limiting characteristic curve. In summary, the motor is configured as follows:



- M_{max} Curve of the maximum torque
- M_{eff} Effective torque
- n_{mean} Mean speed
- S1 S1 characteristic = M_0
- Points from the traversing profile

Figure 3-11 Motor selection for duty cycle

You have defined the characteristic motor values corresponding to the duty cycle.



Specification of the motor

By varying, you can find the motor that satisfies the conditions of the operating mode (duty cycle).

- Determine the motor current at base load. The calculation depends on the type of motor (synchronous motor or induction motor) and the operating mode (duty cycle) used.

Note

When configuring according to duty cycle with constant ON duration with overload, the overload current is calculated in relation to the required overload torque.

- Comply with the thermal limits of the motor.
- Configure the other properties of the motor through the available motor options.

3.4 Configuring the external braking resistor

The converter has a Braking Module that converts regenerative energy of the servo motors into heat via an integrated braking resistor. Regenerative energy is produced, for example, when braking the connected mechanical system.

The continuous braking power and the braking energy that the integrated braking resistor can convert into heat are listed in the following table:

Table 3-2 Braking energy and continuous braking power with the integrated braking resistor in relation to the shaft of the servo motor

| Converter | | Braking energy [J] | Continuous braking power [W] |
|--------------------|-----------|--------------------|------------------------------|
| Article number | Power [W] | | |
| 6SL3210-5HB10-1UF0 | 100 | 20 | 5 |
| 6SL3210-5HB10-2UF0 | 200 | 570 | 10 |
| 6SL3210-5HB10-4UF0 | 400 | 840 | 20 |
| 6SL3210-5HB10-8UF0 | 750 | 1680 | 40 |


When do you require an external braking resistor?

Applications with frequent and very fast braking processes are typical applications that may require an external braking resistor.

To find out whether you require an external braking resistor, calculate the braking energy that you require according to the following formula:

$$W = 0.5 (J_{\text{Mot}} + J) \times 4\pi^2 / 3600 \times (n_1^2 + n_2^2)$$

J_{mot} Moment of inertia of the servomotor

 High Dynamic (Page 187)

 Compact (Page 194)

J Moment of inertia of the driven mechanical system in relation to the shaft of the servo motor

Note

As the actual friction is not taken into account in the above formula, less energy is fed back to the servo drive system in practice than that calculated in the formula.

Example

Moment of inertia of the servomotor 1FK2104-2AG1

$$J_{\text{mot}} = 0.75 \times 10^{-4} \text{ kg m}^2$$

Moment of inertia of the driven mechanical system

$$J = 4 \times 10^{-4} \text{ kg m}^2$$

$$n_1 = 3000 \text{ rpm}$$

$$n_2 = 600 \text{ rpm}$$

$$\Rightarrow W = 22.5 \text{ J} \quad (1 \text{ J} = 1 \text{ Ws})$$

Requirements placed on the external braking resistor

| |
|---|
| WARNING |
| <p>Risk of fire caused by continuous overload</p> <p>If the external braking resistor is continuously overloaded, for example as the result of a defective braking chopper, this can result in an explosion or fire - or the housing could melt.</p> <ul style="list-style-type: none"> • Use only braking resistors that are intrinsically safe. |

Table 3-3 Resistance data for an external braking resistor

| Converter | | Braking resistor | | | |
|--------------------|-----------|-------------------------|-------------------------|---------------------|-----------------|
| Article number | Power [W] | Resistance [Ω] | Peak braking power [kW] | Braking energy [kJ] | Rated power [W] |
| 6SL3210-5HB10-1UF0 | 100 | 150 | 1.09 | 0.8 | 20 |
| 6SL3210-5HB10-2UF0 | 200 | | | | |
| 6SL3210-5HB10-4UF0 | 400 | 100 | 1.64 | 1.23 | 21 |
| 6SL3210-5HB10-8UF0 | 750 | 50 | 3.28 | 2.46 | 62 |

Table 3-4 Examples of suitable external braking resistors from a third party

| Converter | | Braking resistor | | |
|--------------------|-----------|---|-------------------------|--|
| Article number | Power [W] | Continuous braking power of the brake chopper [W] | Peak braking power [kW] | Example of manufacturer or equivalent |
| 6SL3210-5HB10-1UF0 | 100 | 50 | 1.1 | Michael Koch GmbH, BWG250150 |
| 6SL3210-5HB10-2UF0 | 200 | 100 | 1.1 | Michael Koch GmbH, BWG250150 |
| 6SL3210-5HB10-4UF0 | 400 | 200 | 1.7 | Michael Koch GmbH, BWG500100 |
| 6SL3210-5HB10-8UF0 | 750 | 240 | 3.6 | Michael Koch GmbH, BWG600047 ¹⁾ |

1) For thermal reasons, it is not permissible that the continuous braking power of 240 W is exceeded.

Note

Braking resistor with temperature monitoring

Use only a braking resistor with temperature monitoring.

Connecting the external braking resistor

Use shielded cables to connect power to the external braking resistor.

How to connect the external braking resistor and the temperature monitoring is described in the following Sections:



Connections for open-loop and closed-loop control of the converter (Page 101).

Setting the temperature monitoring of the external braking resistor

If you have connected the external braking resistor with motor temperature monitoring, you must activate the temperature monitoring via the web server of the converter.

 Configuring digital inputs (Page 127).

Activate the digital input DI 4 "Temperature monitoring of the external braking resistor".

The converter switches the motor off as soon as the external braking resistor is too hot or when no external braking resistor is connected (wire break).

3.5 Establishing communication of the converter with the controller

You only have to create the communication settings between the converter and the PLC in the corresponding PLC.

The converter takes over the telegram settings from the PLC during run-up.

You can create one standard telegram and two different supplementary or safety telegrams for the converter.

The converter supports the following telegrams:

Standard telegrams:

- Telegram 3
- Telegram 5
- Telegram 102
- Telegram 105


Supplementary telegrams

- Telegram 700
- Telegram 701
- Telegram 750

PROFIsafe telegrams

- Telegram 30
- Telegram 901

For further information about telegrams

 Communication telegrams (Page 737)

Safety functions integrated in the drive

4.1 Overview of Safety Integrated Functions

In comparison to standard drive functions, safety functions have an especially low error rate. Performance level (PL) and safety integrity level (SIL) of the corresponding standards are a measure of the error rate.

As a consequence, the safety functions are suitable for use in safety-related applications to minimize risk. An application is safety-related if the risk analysis of the machine or the system indicates a special hazard potential in the application.

Safety Integrated ("drive-integrated") means that the safety functions are integrated in the converter and can be executed without requiring additional external components.

You make the settings for these Safety Integrated Functions via the web server. Take the instruction in the following section into account:

 Safety settings in the Web server (Page 135)

Overview of Safety Integrated Functions

The Safety Integrated Functions comply with:

- Safety Integrity Level (SIL) 2 according to DIN EN 61508
- Category 3 according to DIN EN ISO 13849-1
- Performance level (PL) d according to DIN EN ISO 13849-1

The Safety Integrated Functions correspond to the functions according to EN 61800-5-2.

Basic Functions

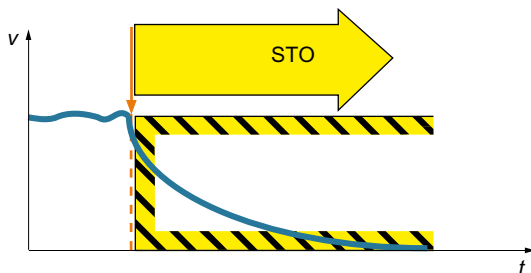
These functions are part of the standard scope of the converter and can be used without requiring an additional license. The Basic Functions consist of the following Safety Integrated Functions:

- Safe Torque Off (STO)
- Safe Brake Control (SBC)
- Safe Stop 1, time-controlled (SS1)

4.2 Basic Functions

4.2.1 Safe Torque Off (STO)

Overview



Safe Torque Off (STO) is a safety function that immediately ensures that torque or force-generating energy is not fed to the motor. This function corresponds to stop category 0 to EN 60204-1.

If the motor is still rotating when STO is selected, then it coasts down to standstill.

Functional features

The switching on inhibited prevents an automatic restart after deselection of STO and therefore satisfies the requirements of EN 60204-1. Consequently, the STO function prevents an electrically-driven machine component from restarting.

Note

There is no galvanic isolation between motor and converter.

The STO function can be selected via PROFIsafe and/or the fail-safe digital input (F-DI). STO is a drive-specific function that must be put into operation individually for each drive.

Applications

Applications include all machines and systems with moving axes (e.g. conveyor technology, handling).

STO is suitable for applications where the motor is already at a standstill or will come to a standstill in a short, safe period of time as a result of friction.

STO facilitates personnel to work safely with the protective door open. A classic Emergency Stop with electromechanical isolation is not required. The converter remains connected to the line and can be fully diagnosed.


Note

The distinction between Emergency Off and Emergency Stop

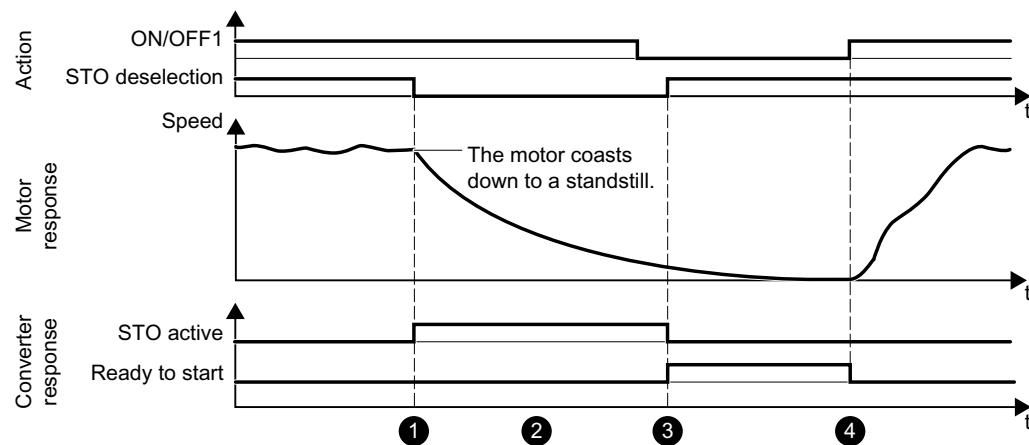
"Emergency Off" and "Emergency Stop" are commands that minimize different risks in the machine or plant.

The STO function is suitable for implementing an Emergency Stop - but not an Emergency Off.

Details regarding the distinction between Emergency Off and Emergency Stop are provided in the following section:

 What is the difference between the Emergency Off and Emergency Stop functions? (Page 745)

Sequence diagram



- ① During operation, STO is selected via PROFIsafe or F-DI.
The converter signals the status to the PLC via PROFIsafe for further processing.
- ② After the response time, the drive immediately initiates safe pulse suppression. This interrupts the torque-generating energy fed to the motor. The motor coasts down to a standstill. STO safely prevents an unwanted restart of the motor.

Restart:

- ③ The converter goes into the "Ready to start" state, when STO is deselected via PROFIsafe or F-DI.
- ④ The converter switches the motor on again with a positive signal edge at ON/OFF.

Selecting/deselecting "Safe Torque Off"

If "Safe Torque Off" is selected, the motor holding brake is closed (if connected and configured).

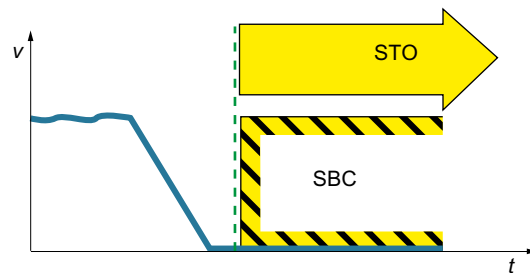
4.2 Basic Functions

Deselecting "Safe Torque Off" represents an internal safety acknowledgment. The following is executed when the cause of the fault has been removed:

1. The Safety requirement "Close motor holding brake" is canceled.
2. Any pending STOP F or STOP A commands are canceled.
3. The messages in the fault memory must also be reset using the general acknowledgment mechanism.

4.2.2 Safe Brake Control (SBC)

Overview



The "Safe Brake Control" function (SBC) is used to safely control the motor-integrated holding brake.

The holding brake opens as soon as voltage is available - and closes when in the no-voltage state.

Functional features

In order that SBC can become active you must enable the function when commissioning the system.

Note

SBC cannot be selected as an autonomous function; however, if it is enabled, it is activated at the same time that STO is selected.

The holding brake is controlled using the encoder integrated in the motor.

Applications

SBC can be used wherever a safe position must be maintained even with a de-energized motor, in order to prevent suspended or passing loads from dropping (e.g. lifting gear, passenger elevators, winders). No external logic or switching elements required, as the functionality is completely integrated in the drive.

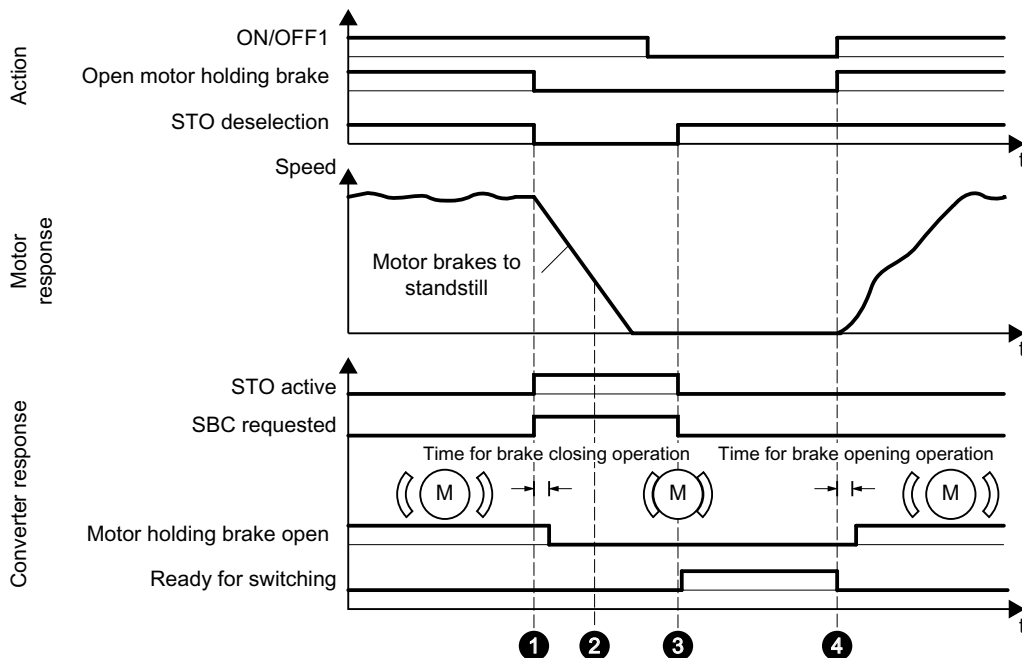
Note

Condition of the motor holding brake

SBC is not able to identify as to whether a holding brake is mechanically worn or is a defective.

As a consequence, observe the maximum permissible number of emergency braking operations for the motor holding brake being used.

Sequence diagram

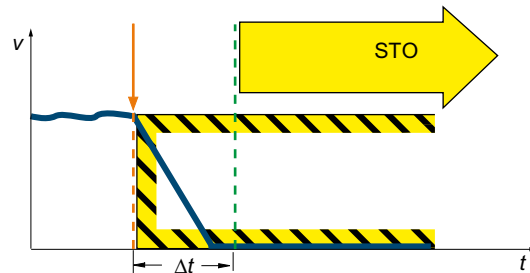


- 1** STO is selected during operation via the control bit of the selected PROFIsafe telegram or via the F-DI.
Safe Brake Control (SBC) is activated at the same time. Taking the brake closing time (r1217) into account, the command to close the motor holding brake closes the brake, thus supporting the shutdown process initiated by STO.
- 2** The mechanical brake brakes the motor down to standstill.
- 3** The converter goes into the "Ready to start" state, when STO is deselected via PROFIsafe or F-DI. SBC is reset at the same time. The brake remains (unsafely) closed until the standard program executes the command to open the brake.
- 4** The converter switches the motor on again with a positive signal edge at ON/OFF.
Taking the brake opening time (r1216) into account, the command to open the motor holding brake opens the brake.

The converter carries out a check to ensure that the "Safe Brake Control" function is working properly and ensures that - if there is a failure or fault - the brake current is interrupted and the brake is thus applied. If a fault is detected by the converter, the brake current is disconnected. The brake then closes and a safe state is reached.

4.2.3 Safe Stop 1 (SS1, time-controlled)

Overview



The "Safe Stop 1" function (SS1, time-controlled) causes a drive-autonomous deceleration of the motor and initiates the "Safe Torque Off" (STO) function after a predefined time interval has elapsed. This function corresponds to stop category 1 to EN 60204-1.

Functional features

There are the following variants for the Basic Function "Safe Stop 1":

- SS1 with OFF3 (SS1-t according to IEC 61800-5-2)
- SS1 with external stop (SS1E)

The setting of the SS1 response is performed during the Safety commissioning in the step "Parameterization"

Applications

SS1 can be used wherever the load torque cannot stop the motor in a sufficiently short time as a result of friction - or where there is a safety risk if the drive coasts down (STO).

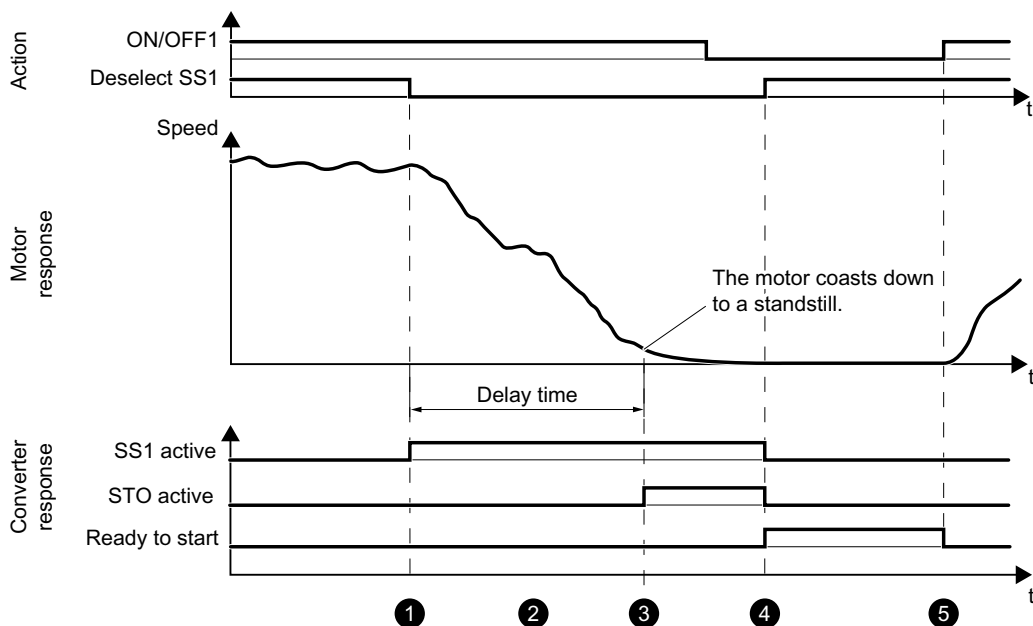
SS1 with OFF3 (SS1-t)

When SS1-t is selected, the motor speed is reduced along the OFF3 ramp for the duration of the selected delay time. After the delay time expires, the converter activates the STO function (independent of the actual speed).

Note

There is a single-channel monitoring of the braking process at the OFF3 ramp!

Flow diagram SS1 with OFF3 (SS1-t)



- ① SS1 is selected during operation (selection via the control bit of the selected PROFIsafe telegram or via F-DI).
The converter signals the status "SS1 active" via the status bit of the PROFIsafe telegram to the PLC for further processing.
- ② After the response time, the converter initiates braking along the OFF3 ramp. The SS1 delay time is started at the same time.
The converter brakes the motor along the OFF3 ramp for the duration of the delay time.
- ③ STO is initiated automatically after the SS1 delay time expires (p9652).
The motor coasts down to a standstill. STO safely prevents an unwanted restart of the motor.
- ④ When SS1 is deselected (via PROFIsafe or F-DI), STO and SS1 are deactivated and the converter goes into the "Ready for switching on" state.
- ⑤ The converter switches the motor on again with a positive signal edge at ON/OFF.

Shutting down the motor with SS1 active

When SS1 is active, the OFF2 command stops the energy supply to the motor, even before the delay time for SS1 has elapsed. The motor coasts down to a standstill.

Proceed as follows in order to switch on the motor again:

1. Deselect SS1. This deactivates SS1 and STO.
2. Deselect the OFF2 command. The converter goes into the "Ready for switching on" state.
3. Switch the motor off and back on to send an ON signal to the motor.

Note**OFF1 or OFF3 for active SS1**

Switching the motor off via an OFF1 or OFF3 command while SS1 is active (e.g. by a limit switch) does not influence the response of converter and motor.

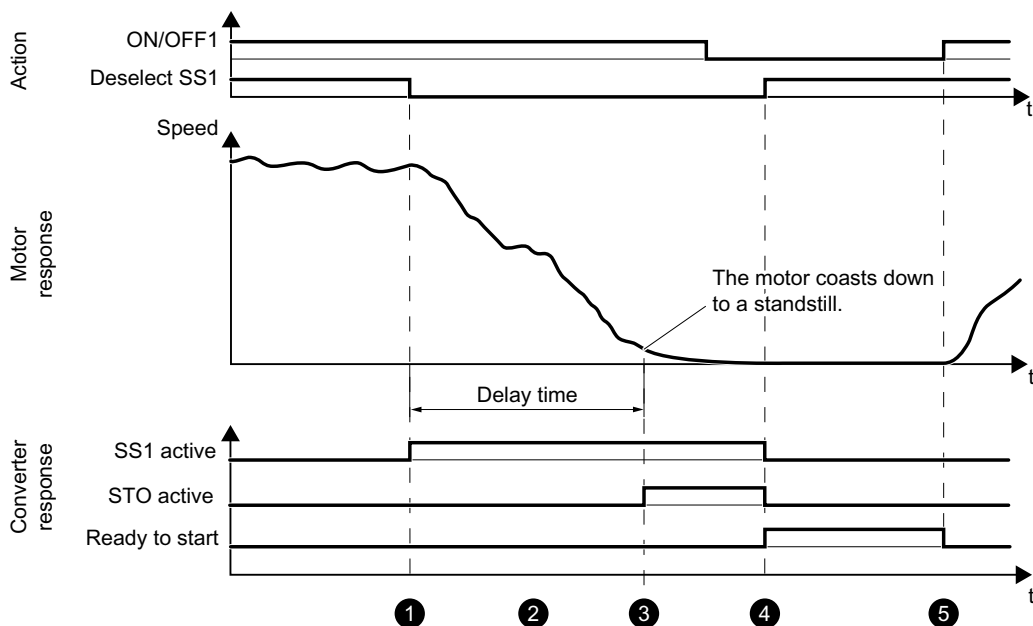
SS1 remains active after the OFF command. After the delay time has elapsed, the converter transitions to STO status.

SS1 with external stop (SS1E)

If several drives are connected with one another through a material web, then braking initiated by a single drive at the related OFF3 ramp can damage the machine or system.

When the safety function SS1E is used, the drive is shut down using the user program of a higher-level control system. Although the safe delay time is activated when SS1E is selected, OFF3 is not activated. The converter signals via PROFIsafe or the Safety Info Channel (SIC) of the supplementary telegram that SS1 was selected. Using an appropriate program, the control must then ramp down the drives involved within the delay time to the safe state. After the delay time has elapsed, the converter activates the STO function and safely interrupts the energy feed to the motor (independent of the actual speed).

Flow diagram SS1 with external stop (SS1E)



- ① SS1E is selected during operation (selection via the control bit of the selected PROFIsafe telegram or via F-DI).
The converter signals the status "SS1 active" via the status bit of the PROFIsafe telegram to the PLC for further processing.
- ② The control system triggers the shutdown via the setpoint input. The SS1 delay time in the converter is started at the same time.
The motor is braked by the external setpoint input, and signals "SS1E selected" to the PLC.
- ③ STO is initiated automatically after the SS1 delay time expires (p9652).
The motor coasts down to a standstill. STO safely prevents an unwanted restart of the motor.
- ④ When SS1 is deselected (via PROFIsafe or F-DI), STO and SS1 are deactivated and the converter goes into the "Ready for switching on" state.
- ⑤ The converter switches the motor on again with a positive signal edge at ON/OFF.

Note

SS1 cannot be interrupted

If SS1 is deselected again during this time, the STO function is selected and deselected again immediately after the delay time has elapsed or the speed has dropped below the shutdown speed. This terminates the SS1 function normally. It cannot be interrupted.

Setting the delay time for SS1

Select the SS1 delay time such that the converter can brake the motor down to standstill along the OFF3 ramp in any state of the work process.

The OFF3 ramp-down time must be orientated to the actual braking capacity of the system or machine.

Use the following procedure to select the SS1 delay time:

SS1 delay time with parameterized motor holding brake:

SS1 delay time (p9652) \geq OFF3 ramp-down time (p1135) + pulse suppression delay time (p1228) + motor holding brake closing time (p1217)

SS1 delay time, without parameterized motor holding brake:

SS1 delay time (p9652) \geq OFF3 ramp-down time (p1135) + pulse suppression delay time (p1228)

4.3 Configuring the safety functions

When configuring the safety functions, you specify the interfaces that activate the safety functions.

Selection via F-DI

You can select or deselect the safety function via the fail-safe digital input (F-DI).

Whether STO or SS1 is activated when you select the safety function depends on the setting of the SS1 delay time:

- SS1 delay time = 0: STO is activated immediately
- SS1 delay time > 0: SS1 is activated; STO is activated after the SS1 delay time has expired

Selection via PROFIsafe

The following safety telegrams are available for the safety functions via PROFIsafe:

- Telegram 30
- Telegram 901

Details of telegrams and control word and status word assignments can be found in section Communication telegrams (Page 737).

Selection via PROFINET

The following supplementary telegrams are available for the safety functions via PROFINET:

- Telegram 700
- Telegram 701

Details of telegrams and control word and status word assignments can be found in section Communication telegrams (Page 737).

4.4 Responses to safety faults

4.4.1 Stop responses

Overview

If Basic Function faults occur, the following stop responses can be triggered:

- STOP A
- STOP F

Internal event

An "internal event" is a major fault that causes the converter to bring the motor to a standstill as quickly as possible by triggering a STOP reaction.

An "internal event" can be triggered, for example, if the converter detects a fault in the monitoring channels during a data cross-check (e.g. F01611 "Defect in a monitoring channel").

An "internal event" can only be acknowledged using a fail-safe signal.

STOP A

For a STOP A, the converter safely switches off the torque of the connected motor immediately.

STOP A corresponds to STO.

STOP F

STOP F is triggered when a fault in the data cross-check of the monitoring channels is detected.

Consequently, STOP A is triggered and fault F01600 issued.

The transition time from STOP F to STOP A can be selected in p9658.

Note

The selected transition time from STOP F to STOP A (p9658) must be greater than or equal to the delay time (p9652).

If a safety function is active, the following happens after a STOP F:

- Fault F01611 initiates a STOP A after the transition time.
- The message C01711 "Defect in a monitoring channel" triggers a STOP A when STO is active.

4.4 Responses to safety faults

If a safety function is not active, the following happens after a STOP F:

- Fault F01611 initiates a STOP A after the transition time.
- Message C01711 does not trigger an immediate stop response. The message continues to be pending.

When selecting a safety function, the converter responds with a stop as described above.

4.4.2 Response to a discrepancy when STO is active

If there is a discrepancy between the two digital inputs of an F-DI, the converter ignores the signals via the fail-safe digital input and transitions to the safe STO state.

Drive response


The converter sets the bit "Internal event" after the discrepancy time has elapsed. You cannot switch on the motor as long as this signal is active.

Note

Discrepancy time

To avoid incorrectly triggered fault messages, the selected discrepancy time in p9650 must always be shorter than the shortest time between 2 switching events at these inputs (ON/OFF, OFF/ON).

The converter indicates the discrepancy error when the RDY-LED flashes quickly red.

- The converter outputs a fault message on the numerical display. It signals the fault via the web server and via PROFIsafe
 - "Discrepancy (fault F01611 or F30611 "Defect in a monitoring channel" with fault values r0949 = 2000 or 2002)"
- The converter sets the error bit of the safety functions (= internal event).
 -  Communication telegrams (Page 737) and Bit assignments of the process data (Page 740)

Independent of the voltage levels present, the converter remains in the STO state until you have acknowledged the "Internal event" state.


Switching the motor on again

Proceed as follows in order to switch on the motor again:

Acknowledging an internal event

Remove the cause of the internal event (e.g. wire break). You have the following options to acknowledge the signal:

- Via PROFIsafe
 - Selecting and deselecting STO
 - Select and deselect SS1
 - Fail-safe acknowledgment

 Communication telegrams (Page 737) and Bit assignments of the process data (Page 740)

- Select and deselect STO via the fail-safe digital input
- Switch-on the motor again by

4.4 Responses to safety faults

Switching the motor on again

- Acknowledge converter faults using one of the following methods:
 - Using the "OK" button at the converter
 - Via the web server
 - Via the PLC
- Issue an OFF1 command (ON/OFF1 = 0).
- Switch on the motor (ON/OFF1 = 1).

4.5 System properties

4.5.1 Response times of the Basic Functions

The Basic Functions are executed with a monitoring cycle of 4 ms. PROFIsafe telegrams are evaluated in the PROFIsafe scan cycle, which corresponds to twice the monitoring cycle.

Note for understanding the following tables

The drive system is the component that provides the safety functions. The designation "fault-free drive system" means that the component that provides the safety functions does not have a defect itself:

- Worst case for a fault-free drive system
For faults outside the drive system, such as e.g. faulty setpoint input from a control system, limit value violations as a result of the behavior of the motor, closed-loop control, load, etc., the "Worst case for a fault-free drive system" response time is guaranteed.
- Worst case when a fault exists
For a single fault within the drive system, such as a defect in a switch-off signal path of the power unit, a defect in an encoder actual value measurement, a defect in a microprocessor (Control Unit or Motor Module) etc., the "Worst case when a fault exists" response time is guaranteed.

4.5.2 Control of the Basic Functions via terminals

The following table lists the response times from the control via terminals until the response actually occurs.

Table 4-1 Response times for control via terminals on the Control Unit and the Motor Module.

| Function | Worst case for | |
|--|--|--|
| | Drive system has no fault | A fault is present |
| STO | $2 \cdot 4 \text{ ms} + t_{\text{E}}^{(1)}$ | $3 \cdot 4 \text{ ms} + t_{\text{E}}^{(1)}$ |
| SBC | $4 \cdot 4 \text{ ms} + t_{\text{E}}^{(1)}$ | $8 \cdot 4 \text{ ms} + t_{\text{E}}^{(1)}$ |
| SS1/SS1E (time-controlled) Selection until STO is initiated | $2 \cdot 4 \text{ ms} + p9652 + t_{\text{E}}^{(1)}$ | $3 \cdot 4 \text{ ms} + p9652 + t_{\text{E}}^{(1)}$ |
| SS1/SS1E (time-controlled) Selection until SBC is initiated | $4 \cdot 4 \text{ ms} + p9652 + t_{\text{E}}^{(1)}$ | $8 \cdot 4 \text{ ms} + p9652 + t_{\text{E}}^{(1)}$ |
| SS1 (time-controlled) Selection until braking is initiated | $3 \cdot 4 \text{ ms} + 2 \text{ ms} + t_{\text{E}}^{(1)}$ | $4 \cdot 4 \text{ ms} + 2 \text{ ms} + t_{\text{E}}^{(1)}$ |

¹⁾ The following applies for t_{E} (debounce time of the digital input being used):

| | |
|-----------|---------------------------------------|
| p9651 = 0 | $t_{\text{E}} = 8 \text{ ms}$ |
| p9651 ≠ 0 | $t_{\text{E}} = p9651 + 5 \text{ ms}$ |

4.5 System properties

4.5.3 Control of the Basic Functions via PROFIsafe

The following table lists the response times¹⁾ from receiving the PROFIsafe telegram at the Control Unit up to initiating the particular response.

Table 4-2 Response times when controlling via PROFIsafe

| Function | Worst case for | |
|--|---|---|
| | Drive system has no fault | A fault is present |
| STO | $5 \cdot 4 \text{ ms} + t_K^{(2)}$ | $5 \cdot 4 \text{ ms} + t_K^{(2)}$ |
| SBC | $6 \cdot 4 \text{ ms} + t_K^{(2)}$ | $10 \cdot 4 \text{ ms} + t_K^{(2)}$ |
| SS1/SS1E (time-controlled) Selection until STO is initiated | $5 \cdot 4 \text{ ms} + p9652 + t_K^{(2)}$ | $5 \cdot 4 \text{ ms} + p9652 + t_K^{(2)}$ |
| SS1/SS1E (time-controlled) Selection until SBC is initiated | $6 \cdot 4 \text{ ms} + p9652 + t_K^{(2)}$ | $10 \cdot 4 \text{ ms} + p9652 + t_K^{(2)}$ |
| SS1 (time-controlled) Selection until braking is initiated | $5 \cdot 4 \text{ ms} + 2 \text{ ms} + t_K^{(2)}$ | $5 \cdot 4 \text{ ms} + 2 \text{ ms} + t_K^{(2)}$ |

¹⁾ The specified response times involve internal SINAMICS response times. Program run times in the F-host and the transmission time via PROFIBUS or PROFINET are not taken into account. When calculating the response times between the F-CPU and the converter, you must take into account that faults in the communication can result in a safety function only being selected after the PROFIsafe monitoring time (F_WD_Time) has expired. The PROFIsafe monitoring time (F_WD_Time) must also be included in the calculation when an error occurs.

²⁾ t_K is the time for internal communication within the SINAMICS module; t_K can be determined as follows:

| | |
|-------------------------------|--|
| For isochronous communication | $t_K = T_o$ (for T_o see settings in the controller) |
|-------------------------------|--|

4.5.4 PFH values



You can find more details about the PFH values via the following link: SINAMCS Industrial Security (<https://support.industry.siemens.com/cs/ww/en/view/76254308>)

4.6 Acceptance - completion of commissioning

What is an acceptance?

The machine manufacturer is responsible in ensuring that the plant or machine functions perfectly. As a consequence, after commissioning, the machine manufacturer must check those functions or have them checked by specialist personnel, which represent an increased risk of injury or material damage. This acceptance or validation is, for example, also specified in the European machinery directive and essentially comprises two parts:

- **Acceptance test:** Checking the safety-relevant functions and machine parts after startup.
- **Documentation:** Generate an "Acceptance report" that describes the test results.

Supply information for the validation, e.g. the harmonized European standards EN ISO 13849-1 and EN ISO 13849-2.

Acceptance test of the machine or plant

The acceptance test is used to check whether the safety-relevant functions in the machine or system function properly. The documentation of the components used in the safety functions can also provide information about the necessary tests.

Testing the safety-relevant functions includes, e.g. the following:

- Are all safety equipment such as protective door monitoring devices, light barriers or emergency-off switches connected and ready for operation?
- Does the higher-level controller respond as expected to the safety-relevant feedback signals of the converter?
- Do the converter settings match the configured safety-relevant function in the machine?

Acceptance test of the converter

The acceptance test of the converter is a part of the acceptance test of the entire machine or plant.

The acceptance test of the converter checks whether the settings of the Basic Functions are compatible with the configured safety functions of the machine.

Documentation

The following must be documented for the converter:

- Result of the acceptance tests
- Settings of the integrated drive safety functions

This documentation must be countersigned.

Persons authorized for acceptance

Personnel from the machine manufacturer, who, on account of their technical qualifications and knowledge of the safety functions, are in a position to perform the acceptance test in the correct manner are authorized to perform the acceptance testing of the converter.

Recommendations

With the acceptance test, you check whether the safety functions in the converter have been set correctly.

- Perform the acceptance test with the maximum possible velocity and acceleration to test the expected maximum braking distances and braking times.
- Alarm A01697:
This alarm is issued following each system startup and is not critical for acceptance.

After the acceptance test of the converter's safety functions, you must also check whether the safety-related functions in the machine or system are functioning correctly.

Note

Examples of acceptance tests

The following acceptance tests are examples which demonstrate the basic procedure. They are not suitable for every possible setting of the converter.

When do you have to conduct an acceptance test of the machine or plant?

You must conduct an acceptance test of the machine or plant in the following cases:

- After commissioning
- After a new firmware version has been uploaded to the converter
- When you change the parameter assignment of the converter

When do you have to conduct an acceptance test of the converter?

If you have replaced the converter, you have to conduct an acceptance test for it.

Note

When you replace the converter, an error message appears. Acknowledge this error message, e.g. by switching off and on.

What does the acceptance test for the converter consist of?

Documentation

1. Supplement/change the hardware data
2. Supplement/change the software data (specify version)

Function test, safety functions

1. Test of the SI function "Safe Torque Off" (STO)
2. Test of the SI function "Safe Stop 1" (SS1)
3. Test of the SI function "Safe Brake Control" (SBC)

Functional testing of forced checking procedure (test stop)

Select and deselect STO.

4.6.1 STO acceptance test

Precondition

The converter is ready for operation.

- The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).
- STO is not active (r9734.0 = 0).

Procedure



Use the following procedure for the acceptance test of the Basic Function STO:

Switch on motor

1. Enter a speed setpoint $\neq 0$.
2. Switch on the motor (ON command).
3. Check that the correct motor is running.

Select STO

1. Select STO while the motor is running.
Test each configured activation, e.g. via digital inputs and PROFIsafe.
2. Check the following:
 - If a mechanical brake is not available, the motor coasts down.
A mechanical brake brakes the motor and holds it to ensure that it remains at a standstill.
 - The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).
 - The converter signals the following:
"STO is active" (r9734.0 = 1).

Deselect STO

1. Deselect STO.
2. Check the following:
 - STO is not active (r9734.0 = 0).
 - The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).

4.6.2 SBC acceptance test

Precondition

The converter is ready for operation.

- The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).
- SBC is not active (r9734.0 = 0 **and** r0899.12 = 1).

Procedure



1. Use the following procedure for the acceptance test of the Basic Function SBC:
2.

Switch on motor

1. Enter a speed setpoint $\neq 0$.
2. Switch on the motor (ON command).
3. Check that the correct motor is running.
4. Enter the speed setpoint = 0.

Select SBC

1. Select the STO function or the SS1 function.
2. Check the following: The converter signals the following: "SBC is active" (r9734.0 = 1 **and** r0899.12 = 0).

Deselect STO

1. Deselect STO.
2. Check the following:
 - The converter signals the following: "SBC is not active" (r9734.0 = 0 **and** r0899.12 = 1).
 - The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).

4.6.3 SS1 acceptance test

Precondition

The converter is ready for operation.

- The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).
- SS1 is not active (r9734.1 = 0).

Procedure



To perform the acceptance test of the SS1 Basic Function, proceed as follows:

Switch on motor

1. Enter a speed setpoint $\neq 0$.
2. Switch on the motor (ON command).
3. Check that the correct motor is running.

Select SS1

1. Select SS1 while the motor is switched on.
Test each configured activation, e.g. via digital inputs and PROFIsafe.
2. In your machine, check the following:
 - The motor brakes on the OFF3 ramp.
 - SS1 is active (r9734.1 = 1).
 - After the p9652 time has expired, the converter signals: "STO is active" (r9734.0 = 1).

Deselect SS1

1. Deselect SS1.
2. Check the following:
 - SS1 is not active (r9734.1 = 0).
 - The converter signals neither faults nor alarms of the safety functions (r0945[0...7], r2122[0...7]).

4.7 Functional safety

Safety, from the perspective of the object to be protected, cannot be split-up. The causes of hazards and, in turn, the technical measures to avoid them can vary significantly. This is why a differentiation is made between different types of safety (e.g. by specifying the cause of possible hazards). "Functional safety" is involved if safety depends on the correct function.

To ensure the functional safety of a machine or plant, the safety-related parts of the protection and control devices must function correctly. In addition, the systems must behave in such a way that either the plant remains in a safe state or it is brought into a safe state if a fault occurs. In this case, it is necessary to use specially qualified technology that fulfills the requirements described in the associated Standards. The requirements to implement functional safety are based on the following basic goals:

- Avoiding systematic faults
- Controlling random faults or failures

Benchmarks for establishing whether or not a sufficient level of functional safety has been achieved include the probability of hazardous failures, the fault tolerance, and the quality that is to be ensured by avoiding systematic faults. This is expressed in the standards using specific classification. In IEC/EN 61508, IEC/EN 62061 "Safety Integrity Level" (SIL) and EN ISO 13849-1 "Category" and "Performance Level" (PL).

4.8 Machinery Directive

The basic safety and health requirements specified in Annex I of the Directive must be fulfilled for the safety of machines.

The protective goals must be implemented responsibly to ensure compliance with the Directive.

Manufacturers of a machine must verify that their machine complies with the basic requirements. This verification is facilitated by means of harmonized standards.

IEC 61800-5-2 Adjustable-speed electrical power drive systems Part 5-2 is relevant for the Machinery Directive: Safety requirements - Functional safety

Within the context of IEC 61508, IEC 61800-5-2 considers adjustable speed electric power drive systems (PDS), which are suitable for use in safety-related applications (PDS(SR)).

IEC 61800-5-2 places demands on PDS(SR) as subsystems of a safety-related system. This therefore permits the implementation of the electrical/electronic/programmable electronic elements of a PDS(SR) taking into account the safety-relevant performance of the safety function(s) of a PDS.

Manufacturers and suppliers of PDS(SR) can prove to users (e.g. integrators of control systems, developers of machines and plants etc.) the safety-relevant performance of their equipment by implementing the specifications stipulated in standard IEC 61800-5-2.

Installing

5.1 Safety instructions



NOTICE

Thermal damage to temperature-sensitive parts

Some parts of the electrical motor enclosure can reach temperatures that exceed 100 °C. If temperature-sensitive parts, for instance electric cables or electronic components, come into contact with hot surfaces then these parts can be damaged.

- Ensure that no temperature-sensitive parts come into contact with hot surfaces.

5.2 Installing the motor

5.2.1 Checklists prior to assembly

Note

Required checks

The checks listed below are a minimum benchmark and must be performed in any case. Further checks before, during and after the installation of the motor depend on the system-specific conditions and are the responsibility of the plant or system manufacturer.

- Thoroughly familiarize yourself with the safety instructions and observe the checklists below before starting any work.

Table 5-1 Checklist

| Check | OK |
|---|----|
| General checks | |
| Are the environmental conditions in the permissible range? See Chapter "Permissible environmental conditions for the motor (Page 176)". | |
| Checks regarding the mechanical system | |
| Is the motor free of visible damage? | |
| Have the mounting surfaces (e.g. flange, shaft) on the customer machine and on the motor been cleaned? | |
| Are the mounting surfaces free of corrosion? | |
| Do the mounting dimensions (e.g. shaft diameter, shaft length, true run) on the customer machine meet the specification? | |

5.2.2 Mounting instructions for the motor

NOTICE

Damage to shaft sealing rings caused by solvent

If shaft sealing rings come into contact with solvents when removing the corrosion protection, the shaft sealing rings can be damaged.

- Avoid contact between solvents and shaft sealing rings.

NOTICE

Damage to the motor due to runout on the shaft extension

Runout and thrust on the shaft extension of the motor damage the motor.

- Mount the motor without runout and thrust on the shaft extension.

- Observe the specifications on the rating plate.
- Observe the warning and information plates on the motor.
- Remove the anti-corrosion protection thoroughly from the motor shaft. Use commercially available solvents.
- Please pay attention to the notes on the thermal mounting variants.
- If the motor is installed vertically with the shaft extension facing up, ensure that no liquid can enter the upper bearing.
- Ensure that the flange is in even contact with the mounting surface.
- Use hexagon socket head cap screws with a property class of at least 8.8.
- When tightening the fastening bolts avoid any uneven stressing.
- Observe the tightening torques for the fastening bolts.

Tightening torques for fastening bolts

The general tolerance for the tightening torque is 10%. The tightening torque is based on a friction coefficient of $\mu = 0.14$.

| Motor | Bolt DIN 7984 | Washer ISO 7092 [mm] | Tightening torque for bolts (not for electrical connections) |
|---------|---------------|----------------------|--|
| 1FK2□02 | M4 | 4 (d2 = 8) | 2.2 Nm |
| 1FK2□03 | M5 | 5 (d2 = 9) | 4 Nm |
| 1FK2□04 | M6 | 6 (d2 = 11) | 8 Nm |

Tightening torques for fastening bolts

5.2.3 Fitting output elements

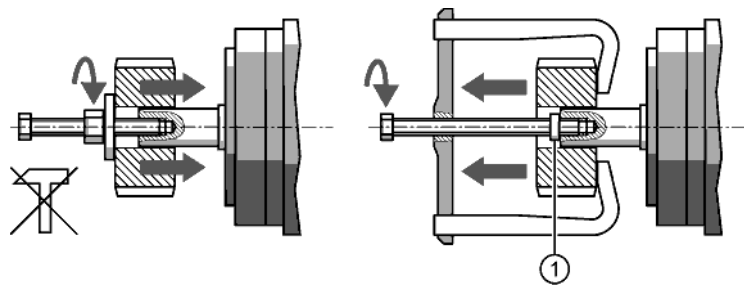
| |
|---|
| NOTICE |
| Damage to the motor due to runout on the shaft extension |
| Runout and thrust on the shaft extension of the motor can damage the motor. |
| <ul style="list-style-type: none">• Mount the motor without runout and thrust on the shaft extension. |

Mount or remove the power output elements (e.g. couplings, gear wheels, belt pulleys) using suitable devices only (see figure).

- Use the threaded hole in the shaft extension.
- If required, heat up the output elements before mounting or removing.
- When removing the output elements, use an intermediate disk to protect the centering in the shaft extension.
- If necessary, completely balance the motor together with the output elements according to ISO 1940.


Note

Motors with feather key are half-key balanced. The motors have been balanced with half a feather key.



1 Intermediate washer/disk (to protect the centering in the shaft extension)

Figure 5-1 Mounting and removing output elements

The motor dimensions can be found in Chapter:
 "Dimension drawings of motor (Page 207)"

5.3 Installing the converter

5.3.1 Installation conditions

When installing the converter carefully observe the conditions listed below in order to guarantee reliable, continuous and trouble-free operation.

- The converter is designed for installation in a control cabinet.
- The converter is certified for use in environments with degree of pollution 2 without condensation; i.e. in environments where no conductive pollution/dirt occurs. Condensation is not permissible.
- The converter fulfills degree of protection IP20.
- EMC-compliant installation:
 - ➡ EMC-compliant installation of a machine or system (Page 35).

Additional requirements for plants and systems in the United States / Canada (UL/cUL)

A label with the following number is provided with the device: A5E36790112.

Note the instructions on the label and attach the label in a clearly visible location close to the converter in the control cabinet.

Installation notes

- Install the converter vertically with the flap for the LED display facing upwards.



Figure 5-2 Mounting position of the converter

- Maintain the minimum clearances to other components.
- Use the recommended hardware (screws M5) and comply with the specified torques.

5.3.2 Dimension drawings and drilling dimensions

Leave a minimum 100 mm clearance to other devices at the top and bottom. A lateral clearance between multiple SINAMICS S210 converters is not mandatory. Observe a lateral clearance of at least 10 mm to other devices.

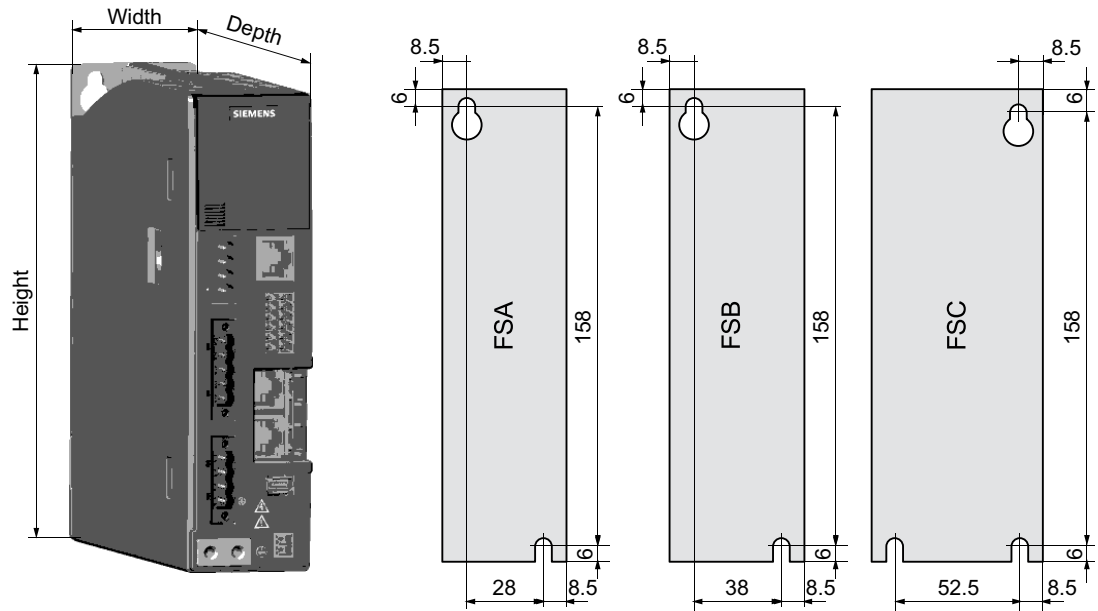


Figure 5-3 Dimension drawing and drilling dimensions

| Frame size | Width | Height | Depth | Weight |
|------------|-------|--------|--------|--------|
| FSA | 45 mm | 170 mm | 170 mm | 1.1 kg |
| FSB | 55 mm | 170 mm | 170 mm | 1.2 kg |
| FSC | 70 mm | 170 mm | 195 mm | 1.9 kg |

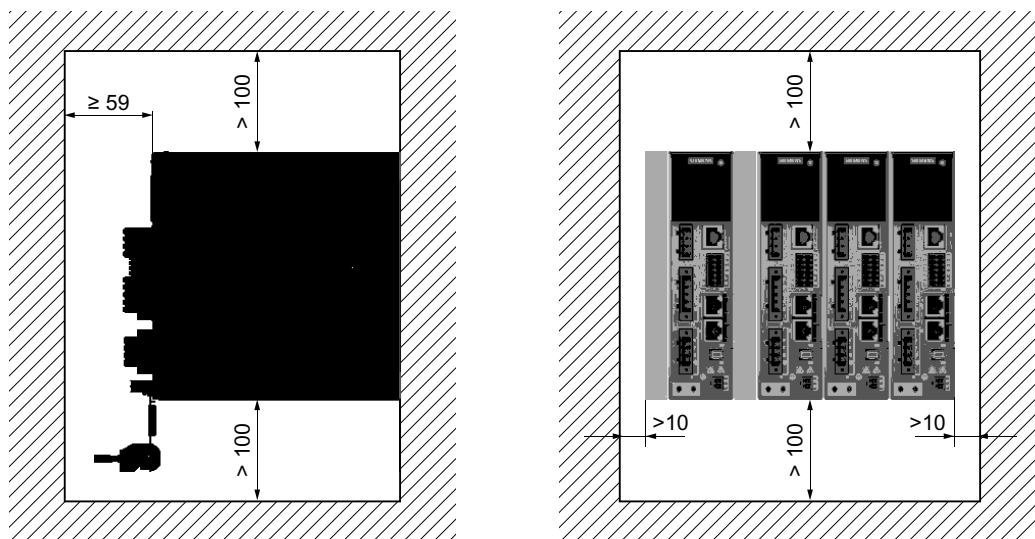



Figure 5-4 Distances to cabinet walls and other components


5.4 Connecting the converter and the motor


5.4.1 Cable lengths

Permissible cable lengths for the connection of the motor to the converter.

| | Converter without additional line filter | Converter with additional external filter |
|-----------------|--|---|
| EMC category C2 | 10 m | 25 m |
| EMC category C3 | 25 m | 50 m |

 External line filter (Page 219)

 Connection cables between the motor and the converter (Page 217)

 Electromagnetic compatibility (Page 199)

Permissible cable lengths for the other converter connections

| Type of connection | Connection via | Permissible cable length |
|---|--------------------|--------------------------|
| Control voltage 24 VDC | X124 | 30 m |
| External braking resistor | X1 (R1, DCP) | 3 m |
| Motor power connections | X2 | 50 m |
| Service interface | X127 | 10 m |
| Digital inputs | X130 | 30 m |
| Connection to the control system via PROFINET | X150 P1 X150 P2 | 100 m |
| Encoder | X100 | 50 m |
| Motor holding brake | X107 | 50 m |

5.4.2 Connecting the motor

NOTICE

Destruction of the motor if it is directly connected to the three-phase line supply

The motor will be destroyed if it is directly connected to the three-phase line supply.

- Only operate motors with the permitted converters.

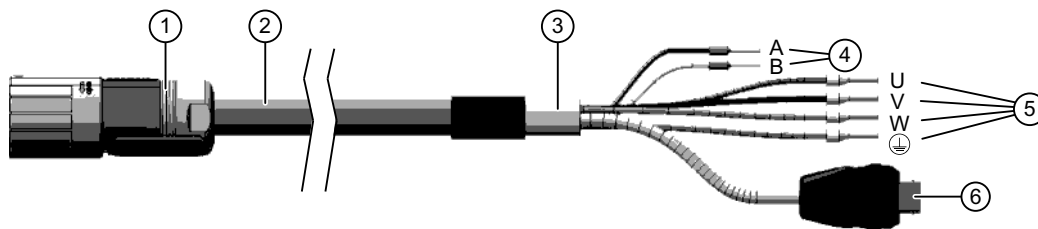
The manufacturer of the system/machine is responsible for ensuring that installation is performed correctly.

Ensure that the associated warning labels in the appropriate national language are attached.

The motors are equipped with a rotatable cable outlet with SPEED-CONNECT connectors M12 or M17.

The motor is connected to the converter with a MOTION-CONNECT OCC cable. The cables for the power, the holding brake, the encoder and the shielding are integrated in the OCC cable.

- Use the prefabricated MOTION-CONNECT OCC cables from SIEMENS.



- | | |
|--------------------------------------|--|
| ① Round connector M12 or M17, 10-pin | ④ Cables for holding brake |
| ② MOTION-CONNECT OCC cable | ⑤ Power cables |
| ③ Shielding | ⑥ SIEMENS IX connector for signal line |

Figure 5-5 MOTION-CONNECT OCC

The cables have a SPEED-CONNECT connector. This reduces the installation time and costs, and increases the operational reliability of the drive.

- Check that the sealing surfaces of the connectors have not been damaged.

Clearance required when connecting the motor

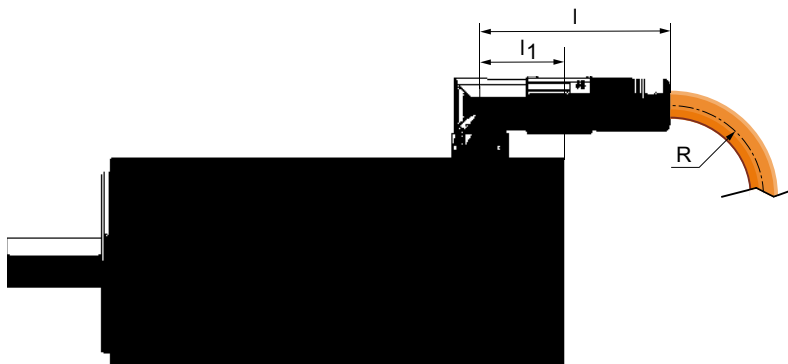


Figure 5-6 Clearances for OCC connection at the motor

| Motor | Connector size | Distance, point of rotation to NDE | Length of the plug connection | Minimum bending radius, static | |
|---------|----------------|------------------------------------|-------------------------------|--------------------------------|------------|
| | | | | MC500 | MC800 PLUS |
| | | l_1 / mm | l / mm | R / mm | |
| 1FK2□02 | M12 | 40 | 61 | 23 | 29 |
| 1FK2□03 | | 22 | | | |
| 1FK2□04 | M17 | 32.5 | 70 | 25 | 31 |

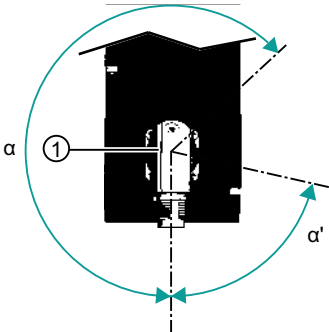
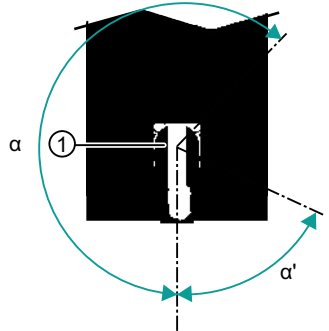
Rotation range of the OCC connector on the motor

You can rotate the motor connector. Use a suitable socket connector as lever to rotate the connector.

Note

A maximum of 10 twists are permitted so as not to impair the degree of protection of the motor.

Table 5-2 Rotation range of the power connector

| Motor | Angle α | Angle α' | Connector size | Drawing |
|--------------------|------------------|-----------------|----------------|---|
| 1FK2□02 1FK2□03 | $\leq 225^\circ$ | $\leq 81^\circ$ | M12 |  |
| 1FK2□04 | $\leq 215^\circ$ | $\leq 75^\circ$ | M17 |  |

The motors are equipped with SPEED-CONNECT connectors.

You can also connect quick-connection cables with SPEED-CONNECT to motor connectors as conventional cables with screw locks (fully threaded).

Note

We recommend cables equipped with SPEED-CONNECT connectors.

Handling plug-in connections

The following information on the handling of plug-in connections applies for power connectors and signal connectors as round connector in the SPEED-CONNECT version and fully threaded.

The figures show the connecting and disconnecting of the power connector in the SPEED-CONNECT version.

Connecting

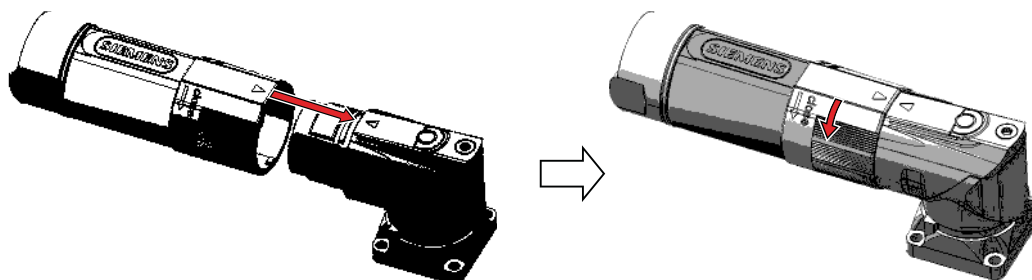


Figure 5-7 Connecting the SPEED-CONNECT plug-in connection

1. Make sure that the SIEMENS logo on the connector enclosure is at the top or that the arrows on both connectors are opposite to each other. This ensures that the pins and coding keys of the connector and motor connector are aligned.
2. Push the connector into the motor connector up to the endstop.
3. Tighten the fastener or the screw cap per hand in a clockwise direction.

Disconnecting

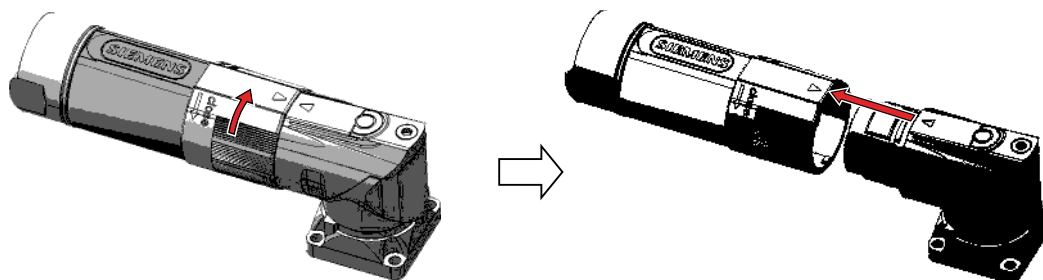


Figure 5-8 Disconnecting the SPEED-CONNECT plug-in connection

1. Turn the fastener or the screw cap per hand in an anticlockwise direction up to the endstop.
2. Pull the connector out of the motor connector.

Note

To disconnect the plug-in connection, always pull the cable connector and not the cable.

Routing cables in a damp environment

If you are operating the motor in environments in which moisture can arise follow the installation instructions below.

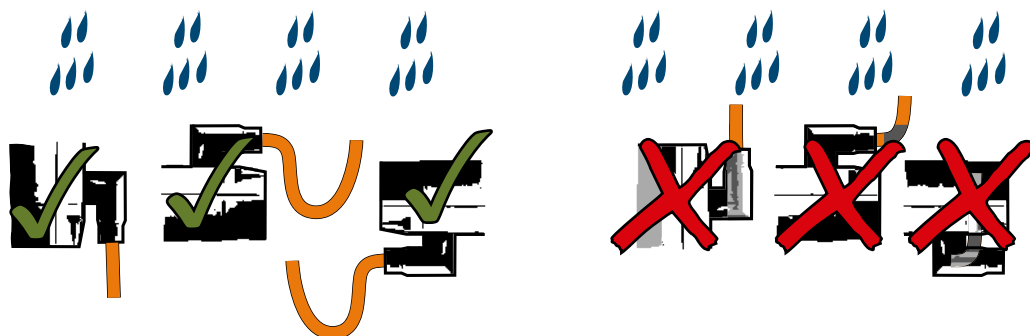


Figure 5-9 Permissible and impermissible cable routing when connecting in a damp environment

5.4.3 Connecting the converter

Install the converter so that you are compliant with local regulations for erecting and installing low-voltage systems.

Note

Safety devices

Install suitable protective equipment between the line supply and converter.

 Technical specifications of the converter (Page 197)

Note

Operating displays for converter operation

If, when switching over a function from ON to OFF, an LED or other similar display is not lit or not active; this does not indicate that the device is switched-off or in a no-current condition.

Observe the following product note about protection against indirect contact:



To protect against indirectly touching part of the motor circuit of a frequency converter and to automatically shut down in the case of a fault according to DIN EN 60364-4-41 (VDE 0100-410) (<http://support.automation.siemens.com/WW/view/en/103474630>)

Protection and monitoring equipment

To provide protection against short-circuit, use the overcurrent devices listed in the Technical data (fuses, circuit breakers, etc.).

If the apparent impedance of the line supply at the infeed point is not suitable, so that fuses do not rupture in the specified time in the case of insulation failure (ground fault, fault to frame),

5.4 Connecting the converter and the motor

then you must use additional residual current protective devices RCD (RCCB or MRCD), type B.

- RCCB: Residual current circuit breaker
- MRCD: An MRCD comprises an RCM (differential current monitoring device), a measuring current transducer and a circuit breaker with additional undervoltage release, listed in the Technical data.

To prevent an RCD from unnecessarily tripping as a result of operational leakage currents, the following preconditions must be fulfilled:

- The neutral point of the line supply is grounded.
- Use an RCCB type B with a response limit current of 300 mA. Connect the RCCB in series with the overcurrent protective devices.
- Use a separate RCD for each converter.
- The motor cables are shorter than 50 m (164 ft) and shielded.

| |
|--|
| WARNING |
| Risk of electric shock and fire from a network with an excessively high impedance |
| Excessively low short-circuit currents can lead to the protective devices not tripping or tripping too late, and so causing electric shock or a fire. |
| <ul style="list-style-type: none">• In the case of a conductor-conductor or conductor-ground short-circuit, ensure that the short-circuit current at the point where the inverter is connected to the line supply at least meets the minimum requirements for the response of the protective device used.• You must use an additional residual-current device (RCD) if a conductor-ground short circuit does not reach the short-circuit current required for the protective device to respond. The required short-circuit current can be too low, especially for TT systems. |

| |
|---|
| WARNING |
| Risk of electric shock and fire from a network with an impedance that is too low. |
| Excessively high short-circuit currents can lead to the protective devices not being able to interrupt these short-circuit currents and being destroyed, and so causing electric shock or a fire. |
| <ul style="list-style-type: none">• Ensure that the uninfluenced short-circuit current at the line terminal of the inverter does not exceed the breaking capacity (SCCR or I_{cc}) of the protective device used. |

5.4.3.1 Connections at the converter

Connections and operator controls on the converter

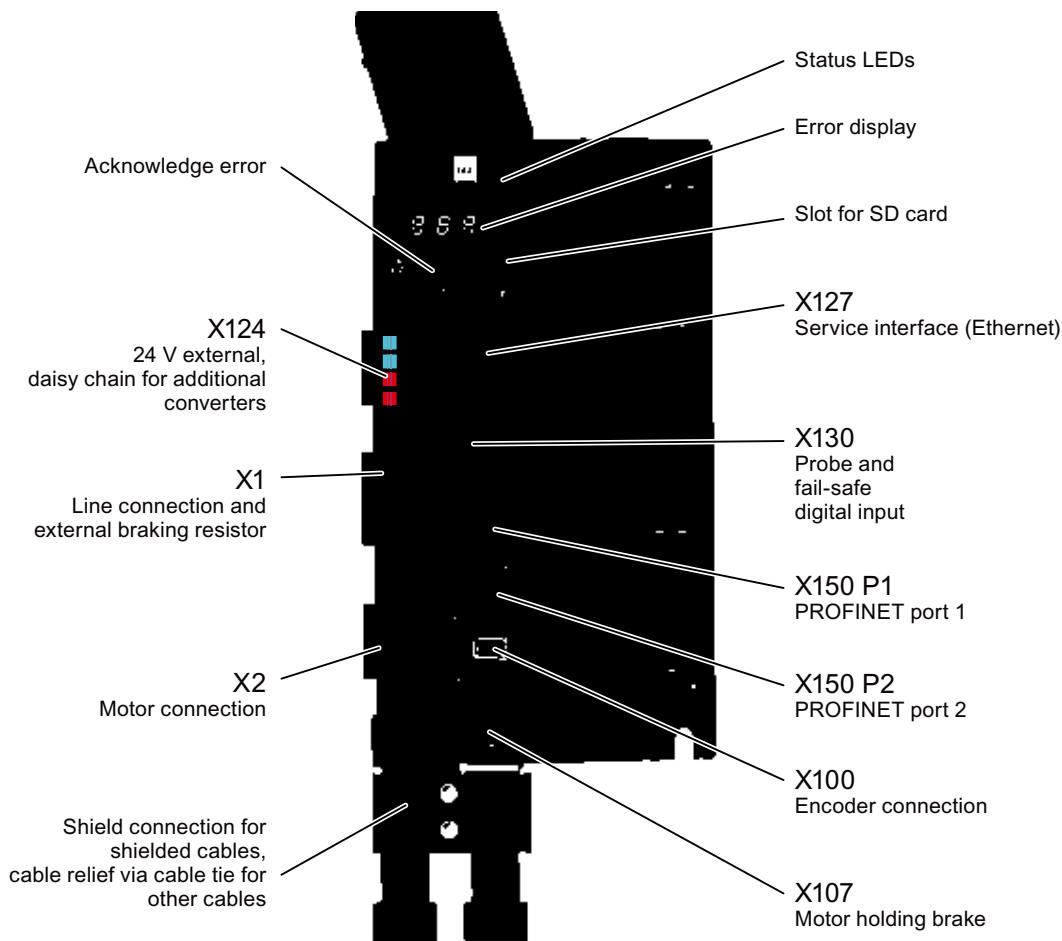


Figure 5-10 Overview of connections and operator controls on the converter

| Type of connection | Connector | |
|---|--------------------|---------------------------------|
| Control voltage 24 VDC | X124 | Included in the scope of supply |
| Line connection and external braking resistor | X1 | Included in the scope of supply |
| Motor power connections | X2 | Included in the scope of supply |
| Service interface | X127 | RJ45 |
| Digital inputs | X130 | Included in the scope of supply |
| Connection to the control system via PROFINET | X150 P1 X150 P2 | RJ45 |

| Type of connection | Connector | |
|---------------------|-----------|------------------------------------|
| Encoder | X100 | Siemens IX connector ¹⁾ |
| Motor holding brake | X107 | Included in the scope of supply |

¹⁾ Part of the prefabricated MOTION-CONNECT OCC cable

The permissible cable lengths can be found in Chapter: "Cable lengths (Page 89)".

Note

Connection of motor holding brake, connector X107

Also connect the conductors for the motor holding brake to the connector at X107, even when you are using a motor without holding brake.

Shielded cables

To ensure the proper functioning of the drive, use shielded cables for the connection of the motor (OCC cable with connection of encoder and holding brake), of the external braking resistor and of the fail-safe digital input.

Use the shield support that comes with the converter to connect the shield. Siemens recommends connecting the shield - as shown in the figure - with the shield clamp that comes with the prefabricated OCC cable for the motor connection.

- Connect the shield at both ends of the cable.
- Use cables with finely-stranded, braided shields.
- Do not interrupt the shield.

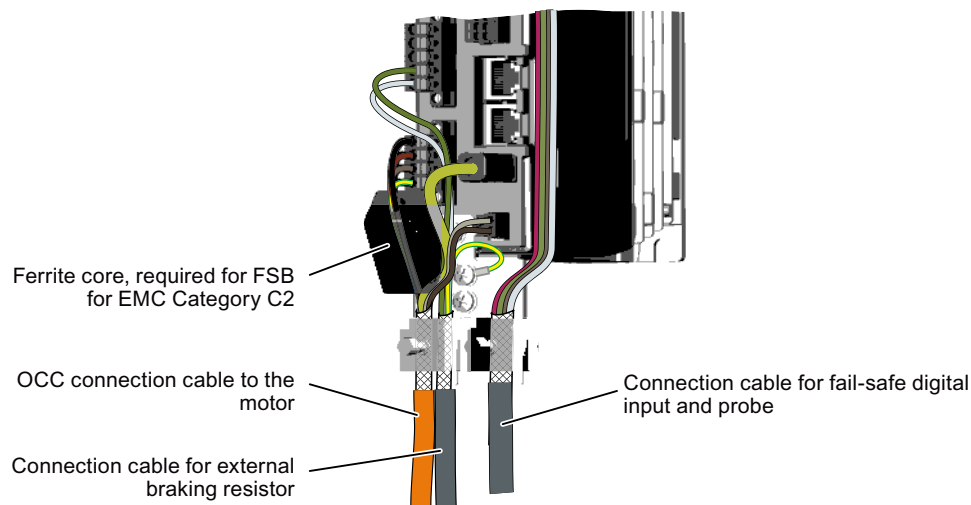


Figure 5-11 Shield support with shield plate and shield clamps for prefabricated OCC cable

Ferrite core with FSB

For devices of frame size FSB, you must attach the ferrite cores provided in order to achieve EMC Category C2.

- Place the ferrite core supplied as shown in the figure around the motor cable conductors and press the ferrite core until it snaps together.

Note

Without the ferrite core, EMC Category C3 is achieved.

5.4.3.2 Connecting the line supply, motor, motor holding brake and encoder to the converter

Connecting the line supply to the converter

Connect the line supply as shown in the following to connector X1 of the converter. Connect the protective conductor with a cable lug and an M4 screw to the shield plate of the converter.

Information about stripping the insulation can be found in Chapter "Connection cables between the motor and the converter (Page 217)".

If you do not use a shield plate, then you must connect the protective conductor directly at the device.

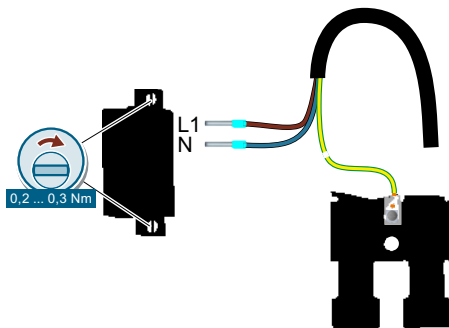


Figure 5-12 X1 - line connection

The terminals are spring-loaded terminals.

Permissible conductor cross-sections for single-core connection or for the connection of flexible cables with end sleeves:

- 0.2 mm² ... 2.5 mm²
- AWG: 26 ... 12

Connecting the motor to the converter

Connect the motor as shown in the following to connector X2 of the converter.

Color coding for MOTION-CONNECT OCC cables: Phase U = brown, phase = V black, phase W = gray



Figure 5-13 X2 - motor connection

The terminals are spring-loaded terminals.

Permissible conductor cross-sections for single-core connection or for the connection of flexible cables with end sleeves:

- 0.2 mm² ... 2.5 mm²
- AWG: 26 ... 12

Connect the shield of the motor connection cable to the shield plate over a large area. Use commercially available clamps, the clamps supplied with the prefabricated cable or the shield connection clamps supplied as accessories.

Connecting the encoder to the converter

The cables and the connector for the encoder connection are part of the prefabricated MOTION-CONNECT cable from the motor to the converter.

NOTICE

Damage to the device by connecting other motors or devices

Connecting other devices (motors, encoders) can destroy the converter or the connected device.

- Only connect 1FK2 motors to this interface.
- Use only MOTION-CONNECT OCC cables from Siemens - or cables that you have fabricated yourself with the correct pin assignment.

To connect the encoder, insert the Siemens IX connector as shown in the following in the X100 plug socket.

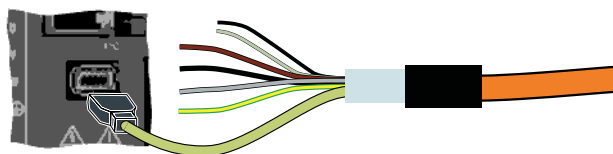


Figure 5-14 X100 - encoder connection

Connecting the motor holding brake

The cables for the motor holding brake are part of the prefabricated MOTION-CONNECT cable from the motor to the converter.

Connect the cables as shown below to the connector X107 of the converter.

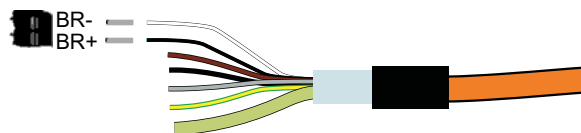


Figure 5-15 X107 - connecting the motor holding brake

The terminals are spring-loaded terminals.

Permissible conductor cross-sections:

- For single-conductor cables or for flexible cables with end sleeves without plastic protection: 0.25 mm² ... 1.5 mm², AWG: 24 ... 16
- For flexible cables with end sleeves with plastic protection: 0.25 mm² ... 0.75 mm², AWG: 24 ... 19

Note

Connection of motor holding brake, connector X107

Also connect the conductors for the motor holding brake to the connector at X107, even when you are using a motor without holding brake.

5.4.3.3 Connections for open-loop and closed-loop control of the converter

Connecting service interface and PROFINET


Connect your commissioning device using an Ethernet cable to the service interface (socket X127).



The transmission rates are 10 Mbit/s or 100 Mbit/s.

Connect the converter with PROFINET cables with RJ45 FastConnect connectors or with PROFINET patch cables (see accessories) via the sockets X150 P1 and X150 P2 to the PROFINET network.

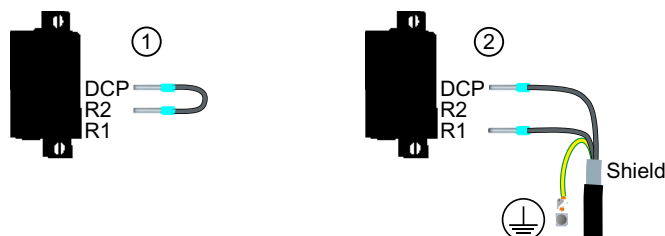
Table 5-3 Pin assignment for X127, X150 P1 and X150 P2

| | Pin | Pin assignment | Explanation |
|---|-----|----------------|------------------|
|  | 1 | RXP | Receiving data + |
| | 2 | RXN | Receiving data - |
| | 3 | TXP | Sending data + |
| | 4 | Reserved | |
| | 5 | Reserved | |
| | 6 | TXN | Sending data - |
| | 7 | Reserved | |
| | 8 | Reserved | |

Connecting an external braking resistor

If you are using the internal braking resistor, DCP and R2 must be jumpered.

If you are using an external braking resistor, DCP and R2 must not be jumpered. Connect the external braking resistor via the DCP and R1 terminals.



- ① Jumper when you use the internal braking resistor.
The jumper is included in the scope of delivery of the converter
- ② Connect an external braking resistor
Protective conductor connection and shield support via the shield plate

Figure 5-16 X1 - connecting an external braking resistor

The terminals are spring-loaded terminals.

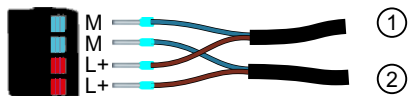
Permissible conductor cross-sections for single-core connection or for the connection of flexible cables with end sleeves:

5.4 Connecting the converter and the motor

- 0.2 mm² ... 2.5 mm²
- AWG: 26 ... 12

Connecting the external 24 V supply

Connect a 24 V power supply to the converter.



- ① 24 V external
- ② Loop-through for additional converters

Figure 5-17 X124 - 24 V external

The terminals are spring-loaded terminals.

Permissible conductor cross-sections for single-core connection or for the connection of flexible cables with end sleeves:

- 0.2 mm² ... 2.5 mm²
- AWG: 26 ... 12

Connecting high-speed digital inputs, temperature monitoring for external braking resistor and fail-safe digital input

Digital inputs DI 0 and DI 1 are high-speed digital inputs and can be used as measuring inputs.

Digital inputs DI 2 and DI 3 form a fail-safe digital input.

The temperature monitoring for an external braking resistor can be connected to DI 4. When the temperature of the external braking resistor is too high, the converter shuts down the motor.

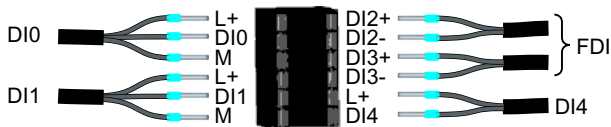


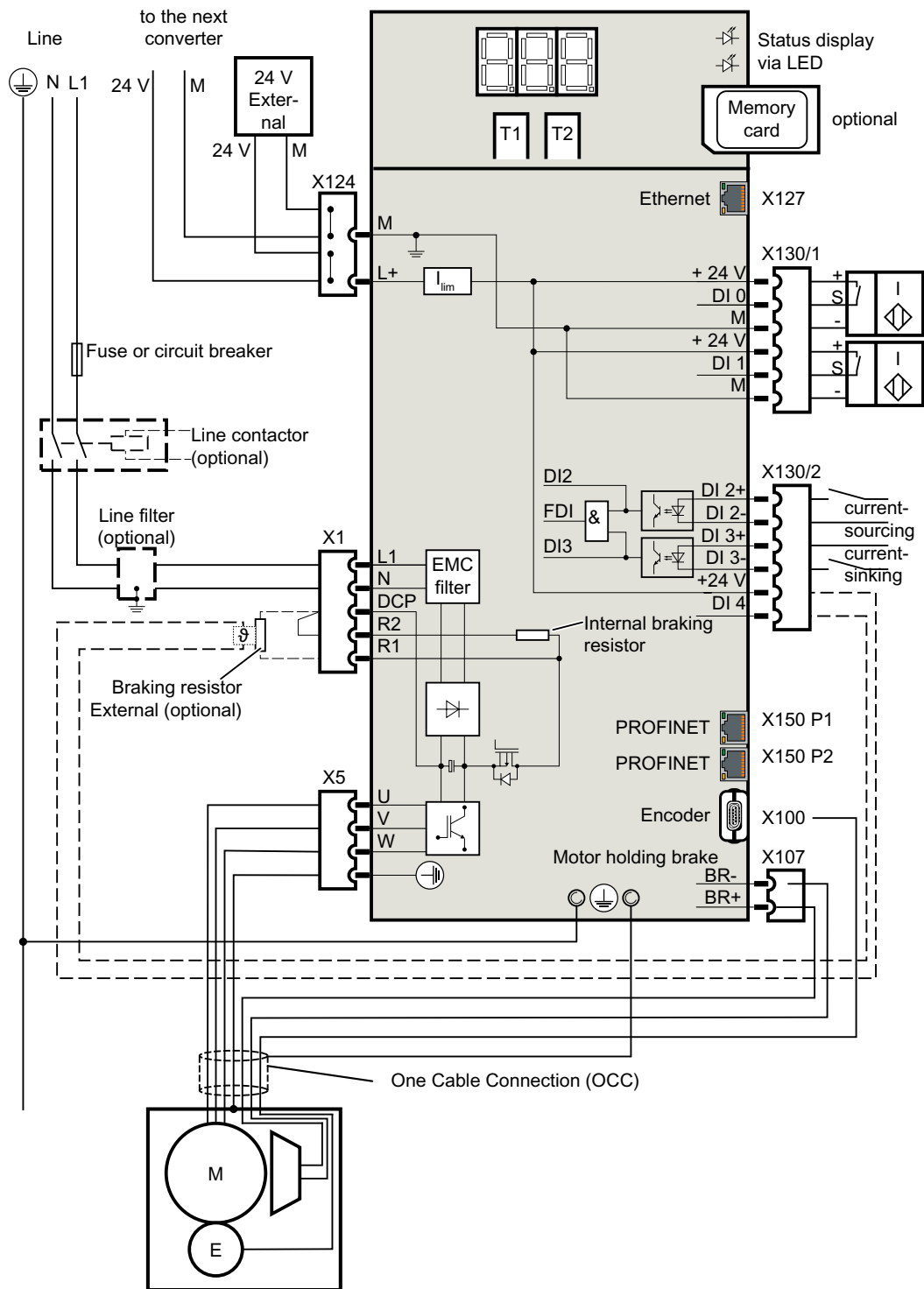
Figure 5-18 X130 - connector for digital inputs

The terminals are spring-loaded terminals.

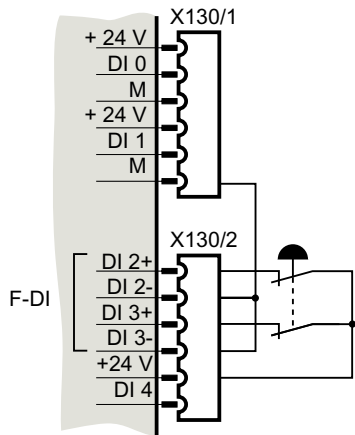
Permissible conductor cross-sections

- for single-wire connection: 0.2 mm² ... 1.5 mm², AWG: 24 ... 16
- for flexible cables with end sleeves: 0.25 mm² ... 1.5 mm²
- for flexible cables with end sleeves with plastic protection: 0.25 mm² ... 0.75 mm²

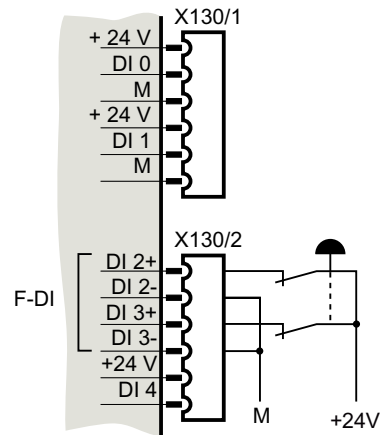
5.4.3.4 Connection example



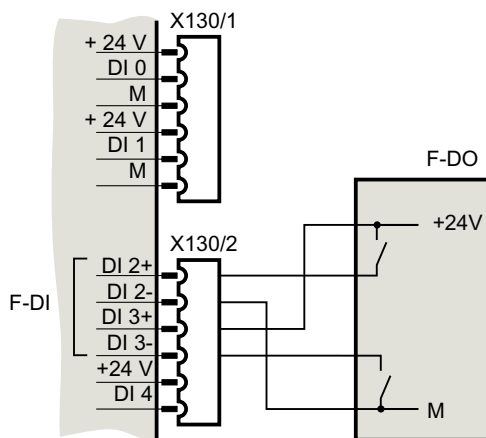
5.4.3.5 Connection example of the fail-safe digital input



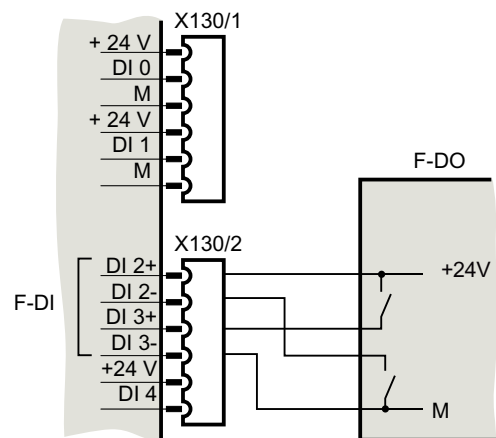
Connection for an Emergency Stop with internal 24 V



Connection for an Emergency Stop with external 24 V



Connection of the fail-safe digital input with a fail-safe digital output









Connection of the fail-safe digital input with a fail-safe digital output

Commissioning and diagnostics in the Web server

Overview

Use the web server for the commissioning, fine parameterization and diagnostics of the converter. The following important functions can be found in the web server:

-  Perform commissioning (Page 118)
-  Perform parameterization settings (Page 124)
-  Perform safety settings (Page 135)
-  Display diagnostics (Page 150)
-  Backup and restore (Page 153)
-  System settings (Page 156)

Supported browsers

The web server integrated in the converter supports the following browsers:

| Commissioning device | Operating system | Supported browsers |
|-----------------------|---------------------------------|---|
| PC | Windows Version 7 or higher | <ul style="list-style-type: none"> • Microsoft Internet Explorer, Version 11 or higher • Microsoft Edge Version 14 or higher • Mozilla Firefox, Version 45 or higher • Google Chrome Version 52 or higher |
| Smartphone/ tablet | Apple iOS Version 9.3 or higher | <ul style="list-style-type: none"> • Google Chrome Version 54.0 • Safari Version 9.3 or higher |
| | Android Version 4.4.4 or higher | <ul style="list-style-type: none"> • Google Chrome Version 54.0 or higher |

6.1 Fundamentals

Accessing the web server

The web server is accessed per default via the service interface X127.

The service interface is designed for point-to-point connections and must not be networked.


The service interface has the following default setting:

- IP address: 169.254.11.22
- Subnet mask: 255.255.0.0

The interface can be assigned via DHCP or also another address (e.g. from an external WLAN access point).


If you want to access the converter via WLAN from a mobile terminal device, connect a commercially available WLAN access point to the service interface. Refer to the description of the device on how to configure the access point.

Access via PROFINET

 Configuring the IP connection (Page 158)

The IP addresses of the service and PROFINET interfaces must not be in the same subnet.

Preparations

1. Install the motor and converter according to the specifications in the following section:
 Installing (Page 83)
2. Mount the motor on the mechanical system. Connect the motor to the converter.
3. Connect the converter to your commissioning device via the service interface (X127).
4. Switch the converter on.
The converter powers up and reads the motor data.
5. Start the browser for commissioning.
6. Enter the IP address of the converter in the input line of your browser.
Default IP address: 169.254.11.22.

Interfaces and connection type

Using the default configuration of the web server, you can access the SINAMICS frequency converter using the service interface (X127) - both via an HTTP connection as well as via an encrypted HTTPS connection.

In the standard configuration, interface X150 is deactivated for web server access operations. If the X150 interface is activated for access to the web server, then access takes place automatically via a secure HTTPS connection.

For details on this, see:

 "Configuring the IP connection (Page 158)"

NOTICE**Software manipulation when using non-encrypted connections (HTTP)**

The HTTP protocol transfers data without encryption. This facilitates password theft, for example, and can lead to data manipulation by unauthorized parties and thus ultimately to damage.

- Limit access to HTTPS connections so that all data is transferred encrypted.

6.2 First login

Assigning the administrator password

You must log in as administrator to obtain complete access to the converter. A password is required for access as administrator.

To assign an administrator password, proceed as follows:

1. Switch the converter on and within 10 minutes, connect it via the service interface (X127) to the web server (default IP address: 169.254.11.22.).
The following screen form only appears when an administrator password has not yet been assigned and only for 10 minutes after switch-on.

The screenshot shows a web browser window titled "Initial Setup". At the top left is a black circle with a white lowercase 'i' (information icon). To its right, the text reads: "To receive access to the drive you must log in as Administrator within ten minutes. Assign a password for this". Below this text are two input fields: "Password" and "Confirm password". At the bottom of the form, there is a section titled "Security Information" with the following text: "In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement - and continuously maintain - a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept. <http://www.siemens.com/industrialsecurity>".

Figure 6-1 Prompt for the administrator password

2. Enter an administrator password in the "Password" field.

Note

To protect against unauthorized access, by an attacker, for example, select a password that is as secure as possible, and consists of:

- At least 8 characters
- Uppercase and lowercase letters
- Numbers and special characters (e.g.: ?!%+ ...)


It is not permissible that the password is used elsewhere.

Checking the password

The length of the password is checked by the converter. There is no check for uppercase and lowercase letters and special characters!

3. Repeat the password in the "Confirm password" field.
If the input is not identical in both fields, the "OK" button is not enabled.

6.2 First login

4. Confirm your password entry with "OK".
Remember the password or store the password in a safe place that cannot be accessed by unauthorized persons.
5. The display changes to the Login screen form. Log in there with the administrator password.
 Login/logout (Page 116)

Note

The display also changes to the Login screen form if you do not enter a password within 10 minutes.


If you wish to assign an administrator password for the first time, switch the converter off and on again so that the initial input screen form appears again.

Password reset

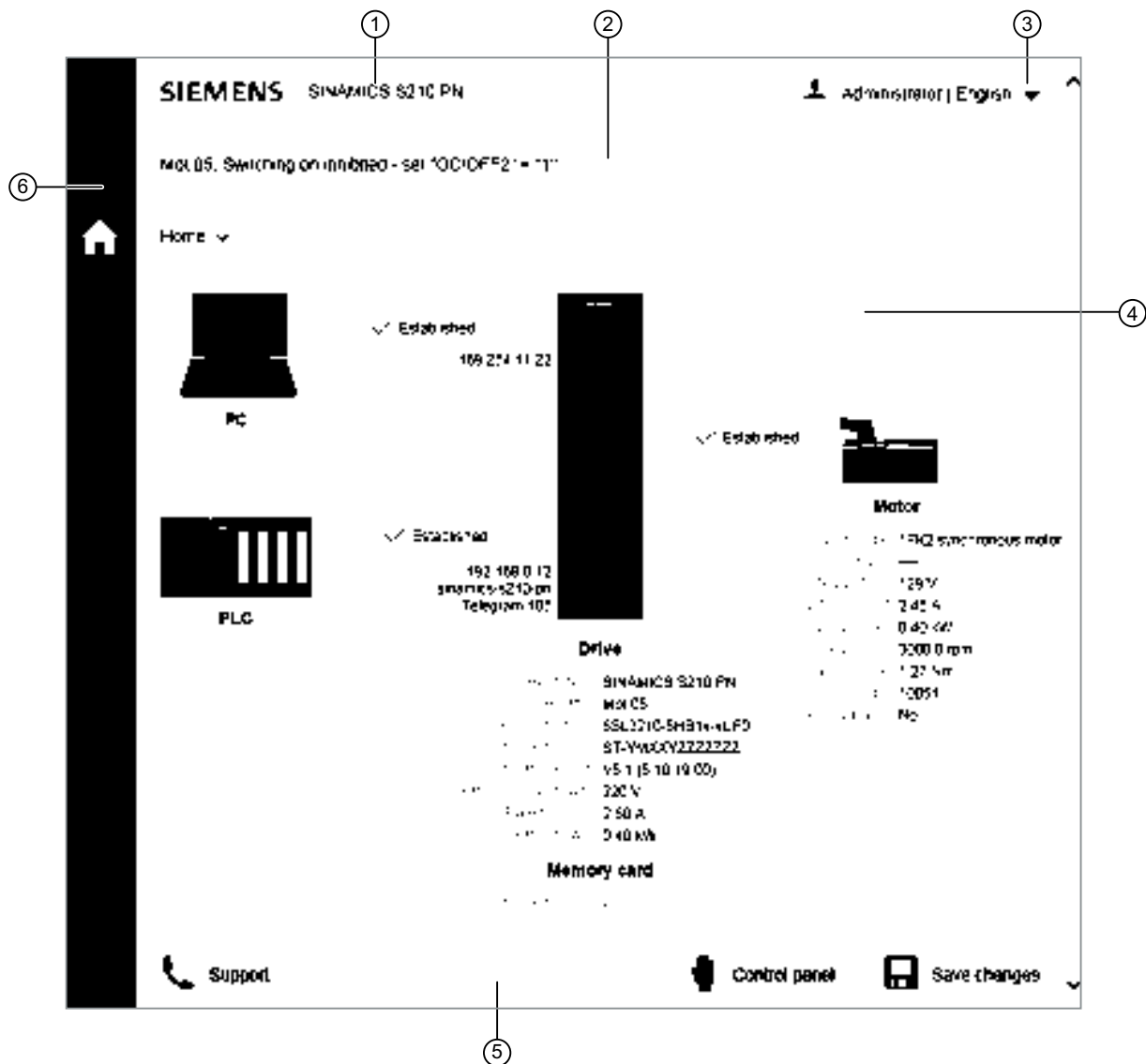
It will be no longer possible to access the converter if the administrator password is lost. In this case, you must reset the password. To do this, use a memory card that contains a configuration with a known password.

Procedure:

Load a configuration for a converter which has a known administrator password and reset it to factory settings.

1. Insert an empty memory card (max. 2 GB) into the PC.
2. Copy the configuration to the memory card (as a minimum, to the USER directory).
3. Insert the memory card into the converter and switch on the converter.
4. Open the web browser and log on as administrator with the known password.
5. Reset the converter to the factory settings.
 Backup and restore (Page 153)
6. The converter starts with the factory settings. After the run-up, the input dialog for the administrator password appears.
7. Re-assign the administrator password.
Remember the password or store the password in a safe place that cannot be accessed by unauthorized persons.
8. Recommission the converter.
9. Save the changes.

6.3 Structure of the Web browser



- ① Device designation
- ② Status bar (from left to right):
Name of the converter (if entered) / Status of the converter / Fault and warning messages
- ③ Drop-down list for the language selection and to log out from the web server.
Displays the logged-in user and the set language
- ④ Active view of the web server (in the example: Start page after the user has logged in)
- ⑤ Action bar (from left to right):
Support information / Call control panel / Save retentively (RAM to ROM)
- ⑥ Navigation toolbar (see following "Navigation of the web server")

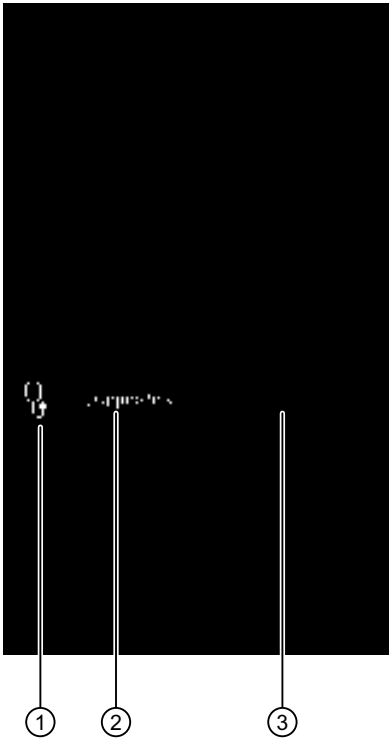
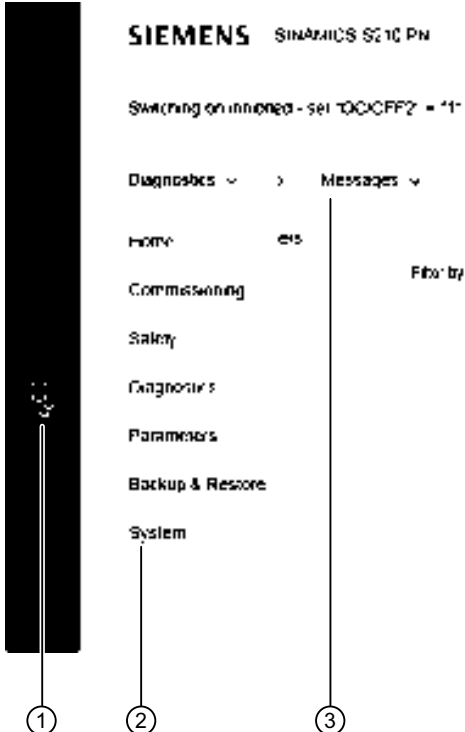
Figure 6-2 Basic structure of the web server

6.3 Structure of the Web browser

Navigation in the web server

The web server provides the following options for navigating:

- Multi-level navigation bar of the web server
- In the active web server view via drop-down lists

| Navigation via the navigation bar | Navigation via drop-down lists (drop-down menus) |
|--|--|
| <p>The navigation bar of the web server has a multi-level structure. Example:</p>  | <p>Alternatively, the screen forms can also be called in the active view of the web server via drop-down lists (drop-down menus). This also allows easy navigation in small displays (smartphone).</p>  |

- ① Main menu as icon
- ② Main menu in text format
- ③ Submenus of the active main menu

6.3.1 Changing parameter values in dialog input screens

The web pages are structured to include an information section, a graphic section and a context sensitive table section with parameters.

Mot 05

Parameters > Limits

Illustration

| Parameter name | Value | Unit |
|---------------------------------------|----------|-------|
| Maximum speed | 2517.081 | 1/min |
| Torque limit motoring | 20.38 | Nm |
| Torque limit regenerating | -20.38 | Nm |
| Torque limit motoring active | 16.7 | Nm |
| Torque limit when regenerating active | -16.7 | Nm |

You make changes to the parameter values in the table rows under the graphic display. It is not possible to make entries in the graphics. However, the edited rows are highlighted context-sensitive in the table and graphic.

In most cases you will be able to work with the parameters in the table directly below the diagram.

In some cases, you must make the parameter settings which can only be found in the parameter list of the converter.

Further information:



Adapt parameter list (Page 129)

6.4 Login/logout

6.4.1 Users and access rights

There are two or permanent defined users for access to the converter via the web server:

- Administrator
The administrator has full access to the converter data displayed in the web server. A password is always required for access as administrator.
- SINAMICS
The SINAMICS user has restricted access rights, see the following table. Per default, a password is not assigned for the SINAMICS user.

Note

Configuring passwords for the users

You can configure the passwords of the two users in the system settings with administrator rights (see Chapter "Setting or changing user accounts (Page 156)").

The following access rights apply for the users of the web server:

| Functions of the web server | Access rights | |
|---|--|---|
| | SINAMICS | Administrator |
| Start page Password input | Write | Write |
| Perform commissioning <ul style="list-style-type: none"> • Change drive name • Perform One Button Tuning • Use control panel | None ¹⁾ | Write |
| Safety settings <ul style="list-style-type: none"> • Make commissioning settings • Check commissioning in read mode • Diagnostics | None ¹⁾ None ¹⁾ Read | Write Read Read |
| Diagnostics <ul style="list-style-type: none"> • Display communication settings • Adapt message list • Acknowledge alarms | Write Write Write | Write Write Write |
| Settings <ul style="list-style-type: none"> • Set limits • Adapt brake control • Adapt digital inputs • Adapt parameter list • Change parameterization | Read Read Read Write Read | Write Write Write Write Write |

| Functions of the web server | Access rights | |
|---|--------------------|---------------|
| | SINAMICS | Administrator |
| Back up and restore <ul style="list-style-type: none"> • Back up parameter settings externally • Load externally backed-up parameter settings • Restore factory settings | None ¹⁾ | Write |
| Adapt system settings <ul style="list-style-type: none"> • Set user accounts • Configure IP connection • Configure system time | None ¹⁾ | Write |
| Save permanently (Copy RAM to ROM) | None ¹⁾ | Write |
| Call support information | Read | Read |

¹⁾ This function is not displayed for a logged-in "SINAMICS" user.

6.4.2 Login/logout

In order to be able to work in the web server, you must be logged in as "SINAMICS" or "Administrator" user.

Logging in to the web server

1. Enter the IP address for the converter in the entry line of your browser (default IP address: 169.254.11.22).
The password prompt appears in the browser.

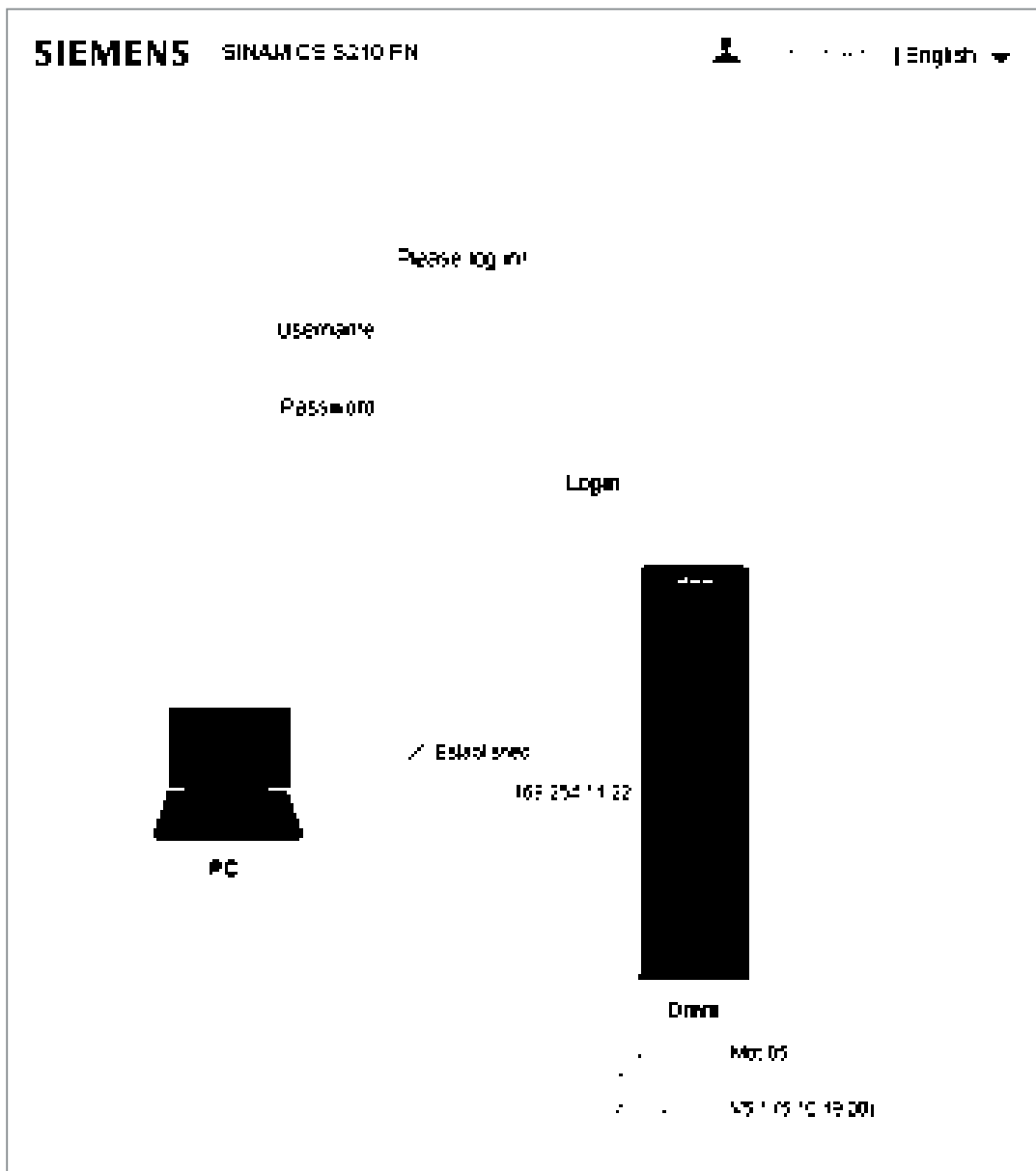



Figure 6-3 Login screen

2. Enter the name of the user (Administrator or SINAMICS) in the "User name" field.

3. Then enter the password of the user.
Per default, a password is not assigned for the "SINAMICS" user. In this case, you can skip the password input.
4. Click "Login".
When you have successfully logged in, the browser displays the user name at the top right. The most important elements of your drive system are shown centrally in the view:

Logging out from the web server

1. In the window, click the  icon with the user name at the top right.
2. Click "Logout".
If have changed the converter settings, a save prompt appears. You can select here whether to save or discard the changes.

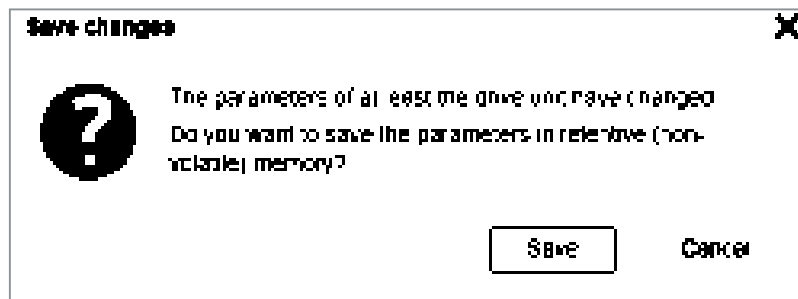


Figure 6-4 Save prompt when logging out

3. If you want to save the changes, click "Save".

Automatic logout

If you are not using the web server, access to the web server is automatically logged out after 10 minutes. You must log in again to access the web server.

6.5 Commissioning


After being switched on, the converter starts extensive self-configuration. The most important data is read from the electronic rating plate of the motor connected using the OCC cable and used for the self-configuration. The following steps are required to complete the commissioning:

- Name assignment of the converter (initialization) according to its technical application
- One Button Tuning for the optimal controller setting of the converter

Note

Rights required for commissioning

Administrator rights are essential for commissioning via the Web server:

 "Users and access rights (Page 114)"

6.5.1 Assigning the drive name



During converter commissioning you can allocate a specific system name.

Procedure

1. Select "Commissioning" and "Device" in the navigation.

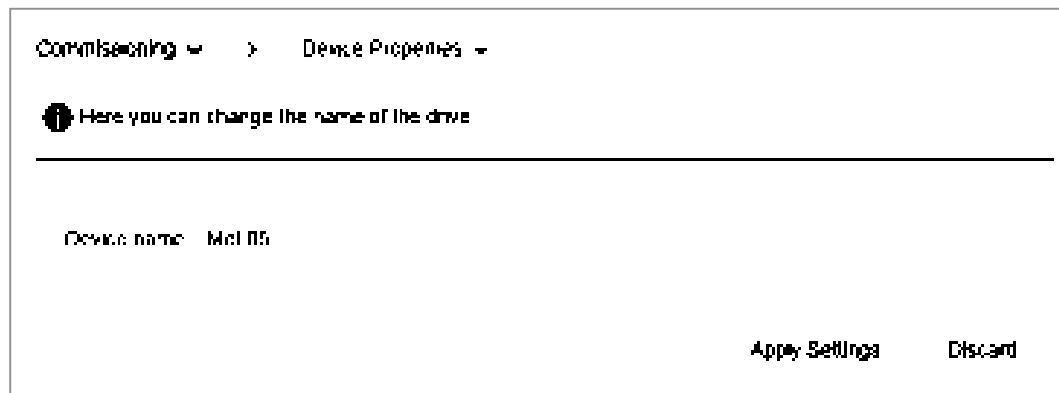



Figure 6-5 Device name

2. Enter a new drive name in the "Drive name" field.
Do not use special characters for the drive name. The name cannot be saved when special characters are used.
3. Click "Apply Settings" to save the changes in the RAM of the device.
The assigned drive name is displayed in the status bar of the web browser, on the overview page for the converter data and on the tab of the browser window.
4. Click  to save the data permanently.

6.5.2 Performing One Button Tuning



An important part of the basic commissioning is performed using "One Button Tuning" ("OBT"). In this way, the optimum controller settings of the converter can be quickly determined with just a few entries.

Procedure

1. Select the "Optimization" submenu in the "Commissioning" navigation.

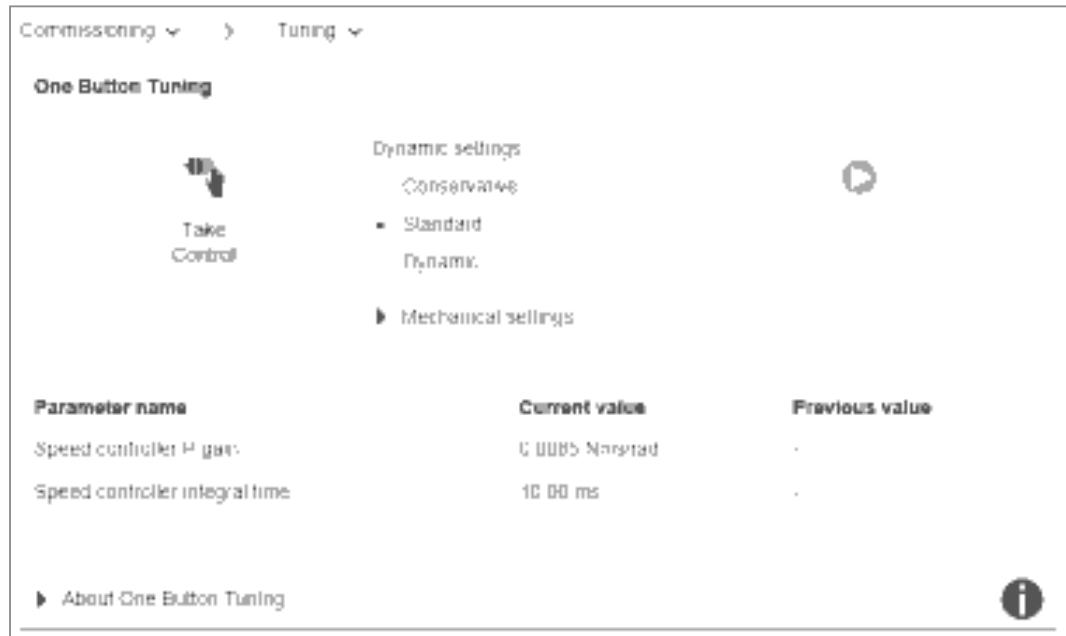


Figure 6-6 View before performing the One Button Tuning

2. Click "Take Control".
Confirm the "Activate master control" prompt.
The master control is indicated by a broken orange bar.
3. Select the desired dynamic response setting for the One Button Tuning corresponding to the mechanical system of your machine.
One Button Tuning optimizes the drive based on the selected dynamic response setting.
 - "Conservative":
Slow control – low mechanical load.
 - "Standard":
Best compromise between fast speed control and low mechanical load.
 - "Dynamic":
Fast speed control – high mechanical load.

6.5 Commissioning

- 4. Click "Start Tuning...".
A prompt for the permissible angle of rotation (rotation limit) of the motor shaft appears.

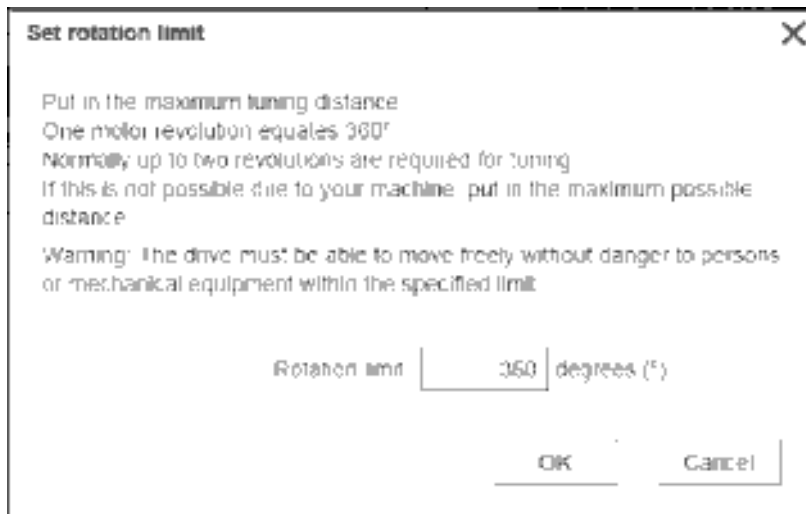


Figure 6-7 Rotation limit

- 5. Enter the angle through which the motor and the connected machine are permitted to turn for the required measurements (e.g. 360°) without the mechanical system being damaged. The angle should be at least 60° in order to be able to determine useful controller parameters. Generally, longer traversing distances result in better optimization results.

6. Click "OK".

The tuning through the One Button Tuning starts. No entries are possible during the tuning. After the tuning has been completed, a message appears as to whether the "One Button Tuning" was successful - or not. If the OBT was not successful, then optimization must be repeated, possibly with modified entries.

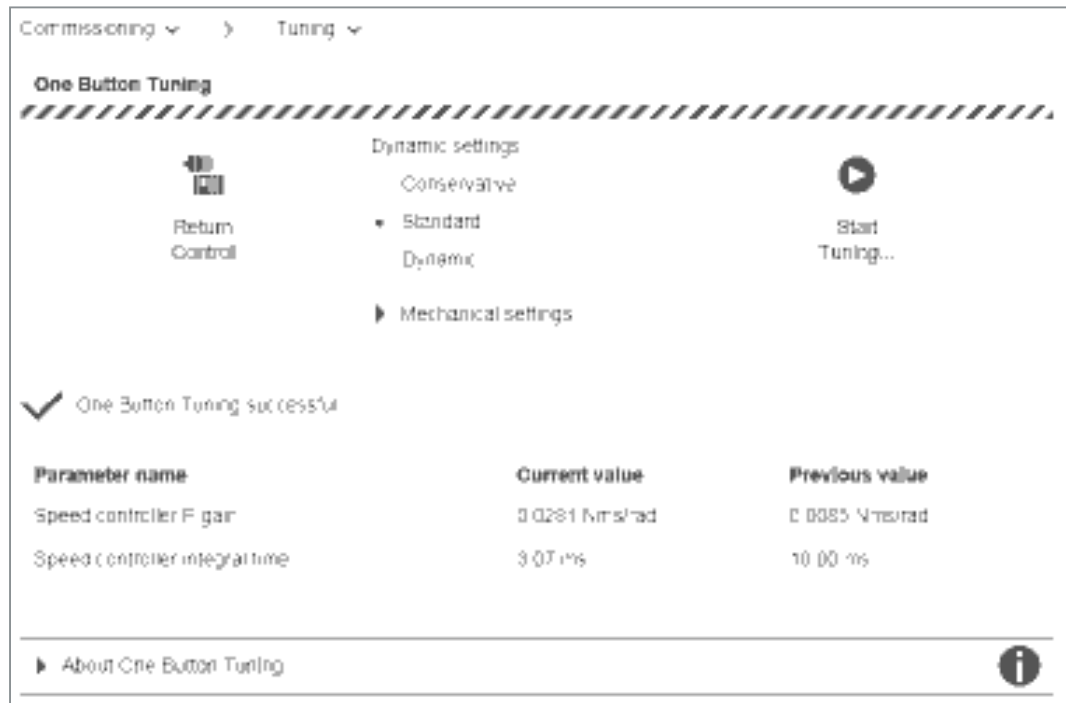



Figure 6-8 View after performing the One Button Tuning

A list in the lower part of the window shows how the settings have been changed by the One button tuning.

Note

If the machine vibrates or whistles at certain speeds following One Button Tuning, then the dynamic response setting is too high. In this case, select a lower dynamic response and repeat the One Button Tuning.

7. After completing the controller tuning, you must return the master control over the converter. Click "Return control".
8. Confirm the confirmation prompt with "Confirm".
The color bar is no longer displayed.
9. Click  to save the data permanently.

Result

When One Button Tuning is completed, the basic commissioning of the converter is finished. All other parameters are automatically preset according to the motor characteristic.

6.5.3 Using the control panel

The control panel is only used during the commissioning phase to control and monitor the drive. The required safety measures must be strictly complied with. It offers the following options:

- Monitoring drive movements
- Checking missing enables
- Testing drive movements or traversing manually

Call the control panel

You can always call the control panel when you access the web server in the converter with your commissioning device.

1. To call the control panel, click "Control panel" in the footer of the web server. The control panel is started in monitoring mode.



Figure 6-9 Control panel - Monitoring mode

2. To close the control panel again, click the "Control panel" button again in the footer of the web server or on the X at the top right in the header of the control panel.

Control panel in monitoring mode

When all enables are present, the "Missing Enables" line is not displayed and the "Actual speed", "Actual torque" and "Actual current" display fields show the current values of the drive.

If enables are missing, the motor does not turn. In this case the "Missing Enables" LED lights up in blue.

1. Click the "Click here for details" link to display the details. The "Missing enables" dialog opens:
2. Click "Close" to close the display dialog.

Control panel in control mode

If you take control, you can test the drive movements or traverse manually.

1. To call the control panel, click the "Control panel" button in the footer of the web server. The control panel is displayed in monitoring mode.
2. Click the "Take control" button.

3. Confirm the "Take control" confirmation prompt with "Confirm".
The control panel now has master control over the drive. This is indicated by a broken orange line. All other control sources are switched off.

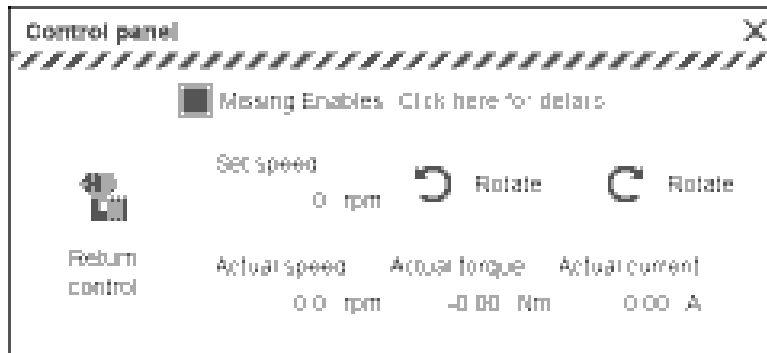


Figure 6-10 Control panel - Control mode

4. To specify a new speed for traversing, click in the "Speed" field.
The "Set speed" dialog opens. Define the speed and acknowledge with "OK".
5. To traverse the drive manually, click the "Rotate" button with counterclockwise or clockwise arrow briefly and check the response in the display fields or at the missing enables.
The traversing motion is only performed as long as the button is clicked. The traversing motion stops when you release the mouse button.
The arrows on the buttons indicate the direction of rotation of the drive when viewing the end of the motor with the shaft extension.
Check the correct direction of rotation of the motor shaft.
6. Click "Return control" to return the master control.
Confirm the confirmation prompt with "Confirm".
7. To close the control panel again, click the "Control panel" button again in the footer of the web server or the X at the top right in the "Control panel" dialog.

6.6 Settings

6.6.1 Setting limits



When required, you can configure limits for elements of your converter and adapt to the requirements of your mechanical system in the "Parameters - Limits" view.

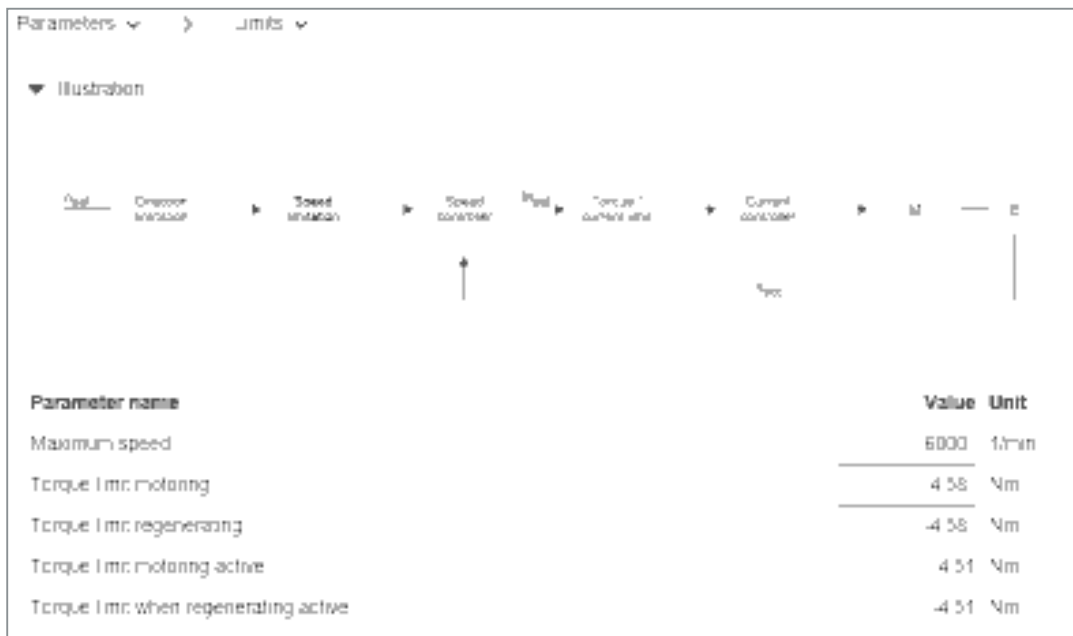



Figure 6-11 Parameters - Limits

Setting limits

1. Select "Parameters" and "Limits" in the navigation.
The table below the graphic shows the "Maximum speed" line of the speed limitation.
2. Enter the maximum speed in the input field of the same name.
3. Enter the two torque limit values.
 - "Torque limit when motoring"
 - "Torque limit when generating"
4. Click  to save the data permanently.


6.6.2 Setting the brake control



The simple brake control is used exclusively for the control of holding brakes. The holding brake is used to secure drives against unwanted motion when deactivated.

Based on system-internal sequences, the converter checks and monitors the commands for opening and closing the holding brake and controls the output accordingly. The data required for the brake control is stored in the motor and only has to be corrected in exceptional circumstances.

More detailed information on the closing and opening times of the motor can be found in Chapter:

 Brake data (Page 185)

The start of the closing time for the brake depends on the end of the shorter of the two times "Standstill detection monitoring time" and "Pulse cancellation delay time".

Note

Automatic default setting

The values of the holding brake are automatically set correctly through the self-configuration of the converter in accordance with the electronic rating plate. As a consequence, generally the displayed values no longer have to be corrected.

The values in this screen form serve more as a check. It may only be necessary to adapt the values for suspended axes.

Procedure

1. Select "Parameters" and "Brake control" in the navigation.

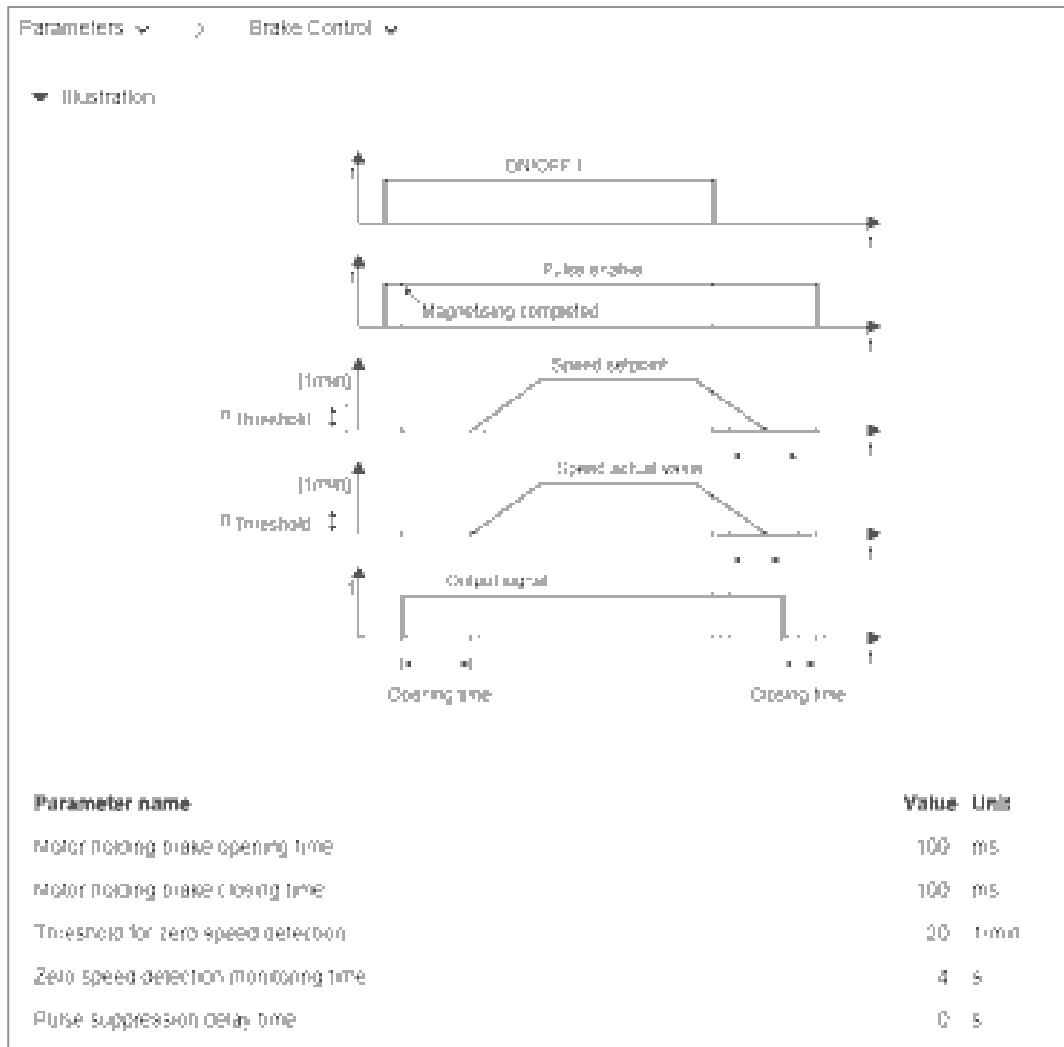



Figure 6-12 Brake control

2. If required, adapt the brake control values in the "Value" column:
 - "Standstill detection speed threshold"
 - "Standstill detection monitoring time"
 - "Pulse cancellation delay time"
3. Click  to save the data permanently.

6.6.3

Configuring digital inputs



In addition to the fail-safe digital input (F-DI, DI 2 and DI 3), the converter has two high-speed digital inputs (DI 0 and DI 1) as measuring inputs and for the evaluation in the controller.

If you use these digital inputs, you have to set a telegram in the controller that transfers the values, e.g. the PROFIdrive telegram 105.

The converter also has an input (DI 4) to monitor the temperature of an optional external braking resistor.



Connection example (Page 103)

Setting digital inputs

1. Select "Parameters" and "Inputs" in the navigation.

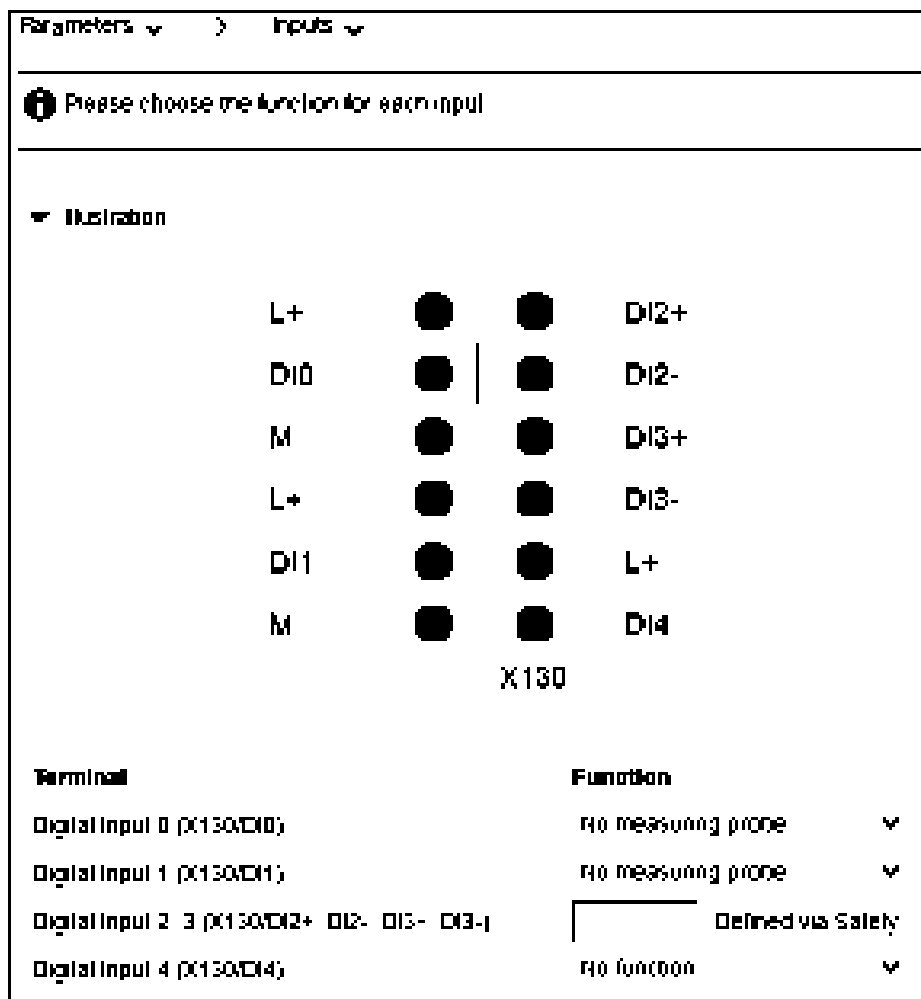


Figure 6-13 Digital inputs

2. Select the appropriate input signal in the table for the measuring inputs and the temperature control:
 - "Digital input 0 (X130/DI 0)": Probe 1
 - "Digital input 1 (X130/DI 1)": Probe 2
 - "Digital input 2, 3 (X130/DI 2+, DI 2-, DI 3+, DI 3-)":
Fail-safe digital input for the Safety Integrated Basic Function "STO" or "SS1".
The configuration is performed via the Safety commissioning. By clicking "Safety", you open the Safety commissioning and can make the appropriate settings there.
 "Safety commissioning (Page 135)"
 - "Digital input 4 (X130/DI 4)": Temperature monitoring of ext. braking resistor
3. Click to save the data permanently.

6.6.4 Adapt parameter list

You can make all of the essential settings after commissioning using the setting web pages. In certain cases, it may be necessary to make extra settings or evaluations of status and measured value outputs.

The available parameter list in which you can view or change all the available device parameters, is used for this purpose.

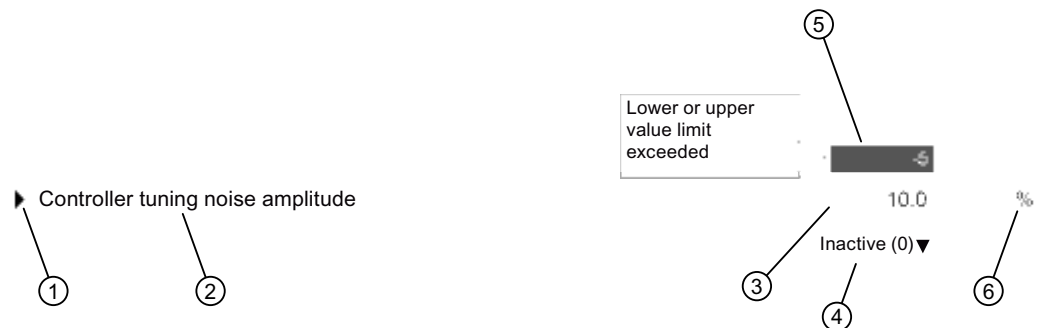
You will find a detailed description of all S210 parameters in the following Section:

 Parameters (Page 225).

Parameter types used in the parameter list

There are two main groups for the parameters:

- Adjustable parameters
Adjustable parameters are identified by a frame in which you can either enter values or select values via drop-down menus. Invalid values have a red background and are rejected.



- ① Adjustable parameters with this icon have several indices or bit arrays
- ② Name of the parameter
- ③ Input field for the parameter value
- ④ Select the parameter value via the drop-down menu
- ⑤ Invalid value
- ⑥ Unit of the parameter

Figure 6-14 Example of the representation of an adjustable parameter

- Display parameters
Display parameters are for information purposes only and cannot be changed.



- ① Display parameters with this icon have several indices or bit arrays

Figure 6-15 Example of the representation of a display parameter

Calling the parameter list

Select "Parameters" and "Parameter list" in the navigation. The "Parameters - Parameter List" view is displayed.

6.6 Settings

6.6.4.1 Configuring the parameter list



Per default, the web server displays the parameter list with all parameters of the converter in the simple view.

In order to keep the display as clear and compact as possible, some of the columns of the parameter list are hidden. The detailed information of the parameters (index or bit array) is also hidden and can be displayed manually.

Changing the display of the parameters

Displaying the advanced list view

The parameter list is displayed in the simple view when called.


- To display the advanced view of the parameter list, click "Advanced view".
The "ID" and "My group" columns are now displayed to the left of the "Parameter" column.

| My group | ID | Parameter | Value | Unit |
|--------------------------|------|---------------------------------------|--------------------------------------|------|
| <input type="checkbox"/> | p10 | Drive commissioning parameter (Mtr 2) | Ready (0) | |
| <input type="checkbox"/> | p210 | Drive unit line supply voltage | 230 | V |
| <input type="checkbox"/> | r302 | Motor code (DRIVE CLM) | 27204 | |
| <input type="checkbox"/> | r304 | Rated motor voltage | 129 | Vrms |
| <input type="checkbox"/> | r305 | Rated motor current | 2.45 | Arms |
| <input type="checkbox"/> | r307 | Rated motor power | 0.40 | kW |
| <input type="checkbox"/> | r311 | Rated motor speed | 3000.0 | rpm |
| <input type="checkbox"/> | r322 | Maximum motor speed | 6000.0 | rpm |
| <input type="checkbox"/> | r323 | Maximum motor current | 0.80 | Arms |
| <input type="checkbox"/> | r330 | Brake status | No data (0) | |
| <input type="checkbox"/> | r322 | Telegram selection | SIEMENS program 105, F20-10*10 (105) | |

Figure 6-16 Parameter list: Advanced view

This advanced list view is only temporary. The next time the web server is called, the simple view is displayed again.

Displaying parameter details

- To display parameter details, click the  icon in front of the parameter name.











| | | | | | |
|--------------------------|---|---|---|-----------------------------------|---|
| <input type="checkbox"/> |  | p5271 | One Button Tuning configuration 1 | | 11100 B |
| | |  | p5271[0] | One Button Tuning configuration 1 | 11100 B |
| | | p5271[0] 0 | PD controller for large load moments of inertia | No |  |
| | | p5271[0] 1 | Reduce gain at low speeds | No |  |
| | | p5271[0] 2 | Load adaptation Kp | Yes |  |
| | | p5271[0] 3 | Speed precontrol | Yes |  |
| | | p5271[0] 4 | Torque precontrol | Yes |  |
| | | p5271[0] 5 | Set maximum acceleration limiting | No |  |
| | | p5271[0] 6 | Do not change Kp | No |  |
| | | p5271[0] 7 | Voltage feedforward control | No |  |
| <input type="checkbox"/> | | r5274 | One Button Tuning dynamic response estimated | | 0.67 ms |

Figure 6-17 Example: Parameter details in the extended view


The parameter details are displayed. They are either:

- Values
- Index
- Bit array

An additional line is displayed in the table for each detail. This display is temporary. The parameter details are hidden again the next time the web server is called.

Grouping parameters

You can combine individual parameters of the parameter list into a personal group. You can activate the checkboxes in the "My group" column to assign the selected parameters to your personal group.

- In the "My group" column, activate all checkboxes of the parameters that you want to take into your group.
- Click  to save the data permanently.

6.6.4.2 Changing the parameter value




You can change the parameter values of the parameters that can be written to (p parameters) in the parameter list.

To do this, you have one of the following options:

1. Overwrite the current parameter value with the new value.
2. Select a value via the drop-down list.

Invalid values will be rejected.

Click  to save the data permanently.

6.6.4.3 Filtering the parameter list



You can set filters in the parameter list of the Web server and therefore limit the display of the parameters. You can make the filter settings via a filter bar above the parameter list. You can also combine the individual filter settings.

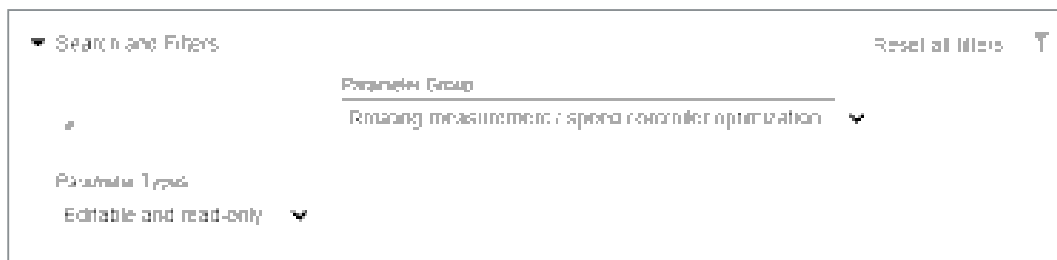


Figure 6-18 Filter bar of the parameter list


Setting the filters of the parameter list

1. In the "Search" field, enter a search term (any number of characters) for which you want to search in the parameter list, e.g. "Current".
The search term is applied to the "ID" (only in the advanced view) and "Parameter" columns in the parameter list.
2. Select a group from the "Parameter Group" drop-down list.
 - All groups
 - My groups (configured by the user)
 - Specific groups, such as motor parameters
3. In the "Parameter Types" drop-down list, select whether adjustable parameters ("Editable"), display parameters ("write protected") - or both are to be displayed in the parameter list.

The parameter list is limited further after every further filter setting (the filters are linked via an AND operation). The filters can be set in any order.

Note

Collapsing the filter bar

The filter bar is opened per default. To collapse the filter bar, click the  arrow next to "Search and Filters".

Resetting filters

As long as you are logged in to the Web server and the filter settings have not changed, the parameter list is always displayed with the last filter settings. To reset all filter settings in the parameter list, proceed as follows:

Click "Reset all filters" at the top right in the filter bar.


6.7 Plant-specific settings

To make plant-specific settings, go to the "Parameter - Parameter list" menu and select the expanded view there.

6.7.1 Changing the direction of rotation of the motor



If you determine that the motor is rotating in the wrong direction, you can reverse the direction of rotation as described below.

1. Set p0010 to value 3 (motor commissioning).
2. Change the direction of rotation via p1821.
 - 0: Clockwise rotation
 - 1: Counter-clockwise rotation
3. Reset p0010 to value 0 (ready).
4. If possible, check the new setting using the control panel.
5. Save the setting via .

This change takes effect in both the control panel and the PLC.

6.7.2 Electronic weight counterbalance for a vertical axis



With a vertical axis without mechanical weight compensation, you can set an electronic weight compensation by offsetting the torque limits (p1532).

The torque limits (p1520 and p1521 - can also be set via "Parameter - Limits") are shifted by this offset.

The required offset value is displayed in r0031 during a standstill. Transfer this value to p1532.

Save the setting via .

To prevent the axis from dropping after the brake is released, you can specify the torque offset as an additional torque setpoint (M_ADD) via the supplementary telegram 750. As a result, the holding torque is specified immediately after the brake is released.

Note

Due to the specified supplementary torque setpoint via the controller, a switchover of the supplementary torque is also possible. Thus, when the product is lifted, a supplementary torque can be specified that is different from the supplementary torque for a movement without a load.

The supplementary telegram 750 must be configured in the PLC.



Supplementary telegrams (Page 739)

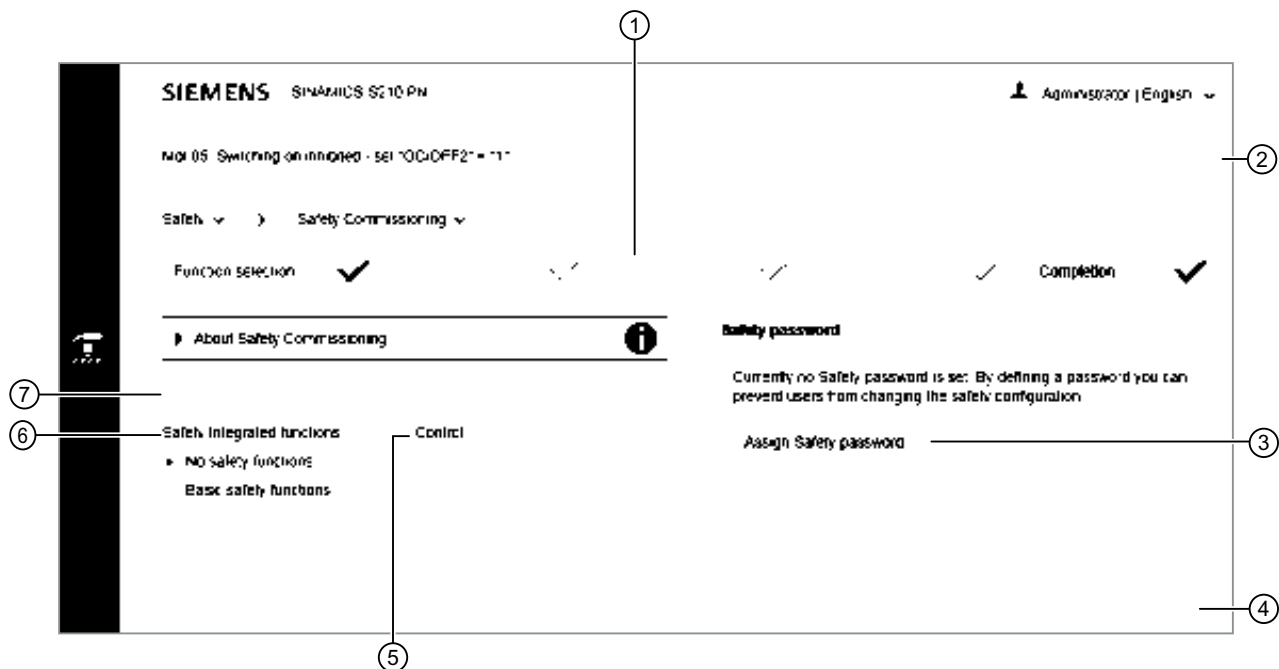
6.8 Safety settings

6.8.1 Safety commissioning

6.8.1.1 Overview



The web server provides you with a commissioning Wizard that navigates you through all of the steps required when commissioning safety. The basic handling is shown in the following diagram:



- ① Wizard with commissioning steps
- ② Access to fault and alarm messages
- ③ Safety password
- ④ Start and carry out Safety commissioning
- ⑤ Selection for controlling the safety functions
- ⑥ Selects the safety functions
- ⑦ Activation of the read-only mode (prevents inadvertent changes)

Figure 6-19 Overview: Safety commissioning Wizard

Basic information on commissioning Safety in the web server

- Safety settings can only be made in the "Safety Integrated commissioning" mode. The converter is in a safe state (STO active) as long as the commissioning mode is active. The commissioning mode is activated in step "Function selection" using the "Start" button.
- Safety settings are carried out step-by-step in the individual screen forms. A green checkmark indicates that a commissioning step has been completed.

6.8 Safety settings

- The safety commissioning must have been fully completed. It is not possible to cancel commissioning.
- A password can be defined to protect against unauthorized changes to safety settings. This can either be done at the beginning or at the end of the safety commissioning. The converter issues an alarm if a password has not been defined.
- The fault and alarm messages for safety are provided in the general message window.
- The set safety settings can be checked in the read mode at a later point in time. The commissioning mode is not required for this.

Displaying the Safety commissioning view

The individual commissioning steps are displayed in the header of the "Safety Commissioning" screen form. All commissioning steps in which settings have already been made are marked in the header with a green check mark.

The Safety commissioning in the web server is described step-by-step in the following.

1. Select "Safety" and "Safety Commissioning" in the navigation.

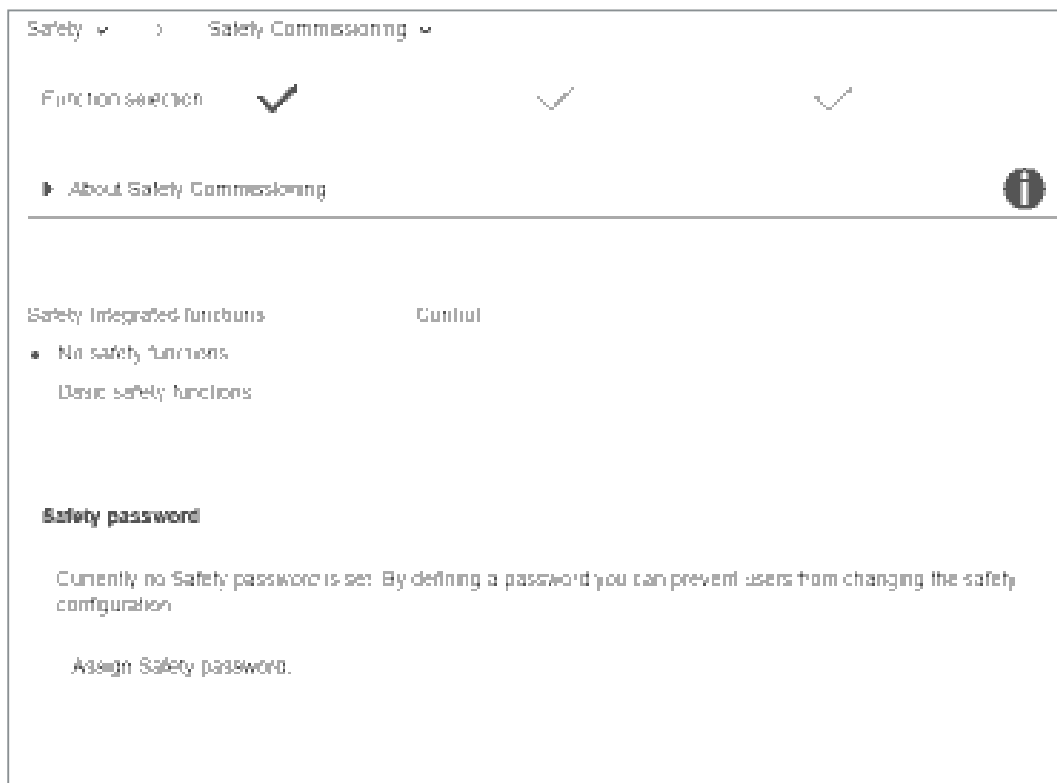


Figure 6-20 After calling

2. Specify how you want to continue with the Safety commissioning. The following options are available for selection:
 - Execute commissioning step-by-step (Page 138)
 - Check commissioning in read mode (Page 148)

Basic information on the safety functions

Detailed information on the safety functions used can be found in the following Chapter:

 Safety functions integrated in the drive (Page 57)

6.8 Safety settings

6.8.1.2 Commissioning step 1

The commissioning steps marked with a checkmark do not require any compulsory entries. The commissioning steps marked with a red pen require entries.

Function selection

Select the desired functions and the control method in the "Function selection".

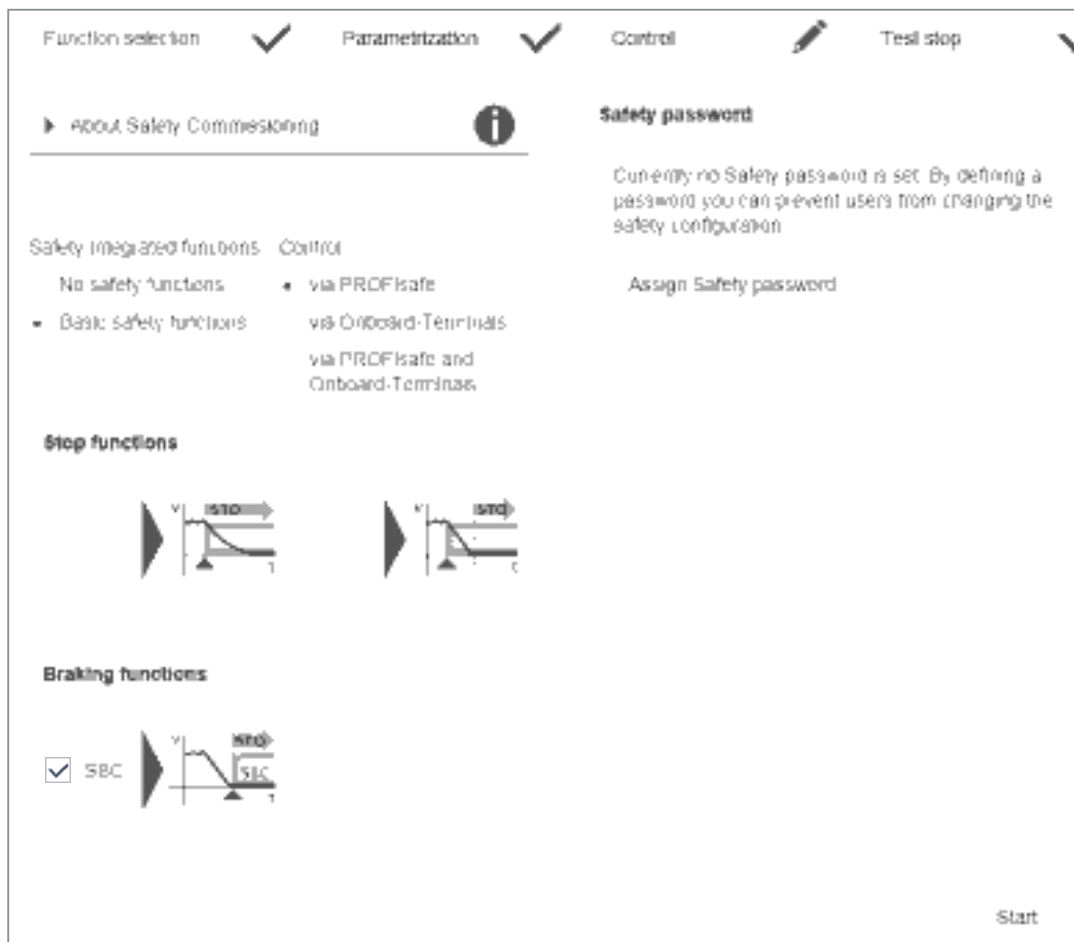



Figure 6-21 Defining the function selection

1. Select the "Basic Functions" safety function group. In this way, you select the "STO" and "SS1" safety functions.
2. Select the "SBC" function if your motor has an integrated holding brake.
3. Also select the control method of the safety functions:
 - "Via PROFIsafe"
 - "via onboard terminals"
 - "via PROFIsafe and onboard terminals"

4. Assign a safety password. You can also define the safety password later. As long as a safety password is not defined, the drive issues an alarm.
 Configuring the safety password (Page 146)
5. If a safety password has been defined, enter the safety password in the input field. You cannot make any further Safety settings without this entry.
6. To start the configuration of the individual Safety commissioning steps, click "Start" in the footer of the screen form.

6.8 Safety settings

6.8.1.3 Commissioning step 2

Parameterization

Adapt the required settings in the "Parameterization" tab.

Function selection
Parameterization
Control
Test stop

i The PROFIsafe control bit for SS1 is not evaluated for an SI SS1 delay time = 0 s

STO / SS1 - Illustration

The diagram shows a step function for 'SS1 selection' that transitions from 0 to 1. A horizontal double-headed arrow below the signal indicates a 'Delay time SS1 - STO active'. Following this delay, two signals are shown: 'SBC active' and 'STO active', both of which transition from 0 to 1.

| Parameter name | Value | Unit |
|--|------------|------|
| SI SS1 delay time | 1 | s |
| SI enable safe brake control | Enable SBC | |
| SI Safety Info Channel status word S_2SW* B STO active | Yes | |

More Function Parameters

| Parameter name | Value | Unit |
|-------------------------------------|----------------|------|
| OFF3 ramp-down time | 3 | s |
| SI SS1 drive-based braking response | SS1 with I(FF) | |
| SI transition time STOP F to STOP A | 2 | ms |

Back
Continue

Figure 6-22 Configuring the parameterization

1. Parameterize the emergency stop function with the "SI SS1 delay time".
The following settings are possible:
 - SS1 delay time = 0 → STO (stop category 0 according to EN 60204-1)
 - SS1 delay time ≠ 0 → SS1 (stop category 1 according to EN 60204-1)
2. If the converter is not to be autonomously braked in the event of an emergency stop ("SS1 with OFF3"), but via the higher-level controller ("SS1E external stop"), select this via the drop-down list "SI SS1 drive-based braking response".
3. Click "Continue".
The "Control" commissioning step is activated.

6.8.1.4 Commissioning step 3

Variant A: Control via PROFIsafe

The telegram and the address must be entered for control of the safety functions via PROFIsafe.

Figure 6-23 Parameterizing control via PROFIsafe

If, in the HW configuration, a PROFIsafe telegram was already selected and downloaded to the converter, then this telegram is displayed in field "PROFIsafe telegram from HW configuration".

1. In the "PROFIsafe telegram" drop-down list, select the desired PROFIsafe telegram and enter the PROFIsafe address. The PROFIsafe telegram and PROFIsafe address must match the definitions in the higher-level controller.
2. Click "Continue".
The "Test stop" commissioning step is activated.

Variant B: Control via onboard terminals

The Basic Functions (STO, SS1) can be controlled via terminals.

The following connections are supported:

- Current sourcing/sinking F-DO of external devices
- Current sourcing/sourcing F-DO of external devices
- Self-monitoring sensors (OSSD)
- Non-self-monitoring sensors (e.g. emergency stop button)

The existing modules of external devices operate with different test pulses for the on/off test.

The debounce time is set in conjunction with the connected module. The debounce time specifies the duration of an interference pulse at the F-DIs, which does not change the state of the drive.

The signal states at the two terminals of an F-DI are monitored in order to determine whether these have assumed the same logical state within the discrepancy time (unavoidable time delay). The selection and deselection must be performed in both monitoring channels within this discrepancy time.

The discrepancy time and the debounce time are pre-assigned default values and do not have to be changed in most cases. See the following figure.

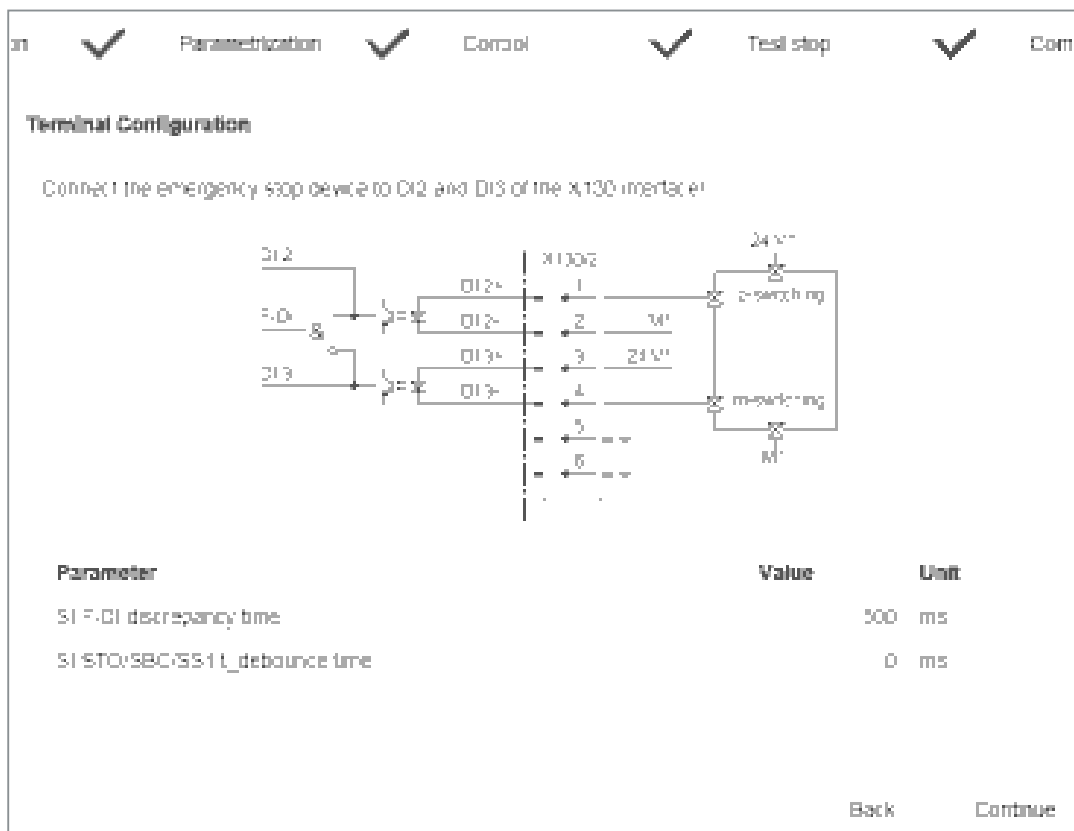


Figure 6-24 Parameterizing the controller via terminals

1. If you want to change the discrepancy time, click the "SI F-DI discrepancy time" field.
An input dialog with the same name opens. Adjust the set discrepancy time and confirm with "OK".
2. If you want to change the debounce time, click the "SI STO/SS1 debounce time" field.
An input dialog with the same name opens. Set the debounce time and confirm with "OK".
3. Click "Continue".
The "Test stop" commissioning step is activated.

Variant C: Control via PROFIsafe and onboard terminals

The settings of variants A and B are combined in variant C.

As a consequence, the STO and SS1 functions can be independently controlled via PROFIsafe and F-DI.

6.8.1.5 Commissioning step 4

Test stop (forced checking procedure)

To meet the requirements of the EN ISO 13849-1 and IEC 61508 standards in terms of timely fault detection, the converter must test its safety-related circuits regularly - at least once a year - for correct functioning.

The "Test stop timer" exists for the forced checking procedure; by default, it is set to 8760 hours = 1 year. After this time, the drive signals that a forced checking procedure is necessary by issuing error message ("Acceptance test required"). The remaining time up to the test stop is determined automatically and displayed.

The test stop (forced checking procedure) for the Safety Integrated Basic Functions is performed by selecting STO and then deselecting it. As a consequence, the timer is reset and the active message acknowledged.

If a different time interval is required for the test stop (e.g. as the result of a risk analysis), change the interval as described in the following.

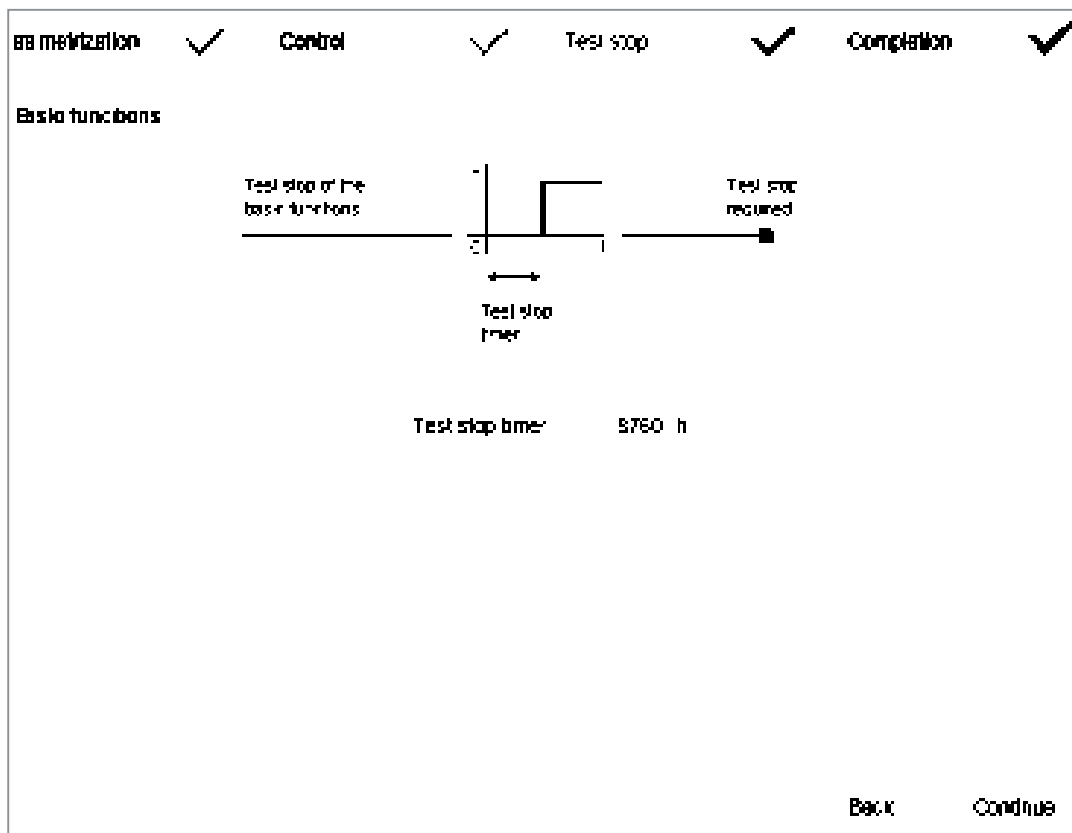


Figure 6-25 Configuring test stop (forced checking procedure)

1. To change the time interval, click in the "Test stop timer" field. An input dialog with the same name opens.
Set the timer interval here and confirm by clicking "OK".
The remaining time up to the test stop is determined automatically and displayed.
2. Click "Continue".
The "Completion" commissioning step is activated.

6.8.1.6 Commissioning step 5

Completion

You have made all of the settings for commissioning the drive-integrated safety functions. If, up until now a safety password has not been configured, then it can now be configured in this step (see the following chapter).

1. Click "Finish".
The following prompt appears. Click "Finish" again to confirm the prompt.

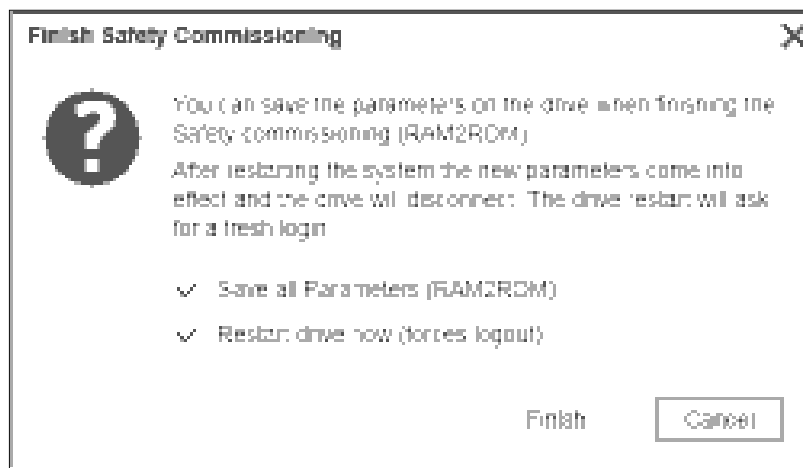


Figure 6-26 Completing the safety commissioning

If both checkmarks are checked, the converter imports the settings of the safety commissioning and performs a restart when the user clicks "Finish". After the restart, the commissioning of the drive-integrated safety functions is completed and the browser once again shows the home page of the web server.

6.8 Safety settings

6.8.1.7 Configuring the safety password



The safety password protects the safety parameters against maloperation by unauthorized users.

The safety password can be assigned either before starting to commission the safety functions or at the end. The drive issues an alarm as long as a password is not assigned.

Note

The safety password is write protection specified in the appropriate standards to prevent against maloperation by unauthorized users.

The password must also include the following elements to provide protection against unauthorized access, e.g. unauthorized persons.

- At least 8 characters
- Uppercase and lowercase letters
- Numbers and special characters (e.g.: ?!%+ ...)

It is not permissible that the safety password is used elsewhere.

Checking the password

The length of the password is checked by the converter. There is no check for uppercase and lowercase letters and special characters!

Assigning the safety password


If you have not yet assigned a safety password, the "Assign safety password" button is active in the "Function selection" and "Completion" screen forms.

1. Click the "Assign safety password" button.
The password dialog with the same name opens.
2. Enter the new safety password in the "Safety password" field.
3. Repeat the input in the "Confirm safety password" field.


- If you click "OK", the converter imports the safety password.
Remember the password or store the password in a safe place that cannot be accessed by unauthorized persons.
You are prompted to enter a password each time safety commissioning is started.

Figure 6-27 Safety password


You must enter the safety password in this input field so that you can continue with the other safety settings.

- Click  to save the data permanently.

Changing the safety password

- Click "Change safety password ...".
The input dialog opens.
- Enter the current safety password in the first field.
- Enter the new safety password in the second field.
- Repeat the input in the "Confirm new safety password" field.
- Click "OK" to confirm the input of the password.
- Click  to save the data permanently.

Resetting the safety password

- Click "Reset safety password ...".
The input dialog opens.
- Enter the current safety password.
- Click "OK" to confirm the resetting of the password.
The drive then outputs an alarm that password protection is no longer active.
- Click  to save the data permanently.

6.8 Safety settings

6.8.1.8 Checking existing safety settings in the read mode



You can run through the complete safety commissioning step-by-step in the read mode and check the settings that have been made.

1. Activate the "Read-only mode" option.

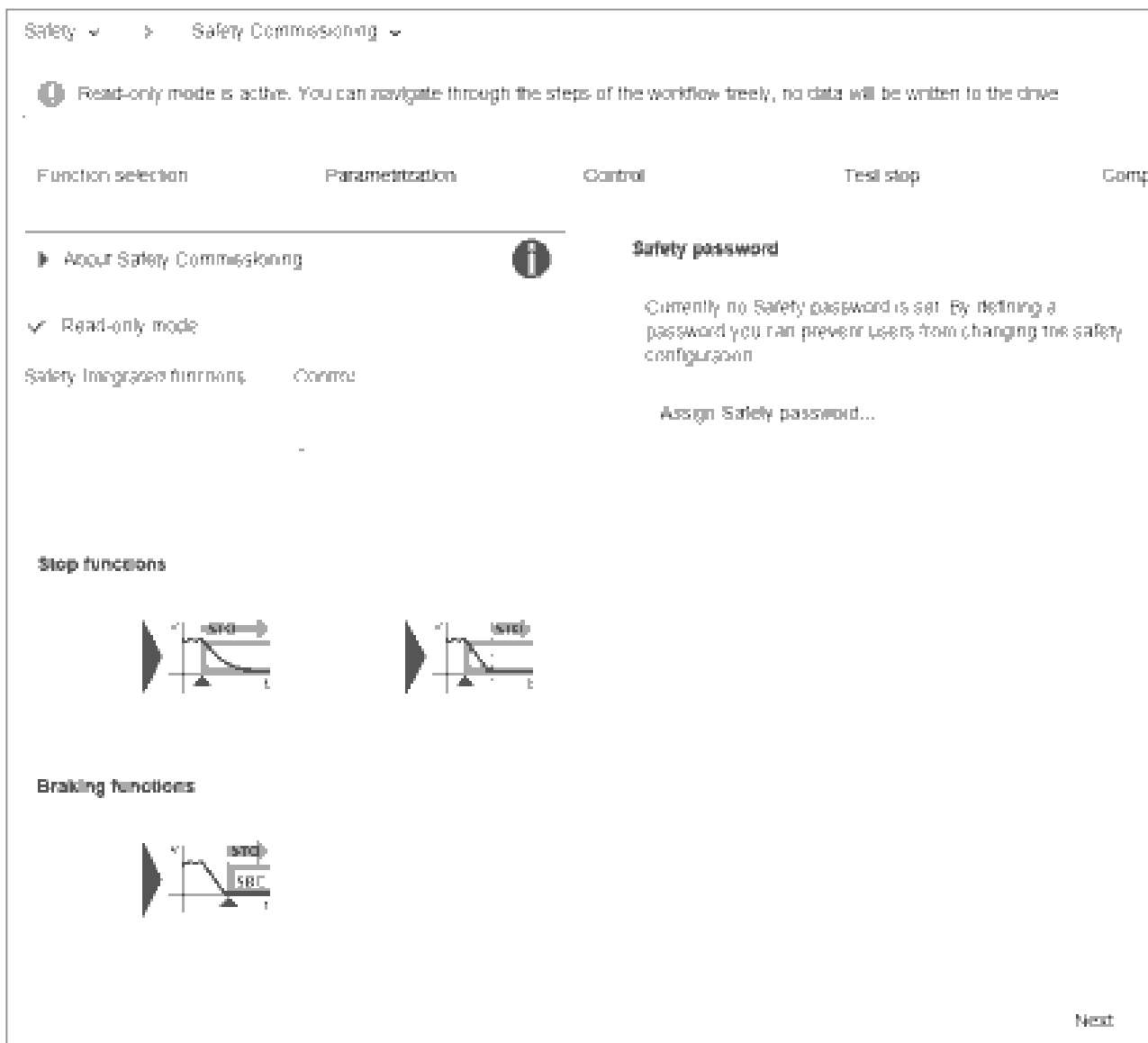


Figure 6-28 Safety commissioning in read mode

The individual commissioning steps are displayed in the header of the "Safety Commissioning" screen form.

2. Click the "Continue" button each time and check the settings that are required Safety commissioning.

6.8.2 Safety diagnostics



The most important information on the safety settings and the states of the converter are displayed using the safety diagnostics.

Select "Safety" and "Safety Diagnostics" in the navigation.

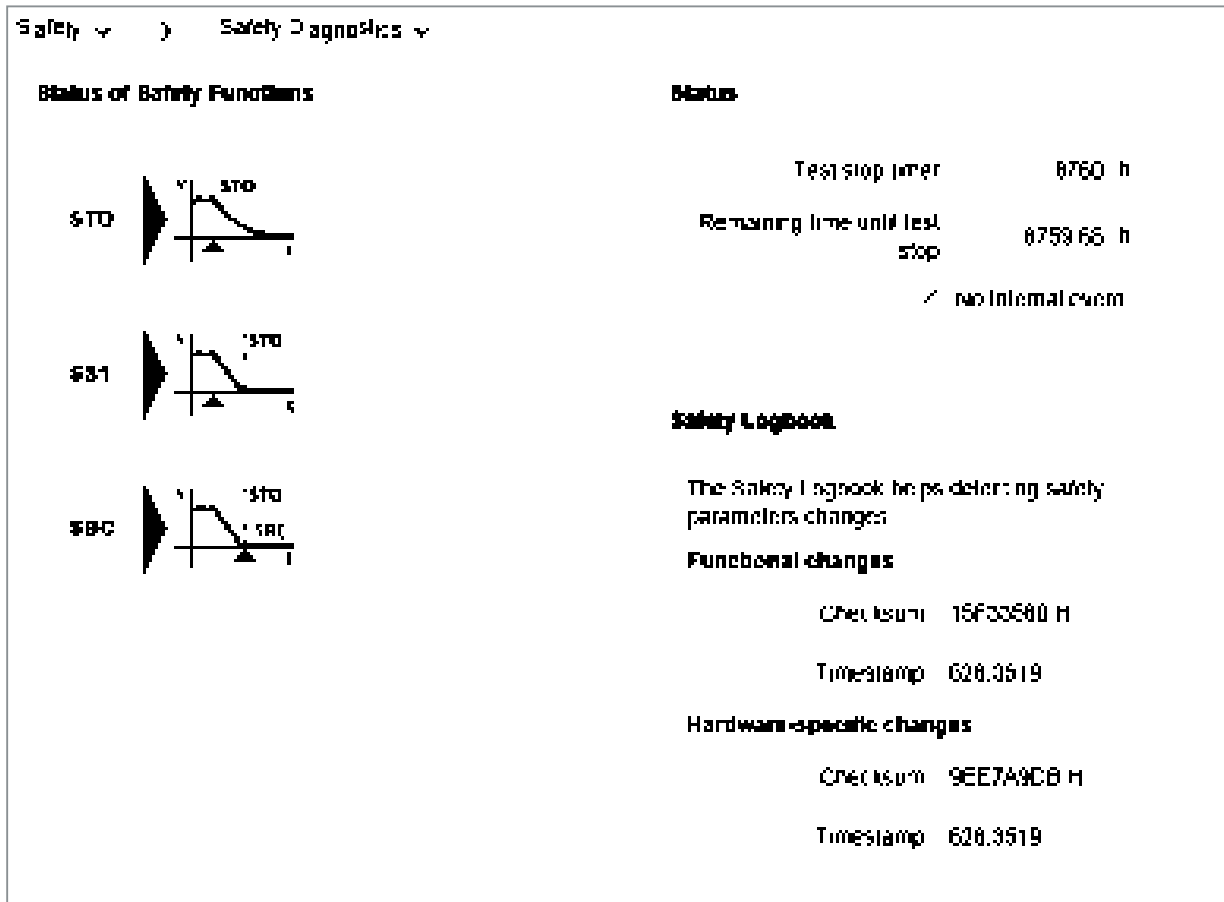


Figure 6-29 Display of the safety functions

You receive the following individual information via separate display areas:

- "Diagnostics of the safety functions"
Shows which safety functions have been activated in the converter.
- "Status"
Information on the status of the converter. If a forced checking procedure is required, then this is displayed. The times for the forced checking procedure of the timer and the remaining time up to the forced checking procedure are displayed.
The display area also shows whether internal events (e.g. software errors in the converter or a discrepancy in the monitoring channels) have taken place and whether the communication is OK.
- "Checksums"
Uses the safety logbook to determine changes to safety parameters and to indicate if a component has been replaced/exchanged. Shows changes in the form of functional checksums with time stamps.



6.9 Diagnostics in the Web server

6.9.1 Adapt message list

6.9.1.1 Displaying messages



Calling the list of messages

1. Select "Diagnostics" and "Messages" in the navigation.
- Or -
2. Click the  or  icon in the header of the web server.
The "Diagnostics - Messages" view appears with a message list. Further information about S210 messages can be found in Chapter "Faults and alarms (Page 291)".








| Type | Time received | Alarm | Time removed |
|---|----------------------------|--|----------------------------|
|  Fault | 2000-11-16 14:31:46.45 | 1650 SI P1 (CU) Acceptance test required (2003) | 2000-11-16 14:31:48.781 |
|  Fault | 2000-11-16 14:31:46.61 | 30650 SI P2 Acceptance test required (2003) | 2000-11-16 14:31:49.277 |
|  Fault | 2000-11-16 12:28:11.855 | 1658 SI P1 (CU) PROFIsafe telegram number differ (D) | 2000-11-16 12:41:01.0 |
|  Fault | 2000-11-16 13:06:05.908 | 1650 SI P1 (CU) Acceptance test required (2003) | 2000-11-16 13:06:09.36 |

Figure 6-30 Message list

Explanation of the icons:

-  Alarm
-  Fault
-  OK (acknowledged fault)

6.9.1.2 Filtering messages



You can set filters in the message list of the Web server and therefore limit the display of the messages. You can make the filter settings via a filter bar above the message list. All filters are linked by an AND connection.

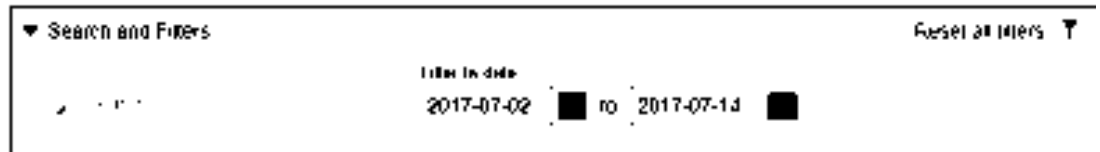



Figure 6-31 Filter bar of the message list

Setting filters

1. In the "Search" field, enter a search term (any number of characters) for which you want to search in the message list.
The search term is also active in the "Alarm" column in the message list.
2. In the two "Filter by Date" fields, enter a period for which the messages are to be displayed.
The message list is limited further after every filter setting. The filters can be set in any order.

Note

Collapsing the filter bar

The filter bar is opened per default. To collapse the filter bar, click the  arrow next to "Search and Filters".

Resetting filters

As long as you are logged in to the Web server and the filter settings have not changed, the message list is always displayed with the last filter settings. To reset all filter settings in the message list, proceed as follows:

Click "Reset all filters" at the top right in the filter bar.

The message list then displays the unfiltered view of the messages again.

6.9.2 Displaying communication settings

Proceed as follows to display the communication settings:

Select "Diagnostics" and "Communication" in the navigation.

The web server shows a window with the following contents:

- IP address of the converter
- Name of the station
- Information as to whether the connection between the controller and the converter is active
- The standard telegram
 - Table with process data for the transfer direction "controller > converter"
 - Table with process data for the transfer direction "converter > controller"

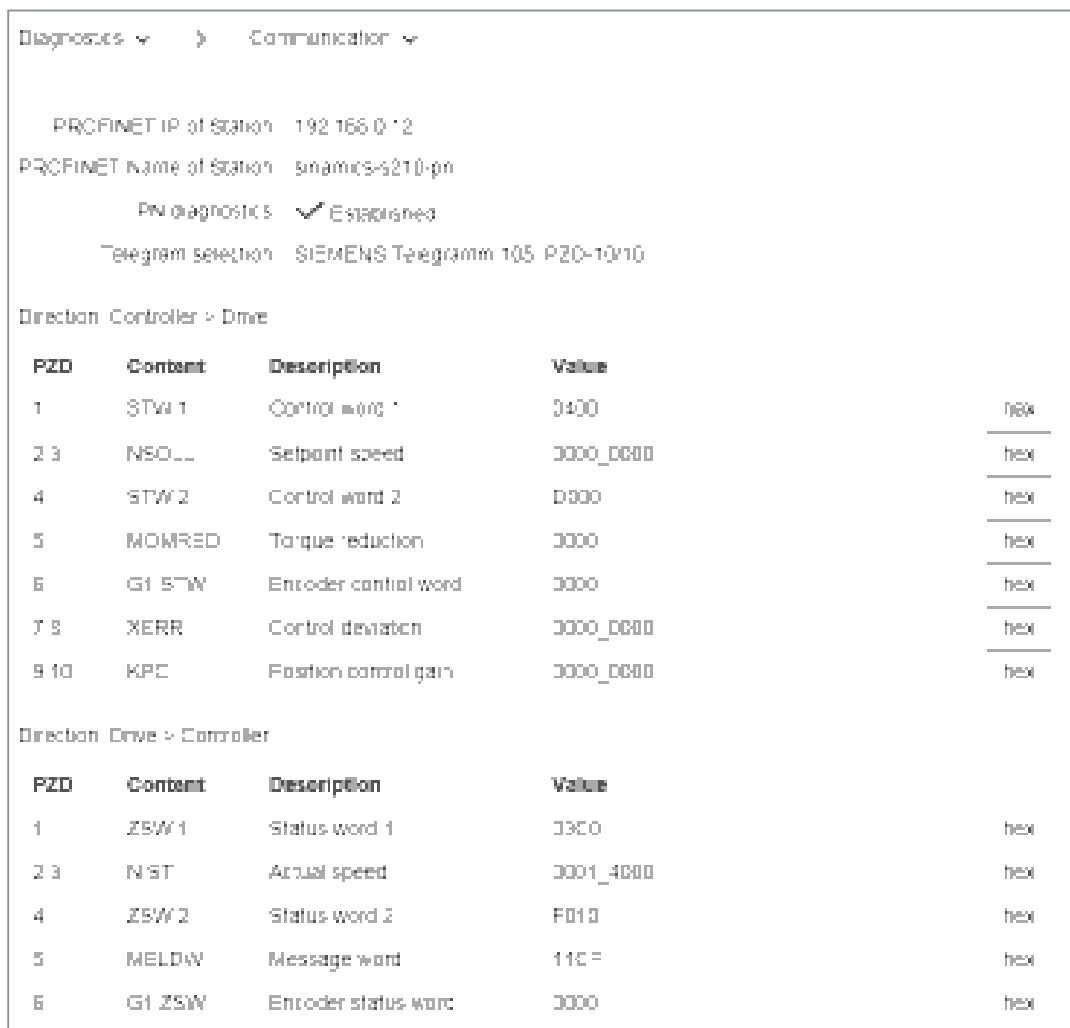


Figure 6-32 Communication settings

The values are displayed in hexadecimal format in the default setting. You can switch the display of individual values between binary and hex format by clicking on the button to the right of the value.

6.10 Backup and restore

Select entry "Backup and restore" in the navigation.

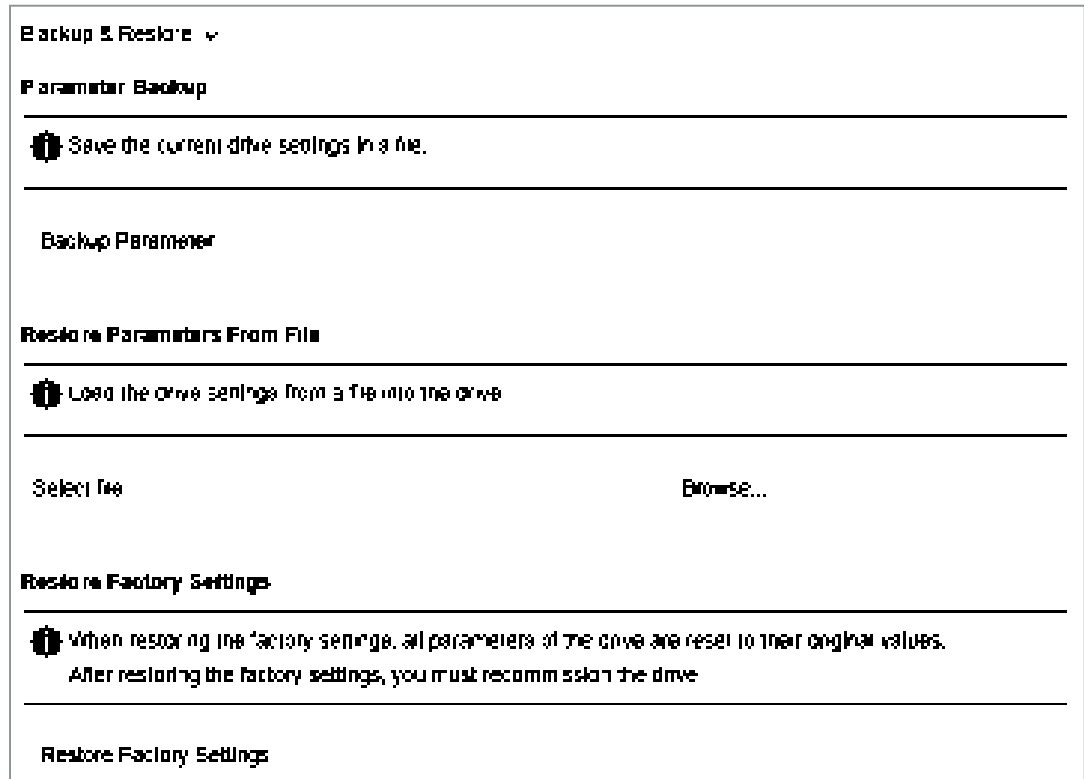


Figure 6-33 Backing up and restoring data

You can perform backup and restoration functions in the 3 setting ranges of the view.

6.10.1 Backing up the parameter settings externally



You can back up the converter settings externally on the commissioning device via the web server.

You can perform the data backup at any time. We recommend a data backup after the commissioning of the converter.

1. Click "Back up parameters" in the "Parameter Backup" setting area.
The data backup of the parameters is performed. A message is displayed when the data backup is successful.
Depending on the browser used, a storage dialog appears in which you can specify where the backup file is to be saved.
In some browsers, e.g. Google Chrome, the file is stored in the standard directory for downloads as "Backup.zip".
2. Correct the automatically generated name of the data backup so that the required data backup can be clearly identified by the name when there are several data backups.

Note

The parameterization is saved in encrypted form during a data backup. Therefore, it is not possible to check or edit parameters.

6.10.2 Restoring externally backed-up parameter settings



If you load the externally backed-up parameter settings to the converter again, you restore the converter state to the time of the data backup. You can also use the externally backed-up files for a series commissioning.

1. Click "Browse" in the "Restore Parameters From File" setting area.
2. Select the data backup file in your file system.
The data backup file is now displayed in the view.
3. Click "Restore" in the "Restore Parameters From File" setting area.
The data backup is loaded. The converter is then restarted. You must log in to the Web server again.
4. Log in to the Web server again.

6.10.3 Restoring the factory settings



If required, you can restore the factory settings for your converter.

1. In view "Backup and restore", click on "Restore Factory Settings".
2. Confirm the prompt with "Restore Factory Settings".
The restoration of the factory settings starts. The converter is then restarted. You must log in to the Web server again.
3. Reassign the administrator password and log on to the Web server with it.

6.11 System settings

6.11.1 Setting or changing user accounts



For SINAMICS S210, both user accounts - "SINAMICS" and "Administrator" - are permanently defined, and cannot be changed by users.

You can make the following settings in the user accounts:

- Changing the Administrator password
- Authorize or inhibit "SINAMICS" user
- Defining a new password for the "SINAMICS" user
- Changing/deleting the password for the "SINAMICS" user

Password requirements

The password must fulfill the following conditions to provide protection against unauthorized access, e.g. cyber attacks:

- At least 8 characters
- Both uppercase and lowercase letters
- Numbers and special characters (e.g.: ?!%+ ...)
- Different passwords for different types of access (administrator / user)

The length of the password is checked by the converter. There is no check for uppercase and lowercase letters and special characters!

Remember the passwords or store the passwords in a safe place that cannot be accessed by unauthorized persons.

Procedure

1. Select "System" and "Settings" in the navigation.
2. Select the "User Accounts" tab.




Figure 6-34 Changing the password


Perform the following steps to configure the user accounts for the web server:

Changing the Administrator password


The "Administrator" cannot be deactivated.

1. To change the Administrator password, click "Change password..." at the "Administrator" user.
A password dialog opens.
2. Enter the old password.
3. Enter a new password.
4. Enter the new password again.
5. Confirm the password change with "Change".
The dialog closes.
6. Click  to save the data permanently.

Defining a new password for the "SINAMICS" user

1. Activate the "Enable SINAMICS user" option.
2. Click "Define password..." at the "SINAMICS" user.
A password dialog opens.
3. Enter a new password.
4. Enter the new password again.
5. Confirm the password input with "OK".
The dialog closes.
6. Click  to save the data permanently.

Changing/deleting the password for the "SINAMICS" user

1. If you want to change the password of the "SINAMICS" user, proceed as for the Administrator password (see "Changing the Administrator password").
- Or -
2. If you want to delete the password of the "SINAMICS" user, click "Delete password...".
A prompt appears.
Enter the old password and click "Delete".
3. Click  to save the data permanently.

6.11.2 Configuring the IP connection



The X127 and X150 interfaces have the following defaults:

- Service interface (X127)
Access to the web server via the service interface is always active. Communication is performed in the factory setting via an HTTP connection.

NOTICE

Software manipulation when using non-encrypted connections (HTTP)

The HTTP protocol transfers data without encryption. This facilitates password theft, for example, and can lead to data manipulation by unauthorized parties and thus ultimately to damage.

- Limit access to HTTPS connections so that all data is transferred encrypted.

- PROFINET interface (X150)
Access to the web server via the PROFINET interface is deactivated by default. Communication via the PROFINET interface is always performed via the secure HTTPS connection.

Note

Security measures for communication via PROFINET

In accordance with the Defense in Depth concept, PROFINET must be isolated from the remaining plant network (see Industrial Security (<https://www.industry.siemens.com/topics/global/en/industrial-security/pages/default.aspx>)). Access to cables and possibly open connections must be implemented in a protected fashion, as in a control cabinet.

Note

Certificates for the secure data transfer

To secure an HTTPS connection, it requires security certificates for the encryption of the access. Detailed information on working with these security certificates can be found in Section "Certificates for the secure data transfer (Page 750)".

You can make the connection between the converter and the commissioning device more secure through the settings described in the following.

Procedure

1. Select "System" and "Settings" in the navigation.
2. Select the "IP Connections and Addresses" tab.

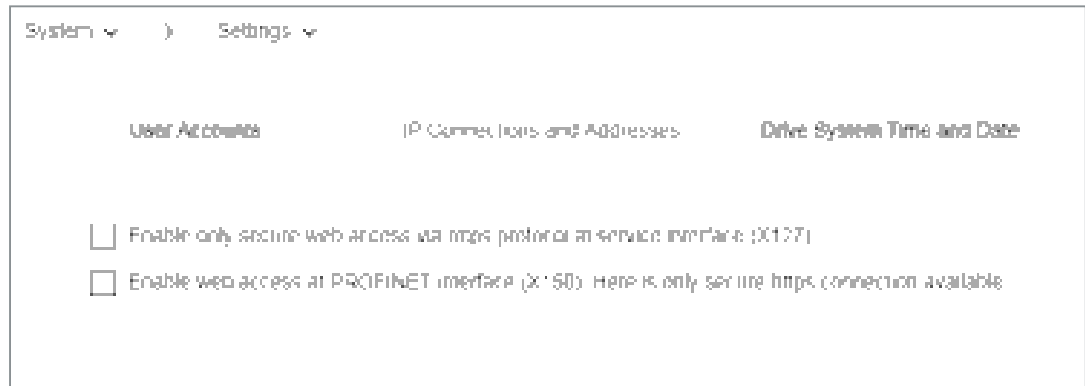



Figure 6-35 IP connections

3. Activate the desired connection options.
4. Click "Apply Settings" to save the changes in the RAM of the device.
5. Click  to save the data permanently.

Note

Switchover from HTTP to HTTPS

If you were logged-in via HTTP, then after activating option "Only use HTTPS connection", you will be logged-out. To log in again, you must set a secure HTTPS connection (https://...) to the converter.

6.11.3 Configuring the system time



Per default, an NTP time synchronization (NTP = Network Time Protocol) is activated for the system time of the converter. The converter then synchronizes its system time with a central NTP server in the PROFINET network.

A library for use as SNTP server is available for the SIMATIC controllers. You will find these on the Support pages:



Library for the SNTP server functionality in SIMATIC S7 CPUs (<https://support.industry.siemens.com/cs/ww/en/view/82203451>)

Note


If the NTP server cannot be accessed for more than 10 minutes when NTP time synchronization is activated, alarm A01097 "NPT server cannot be accessed" appears.

If you want to deactivate this time synchronization or activate it again, proceed as follows:

1. Select "System" and "Settings" in the navigation.
2. Select the "Drive System Time and Date" tab.



Figure 6-36 System time

3. Deactivate/activate "Activate NTP time synchronization".
4. Click "Apply Settings" to save the changes in the RAM of the device.
5. Click  to save the data permanently.

6.12 Saving permanently

The changed settings are only saved in the volatile memory. They are lost when you switch off the converter or close the Web server. For this reason, it is important that the settings made in the Web server are regularly saved permanently (also known as "Copy RAM to ROM"). You can either save the setting for each individual commissioning step or save all the settings made and the tuning results at the end of the commissioning.

1. To save permanently, click  in the footer of the Web server.
A save prompt appears:

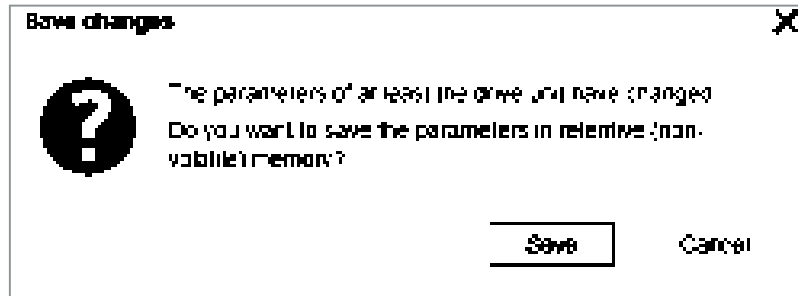


Figure 6-37 Permanent saving prompt

2. Click "Save" to save the data permanently.

6.13 Calling Support information

You can call the Support addresses for the SINAMICS S210 via the footer of the Web server.

1. Click "Support" in the footer of the Web server.
The following information is displayed:

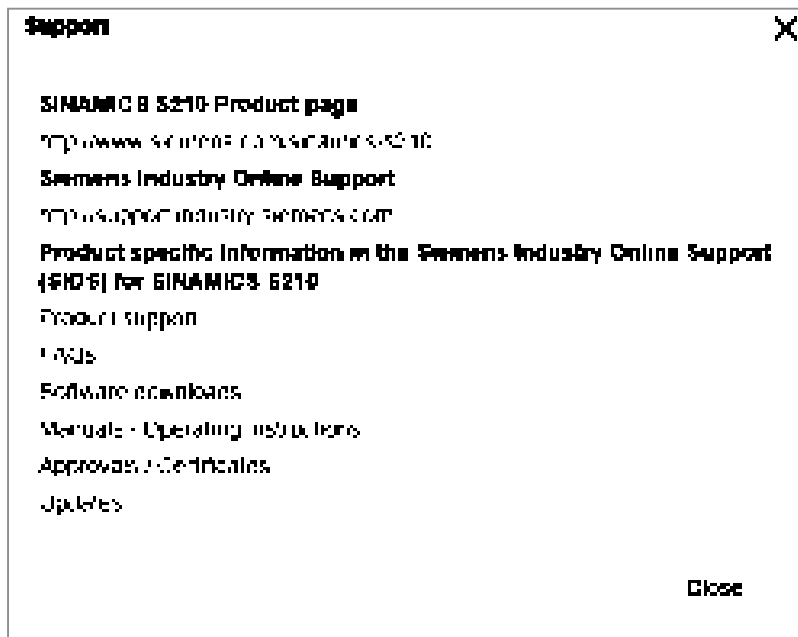


Figure 6-38 Support addresses

Click the links to open the desired support addresses - or to open in another browser - or to copy at a later point in time.

2. Click "Close" to close the Support information.

6.14 Firmware update

You have the option of upgrading your converter to a newer firmware version. You can also install an older firmware version to always provide the same machine configurations.

Settings made before the upgrade will be retained.

During a downgrade to an older firmware version, the converter is reset to the factory settings.

Proceed as follows to perform an upgrade or downgrade:

1. Save the firmware version that you would like to install on the converter on a blank SD card (maximum storage capacity 2 GB).
2. Switch off the converter.
3. Insert the SD card into the converter and switch on the converter.
4. The new firmware will be installed - this can take up to five minutes or longer.
The update is completed when both LEDs are flashing red at 1 Hz in sync with each other.
5. Switch the converter off and remove the memory card.
6. Switch on the converter again. The firmware of the connected DRIVE-CLiQ components is updated. This may require a restart (see alarm messages in the web server).
7. Check whether the new version is installed. The firmware version of the converter is displayed on the home page of the web server under the converter.

Diagnostics

7.1 Status displays and operating elements on the converter


The status of the converter is displayed via the three-digit display as well as by the "RDY" and "COM" LEDs.

Status display via the three-digit display

Normally, the display is dark.

Alarms and faults are shown according to the message classes defined in PROFIdrive. If PROFIdrive diagnostics is active, then they are simultaneously transferred to the control system.

Detailed information about alarms and faults is provided by the Web server of the converter.

 Diagnostics in the Web server (Page 150)

Status display via LEDs

The converter displays the current operating state via two LEDs.

- RDY: converter state
- COM: communication state

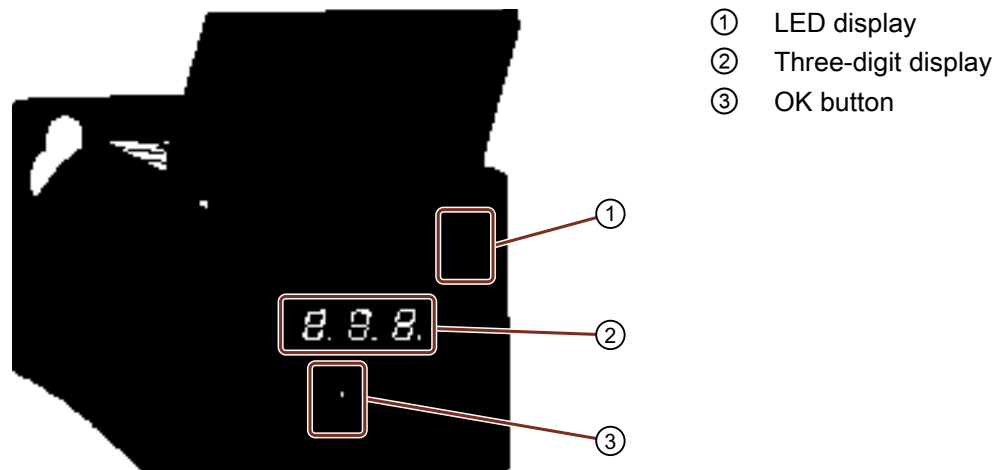
During ramp-up, the LEDs assume different states.

The converter is ready for operation when the "RDY" LED is permanently green.

The LEDs always operate independently of one another, except when updating the firmware.

OK button



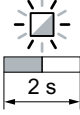
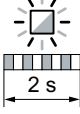

You can acknowledge the faults whose cause has been corrected with the OK button.



Display and operating elements on the converter










7.1.1 Status display via LEDs

Table 7-1 Explanation of symbols for the following tables

| | |
|---|-------------------------------------|
|  | LED is ON |
|  | LED is OFF |
|  | LED flashes slowly |
|  | LED flashes quickly |
|  | LED flashes with variable frequency |

Please contact Technical Support for LED states that are not described in the following.

Table 7-2 Status explanation of the RDY LED

| RDY | Explanation |
|---|---|
|  | The electronics power supply is missing or outside the permissible tolerance range. Remedy: Check the power supply. |
|  | Temporary status after the supply voltage is switched on. |
|  | The device is ready for operation. Cyclic DRIVE-CLiQ communication is in progress. |
|  | Writing to the memory card |
|  | Commissioning or reset to factory settings |
|  | PROFenergy energy-saving mode is active. Switch-on/off ratio: On: 0.5 s Off: 3 s |
|  | A fault is active Remedy: Check the converter settings/configuration. |
|  | Firmware update is active |
|  | Converter waits until the power supply is switched off and switched on again after a firmware update |

7.1 Status displays and operating elements on the converter





| RDY | Explanation |
|--|--|
|  | Firmware update in progress for the connected DRIVE-CLiQ components. |
|  | DRIVE-CLiQ component firmware update has been completed. Waiting for POWER ON of the corresponding components. Remedy: Switch the component off and on again. |
|  or  | CU detection via DCP flashing. Remark: Both options depend on the LED status when activating via DCP. |

Table 7-3 Status explanation of the COM LED











| COM | Explanation |
|---|---|
|  | No bus fault is present. When the RDY LED lights up green and the COM LED is off, the converter is ready for communication. |
|  | Temporary status after the supply voltage is switched on. |
|  | Bus ok. cyclic communication running perfectly |
|  | <ul style="list-style-type: none"> • Bus ok, however no setpoints (PLC in stop) • In the isochronous mode: Bus ok, no synchronization |
|  | No bus connection Remedy: Make sure that the bus cables are connected and are not damaged. |
|  | Bus error, possible causes: <ul style="list-style-type: none"> • Incorrect configuration in the PLC (the same supplementary telegram has been set twice?) |

Table 7-4 Explanation of the RDY and COM LEDs - firmware update

| RDY | COM | Explanation |
|---|---|--|
|  |  | Firmware update is active |
|  |  | LEDs are flashing synchronously: Converter waits until the power supply is switched off and switched on again after a firmware update |

7.2 Message classes in accordance with PROFIdrive

| Message class | PN ¹⁾ (hex) | Explanation of the message class according to PROFIdrive - cause and remedy. |
|---------------|------------------------|---|
| 1 | 9000 | <p>Hardware fault/software error</p> <p>A hardware or software malfunction has been identified.</p> <ul style="list-style-type: none"> • Carry out a POWER ON for the relevant component. • If it occurs again, replace again. |
| 2 | 9001 | <p>Line fault</p> <p>A line supply fault has occurred (phase failure, voltage level, etc.).</p> <ul style="list-style-type: none"> • Check the line supply/fuses • Check the supply voltage. • Check the wiring. |
| 3 | 9002 | <p>Supply voltage fault</p> <p>An electronics power supply fault (24 V) has been identified. Check the wiring.</p> <ul style="list-style-type: none"> • Check the voltage level. |
| 4 | 9003 | <p>DC link overvoltage</p> <p>The DC-link voltage has assumed an inadmissibly high value.</p> <ul style="list-style-type: none"> • Check the dimensioning of the system (line supply, reactor, voltages). • Check the infeed settings. |
| 5 | 9004 | <p>Power electronics fault</p> <p>An inadmissible operating state of the power electronics has been identified (overcurrent, overtemperature, IGBT failure,...).</p> <ul style="list-style-type: none"> • Check compliance with the permissible load cycles. • Check the ambient temperatures (fan). |
| 6 | 9005 | <p>Electronic component overload</p> <p>The temperature in the component has exceeded the highest permissible limit.</p> <ul style="list-style-type: none"> • Check the ambient temperature / control cabinet ventilation. |
| 7 | 9006 | <p>Ground fault / inter-phase short-circuit detected</p> <p>A ground fault / inter-phase short-circuit has been identified in the power cables or in the motor windings.</p> <ul style="list-style-type: none"> • Check the power cables (connection). • Check the motor. |
| 8 | 9007 | <p>Motor overload</p> <p>The motor was operated outside the permissible limits (temperature, current, torque...).</p> <ul style="list-style-type: none"> • Check the load cycles and set limits. • Check the ambient temperature / motor cooling. |
| 9 | 9008 | <p>Communication error to the higher-level controller</p> <p>The communication to the higher-level controller is faulted or interrupted. Check the state of the higher-level controller.</p> <ul style="list-style-type: none"> • Check the communication connection/wiring. • Check the bus configuration / clock cycles. |

| Message class | PN ¹⁾ (hex) | Explanation of the message class according to PROFIdrive - cause and remedy. |
|---------------|------------------------|---|
| 10 | 9009 | Safety monitoring channel has identified an error A safe operation monitoring function has detected an error. |
| 11 | 900A | Actual position value / actual speed value incorrect or not available An illegal signal state has been detected while evaluating the encoder signals (track signals, zero marks, absolute values...) <ul style="list-style-type: none"> • Check the encoder / state of the encoder signals. • Observe the maximum permissible frequencies. |
| 12 | 900B | Internal (DRIVE-CLiQ) communication error The internal communication between the SINAMICS components is faulted or interrupted. Check the DRIVE-CLiQ wiring. <ul style="list-style-type: none"> • Ensure an EMC-compliant design. |
| 13 | 900C | Infeed fault The infeed is faulted or has failed. <ul style="list-style-type: none"> • Check the infeed and its environment (line supply, filters, reactors, fuses...). • Check the infeed control. |
| 14 | 900D | Braking controller / Braking Module faulted The internal or external Braking Module is faulted or overloaded (temperature). <ul style="list-style-type: none"> • Check the connection/state of the Braking Module. • Comply with the permissible number of braking operations and their duration. |
| 15 | 900E | Line filter faulted The line filter monitoring has identified an excessively high temperature or other inadmissible state. <ul style="list-style-type: none"> • Check the temperature / temperature monitoring. • Check the configuration to ensure that it is permissible (filter type, infeed, thresholds). |
| 16 | 900F | External measured value / signal state outside of the permissible range A measured value / signal state read in via the input area (digital/analog/temperature) has assumed an inadmissible value/state. <ul style="list-style-type: none"> • Identify and check the relevant signal. • Check the set thresholds. |
| 17 | 9010 | Application / technology function faulted The application / technological function has exceeded a (set) limit (position, velocity, torque...) <ul style="list-style-type: none"> • Identify and check the relevant limit. • Check the setpoint specification of the higher-level controller. |

7.2 Message classes in accordance with PROFIdrive

| Message class | PN ¹⁾ (hex) | Explanation of the message class according to PROFIdrive - cause and remedy. |
|---------------|------------------------|---|
| 18 | 9011 | Error in the parameterization/configuration/commissioning sequence An error has been identified in the parameterization or in a commissioning procedure, or the parameterization does not match the actual device configuration. <ul style="list-style-type: none">• Determine the precise cause of the fault using the commissioning tool.• Adapt the parameterization or device configuration. |
| 19 | 9012 | General drive fault Group fault. <ul style="list-style-type: none">• Determine the precise cause of the fault using the commissioning tool. |

¹⁾ "Channel Error Type" of the PROFINET channel diagnostics. When channel diagnostics is activated, then the fault texts are indicated in the PLC.

7.3 Correcting faults on the motor

| |
|--|
| WARNING |
| Operation without functioning protective devices |
| Operation without functioning protective devices can cause death or severe injury. |
| <ul style="list-style-type: none"> Operate the motor, even in test operation, only with functioning protective devices. |

If there are deviations from normal operation or if faults occur, proceed as follows.

- Identify the fault using the "Possible faults" table.
Also observe the converter messages.
- Try to correct the fault using the "Fault causes and remedial measures" key table.

Table 7-5 Possible faults

| Fault | Fault cause (see "Fault causes and remedial measures" key table) | | | | | | | | | | | | | | | | | |
|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
| Motor does not start | A | B | | | | | | | | | | | | | | | | |
| Motor starts slowly | A | | C | | | F | | | | | | | | | | | | |
| Humming sound when starting | | | C | | | F | | | | | | | | | | | | |
| Humming sound in operation | A | | C | | | F | | | | | | | | | | | | |
| High temperature rise under no-load operation | | | | D | | I | | | | | | | | | | | | |
| High temperature rise under load | A | | C | | | I | | | | | | | | | | | | |
| High temperature rise of individual winding sections | | | | | | F | | | | | | | | | | | | |
| Uneven running | | | | | | | | | J | K | | | | | | | | |
| Grinding sound, running noise | | | | | | | | | | | L | | | | | | | |
| Radial vibrations | | | | | | | | | | | | M | N | O | P | | | R |
| Axial vibrations | | | | | | | | | | | | | | O | | Q | | R |

Table 7-6 "Fault causes and remedial measures" key table

| No. | Fault cause | Remedial measures |
|-----|--|--|
| A | Overload | Reduce load |
| B | Interruption of a phase in the supply cable / motor winding | Check the frequency converter and supply cables, measure the winding resistances and insulation resistances, repair after consultation with manufacturer |
| C | Interrupted phase in the feeder cable after switching on | Check the frequency converter, supply cables and the winding resistances |
| D | Converter output voltage too high, frequency too low | Check the settings on the frequency converter, perform automatic motor identification |
| F | Winding short-circuit or phase short-circuit in stator winding | Measure the winding resistances and insulation resistances, repair after consultation with the manufacturer, if required, replace the motor |

7.3 Correcting faults on the motor

| No. | Fault cause | Remedial measures |
|-----|---|--|
| I | Heat dissipation impeded by deposits | Clean the surface of the drives and ensure that the cooling air can flow in and out unimpeded |
| | Cooling air inlet/outlet is blocked by foreign bodies | Remove the reason for the blocking and ensure that the cooling air can flow in and out unimpeded |
| J | Insufficient shielding for motor and/or encoder cable | Check the shielding and grounding |
| K | Excessive drive controller gain | Adjust the controller |
| L | Rotating parts are grinding | Determine cause and adjust parts |
| | Foreign bodies inside the motor | Replace the motor |
| | Bearing damage | Replace the motor |
| M | Rotor not balanced | Replace the motor |
| N | Rotor out of true, shaft bent | Consult the manufacturer |
| O | Poor alignment | Align motor set, check coupling |
| P | Coupled machine not balanced | Re-balance coupled machine |
| Q | Shocks from coupled machine | Check coupled machine |
| R | Fault originating from the gearbox | Adjust/repair gearbox |

If the fault still cannot be resolved after taking the measures stated above, please contact the manufacturer or the Siemens Service Center.

7.4 Alarms

Alarms

Alarms have the following properties:

- Alarms have no direct influence on the drive.
- Alarms disappear again when the cause is eliminated.
- Alarms cannot be acknowledged.
- Alarms are displayed as follows:
 - In the PLC according to the PROFIdrive message class
 - On the drive via LEDs
 - At the drive using the three-digit display according to the PROFIdrive message classes
 - In the Web server via the "Diagnostics - Messages" view

Alarm code or alarm value describe the cause of the alarm.

Reference

You can find additional information on alarms in Chapter "Overview of faults and alarms (Page 291)".

7.5 Faults

Faults

Faults have the following properties:

- The fault causes the motor to be switched off.
- Faults must be acknowledged.
- Faults are displayed as follows:
 - In the PLC according to the PROFIdrive message class
 - On the drive via LEDs
 - At the drive using the three-digit display according to the PROFIdrive message classes
 - In the Web server via the "Diagnostics - Messages" view

Acknowledge fault

Before you can acknowledge a fault, you must have resolved the cause of the fault.

To acknowledge, you have the following options:

- Acknowledging via the PLC
- Acknowledging via the OK button under the front cover
- Switch off the converter power supply and switch on again
- Acknowledging via the Web server

Faults detected during the converter-internal monitoring of hardware and firmware can be acknowledged only by switching the power supply off and on again. In the list of faults, you will find the information on limitations when acknowledging at the corresponding fault codes.

Reference

You can find additional information on faults in Chapter "Overview of faults and alarms (Page 291)".

Technical specifications

8.1 Technical data and properties of the motor

8.1.1 Technical features

Table 8-1 Technical features

| | |
|---|--|
| Type of motor | Permanent-magnet synchronous motor |
| Rotor inertia | 1FK21 - High Dynamic - motor with low rotor inertia 1FK22 - Compact - motor with average rotor inertia |
| Power range | 0.05 kW ... 0.75 kW for a line supply voltage of 1 AC 230 V |
| Cooling | Natural cooling |
| Insulation of the stator winding according to EN 60034-1 (IEC 60034-1) | 1FK2□02, 1FK2□03: Temperature class 130 (B) for a winding temperature of $\Delta T = 80$ K at an ambient temperature of $+40$ °C 1FK2□04: Temperature class 155 (F) for a winding temperature of $\Delta T = 100$ K at an ambient temperature of $+40$ °C |
| Pulse voltage insulation class according to EN 60034-18-41 (IEC 60034-18-41) | IVIC: C |
| Operating range | -15° to $+40^{\circ}$ C, derating at higher temperatures |
| Installation altitude (according to EN 60034-1 and IEC 60034-1) | ≤ 1000 m above sea level, otherwise power derating |
| Type of construction according to EN 60034-7 (IEC 60034-7) | IM B5 (IM V1, IM V3) |
| Degree of protection according to EN 60034-5 (IEC 60034-5) | IP64, optional IP65 |
| Temperature monitoring | Thermal motor model |
| Paint finish | Anthracite (RAL 7016) |
| Shaft extension according to DIN 748-3 (IEC 60072-1) | Plain shaft, optionally with feather key and half-key balancing |
| Radial eccentricity, concentricity, and axial eccentricity according to DIN 42955 (IEC 60072-1) ¹⁾ | Tolerance N (normal) |
| Vibration severity grade according to EN 60034-14 (IEC 60034-14) | Grade A is maintained up to rated speed |
| Sound pressure level L_{pA} (1 m) according to DIN EN ISO 1680, max. tolerance $+3$ dB(A) | Natural cooling: 55 dB(A) |
| Encoder systems, built-in with DRIVE-CLiQ interface | <ul style="list-style-type: none"> AS20DQC, absolute encoder singleturn 20-bit AM20DQC absolute encoder 20-bit + 12-bit multiturn |


8.1 Technical data and properties of the motor


| | |
|---------------|--|
| Connection | One cable system (OCC), rotatable |
| Holding brake | Optional integrated holding brake (24 V) |

- 1) Radial eccentricity of the shaft extension, concentricity of centering edge, and axial eccentricity of the mounting flange to the axis of the shaft extension.

8.1.2 Permissible environmental conditions for the motor

| Property | Version |
|---|--|
| Environmental conditions for transport in the transport packaging according to Class 2K3 to EN 60721-3-2 except for the "air temperature" and "condensation" environmental factors | |
| Climatic environmental conditions | - 15° C ... + 70° C |
| Highest relative humidity | < 95% at 40° C, condensation not permissible |
| Mechanical environmental conditions | Shock and vibration permissible according to 3M8 to EN 60721-3-3: Single shocks (6 ms) max. 250 m/s ² |
| Protection against chemical substances | Protected according to Class 2C2 |
| Biological environmental conditions | Suitable according to Class 2B2 |

| Property | Version |
|--|--|
| Environmental conditions for long-term storage in the transport packaging according to Class 1K3 to EN 60721-3-1 except for the "air temperature", "highest relative humidity" and "condensation" environmental factors | |
| Climatic environmental conditions | - 15° C ... + 55° C |
| Highest relative humidity | < 60% - condensation not permissible |
| Mechanical environmental conditions | Vibration-free storage space, $v_{rms} < 0.2$ mm/s |
| Protection against chemical substances | Protected according to Class 1C2 |
| Biological environmental conditions | Suitable according to Class 1B2 |
| Duration | <ul style="list-style-type: none"> • Six months for the above-mentioned conditions. • For storage periods of six months up to a maximum of two years, special preservation measures are required. Further information  Calling Support information (Page 162) |

| Property | Version |
|---|---|
| Ambient conditions during operation according to 3K4 to EN 60721-3-3 except for the "low air temperature", "condensation" and "low air pressure" environmental factors | |
| Installation altitude | Up to 1000 m above sea level without limitations  Derating factors (Page 180) |

8.1 Technical data and properties of the motor

| Property | Version |
|--|---|
| Climatic environmental conditions ¹⁾ | <ul style="list-style-type: none"> • Temperature range: - 15 °C ¹⁾ ... + 40 °C • Relative humidity: 5 ... 95%, condensation not permitted • Absolute air humidity: 1 ...29 g/m³ • Rate of temperature change²⁾: 0.5°/min • Atmospheric pressure: 89 ^{1), 3)} ... 106 kPa⁴⁾ • Solar radiation: 700 W/m² ²⁾ • Movement of the air: 1.0 m/s • Water (other than rain): See protection class |
| Mechanical environmental conditions | <ul style="list-style-type: none"> • Vibration levels permissible according to Class 3M8 to EN 60721-3-3: Max. 50 m/s² • Shock permissible according to Class 3M8 to EN 60721-3-3 |
| Protection against chemical substances | Protected according to 3C2 to EN 60721-3-3 |
| Biological environmental conditions | Suitable according to 3B2 to EN 60721-3-3 |
| Pollution | Suitable for environments with degree of pollution 2 according to EN 61800-5-1 |
| Cooling air | Clean and dry air |
| <p>The motors are not suitable for operation</p> <ul style="list-style-type: none"> • In a vacuum⁵⁾ • In salt-laden or aggressive atmospheres • Outdoors | |

¹⁾ Increased ruggedness with regard to low temperature and low atmospheric pressure better than 3K3 according to EN 60721-3-3

²⁾ Averaged over a period of 5 min

³⁾ The limit value of 89 kPa covers applications at altitudes up to 1000 m.

⁴⁾ Conditions in mines are not considered.

⁵⁾ Operation in a vacuum is not permissible because of the low dielectric strength and poor heat dissipation.

8.1.3 Cooling

The 1FK2 is a non-ventilated motor.

To ensure sufficient heat dissipation when installed, the motor requires a minimum clearance of 100 mm from adjacent components on three lateral surfaces.

- Maintain these clearances irrespective of the following mounting variants.

Non-thermally insulated mounting


Some of the motor power loss is dissipated through the flange when the motor is connected to the mounting surface.

- Observe the following mounting conditions for the specified motor data:

| Shaft height | Steel plate, width x height x thickness (in mm) |
|--------------|---|
| 1FK2□02 | 200 x 200 x 6 |
| 1FK2□03 | 250 x 250 x 6 |
| 1FK2□04 | 250 x 250 x 6 |

The data in the table refers to an ambient temperature of 40 °C and an installation altitude up to 1000 m above sea level.

If the environmental conditions are different, derating may be required. For more information, refer to Chapter:

 "Derating factors (Page 180)"

For larger mounting surfaces, the heat dissipation conditions improve.

Thermally insulated mounting without additional mounted components

For self-cooled motors, you must reduce the S1/characteristic curve as follows:

Reduce the motor static torque by 20 to 30%.

Reduce the torque at 3000 rpm by 40 to 50%.

Thermal motor protection


The converter monitors the motor temperature based on a thermal motor model and issues the alarm "Motor overtemperature" before the maximum temperature is reached. If the motor exceeds the maximum temperature, the converter switches off the motor with the error message "Motor overtemperature".

The thermal motor model requires the ambient temperature to be entered at the converter.

- To do this, select parameter p0613 at the converter.

Parameter r0034 indicates the thermal load of the motor as a percentage. The reading is influenced by the ambient temperature selected in parameter p0613.

Additional information can be found in the parameter lists:

 "Parameters (Page 225)"

8.1 Technical data and properties of the motor

8.1.4 Derating factors

Given an ambient temperature > 40 °C or installation altitude > 1000 m above sea level, the permissible torques/powers must be determined with the factors from the following table.

The factors refer to the static torque M_0 . Shift the S1 characteristic curve in parallel.

Table 8-2 Power derating depending on the installation altitude and the ambient temperature

| Installation altitude above sea level in m | Ambient temperature in ° C | | | |
|--|----------------------------|------|------|------|
| | 30 | 40 | 45 | 50 |
| 1000 | 1.05 | 1.00 | 0.97 | 0.94 |
| 2000 | 1.00 | 0.95 | 0.92 | 0.88 |

Calculate the derating value for ambient temperatures that are not shown here and installation altitudes below the maximum values by interpolating. For example: 40 °C at 1500 m above sea level = derating factor 0.975

8.1.5 Degree of protection

The degree of protection designation in accordance with EN 60034-5 (IEC 60034-5) is described using the letters IP and two digits (e.g. IP64).

IP = International Protection

1st digit = protection against the ingress of foreign bodies

2nd digit = protection against water

DIN 60034-5 is valid for water as potentially occurring medium, not for oil or other creeping fluids.

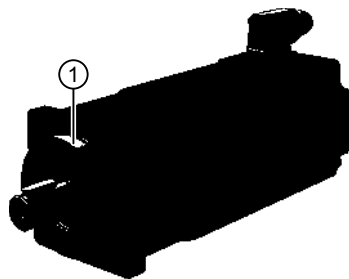
Configure the motor in the required degree of protection.

Degrees of protection available for the 1FK2

The 1FK2 motors are available with the following degrees of protection:

- IP64
- IP65 optional

The motors with IP65 degree of protection have a radial shaft seal.



1 Radial shaft sealing ring

Note


It is permissible that the radial shaft sealing ring runs dry.

With degree of protection IP65, it is not permissible for liquid to collect in the flange.

The service life of the radial shaft sealing ring is approximately 25000 operating hours.

The radial shaft seal ring shortens the usable shaft end.

For additional information, see Chapter:

 "Shaft extension (Page 183)"

8.1.6 Balancing

The motors are balanced according to DIN ISO 8821.

Motors with featherkey in the shaft are half-key balanced.

A mass equalization for the protruding half key must be taken into account for the output elements.

8.1.7 Vibration response

Vibration severity grade

The vibration response of the system at the location of use is influenced by output elements, any built-on parts, the alignment, the installation, and external vibrations. This can change the vibration values of the motor.

The motors conform to vibration severity grade A according to EN 60034-14 (IEC 60034-14).

The specified values refer only to the motor. The installation-dependent system vibration behavior can increase these values at the motor.

The vibration severity grade is maintained up to the rated speed (n_N).

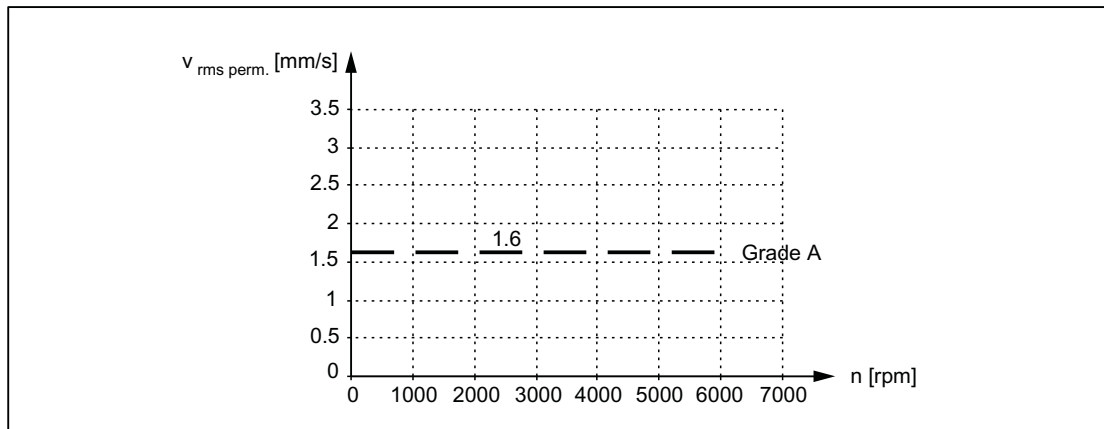


Figure 8-1 Vibration severity levels

Permissible vibration in operation

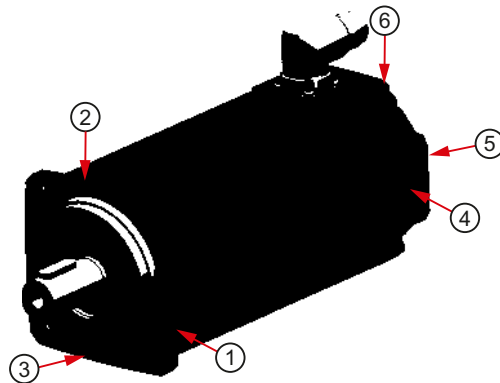
In order to guarantee the proper function of the motor and not to impair the lifetime of the bearing, the following vibration values must be observed during operation.

- Vibration velocity ¹⁾ V_{rms} according to ISO 10816 Max. 4.5 mm/s
- Vibration acceleration a_{peak} axial ²⁾ 50 m/s²
- Vibration acceleration a_{peak} radial ²⁾ 50 m/s²

¹⁾ To measure the vibration velocity, the measuring equipment must fulfill the requirements of ISO 2954.

²⁾ The vibration acceleration is evaluated in the frequency range of 10 Hz to 2000 Hz. The maximum peak in the time range is considered.

Select the measuring points according to ISO 10816-1 section 3.2. The vibration values must not exceed the specified limits at any measuring point.



- 1 End shield DE radial
- 2 End shield DE axial
- 3 End shield NDE radial
- 4 End shield NDE axial
- 5 End shield DE radial
- 6 End shield DE axial

Measuring points for vibration values

8.1.8 Shaft extension

The motors are supplied with cylindrical shaft extensions. The shaft extension usually has a centering thread according to DIN 332, form DR.

Optionally, a shaft extension can also be supplied with a keyway and feather key.

With the IP65 degree of protection, the useable shaft extension is reduced by the radial shaft sealing ring.

| Shaft height | Shaft dimensions Diameter x length in mm | Shaft dimensions with IP65 Diameter x length in mm | Feather key Width x height x length in mm | Centering thread DIN 332-DR |
|--------------|---|--|---|--------------------------------|
| 20 | 8 x 25 | 8 x 18 | 2 x 2 x 10 | M3 |
| 30 | 14 x 30 | 14 x 21.5 | 5 x 5 x 16 | M5 |
| | optional 11 X 23 ¹⁾ | - | - | M4 |
| 40 | 19 x 40 | 19 x 32 | 6 x 6 x 22 | M6 |

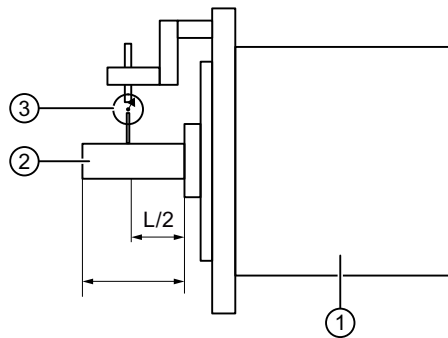
¹⁾ The optional 11 mm x 23 mm shaft extension is only available without a keyway and without a shaft sealing ring (IP65).

8.1.9 Radial eccentricity, concentricity and axial eccentricity

The shaft and flange accuracies for the 1FK2 motors are implemented to DIN 42955 (IEC 60072-1) as standard (Normal class).

Table 8-3 Radial eccentricity tolerance of the shaft to the frame axis (referred to cylindrical shaft ends)

| Motor | Standard (Normal class) |
|---------|-------------------------|
| 1FK2□02 | 0.03 mm |
| 1FK2□03 | 0.035 mm |
| 1FK2□04 | 0.04 mm |

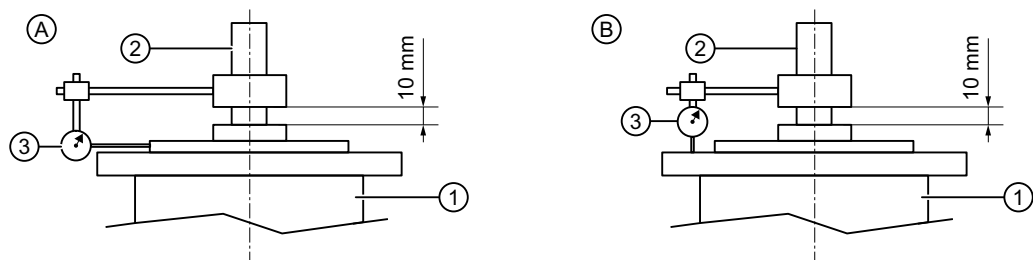


- ① Motor
- ② Motor shaft
- ③ Dial gauge

Figure 8-2 Checking the radial eccentricity

Table 8-4 Concentricity and axial eccentricity tolerance of the flange surface to the shaft axis (referred to the centering diameter of the mounting flange)

| Motor | Standard (Normal class) |
|---------|-------------------------|
| 1FK2□02 | 0.08 mm |
| 1FK2□03 | |
| 1FK2□04 | |



- A Check for concentricity
- B Check for axial eccentricity
- ① Motor
- ② Motor shaft
- ③ Dial gauge

Figure 8-3 Checking the concentricity and axial eccentricity

8.1.10 Permissible radial and axial forces

| Shaft height | Reference type without brake M_0 / Nm | Average operating speed n / rpm | Point of load (distance from the flange) // mm | Radial force reference type F_R / N | Axial force, dynamic ¹⁾ $F_{A \text{ dyn}} / \text{N}$ | Axial force, static ¹⁾ $F_{A \text{ stat}} / \text{N}$ |
|--------------|---|---|---|---|--|--|
| 20 | 0.32 | 3000 | 20 | 120 | 20 | 30 |
| 30 | 1.27 | 3000 | 25 | 280 | 40 | 75 |
| 40 | 3.18 | 3000 | 30 | 400 | 60 | 100 |

1) The specified axial forces are determined by the spring loading and therefore also apply for motors with holding brake.

Note

Applications with an angular toothed pinion directly on the motor are not permitted with standard bearings because the permissible axial forces are exceeded.

8.1.11 Available encoders

| | Encoders that can be ordered for the 1FK2: | |
|--------------------------------------|--|---|
| | Absolute encoder, singleturn, 20 bit | Absolute encoder 20 bit +12 bit multiturn |
| Encoder designation | AS20DQC | AM20DQC |
| Identification in the article number | C | D |
| Resolution | 1,048,576 = 20 bits | 1,048,576 = 20 bits |
| Absolute position | Yes, one revolution | Yes, 4096 revolutions (12 bits) |
| Angular error | $\pm 100''$ | $\pm 100''$ |

8.1.12 Brake data

| |
|---|
| WARNING |
| <p>Unintentional movements through inadequate braking effect</p> <p>If you use the holding brake incorrectly, e.g. as a safety brake, or you ignore the number of permissible operating cycles of the brake, the brake does not close reliably. As a consequence, there may be no brake effect. Unintentional movements of the machine or system can result in death or serious injury.</p> <ul style="list-style-type: none"> • Observe the permissible number of operating cycles and EMERGENCY STOP properties. • Operate the motor only in conjunction with an intact brake. • Avoid repeated brief acceleration of the motor against a holding brake that is still closed. |

8.1 Technical data and properties of the motor

The holding brakes of the 1FK2 have a torsional backlash of less than 1°. The following table contains additional technical data regarding the holding brakes:

| Motor type | Holding torque M_4 at 120 °C | Dyn. braking torque M_{1m} | Opening time | Closing time | Maximum permissible single switching energy | Maximum EMERGENCY STOP speed | Total operating energy (service life) |
|------------|--------------------------------------|---------------------------------|--------------|--------------|---|------------------------------|---------------------------------------|
| | M_4 / Nm | M_1 / Nm | t / ms | t / ms | W / J | n / rpm | W_{max} / kJ |
| 1FK2□02 | 0.32 | 0.2 | 50 | 15 | 7.4 | 8000 | 0.5 |
| 1FK2□03 | 1.3 | 1.1 | 90 | 20 | 62 | 7500 | 5 |
| 1FK2□04 | 3.3 | 3 | 110 | 30 | 268 | 7500 | 35 |

Holding torque M_4

The holding torque M_4 is the highest permissible torque for the closed brake in steady-state operation without slip (holding function when motor is at standstill). The data applies for the state at operating temperature (120 °C).

Dynamic braking torque M_{1m}

The dynamic braking torque M_{1m} is the smallest mean dynamic braking torque that can occur for an EMERGENCY STOP.

Opening time and closing time

The delay times that occur when switching the brake.

Maximum permissible single switching energy

The maximum permissible single switching energy of an individual EMERGENCY STOP procedure.

After an EMERGENCY STOP with the maximum single switching energy, allow for a cooling time of at least 5 minutes before you put the motor into operation again.

Maximum EMERGENCY STOP speed

Maximum permitted speed for a safe EMERGENCY STOP procedure.

Total operating energy (service life)

The total switching energy is the sum of the single switching energy (switching energy for each EMERGENCY STOP procedure). If the total switching energy is exceeded, flawless functioning of the brakes can no longer be guaranteed.



- Refurbish the motor.

Formula for calculating the operating energy per braking operation

$$W_{BR} = (J_{Mot Br} + J_{load}) \cdot n_{mot}^2 / 182.4$$

W_{Br} / J Operating energy per braking operation

n_{Mot} / rpm Speed at which the brake is engaged

$J_{\text{Mot Br}} / \text{kgm}^2$ Rotor moment of inertia of the motor with brake
 You can find this information in the chapters:
 "Technical data and characteristics 1FK2 High Dynamic (Page 187)" or
 "Technical data and characteristics 1FK2 Compact (Page 194)"

$J_{\text{load}} / \text{kgm}^2$ Load moment of inertia of the mounting part on the motor with brake (kgm²)
 182.4 Constant for calculating the circular frequency and SI units

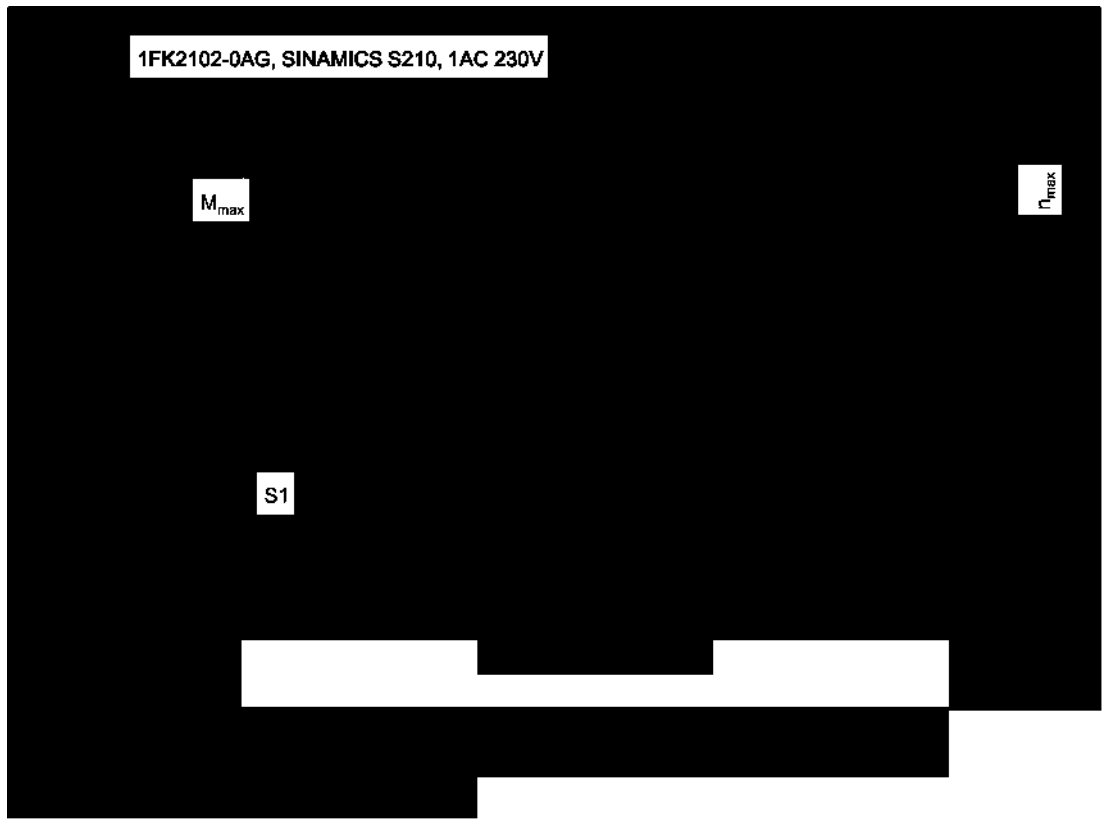
8.1.13 Technical data and characteristics 1FK2 High Dynamic

8.1.13.1 1FK2102-0AG

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|---------------------|-------------------|--------|
| Static torque | M_0 | Nm | 0.16 |
| Stall current | I_0 | A | 0.75 |
| Maximum permissible speed | n_{max} | rpm | 8000 |
| Maximum torque | M_{max} | Nm | 0.56 |
| Maximum current | I_{max} | A | 3.1 |
| Thermal time constant | T_{th} | rpm | 14 |
| Rotor moment of inertia | J_{mot} | kgcm ² | 0.0245 |
| Rotor moment of inertia (with brake) | $J_{\text{mot br}}$ | kgcm ² | 0.0285 |
| Weight | m_{mot} | kg | 0.47 |
| Weight (with brake) | $m_{\text{mot br}}$ | kg | 0.73 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 0.16 |
| Rated current | I_{rated} | A | 0.75 |
| Rated power | P_{rated} | kW | 0.05 |

The rated data applies when the converter is connected to 1AC 230V.

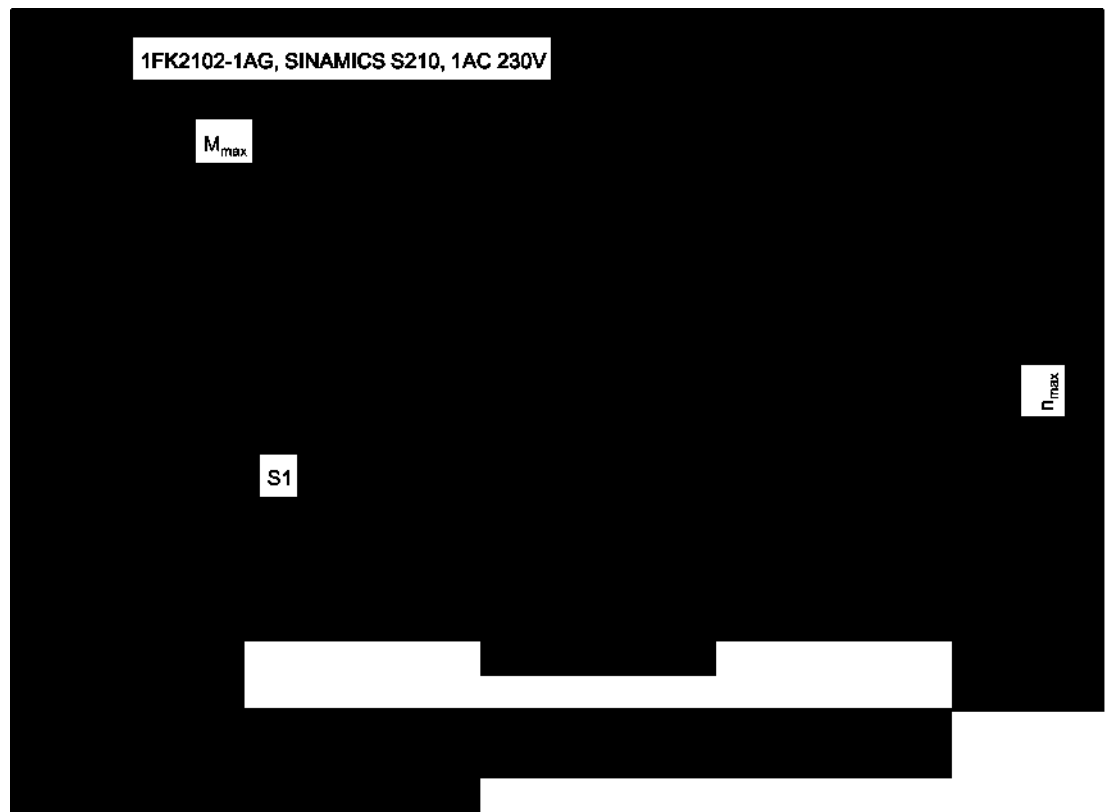
8.1 Technical data and properties of the motor



8.1.13.2 1FK2102-1AG

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|--------------|-------------------|-------|
| Static torque | M_0 | Nm | 0.32 |
| Stall current | I_0 | A | 0.76 |
| Maximum permissible speed | n_{max} | rpm | 8000 |
| Maximum torque | M_{max} | Nm | 1.11 |
| Maximum current | I_{max} | A | 3.1 |
| Thermal time constant | T_{th} | rpm | 16 |
| Rotor moment of inertia | J_{mot} | kgcm ² | 0.036 |
| Rotor moment of inertia (with brake) | $J_{mot br}$ | kgcm ² | 0.04 |
| Weight | m_{mot} | kg | 0.6 |
| Weight (with brake) | $m_{mot br}$ | kg | 0.86 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 0.32 |
| Rated current | I_{rated} | A | 0.76 |
| Rated power | P_{rated} | kW | 0.1 |

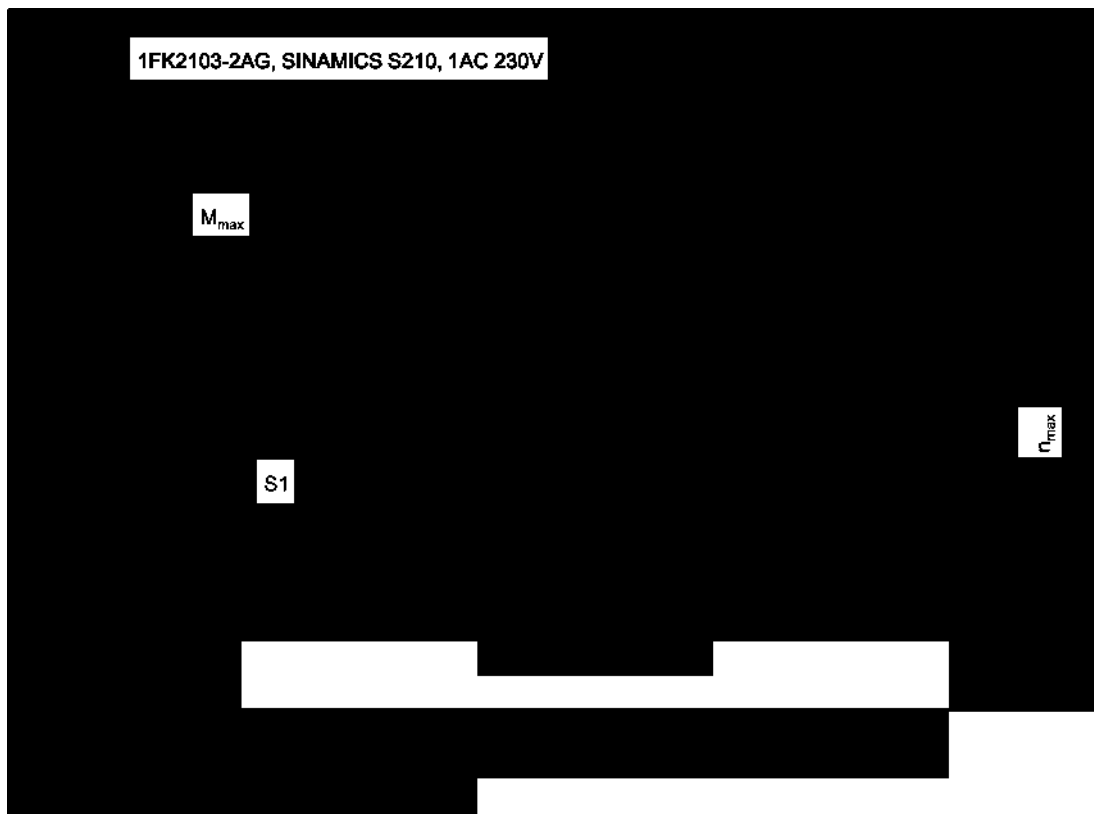
The rated data applies when the converter is connected to 230 V 1 AC.



8.1.13.3 1FK2103-2AG

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|-------------------------|-------------------|-------|
| Static torque | M_0 | Nm | 0.64 |
| Stall current | I_0 | A | 1.36 |
| Max. permissible speed | $n_{\max \text{ mech}}$ | rpm | 8000 |
| Maximum torque | M_{\max} | Nm | 1.95 |
| Maximum current | I_{\max} | A | 4.8 |
| Thermal time constant | T_{th} | min | 17 |
| Moment of inertia | J_{mot} | kgcm ² | 0.093 |
| Moment of inertia (with brake) | $J_{\text{mot br}}$ | kgcm ² | 0.112 |
| Weight | m_{mot} | kg | 1.16 |
| Weight (with brake) | $m_{\text{mot br}}$ | kg | 1.66 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 0.64 |
| Rated current | I_{rated} | A | 1.36 |
| Rated power | P_{rated} | kW | 0.2 |

The rated data applies when the converter is connected to 230 V 1 AC.



8.1.13.4 1FK2103-4AG

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|-------------------------|-------------------|-------|
| Static torque | M_0 | Nm | 1.27 |
| Stall current | I_0 | A | 2.4 |
| Max. permissible speed | $n_{\max \text{ mech}}$ | rpm | 7300 |
| Maximum torque | M_{\max} | Nm | 4.05 |
| Maximum current | I_{\max} | A | 8.7 |
| Thermal time constant | T_{th} | min | 21 |
| Moment of inertia | J_{mot} | kgcm ² | 0.139 |
| Moment of inertia (with brake) | $J_{\text{mot br}}$ | kgcm ² | 0.158 |
| Weight | m_{mot} | kg | 1.63 |
| Weight (with brake) | $m_{\text{mot br}}$ | kg | 2.15 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 1.27 |
| Rated current | I_{rated} | A | 2.4 |
| Rated power | P_{rated} | kW | 0.4 |

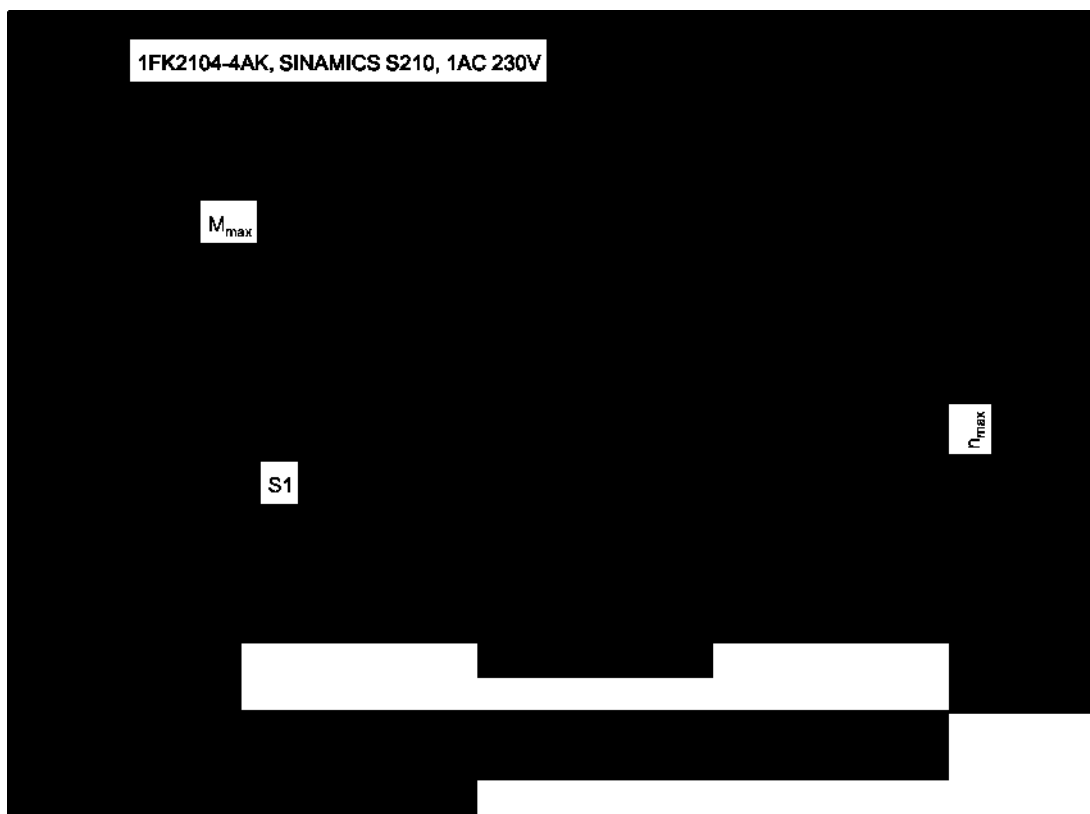
The rated data applies when the converter is connected to 230 V 1 AC.



8.1.13.5 1FK2104-4AK

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|--------------|-------------------|-------|
| Static torque | M_0 | Nm | 1.27 |
| Stall current | I_0 | A | 2.4 |
| Maximum permissible speed | n_{max} | rpm | 7400 |
| Maximum torque | M_{max} | Nm | 3.85 |
| Maximum current | I_{max} | A | 8.7 |
| Thermal time constant | T_{th} | rpm | 27 |
| Rotor moment of inertia | J_{mot} | kgcm ² | 0.35 |
| Rotor moment of inertia (with brake) | $J_{mot br}$ | kgcm ² | 0.43 |
| Weight | m_{mot} | kg | 2.05 |
| Weight (with brake) | $m_{mot br}$ | kg | 2.9 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 1.27 |
| Rated current | I_{rated} | A | 2.4 |
| Rated power | P_{rated} | kW | 0.4 |

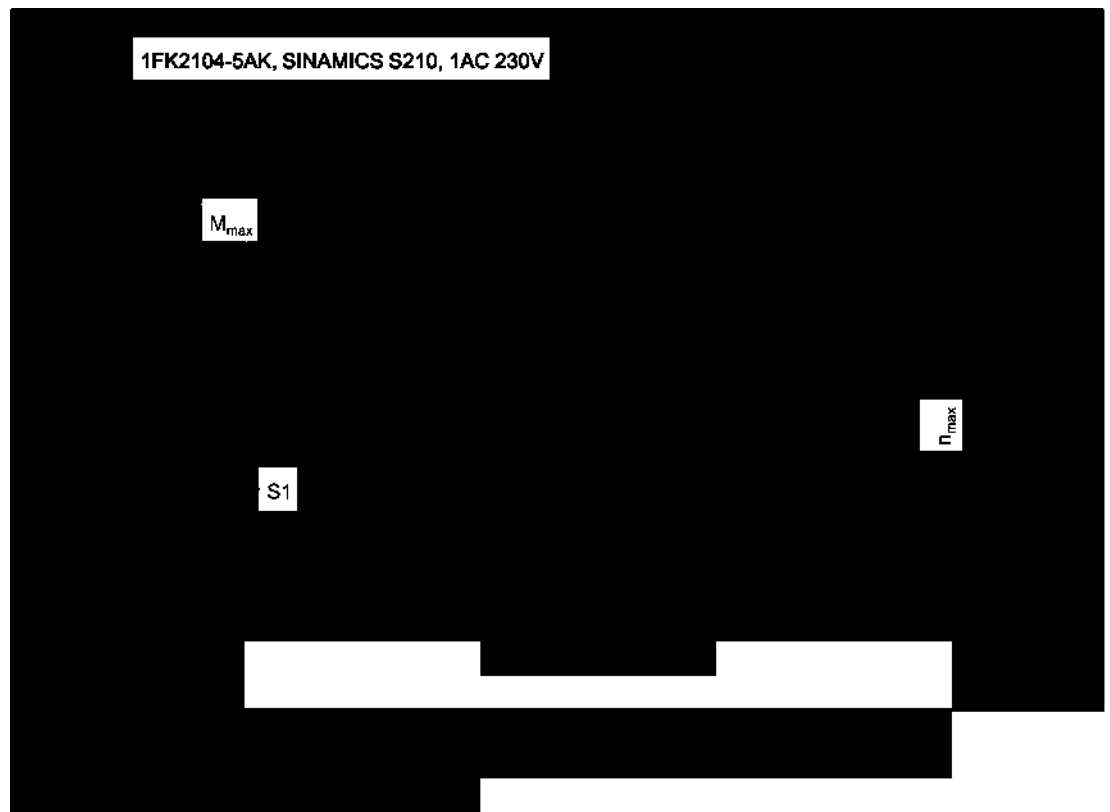
The rated data applies when the converter is connected to 230 V 1 AC.



8.1.13.6 1FK2104-5AK

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|--------------|-------------------|-------|
| Static torque | M_0 | Nm | 2.4 |
| Stall current | I_0 | A | 4.35 |
| Maximum permissible speed | n_{max} | rpm | 7100 |
| Maximum torque | M_{max} | Nm | 7.6 |
| Maximum current | I_{max} | A | 16 |
| Thermal time constant | T_{th} | rpm | 31 |
| Rotor moment of inertia | J_{mot} | kgcm ² | 0.56 |
| Rotor moment of inertia (with brake) | $J_{mot br}$ | kgcm ² | 0.65 |
| Weight | m_{mot} | kg | 2.85 |
| Weight (with brake) | $m_{mot br}$ | kg | 3.7 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 2.4 |
| Rated current | I_{rated} | A | 4.35 |
| Rated power | P_{rated} | kW | 0.75 |

The rated data applies when the converter is connected to 230 V 1 AC.

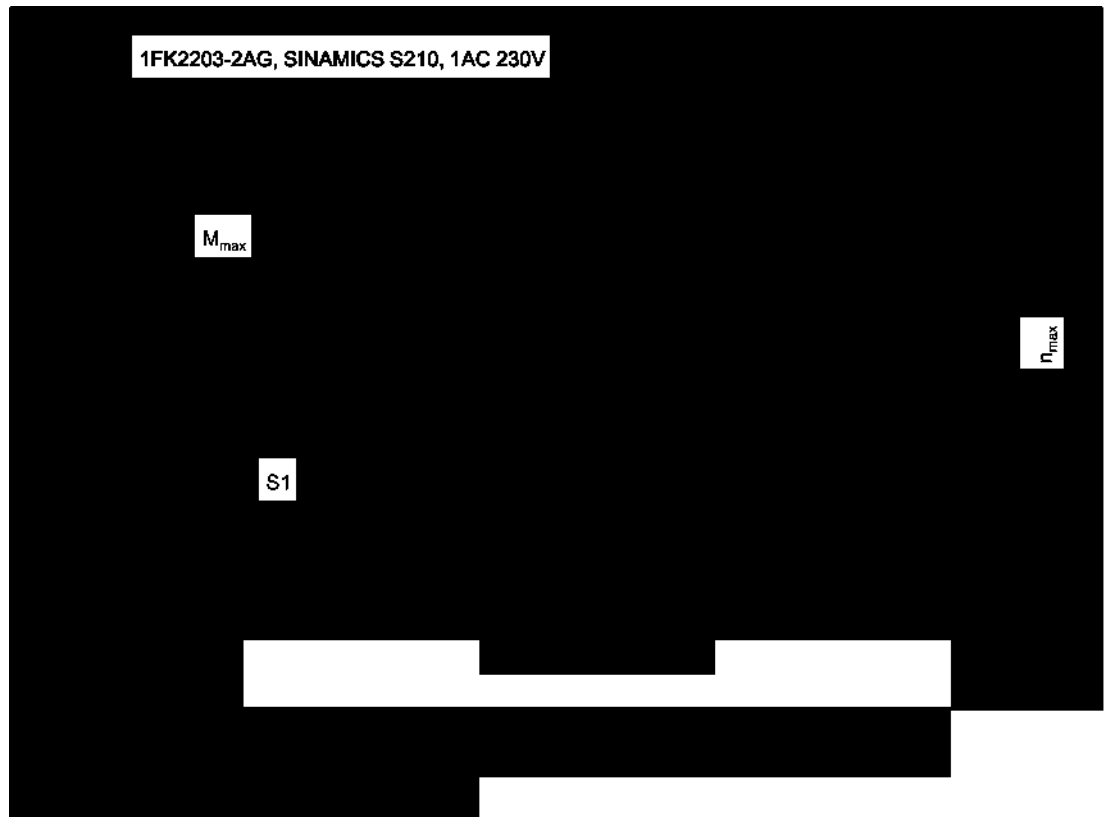


8.1.14 Technical data and characteristics 1FK2 Compact

8.1.14.1 1FK2203-2AG

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|--------------|-------------------|-------|
| Static torque | M_0 | Nm | 0.64 |
| Stall current | I_0 | A | 1.38 |
| Maximum permissible speed | n_{max} | rpm | 8000 |
| Maximum torque | M_{max} | Nm | 1.85 |
| Maximum current | I_{max} | A | 4.2 |
| Thermal time constant | T_{th} | rpm | 21 |
| Rotor moment of inertia | J_{mot} | kgcm ² | 0.2 |
| Rotor moment of inertia (with brake) | $J_{mot br}$ | kgcm ² | 0.22 |
| Weight | m_{mot} | kg | 1.1 |
| Weight (with brake) | $m_{mot br}$ | kg | 1.6 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 0.64 |
| Rated current | I_{rated} | A | 1.38 |
| Rated power | P_{rated} | kW | 0.2 |

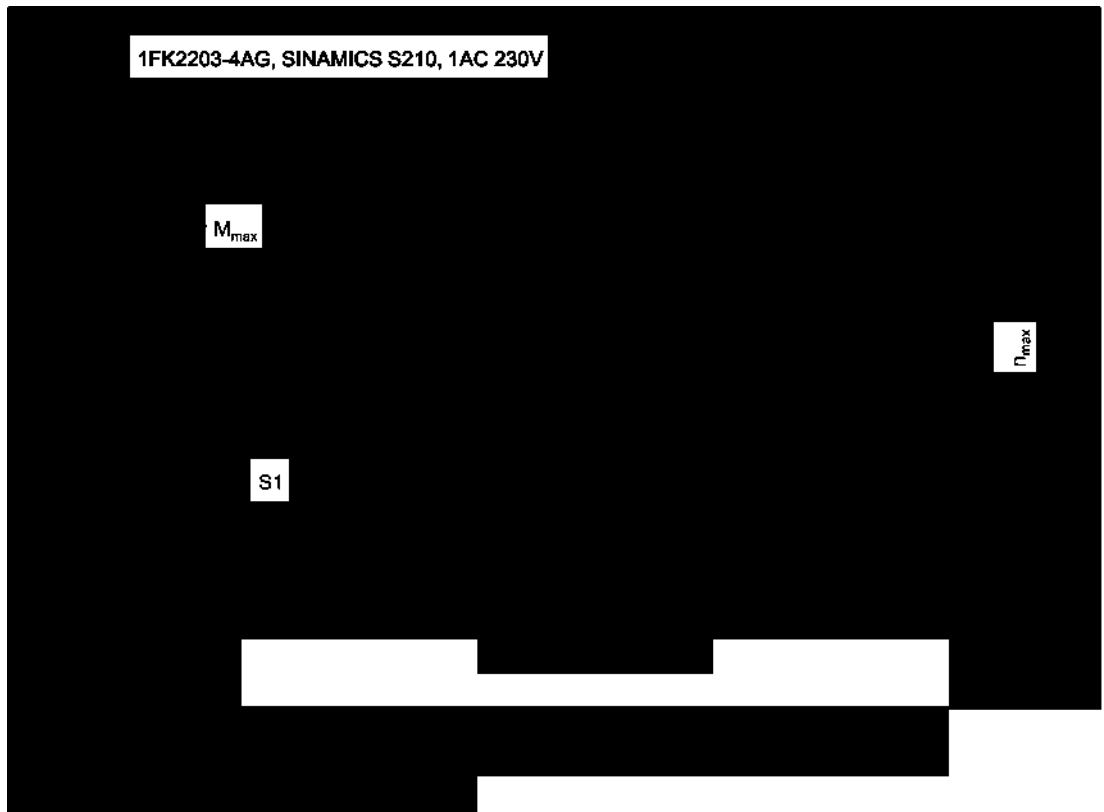
The rated data applies when the converter is connected to 230 V 1 AC.



8.1.14.2 1FK2203-4AG

| Technical data (in SINAMICS S210 system) | Symbol | Unit | Value |
|--|--------------|-------------------|-------|
| Static torque | M_0 | Nm | 1.27 |
| Stall current | I_0 | A | 2.52 |
| Maximum permissible speed | n_{max} | rpm | 7800 |
| Maximum torque | M_{max} | Nm | 3.75 |
| Maximum current | I_{max} | A | 7.8 |
| Thermal time constant | T_{th} | rpm | 28 |
| Rotor moment of inertia | J_{mot} | kgcm ² | 0.35 |
| Rotor moment of inertia (with brake) | $J_{mot br}$ | kgcm ² | 0.37 |
| Weight | m_{mot} | kg | 1.57 |
| Weight (with brake) | $m_{mot br}$ | kg | 2.1 |
| Rated data for S210 on 230 V 1 AC | | | |
| Rated speed | n_{rated} | rpm | 3000 |
| Rated torque | M_{rated} | Nm | 1.27 |
| Rated current | I_{rated} | A | 2.52 |
| Rated power | P_{rated} | kW | 0.4 |

The rated data applies when the converter is connected to 230 V 1 AC.



8.2 Technical specifications of the converter

Overload capability and shutdown behavior of the converter

For a short time, the servomotors are able to withstand maximum current.

The values for the individual motors can be found in the following sections:



Technical data and characteristics 1FK2 High Dynamic (Page 187).



Technical data and characteristics 1FK2 Compact (Page 194).

When the load exceeds the rated current, the thermal protection of the converter starts and switches the motor off in accordance with the overload characteristics shown below.

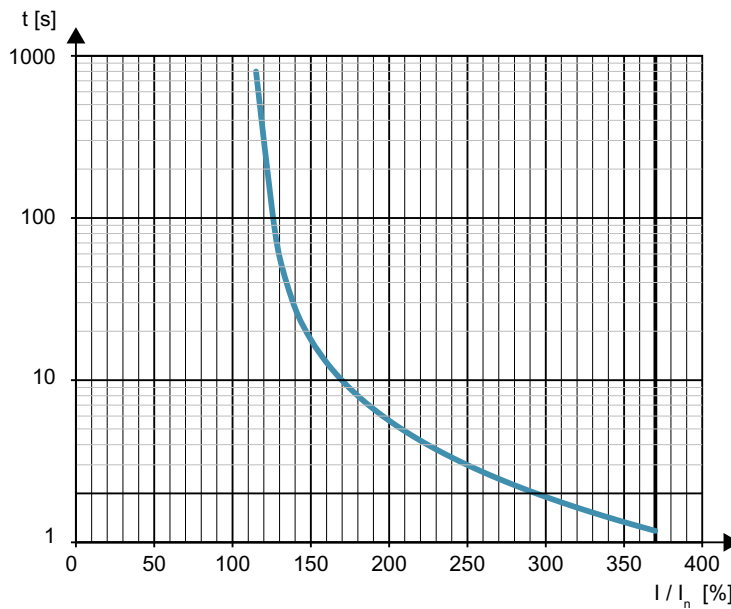


Figure 8-4 Overload characteristics for motor shutdown

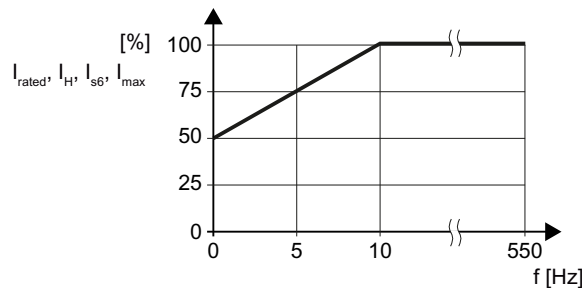


Figure 8-5 Permitted output current at low frequencies

8.2 Technical specifications of the converter

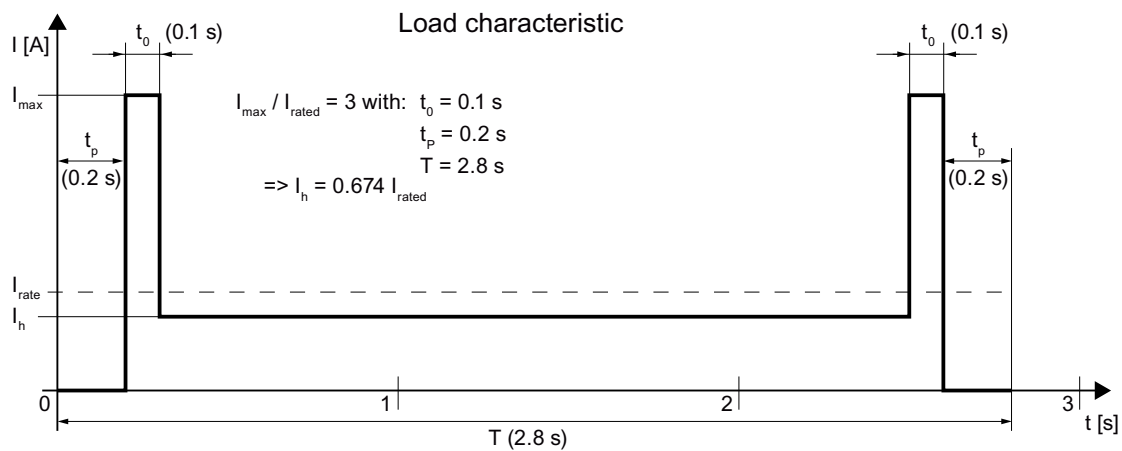


Figure 8-6 Load characteristic - example

8.2.1 Electromagnetic compatibility

Converters are equipment used on a professional basis, deployed in certain areas of business and industry – and are not operated in the general public domain.



For an EMC-compliant installation, observe the information provided in the Configuration Manual: EMC installation guideline (<http://support.automation.siemens.com/WW/view/en/60612658>).

The devices described there are intended for operation in the first and second environments.

The drive system must be installed by appropriately qualified personnel in compliance with EMC regulations - and the installation notes provided in the manual.

Electromagnetic compatibility according to EN61800-3

| Property | Version |
|---|---|
| Interference immunity | The converters are suitable for use in the first and second environments without restrictions |
| Interference emission - second environment | Category C2 Up to a motor cable length of 10 m ¹⁾ Up to a motor cable length of 25 m with additional external line filter |
| | Category C3 Up to a motor cable length of 25 m Up to a motor cable length of 50 m with additional external line filter |

¹⁾ Converters of frame size FSB require a ferrite core for the motor cable to reach category C2.



Connecting the converter (Page 93).

Note

Installation in Category C2 environments

Converters that are installed in environments of category C2 require a connection approval for the low-voltage supply system. In this regard, contact your power system operator.

8.2.2 Converter ambient conditions


| Property | Version |
|--|---|
| Ambient conditions for transport in the transport packaging | |
| Climatic ambient conditions | -40 °C ... +70 °C, according to Class 2K4 to EN 60721-3-2 maximum humidity 95 % at 40 °C |
| Mechanical ambient conditions | Shock and vibration permissible according to 2M3 to EN 60721-3-2 |
| Protection against chemical substances | Protected according to Class 2C2 to EN 60721-3-2 |
| Biological environmental conditions | Suitable according to Class 2B2 to EN 60721-3-2 |
| Ambient conditions for long-term storage in the product packaging | |
| Climatic ambient conditions | -25 °C ... +55 °C, according to Class 1K4 to EN 60721-3-1 ¹⁾ |
| Protection against chemical substances | Protected according to Class 1C2 to EN 60721-3-1 |
| Biological environmental conditions | Suitable according to Class 1B2 to EN 60721-3-1 |
| Ambient conditions in operation | |
| Installation altitude | <ul style="list-style-type: none"> Up to 1000 m above sea level without restrictions Up to 4000 m, restrictions, see the following table |
| Climatic ambient conditions | <ul style="list-style-type: none"> Temperature range: 0 °C ... +50 °C Relative humidity: 5 ... 95%, condensation not permitted Oil mist, salt mist, ice formation, condensation, dripping water, spraying water, splashing water and water jets are not permitted <p>Increased ruggedness regarding temperature range and relative humidity; therefore better than 3K3 according to EN 60721-3-3</p> |
| Mechanical ambient conditions | <ul style="list-style-type: none"> Vibration levels permissible according to Class 3M2 to EN 60721-3-3 Vibration test in operation according to IEC 60068-2-6 Test Fc (sinusoidal) <ul style="list-style-type: none"> 10 Hz ... 13 Hz: 0.075 mm deflection amplitude 13 Hz ... 150 Hz: 1 g acceleration amplitude 10 frequency cycles per axis Shock permissible according to Class 3M2 to EN 60721-3-3 Shock test in operation according to IEC 60068-2-27 Test Ea (half sinusoidal) <ul style="list-style-type: none"> 5 g peak acceleration 30 ms duration 3 shocks in all three axes in both directions |
| Protection against chemical substances | Protected according to 3C2 to EN 60721-3-3 |
| Biological environmental conditions | Suitable according to 3B2 to EN 60721-3-3 |
| Pollution | Suitable for environments with degree of pollution 2 according to EN 61800-5-1 |

Table 8-5 Maximum permissible output current depending on the installation altitude and ambient temperature

| Installation altitude [m] up to | Ambient temperature [° C] | | |
|------------------------------------|---------------------------|-----|-----|
| | 50 | 45 | 40 |
| | Output current [%] | | |
| 1000 | 100 | | |
| 2000 | 90 | 100 | |
| 3000 | 80 | 90 | 100 |
| 4000 | 70 | 80 | 90 |

An isolating transformer is required above an installation altitude of 2000 m.

8.2.3 General data, converter

| Property | Version |
|---|---|
| Line voltage | 200 V ... 240 V 1 AC, ±10 % |
| Output voltage | 0 V 3 AC ... input voltage |
| Input frequency | 50 Hz ... 60 Hz, ±10% |
| Output frequency | 0 ... 550 Hz |
| Relative supply short-circuit power | RSC ≥ 25 |
| Power factor λ | > 0.9 |
| Overvoltage category to IEC/ EN 61800-5-1 | <ul style="list-style-type: none"> Up to 2000 m: The converter insulation is designed for surge voltages of overvoltage category III. More than 2000 m: The surge voltages must be limited to values of overvoltage category II, using an isolation transformer, for example. |
| Pulse frequency | 8 kHz |
| Short-circuit current rating (SCCR) and branch protection | ≤ 65 kA rms Branch protection and short-circuit strength according to UL and IEC  Protective devices (https://support.industry.siemens.com/cs/ww/en/view/109748999) |
| Degree of protection according to EN 60529 | IP20 Must be installed in a control cabinet |
| Electronics power supply | 24 V DC, -15% ... +20%, I _{max} = 1.6 A (PELV or SELV) |
| Control mode | Servo control |
| Protection functions | Ground fault protection, output short-circuit protection, overvoltage/undervoltage protection, I _{2t} detection, IGBT overtemperature protection |

Technical data of the digital inputs

| Type | High-speed digital inputs for probe or reference marks | Fail-safe input (F-DI) | Digital input for monitoring the temperature of an external braking resistor |
|-------------------------------|--|---------------------------|--|
| Number | 2 (DI 0, DI 1) | 1 (DI 2 and DI 3) | 1 (DI 4) |
| • Low level | -30 V ... +5 V and ≤ 2 mA | -30 V ... +5 V and ≤ 2 mA | -30 V ... +5 V and ≤ 2 mA |
| • High level | 15 V ... 30 V | 15 V ... 30 V | 15 V ... 30 V |
| • Current consumption | 6 mA | 5 mA | 6 mA |
| • Delay time, typ. L → H | 5 μs | 50 μs | 5 μs |
| • Delay time, typ. H → L | 50 μs | 100 μs | 50 μs |
| • Electrical isolation | No | Yes | No |
| Conductor cross section, max. | 1.5 mm ² | 1.5 mm ² | 1.5 mm ² |

8.2.4 Specific data, converter

Table 8-6 S210, IP20, Frame Size A, 200 V ... 240 V 1 AC

| Article no. | 6SL3210-5HB10-1UF0 | 6SL3210-5HB10-2UF0 |
|-------------------------------|--------------------------------|--------------------------------|
| Rated output current | 0.8 A | 1.36 A |
| Maximum output current | 3.1 A | 4.8 A |
| Rated power | 100 W | 200 W |
| Maximum power | 142 W | 303 W |
| Rated input current | 1.4 A | 2.7 A |
| Inrush current | 8 A | 8 A |
| Fuse according to IEC | 3NA3 801 (6 A) | 3NA3 801 (6 A) |
| Fuse according to UL, class J | 6 A | 6 A |
| Cooling air requirement | Convection cooling without fan | Convection cooling without fan |
| Weight | 1 kg | 1.1 kg |

Table 8-7 S210, IP20, Frame Size B, 200 V ... 240 V 1 AC

| Article no. with filter | 6SL3210-5HB10-4UF0 |
|-------------------------------|--------------------------------|
| Rated output current | 2.4 A |
| Maximum output current | 8.7 A |
| Rated power | 400 W |
| Maximum power | 559 W |
| Rated input current | 5 A |
| Inrush current | 8 A |
| Fuse according to IEC | 3NA3 803 (10 A) |
| Fuse according to UL, class J | 10 A |
| Cooling air requirement | Convection cooling without fan |
| Weight | 1.2 kg |

Table 8-8 S210, IP20, Frame Size C, 200 V ... 240 V 1 AC

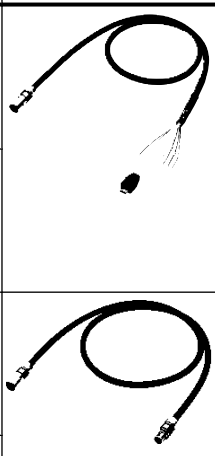
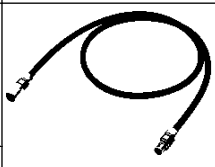
| Article no. with filter | 6SL3210-5HB10-8UF0 |
|-------------------------------|--------------------------------|
| Rated output current | 4.4 A |
| Maximum output current | 16 A |
| Rated power | 750 W |
| Maximum power | 961 W |
| Rated input current | 9.3 A |
| Inrush current | 8 A |
| Fuse according to IEC | 3NA3 805 (16 A) |
| Fuse according to UL, class J | 20 A |
| Cooling air requirement | Convection cooling without fan |
| Weight | 1.8 kg |

8.3 Technical data and properties of the connection system

MOTION-CONNECT connection cables between the motor and the converter


The following technical data applies to the MOTION-CONNECT OCC cables.

Table 8-9 MOTION-CONNECT OCC cable with SPEED-CONNECT connector

| Designation and use | Cable type | Connector size | Outer diameter | Minimum bending radius, static | For connection to motor | Article number ¹⁾ |
|---|--|----------------|----------------|--------------------------------|-------------------------|------------------------------|
| | | | D_{max} / mm | R / mm | | |
| Motor connection cable MC500 OCC for predominantly fixed installation |  | M12 | 9.7 | 23.5 | 1FK2□02 1FK2□03 | 6FX5002-8QN04-□□□□ |
| | | M17 | 10.5 | 25.5 | 1FK2□04 | 6FX5002-8QN08-□□□□ |
| Motor connection cable MC800 OCC for use in a cable carrier | | M12 | 9.7 | 28.2 | 1FK2□02 1FK2□03 | 6FX8002-8QN04-□□□□ |
| | | M17 | 10.5 | 30.6 | 1FK2□04 | 6FX8002-8QN08-□□□□ |
| Extension cable MC500 OCC for predominantly fixed installation |  | M12 | 9.7 | 23.5 | 1FK2□02 1FK2□03 | 6FX5002-8QE04-□□□□ |
| | | M17 | 10.5 | 25.5 | 1FK2□04 | 6FX5002-8QE08-□□□□ |
| Extension cable MC800 OCC for use in a cable carrier | | M12 | 9.7 | 28.2 | 1FK2□02 1FK2□03 | 6FX8002-8QE04-□□□□ |
| | | M17 | 10.5 | 30.6 | 1FK2□04 | 6FX8002-8QE08-□□□□ |

¹⁾ The last 4 positions (□□□□) define the cable length corresponding to the length code.

The length code can be found in Chapter:

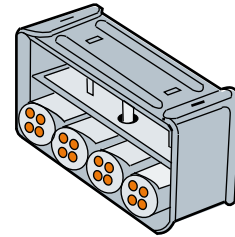
 Connection cables between the motor and the converter (Page 217)

Technical data and notes for cable carrier use with MC800 PLUS

Note

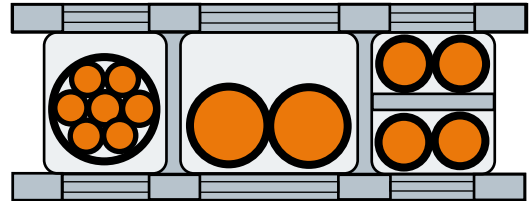
You require an MC800 PLUS cable to connect the motor using a cable carrier.

- When inserting prefabricated cables in the cable carrier, do not pull the connector, as this may damage the strain relief or cable clamping.



Strain relief in a cable carrier

- Lay the cables loosely in the carrier. They must be free to move. The cables must be free to move in particular in the bending radii of the carrier. Observe the specified minimal bending radii.



Cable routed in a cable carrier

- The cable fixings must be attached at both ends at an appropriate distance away from the end points of the moving parts in a dead zone.

When laying cables, comply with the instructions given by the cable carrier manufacturer.

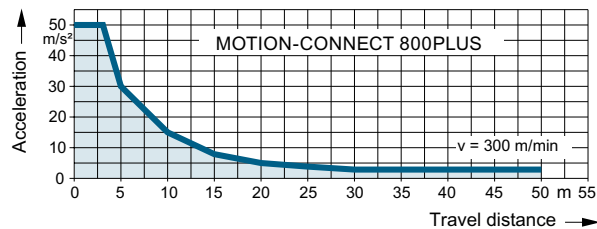


Figure 8-7 Permissible acceleration levels for MOTION-CONNECT 800 PLUS cables

Note

Additional fixing of the cable

If between the cable strain relief on the cable carrier and the terminal at the motor, part of the cable is hanging loose or is not routed, we recommend that the cable is additionally fixed for vibration load and with horizontal or vertical cable entries.

- Also fix the cable where the motor is fixed so that machine vibrations are not transferred to the connector.

Dimension drawings

9.1 Dimension drawings of motor

Dimension drawing 1FK2, shaft height 20

All dimensions in mm (inches).

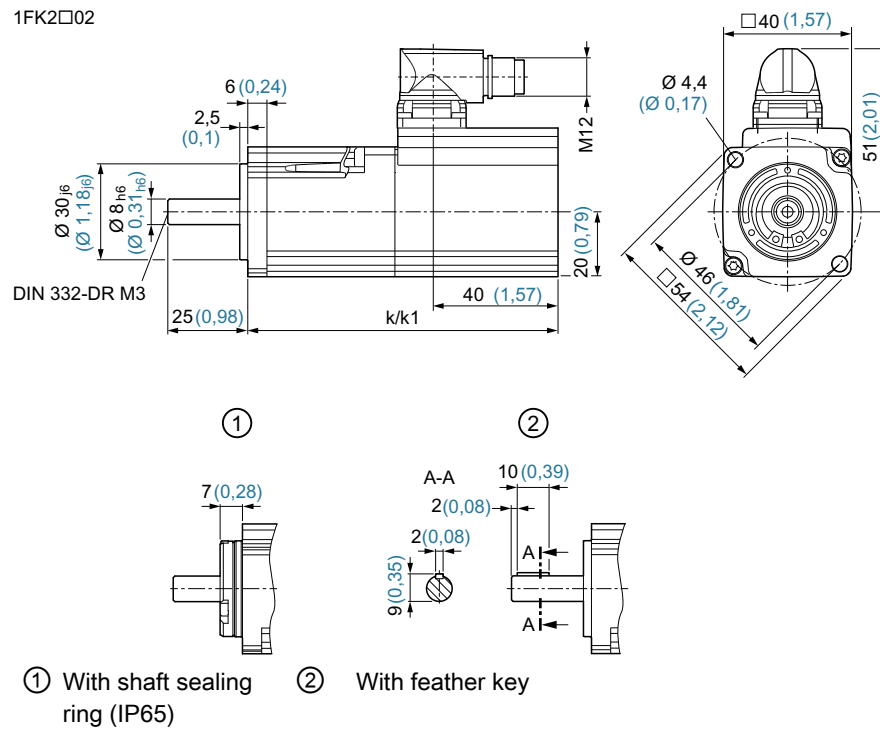
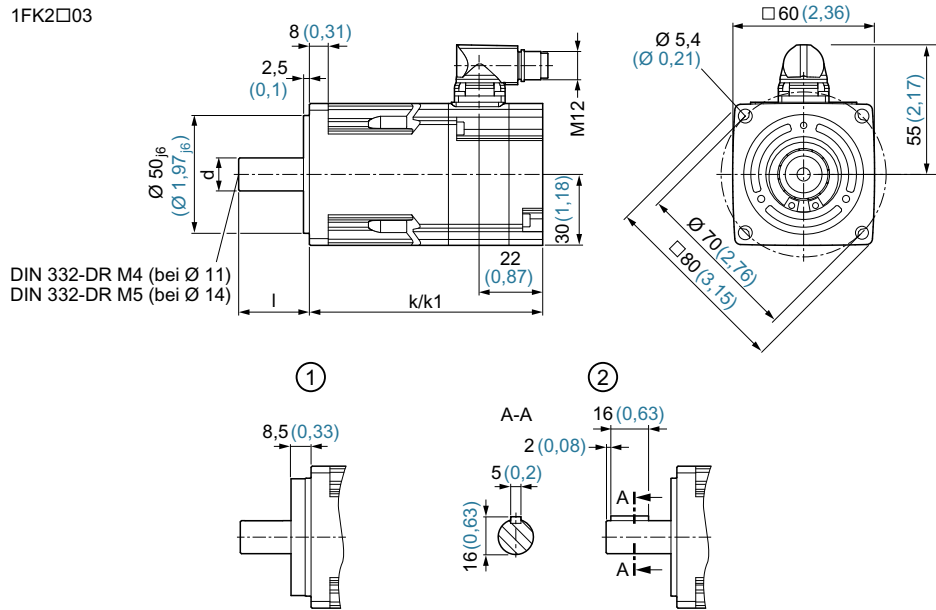


Figure 9-1 Dimension drawing 1FK2102

| SIMOTICS S-1FK2 shaft height 20 | Dimensions | |
|---------------------------------|---------------|------------|
| | Without brake | With brake |
| | DIN k | IEC k1 |
| 1FK2102-0A□ (50 W) | 97 (3.82) | 128 (5.04) |
| 1FK2102-1A□ (100 W) | 113 (4.45) | 144 (5.67) |

Dimension drawing 1FK2, shaft height 30

All dimensions in mm (inches).



① With shaft seal-ring ring (IP65) ② With feather key

Figure 9-2 Dimension drawing 1FK2□03

| SIMOTICS S-1FK2 shaft height 30 | Dimensions | | | | | | |
|--|------------|---------------|--|------------------|--|------------------|---|
| | | Without brake | With brake | Shaft 14 x 30 mm | | Shaft 11 x 23 mm | |
| | DIN | k | k1 | d | l | d | l |
| | IEC | LB | LB1 | D | L | D | L |
| 1FK2□03-2A□□□-0□□□ (200 W), plain shaft | 99 (3.9) | 130 (5.12) | 14 _{h6} (0.55 _{h6}) | 30 (1.18) | | | |
| 1FK2□03-2A□□□-1□□□ (200 W), shaft with feather key | | | | | 11 _{k6} (0.43 _{k6}) | 23 (0.91) | |
| 1FK2□03-4A□□□-0□□□ (400 W), plain shaft | 123 (4.84) | 154 (6.06) | 14 _{h6} (0.55 _{h6}) | 30 (1.18) | | | |
| 1FK2□03-4A□□□-1□□□ (400 W), shaft with feather key | | | | | 11 _{k6} (0.43 _{k6}) | 23 (0.91) | |
| 1FK2□03-4A□□□-2□□□ (400 W), plain shaft | | | | | 11 _{k6} (0.43 _{k6}) | 23 (0.91) | |

Dimension drawing 1FK2, shaft height 40

All dimensions in mm (inches).

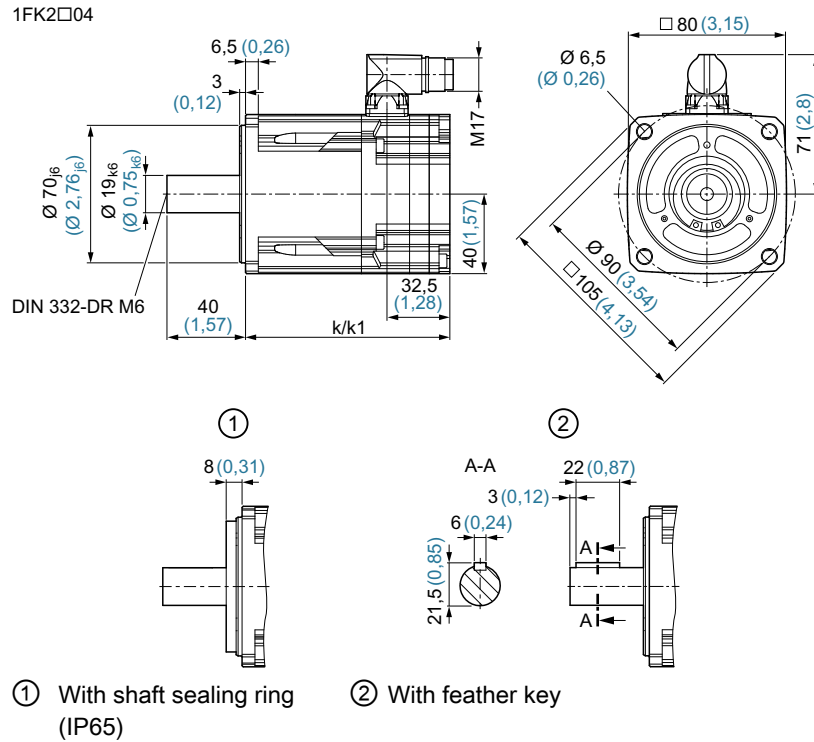


Figure 9-3 Dimension drawing 1FK2□04

| SIMOTICS S-1FK2 shaft height 40 | Dimensions | |
|---------------------------------|---------------|------------|
| | Without brake | With brake |
| | k | k1 |
| DIN | k | k1 |
| IEC | LB | LB1 |
| 1FK2□04-4A□ (400 W) | 104 (4.09) | 148 (5.83) |
| 1FK2□04-5A□ (750 W) | 132 (5.2) | 176 (6.93) |

9.2 Dimension drawings of converter

SINAMICS S210 FSA

6SL3210-5HB10-1UF0 (100 W)

6SL3210-5HB10-2UF0 (200 W)

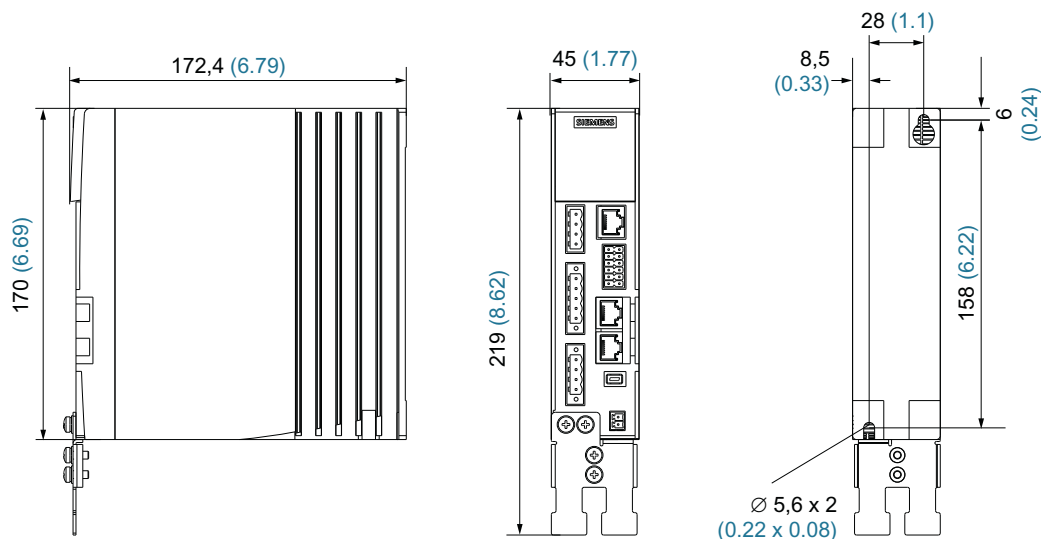


Figure 9-4 Dimension drawing SINAMICS S210 FSA, dimensions in mm (Inch)

SINAMICS S210 FSB

6SL3210-5HB10-4UF0 (400 W)

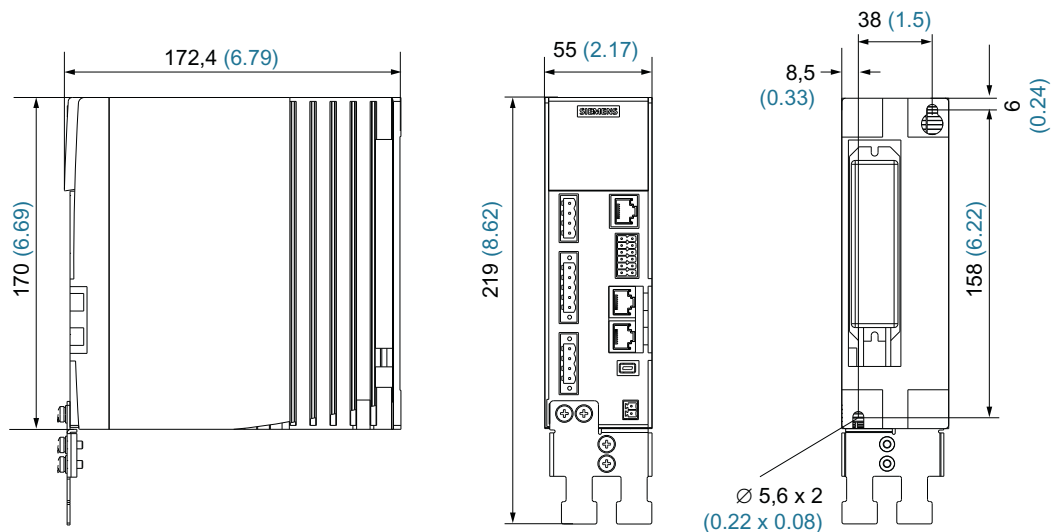


Figure 9-5 Dimension drawing SINAMICS S210 FSB, dimensions in mm (inches)

SINAMICS S210 FSC

6SL3210-5HB10-8UF0 (750 W)

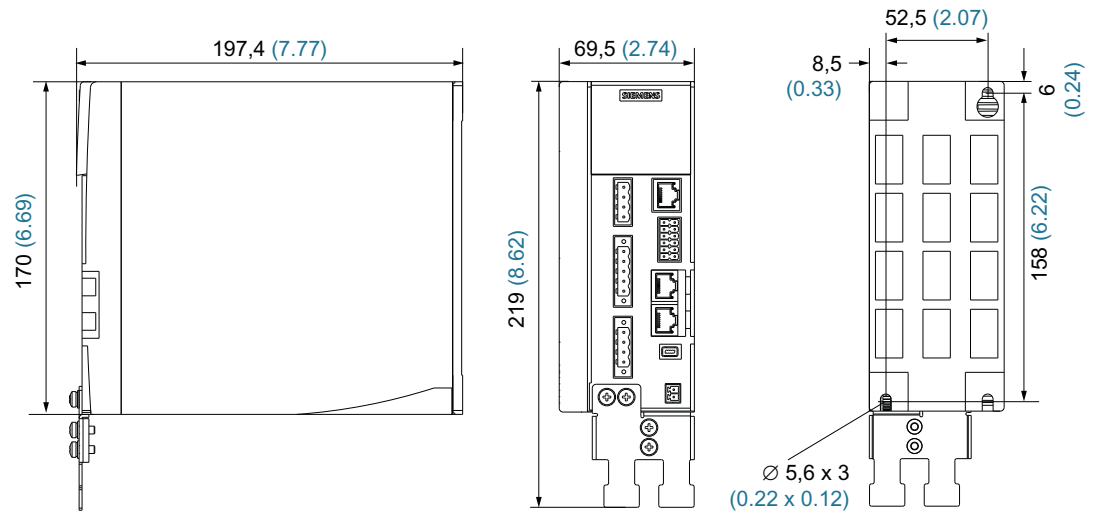


Figure 9-6 Dimension drawing SINAMICS S210 FSC, dimensions in mm (inches)

Decommissioning and disposal

10.1 Removing and disposing of the motor

WARNING**Risk of injury through falling motors or machine components**

Motors and machine components can fall when being dismantled from the machine. They can cause serious injury or property damage.

- Secure the machine components being dismantled to prevent them falling.

The removal of the motor must be performed and/or supervised by qualified personnel with appropriate expert knowledge.

Removing the motor from the machine

1.
2.

1. Check that all parts of the motor are in a no voltage condition.
2. Let the motor cool down enough so that you are not burnt.
3. Disconnect all electrical connections.
4. Remove the fixing elements from the motor.
5. Transport the motor to a suitable location for disposal.



You have removed the motor.

Dispose of the motor in accordance with the local legal requirements.

10.2 Disposing of converter

Observe the following disposal instructions:

- Be sure to comply with local disposal regulations.
- Separate the housing parts according to their material.
- Dispose of the parts in accordance with the applicable legal regulations.
- Dispose of the packaging material in accordance with the applicable legal regulations.

Components

Sort the components for recycling according to whether they are:

- Electronic waste
- Scrap iron, e.g. shield plates
- Aluminum
- Insulating materials and plastics

Ordering data

11.1 Ordering data of the motor

You can configure the motor with the aid of the article number: The article number comprises a combination of digits and letters. It is divided into three hyphenated blocks.

| Description | | Data digits of the article number | | | | | | | | | | | | | | | | | | | | | |
|--|-------|--|----------------|---------|------------------------|--|---|---|---|---|---|----|----|----|---|----|----|----|----|---|--|--|--|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | - | 8 | 9 | 10 | 11 | 12 | - | 13 | 14 | 15 | 16 | | | | |
| SIMOTICS M-1FK2 synchronous servomotors | | 1 | F | K | 2 | | | | | | | | | | | | | | | | | | |
| Version | | High Dynamic | | | | 1 | | | | | | | | | | | | | | | | | |
| | | Compact | | | | 2 | | | | | | | | | | | | | | | | | |
| Frame size / shaft height | | SH 20 | | | | 0 | 2 | | | | | | | | | | | | | | | | |
| | | SH 30 | | | | 0 | 3 | | | | | | | | | | | | | | | | |
| | | SH 40 | | | | 0 | 4 | | | | | | | | | | | | | | | | |
| Power range | | | | | | | | | | | | | | | | | | | | | | | |
| High Dynamic | SH 20 | 230 V 1 AC | M ₀ | 0.16 Nm | P _{rat} ed | 50 W | 0 | 2 | 0 | | | | | | | | | | | | | | |
| | | 230 V 1 AC | | 0.32 Nm | | 100 W | 0 | 2 | 1 | | | | | | | | | | | | | | |
| | SH 30 | 230 V 1 AC | | 0.64 Nm | | 200 W | 0 | 3 | 2 | | | | | | | | | | | | | | |
| | | 230 V 1 AC | | 1.27 Nm | | 400 W | 0 | 3 | 4 | | | | | | | | | | | | | | |
| | SH 40 | 230 V 1 AC | | 1.27 Nm | | 400 W | 0 | 4 | 4 | | | | | | | | | | | | | | |
| | | 230 V 1 AC | | 2.4 Nm | | 750 W | 0 | 4 | 5 | | | | | | | | | | | | | | |
| Compact | SH 30 | 230 V 1 AC | M ₀ | 0.64 Nm | P _{rat} ed | 200 W | 0 | 3 | 2 | | | | | | | | | | | | | | |
| | | 230 V 1 AC | | 1.27 Nm | | 400 W | 0 | 3 | 4 | | | | | | | | | | | | | | |
| Cooling | | Natural cooling | | | | | | | | A | | | | | | | | | | | | | |
| Winding, rated speed | | For converters connected to max. 240 V | | | | For converters connected to max. 480 V | | | | | | | | | | | | | | | | | |
| | | 3000 rpm at 230 V | | | | - | | | | G | | | | | | | | | | | | | |
| | | 1500 rpm at 230 V | | | | 3000 rpm at 400 V | | | | F | | | | | | | | | | | | | |
| | | 3000 rpm at 230 V | | | | 6000 rpm at 400 V | | | | K | | | | | | | | | | | | | |
| Holding brake | | Without | | | | | | | | 0 | | | | | | | | | | | | | |
| | | With | | | | | | | | 1 | | | | | | | | | | | | | |
| Protection class | | IP64 | | | | | | | | 0 | | | | | | | | | | | | | |
| | | IP65 with shaft sealing ring | | | | | | | | 1 | | | | | | | | | | | | | |
| Shaft geometry | | Plain shaft | | | | | | | | 0 | | | | | | | | | | | | | |
| | | Shaft with feather key | | | | | | | | 1 | | | | | | | | | | | | | |
| Encoder | | Plain shaft, alternative shaft geometry (D x l; 11 mm x 23 mm), only SH 30 | | | | | | | | 0 | 3 | 0 | 2 | | | | | | | | | | |
| | | Absolute encoder, singleturn, 20 bit (encoder AS20DQC) | | | | | | | | | | | | | | | | | | C | | | |
| Absolute encoder 20 bit + 12 bit multiturn (encoder AM20DQC) | | | | | | | | | | | | | | | | | | D | | | | | |
| Type of connection | | OCC (one cable connection) for S210 | | | | | | | | | | | | | | | A | | | | | | |
| Revision number | | 0 | | | | | | | | | | | | | | | | | | | | | |

11.2 Ordering data of the converter

An overview of the available converters is provided below.

| Converter - supply voltage: 200 V ... 240 V 1 AC | | |
|--|------------|-------------|
| Article number | Frame size | Rated power |
| 6SL3210-5HB10-1UF0 | FSA | 100 W |
| 6SL3210-5HB10-2UF0 | FSA | 200 W |
| 6SL3210-5HB10-4UF0 | FSB | 400 W |
| 6SL3210-5HB10-8UF0 | FSC | 750 W |

You can find further details regarding motors and converters here:

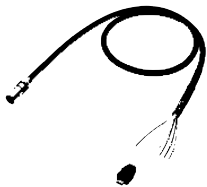





Technical specifications (Page 175).

11.3 Connection cables between the motor and the converter

OCC MOTION-CONNECT cables can only be ordered as prefabricated cables.

OCC MOTION-CONNECT cable with SPEED-CONNECT connector

| Designation and use | Cable type | For connection to motor | Connector size | Article number ¹⁾ |
|--|---|-------------------------|----------------|------------------------------|
| Motor connection cable OCC MC 500 for predominantly fixed installation |  | 1FK2□02 | M12 | 6FX5002-8QN04-□□□□ |
| | | 1FK2□03 | | |
| | | 1FK2□04 | M17 | 6FX5002-8QN08-□□□□ |
| Motor connection cable OCC MC 800PLUS for use in cable carrier |  | 1FK2□02 | M12 | 6FX8002-8QN04-□□□□ |
| | | 1FK2□03 | | |
| | | 1FK2□04 | M17 | 6FX8002-8QN08-□□□□ |
| Extension cable OCC MC 500 for predominantly fixed installation |  | 1FK2□02 | M12 | 6FX5002-8QE04-□□□□ |
| | | 1FK2□03 | | |
| | | 1FK2□04 | M17 | 6FX5002-8QE08-□□□□ |
| Extension cable OCC MC 800PLUS for use in cable carriers |  | 1FK2□02 | M12 | 6FX8002-8QE04-□□□□ |
| | | 1FK2□03 | | |
| | | 1FK2□04 | M17 | 6FX8002-8QE08-□□□□ |

¹⁾ The last 4 positions (□□□□) define the cable length corresponding to the length code

Determining the article number of a prefabricated OCC MOTION-CONNECT cable

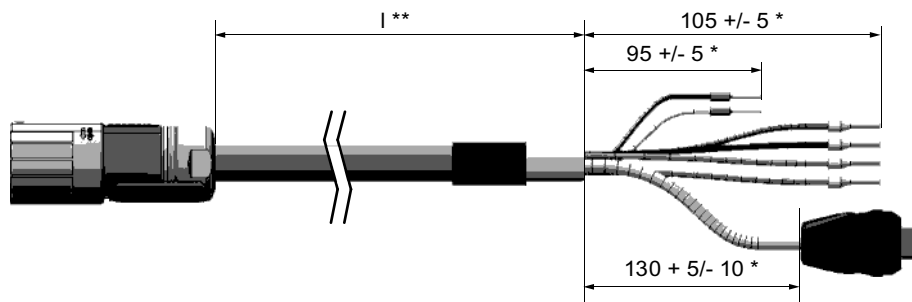


Figure 11-1 Lengths of an OCC MOTION-CONNECT cable

Procedure



1. Determine the required cable length l^{**} . Consider having cable in reserve for strain-free routing.
2. Determine the length code for the required length l^{**} corresponding to the following overview. The stretched lengths (*) are added automatically for the prefabricated cables.

11.3 Connection cables between the motor and the converter

3. Also select the cable type, the desired cable version, and the required connectors for the article number

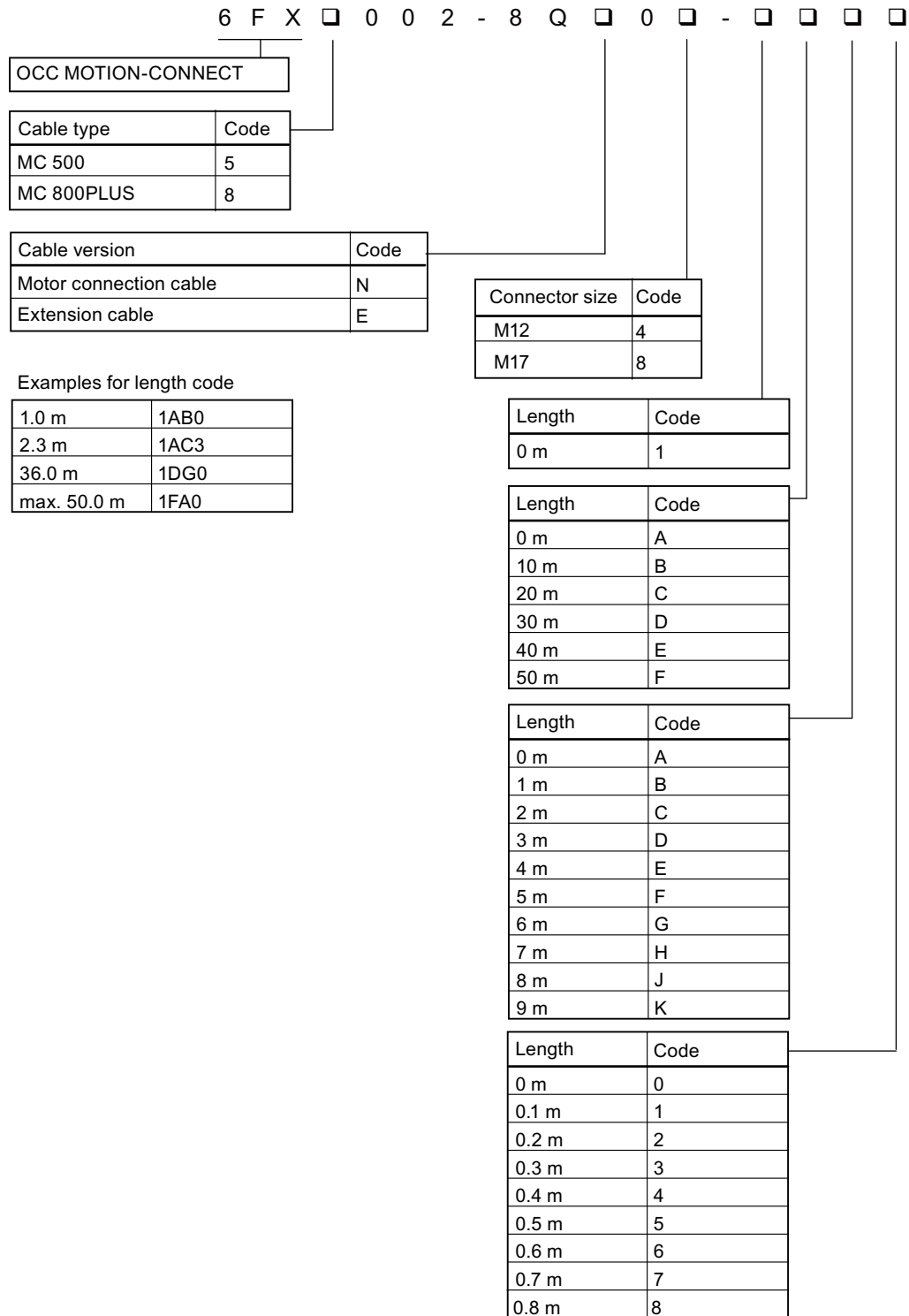


Figure 11-2 Structure of the article number with length code for an OCC MOTION-CONNECT cable

4. Order the required cable with the article number thus determined.

11.4 Accessories

11.4.1 Memory cards

Memory card for data backup and series commissioning

Use the following memory cards to backup data and for series commissioning:

| Card type | Article number |
|----------------------------|--------------------|
| Empty SD card | 6SL3054-4AG00-2AA0 |
| SD card with firmware V5.1 | 6SL3054-4FB00-2BA0 |

These SD cards are also required to save licenses of functions that require a license. It is not possible to use commercially available SD cards.

Note

Permissible memory cards

The integrated card reader supports SD cards up to a memory capacity of 2 GB.

SDHC or SDXC cards are not supported.

11.4.2 PROFINET patch cable

PROFINET patch cable

Use the following patch cable to network converters located adjacent one another via PROFINET:

| Cable type | Length | Article number |
|--|--------|----------------|
| Industrial Ethernet TP cord, CAT 6A, TP cable 4 x 2 conductors, prefabricated with 2 RJ45 connectors | 0.3 m | 6XV1870-3QE30 |
| | 0.5 m | 6XV1870-3QE50 |


11.4.3 External line filter

The following external line filter is available for the converter:

| Article number | Rated current | Type of connection | Conductor cross-section | Degree of protection | Dimensions (W x H x D) |
|--------------------|---------------|-------------------------|-------------------------------|----------------------|------------------------|
| 6SL3203-0BB21-8VA0 | 18 A | 200 V ... 240 V 1 AC | 0.3 mm ... 10 mm ² | IP20 | 59 x 153 x 55 |

11.4.4 Cabinet bushing via mounting flange

Mounting accessories for connection system

| Accessories | Diagram | For connector size | For motor | Article number |
|---|---|--------------------|--------------------|----------------|
| Mounting flange as cabinet bushing (with installation instructions) Packing unit: 1 item |  | M12 | 1FK2□02 1FK2□03 | 6FX2003-7JX00 |
| | | M17 | 1FK2□04 | 6FX2003-7HX00 |

The mounting flange is installed on the external wall of the control cabinet. It ensures the degree of protection of the control cabinet.

- Install the mounting flange as specified in the enclosed installation instructions.


11.4.5 Degree of protection kit IP65 for the motor

Shaft sealing ring - IP65 degree of protection kit for the motor


The shaft sealing ring can be used as spare part or for retrofitting.

Note

You can order a motor with shaft sealing ring (degree of protection IP65) directly.

Additional information about ordering degree of protection IP65 can be found in Chapter:  "Ordering data of the motor (Page 215)"

The motor satisfies degree of protection IP65 when the shaft sealing ring is installed.

| Motor article number | Figure of the shaft sealing ring | Article number of the degree of protection kit |
|----------------------|---|--|
| 1FK2□02 |  | 1FK2902-0GC00 |
| 1FK2□03 | | 1FK2903-0GC00 |
| 1FK2□04 | | 1FK2904-0GC00 |


11.5 Spare parts

Connector set 230 V 1 AC - 6SL3260-2DB00-0AA0

Under this article number, you will receive a spare parts package for the frame sizes FSA, FSB and FSC with the following content:

- Connectors
 - X1: Connector for line connection and external braking resistor (jumper for internal braking resistor is enclosed.)
 - X2: Connector for motor connection
 - X107: Connector for motor holding brake
 - X124: Connector for 24 V DC supply voltage
 - X130: Connector for digital inputs
- Ferrite core
- Shield plate for FSA
- Shield plate for FSB and FSC

Terminal X1: Line connection and connection for external braking resistor


| | Pin | Pin assignment | Explanation |
|---|-----|--|--|
|  | L1 | Phase L1 line system | |
| | N | Neutral conductor | |
| | DCP | Braking resistor, external Braking resistor, internal | If you are using the internal braking resistor, DCP and R2 must be jumpered. |
| | R2 | Internal braking resistor | If you are using the external braking resistor, remove the jumper between DCP and R2. Connect the external braking resistor via the DCP and R1 terminals. |
| | R1 | External braking resistor | |
| Weidmüller: BLF 5.08HC/05/180F SN BK BX, article number 1012670000 As daisy chain: BLDF 5.08/05/180F SN BK BX, article number 1000970000 | | | |

The terminals are spring-loaded terminals.

Permissible conductor cross-sections for single-core connection or for connecting flexible cables with end sleeves:

- 0.2 mm² ... 2.5 mm², AWG: 26 ... 12

Terminal X2: Power connections of the motor

| | Pin | Pin assignment | Color coding for Siemens OCC cables |
|---|-----|-------------------|-------------------------------------|
|  | U | Motor phase U | Brown |
| | V | Motor phase V | Black |
| | W | Motor phase W | Gray |
| | PE | Protective ground | Green-yellow |
| Weidmüller: BLF 5.08HC/04/180F SN BK BX, article number 1012660000 | | | |

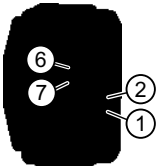
The terminals are spring-loaded terminals.

Permissible conductor cross-sections for single-core connection or for connecting flexible cables with end sleeves:


- 0.2 mm² ... 2.5 mm², AWG: 26 ... 12

X100, Siemens IX connector: Encoder connection *

* Probably available from spring 2018

| | Pin | Pin assignment | Explanation |
|--|-----|----------------|--|
|  | 1 | TXP | Sending data + / encoder power supply M |
| | 2 | TXN | Sending data - / encoder power supply M |
| | 3 | Reserved | |
| | 4 | Reserved | |
| | 5 | Reserved | |
| | 6 | RXP | Receiving data + / encoder power supply P24+ |
| | 7 | RXN | Receiving data - / encoder power supply P24+ |
| | 8 | Reserved | |
| | 9 | Reserved | |
| | 10 | Reserved | |
| Siemens IX connector, article number 6FX2003-0DE01 | | | |

Terminal X107: Motor holding brake

| | Pin | Pin assignment | Explanation |
|---|-----|----------------|---|
|  | BR- | B- | Voltage for motor holding brake, 0 V (white) |
| | BR+ | B+ | Voltage for motor holding brake, 24 V (black) |
| Phoenix 1745894 FMC 1.5 / 2-ST-3.81, article number 1745894 | | | |


The terminals are spring-loaded terminals.

Permissible conductor cross-sections:

- For single-conductor cables or for flexible cables with end sleeves without plastic protection: 0.25 mm² ... 1.5 mm², AWG: 24 ... 16
- For flexible cables with end sleeves with plastic protection: 0.25 mm² ... 0.75 mm², AWG: 24 ... 19

Also connect the conductors for the motor holding brake to the connector at X107, even when you are using a motor without holding brake.

Terminal X124: 24 VDC external control voltage


| | Pin | Pin assignment | Explanation |
|---|-----|----------------|--|
|  | M | 0 V | Power supply for the converter electronics |
| | M | 0 V | |
| | L+ | 24 V | |
| | L+ | 24 V | |
| Dinkle: Article number A000101686 | | | |

The terminals are spring-loaded terminals.

Permissible conductor cross-sections for single-core connection or for connecting flexible cables with end sleeves:

- 0.2 mm² ... 2.5 mm², AWG: 26 ... 12

Terminal X130: Connector for digital inputs

| | Pin | Pin assignment | Pin assignment | Pin |
|--|------|--------------------------------|-------------------------|-------|
|  | L+ | 24 V supply | Fail-safe digital input | DI 2+ |
| | DI 0 | High-speed DI, measuring input | | DI 2- |
| | M | Ground | | DI 3+ |
| | L+ | 24 V supply | | DI 3- |
| | DI 1 | High-speed DI, measuring input | 24 V supply | L+ |
| | M | Ground | Digital input | DI 4 |
| Phoenix 1790140 DFMC 1.5 / 6-ST-3.5, article number 1790140 | | | | |

The terminals are spring-loaded terminals.

Permissible conductor cross-sections:

- For single-conductor connection: 0.2 mm² ... 1.5 mm², AWG: 24 ... 16
- For flexible cables with end sleeves: 0.25 mm² ... 1.5 mm², AWG: 24 ... 16
- For flexible cables with end sleeves with plastic protection: 0.25 mm² ... 0.75 mm², AWG: 24 ... 19

Parameters

12.1 Parameter overview

Structure of the parameter descriptions

Some variables and settings of the converter are displayed via parameters. There are adjustable parameters and display parameters.

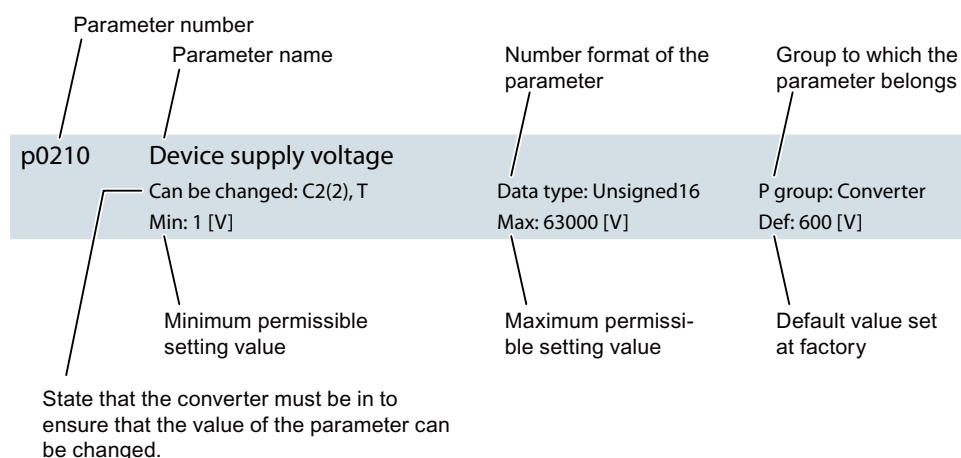


Figure 12-1 Adjustable parameters

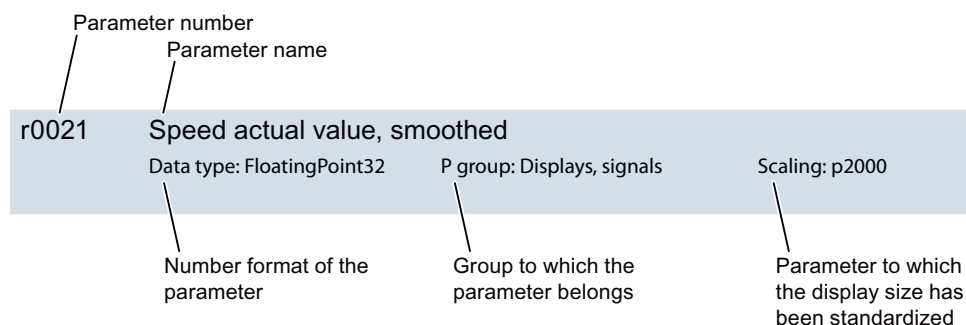


Figure 12-2 Display parameters

These components of the parameter description are explained below.

Parameter number

The parameter number is made up of a "p" or "r", followed by the parameter number and optionally the index or bit array.

Examples of how parameters are shown in the parameter list:

- **p...** Adjustable parameters (read and write)
- **r...** Display parameters (read-only)
- **p0918** Adjustable parameter 918
- **p0099[0...3]** Adjustable parameter 99, indices 0 to 3
- **r0944** Display parameter 944
- **r2129.0...15** Display parameter 2129 with bit array from bit 0 (lowest bit) to bit 15 (highest bit)

Further examples of the notation in the documentation:

- **p1070[1]** Adjustable parameter 1070, index 1
- **p2098[1].3** Adjustable parameter 2098 index 1 bit 3
- **p0795.4** Adjustable parameter 795, bit 4

Can be changed

The "-" sign indicates that the parameter can be changed in any object state and that the change will be effective immediately.

The information "C1(x), C2(x), T, U" ((x): optional) means that the parameter can be changed only in this drive unit state and that the change will not take effect until switching to another state. One or more states are possible.

The following states are possible:

- **C1(x) Device commissioning C1: Commissioning 1**
The device is being commissioned (p0009 > 0). The pulses cannot be enabled.
The parameter can only be changed in the following device commissioning settings (p0009 > 0):
 - C1: Can be changed for all settings p0009 > 0.
 - C1(x): Can only be changed for settings p0009 = x.

A changed parameter value does not take effect until the device commissioning is exited with p0009=0.

- **C2(x) Drive object commissioning C2: Commissioning 2**
The drive is being commissioned (p0009 = 0 and p0010 > 0). The pulses cannot be enabled.
The parameter can only be changed in the following drive commissioning settings (p0010 > 0):
 - C2: Can be changed for all settings p0010 > 0.
 - C2(x): Can only be changed for settings p0010 = x.

A changed parameter value does not take effect until drive commissioning mode is exited with p0010=0.

- **U Operation U: Run**
The pulses have been enabled.
- **T ready T: Ready to run**
The pulses have not been enabled and the state "C1(x)" or "C2(x)" is not active.

Data type

The following data types are available for the parameters:

- Integer8 I8 8-bit integer
- Integer16 I16 16-bit integer
- Integer32 I32 32-bit integer
- Unsigned8 U8 8-bit without sign
- Unsigned16 U16 16-bit without sign
- Unsigned32 U32 32-bit without sign
- FloatingPoint32 Float 32-bit floating-point number

P group

Specifies the functional group to which this parameter belongs.

Scaling

Specification of the reference variable with which a signal value is automatically converted with a BICO interconnection.

The following reference variables are available:

- p2000 ... p2003: Reference speed, reference voltage, etc.
- PERCENT: 1.0 = 100%
- 4000H: 4000 hex = 100% (word) or 4000 0000 hex = 100% (double word)

Parameter values

- **Min**
Minimum value of the parameter [unit]
- **Max**
Maximum value of the parameter [unit]
- **Def**
Value when delivered [unit]

12.2 List of parameters

Product: SINAMICS S210, version: 5101800

All objects: S210

| | | | |
|---------------------|---|-----------------------------|-------------------|
| r0002 | Operating display | Data type: Integer16 | P group: - |
| Description: | Operating display for the drive. | | |
| Value: | 0: Operation - everything enabled 10: Operation - set "enable setpoint" = "1" 11: Operation - set "Enable speed controller" = "1" 12: Operation - RFG frozen, set "RFG start" = "1" 13: Operation - set "enable RFG" = "1" 14: Operation - speed setpoint not enabled 15: Operation - open brake (p1215) 16: Operation - withdraw braking with OFF1 using "ON/OFF1" = "1" 17: Operation - braking with OFF3 can only be interrupted with OFF2 18: Operation - brake on fault, remove fault, acknowledge 21: Ready for operation - set "Enable operation" = "1" 31: Ready for switching on - set "ON/OFF1" = "0/1" 41: Switching-on inhibited - set "ON/OFF1" = "0" 42: Switching on inhibited - set "OC/OFF2" = "1" 43: Switching on inhibited - set "OC/OFF3" = "1" 44: Switching on inhibited - supply STO terminal w/ 24 V (hardware) 45: Switching on inhibited - rectify fault, acknowledge fault, STO 46: Switching-on inhibited - exit commissioning mode (p0009, p0010) 70: Initialization 200: Wait for booting/partial booting 250: Device signals a topology error | | |

Dependency: See also: r0046

NOTICE

For a display not equal to 0, the drive is either powering up or an enable signal is missing. The control sends these enable signals.
 For several missing enable signals, the corresponding value with the highest number is displayed.

Note
 The drive only controls the motor speed in the "Operation" state (r0002 = 0).
 OC: Operating condition
 EP: Enable Pulses (pulse enable)
 RFG: Ramp-function generator
 COMM: Commissioning
 MotID: Motor data identification
 SS2: Safe Stop 2
 STO: Safe Torque Off

| | | | | |
|---------------------|---|--------------------------|-----------------------------|----------------------------|
| p0009 | Drive commissioning parameter filter 1 | Changeable: C1, T | Data type: Integer16 | P group: All groups |
| | | Min: 0 | Max: 30 | Def: 1 |
| Description: | Setting parameter filter 1 to commission the drive. | | | |
| Value: | 0: Ready | | | |

- 1: Device configuration
30: Parameter reset

Note

The drive can only be switched on when in the "Ready" state (p0009 = 0).

p0010 **Drive commissioning parameter filter 2**
Changeable: C2(1), T **Data type:** Integer16 **P group:** All groups
Min: 0 **Max:** 95 **Def:** 1

Description: Setting parameter filter 2 for commissioning the drive.

Value: 0: Ready
1: Only Siemens internal
3: Motor commissioning
95: Safety Integrated commissioning

NOTICE

For p0010 = 95:

The safety commissioning Wizard must be carried out in the web server after changing safety parameters. These changes become effective after carry out all of the commissioning steps of the wizards.

Note

The drive can only be switched on when in the "Ready" state (p0010 = 0).

r0020 **Speed setpoint smoothed**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2000

Description: Displays the smoothed speed setpoint at the speed controller input.

r0021 **Actual speed smoothed**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2000

Description: Displays the smoothed actual value of the motor speed.

Dependency: See also: r0063

r0026 **DC link voltage smoothed**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2001

Description: Displays the smoothed actual value of the DC link voltage.

Dependency: See also: r0070

r0027 **Absolute actual current smoothed**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2002

Description: Displays the smoothed absolute actual current value.

Dependency: See also: r0068

r0031 **Actual torque smoothed**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2003

Description: Displays the smoothed torque actual value.

Dependency: See also: r0080

r0032 **Active power actual value smoothed**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** r2004

Description: Display for the smoothed actual value of the active power.

Parameters

12.2 List of parameters

Dependency: See also: r0082

r0034 **Motor utilization thermal**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** PERCENT

Description: Displays the thermal motor utilization taking into account the ambient temperature set in p0613.

Dependency: See also: p0613
See also: F07011, A07012

NOTICE

After the drive is switched on, the system starts to determine the motor temperature with an assumed model value. This means that the value for the motor utilization is only valid after a stabilization time.

r0037[0...20] **Drive temperatures**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2006

Description: Displays the temperatures of the drive components.

Index: [0] = Inverter maximum value
[1] = Depletion layer maximum value
[2] = Reserved
[3] = Reserved
[4] = Interior of power unit
[5] = Inverter 1
[6...12] = Reserved
[13] = Depletion layer 1
[14...20] = Reserved

Note

The value of -200 indicates that there is no measuring signal.
For index [0]:
Maximum value of the inverter temperatures (r0037[5...10]).
For index [1]:
Maximum value of the depletion layer temperatures (r0037[13...18]).
The maximum value is the temperature of the hottest inverter or depletion layer.
In the case of a fault, the particular shutdown threshold depends on the power unit, and cannot be read out.

r0039[0...2] **Energy display**
Data type: FloatingPoint32 **P group:** Displays, signals

Description: Display for the energy values at the drive output terminals.

Index: [0] = Energy balance (sum)
[1] = Energy drawn
[2] = Energy fed back

Note

For index [0]:
Difference between the energy drawn and energy that is fed back.

r0046 **Enable signals status**
Data type: Unsigned32 **P group:** Displays, signals

Description: Displays the status of the enable signals.

All enable signals are required to operate the drive. The enable signals are set by the control.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|-------------------|------------|---------------------|-----------------|-----------------|-----------|
| | 00 | OFF1 enable missing | Yes | No | 7954 |
| | 01 | OFF2 enable missing | Yes | No | - |
| | 02 | OFF3 enable missing | Yes | No | - |

| | | | | |
|----|---|-----|----|---------------|
| 03 | Operation enable missing | Yes | No | - |
| 04 | Armature short-circuit / DC braking enable missing | Yes | No | 7014, 7016 |
| 05 | STOP2 enable missing | Yes | No | - |
| 08 | Safety enable missing | Yes | No | - |
| 09 | Infeed enable missing | Yes | No | - |
| 10 | Ramp-function generator enable missing | Yes | No | - |
| 11 | Ramp-function generator start missing | Yes | No | - |
| 12 | Setpoint enable missing | Yes | No | - |
| 16 | OFF1 enable internal missing | Yes | No | - |
| 17 | OFF2 enable internal missing | Yes | No | - |
| 18 | OFF3 enable internal missing | Yes | No | - |
| 19 | Pulse enable internal missing | Yes | No | - |
| 20 | Armature short-circuit/DC braking internal enable missing | Yes | No | 7014, 7016 |
| 21 | STOP2 enable internal missing | Yes | No | - |
| 25 | Function bypass active | Yes | No | - |
| 26 | Drive inactive or not operational | Yes | No | - |
| 27 | De-magnetizing not completed | Yes | No | - |
| 28 | Brake open missing | Yes | No | - |
| 29 | Cooling unit ready signal missing | Yes | No | - |
| 30 | Speed controller inhibited | Yes | No | - |
| 31 | Jog setpoint active | Yes | No | - |

Dependency:

See also: r0002

Note

The value r0046 = 0 indicates that all enable signals for this drive are present.

Bit 00 = 1 (enable signal missing), if:

- the signal source in p0840 is a 0 signal.
- there is a "switching-on inhibited".

Bit 01 = 1 (enable signal missing), if:

- the signal source in p0844 or p0845 is a 0 signal.

Bit 02 = 1 (enable signal missing), if:

- the signal source in p0848 or p0849 is a 0 signal.

Bit 03 = 1 (enable signal missing), if:

- the signal source in p0852 is a 0 signal.

Bit 04 = 1 (armature short-circuit active), if:

- the signal source in p1230 has a 1 signal

Bit 05, Bit 06: Being prepared

Bit 08 = 1 (enable signal missing), if:

- safety functions have been enabled and STO is active.
- a safety-relevant signal is present with a STOP A response.

STO enabled via terminals:

- the pulse enable via terminal EP is missing (booksize: X21, chassis: X41), or the signal source in p9620 is for a 0 signal.

STO enabled via PROFIsafe or TM54F:

- STO is selected via PROFIsafe or TM54F.

Bit 09 = 1 (enable signal missing), if:

- the signal source in p0864 is a 0 signal.

Bit 10 = 1 (enable signal missing), if:

- the signal source in p1140 is a 0 signal.

Bit 11 = 1 (enable signal missing) if the speed setpoint is frozen, because:

- the signal source in p1141 is a 0 signal.
- the speed setpoint is entered from jogging and the two signal sources for jogging, bit 0 (p1055) and bit 1 (p1056) have a 1 signal.

Bit 12 = 1 (enable signal missing), if:

- the signal source in p1142 is a 0 signal.
- When activating the function module "basic positioner" (r0108.4 = 1), the signal source in p1142 is set to a 0 signal.

Bit 16 = 1 (enable signal missing), if:

- there is an OFF1 fault response. The system is only enabled if the fault is removed and was acknowledged and the "switching-on inhibited" withdrawn with OFF1 = 0.

Bit 17 = 1 (enable signal missing), if:

- commissioning mode is selected (p0009 > 0 or p0010 > 0).
- there is an OFF2 fault response.
- the drive is inactive (p0105 = 0) or is not operational (r7850[DO-Index]=0).

Bit 18 = 1 (enable signal missing), if:

- OFF3 has still not been completed or an OFF3 fault response is present.

Bit 19 = 1 (internal pulse enable missing), if:

- synchronization is running between the basic clock cycle, DRIVE-CLiQ clock cycle and application clock cycle.

Bit 20 = 1 (internal armature short-circuit active), if:

- the drive is not in the state "S4: Operation" or "S5x" (refer to function diagram 2610).
- the internal pulse enable is missing (r0046.19 = 0).

Bit 21 = 1 (enable signal missing), if:

The pulses have been enabled and the speed setpoint has still not been enabled, because:

- the holding brake opening time (p1216) has still not expired.
- the motor has still not been magnetized (induction motor).
- the encoder has not been calibrated (U/f vector and synchronous motor)

Bit 22: Being prepared

Bit 26 = 1 (enable signal missing), if:

- the drive is inactive (p0105 = 0) or is not operational (r7850[DO-Index]=0).
- the function "parking axis" is selected (BI: p0897 = 1 signal)..
- all power units of a parallel connection are deactivated (p0125, p0895).

Bit 27 = 1 (enable signal missing), if:

- de-magnetizing has still not been completed (only for vector).

Bit 28 = 1 (enable signal missing), if:

- the holding brake is closed or has still not been opened.

Bit 29 = 1 (enable signal missing), if:

- the cooling unit ready signal via binector input p0266[1] missing.

Bit 30 = 1 (speed controller inhibited), if one of the following reasons is present:

- a 0 signal is available via binector input p0856.
- the function generator with current input is active.
- the measuring function "current controller reference frequency characteristic" is active.
- the pole position identification is active.
- motor data identification is active (only certain steps).

Bit 31 = 1 (enable signal missing), if:

- the speed setpoint from jog 1 or 2 is entered.

r0062 **Speed setpoint after the filter**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2000
Description: Display for the speed setpoint after the setpoint filters.

r0063 **Speed actual value**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2000
Description: Display for the speed actual value.
Dependency: See also: r0021, p1441

r0068 **Absolute current actual value**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2002
Description: Displays actual absolute current.
Dependency: See also: r0027

NOTICE

The value is updated with a sampling time of 1 ms.

Note

Absolute current value = $\sqrt{I_q^2 + I_d^2}$

The absolute current actual value is available smoothed (r0027) and unsmoothed (r0068).

r0070 **Actual DC link voltage**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2001
Description: Display for the measured actual value of the DC link voltage.
Dependency: See also: r0026

Note

The DC link voltage is available smoothed (r0026) and unsmoothed (r0070).

r0076 **Current actual value field-generating**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2002
Description: Display for the actual value of the field-generating current I_d .

r0078[0...1] **Current actual value torque-generating**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2002
Description: Display for the actual value of the torque-generating current I_q .

Parameters

12.2 List of parameters

Index: [0] = Unsmoothed
[1] = Smoothed with p0045

r0079[0...1] **Torque setpoint total**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2003
Description: Display for the torque setpoint at the output of the speed controller.
Index: [0] = Unsmoothed
[1] = Smoothed with p0045

r0080 **Torque actual value**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** p2003
Description: Display for the actual torque.
Dependency: See also: r0031

Note

The value is available smoothed (r0031) and unsmoothed (r0080).

r0082[0...3] **Active power actual value**
Data type: FloatingPoint32 **P group:** Displays, signals **Scaling:** r2004
Description: Displays the actual active power.
Index: [0] = Unsmoothed
[1] = Smoothed with p0045
[2] = Power drawn
[3] = Power drawn smoothed
Dependency: See also: r0032

Note

The mechanical active power is available smoothed (r0032 with 100 ms, r0082[1] with p0045) and unsmoothed (r0082[0]).

For index [3]:

Smoothing time constant = 4 ms

p0210 **Drive unit line supply voltage**
Changeable: C2(2), T **Data type:** Unsigned16 **P group:** Converter
Min: 1 [V] **Max:** 63000 [V] **Def:** 600 [V]

Description: Sets the drive unit supply voltage.
The voltage between two phases should be entered as the device supply voltage.
This setting is important for operating with voltages that are less than the voltage range intended for the drive.

NOTICE

If, in the switched-off state (pulse inhibit), the supply voltage is higher than the entered value, the Vdc controller may be automatically deactivated in some cases to prevent the motor from accelerating the next time the system is switched on. In this case, an appropriate alarm A07401 is output.

Note

Setting ranges for p0210 as a function of the rated power unit voltage:

U_{rated} = 400 V:

- p0210 = 380 ... 480 V (AC/AC), 510 ... 720 V (DC/AC)

U_{rated} = 500 V:

- p0210 = 500 ... 600 V (AC/AC), 675 ... 900 V (DC/AC)

U_{rated} = 660 ... 690 V:

- p0210 = 660 ... 690 V (AC/AC), 890 ... 1035 V (DC/AC)

U_{rated} = 500 ... 690 V:

- p0210 = 500 ... 690 V (AC/AC), 675 ... 1035 V (DC/AC)

The precharging switch-in threshold for the DC link voltage (V_{dc}) is calculated from p0210:

V_{dc_pre} = p0210 * 0.82 * 1.35 (AC/AC)

V_{dc_pre} = p0210 * 0.82 (DC/AC)

The undervoltage thresholds for the DC link voltage (V_{dc}) are calculated from p0210 as a function of the rated power unit voltage:

U_{rated} = 400 V:

- U_{min} = p0210 * 0.78 (AC/AC) > 330 V, p0210 * 0.60 (DC/AC) > 380 V

U_{rated} = 500 V:

- U_{min} = p0210 * 0.76 (AC/AC) > 410 V

U_{rated} = 660 ... 690 V:

- U_{min} = p0210 * 0.82 (AC/AC) > 565 V, p0210 * 0.63 (DC/AC) > 650 V

U_{rated} = 500 ... 690 V:

- U_{min} = p0210 * 0.82 (AC/AC) > 420 V, p0210 * 0.63 (DC/AC) > 480 V

| | | |
|---------------------|---|-----------------------|
| r0302[0] | motor code DRIVE-CLiQ | |
| | Data type: Unsigned16 | P group: Motor |
| Description: | Displays the number of the motor with DRIVE-CLiQ When the drive powers up, the motor code is read out the motor. For r0302 = 0, the motor was not identified. | |

| | | |
|---------------------|-----------------------------------|-----------------------|
| r0304[0] | Rated motor voltage | |
| | Data type: FloatingPoint32 | P group: Motor |
| Description: | Displays the rated motor voltage. | |

| | | |
|---------------------|-----------------------------------|-----------------------|
| r0305[0] | Rated motor current | |
| | Data type: FloatingPoint32 | P group: Motor |
| Description: | Displays the rated motor current. | |

| | | |
|---------------------|-----------------------------------|-----------------------|
| r0307[0] | Rated motor power | |
| | Data type: FloatingPoint32 | P group: Motor |
| Description: | Displays the rated motor power. | |

| | | |
|---------------------|-----------------------------------|-----------------------|
| r0311[0] | Rated motor speed | |
| | Data type: FloatingPoint32 | P group: Motor |
| Description: | Displays the rated motor speed. | |

| | | |
|---------------------|-----------------------------------|-----------------------|
| r0312[0] | Rated motor torque | |
| | Data type: FloatingPoint32 | P group: Motor |
| Description: | Displays the rated motor torque. | |

Parameters

12.2 List of parameters

| | |
|---|--|
| r0318[0] | Motor stall current Data type: FloatingPoint32 P group: Motor |
| Description: | Displays the rated motor stall current. |
| r0319[0] | Motor stall torque Data type: FloatingPoint32 P group: Motor |
| Description: | Displays the motor standstill/stall torque. |
| r0322[0] | Maximum motor speed Data type: FloatingPoint32 P group: Motor |
| Description: | Displays the maximum motor speed. |
| Dependency: | See also: p1082, r1082 |
| r0323[0] | Maximum motor current Data type: FloatingPoint32 P group: Motor |
| Description: | Displays the maximum permissible motor current. |
| r0341[0] | Motor moment of inertia Data type: FloatingPoint32 P group: Motor |
| Description: | Displays the motor moment of inertia (without load). |
| r0479[0...2] | Diagnostics encoder position actual value Gn_XIST1 Data type: Integer32 P group: Encoder |
| Description: | Display for the encoder actual position value Gn_XIST1 according to PROFIdrive for diagnostics. The value of r0479 is updated in each DRIVE-CLiQ basic clock cycle and displayed with sign. |
| Index: | [0] = Encoder 1 [1] = Reserved [2] = Reserved |
| p0488[0...2] | Activate measuring probe 1 Changeable: T, U Data type: Integer16 P group: Encoder Min: 0 Max: 210 Def: 0 |
| Description: | Setting to activate/de-activate measuring probe 1. The inversion of probe 1 is set in p0490.0. |
| Value: | 0: No measuring probe 210: DI 0 (X130 / 1.2) |
| Index: | [0] = Encoder 1 [1] = Reserved [2] = Reserved |
| Dependency: | See also: p0489, p0490 |
| CAUTION In order to prevent incorrect measurement values, these parameters may not be written during an active measurement. | |
| Note DI: Digital Input Refer to the encoder interface for PROFIdrive. | |

| | | | | |
|---------------------|---|-------------------------|-----------------------------|-------------------------|
| p0489[0...2] | Activate measuring probe 2 | Changeable: T, U | Data type: Integer16 | P group: Encoder |
| | | Min: 0 | Max: 211 | Def: 0 |
| Description: | Setting to activate/de-activate measuring probe 2. The inversion of probe 2 is set in p0490.1. | | | |
| Value: | 0: No measuring probe 211: DI 1 (X130 / 1.5) | | | |
| Index: | [0] = Encoder 1 [1] = Reserved [2] = Reserved | | | |
| Dependency: | See also: p0488, p0490 | | | |

CAUTION

In order to prevent incorrect measurement values, these parameters may not be written during an active measurement.

Note

DI: Digital Input
Refer to the encoder interface for PROFIdrive.

| | | | | | |
|---------------------|--|-------------------------|------------------------------|-------------------------|-----------|
| p0490 | Invert measuring probe | Changeable: T, U | Data type: Unsigned32 | P group: Encoder | |
| | | Min: - | Max: - | Def: 0000 bin | |
| Description: | Setting to invert digital input 0 or 1 (probe 1, 2). | | | | |
| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
| | 00 | DI 0 (X130 / 1.2) | Inverted | Not inverted | - |
| | 01 | DI 1 (X130 / 1.5) | Inverted | Not inverted | - |
| Dependency: | See also: p0488, p0489 | | | | |

Note

DI: Digital Input
The inversion has no effect on the status display of the digital inputs (r0722).

| | | | |
|---------------------|---|-----------------------------|-----------------------|
| r0550[0] | Brake status | Data type: Integer16 | P group: Motor |
| Description: | Displays the status of the brake. The value of r0550 is read when the drive powers up. | | |
| Value: | 0: No data 1: Holding brake | | |
| Dependency: | See also: p1215, p1216, r1216, p1217, r1217 | | |

| | | | | |
|---------------------|---|--------------------------------|-----------------------------------|-----------------------|
| p0613[0] | Motor temperature model ambient temperature | Changeable: C2(3), T, U | Data type: FloatingPoint32 | P group: Motor |
| | | Min: -40 [°C] | Max: 100 [°C] | Def: 20 [°C] |
| Description: | Sets the motor ambient temperature. Based on this value, the motor temperature model calculates the thermal motor utilization (r0034). | | | |
| Dependency: | See also: r0034 See also: F07011, A07012 | | | |

| | | | |
|--------------|------------------------------|------------------------------|--------------------------|
| r0722 | Digital inputs status | Data type: Unsigned32 | P group: Commands |
|--------------|------------------------------|------------------------------|--------------------------|

Parameters

12.2 List of parameters

Description: Displays the status of the digital inputs.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|---------------------|----------|----------|----|
| | 00 | DI 0 (X130 / 1.2) | High | Low | - |
| | 01 | DI 1 (X130 / 1.5) | High | Low | - |
| | 02 | DI 2 (X130 / 2.1-2) | High | Low | - |
| | 03 | DI 3 (X130 / 2.3-4) | High | Low | - |
| | 04 | DI 4 (X130 / 2.6) | High | Low | - |

Dependency: See also: p0488, p0489

Note

DI: Digital Input

For bit 00, 01:

DI 0 and DI 1 are fast digital inputs and can be used to connect a measuring probe (p0488, p0489).

For bits 02, 03:

DI 2 and DI 3 form a fail-safe digital input.

For bit 04:

DI 4 is intended to monitor the temperature of the external brake resistor.

r0898 Control word sequence control

Data type: Unsigned16 **P group:** Displays, signals

Description: Display for the control word of the sequence control.

The higher-level control cyclically sends the control word to the drive.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|----------------------------------|----------|----------|------|
| | 00 | ON/OFF1 | Yes | No | - |
| | 01 | OC / OFF2 | Yes | No | - |
| | 02 | OC / OFF3 | Yes | No | - |
| | 03 | Enable operation | Yes | No | - |
| | 04 | Enable ramp-function generator | Yes | No | - |
| | 05 | Continue ramp-function generator | Yes | No | - |
| | 06 | Enable speed setpoint | Yes | No | - |
| | 07 | Command open brake | Yes | No | - |
| | 08 | Jog 1 | Yes | No | 3001 |
| | 09 | Jog 2 | Yes | No | 3001 |
| | 10 | Master control by PLC | Yes | No | - |
| | 12 | Speed controller enable | Yes | No | - |
| | 14 | Command close brake | Yes | No | - |

r0899 Status word sequence control

Data type: Unsigned16 **P group:** Displays, signals

Description: Display for the status word of the sequence control.

The status word is cyclically sent from the drive to the higher-level control.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|-------------------------------|---------------|-------------|----|
| | 00 | Ready for switching on | Yes | No | - |
| | 01 | Ready | Yes | No | - |
| | 02 | Operation enabled | Yes | No | - |
| | 03 | Jog active | Yes | No | - |
| | 04 | No coasting active | OFF2 inactive | OFF2 active | - |
| | 05 | No Quick Stop active | OFF3 inactive | OFF3 active | - |
| | 06 | Switching-on inhibited active | Yes | No | - |
| | 07 | Drive ready | Yes | No | - |

| | | | | |
|----|--|-----|----|---|
| 08 | Controller enable | Yes | No | - |
| 09 | Control request | Yes | No | - |
| 11 | Pulses enabled | Yes | No | - |
| 12 | Open holding brake | Yes | No | - |
| 13 | Command close holding brake | Yes | No | - |
| 14 | Pulse enable from the brake control | Yes | No | - |
| 15 | Setpoint enable from the brake control | Yes | No | - |

Note

For bits 00, 01, 02, 04, 05, 06, 09:

For PROFIdrive, these signals are used for status word 1.

For bit 13:

When the "Safe Brake Control" (SBC) is activated and selected, the brake is no longer controlled using this signal.

For bit 14, 15:

These signals are only of significance when the "extended brake control" function module is activated (r0108.14 = 1).

r0922**Telegram selection**

Data type: Unsigned16

P group: Communications

Description:

Displays the send and receive telegram.

When commissioning the drive, the telegram settings of the higher-level control are used.

Value:

3: Standard telegram 3, PZD-5/9

5: Standard telegram 5, PZD-9/9

102: SIEMENS telegram 102, PZD-6/10

105: SIEMENS telegram 105, PZD-10/10

Note

If a value is not equal to 999, a telegram is set and the automatically set interconnections in the telegram are inhibited.

The inhibited interconnections can only be changed again after setting value 999.

r0924[0...1]**ZSW bit pulses enabled**

Data type: Unsigned16

P group: Communications

Description:

Displays the position of the "Pulses enabled" status signal in the PROFIdrive telegram.

Index:

[0] = Signal number

[1] = Bit position

p0925**PROFIdrive clock synchronous sign-of-life tolerance**

Changeable: T, U

Data type: Unsigned16

P group: Communications

Min: 0

Max: 65535

Def: 1

Description:

Sets the number of tolerated consecutive sign-of-life errors of the isochronous controller.

The sign-of-life signal is normally received in PZD4 (control word 2) from the controller.

Dependency:

See also: F01912

Note

The sign-of-life monitoring is disabled for p0925 = 65535.

r0930**PROFIdrive operating mode**

Data type: Unsigned16

P group: Setpoints

Description:

Displays the operating mode.

1: Closed-loop speed controlled operation with ramp-function generator

2: Closed-loop position controlled operation

3: Closed-loop speed controlled operation without ramp-function generator

Parameters

12.2 List of parameters

| | | | |
|------------------------|---|------------------------------|--------------------------|
| r0944 | Fault buffer counter | Data type: Unsigned16 | P group: Messages |
| Description: | Display for the fault buffer counter This counter is incremented every time that a fault occurs. | | |
| Recommendation: | This is used to check whether an additional fault has occurred while reading out the fault buffer. | | |
| Dependency: | See also: r0945, r0947, r0948, r0949, r2109 | | |

| | | | |
|--|---|------------------------------|--------------------------|
| r0945[0...63] | Fault code | Data type: Unsigned16 | P group: Messages |
| Description: | Displays the numbers of faults that have occurred. | | |
| Dependency: | See also: r0947, r0948, r0949, r2109, r2130, r2133, r2136 | | |
| NOTICE | | | |
| The properties of the fault buffer should be taken from the corresponding product documentation. | | | |
| Note | | | |
| The buffer parameters are cyclically updated in the background (refer to status signal in r2139). Drive faults are signaled using parameters r0945, r0947, r0948 and r0949. | | | |

| | | | |
|----------------------|---------------------------------------|------------------------------|--------------------------|
| r0947[0...63] | Fault code | Data type: Unsigned16 | P group: Messages |
| Description: | This parameter is identical to r0945. | | |

| | | | |
|--|--|------------------------------|--------------------------|
| r0948[0...63] | Fault received in milliseconds | Data type: Unsigned32 | P group: Messages |
| Description: | Displays the system runtime in milliseconds referred to the day that the fault occurred. | | |
| Dependency: | See also: r0945, r0947, r0949, r2109, r2130, r2133, r2136 | | |
| NOTICE | | | |
| The time comprises r2130 (complete days) and r0948 (milliseconds, incomplete day). | | | |

| | | | |
|---|--|-----------------------------|--------------------------|
| r0949[0...63] | Fault value | Data type: Integer32 | P group: Messages |
| Description: | Displays additional information about the fault that occurred (as integer number). The fault causes can be found under the fault values of the particular fault number. | | |
| Dependency: | See also: r0945, r0947, r0948, r2109, r2130, r2133, r2136 | | |
| Note | | | |
| The buffer parameters are cyclically updated in the background (refer to status signal in r2139). The structure of the fault buffer and the assignment of the indices is shown in r0945. | | | |

| | | | | |
|---------------------|--|-------------------------|------------------------------|--------------------------|
| p0952 | Fault cases counter | Changeable: T, U | Data type: Unsigned16 | P group: Messages |
| | | Min: 0 | Max: 65535 | Def: 0 |
| Description: | Number of fault situations since the last reset. | | | |
| Dependency: | The counter is reset with p0952 = 0. See also: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136 | | | |

| | | | |
|---------------------|------------------------------|------------------------------|--------------------------------|
| r0964[0...6] | Device identification | Data type: Unsigned16 | P group: Communications |
|---------------------|------------------------------|------------------------------|--------------------------------|

| | |
|---------------------|---|
| Description: | Displays the device identification. The drive internally comprises components, device and drive object. Both components require their own identification parameters according to PROFIdrive |
| Index: | [0] = Company (Siemens = 42) [1] = Device type [2] = Firmware version [3] = Firmware date (year) [4] = Firmware date (day/month) [5] = Number of drive objects [6] = Firmware patch/hot fix |
| Dependency: | See also: r0975 |

Note

Example:

r0964[0] = 42 --> SIEMENS

r0964[1] = 5410 --> SINAMICS S210 PN

r0964[2] = 409 --> first part of the firmware version V04.09 (for second part, refer to index 6)

r0964[3] = 2017 --> year 2017

r0964[4] = 1705 --> 17th of May

r0964[5] = 1 --> 1 drive object

r0964[6] = 100 --> second part, firmware version (complete version: V04.09.01.00)

| | | | |
|--------------|----------------------------------|------------------------------|--------------------------------|
| r0965 | PROFIdrive profile number | Data type: Unsigned16 | P group: Communications |
|--------------|----------------------------------|------------------------------|--------------------------------|

| | |
|---------------------|---|
| Description: | Displays the PROFIdrive profile number and profile version. Constant value = 0329 hex. Byte 1: Profile number = 03 hex = PROFIdrive profile Byte 2: Profile version = 29 hex = Version 4.1 |
|---------------------|---|

Note

When the parameter is read via PROFIdrive, the Octet String 2 data type applies.

| | | | |
|----------------------|------------------------------------|------------------------------|--------------------------------|
| r0975[0...10] | Drive object identification | Data type: Unsigned16 | P group: Communications |
|----------------------|------------------------------------|------------------------------|--------------------------------|

| | |
|---------------------|--|
| Description: | Displays the identification of the drive object. The drive internally comprises components, device and drive object. Both components require their own identification parameters according to PROFIdrive |
| Index: | [0] = Company (Siemens = 42) [1] = Drive object type [2] = Firmware version [3] = Firmware date (year) [4] = Firmware date (day/month) [5] = PROFIdrive drive object type class [6] = PROFIdrive drive object sub-type Class 1 [7] = Drive object number [8] = Reserved [9] = Reserved [10] = Firmware patch/hot fix |
| Dependency: | See also: r0964 |

12.2 List of parameters

Note

Example:

- r0975[0] = 42 --> SIEMENS
- r0975[1] = 11 --> SERVO drive object type
- r0975[2] = 102 --> first part, firmware version V01.02 (second part, refer to index 10)
- r0975[3] = 2003 --> year 2003
- r0975[4] = 1401 --> 14th of January
- r0975[5] = 1 --> PROFIdrive drive object, type class
- r0975[6] = 9 --> PROFIdrive drive object sub-type class 1
- r0975[7] = 2 --> drive object number = 2
- r0975[8] = 0 (reserved)
- r0975[9] = 0 (reserved)
- r0975[10] = 600 --> second part, firmware version (complete version: V01.02.06.00)

p0976 **Reset all parameters**

Changeable: C-1(30) **Data type:** Unsigned16 **P group:** Factory settings

Min: 0 **Max:** 1 **Def:** 0

Description: Resets all parameters of the drive system.

Value:

- 0: Inactive
- 1: Start reset of all parameters to factory setting

Dependency: See also: p0977

NOTICE
After changing the value, it is not possible to change parameters until the operation has been completed.

Note

After all of the parameters have been reset to their factory setting, the system must be commissioned for the first time again.

Reset is realized in the non-volatile memory.

Procedure:

1. Set p0009 = 30 (parameter reset).
2. Set p0976 = 1 The system is powered up again.

p0976 is automatically set to 0 and p0009 is automatically set to 1 after this has been carried out.

p0977 **Save all parameters**

Changeable: T, U **Data type:** Unsigned16 **P group:** Factory settings

Min: 0 **Max:** 1 **Def:** 0

Description: Saves all parameters of the drive system to the non-volatile memory.
When saving, only the adjustable parameters intended to be saved are taken into account.

Value:

- 0: Inactive
- 1: Save in non-volatile memory - loaded at POWER ON

Dependency: See also: p0976

NOTICE
The drive power supply may only be switched off after data has been saved (i.e. after data save has been started, wait until the parameter again has the value 0).
Writing to parameters is inhibited while saving.

r0979[0...30] **PROFIdrive encoder format**

Data type: Unsigned32 **P group:** Encoder

Description: Displays the actual position encoder used according to PROFIdrive.

| | |
|---------------|---|
| Index: | [0] = Header |
| | [1] = Type encoder 1 |
| | [2] = Resolution encoder 1 |
| | [3] = Shift factor G1_XIST1 |
| | [4] = Shift factor G1_XIST2 |
| | [5] = Distinguishable revolutions encoder 1 |
| | [6...30] = Reserved |

Note

Information about the individual indices can be taken from the following literature:
PROFIdrive Profile Drive Technology

| | | | | |
|---------------------|---|---|-----------------------------------|-------------------------------|
| p1082[0] | Maximum speed | Changeable: C2(1), T | Data type: FloatingPoint32 | P group: Setpoints |
| | | Min: 0.000 [rpm] | Max: 210000.000 [rpm] | Def: 1500.000 [rpm] |
| Description: | Sets the maximum motor speed to a value less than or equal to the maximum motor speed (r0322). The set value is valid for both directions of rotation. | | | |
| Dependency: | See also: p0322, r0322 | | | |
| p1083[0] | Speed limit positive | Changeable: T, U | Data type: FloatingPoint32 | P group: Setpoints |
| | | Scaling: p2000 | | |
| | | Min: 0.000 [rpm] | Max: 210000.000 [rpm] | Def: 210000.000 [rpm] |
| Description: | Sets the maximum speed for the positive direction. The set value must be less than or equal to the maximum speed (p1082). | | | |
| p1086[0] | Speed limit negative | Changeable: T, U | Data type: FloatingPoint32 | P group: Setpoints |
| | | Scaling: p2000 | | |
| | | Min: -210000.000 [rpm] | Max: 0.000 [rpm] | Def: -210000.000 [rpm] |
| Description: | Sets the maximum speed for the negative direction. The set value must be less than or equal to the maximum speed (p1082). | | | |
| p1121[0] | OFF1 ramp-down time | Changeable: C2(1), T, U | Data type: FloatingPoint32 | P group: Setpoints |
| | | Min: 0.000 [s] | Max: 999999.000 [s] | Def: 10.000 [s] |
| Description: | Sets the ramp-down time after an OFF1 command. The value is referred to the maximum speed (p1082). After an OFF1 command, within this time, the speed setpoint is ramped down from the maximum speed (p1082) to standstill. | | | |
| Dependency: | See also: p1082, r1082 | | | |
| p1135[0] | OFF3 ramp-down time | Changeable: C2(1), T, U | Data type: FloatingPoint32 | P group: Setpoints |
| | | Min: 0.000 [s] | Max: 600.000 [s] | Def: 0.000 [s] |
| Description: | Sets the ramp-down time for quick stop. In this time, after an OFF3, the speed setpoint is reduced from the maximum speed (p1082) down to standstill. | | | |
| | Note | This time can be exceeded if the DC link voltage reaches its maximum value. | | |

12.2 List of parameters

r1196 DSC position setpoint

Data type: Integer32 **P group:** Encoder

Description: Displays the position setpoint of Dynamic Servo Control in fine pulses.

Note

DSC: Dynamic Servo Control

p1215 Motor holding brake configuration

Changeable: T **Data type:** Integer16 **P group:** Functions
Min: 0 **Max:** 2 **Def:** 0

Description: Sets the configuration for the motor holding brake.
 Re value 2:
 This setting allows the motor shaft to be rotated for installation purposes.

Value:
 0: No motor holding brake available
 1: Motor holding brake acc. to sequence control
 2: Motor holding brake always open

Dependency: See also: p1216, r1216, p1217, r1217, p1226, p1227, p1228

CAUTION
 For the setting p1215 = 0, if a brake is used, it remains closed. If the motor moves, this will destroy the brake. Setting p1215 = 2 is not permissible if the brake is used to hold loads.

r1216 Motor holding brake opening time

Data type: FloatingPoint32 **P group:** Functions

Description: Displays the opening time for the motor holding brake.
 The speed setpoint is kept at 0 for this time. The speed setpoint is then enabled.

Recommendation: This time should be set longer than the actual opening time of the brake. This ensures that the drive cannot accelerate when the brake is applied.

Dependency: See also: p1215, p1217, r1217

Note

For p1216 = 0 ms, the monitoring and the message A07931 "Brake does not open" are deactivated.

r1217 Motor holding brake closing time

Data type: FloatingPoint32 **P group:** Functions

Description: Displays the time to close the motor holding brake.
 If the drive signals that the motor is at a standstill, if the holding brake is activated, after the closing time has expired, the pulses are canceled. This prevents the load from sagging, for example.

Recommendation: This time should be set longer than the actual closing time of the brake. This ensures that the pulses are only suppressed after the brake has closed.

Dependency: See also: p1215, p1216, r1216

NOTICE
 If the selected closing time is too short with respect to the actual closing time of the brake, then the load can sag. If the closing time is selected to be too long with respect to the actual closing time of the brake, the control works against the brake and therefore reduces its lifetime.

Note

For p1217 = 0 ms, the monitoring and the message A07932 "Brake does not close" are deactivated.

p1226[0] Threshold for zero speed detection

Changeable: T, U **Data type:** FloatingPoint32 **P group:** Functions
Min: 0.00 [rpm] **Max:** 210000.00 [rpm] **Def:** 20.00 [rpm]

Description: Sets the speed threshold for the standstill identification.
The following applies when the motor holding brake is activated:
The motor is shut down and held by the brake after the closing time for the brake in p1217 has elapsed.
The following applies when the motor holding brake is not activated:
The motor is shut down and it then coasts down.

Dependency: See also: p1215, p1216, r1216, p1217, r1217, p1227

Note

In order that standstill is identified, the speed threshold in p1226 must be somewhat higher than the speed actual value noise level.

p1227**Zero speed detection monitoring time**

Changeable: T, U **Data type:** FloatingPoint32 **P group:** Functions
Min: 0.000 [s] **Max:** 300.000 [s] **Def:** 4.000 [s]

Description: Sets the monitoring time for the standstill identification.
When speed threshold p1226 is fallen below after OFF1 or OFF3, after the monitoring time that has been set expires, the drive signals that the motor is at a standstill.

Dependency: See also: p1215, p1216, r1216, p1217, r1217, p1226

Note

The monitoring is deactivated with p1227 = maximum value.

p1228**Pulse suppression delay time**

Changeable: T, U **Data type:** FloatingPoint32 **P group:** Functions
Min: 0.000 [s] **Max:** 299.000 [s] **Def:** 0.000 [s]

Description: Sets the delay time for pulse suppression.
When speed threshold p1226 is fallen below after OFF1 or OFF3, after the delay time that has been set expires, the drive signals that the motor at a standstill.

Dependency: See also: p1226, p1227

p1416[0]**Speed setpoint filter 1 time constant**

Changeable: T, U **Data type:** FloatingPoint32 **P group:** Closed-loop control
Min: 0.00 [ms] **Max:** 5000.00 [ms] **Def:** 0.00 [ms]

Description: Sets the time constant for the speed setpoint filter 1 (PT1).

Note

This parameter is only effective if the filter is set as a PT1 low pass.

p1441[0]**Actual speed smoothing time**

Changeable: T, U **Data type:** FloatingPoint32 **P group:** Closed-loop control
Min: 0.00 [ms] **Max:** 50.00 [ms] **Def:** 0.00 [ms]

Description: Sets the smoothing time constant (PT1) for the speed actual value.

Dependency: See also: r0063

p1460[0]**Speed controller P gain**

Changeable: T, U **Data type:** FloatingPoint32 **P group:** Closed-loop control
Min: 0.0000 [Nms/rad] **Max:** 500000000.0000 [Nms/rad] **Def:** 0.3000 [Nms/rad]

Description: Sets the P gain of the speed controller.
The drive determines the P gain for One Button Tuning and writes the value to p1460.
The value can be changed.

Dependency: See also: p1462

12.2 List of parameters

| | |
|-----------------|--|
| | Note The higher the set P gain, the faster and more unstable the control. |
| p1462[0] | Speed controller integral time Changeable: T, U Data type: FloatingPoint32 P group: Closed-loop control Min: 0.00 [ms] Max: 100000.00 [ms] Def: 20.00 [ms] Description: Sets the integral time for the speed controller The drive determines the integral time for One Button Tuning - and writes the value to p1462. Dependency: See also: p1460 Note The shorter the integral time, the faster and more unstable the control. |
| p1498[0] | Load moment of inertia Changeable: T, U Data type: FloatingPoint32 P group: Closed-loop control Min: - [kgm ²] Max: - [kgm ²] Def: - [kgm ²] Description: Sets the load moment of inertia. The setting is made during commissioning while the One Button Tuning is being performed. |
| p1520[0] | Torque limit motoring Changeable: T, U Data type: FloatingPoint32 P group: Closed-loop control Scaling: p2003 Min: -1000000.00 [Nm] Max: 20000000.00 [Nm] Def: 0.00 [Nm] Description: Sets the torque limit value when motoring. This setting is made as part of the basic commissioning. Dependency: See also: p1521, p1532, r1538, r1539 |
| p1521[0] | Torque limit regenerating Changeable: T, U Data type: FloatingPoint32 P group: Closed-loop control Scaling: p2003 Min: -20000000.00 [Nm] Max: 1000000.00 [Nm] Def: 0.00 [Nm] Description: Setting the regenerative torque limit This setting is made as part of the basic commissioning. Dependency: See also: p1520, p1532, r1538, r1539 |
| p1532[0] | Torque limit offset Changeable: T, U Data type: FloatingPoint32 P group: Closed-loop control Scaling: p2003 Min: -100000.00 [Nm] Max: 100000.00 [Nm] Def: 0.00 [Nm] Description: Sets the offset for the torque limit. The setting allows electronic weight equalization to be used for vertical axes. Parameters p1520 and p1521 are offset by the set value in the same direction. Dependency: See also: p1520, p1521 |
| r1538 | Torque limit motoring active Data type: FloatingPoint32 P group: Closed-loop control Scaling: p2003 Description: Displays the currently active torque limit when motoring. Note The value in p1538 may not exceed the value in p1521. |

| | | | | |
|----------------------|---|-----------------------------------|-------------------------------------|-------------------------------------|
| r1539 | Torque limit when regenerating active | Data type: FloatingPoint32 | P group: Closed-loop control | Scaling: p2003 |
| Description: | Displays the currently effective torque limit when regenerating. | | | |
| | Note | | | |
| | The value in p1539 may not exceed the value in p1521. | | | |
| p1703[0] | Isq current controller precontrol scaling | Changeable: T, U | Data type: FloatingPoint32 | P group: Closed-loop control |
| | | Min: 0.0 [%] | Max: 200.0 [%] | Def: 0.0 [%] |
| Description: | Sets the scaling of the dynamic current controller precontrol for the torque-generating current component Isq. | | | |
| p1821[0] | Direction of rotation | Changeable: C2(3) | Data type: Integer16 | P group: Motor |
| | | Min: 0 | Max: 1 | Def: 0 |
| Description: | Setting to change the direction of rotation. If the parameter is changed, it reverses the direction of rotation of the motor and the encoder actual value without changing the setpoint. | | | |
| Value: | 0: Clockwise 1: Counter-clockwise | | | |
| Dependency: | See also: F07434 | | | |
| | NOTICE After changing parameter p1821, the direction of rotation is not automatically adapted in the safety area. The following parameters can be used to set the direction of rotation for safety monitoring: -SI Motion encoder configuration safety functions - position actual value sign change (p9516.1/p9316.1, only active for operation with encoder) | | | |
| p2000 | Reference speed | Changeable: T | Data type: FloatingPoint32 | P group: Communications |
| | | Min: 6.00 [rpm] | Max: 210000.00 [rpm] | Def: 3000.00 [rpm] |
| Description: | Sets the reference quantity for the speed values. All speeds specified as relative values refer to this reference quantity. The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word). | | | |
| Dependency: | See also: p2003 | | | |
| p2003 | Reference torque | Changeable: T | Data type: FloatingPoint32 | P group: Communications |
| | | Min: 0.01 [Nm] | Max: 20000000.00 [Nm] | Def: 1.00 [Nm] |
| Description: | Sets the reference quantity for the torque values. All torques specified as relative value are referred to this reference quantity. The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word). | | | |
| r2050[0...19] | PZD receive word | Data type: Integer16 | P group: Communications | Scaling: 4000H |
| Description: | Interconnection of the receiving process data in the word format. | | | |

12.2 List of parameters

| | |
|--------------------|-----------------|
| Index: | [0] = PZD 1 |
| | [1] = PZD 2 |
| | [2] = PZD 3 |
| | [3] = PZD 4 |
| | [4] = PZD 5 |
| | [5] = PZD 6 |
| | [6] = PZD 7 |
| | [7] = PZD 8 |
| | [8] = PZD 9 |
| | [9] = PZD 10 |
| | [10] = PZD 11 |
| | [11] = PZD 12 |
| | [12] = PZD 13 |
| | [13] = PZD 14 |
| | [14] = PZD 15 |
| | [15] = PZD 16 |
| | [16] = PZD 17 |
| | [17] = PZD 18 |
| | [18] = PZD 19 |
| | [19] = PZD 20 |
| Dependency: | See also: r2060 |

| | |
|----------------------|--|
| r2053[0...27] | Diagnostics PZD send word |
| | Data type: Unsigned16 P group: Communications |
| Description: | Displays the send process data (actual values) in the word format. |

| | |
|---------------|---------------|
| Index: | [0] = PZD 1 |
| | [1] = PZD 2 |
| | [2] = PZD 3 |
| | [3] = PZD 4 |
| | [4] = PZD 5 |
| | [5] = PZD 6 |
| | [6] = PZD 7 |
| | [7] = PZD 8 |
| | [8] = PZD 9 |
| | [9] = PZD 10 |
| | [10] = PZD 11 |
| | [11] = PZD 12 |
| | [12] = PZD 13 |
| | [13] = PZD 14 |
| | [14] = PZD 15 |
| | [15] = PZD 16 |
| | [16] = PZD 17 |
| | [17] = PZD 18 |
| | [18] = PZD 19 |
| | [19] = PZD 20 |
| | [20] = PZD 21 |
| | [21] = PZD 22 |
| | [22] = PZD 23 |
| | [23] = PZD 24 |
| | [24] = PZD 25 |
| | [25] = PZD 26 |
| | [26] = PZD 27 |
| | [27] = PZD 28 |

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|-------------------|------------|--------------------|-----------------|-----------------|-----------|
| | 00 | Bit 0 | ON | OFF | - |
| | 01 | Bit 1 | ON | OFF | - |
| | 02 | Bit 2 | ON | OFF | - |
| | 03 | Bit 3 | ON | OFF | - |
| | 04 | Bit 4 | ON | OFF | - |
| | 05 | Bit 5 | ON | OFF | - |
| | 06 | Bit 6 | ON | OFF | - |
| | 07 | Bit 7 | ON | OFF | - |
| | 08 | Bit 8 | ON | OFF | - |
| | 09 | Bit 9 | ON | OFF | - |
| | 10 | Bit 10 | ON | OFF | - |
| | 11 | Bit 11 | ON | OFF | - |
| | 12 | Bit 12 | ON | OFF | - |
| | 13 | Bit 13 | ON | OFF | - |
| | 14 | Bit 14 | ON | OFF | - |
| | 15 | Bit 15 | ON | OFF | - |

r2060[0...18] PZD receive double word**Data type:** Integer32**P group:** Communications**Scaling:** 4000H**Description:** Interconnection of the receiving process data (setpoints) in the double word format.

12.2 List of parameters

Index:

- [0] = PZD 1 + 2
- [1] = PZD 2 + 3
- [2] = PZD 3 + 4
- [3] = PZD 4 + 5
- [4] = PZD 5 + 6
- [5] = PZD 6 + 7
- [6] = PZD 7 + 8
- [7] = PZD 8 + 9
- [8] = PZD 9 + 10
- [9] = PZD 10 + 11
- [10] = PZD 11 + 12
- [11] = PZD 12 + 13
- [12] = PZD 13 + 14
- [13] = PZD 14 + 15
- [14] = PZD 15 + 16
- [15] = PZD 16 + 17
- [16] = PZD 17 + 18
- [17] = PZD 18 + 19
- [18] = PZD 19 + 20

Dependency: See also: r2050

r2063[0...26]

Diagnostics PZD send double word

Data type: Unsigned32 **P group:** Communications

Description: Displays the send process data (actual values) in the double word format.

Index:

- [0] = PZD 1 + 2
- [1] = PZD 2 + 3
- [2] = PZD 3 + 4
- [3] = PZD 4 + 5
- [4] = PZD 5 + 6
- [5] = PZD 6 + 7
- [6] = PZD 7 + 8
- [7] = PZD 8 + 9
- [8] = PZD 9 + 10
- [9] = PZD 10 + 11
- [10] = PZD 11 + 12
- [11] = PZD 12 + 13
- [12] = PZD 13 + 14
- [13] = PZD 14 + 15
- [14] = PZD 15 + 16
- [15] = PZD 16 + 17
- [16] = PZD 17 + 18
- [17] = PZD 18 + 19
- [18] = PZD 19 + 20
- [19] = PZD 20 + 21
- [20] = PZD 21 + 22
- [21] = PZD 22 + 23
- [22] = PZD 23 + 24
- [23] = PZD 24 + 25
- [24] = PZD 25 + 26
- [25] = PZD 26 + 27
- [26] = PZD 27 + 28

| | | | | | |
|-------------------|------------|--------------------|-----------------|-----------------|-----------|
| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|-------------------|------------|--------------------|-----------------|-----------------|-----------|

| | | | | |
|----|--------|----|-----|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |
| 16 | Bit 16 | ON | OFF | - |
| 17 | Bit 17 | ON | OFF | - |
| 18 | Bit 18 | ON | OFF | - |
| 19 | Bit 19 | ON | OFF | - |
| 20 | Bit 20 | ON | OFF | - |
| 21 | Bit 21 | ON | OFF | - |
| 22 | Bit 22 | ON | OFF | - |
| 23 | Bit 23 | ON | OFF | - |
| 24 | Bit 24 | ON | OFF | - |
| 25 | Bit 25 | ON | OFF | - |
| 26 | Bit 26 | ON | OFF | - |
| 27 | Bit 27 | ON | OFF | - |
| 28 | Bit 28 | ON | OFF | - |
| 29 | Bit 29 | ON | OFF | - |
| 30 | Bit 30 | ON | OFF | - |
| 31 | Bit 31 | ON | OFF | - |

r2109[0...63]**Fault removed in milliseconds****Data type:** Unsigned32**P group:** Messages**Description:**

Displays the time in milliseconds referred to the day that the fault was resolved.

Dependency:

See also: r0945, r0947, r0948, r0949, r2130, r2133, r2136

NOTICE

The time comprises r2136 (days) and r2109 (milliseconds).

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
The structure of the fault buffer and the assignment of the indices is shown in r0945.

p2111**Alarm counter****Changeable:** T, U**Data type:** Unsigned16**P group:** Messages**Min:** 0**Max:** 65535**Def:** 0**Description:**

Number of alarms that have occurred after the last reset.

Parameters

12.2 List of parameters

Dependency: When setting p2111 = 0, all of the alarms that have been removed from the alarm buffer [0...7] are transferred into the alarm history [8...63] - and alarm buffer [0...7] is deleted.
See also: r2122, r2123, r2124, r2125

Note

The parameter is reset to 0 at POWER ON.

r2121 Counter alarm buffer changes

Data type: Unsigned16 **P group:** Messages

Description: This counter is incremented every time the alarm buffer changes.

Dependency: See also: r2122, r2123, r2124, r2125

r2122[0...63] Alarm number

Data type: Unsigned16 **P group:** Messages

Description: Displays the number of the last 64 alarms.

Dependency: See also: r2123, r2124, r2125, r2134, r2145, r2146

NOTICE

The properties of the alarm buffer should be taken from the corresponding product documentation.

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

Alarm buffer structure (general principle):

r2122[0], r2124[0], r2123[0], r2125[0] --> alarm 1 (the oldest)

...

r2122[7], r2124[7], r2123[7], r2125[7] --> Alarm 8 (the latest)

When the alarm buffer is full, the alarms that have gone are entered into the alarm history:

r2122[8], r2124[8], r2123[8], r2125[8] --> Alarm 1 (the latest)

...

r2122[63], r2124[63], r2123[63], r2125[63] --> alarm 56 (the oldest)

r2123[0...63] Alarm received in milliseconds

Data type: Unsigned32 **P group:** Messages

Description: Displays the time in milliseconds referred to the day that the alarm occurred.

Dependency: See also: r2122, r2124, r2125, r2134, r2145, r2146

NOTICE

The time comprises r2145 (days) and r2123 (milliseconds).

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

r2124[0...63] Alarm value

Data type: Integer32 **P group:** Messages

Description: Displays additional information about the active alarm (as integer number).

Dependency: See also: r2122, r2123, r2125, r2134, r2145, r2146

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices are shown in r2122.

r2125[0...63] Alarm removed in milliseconds

Data type: Unsigned32 **P group:** Messages

Description: Displays the time in milliseconds referred to the day that the alarm was resolved.
Dependency: See also: r2122, r2123, r2124, r2134, r2145, r2146

| |
|---|
| NOTICE |
| The time comprises r2146 (days) and r2125 (milliseconds). |

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
The structure of the alarm buffer and the assignment of the indices is shown in r2122.

r2130[0...63]**Fault received in days**

Data type: Unsigned16 **P group:** Messages

Description: Displays the time in days referred to the day that the fault occurred.
Dependency: See also: r0945, r0947, r0948, r0949, r2109, r2133, r2136

| |
|---|
| NOTICE |
| The time comprises r2130 (days) and r0948 (milliseconds). |

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

r2131**Actual fault number**

Data type: Unsigned16 **P group:** Messages

Description: Displays the number of the active fault that occurred last.

Note

0: No fault present.

r2132**Actual alarm value**

Data type: Unsigned16 **P group:** Messages

Description: Displays the alarm that last occurred.

Note

0: No alarm present.

r2133[0...63]**Fault value for float values**

Data type: FloatingPoint32 **P group:** Messages

Description: Displays the additional information about the fault that occurred for float values.
Refer to the fault for the interpretation of the fault value.

Dependency: See also: r0945, r0947, r0948, r0949, r2109, r2130, r2136

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

r2134[0...63]**Alarm value for float values**

Data type: FloatingPoint32 **P group:** Messages

Description: Displays the additional information about the alarm that occurred for float values.
Refer to the alarm for an interpretation of the alarm value.

Dependency: See also: r2122, r2123, r2124, r2125, r2145, r2146

Note

The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

12.2 List of parameters

| | |
|----------------------|---|
| r2136[0...63] | Fault removed in days Data type: Unsigned16 P group: Messages |
| Description: | Displays the time in days referred to the day when the fault was rectified. |
| Dependency: | See also: r0945, r0947, r0948, r0949, r2109, r2130, r2133 |
| | NOTICE The time comprises r2136 (days) and r2109 (milliseconds). |
| | Note The buffer parameters are cyclically updated in the background (refer to status signal in r2139). |
| r2145[0...63] | Alarm received in days Data type: Unsigned16 P group: Messages |
| Description: | Displays the time in days referred to the day that the alarm occurred. |
| Dependency: | See also: r2122, r2123, r2124, r2125, r2134, r2146 |
| | NOTICE The time comprises r2145 (days) and r2123 (milliseconds). |
| | Note The buffer parameters are cyclically updated in the background (refer to status signal in r2139). |
| r2146[0...63] | Alarm removed in days Data type: Unsigned16 P group: Messages |
| Description: | Displays the time in days referred to the day when the alarm was cleared. |
| Dependency: | See also: r2122, r2123, r2124, r2125, r2134, r2145 |
| | NOTICE The time comprises r2146 (days) and r2125 (milliseconds). |
| | Note The buffer parameters are cyclically updated in the background (refer to status signal in r2139). |
| p2175[0] | Motor blocked speed threshold Changeable: T, U Data type: FloatingPoint32 P group: Messages Min: 0.00 [rpm] Max: 210000.00 [rpm] Def: 120.00 [rpm] |
| Description: | Sets the speed threshold for the message "Motor locked". Monitoring is deactivated with p2175 = 0. |
| Dependency: | See also: F07900 |
| | Note If the motor speed is less than the threshold value set in p2175 - and the motor is operated for longer than 200 ms at the torque limit - then the motor is shut down and a fault is output. |
| p3103 | UTC synchronization process Changeable: T, U Data type: Integer16 P group: - Min: 4 Max: 99 Def: 4 |
| Description: | Setting the synchronization process. |
| Value: | 4: Network Time Protocol 99: No synchronization |
| | Note If value = 4: Synchronization of the time in the drive with the time specified by the higher-level control system. |

| | | | |
|---------------------|--|------------------------------|---------------------------|
| p3106 | NTP time zone | | |
| | Changeable: T, U | Data type: Integer16 | P group: - |
| | Min: 0 | Max: 38 | Def: 14 |
| Description: | Sets the local time zone for NTP (Network Time Protocol). | | |
| Value: | <ul style="list-style-type: none"> 0: UTC-12 (AOE) 1: UTC-11 (NURT) 2: UTC-10 (HAST) 3: UTC-9:30 (MART) 4: UTC-9 (AKST) 5: UTC-8 (PST) 6: UTC-7 (MST) 7: UTC-6 (CST) 8: UTC-5 (EST) 9: UTC-4 (VET) 10: UTC-3:30 (NST) 11: UTC-3 (ART) 12: UTC-2 (GST) 13: UTC-1 (CVT) 14: UTC+0 (GMT) 15: UTC+1 (CET) 16: UTC+2 (EEK) 17: UTC+3 (MISK) 18: UTC+3:30 (IRST) 19: UTC+4 (GST) 20: UTC+4:30 (AFT) 21: UTC+5 (UZT) 22: UTC+5:30 (IST) 23: UTC+5:45 (NPT) 24: UTC+6 (BST) 25: UTC+6:30 (MMT) 26: UTC+7 (WIB) 27: UTC+8 (CST) 28: UTC+8:30 (PYT) 29: UTC+8:45 (ACWST) 30: UTC+9 (JST) 31: UTC+9:30 (ACST) 32: UTC+10 (AEST) 33: UTC+10:30 (ACDT) 34: UTC+11 (AEDT) 35: UTC+12 (ANAT) 36: UTC+13 (NZDT) 37: UTC+13:45 (CHADT) 38: UTC+14 (LINT) | | |
| Dependency: | See also: p3103 | | |
| p5271[0] | One Button Tuning configuration 1 | | |
| | Changeable: T | Data type: Unsigned16 | P group: - |
| | Min: - | Max: - | Def: 0001 1100 bin |

Parameters

12.2 List of parameters

Description: Sets the configuration for One Button Tuning.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|-----------------------------|----------|----------|------|
| | 03 | Speed precontrol | Yes | No | 5045 |
| | 04 | Torque precontrol | Yes | No | 5045 |
| | 07 | Voltage feedforward control | Yes | No | - |

Dependency: See also: r5274

Note

For bit 03:
Activation of speed feedforward control.
For bit 04:
Activation of speed/torque feedforward control in the drive.
For bit 07:
Activation of the voltage precontrol.

r5274 One Button Tuning dynamic response estimated

Data type: FloatingPoint32 **P group:** -

Description: Displays the estimated dynamic response of the speed control loop as PT1 time constant for One Button Tuning. The lower the time constant, the higher the dynamic performance.

Dependency: See also: p5271

r5276[0] One Button Tuning Kv factor estimated

Data type: FloatingPoint32 **P group:** -

Description: Displays the estimated position controller gain (Kv factor) for One Button Tuning.

Dependency: See also: p5271

Note

The value for the closed-loop position control is required by a higher-level control system.

r5277[0] One Button Tuning precontrol symmetrizing time estimated

Data type: FloatingPoint32 **P group:** -

Description: Displays the estimated precontrol symmetrizing time for One Button Tuning. This is required to symmetrize the position controller if the closed-loop position control is in an external control system.

Dependency: See also: p5271

p5291 FFT tuning configuration

Changeable: T, U **Data type:** Unsigned16 **P group:** -
Min: - **Max:** - **Def:** 0000 0000 0011 1001 bin

Description: Sets the configuration for the "FFT tuning" function. This function is used for One Button Tuning (p5300 = 1).

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|--|----------|----------|----|
| | 00 | Noise excitation after pulse enable | Yes | No | - |
| | 01 | Set current setpoint filter (HF) | Yes | No | - |
| | 02 | Set speed controller gain (HF) | Yes | No | - |
| | 03 | Length of FFT window bit 0 (LF, HF) | Yes | No | - |
| | 04 | Length of FFT window bit 1 (LF, HF) | Yes | No | - |
| | 05 | Windowing the time signals using a Hamming window (LF, HF) | Yes | No | - |
| | 06 | Measure current controller | Yes | No | - |
| | 07 | Bandwidth bit 0 (LF) | Yes | No | - |
| | 08 | Bandwidth bit 1 (LF) | Yes | No | - |

| | | | | |
|----|---|-----|----|---|
| 09 | Bandwidth bit 2 (LF) | Yes | No | - |
| 10 | Measuring periods bit 0 | Yes | No | - |
| 11 | Measuring periods bit 1 | Yes | No | - |
| 12 | Inject noise onto speed setpoint | Yes | No | - |
| 13 | Do not reduce Kp for measurement | Yes | No | - |
| 14 | Current setpoint filter that inverts the control loop | Yes | No | - |

Dependency:

See also: r5293, p5296

Note

HF: High Frequency

LF: low frequency

For bit 00:

A PRBS signal (pseudo random binary signal) is superimposed on the current setpoint to be able to better identify the mechanical controlled system.

For bit 01:

The identified mechanical resonance points are suppressed using current setpoint filters.

For bit 02:

The maximum speed controller gain is determined from the identified mechanical controlled system.

For bits 03, 04:

The measured value buffer length is set using these bits:

Bit 04 = 0 and bit 03 = 0 -> buffer length = 256

Bit 04 = 0 and bit 03 = 1 -> buffer length = 512

Bit 04 = 1 and bit 03 = 0 -> buffer length = 1024

Bit 04 = 1 and bit 03 = 1 -> buffer length = 2048

For bit 05:

A Hamming window is used to filter the measured time signals.

For bit 06:

The measurement checks the current controller frequency response and this is taken into account in the speed controller loop. For high amplitudes in p5298, it is possible that the measurement is unsuccessful, as the converter reaches its voltage limit.

For bits 07, 08, 09:

The measurement bandwidth is set using these bits:

Bit 09 = 0, bit 08 = 0, bit 07 = 0 -> bandwidth = 50 Hz

Bit 09 = 0, bit 08 = 0, bit 07 = 1 -> bandwidth = 100 Hz

Bit 09 = 0, bit 08 = 1, bit 07 = 0 -> bandwidth = 200 Hz

Bit 09 = 0, bit 08 = 1, bit 07 = 1 -> bandwidth = 400 Hz

Bit 09 = 1, bit 08 = 0, bit 07 = 0 -> bandwidth = 800 Hz

Bit 09 = 1, bit 08 = 0, bit 07 = 1 -> bandwidth = 1600 Hz

Zu Bit 10, 11:

Number of measuring periods.

Bit 11 = 0 and bit 10 = 0 -> number of measurements = 1

Bit 11 = 0 and bit 10 = 1 -> number of measurements = 2

Bit 11 = 1 and bit 10 = 0 -> number of measurements = 4

Bit 11 = 1 and bit 10 = 1 -> number of measurements = 8

For bit 12:

The PRBS signal is switched to the speed setpoint (in front of the filter).

For bit 13:

The input signal for the torque actual value is taken from in front of the current setpoints filters.

p5292**Controller optimization dynamic factor****Changeable:** T, U**Data type:** FloatingPoint32**P group:** -**Min:** 25.0 [%]**Max:** 125.0 [%]**Def:** 80.0 [%]**Description:**

Sets the dynamic factor for optimizing the speed controller when One Button Tuning is activated (p5300 = 1).

Dependency:

The higher the value in p5292, the lower the value in r5274.

See also: p5291

12.2 List of parameters

| | | | | |
|---------------------|---|-------------------------------------|---|-----------------|
| | Note | | | |
| | The higher the dynamic factor, the faster and more unstable the control. | | | |
| r5293 | FFT tuning speed controller P gain identified | | | |
| | Data type: FloatingPoint32 | P group: Closed-loop control | | |
| Description: | Displays the determined proportional gain Kp of the speed controller before FFT tuning. This function is used for One Button Tuning (p5300 = 1). | | | |
| Dependency: | See also: p5291 | | | |
| p5296[0...2] | Controller optimization noise amplitude | | | |
| | Changeable: T, U | Data type: FloatingPoint32 | P group: - | |
| | Min: 1.0 [%] | Max: 300.0 [%] | Def: [0] 10.0 [%] [1] 30.0 [%] [2] 5.0 [%] | |
| Description: | The drive determines the noise amplitude for One Button Tuning and writes the value to p5296. | | | |
| Dependency: | See also: p5291 | | | |
| p5300[0] | One Button Tuning selection | | | |
| | Changeable: T | Data type: Integer16 | P group: - | |
| | Min: -1 | Max: 1 | Def: 0 | |
| Description: | Setting to activate/de-activate the One Button Tuning function. If p5300 = 1: The One Button Tuning function is configured using p5271 and p5301. | | | |
| Value: | -1: Reset controller parameters 0: Inactive 1: One Button Tuning | | | |
| Dependency: | The motor must have already been commissioned so that One Button Tuning functions perfectly. The One Button Tuning function is configured using p5271 and p5301. The required dynamic performance of the control loop is set in p5292. The traversing path for the test signal is parameterized in p5308. Additional relevant parameters p5309, p5296, p5297, r5274 See also: p5271, r5274, p5292, r5293, p5296, p5301, p5308, p5309 | | | |
| | Note | | | |
| | If p5300 = -1: One Button Tuning is deactivated and p5300 is automatically set = 0. Further, the presetting values for the speed controller are restored. If p5300 = 0: To permanently save the values for the speed controller that have been determined, the parameters must be saved in a non-volatile memory. If p5300 = 1: One Button Tuning is active. The moment of inertia is determined once using a test signal. The controller parameters and current setpoint filters are additionally determined once using a noise signal as excitation source. The steps to be executed can be configured using p5301. | | | |
| p5301[0] | One Button Tuning configuration 2 | | | |
| | Changeable: T, U | Data type: Unsigned32 | P group: - | |
| | Min: - | Max: - | Def: 0000 0000 0000 0111 bin | |
| Description: | Setting the functions for One Button Tuning (p5300 = 1). A test signal is required for some functions. Here, parameters p5307 to p5309 must be taken into consideration. | | | |
| Bit field: | Bit | Signal name | 1 signal | 0 signal |
| | | | | FP |

| | | | | |
|----|---|-----|----|---|
| 00 | Setting the proportional gain Kp | Yes | No | - |
| 01 | Setting current setpoint filter | Yes | No | - |
| 02 | Activating the moment of inertia estimator | Yes | No | - |
| 07 | Activating synchronized axes | Yes | No | - |
| 08 | Moment of inertia determination from frequency response | Yes | No | - |

Dependency: It is only possible to change the configuration if One Button Tuning is not active (p5300 = 0).
See also: p5292, r5293, p5296, p5300, p5308, p5309

Note

For bit 00:

The speed controller gain is determined and set using a noise signal.

For bit 01:

Possibly required current setpoint filters are determined and set using a noise signal.

As a consequence, a higher dynamic performance can be achieved in the speed control loop.

For bit 02:

Using this bit, the moment of inertia is determined using a test signal. If this bit is not set, then the load moment of inertia must be manually set using parameter p1498. The test signal must have been previously set using parameters p5308 and p5309.

For bit 07:

With this function, these axes are adapted to the dynamic response set in p5275. This is necessary for interpolating axes. The time in p5275 should be set according to the axis with the lowest dynamic response.

p5306[0] One Button Tuning status

Data type: Unsigned16 **P group:** -

Description: Displays the status of the functions performed using One Button Tuning.

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|--|----------|----------|----|
| 00 | Proportional gain Kp set | Yes | No | - |
| 01 | Current setpoint filter set | Yes | No | - |
| 02 | Moment of inertia estimation carried out | Yes | No | - |
| 13 | One Button Tuning successfully completed | Yes | No | - |
| 14 | Controller parameters reset due to fault | Yes | No | - |

Dependency: See also: p5300, p5301

Note

For bit 00 = 1: The speed controller gain was set using One Button Tuning.

For bit 01 = 1: The current setpoint filter was set using One Button Tuning

For bit 02 = 1: The moment of inertia was determined.

p5308[0] One Button Tuning distance limiting

Changeable: T **Data type:** Integer32 **P group:** -
Min: -30000 [°] **Max:** 30000 [°] **Def:** 0 [°]

Description: Setting the distance limiting (permissible traversing range des motor).
The traversing range is limited in the positive and negative directions.

Note

A value of 360 degrees corresponds to one motor revolution.

The position before the pulse enable is used as zero point.

p5309[0] One Button Tuning duration

Changeable: T **Data type:** Unsigned32 **P group:** -
Min: 0 [ms] **Max:** 5000 [ms] **Def:** 2000 [ms]

Description: Sets the duration for One Button Tuning (several acceleration operations)
This function is used for One Button Tuning p5300=1 to identify the total moment of inertia of the drive train.

12.2 List of parameters

Dependency: See also: F07093

Note

If, within this time, no setting values can be determined, then the drive is shut down with the corresponding fault.

r5600 Pe energy-saving mode ID

Data type: Integer16 **P group:** Communications

Description: Displays the PROFenergy mode ID of the effective energy-saving mode.

Value:
 0: POWER OFF
 2: Energy-saving mode
 240: Operation
 255: Ready

Note

Pe: PROFenergy profiles

p5611 Pe energy-saving properties general

Changeable: T **Data type:** Unsigned32 **P group:** Communications

Min: - **Max:** - **Def:** 0000 bin

Description: Sets the general properties for energy-saving.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|-------------------------------------|----------|----------|----|
| | 00 | Inhibit PROFenergy control commands | Yes | No | - |

Note

Pe: PROFenergy profiles

r8936[0...1] PN cyclic connection state

Data type: Integer16 **P group:** -

Description: Displays the state of the cyclic PROFINET connections.

Value:
 0: Interrupted
 1: Not connected
 2: Connection starts to be established
 3: Module information expected
 4: Module information received
 5: Module address expected
 6: Module address received
 7: Parameterization data expected
 8: Parameterization data received
 9: Evaluate parameterization data
 10: Connection being established completion expected
 11: Configured controller RUN expected
 12: Configured controller STOP
 13: Configured controller RUN

Index:
 [0] = Controller 1
 [1] = Controller 2

Note

For two connections (Shared Device or system redundancy) the display in the index depends on the sequence in which the connections are established.

The IP addresses of controllers 1 and 2 are displayed in r8961 and r8962.

The following states are displayed for system redundancy:

Primary controller: r8936[x] = 13

Backup controller: r8936[x] = 11

If value = 10:

If the connection remains in this state, then when using PROFINET IRT the following can apply:

- topology error (incorrect port assignment).

- synchronization missing.

r8937[0...5]**PN diagnostics**

Data type: Unsigned32 **P group:** -

Description: Display to diagnose the cyclic PROFINET connections.

Index:
 [0] = Number of cyclic connections
 [1] = Number of send subslots of all connections
 [2] = Number of send net data (bytes) of all connections
 [3] = Number of receive subslots of all connections
 [4] = Number of receive net data (bytes) of all connections
 [5] = Connection type (RT, IRT)

Note

For index [5]:

Bit 0 = 1: there is at least one RT connection.

Bit 1 = 1: there is an IRT connection.

p8984[0...1]**BI: Web server interface enable**

Changeable: T **Data type:** Unsigned32 / Binary **P group:** -
Min: - **Max:** - **Def:** [0] 1 [1] 0

Description: Setting to enable the interface for access via the web server.

Index:
 [0] = Reserved
 [1] = PROFINET X150

Dependency: See also: p8986

Note

BI:p8984[1] = 1 signal:

PROFINET interface X150 is enabled for access to the web server.

BI:p8984[1] = 0 signal:

PROFINET interface X150 is enabled for access to the web server.

p8986**Web server configuration**

Changeable: T **Data type:** Unsigned16 **P group:** -
Min: - **Max:** - **Def:** 1101 bin

Description: Setting to activate and configure the "Web server" function in the drive.

It is possible to access the web server via the integrated Ethernet and PROFINET interfaces of the drive. The addressing is realized via the set IP address.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|------------------------------|----------|----------|----|
| | 00 | Activating | Yes | No | - |
| | 01 | Only permit access via https | Yes | No | - |
| | 02 | Enable "SINAMICS" user | Yes | No | - |
| | 03 | Enable "Administrator" user | Yes | No | - |

12.2 List of parameters

| | | | | |
|---------------------|---|-------------------------|-----------------------------|-----------------------------------|
| p9370 | SI Motion acceptance test mode | Changeable: T, U | Data type: Integer16 | P group: Safety Integrated |
| | | Min: 0000 hex | Max: 00AC hex | Def: 0000 hex |
| Description: | Setting to select and de-select the acceptance test mode. | | | |
| Value: | 0: [00 hex] De-select the acceptance test mode | | | |
| | 172: [AC hex] Select the acceptance test mode | | | |
| Dependency: | See also: C01799 | | | |
| | Note | | | |
| | The acceptance test mode can only be selected if the motion monitoring functions integrated in the drive are enabled (p9601.2). | | | |

| | | | |
|---------------------|---|-----------------------------|-----------------------------------|
| r9371 | SI Motion acceptance test status (Motor Module) | Data type: Integer16 | P group: Safety Integrated |
| Description: | Displays the status of the acceptance test mode. | | |
| Value: | 0: [00 hex] Acc_mode inactive | | |
| | 12: [0C hex] Acc_mode not possible due to POWER ON fault | | |
| | 13: [0D hex] Acc_mode not possible due to incorrect ID in p9370 | | |
| | 15: [0F hex] Acc_mode not possible due to expired Acc_timer | | |
| | 172: [AC hex] Acc_mode active | | |
| Dependency: | See also: p9370 | | |
| | See also: C01799 | | |

| | | | | | |
|---------------------|---|---|------------------------------|---|-----------|
| p9501 | SI Motion enable safety functions | Changeable: C2(95) | Data type: Unsigned32 | P group: Safety Integrated | |
| | | Min: - | Max: - | Def: 0000 0000 0000 0000 0000 0000 0000 0000 bin | |
| Description: | Sets the enable signals for the safe motion monitoring. | | | | |
| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
| | 00 | Enable SOS/SLS | Enable | Inhibit | - |
| | 16 | Enable SSM hysteresis and filtering | Enable | Inhibit | 2823 |
| | 17 | Enable SDI | Enable | Inhibit | 2824 |
| | 18 | Enable SS2E | Enable | Inhibit | - |
| | 24 | Enable transfer SLS limit value via PROFIsafe | Enable | Inhibit | - |
| Dependency: | See also: F01682, F01683 | | | | |
| | Note | | | | |
| | A change only becomes effective after a POWER ON. | | | | |
| | SDI: Safe Direction (safe motion direction) | | | | |
| | SLS: Safely Limited Speed | | | | |
| | SOS: Safe Operating Stop | | | | |
| | SS2E: Safe Stop 2 external (Safe Stop 2 with external stop) | | | | |
| | SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring) | | | | |

| | | | | |
|---------------------|--|---------------------------|-----------------------------|-----------------------------------|
| p9502 | SI Motion axis type | Changeable: C2(95) | Data type: Integer16 | P group: Safety Integrated |
| | | Min: 0 | Max: 1 | Def: 0 |
| Description: | Sets the axis type (linear axis or rotary axis/spindle). | | | |
| Value: | 0: Linear axis | | | |
| | 1: Rotary axis/spindle | | | |

Note

For the commissioning tool, after changing over the axis type, the units dependent on the axis type are only updated after a project upload.

A change only becomes effective after a POWER ON.

p9505**SI Motion SP modulo value is****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0 [°]**Max:** 737280 [°]**Def:** 0 [°]**Description:**

Sets the modulo value in degrees for rotary axes of the "Safe position" function.

This modulo value is taken into account when safely referencing as well as when transferring the safe position via PROFIsafe when the absolute position is enabled.

The value should be set, so that it is precisely at 2^n revolutions, so that when the range that can be represented (+/-2048) overflows, this does not cause the position actual value to jump.

The modulo function is deactivated for a value = 0.

Dependency:

See also: p9501

See also: F01681

NOTICE

When the "SLP" function is activated, the modulo function must be deactivated as otherwise fault F01681 will be output.

If the absolute position is not enabled, then the parameterized modulo value is not taken into account.

Note

SLP: Safely Limited Position

SP: Safe Position

p9506**SI Motion function specification****Changeable:** C2(95)**Data type:** Integer16**P group:** Safety Integrated**Min:** 0**Max:** 2**Def:** 0**Description:**

Sets the function specification for the safe motion monitoring.

Value:

0: Safety with encoder and accel_monitoring (SAM) / delay time

2: Safety with encoder with brake ramp (SBR)

Dependency:

See also: C01711

Note

A change only becomes effective after a POWER ON.

p9507**SI Motion function configuration****Changeable:** C2(95)**Data type:** Unsigned32**P group:** Safety Integrated**Min:** -**Max:** -**Def:** 0100 0001 bin**Description:**

Sets the function configuration for the safe motion monitoring functions.

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|------------------------------------|--------------------|---------------|----|
| 00 | Extended message acknowledgment | Yes | No | - |
| 01 | Setpoint velocity limit for STOP F | No | Yes | - |
| 03 | SS1 with OFF3 (brake response) | SS1E external stop | SS1 with OFF3 | - |

Dependency:

See also: C01711

12.2 List of parameters

Note

SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)

SS1E: Safe Stop 1 external (Safe Stop 1 with external stop)

For bit 00:

When the function is activated, a safety-relevant acknowledgment (internal event acknowledge) can be performed by selecting/deselecting STO.

For bit 01:

When the function is activated, the active setpoint velocity limit (CO: r9733) is set to zero when STOP F is active.

For bit 03:

When the bit is activated – when selecting function SS1 or activating a STOP B – an SS1E or a STOP B with Stop, which should be externally initiated, is triggered instead of SS1 with a drive-based braking response. As a consequence, brake monitoring (SBR, SAM) is deactivated.

p9513

SI Motion non safety-relevant measuring steps POS1

Changeable: C2(95)

Data type: Unsigned32

P group: Safety Integrated

Min: 0

Max: 4294967295

Def: 22000

Description:

Sets the non safety-relevant measuring steps of position value POS1.

The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Dependency:

See also: F01670

Note

For safe functions that are not enabled (p9501 = 0), the following applies:

- p9513 is automatically set when the system powers up.

For safety functions that are enabled (p9501 > 0), the following applies:

- p9513 is checked to see that it matches the encoder.

p9515

SI Motion encoder coarse position value configuration

Changeable: C2(95)

Data type: Unsigned32

P group: Safety Integrated

Min: -

Max: -

Def: 0000 0000 0000 0000 0000 0000
0000 0000 bin

Description:

Sets the encoder configuration for the redundant coarse position value.

The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|--|----------|----------|----|
| 00 | Incrementer | Yes | No | - |
| 01 | Encoder CRC least significant byte first | Yes | No | - |
| 02 | Redundant coarse position val. most significant bit left-aligned | Yes | No | - |
| 04 | Binary comparison not possible | Yes | No | - |
| 05 | Single-channel encoder | Yes | No | - |
| 16 | DRIVE-CLiQ encoder | Yes | No | - |

Note

- after starting the copy function (p9700 = 57 hex), p9515.0...5 are set according to the encoder.

For safe functions that are not enabled (p9501 = 0), the following applies:

- p9515.16 is automatically set when the system powers up.

For safety functions that are enabled (p9501 > 0), the following applies:

- p9515.16 is checked to see that it matches the encoder.

p9516

SI Motion encoder configuration safety functions

Changeable: C2(95)

Data type: Unsigned16

P group: Safety Integrated

Min: -

Max: -

Def: 0000 0000 bin

Description:

Sets the configuration for the motor encoder and position actual value.

The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|-------------|----------|----------|----|
|-----|-------------|----------|----------|----|

| | | | | |
|----|--|-----|----|---|
| 01 | Position actual value sign change | Yes | No | - |
| 04 | No STOP A after encoder fault for 1 encoder safety | Yes | No | - |

Dependency: See also: F01671

p9518 SI Motion encoder pulses per revolution

Changeable: C2(95) **Data type:** Unsigned32 **P group:** Safety Integrated
Min: 0 **Max:** 16777215 **Def:** 2048

Description: Sets the number of encoder pulses per revolution.
The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Dependency: See also: F01671

Note

For safe functions that are not enabled (p9501 = 0), the following applies:
- p9518 is automatically set when the system powers up.
For safety functions that are enabled (p9501 > 0), the following applies:
- p9518 is checked to see that it matches the encoder.

p9519 SI Motion fine resolution G1_XIST1

Changeable: C2(95) **Data type:** Unsigned32 **P group:** Safety Integrated
Min: 2 **Max:** 18 **Def:** 11

Description: Sets the fine resolution for G1_XIST1 in bits.
The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Dependency: See also: F01671

Note

G1_XIST1: encoder 1 position actual value 1 (PROFIdrive)
For safe functions that are not enabled (p9501 = 0), the following applies:
- p9519 is automatically set when the system powers up.
For safety functions that are enabled (p9501 > 0), the following applies:
- p9519 is checked to see that it matches the encoder.

p9520 SI Motion spindle pitch

Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.1000 [mm] **Max:** 8388.0000 [mm] **Def:** 10.0000 [mm]

Description: Sets the gear ratio between the encoder and load in mm/revolution for a linear axis with rotary encoder.

NOTICE

The fourth decimal point can be rounded-off depending on the size of the entered number (from 3 places before the decimal point).

p9521[0...7] SI Motion gearbox encoder (motor)/load denominator

Changeable: C2(95) **Data type:** Unsigned32 **P group:** Safety Integrated
Min: 1 **Max:** 2147000000 **Def:** 1

Description: Sets the denominator for the gearbox between the encoder and load.

Index: [0] = Gearbox 1
[1...7] = Reserved

Dependency: See also: p9522

p9522[0...7] SI Motion gearbox encoder (motor)/load numerator

Changeable: C2(95) **Data type:** Unsigned32 **P group:** Safety Integrated
Min: 1 **Max:** 2147000000 **Def:** 1

Description: Sets the numerator for the gearbox between the encoder and load.

Parameters

12.2 List of parameters

Index: [0] = Gearbox 1
[1...7] = Reserved

Dependency: See also: p9521

p9523 **SI Motion redundant coarse position value valid bits**

Changeable: C2(95) **Data type:** Unsigned16 **P group:** Safety Integrated
Min: 0 **Max:** 16 **Def:** 9

Description: Sets the number of valid bits of the redundant coarse position value.
The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Note
After starting the SI Motion copy function, this parameter is set after the encoder.

p9524 **SI Motion Redundant coarse position value fine resolution bits**

Changeable: C2(95) **Data type:** Integer16 **P group:** Safety Integrated
Min: -16 **Max:** 16 **Def:** -2

Description: Sets the number of valid bits for the fine resolution of the redundant coarse position value.
The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Note
After starting the SI Motion copy function, this parameter is set after the encoder.

p9525 **SI Motion Redundant coarse position value relevant bits**

Changeable: C2(95) **Data type:** Unsigned16 **P group:** Safety Integrated
Min: 0 **Max:** 16 **Def:** 16

Description: Sets the number of relevant bits for the redundant coarse position value.
The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Note
For safe functions that are not enabled (p9501 = 0), the following applies:
- p9525 is automatically set when the system powers up.
For safety functions that are enabled (p9501 > 0), the following applies:
- p9525 is checked to see that it matches the encoder.

p9529 **SI Motion Gx_XIST1 coarse position safe most significant bit**

Changeable: C2(95) **Data type:** Unsigned16 **P group:** Safety Integrated
Min: 0 **Max:** 31 **Def:** 14

Description: Sets the bit number for the safe most significant bit (MSB) of the Gx_XIST1 coarse position.
The encoder that is used for the safe motion monitoring function must be parameterized in this parameter.

Note
MSB: Most Significant Bit
For safe functions that are not enabled (p9501 = 0), the following applies:
- p9529 is automatically set when the system powers up.
For safety functions that are enabled (p9501 > 0), the following applies:
- p9529 is checked to see that it matches the encoder.

p9530 **SI Motion standstill tolerance**

Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.000 [mm] **Max:** 100.000 [mm] **Def:** 1.000 [mm]

Description: Sets the tolerance for the "SOS" function.

Dependency: See also: C01707

Note

SOS: Safe Operating Stop

| | | | |
|---------------------|--|-----------------------------------|-----------------------------------|
| p9531[0...3] | SI Motion SLS limit values | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 0.00 [mm/min] | Max: 1000000.00 [mm/min] | Def: 2000.00 [mm/min] |
| Description: | Sets the limit values for the function "SLS" function. | | |
| Index: | [0] = Limit value SLS1 [1] = Limit value SLS2 [2] = Limit value SLS3 [3] = Limit value SLS4 | | |
| Dependency: | See also: p9563 See also: C01714 | | |

Note

SLS: Safely Limited Speed

| | | | |
|---------------------|--|-----------------------------------|-----------------------------------|
| p9533 | SI Motion SLS setpoint speed limiting | | |
| | Changeable: T, U | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 0.000 [%] | Max: 100.000 [%] | Def: 80.000 [%] |
| Description: | This is an evaluation factor to define the setpoint limit from the selected actual speed limit. The active SLS limit value is evaluated with this factor and is made available as setpoint limit in r9733. | | |
| Dependency: | This parameter only has to be parameterized for the motion monitoring functions integrated in the drive (p9601.2 = 1) r9733[0] = p9531[x] x p9533 (converted from the load side to the motor side) r9733[1] = - p9531[x] x p9533 (converted from the load side to the motor side) [x] = Selected SLS stage Conversion factor from the motor side to the load side: - motor type = rotary and axis type = linear: p9522 / (p9521 x p9520) - otherwise: p9522 / p9521 See also: p9501, p9531, p9601 | | |

Note

The active actual speed limit is selected via safety-relevant inputs.
When selecting SOS or a STOP A ... D, setpoint 0 is specified in r9733.
SLS: Safely Limited Speed

| | | | |
|---------------------|---|-----------------------------|-----------------------------------|
| p9539[0...7] | SI Motion gearbox direction of rotation reversal | | |
| | Changeable: C2(95) | Data type: Integer16 | P group: Safety Integrated |
| | Min: 0 | Max: 1 | Def: 0 |
| Description: | Sets the direction of rotation reversal for the gearbox. 0: No direction of rotation reversal 1: Direction of rotation reversal | | |
| Index: | [0] = Gearbox 1 [1...7] = Reserved | | |
| Dependency: | See also: p9521 | | |

| | | | |
|---------------------|---|-----------------------------------|-----------------------------------|
| p9542 | SI Motion actual value comparison tolerance (cross-check) | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 0.0010 [mm] | Max: 360.0000 [mm] | Def: 0.1000 [mm] |
| Description: | Sets the tolerance for the data cross-check of the actual position between the two monitoring channels. | | |
| Dependency: | See also: C01711 | | |

12.2 List of parameters

Note

For a "linear axis with rotating motor" and factory setting of p9520, p9521 and p9522, the factory setting of p9542 corresponds to a position tolerance of 36 ° on the motor side.

| | | | | |
|--------------|----------------------------------|---------------------------|-----------------------------------|-----------------------------------|
| p9545 | SI Motion SSM filter time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [ms] | Max: 500.00 [ms] | Def: 0.00 [ms] |

Description: Sets the filter time for the SSM feedback signal to detect standstill.

Note

The filter time is effective only if the function is enabled (p9501.16 = 1).
 The parameter is included in the data cross-check of the two monitoring channels.
 The set time is rounded internally to an integer multiple of the monitoring clock cycle.
 SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring)

| | | | | |
|--------------|-------------------------------------|---------------------------|-----------------------------------|-----------------------------------|
| p9546 | SI Motion SSM velocity limit | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [mm/min] | Max: 1000000.00 [mm/min] | Def: 20.00 [mm/min] |

Description: Sets the velocity limit for the SSM feedback signal to detect standstill.
 When this limit value is undershot, the signal "SSM feedback signal active" is set.
 For p9568 = 0, the value in p9546 is also applicable for SAM/SBR.

Note

SAM: Safe Acceleration Monitor (safe acceleration monitoring)
 SBR: Safe Brake Ramp (safe brake ramp monitoring)
 SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring)

| | | | | |
|--------------|--|-----------------------------|-----------------------------------|-----------------------------------|
| p9547 | SI Motion SSM velocity hysteresis | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.0010 [mm/min] | Max: 500.0000 [mm/min] | Def: 10.0000 [mm/min] |

Description: Sets the velocity hysteresis for the SSM feedback signal to detect standstill.

Dependency: See also: C01711

Note

The velocity hysteresis is effective only if the function is enabled (p9501.16 = 1).
 The parameter is included in the data cross-check of the two monitoring channels.
 SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring)

| | | | | |
|--------------|---|---------------------------|-----------------------------------|-----------------------------------|
| p9548 | SI Motion SAM actual speed tolerance | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [mm/min] | Max: 120000.00 [mm/min] | Def: 300.00 [mm/min] |

Description: Sets the velocity tolerance for the "SAM" function.

Dependency: See also: C01706

Note

SAM: Safe Acceleration Monitor (safe acceleration monitoring)

| | | | | |
|--------------|--|---------------------------|-----------------------------------|-----------------------------------|
| p9551 | SI Motion SLS switchover/SOS delay time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [ms] | Max: 600000.00 [ms] | Def: 100.00 [ms] |

Description: Sets the delay time for the SLS changeover and for the activation of SOS for the "SLS" and "SOS" functions. When transitioning from a higher to a lower safely limited speed level, and when activating SOS, within this delay time, the "old" speed level remains active.

This delay is also applicable when activating SLS from the state "SOS and SLS inactive" and activating SOS from the state "SOS inactive".

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

SLS: Safely Limited Speed

SOS: Safe Operating Stop

p9552 **SI motion, transition time STOP C to SOS**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.00 [ms] **Max:** 600000.00 [ms] **Def:** 100.00 [ms]

Description: Sets the transition time from STOP C to "SOS".

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

SOS: Safe Operating Stop

p9553 **SI motion transition time STOP D to SOS**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.00 [ms] **Max:** 600000.00 [ms] **Def:** 100.00 [ms]

Description: Sets the transition time from STOP D to "SOS".

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

SOS: Safe Operating Stop

p9555 **SI Motion transition time STOP F to STOP B**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.00 [ms] **Max:** 600000.00 [ms] **Def:** 0.00 [ms]

Description: Sets the transition time from STOP F to STOP B.

Dependency: See also: C01711

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

p9556 **SI Motion STOP A delay time**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.00 [ms] **Max:** 3600000.00 [ms] **Def:** 100.00 [ms]

Description: Sets the delay time for STOP A after STOP B.

Dependency: See also: p9560

See also: C01701

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

p9557 **SI Motion STO test time**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.00 [ms] **Max:** 10000.00 [ms] **Def:** 100.00 [ms]

Description: Sets the time after which STO must be active when initiating the test stop.

Dependency: See also: C01798

12.2 List of parameters

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.
STO: Safe Torque Off

p9558**SI Motion acceptance test mode, time limit****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 5000.00 [ms]**Max:** 100000.00 [ms]**Def:** 40000.00 [ms]**Description:**

Sets the maximum time for the acceptance test mode.

If the acceptance test mode takes longer than the selected time limit, then the mode is automatically terminated.

Dependency:

See also: C01799

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

p9559**SI Motion forced checking procedure timer****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0.00 [h]**Max:** 9000.00 [h]**Def:** 8.00 [h]**Description:**

Sets the time interval for carrying out the forced checking procedure and testing the safety motion monitoring functions integrated in the drives.

Within the parameterized time, the safety functions must have been tested at least once (including de-selection of the "STO" function).

This monitoring time is reset each time the test is carried out.

The signal source to initiate the forced checking procedure is set in p9705.

Dependency:

See also: A01697, C01798

Note

STO: Safe Torque Off

p9560**SI Motion STO shutdown speed****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0.00 [mm/min]**Max:** 6000.00 [mm/min]**Def:** 0.00 [mm/min]**Description:**

Sets the shutdown velocity for activating STO.

Below this velocity "standstill" is assumed and for STOP B / SS1, STO is selected.

Dependency:

See also: p9556

Note

The shutdown velocity has no effect for a value = 0.

SS1: Safe Stop 1

STO: Safe Torque Off

p9563[0...3]**SI motion, SLS-specific stop response****Changeable:** C2(95)**Data type:** Integer16**P group:** Safety Integrated**Min:** 0**Max:** 13**Def:** 1**Description:**

Sets the SLS-specific stop response for the "SLS" function.

These settings apply to the individual limit values for SLS.

An input value of less than 5 signifies personnel protection, from 10 and upwards, machine protection.

Value:

0: STOP A

1: STOP B

2: STOP C

3: STOP D

10: STOP A with delayed stop response when the bus fails

11: STOP B with delayed stop response when the bus fails

| | | |
|--------------------|------------------------|--|
| | 12: | STOP C with delayed stop response when the bus fails |
| | 13: | STOP D with delayed stop response when the bus fails |
| Index: | [0] = | Limit value SLS1 |
| | [1] = | Limit value SLS2 |
| | [2] = | Limit value SLS3 |
| | [3] = | Limit value SLS4 |
| Dependency: | See also: p9531, p9580 | |

Note

In an extended sense, bus failure is interpreted here as a communication error in the control signals of the safety functions (e.g. via PROFIsafe).

SLS: Safely Limited Speed

| | | | | |
|---------------------|--|---------------------------|-----------------------------------|-----------------------------------|
| p9564 | SI Motion SDI tolerance | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.001 [mm] | Max: 360.000 [mm] | Def: 12.000 [mm] |
| Description: | Sets the tolerance for the "SDI" function. This motion in the monitored direction is still permissible before safety message C01716 is initiated. | | | |
| Dependency: | See also: p9565, p9566 See also: C01716 | | | |

Note

SDI: Safe Direction (safe motion direction)

| | | | | |
|---------------------|---|---------------------------|-----------------------------------|-----------------------------------|
| p9565 | SI Motion SDI delay time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [ms] | Max: 600000.00 [ms] | Def: 100.00 [ms] |
| Description: | Sets the delay time for the "SDI" function. After selecting the SDI function, then for a maximum of this time, motion in the monitored direction is permissible. This time can therefore be used for braking any motion. | | | |
| Dependency: | See also: p9564, p9566 See also: C01716 | | | |

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

SDI: Safe Direction (safe motion direction)

| | | | | |
|---------------------|--|--|-----------------------------|-----------------------------------|
| p9566 | SI Motion SDI stop response | Changeable: C2(95) | Data type: Integer16 | P group: Safety Integrated |
| | | Min: 0 | Max: 13 | Def: 1 |
| Description: | Sets the stop response for the "SDI" function. This setting applies to both directions of motion. | | | |
| Value: | 0: | STOP A | | |
| | 1: | STOP B | | |
| | 2: | STOP C | | |
| | 3: | STOP D | | |
| | 10: | STOP A with delayed stop response when the bus fails | | |
| | 11: | STOP B with delayed stop response when the bus fails | | |
| | 12: | STOP C with delayed stop response when the bus fails | | |
| | 13: | STOP D with delayed stop response when the bus fails | | |
| Dependency: | See also: p9564, p9565 See also: C01716 | | | |

12.2 List of parameters

Note

In an extended sense, bus failure is interpreted here as a communication fault in the control signals of the safety functions (e.g. via PROFIsafe).

SDI: Safe Direction (safe motion direction)

p9568**SI Motion SAM/SBR speed limit****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0.00 [mm/min]**Max:** 1000.00 [mm/min]**Def:** 0.00 [mm/min]**Description:**

Sets the velocity limit for the "SAM" and "SBR" functions.

If the drive is being ramped down, but accelerates by the tolerance in p9548, then the SAM function identifies this and a STOP A is initiated.

The monitoring operates as follows:

- monitoring by SAM is activated for SS1 (or STOP B) and SS2 (or STOP C).
- the SAM limit value is frozen after the velocity limit in p9568 is undershot.
- SAM monitoring is still executed until the transition time to SOS/STO has expired.

Note

SAM: Safe Acceleration Monitor (safe acceleration monitoring)

SBR: Safe Brake Ramp (safe brake ramp monitoring)

SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring)

For p9568 = 0, the following applies:

The value in p9546 (SSM) is applied as the velocity limit for SAM/SBR.

p9570**SI Motion acceptance test mode****Changeable:** T, U**Data type:** Integer16**P group:** Safety Integrated**Min:** 0000 hex**Max:** 00AC hex**Def:** 0000 hex**Description:**

Setting to select and de-select the acceptance test mode.

Value:

0: [00 hex] De-select the acceptance test mode

172: [AC hex] Select the acceptance test mode

Dependency:

See also: p9558, r9571, p9601

See also: C01799

Note

Acceptance test mode can only be selected if the safe motion monitoring functions are enabled.

r9571**SI Motion acceptance test status****Data type:** Integer16**P group:** Safety Integrated**Description:**

Displays the status of the acceptance test mode.

Value:

0: [00 hex] Acc_mode inactive

12: [0C hex] Acc_mode not possible due to POWER ON fault

13: [0D hex] Acc_mode not possible due to incorrect ID in p9570

15: [0F hex] Acc_mode not possible due to expired Acc_timer

172: [AC hex] Acc_mode active

Dependency:

See also: p9558, p9570

See also: C01799

p9580**SI Motion stop response delay bus failure****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0.00 [ms]**Max:** 800.00 [ms]**Def:** 0.00 [ms]**Description:**

Sets the delay time, after which the stop response parameterized in p9612 for bus failure is executed.

Dependency:

See also: p9563

Note

In an extended sense, bus failure is interpreted here as a communication error in the control signals of the safety functions (e.g. via PROFIsafe).

The main use of the wait time is the function "Extended stopping and retraction" (ESR).

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

| | | | | |
|---------------------|--|-------------------------------|-----------------------------------|-----------------------------------|
| p9581 | SI Motion brake ramp reference value | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 600.0000 [mm/min] | Max: 240000.0000 [mm/min] | Def: 1500.0000 [mm/min] |
| Description: | Sets the reference value to define the brake ramp. | | | |
| | The rate of rise of the brake ramp depends upon p9581 (reference value) and p9583 (monitoring time). | | | |
| Dependency: | See also: p9582, p9583 | | | |

| | | | | |
|---------------------|--|---------------------------|-----------------------------------|-----------------------------------|
| p9582 | SI Motion brake ramp delay time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 10.00 [ms] | Max: 99000.00 [ms] | Def: 250.00 [ms] |
| Description: | Sets the delay time for monitoring the brake ramp. | | | |
| | Monitoring of the brake ramp starts once the delay time has elapsed. | | | |
| Dependency: | See also: p9581, p9583 | | | |

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

The set time is internally limited (lower limit) to 2 safety monitoring clock cycles.

| | | | | |
|---------------------|--|---------------------------|-----------------------------------|-----------------------------------|
| p9583 | SI Motion brake ramp monitoring time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.50 [s] | Max: 3600.00 [s] | Def: 10.00 [s] |
| Description: | Sets the monitoring time to define the brake ramp. | | | |
| | The rate of rise of the brake ramp depends upon p9581 (reference value) and p9583 (monitoring time). | | | |
| Dependency: | See also: p9581, p9582 | | | |

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

| | | | |
|---------------------|---|------------------------------|-----------------------------------|
| r9590[0...3] | SI Motion version, safe motion monitoring functions | Data type: Unsigned16 | P group: Safety Integrated |
| Description: | Displays the Safety Integrated version for the safe monitoring functions. | | |
| Index: | [0] = Safety Version (major release) | | |
| | [1] = Safety Version (minor release) | | |
| | [2] = Safety Version (baselevel or patch) | | |
| | [3] = Safety Version (hotfix) | | |
| Dependency: | See also: r9770 | | |

Note

Example:

r9590[0] = 5, r9590[1] = 10, r9590[2] = 1, r9590[3] = 0 --> SI Motion version V05.10.01.00

| | | | | |
|--------------|---|---------------------------|------------------------------|-----------------------------------|
| p9601 | SI enable, functions integrated in the drive | Changeable: C2(95) | Data type: Unsigned32 | P group: Safety Integrated |
| | | Min: - | Max: - | Def: 0000 bin |

12.2 List of parameters

Description: Sets the enable signals for the safety functions integrated in the drive and the type of selection.
 Only a selection of the subsequently listed settings is permissible:
 0000 hex:
 Safety functions integrated in the drive inhibited (no safety function).
 0001 hex:
 Basis functions are enabled via the onboard terminals.
 0008 hex:
 Basis functions are enabled via PROFIsafe.
 0009 hex:
 Basis functions are enabled via PROFIsafe and onboard terminals.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|----------------------------|----------|----------|----|
| | 00 | STO enabled via terminals: | Enable | Inhibit | - |
| | 03 | Enable PROFIsafe | Enable | Inhibit | - |

Note

A change always becomes effective only after a POWER ON. Exception: change to p9601.0 becomes immediately effective.
 STO: Safe Torque Off
 SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
 SI: Safety Integrated

p9602 **SI enable safe brake control**
Changeable: C2(95) **Data type:** Integer16 **P group:** Safety Integrated
Min: 0 **Max:** 1 **Def:** 0

Description: Sets the enable for the "SBC" function.
Value:
 0: Inhibit SBC
 1: Enable SBC

Note

The "SBC" function is not activated until at least one safety monitoring function has been enabled (i.e. p9501 not equal to 0 and/or p9601 not equal to 0).
 The parameterization "No motor holding brake available" and "Safe Brake Control" enabled (p1215 = 0, p9602 = 1) does not make sense if a motor holding brake is not being used.
 SBC: Safe Brake Control
 SI: Safety Integrated

p9610 **SI PROFIsafe address**
Changeable: C2(95) **Data type:** Unsigned16 **P group:** Safety Integrated
Min: 0 **Max:** 65534 **Def:** 0

Description: Sets the PROFIsafe address.

Note

A change only becomes effective after a POWER ON.
 The PROFIsafe address in the drive must be identical with the address in the control.

p9611 **SI PROFIsafe telegram selection**
Changeable: C2(95) **Data type:** Unsigned16 **P group:** Safety Integrated
Min: 0 **Max:** 901 **Def:** 0

Description: Sets the PROFIsafe telegram number.
Value:
 0: No PROFIsafe telegram selected
 30: PROFIsafe standard telegram 30, PZD-1/1
 901: PROFIsafe SIEMENS telegram 901, PZD-3/5

Dependency: See also: p60022, r60022

Note

A change only becomes effective after a POWER ON.

To select the PROFIdrive telegram, PROFIsafe must have been enabled (p9601.3 = 1).

| | | | | |
|------------------------|---|--|-----------------------------------|-----------------------------------|
| p9612 | SI PROFIsafe failure response | Changeable: C2(95) | Data type: Integer16 | P group: Safety Integrated |
| | | Min: 0 | Max: 1 | Def: 0 |
| Description: | Sets the stop response when PROFIsafe communication fails. | | | |
| Value: | 0: STOP A 1: STOP B | | | |
| | Note | | | |
| | For p9612 = 0 (STOP A): The drive safely switches off the motor, the motor coasts down. For p9612 = 1 (STOP B): The drive brakes the motor with OFF3 ramp-down time until standstill is detected. STOP A is then selected. The following must be observed: - the transition time STOP F to STOP A (p9658) must be set longer or equal to the delay time (p9652). | | | |
| p9650 | SI F-DI discrepancy time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [ms] | Max: 2000.00 [ms] | Def: 500.00 [ms] |
| Description: | Sets the time during which the drive tolerates different signal states of the fail-safe digital input. | | | |
| | Note | F-DI: Fail-safe Digital Input | | |
| p9651 | SI STO/SBC/SS1 t_debounce time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [ms] | Max: 100.00 [ms] | Def: 0.00 [ms] |
| Description: | Sets the debounce time for the fail-safe digital input used to control STO/SBC/SS1. The debounce time specifies the duration of a fault (noise) pulse at a fail-safe digital input that does not change the drive state. | | | |
| | Note | The debounce time is rounded to whole milliseconds. Example: Debounce time = 1 ms: Fault pulses of 1 ms are tolerated; only pulses longer than 2 ms result in a response. Debounce time = 3 ms: Fault pulses of 3 ms are tolerated; only pulses longer than 4 ms result in a response. The set debounce time impacts the response time of the safety function. | | |
| p9652 | SI SS1 delay time | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | | Min: 0.00 [s] | Max: 300.00 [s] | Def: 0.00 [s] |
| Description: | Sets the delay time of the pulse suppression for the "Safe Stop 1" (SS1) function to brake along the OFF3 down ramp (p1135). | | | |
| Recommendation: | In order that the drive can completely ramp-down along the OFF3 ramp and a motor holding brake that is possibly available can close, then the delay time should be set as follows: Motor holding brake parameterized: delay time \geq p1135 + p1228 + p1217 Motor holding brake not parameterized: delay time \geq p1135 + p1228 | | | |
| Dependency: | See also: p1135 | | | |

12.2 List of parameters

Note

Pulse cancellation after failure of PROFIsafe communication is delayed by this time if "STOP B" is set (p9612 = 1).
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)

p9653**SI SS1 drive-based braking response****Changeable:** C2(95)**Data type:** Integer16**P group:** Safety Integrated**Min:** 0**Max:** 1**Def:** 0**Description:**

Sets the drive-based braking response for the "SS1" function.
In the factory setting, SS1 uses the OFF3 ramp.

Value:

0: SS1 with OFF3

1: SS1E external stop

Note

When p9653 is set = 1, the switchover is made from SS1 to SS1E - and the SS1 response is transferred to the control. SS1E requires the externally initiated stop in order to be in conformance with stop Category 1 according to EN60204.
SS1: Safe Stop 1
SS1E: Safe Stop 1 external (Safe Stop 1 with external stop)

p9658**SI transition time STOP F to STOP A****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0.00 [ms]**Max:** 30000.00 [ms]**Def:** 0.00 [ms]**Description:**

Sets the transition period from STOP F to STOP A.

Dependency:

See also: r9795

See also: F01611

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.
STOP F: Defect in a monitoring channel (error in the data cross-check)
STOP A: STO as a result of a fault detected by Safety Integrated

p9659**SI forced checking procedure timer****Changeable:** C2(95)**Data type:** FloatingPoint32**P group:** Safety Integrated**Min:** 0.00 [h]**Max:** 9000.00 [h]**Def:** 8760.00 [h]**Description:**

Setting the time interval in order to test safe torque off (STO).
During the test, within the parameterized time, an STO is selected and then again de-selected, e.g. by activating and deactivating Emergency Stop.
The monitoring time in r9660 is reset each time that STO is de-selected.

Dependency:

See also: A01699

Note

STO: Safe Torque Off

r9660**SI forced checking procedure remaining time****Data type:** FloatingPoint32**P group:** Safety Integrated**Description:**

Displays the remaining time until the next forced checking procedure of the safety functions.

Dependency:

See also: A01699

p9670**SI module identification drive****Changeable:** T**Data type:** Unsigned32**P group:** -**Min:** 0**Max:** 4294967295**Def:** 0**Description:**

Safety Integrated module identifier for the drive.
Replacement of the drive is identified when the safety functions are activated.

Dependency: See also: F01641

Note

After replacement, when the drive powers up a fault is output.

p9673

SI module identifier motor encoder evaluation

Changeable: C2(95), T

Data type: Unsigned32

P group: Safety Integrated

Min: 0

Max: 4294967295

Def: 0

Description:

Safety Integrated module identifier for the encoder in the motor.

Replacement of the motor is identified when the safety functions are activated.

Dependency:

See also: F01641

Note

After replacement, when the drive powers up a fault is output.

p9675

SI module identifier motor encoder

Changeable: C2(95), T

Data type: Unsigned32

P group: Safety Integrated

Min: 0

Max: 4294967295

Def: 0

Description:

Safety Integrated module identifier for the encoder in the motor.

Replacement of the motor is identified when the safety functions are activated.

Dependency:

See also: F01641

Note

After replacement, when the drive powers up a fault is output.

p9702

SI Acknowledge component replacement

Changeable: T, U

Data type: Integer16

P group: Safety Integrated

Min: 0

Max: 29

Def: 0

Description:

Setting to acknowledge that a component has been replaced.

By writing 29 to this parameter, the unique identifier of a safety-relevant component is transferred into the drive parameterization.

Value:

0: [00 hex] hardware replacement acknowledge ready

29: [1D hex] hardware replacement acknowledgment

NOTICE

It is not permissible that the safety commissioning mode is set in order to write to this parameter.

Note

After successful execution, this parameter is automatically reset to zero.

Parameters must be saved.

The parameter cannot be written to using a project download, and cannot be set in an offline project.

r9708[0...5]

SI Motion diagnostics safe position

Data type: FloatingPoint32

P group: Safety Integrated

Description:

Displays the actual load-side actual values of both monitoring channels and their difference.

Index:

[0] = Load-side actual value on the CU

[1] = Load-side actual value on the second channel

[2] = Load-side actual value difference CU - second channel

[3] = Load-side max. actual value difference CU - second channel

[4] = Reserved

[5] = Reserved

Dependency:

See also: r9713

12.2 List of parameters

Note

For index [0]:

The display of the load-side position actual value on the first channel is updated in the monitoring clock cycle.

For index [1]:

The display of the load-side position actual value on the second channel is updated in the KDV clock cycle (r9724) and delayed by one KDV clock cycle.

For index [2]:

The difference between the load-side position actual value in the first channel and load-side position actual value in the second channel is updated in the KDV clock cycle (r9724) and delayed by one KDV clock cycle.

For index [3]:

The maximum difference between the load-side position actual value in the first channel and the load-side position actual value in the second channel.

KDV: Data cross-check

r9710[0...1]

SI Motion diagnostics result list 1

Data type: Unsigned32

P group: Safety Integrated

Description:

Displays result list 1 that, for the data cross-check between the monitoring channels, led to the fault.

Index:

[0] = Result list channel 2

[1] = Result list channel 1

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|---|----------|----------|----|
| 00 | Actual value > upper limit SOS | Yes | No | - |
| 01 | Actual value > lower limit SOS | Yes | No | - |
| 06 | Actual value > upper limit SLS1 | Yes | No | - |
| 07 | Actual value > lower limit SLS1 | Yes | No | - |
| 08 | Actual value > upper limit SLS2 | Yes | No | - |
| 09 | Actual value > lower limit SLS2 | Yes | No | - |
| 10 | Actual value > upper limit SLS3 | Yes | No | - |
| 11 | Actual value > lower limit SLS3 | Yes | No | - |
| 12 | Actual value > upper limit SLS4 | Yes | No | - |
| 13 | Actual value > lower limit SLS4 | Yes | No | - |
| 16 | Actual value > upper limit SAM/SBR | Yes | No | - |
| 17 | Actual value > lower limit SAM/SBR | Yes | No | - |
| 18 | Actual value > upper limit SDI positive | Yes | No | - |
| 19 | Actual value > lower limit SDI positive | Yes | No | - |
| 20 | Actual value > upper limit SDI negative | Yes | No | - |
| 21 | Actual value > lower limit SDI negative | Yes | No | - |

Dependency:

See also: C01711

Note

SBR: Safe Brake Ramp (safe brake ramp monitoring)

SDI: Safe Direction (safe motion direction)

SLS: Safely Limited Speed

SOS: Safe Operating Stop

r9711[0...1]

SI Motion diagnostics result list 2

Data type: Unsigned32

P group: Safety Integrated

Description:

Displays result list 2 that, for the data cross-check between the monitoring channels, led to the fault.

Index:

[0] = Result list channel 2

[1] = Result list channel 1

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|---------------------------------|----------|----------|----|
| 16 | Actual value > upper limit SSM+ | Yes | No | - |
| 17 | Actual value > lower limit SSM+ | Yes | No | - |

| | | | | |
|----|-----------------------------------|-----|----|---|
| 18 | Actual value > upper limit SSM- | Yes | No | - |
| 19 | Actual value > lower limit SSM- | Yes | No | - |
| 20 | Actual value > upper limit modulo | Yes | No | - |
| 21 | Actual value > lower limit modulo | Yes | No | - |

Dependency: See also: C01711

Note

SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring)

r9712 SI Motion diagnostics position actual value motor side

Data type: Unsigned32 **P group:** Safety Integrated

Description: Displays the position actual value on the motor side for motion monitoring functions.

Note

The display is updated in the safety monitoring clock cycle.

r9713[0...5] SI Motion diagnostics position actual value load side

Data type: Integer32 **P group:** Safety Integrated

Description: Display and connector output for the actual load-side actual values of both monitoring channels and their difference.

Index:
 [0] = Load-side actual value on the CU
 [1] = Load-side actual value on the second channel
 [2] = Load-side actual value difference CU - second channel
 [3] = Load-side max. actual value difference CU - second channel
 [4] = Reserved
 [5] = Reserved

Dependency: See also: r9708

Note

Regarding the units, this parameter should be interpreted as follows:

- linear axis: μm

- rotary axis: mdegrees

The value of this parameter is displayed in r9708 with units (mm or degrees).

The display is updated in the safety monitoring clock cycle.

For index [0]:

The display of the load-side position actual value on the first channel is updated in the monitoring clock cycle.

For index [1]:

The display of the load-side position actual value on the second channel is updated in the KDV clock cycle (r9724) and delayed by one KDV clock cycle.

For index [2]:

The difference between the load-side position actual value in the first channel and load-side position actual value in the second channel is updated in the KDV clock cycle (r9724) and delayed by one KDV clock cycle.

For index [3]:

The maximum difference between the load-side position actual value in the first channel and the load-side position actual value in the second channel.

KDV: Data cross-check

r9714[0...3] SI motion diagnostics velocity

Data type: FloatingPoint32 **P group:** Safety Integrated

Description: Displays the velocity actual values for motion monitoring functions.

Index:
 [0] = Load side speed actual value
 [1] = Actual SAM/SBR speed limit
 [2] = Actual SLS speed limit
 [3] = Reserved

12.2 List of parameters

Note

The display is updated in the safety monitoring clock cycle.

For linear axes, the following unit applies: millimeters per minute

For rotary axes, the following unit applies: revolutions per minute

r9720**SI Motion control signals integrated in the drive**

Data type: Unsigned32

P group: Safety Integrated

Description:

Control signals for safety-relevant motion monitoring functions integrated in the drive.

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|-----------------------|--------------------|----------|------|
| 00 | De-select STO | Yes | No | - |
| 01 | De-select SS1 | Yes | No | - |
| 02 | De-select SS2 | Yes | No | - |
| 03 | De-select SOS | Yes | No | - |
| 04 | De-select SLS | Yes | No | - |
| 07 | Acknowledgment | Signal edge active | No | - |
| 09 | Select SLS bit 0 | Set | Not set | - |
| 10 | Select SLS bit 1 | Set | Not set | - |
| 12 | Deselect SDI positive | Yes | No | 2824 |
| 13 | Deselect SDI negative | Yes | No | 2824 |
| 24 | Select gearbox bit 0 | Set | Not set | - |
| 28 | Deselect SS2E | Yes | No | - |

Note

This parameter is only supplied with actual values in the case of Safety Integrated Extended Functions. For Safety Integrated Basic Functions (SBC, SS1, STO), the value is equal to zero.

r9722**SI Motion drive-integrated status signals**

Data type: Unsigned32

P group: Safety Integrated

Description:

Status signal for safety-relevant motion monitoring functions integrated in the drive.

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|--------------------------------------|----------|----------|------|
| 00 | STO or safe pulse suppression active | Yes | No | - |
| 01 | SS1 active | Yes | No | - |
| 02 | SS2 active | Yes | No | - |
| 03 | SOS active | Yes | No | - |
| 04 | SLS active | Yes | No | - |
| 07 | Internal event | No | Yes | - |
| 09 | Active SLS stage bit 0 | Set | Not set | - |
| 10 | Active SLS stage bit 1 | Set | Not set | - |
| 11 | SOS selected | Yes | No | - |
| 12 | SDI positive active | Yes | No | 2824 |
| 13 | SDI negative active | Yes | No | 2824 |
| 15 | SSM (speed below limit value) | Yes | No | 2823 |
| 28 | SS2E active | Yes | No | - |

NOTICE

For bit 07:

The signal state behaves in an opposite way to the PROFIsafe Standard.

Note

This parameter is only supplied with actual values in the case of Safety Integrated Extended Functions. For Safety Integrated Basic Functions (SBC, SS1, STO), the value is equal to zero.

For bit 07:

An internal event is displayed if a STOP A ... F is active.

r9723**SI Motion diagnostic signals integrated in the drive**

Data type: Unsigned32

P group: Safety Integrated

Description:

Displays the diagnostic signals for safety-relevant motion monitoring functions integrated in the drive.

Bit field:

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|---|----------|----------|------|
| 00 | Forced checking procedure required | Yes | No | - |
| 01 | STOP F and then STOP B active | Yes | No | 2819 |
| 02 | Communication failure | Yes | No | - |
| 03 | Actual value sensing supplies valid value | Yes | No | 2821 |
| 12 | Test stop active | Yes | No | - |
| 16 | SAM/SBR active | Yes | No | 2820 |

Note

For bit 00:

A required dynamization is also displayed via alarm A01679.

For bit 01:

This bit can be used, to execute a drive-based or control-based ESR.

For bit 12:

An active test stop is also displayed using the safety message C01798.

ESR: Extended Stop and Retract

SAM: Safe Acceleration Monitor (safe acceleration monitoring)

SBR: Safe Brake Ramp (safe brake ramp monitoring)

r9725[0...2]**SI Motion diagnostics STOP F**

Data type: Unsigned32

P group: Safety Integrated

Description:

For index [0]:

Displays the message value that resulted in the STOP F on the drive.

Value = 0:

STOP F was signaled from the first channel.

Value = 1 ... 999:

Number of the incorrect date in the data cross-check between the monitoring channels.

Value >= 1000:

Additional diagnostic values of the drive.

For index [1]:

Displays the value from the first channel that resulted in the STOP F.

For index [2]:

Displays the value from the second channel that resulted in the STOP F.

Index:

[0] = Message value for KDV

[1] = Channel 1 KDV actual value

[2] = Channel 2 KDV actual value

Dependency:

See also: C01711

Note

The significance of the individual message values is described in message C01711.

KDV: Data cross-check

For index [1, 2]:

When Safety message C01711 with message value >= 1000 occurs, these indices are not supplied with values.

12.2 List of parameters

| | |
|---------------------|--|
| r9733[0...2] | SI Motion setpoint speed limit effective |
| | Data type: FloatingPoint32 P group: Safety Integrated Scaling: p2000 |
| Description: | Displays the necessary setpoint speed limit as a result of the selected motion monitoring functions. Contrary to the parameterization of the SI limit values, this parameter specifies the motor-side limit value and not the load-side limit value. |
| Index: | [0] = Setpoint limiting positive [1] = Setpoint limiting negative [2] = Setpoint limit absolute |
| Dependency: | For SLS: $r9733[0] = p9531[x] \times p9533$ (converted from the load side to the motor side) For SDI negative: $r9733[0] = 0$ For SLS: $r9733[1] = -p9531[x] \times p9533$ (converted from the load side to the motor side) For SDI positive: $r9733[1] = 0$ [x] = Selected SLS stage Conversion factor from the motor side to the load side: - motor type = rotary and axis type = linear: $p9522 / (p9521 \times p9520)$ - otherwise: $p9522 / p9521$ See also: p9531, p9533 |
| | Note This parameter is not influenced by setting the axis type (p9502). If the "SLS" or "SDI" function is not selected, r9733[0] shows p1082 and r9733[1] shows -p1082. The display in r9733 can be delayed by up to one Safety monitoring clock cycle as compared to the display in r9719/r9720 and r9721/r9722. When selecting SOS or a STOP A ... D, setpoint 0 is specified in r9733. |

| r9734 | SI Safety Info Channel status word S_ZSW1B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|----------|-------------|----------|----------|----|----|------------|-----|----|---|----|------------|-----|----|---|----|------------|-----|----|---|----|------------|-----|----|---|----|------------|-----|----|---|----|--------------|-----|----|---|----|--------------|-----|----|---|----|----------------|-----|----|---|----|-----------------|-----|----|---|----|-----------------|-----|----|---|----|-----------------------|-----|----|---|----|-----------------------|-----|----|---|----|------------------------|-----|----|---|
| | Data type: Unsigned16 P group: Safety Integrated | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description: | Display for the status word of safety functions (S_ZSW1B). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit field: | <table border="1"> <thead> <tr> <th>Bit</th> <th>Signal name</th> <th>1 signal</th> <th>0 signal</th> <th>FP</th> </tr> </thead> <tbody> <tr><td>00</td><td>STO active</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>01</td><td>SS1 active</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>02</td><td>SS2 active</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>03</td><td>SOS active</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>04</td><td>SLS active</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>05</td><td>SOS selected</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>06</td><td>SLS selected</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>07</td><td>Internal event</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>09</td><td>Select SLS bit0</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>10</td><td>Select SLS bit1</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>12</td><td>SDI positive selected</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>13</td><td>SDI negative selected</td><td>Yes</td><td>No</td><td>-</td></tr> <tr><td>15</td><td>Safety message present</td><td>Yes</td><td>No</td><td>-</td></tr> </tbody> </table> | Bit | Signal name | 1 signal | 0 signal | FP | 00 | STO active | Yes | No | - | 01 | SS1 active | Yes | No | - | 02 | SS2 active | Yes | No | - | 03 | SOS active | Yes | No | - | 04 | SLS active | Yes | No | - | 05 | SOS selected | Yes | No | - | 06 | SLS selected | Yes | No | - | 07 | Internal event | Yes | No | - | 09 | Select SLS bit0 | Yes | No | - | 10 | Select SLS bit1 | Yes | No | - | 12 | SDI positive selected | Yes | No | - | 13 | SDI negative selected | Yes | No | - | 15 | Safety message present | Yes | No | - |
| Bit | Signal name | 1 signal | 0 signal | FP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 00 | STO active | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | SS1 active | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 02 | SS2 active | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 03 | SOS active | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 04 | SLS active | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 05 | SOS selected | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 06 | SLS selected | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 07 | Internal event | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 09 | Select SLS bit0 | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Select SLS bit1 | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | SDI positive selected | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | SDI negative selected | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Safety message present | Yes | No | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Note For bit 07: An internal event is displayed if a STOP A ... F is active. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| r9743 | SI Safety Info Channel status word S_ZSW2B | | | | | | | | | | |
|---------------------|--|----------|-------------|----------|----------|----|----|-----------------------|-----|----|---|
| | Data type: Unsigned16 P group: Safety Integrated | | | | | | | | | | |
| Description: | Display for the status word of the safety functions (S_ZSW2B). | | | | | | | | | | |
| Bit field: | <table border="1"> <thead> <tr> <th>Bit</th> <th>Signal name</th> <th>1 signal</th> <th>0 signal</th> <th>FP</th> </tr> </thead> <tbody> <tr><td>08</td><td>SDI positive selected</td><td>Yes</td><td>No</td><td>-</td></tr> </tbody> </table> | Bit | Signal name | 1 signal | 0 signal | FP | 08 | SDI positive selected | Yes | No | - |
| Bit | Signal name | 1 signal | 0 signal | FP | | | | | | | |
| 08 | SDI positive selected | Yes | No | - | | | | | | | |

| | | | | |
|----|-----------------------|-----|----|---|
| 09 | SDI negative selected | Yes | No | - |
| 12 | Test stop active | Yes | No | - |
| 13 | Test stop required | Yes | No | - |

r9765 SI Motion forced checking procedure remaining time**Data type:** FloatingPoint32 **P group:** Safety Integrated**Description:** Displays the time remaining until the next dynamization and testing of the safety motion monitoring functions integrated in the drives.

The signal source to initiate the forced checking procedure is parameterized in p9705.

Dependency: See also: C01798**r9767 SI safety password status****Data type:** Unsigned32 **P group:** Safety Integrated**Description:** Display and binector output for the status of the safety password.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|------------------|----------|----------|----|
| | 00 | Assign password | Yes | No | - |
| | 01 | Password entered | Yes | No | - |

Note

For bit 00 = 1:

- a valid safety password was assigned.

For bit 01 = 1:

- a valid safety password was assigned (bit 0 = 1).

- safety parameters can be set.

r9768[0...7] Receive SI PROFIsafe control words**Data type:** Unsigned16 **P group:** Safety Integrated**Description:** Displays the received PROFIsafe telegram from the control.

Index:

[0] = PZD 1
 [1] = PZD 2
 [2] = PZD 3
 [3] = PZD 4
 [4] = PZD 5
 [5] = PZD 6
 [6] = PZD 7
 [7] = PZD 8

Dependency: See also: r9769**Note**

The PROFIsafe trailer at the end of the telegram is also displayed (2 words).

r9769[0...7] Send SI PROFIsafe status words**Data type:** Unsigned16 **P group:** Safety Integrated**Description:** Displays the PROFIsafe telegram to be sent to the control.

Index:

[0] = PZD 1
 [1] = PZD 2
 [2] = PZD 3
 [3] = PZD 4
 [4] = PZD 5
 [5] = PZD 6
 [6] = PZD 7
 [7] = PZD 8

12.2 List of parameters

Dependency: See also: r9768

Note

The PROFIsafe trailer at the end of the telegram is also displayed (2 words).

r9770[0...3] SI version safety functions integrated in the drive

Data type: Unsigned16 **P group:** Safety Integrated

Description: Displays the Safety Integrated version for the drive-integrated safety functions

Index:
 [0] = Safety Version (major release)
 [1] = Safety Version (minor release)
 [2] = Safety Version (baselevel or patch)
 [3] = Safety Version (hotfix)

Note

Example:
 r9770[0] = 5, r9770[1] = 10, r9770[2] = 1, r9770[3] = 0 --> safety version V05.10.01.00

r9776 SI diagnostics

Data type: Unsigned32 **P group:** Safety Integrated

Description: Displays the operating state, referred to the safety functions.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|---|----------|----------|----|
| | 00 | Safety parameter changed POWER ON required | Yes | No | - |
| | 01 | Safety functions enabled | Yes | No | - |
| | 02 | Safety component replaced and data save required | Yes | No | - |
| | 03 | Safety component replaced and acknowledge/save required | Yes | No | - |

Note

For bit 00 = 1:
 At least one Safety parameter has been changed that will only take effect after a POWER ON.
 For bit 01 = 1:
 Safety functions (basic functions or extended functions) have been enabled and are active.
 For bit 02 = 1:
 A safety-relevant component has been replaced. Saving required (p0977 = 1).
 For bit 03 = 1:
 A safety-relevant component has been replaced. Acknowledging (p9702 = 29) and saving (p0977 = 1) required.

r9781[0...1] SI checksum to check changes

Data type: Unsigned32 **P group:** Safety Integrated

Description: Displays the checksum to track changes for safety functions.

Index:
 [0] = SI checksum to track functional changes
 [1] = SI checksum to track hardware-specific changes

Dependency: See also: p9601
 See also: F01690

Note

The checksum changes when configuring safety functions.

r9782[0...1] SI change control time stamp

Data type: FloatingPoint32 **P group:** Safety Integrated

Description: Displays the time stamps for the checksums for tracking changes for safety functions.
 Each new checksum is assigned a time stamp (r9781).

Index:
 [0] = SI time stamp for checksum to track functional changes
 [1] = SI time stamp for checksum to track hardware-specific changes

Dependency: See also: p9601
See also: F01690

r9795 **SI diagnostics STOP F**
Data type: Unsigned32 **P group:** Safety Integrated
Description: Displays the number of the cross-checked data item, which caused STOP F.
Dependency: See also: F01611

Note

A complete list of numbers for cross-checked data items appears in fault F01611.

p10201 **SI Motion SBT enable**
Changeable: C2(95) **Data type:** Unsigned32 **P group:** Safety Integrated
Min: - **Max:** - **Def:** 0000 bin

Description: Sets the enable for the safe brake test.

| Bit | Signal name | 1 signal | 0 signal | FP |
|-----|------------------------|----------|----------|----|
| 00 | Enable safe brake test | Yes | No | - |

Note

SBT: Safe Brake Test

p10202[0...1] **SI Motion SBT brake**
Changeable: C2(95) **Data type:** Integer16 **P group:** Safety Integrated
Min: 0 **Max:** 1 **Def:** 0

Description: Selecting the brake to be tested.
p10202[0] must be set = 1 to test the brake.

Value: 0: Inhibit
1: Test motor holding brake

Index: [0] = Brake 1
[1] = Reserved

Dependency: See also: A01785

p10208[0...1] **SI Motion SBT test torque ramp time**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 20 [ms] **Max:** 10000 [ms] **Def:** 1000 [ms]

Description: Sets the time, during which the test torque is ramped up against the closed brake.
The test torque is then ramped down after the safe brake test.

Index: [0] = Brake 1
[1] = Reserved

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

p10209[0...1] **SI Motion SBT brake holding torque**
Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 1.00 [Nm] **Max:** 60000.00 [Nm] **Def:** 10.00 [Nm]

Description: Sets the effective holding torque on the motor side of the brake to be tested.

Index: [0] = Brake 1
[1] = Reserved

Dependency: See also: p10210, p10220

Note

The test torque effective for the brake test can be set for each sequence using a factor (p10210, p10220).

| | | | |
|----------------------|---|-----------------------------------|-----------------------------------|
| p10210[0...1] | SI Motion SBT test torque factor sequence 1 | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 0.30 | Max: 1.00 | Def: 1.00 |
| Description: | Sets the factor for the test torque of sequence 1 for the safe brake test. The factor is referred to the holding torque of the brake (p10209). | | |
| Index: | [0] = Brake 1 [1] = Reserved | | |
| Dependency: | See also: p10209 | | |

| | | | |
|----------------------|---|-----------------------------------|-----------------------------------|
| p10211[0...1] | SI Motion SBT test duration sequence 1 | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 20 [ms] | Max: 10000 [ms] | Def: 1000 [ms] |
| Description: | Sets the test duration for sequence 1 for the safe brake test. The test torque is available for this time at the closed brake. | | |
| Index: | [0] = Brake 1 [1] = Reserved | | |

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

| | | | |
|----------------------|---|-----------------------------------|-----------------------------------|
| p10212[0...1] | SI Motion SBT position tolerance sequence 1 | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 0.001 [mm] | Max: 360.000 [mm] | Def: 1.000 [mm] |
| Description: | Sets the tolerated position deviation for sequence 1 for the safe brake test. | | |
| Index: | [0] = Brake 1 [1] = Reserved | | |

| | | | |
|---------------------|--|-----------------------------|-----------------------------------|
| p10218 | SI Motion SBT test torque sign | | |
| | Changeable: C2(95) | Data type: Integer16 | P group: Safety Integrated |
| | Min: 0 | Max: 1 | Def: 0 |
| Description: | Sets the sign for the test torque for the safe brake test. | | |
| Value: | 0: Positive 1: Negative | | |

| | | | |
|----------------------|---|-----------------------------------|-----------------------------------|
| p10220[0...1] | SI Motion SBT test torque factor sequence 2 | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 0.30 | Max: 1.00 | Def: 1.00 |
| Description: | Sets the factor for the test torque of sequence 2 for the safe brake test. The factor is referred to the holding torque of the brake (p10209). | | |
| Index: | [0] = Brake 1 [1] = Reserved | | |
| Dependency: | See also: p10209 | | |

| | | | |
|----------------------|---|-----------------------------------|-----------------------------------|
| p10221[0...1] | SI Motion SBT test duration sequence 2 | | |
| | Changeable: C2(95) | Data type: FloatingPoint32 | P group: Safety Integrated |
| | Min: 20 [ms] | Max: 10000 [ms] | Def: 1000 [ms] |

Description: Sets the test duration for sequence 2 for the safe brake test.
The test torque is available for this time at the closed brake.

Index: [0] = Brake 1
[1] = Reserved

Note

The set time is rounded internally to an integer multiple of the monitoring clock cycle.

p10222[0...1]**SI Motion SBT position tolerance sequence 2**

Changeable: C2(95) **Data type:** FloatingPoint32 **P group:** Safety Integrated
Min: 0.001 [mm] **Max:** 360.000 [mm] **Def:** 1.000 [mm]

Description: Sets the tolerated position deviation for sequence 2 for the safe brake test.

Index: [0] = Brake 1
[1] = Reserved

r10231**SI Motion SBT control word diagnostics**

Data type: Unsigned32 **P group:** Safety Integrated

Description: Displays the diagnostic bits for the control word of the safe brake test

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|-------------------------|-----------------|-----------------|----|
| | 00 | Select brake test | Yes | No | - |
| | 01 | Start brake test | Yes | No | - |
| | 03 | Select test torque sign | Negative | Positive | - |
| | 04 | Select test sequence | Test sequence 2 | Test sequence 1 | - |

r10234**SI Safety Info Channel status word S_ZSW3B**

Data type: Unsigned32 **P group:** Safety Integrated

Description: Display for the status word of the safety functions (S_ZSW3B).

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|------------|-----|-------------------------------|------------|---------------|----|
| | 00 | Brake test selected | Yes | No | - |
| | 01 | Setpoint input drive/external | Drive | External | - |
| | 03 | Brake test active | Yes | No | - |
| | 04 | Brake test result | Successful | Erroneous/not | - |
| | 05 | Brake test completed | Yes | No | - |
| | 07 | Actual load sign | Negative | Positive | - |
| | 11 | SS2E active | Yes | No | - |
| | 15 | Acceptance test mode selected | Yes | No | - |

Note

SS2E: Safe Stop 2 external (Safe Stop 2 with external stop, external STOP D)

For bits 05, 04:

For r10234.4 = 0 signal, it is possible to make a distinction as to whether the brake test was executed with error - or has still not been executed - using bit 5.

Bit 5/4 = 0/0: The brake test has still not been executed since the last warm restart or POWER ON.

Bit 5/4 = 1/0: The last brake test that was executed had an error.

r10240**SI Motion SBT test torque diagnostics**

Data type: FloatingPoint32 **P group:** Safety Integrated

Description: Displays the effective maximum test torque on the motor side for a safe brake test.

Dependency: See also: p10210, p10220

Note

The value remains displayed until the start of the next test sequence.

r10241 **SI Motion SBT load torque diagnostics**
Data type: FloatingPoint32 **P group:** Safety Integrated
Description: Displays the load torque for a safe brake test.
When initializing the brake test, this load torque is available at the drive.

Note

The value remains displayed until the brake test is deselected.

r10242 **SI Motion SBT state diagnostics**
Data type: Integer16 **P group:** Safety Integrated

Description: Displays the actual state of the safe brake test.

Value:

| | |
|-----|---|
| 0: | Brake test inactive, wait for SBT selection |
| 1: | Setpoint input drive |
| 2: | Determining the load |
| 3: | Brake test is initialized, wait for start of test sequence |
| 4: | Start test sequence |
| 5: | Closing the brake, establishing the test torque |
| 6: | Brake test active, wait for test duration sequence |
| 7: | Reduce test torque |
| 8: | Wait for the brake to open |
| 9: | Brake test successfully completed, wait for start deselection |
| 10: | Change to brake test initialized - fault acknowledgment |
| 11: | Brake test canceled, torque is reduced |
| 12: | Brake test canceled, wait for brake to open |
| 13: | Brake test ended with error, wait for acknowledgment |
| 14: | Brake opening timer elapsed |
| 15: | Error when initializing the brake test, wait for acknowledgment |
| 16: | Change to brake test inactive, acknowledgment active |

r10251 **SI Safety Control Channel control word S_STW1B diagnostics**

Data type: Unsigned32 **P group:** -

Description: Displays the diagnostics of control word S_STW1 of the safety control channel.

| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
|-------------------|------------|---|-----------------|-----------------|-----------|
| | 08 | Extended functions test stop selection | Selected | Not selected | 2837 |
| | 12 | Extended Functions premature SOS after STOP D | Selected | Not selected | - |

Note

SCC: Safety Control Channel

p60000 **PROFIdrive reference speed**
Changeable: T **Data type:** FloatingPoint32 **P group:** Communications
Min: 6.00 [rpm] **Max:** 210000.00 [rpm] **Def:** 3000.00 [rpm]

Description: Sets the reference quantity for the speed values.
All speeds specified as relative values refer to this reference quantity.
The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

Dependency: See also: p2000

Note

Parameter p60000 is an image of parameter p2000 in conformance with PROFIdrive.
A change always effects both parameters.

r60022 **PROFIsafe telegram selection**
Data type: Unsigned16 **P group:** Safety Integrated
Description: Displays the number of the PROFIsafe send and receive telegrams.
The drive takes this number from the higher-level control system.
Value: 0: No PROFIsafe telegram selected
30: PROFIsafe standard telegram 30, PZD-1/1
901: PROFIsafe SIEMENS telegram 901, PZD-3/5
Dependency: See also: p9611

r60122 **PROFIdrive SIC/SCC telegram selection**
Data type: Unsigned16 **P group:** Communications
Description: Displays the telegram for the safety information channel (SIC) / safety control channel (SCC).
SIC/SCC telegram p60122 is attached directly to the PZD telegram p0922.
Value: 700: Supplementary telegram 700, PZD-0/3
701: Supplementary telegram 701, PZD-2/5
999: No telegram
Dependency: For p8864 equal to 999, then p60122 is locked.

r61000[0...239] **PROFINET Name of Station**
Data type: Unsigned8 **P group:** -
Description: Displays PROFINET Name of Station.

r61001[0...3] **PROFINET IP of Station**
Data type: Unsigned8 **P group:** -
Description: Displays PROFINET IP of Station.

Faults and alarms

13.1 Overview of faults and alarms

Explanations for the list of faults and alarms

A message comprises a letter followed by the relevant number.

The letters have the following meaning:

- A means "Alarm"
- F means "Fault"
- N means "No message" or "Internal message"
- C means "Safety message"

Information about reaction and acknowledgment is specified independently for a message with changeable message type (e.g. reaction to F, acknowledgment to F).

Detailed examples:

| | |
|--------|----------------------|
| Axxxxx | Alarm xxxxx |
| Fxxxxx | Fault xxxxx |
| Nxxxxx | No message |
| Cxxxxx | Safety message xxxxx |

13.2 List of faults and alarms

Product: SINAMICS S210, version: 5101800

All objects: S210

F01000 Internal software error

Message value: Module: %1, line: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: An internal software error has occurred.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

Remedy:

- evaluate fault buffer (r0945).
- carry out a POWER ON (switch-off/switch-on) for all components.
- if required, check the data on the non-volatile memory (e.g. memory card).
- upgrade firmware to later version.
- contact Technical Support.
- replace the Control Unit.

F01001 FloatingPoint exception

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: An exception occurred during an operation with the FloatingPoint data type.
The error may be caused by the basic system or a technology function (e.g. FBLOCKS, DCC, TEC).
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

Note:

Refer to r9999 for further information about this fault.

r9999[0]: Fault number.

r9999[1]: Program counter at the time when the exception occurred.

r9999[2]: Cause of the FloatingPoint exception.

Bit 0 = 1: Operation invalid

Bit 1 = 1: Division by zero

Bit 2 = 1: Overflow

Bit 3 = 1: Underflow

Bit 4 = 1: Inaccurate result

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- check configuration and signals of the blocks in FBLOCKS.
- check configuration and signals of DCC charts.
- check configuration and signals of TEC charts.
- upgrade firmware to later version.
- contact Technical Support.

F01002 Internal software error

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY
Cause: An internal software error has occurred.
 Fault value (r0949, interpret hexadecimal):
 Only for internal Siemens troubleshooting.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.

F01003 Acknowledgment delay when accessing the memory

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A memory area was accessed that does not return a "READY".
 Fault value (r0949, interpret hexadecimal):
 Only for internal Siemens troubleshooting.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - contact Technical Support.

N01004 (F, A) Internal software error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An internal software error has occurred.
 Fault value (r0949, hexadecimal):
 Only for internal Siemens troubleshooting.
Remedy: - read out diagnostics parameter (r9999).
 - contact Technical Support.
Reaction upon F: OFF2
Acknowl. upon F: POWER ON
Reaction upon A: NONE
Acknowl. upon A: NONE

F01005 Firmware download for DRIVE-CLiQ component unsuccessful

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: It was not possible to download the firmware to a DRIVE-CLiQ component.
Fault value (r0949, interpret hexadecimal):
yyxxxx hex: yy = component number, xxxx = fault cause
xxxx = 000B hex = 11 dec:
DRIVE-CLiQ component has detected a checksum error.
xxxx = 000F hex = 15 dec:
The selected DRIVE-CLiQ component did not accept the contents of the firmware file.
xxxx = 0012 hex = 18 dec:
Firmware version is too old and is not accepted by the component.
xxxx = 0013 hex = 19 dec:
Firmware version is not suitable for the hardware release of the component.
xxxx = 0065 hex = 101 dec:
After several communication attempts, no response from the DRIVE-CLiQ component.
xxxx = 008B hex = 139 dec:
Initially, a new boot loader is loaded (must be repeated after POWER ON).
xxxx = 008C hex = 140 dec:
Firmware file for the DRIVE-CLiQ component not available on the memory card.
xxxx = 008D hex = 141 dec:
An inconsistent length of the firmware file was signaled. The firmware download may have been caused by a loss of connection to the firmware file. This can occur during a project download/reset in the case of a SINAMICS Integrated Control Unit, for example.
xxxx = 008F hex = 143 dec:
Component has not changed to the mode for firmware download. It was not possible to delete the existing firmware.
xxxx = 0090 hex = 144 dec:
When checking the firmware that was downloaded (checksum), the component detected a fault. It is possible that the file on the memory card is defective.
xxxx = 0091 hex = 145 dec:
Checking the loaded firmware (checksum) was not completed by the component in the appropriate time.
xxxx = 009C hex = 156 dec:
Component with the specified component number is not available (p7828).
xxxx = Additional values:
Only for internal Siemens troubleshooting.

Remedy:

- check the selected component number (p7828).
- check the DRIVE-CLiQ wiring.
- save suitable firmware file for download in the directory "/siemens/sinamics/code/sac/".
- use a component with a suitable hardware version
- after POWER ON has been carried out again for the DRIVE-CLiQ component, download firmware again. Depending on p7826, the firmware will be automatically downloaded.

A01006 Firmware update for DRIVE-CLiQ component required

Message value: Component number: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The firmware of a DRIVE-CLiQ component must be updated as there is no suitable firmware or firmware version in the component for operation with the Control Unit.
Alarm value (r2124, interpret decimal):
Component number of the DRIVE-CLiQ component.

Remedy: Update the firmware using the commissioning tool:
 The firmware version of all of the components on the "Version overview" page can be read in the Project Navigator under "Configuration" of the associated drive unit and an appropriate firmware update can be carried out.
 Firmware update via parameter:
 - take the component number from the alarm value and enter into p7828.
 - start the firmware download with p7829 = 1.

A01007 POWER ON for DRIVE-CLiQ component required

Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A DRIVE-CLiQ component must be switched on again (POWER ON) (e.g. due to a firmware update).
 Alarm value (r2124, interpret decimal):
 Component number of the DRIVE-CLiQ component.
 Note:
 For a component number = 1, a POWER ON of the Control Unit is required.
Remedy:
 - Switch off the power supply of the specified DRIVE-CLiQ component and switch it on again.
 - For SINUMERIK, auto commissioning is prevented. In this case, a POWER ON is required for all components and the auto commissioning must be restarted.

A01009 (N) CU: Control module overtemperature

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature (r0037[0]) of the control module (Control Unit) has exceeded the specified limit value.
Remedy:
 - check the air intake for the Control Unit.
 - check the Control Unit fan.
 Note:
 The alarm is automatically withdrawn once the limit value has been fallen below.
Reaction upon N: NONE
Acknowl. upon N: NONE

F01010 Drive type unknown

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: An unknown drive type was found.
 Fault value (r0949, interpret decimal):
 Drive object number (refer to p0101, p0107).
Remedy:
 - replace Power Module.
 - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.

F01011 (N) Download interrupted

Message value: %1
Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The project download was interrupted.
Fault value (r0949, interpret decimal):
1: The user prematurely interrupted the project download.
2: The communication cable was interrupted (e.g. cable breakage, cable withdrawn).
3: The project download was prematurely terminated by the commissioning tool (e.g. STARTER, SCOUT).
100: Different versions between the firmware version and project files which were loaded by loading into the file system "Download from memory card".
Note:
The response to an interrupted download is the state "first commissioning".
Remedy:
- check the communication cable.
- download the project again.
- boot from previously saved files (switch-off/switch-on or p0976).
- when loading into the file system (download from memory card), use the matching version.
Reaction upon N: NONE
Acknowl. upon N: NONE

F01012 (N) Project conversion error

Message value: %1
Drive object: All objects
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: When converting the project of an older firmware version, an error occurred.
Fault value (r0949, interpret decimal):
Parameter number of the parameter causing the error.
For fault value = 600, the following applies:
The temperature evaluation is no longer assigned to the power unit but to the encoder evaluation.
Notice:
Monitoring of the motor temperature is no longer ensured.
Remedy: Check the parameter indicated in the fault value and correctly adjust it accordingly.
For fault value = 600:
Parameter p0600 must be set to the values 1, 2 or 3 in accordance with the assignment of the internal encoder evaluation to the encoder interface.
Value 1 means: The internal encoder evaluation is assigned to the encoder interface 1 via p0187.
Value 2 means: The internal encoder evaluation is assigned to the encoder interface 2 via p0188.
Value 3 means: The internal encoder evaluation is assigned to the encoder interface 3 via p0189.
- if necessary, the internal encoder evaluation must be assigned to an encoder interface via parameters p0187, p0188 or p0189 accordingly.
- if necessary, upgrade the firmware to a later version.
Reaction upon N: NONE
Acknowl. upon N: NONE

F01015 Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: An internal software error has occurred.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.
- contact Technical Support.

A01016 (F) Firmware changed

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: At least one firmware file in the directory was illegally changed on the non-volatile memory (memory card/device memory) with respect to the version when shipped from the factory.

Alarm value (r2124, interpret decimal):

0: Checksum of one file is incorrect.

1: File missing.

2: File too many.

3: Incorrect firmware version.

4: Incorrect checksum of the back-up file.

Remedy: For the non-volatile memory for the firmware (memory card/device memory), restore the delivery condition.

Note:

The file involved can be read out using parameter r9925.

The status of the firmware check is displayed using r9926.

Reaction upon F: OFF2

Acknowl. upon F: POWER ON

A01017 Component lists changed

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: On the memory card, one file in the directory /SIEMENS/SINAMICS/DATA or /ADDON/SINAMICS/DATA has been illegally changed with respect to that supplied from the factory. No changes are permitted in this directory.
Alarm value (r2124, interpret decimal):
zyx dec: x = Problem, y = Directory, z = File name
x = 1: File does not exist.
x = 2: Firmware version of the file does not match the software version.
x = 3: File checksum is incorrect.
y = 0: Directory /SIEMENS/SINAMICS/DATA/
y = 1: Directory /ADDON/SINAMICS/DATA/
z = 0: File MOTARM.ACX
z = 1: File MOTSRM.ACX
z = 2: File MOTSLM.ACX
z = 3: File ENCDATA.ACX
z = 4: File FILTDATA.ACX
z = 5: File BRKDATA.ACX
z = 6: File DAT_BEAR.ACX
z = 7: File CFG_BEAR.ACX
z = 8: File ENC_GEAR.ACX
z = 9: File CFG_BRK.ACX
z = 10: File THERMMOTMOD.ACX
z = 11: File MAPPING.ACX
z = 12: File LOADGEAR.ACX
z = 13: File MOTRSM.ACX

Remedy: For the file on the memory card involved, restore the status originally supplied from the factory.

F01018 Booting has been interrupted several times

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: POWER ON
Cause: Module booting was interrupted several times. As a consequence, the module boots with the factory setting.
Possible reasons for booting being interrupted:
- power supply interrupted.
- CPU crashed.
- parameterization invalid.

Remedy: - carry out a POWER ON (switch-off/switch-on). After switching on, the module reboots from the valid parameterization (if available).
- restore the valid parameterization.
Examples:
a) Carry out a first commissioning, save, carry out a POWER ON (switch-off/switch-on).
b) Load another valid parameter backup (e.g. from the memory card), save, carry out a POWER ON (switch-off/switch-on).
Note:
If the fault situation is repeated, then this fault is again output after several interrupted boots.

A01019 Writing to the removable data medium unsuccessful

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The write access to the removable data medium was unsuccessful.
Remedy: Remove and check the removable data medium. Then run the data backup again.

A01020 Writing to RAM disk unsuccessful

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A write access to the internal RAM disk was unsuccessful.
Remedy: Adapt the file size for the system logbook to the internal RAM disk (p9930).

F01023 Software timeout (internal)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: An internal software timeout has occurred.
 Fault value (r0949, interpret decimal):
 Only for internal Siemens troubleshooting.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.

F01030 Sign-of-life failure for master control

Message value: -
Drive object: All objects
Reaction: Servo: OFF3 (IASC/DCBRK, NONE, OFF1, OFF2, STOP2)
Acknowledge: IMMEDIATELY
Cause: For active PC master control, no sign-of-life was received within the monitoring time.
 The master control was returned to the active BICO interconnection.
Remedy: Set the monitoring time higher at the PC or, if required, completely disable the monitoring function.
 The monitoring time is set as follows using the commissioning tool:
 <Drive> -> Commissioning -> Control panel -> Button "Fetch master control" -> A window is displayed to set the monitoring time in milliseconds.
 Notice:
 The monitoring time should be set as short as possible. A long monitoring time means a late response when the communication fails!

F01031 Sign-of-life failure for OFF in REMOTE

Message value: -
Drive object: All objects
Reaction: Servo: OFF3 (IASC/DCBRK, NONE, OFF1, OFF2, STOP2)
Acknowledge: IMMEDIATELY
Cause: With the "OFF in REMOTE" mode active, no sign-of-life was received within 3 seconds.
Remedy: - check the data cable connection at the serial interface for the Control Unit (CU) and operator panel.
 - check the data cable between the Control Unit and operator panel.

A01032 (F) ACX: all parameters must be saved

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: The parameters of an individual drive object were saved (p0971 = 1), although there is still no backup of all drive system parameters.
The saved object-specific parameters are not loaded the next time that the system powers up.
For the system to successfully power up, all of the parameters must have been completely backed up.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: Save all parameters (p0977 = 1 or "copy RAM to ROM").
See also: p0977 (Save all parameters)

Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

F01033 Units changeover: Reference parameter value invalid

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: When changing over the units to the referred representation type, it is not permissible for any of the required reference parameters to be equal to 0.0
Fault value (r0949, parameter):
Reference parameter whose value is 0.0.

Remedy: Set the value of the reference parameter to a number different than 0.0.
See also: p0304, r0304, p0305, r0305, p2000, p2003

F01034 Units changeover: Calculation parameter values after reference value change unsuccessful

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The change of a reference parameter meant that for an involved parameter the selected value was not able to be re-calculated in the per unit representation. The change was rejected and the original parameter value restored.
Fault value (r0949, parameter):
Parameter whose value was not able to be re-calculated.
See also: p0304, r0304, p0305, r0305, p2000, p2003

Remedy: - Select the value of the reference parameter such that the parameter involved can be calculated in the per unit representation.
- Technology unit selection (p0595) before changing the reference parameter p0596, set p0595 = 1.

A01035 (F) ACX: Parameter back-up file corrupted

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: When the Control Unit is booted, no complete data set was found from the parameter back-up files. The last time that the parameterization was saved, it was not completely carried out.
 It is possible that the backup was interrupted by switching off or withdrawing the memory card.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 aa = 01 hex:
 Power up was realized without data backup. The drive is in the factory setting.
 aa = 02 hex:
 The last available backup data record was loaded. The parameterization must be checked. It is recommended that the parameterization is downloaded again.
 dd, cc, bb:
 Only for internal Siemens troubleshooting.
 See also: p0977

Remedy: - download the project again using the commissioning tool.
 - save all parameters (p0977 = 1 or "copy RAM to ROM").
 See also: p0977 (Save all parameters)

Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

F01036 (A) ACX: Parameter back-up file missing

Message value: %1

Drive object: All objects

Reaction: Servo: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: When downloading the device parameterization, a parameter back-up file PSxxxxyy.ACX associated with a drive object cannot be found.
 Fault value (r0949, interpret hexadecimal):
 Byte 1: yyy in the file name PSxxxxyy.ACX
 yyy = 000 --> consistency back-up file
 yyy = 001 ... 062 --> drive object number
 yyy = 099 --> PROFIBUS parameter back-up file
 Byte 2, 3, 4:
 Only for internal Siemens troubleshooting.

Remedy: If you have saved your project data using the commissioning tool, carry-out a new download for your project.
 Save using the function "Copy RAM to ROM" or with p0977 = 1.
 This means that the parameter files are again completely written into the non-volatile memory.
 Note:
 If the project data have not been backed up, then a new first commissioning is required.

Reaction upon A: NONE

Acknowl. upon A: NONE

F01038 (A) ACX: Loading the parameter back-up file unsuccessful

Message value: %1

Drive object: All objects

Reaction: Servo: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An error has occurred when downloading PSxxxxxyy.ACX or PTxxxxxyy.ACX files from the non-volatile memory.
Fault value (r0949, interpret hexadecimal):
Byte 1: yyy in the file name PSxxxxxyy.ACX
yyy = 000 --> consistency back-up file
yyy = 001 ... 062 --> drive object number
yyy = 099 --> PROFIBUS parameter back-up file
Byte 2:
255: Incorrect drive object type.
254: Topology comparison unsuccessful -> drive object type was not able to be identified.
Reasons could be:
- incorrect component type in the actual topology
- Component does not exist in the actual topology.
- Component not active.
Additional values:
Only for internal Siemens troubleshooting.
Byte 4, 3:
Only for internal Siemens troubleshooting.

Remedy: - if you have saved the project data using the commissioning tool, download the project again. Save using the function "Copy RAM to ROM" or with p0977 = 1. This means that the parameter files are again completely written to the non-volatile memory.
- replace the memory card or Control Unit.
For byte 2 = 255:
- correct the drive object type (see p0107).

Reaction upon A: NONE
Acknowl. upon A: NONE

F01039 (A) ACX: Writing to the parameter back-up file was unsuccessful

Message value: %1
Drive object: All objects
Reaction: Servo: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY

Cause: Writing to at least one parameter back-up file PSxxxxyy.*** in the non-volatile memory was unsuccessful.
- in the directory /USER/SINAMICS/DATA/ at least one parameter back-up file PSxxxxyy.*** has the "read only" file attribute and cannot be overwritten.
- there is not sufficient free memory space available.
- the non-volatile memory is defective and cannot be written to.
Fault value (r0949, interpret hexadecimal):
dcb hex
a = yyy in the file names PSxxxxyy.***
a = 000 --> consistency back-up file
a = 001 ... 062 --> drive object number
a = 070 --> FEPROM.BIN
a = 080 --> DEL4BOOT.TXT
a = 099 --> PROFIBUS parameter back-up file
b = xx in the file names PSxxxxyy.***
b = 000 --> data save started with p0977 = 1 or p0971 = 1
b = 010 --> data save started with p0977 = 10
b = 011 --> data save started with p0977 = 11
b = 012 --> data save started with p0977 = 12
d, c:
Only for internal Siemens troubleshooting.

Remedy:

- check the file attribute of the files (PSxxxxxyy.***, CAxxxxyy.***, CCxxxxyy.***) and, if required, change from "read only" to "writeable".
- check the free memory space in the non-volatile memory. Approx. 80 kbyte of free memory space is required for every drive object in the system.
- replace the memory card or Control Unit.

Reaction upon A: NONE

Acknowl. upon A: NONE

F01040 Save parameter settings and carry out a POWER ON

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: A parameter was changed in the drive system which means that it is necessary to save the parameters and re-boot.

Remedy:

- save parameters (p0971, p0977).
- carry out a POWER ON (switch-off/switch-on) for all components.

Then:

- upload the drive unit (commissioning tool).

F01041 Parameter save necessary

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: Defective or missing files were detected on the memory card when booting.
 Fault value (r0949, interpret decimal):

- 1: Source file cannot be opened.
- 2: Source file cannot be read.
- 3: Target directory cannot be set up.
- 4: Target file cannot be set up/opened.
- 5: Target file cannot be written to.

Additional values:
 Only for internal Siemens troubleshooting.

Remedy:

- save the parameters.
- download the project again to the drive unit.
- update the firmware
- if required, replace the Control Unit and/or memory card card.

F01042 Parameter error during project download

Message value: Parameter: %1, Index: %2, fault cause: %3

Drive object: All objects

Reaction: Servo: OFF2 (NONE, OFF1, OFF3)

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

- Cause:** An error was detected when downloading a project using the commissioning software (e.g. incorrect parameter value). It is possible that the parameter limits are dependent on other parameters.
The detailed cause of the fault can be determined using the fault value.
Fault value (r0949, interpret hexadecimal):
ccbbaaaa hex
aaaa = Parameter
bb = Index
cc = fault cause
- 0: Parameter number illegal.
 - 1: Parameter value cannot be changed.
 - 2: Lower or upper value limit exceeded.
 - 3: Sub-index incorrect.
 - 4: No array, no sub-index.
 - 5: Data type incorrect.
 - 6: Setting not permitted (only resetting).
 - 7: Descriptive element cannot be changed.
 - 9: Descriptive data not available.
 - 11: No master control.
 - 15: No text array available.
 - 17: Task cannot be executed due to operating state.
 - 20: Illegal value.
 - 21: Response too long.
 - 22: Parameter address illegal.
 - 23: Format illegal.
 - 24: Number of values not consistent.
 - 25: Drive object does not exist.
 - 101: Presently deactivated.
 - 104: Illegal value.
 - 107: Write access not permitted when controller enabled.
 - 108: Unit unknown.
 - 109: Write access only in the commissioning state, encoder (p0010 = 4).
 - 110: Write access only in the commissioning state, motor (p0010 = 3).
 - 111: Write access only in the commissioning state, power unit (p0010 = 2).
 - 112: Write access only in the quick commissioning mode (p0010 = 1).
 - 113: Write access only in the ready mode (p0010 = 0).
 - 114: Write access only in the commissioning state, parameter reset (p0010 = 30).
 - 115: Write access only in the Safety Integrated commissioning state (p0010 = 95).
 - 116: Write access only in the commissioning state, technological application/units (p0010 = 5).
 - 117: Write access only in the commissioning state (p0010 not equal to 0).
 - 118: Write access only in the commissioning state, download (p0010 = 29).
 - 119: Parameter may not be written in download.
 - 120: Write access only in the commissioning state, drive basic configuration (device: p0009 = 3).
 - 121: Write access only in the commissioning state, define drive type (device: p0009 = 2).
 - 122: Write access only in the commissioning state, data set basic configuration (device: p0009 = 4).
 - 123: Write access only in the commissioning state, device configuration (device: p0009 = 1).
 - 124: Write access only in the commissioning state, device download (device: p0009 = 29).
 - 125: Write access only in the commissioning state, device parameter reset (device: p0009 = 30).
 - 126: Write access only in the commissioning state, device ready (device: p0009 = 0).
 - 127: Write access only in the commissioning state, device (device: p0009 not equal to 0).
 - 129: Parameter may not be written in download.
 - 130: Transfer of the master control is inhibited via binector input p0806.
 - 131: Required BICO interconnection not possible because BICO output does not supply floating value

- 132: Free BICO interconnection inhibited via p0922.
- 133: Access method not defined.
- 200: Below the valid values.
- 201: Above the valid values.
- 202: Cannot be accessed from the Basic Operator Panel (BOP).
- 203: Cannot be read from the Basic Operator Panel (BOP).
- 204: Write access not permitted.

Remedy:

- correct the parameterization in the commissioning tool and download the project again.
- enter the correct value in the specified parameter.
- identify the parameter that restricts the limits of the specified parameter.

F01043 Fatal error at project download

Message value: Fault cause: %1

Drive object: All objects

Reaction: Servo: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: A fatal error was detected when downloading a project using the commissioning tool.

Fault value (r0949, interpret decimal):

- 1: Device status cannot be changed to Device Download (drive object ON?).
- 2: Incorrect drive object number.
- 3: A drive object that has already been deleted is deleted again.
- 4: Deleting of a drive object that has already been registered for generation.
- 5: Deleting a drive object that does not exist.
- 6: Generating an undeleted drive object that already existed.
- 7: Regenerating a drive object already registered for generation.
- 8: Maximum number of drive objects that can be generated exceeded.
- 9: Error while generating a device drive object.
- 10: Error while generating target topology parameters (p9902 and p9903).
- 11: Error while generating a drive object (global component).
- 12: Error while generating a drive object (drive component).
- 13: Unknown drive object type.
- 14: Drive status cannot be changed to "ready for operation" (r0947 and r0949).
- 15: Drive status cannot be changed to drive download.
- 16: Device status cannot be changed to "ready for operation".
- 17: It is not possible to download the topology. The component wiring should be checked, taking into account the various messages/signals.
- 18: A new download is only possible if the factory settings are restored for the drive unit.
- 19: The slot for the option module has been configured several times (e.g. CAN and COMM BOARD)
- 20: The configuration is inconsistent (e.g. CAN for Control Unit, however no CAN configured for drive objects A_INF, SERVO or VECTOR).
- 21: Error when accepting the download parameters.
- 22: Software-internal download error.
- 23: download not possible when know-how protection is activated.
- 24: download not possible during a partial power up after inserting a component.
- 25: The configuration is inconsistent. Know-how protection is either not activated or only partially.

Additional values:

Only for internal Siemens troubleshooting.

13.2 List of faults and alarms

- Remedy:**
- use the current version of the commissioning tool.
 - modify the offline project and carry out a new download (e.g. compare the number of drive objects, motor, encoder, power unit in the offline project and at the drive).
 - change the drive state (is a drive rotating or is there a message/signal?).
 - carefully note any other active messages/signals and remove their cause (e.g. correct any incorrectly set parameters).
 - automatically calculate the control parameters (p0340). Then set p0010 = 0.
 - boot from previously saved files (switch-off/switch-on or p0976).
 - before a new download, restore the factory setting if the know-how protection was not activated on all drive objects.

F01044 CU: Descriptive data error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: An error was detected when loading the descriptive data saved in the non-volatile memory.
Remedy: Replace the memory card or Control Unit.

A01045 CU: Configuring data invalid

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An error was detected when evaluating the parameter files PSxxxxxyy.ACX, PTxxxxyyy.ACX, CAxxxxyyy.ACX, or CCxxxxyyy.ACX saved in the non-volatile memory. Because of this, under certain circumstances, several of the saved parameter values were not able to be accepted. Also see r9406 up to r9408.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy: - check the parameters displayed in r9406 up to r9408, and correct these if required.
- Restore the factory setting using (p0976 = 1) and re-load the project into the drive unit.
Then save the parameterization in STARTER using the function "Copy RAM to ROM" or with p0977 = 1. This overwrites the incorrect parameter files in the non-volatile memory – and the alarm is withdrawn.

A01049 CU: It is not possible to write to file

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: It is not possible to write into a write-protected file (PSxxxxxx.acx). The write request was interrupted.
Alarm value (r2124, interpret decimal):
Drive object number.
Remedy: Check whether the "write protected" attribute has been set for the files in the non-volatile memory under .../USER/SINAMICS/DATA/...
When required, remove write protection and save again (e.g. set p0977 to 1).

F01050 Memory card and device incompatible

Message value: -
Drive object: All objects
Reaction: Servo: OFF2 (NONE, OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: The memory card and the device type do not match (e.g. a memory card for SINAMICS S is inserted in SINAMICS G).

Remedy:

- insert the matching memory card.
- use the matching Control Unit or power unit.

F01054 CU: System limit exceeded

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: At least one system overload has been identified.

Fault value (r0949, interpret decimal):

1: Computing time load too high (r9976[1]).

5: Peak load too high (r9976[5]).

Note:

As long as this fault is present, it is not possible to save the parameters (p0971, p0977).

Remedy: For fault value = 1, 5:

- reduce the computing time load of the drive unit (r9976[1] and r9976[5]) to under 100 %.

- check the sampling times and adjust if necessary (p0115, p0799, p4099).

- deactivate function modules.

- deactivate drive objects.

- remove drive objects from the target topology.

- note the DRIVE-CLiQ topology rules and if required, change the DRIVE-CLiQ topology.

When using the Drive Control Chart (DCC) or free function blocks (FBLOCKS), the following applies:

- the computing time load of the individual run-time groups on a drive object can be read out in r21005 (DCC) or r20005 (FBLOCKS).

- if necessary, the assignment of the run-time group (p21000, p20000) can be changed in order to increase the sampling time (r21001, r20001).

- if necessary, reduce the number of cyclically calculated blocks (DCC) and/or function blocks (FBLOCKS).

A01064 (F) CU: Internal error (CRC)

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A checksum error (CRC error) has occurred in the Control Unit program memory

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.

- upgrade firmware to later version.

- contact Technical Support.

Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY (POWER ON)

F01068 CU: Data memory memory overflow

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: The utilization for a data memory area is too large.
Fault value (r0949, interpret binary):
Bit 0 = 1: High-speed data memory 1 overloaded
Bit 1 = 1: High-speed data memory 2 overloaded
Bit 2 = 1: High-speed data memory 3 overloaded
Bit 3 = 1: High-speed data memory 4 overloaded

Remedy:

- deactivate the function module.
- deactivate drive object.
- remove the drive object from the target topology.

A01069 Parameter backup and device incompatible

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The parameter backup on the memory card and the drive unit do not match.
The module boots with the factory settings.
Example:
Devices A and B. are not compatible and a memory card with the parameter backup for device A is inserted in device B.

Remedy:

- insert a memory card with compatible parameter backup and carry out a POWER ON.
- insert a memory card without parameter backup and carry out a POWER ON.
- save the parameters (p0977 = 1).

F01072 Memory card restored from the backup copy

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The Control Unit was switched-off while writing to the memory card. This is why the visible partition became defective.
After switching on, the data from the non-visible partition (backup copy) were written to the visible partition.

Remedy: Check that the firmware and parameterization is up-to-date.

A01073 (N) POWER ON required for backup copy on memory card

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The parameter assignment on the visible partition of the memory card has changed.
In order that the backup copy on the memory card is updated on the non-visible partition, it is necessary to carry out a POWER ON or hardware reset (p0972) of the Control Unit.
Note:
It is possible that a new POWER ON is requested via this alarm (e.g. after saving with p0971 = 1).

Remedy:

- carry out a POWER ON (switch-off/switch-on) for the Control Unit.
- carry out a hardware reset (RESET button, p0972).

Reaction upon N: NONE

Acknowl. upon N: NONE

F01082 Parameter error when powering up from data backup

Message value: Parameter: %1, Index: %2, fault cause: %3

Drive object: All objects

Reaction: Servo: OFF2 (NONE, OFF1, OFF3)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

- Cause:** Parameterizing errors have been detected (e.g. incorrect parameter value). It is possible that the parameter limits are dependent on other parameters.
The detailed cause of the fault can be determined using the fault value.
Fault value (r0949, interpret hexadecimal):
ccbbaaaa hex
aaaa = Parameter
bb = Index
cc = fault cause
- 0: Parameter number illegal.
 - 1: Parameter value cannot be changed.
 - 2: Lower or upper value limit exceeded.
 - 3: Sub-index incorrect.
 - 4: No array, no sub-index.
 - 5: Data type incorrect.
 - 6: Setting not permitted (only resetting).
 - 7: Descriptive element cannot be changed.
 - 9: Descriptive data not available.
 - 11: No master control.
 - 15: No text array available.
 - 17: Task cannot be executed due to operating state.
 - 20: Illegal value.
 - 21: Response too long.
 - 22: Parameter address illegal.
 - 23: Format illegal.
 - 24: Number of values not consistent.
 - 25: Drive object does not exist.
 - 101: Presently deactivated.
 - 104: Illegal value.
 - 107: Write access not permitted when controller enabled.
 - 108: Unit unknown.
 - 109: Write access only in the commissioning state, encoder (p0010 = 4).
 - 110: Write access only in the commissioning state, motor (p0010 = 3).
 - 111: Write access only in the commissioning state, power unit (p0010 = 2).
 - 112: Write access only in the quick commissioning mode (p0010 = 1).
 - 113: Write access only in the ready mode (p0010 = 0).
 - 114: Write access only in the commissioning state, parameter reset (p0010 = 30).
 - 115: Write access only in the Safety Integrated commissioning state (p0010 = 95).
 - 116: Write access only in the commissioning state, technological application/units (p0010 = 5).
 - 117: Write access only in the commissioning state (p0010 not equal to 0).
 - 118: Write access only in the commissioning state, download (p0010 = 29).
 - 119: Parameter may not be written in download.
 - 120: Write access only in the commissioning state, drive basic configuration (device: p0009 = 3).
 - 121: Write access only in the commissioning state, define drive type (device: p0009 = 2).
 - 122: Write access only in the commissioning state, data set basic configuration (device: p0009 = 4).
 - 123: Write access only in the commissioning state, device configuration (device: p0009 = 1).
 - 124: Write access only in the commissioning state, device download (device: p0009 = 29).
 - 125: Write access only in the commissioning state, device parameter reset (device: p0009 = 30).
 - 126: Write access only in the commissioning state, device ready (device: p0009 = 0).
 - 127: Write access only in the commissioning state, device (device: p0009 not equal to 0).
 - 129: Parameter may not be written in download.
 - 130: Transfer of the master control is inhibited via binector input p0806.
 - 131: Required BICO interconnection not possible because BICO output does not supply floating value

- 132: Free BICO interconnection inhibited via p0922.
- 133: Access method not defined.
- 200: Below the valid values.
- 201: Above the valid values.
- 202: Cannot be accessed from the Basic Operator Panel (BOP).
- 203: Cannot be read from the Basic Operator Panel (BOP).
- 204: Write access not permitted.

Remedy:

- correct the parameterization in the commissioning tool and download the project again.
- enter the correct value in the specified parameter.
- identify the parameter that restricts the limits of the specified parameter.

A01097 (N) NTP server cannot be accessed

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The selected NTP server (p3105[0...3]) cannot be accessed. Time synchronization cannot be performed.

Note:
NTP: Network Time Protocol

Remedy: Correctly set the IP address of the NTP server, and check the connection to the NTP server.

Reaction upon N: NONE

Acknowl. upon N: NONE

A01099 (N) UTC synchronization tolerance violated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The tolerance (p3109) set for UTC synchronization was violated.

Note:
UTC: Universal Time Coordinates

Remedy: Select the synchronization intervals shorter so that the deviation between the time of day master and drive system lies within the tolerance.

Note:
The deviation when synchronizing is shown in r3107.

Reaction upon N: NONE

Acknowl. upon N: NONE

F01105 (A) CU: Insufficient memory

Message value: %1

Drive object: All objects

Reaction: OFF1

Acknowledge: POWER ON

Cause: Too many functions have been configured on this Control Unit (e.g. too many drives, function modules, data sets, Technology Extensions, blocks, etc).

Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- change the configuration on this Control Unit (e.g. fewer drives, function modules, data sets, Technology Extensions, blocks, etc).
- use an additional Control Unit.

13.2 List of faults and alarms

Reaction upon A: NONE

Acknowl. upon A: NONE

F01107 CU: Save to memory card unsuccessful

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: A data save in the non-volatile memory was not able to be successfully carried out.

- non-volatile memory is defective.
- insufficient space in the non-volatile memory.

Fault value (r0949, interpret decimal):

Only for internal Siemens troubleshooting.

Remedy: - try to save again.

- replace the memory card or Control Unit.

F01110 CU: More than one SINAMICS G on one Control Unit

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: More than one SINAMICS G type power unit is being operated from the Control Unit.

Fault value (r0949, interpret decimal):

Number of the second drive with a SINAMICS G type power unit.

Remedy: Only one SINAMICS G drive type is permitted.

F01111 CU: Mixed operation of drive units illegal

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: Illegal operation of various drive units on one Control Unit:

- SINAMICS S together with SINAMICS G
- SINAMICS S together with SINAMICS S Value or Combi

Fault value (r0949, interpret decimal):

Number of the first drive object with a different power unit type.

Remedy: Only power units of one particular drive type may be operated with one Control Unit.

F01112 CU: Power unit not permissible

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The connected power unit cannot be used together with this Control Unit.

Fault value (r0949, interpret decimal):

- 1: Power unit is not supported (e.g. PM240).
- 2: DC/AC power unit connected to CU310 not permissible.
- 3: Power unit (S120M) not permitted for vector control.

Remedy: Replace the power unit that is not permissible by a component that is permissible.

F01120 (A) Terminal initialization has failed

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: An internal software error occurred while the terminal functions were being initialized.
 Fault value (r0949, interpret hexadecimal):
 Only for internal Siemens troubleshooting.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.
 - replace the Control Unit.
Reaction upon A: NONE
Acknowl. upon A: NONE

F01122 (A) Frequency at the measuring probe input too high

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: The frequency of the pulses at the measuring probe input is too high.
 Fault value (r0949, interpret decimal):
 1: DI/DO 9 (X122.8)
 2: DI/DO 10 (X122.10)
 4: DI/DO 11 (X122.11)
 8: DI/DO 13 (X132.8)
 16: DI/DO 14 (X132.10)
 32: DI/DO 15 (X132.11)
 64: DI/DO 8 (X122.7)
 128: DI/DO 12 (X132.7)
Remedy: Reduce the frequency of the pulses at the measuring probe input.
Reaction upon A: NONE
Acknowl. upon A: NONE

F01150 CU: Number of instances of a drive object type exceeded

Message value: Drive object type: %1, number permitted: %2, actual number: %3
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The maximum permissible number of instances of a drive object type was exceeded.
 Drive object type:
 Drive object type (p0107), for which the maximum permissible number of instances was exceeded.
 Number permitted:
 Max. permissible number of instances for this drive object type.
 Actual number:
 Current number of instances for this drive object type.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 ddccbaa hex: aa = drive object type, bb = number limited, cc = actual number, dd = no significance

13.2 List of faults and alarms

Remedy:

- switch off the unit.
- suitably restrict the number of instances of a drive object type by reducing the number of inserted components.
- re-commission the unit.

F01151 CU: Number of drive objects of a category exceeded

Message value: Drive object category: %1, number permitted: %2, actual number: %3
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The maximum permissible number of drive objects of a category was exceeded.
Drive object category:
Drive object category, for which the maximum permissible number of drive objects was exceeded.
Number permitted:
Max. permissible number for this drive object category.
Actual number:
Actual number for this drive object category.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
ddccbbaa hex: aa = drive object category, bb = number limited, cc = actual number, dd = no significance

Remedy:

- switch off the unit.
- suitably restrict the number of drive objects of the specified category by reducing the number of inserted components.
- re-commission the unit.

F01152 CU: Invalid constellation of drive object types

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: POWER ON
Cause: It is not possible to simultaneously operate drive object types SERVO, VECTOR and HLA.
A maximum of 2 of these drive object types can be operated on a Control Unit.

Remedy:

- switch off the unit.
- restrict the use of drive object types SERVO, VECTOR, HLA to a maximum of 2.
- re-commission the unit.

F01200 CU: Time slice management internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A time slice management error has occurred.
It is possible that the sampling times have been inadmissibly set.
Fault value (r0949, interpret hexadecimal):
998:
Too many time slices occupied by technology functions (e.g. DCC).
999:
Too many time slices occupied by the basic system. Too many different sampling times may have been set.
Additional values:
Only for internal Siemens troubleshooting.

Remedy:

- check the sampling time setting (p0112, p0115, p4099, p9500, p9511).
- contact Technical Support.

F01205 CU: Time slice overflow

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: Insufficient processing time is available for the existing topology.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy: - reduce the number of drives.
- increase the sampling times.

F01221 CU: Basic clock cycle too low

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The closed-loop control / monitoring cannot maintain the envisaged clock cycle.
The runtime of the closed-loop control/monitoring is too long for the particular clock cycle or the computing time remaining in the system is not sufficient for the closed-loop control/monitoring.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy: Increase the basic clock cycle of DRIVE-CLiQ communication.

A01223 CU: Sampling time inconsistent

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

- Cause:** When changing a sampling time (p0115[0], p0799 or p4099), inconsistency between the clock cycles has been identified.
Alarm value (r2124, interpret decimal):
- 1: Value lower than minimum value.
 - 2: Value higher than maximum value.
 - 3: Value not a multiple of 1.25 μ s.
 - 4: Value does not match isochronous PROFIBUS operation.
 - 5: Value not a multiple of 125 μ s.
 - 6: Value not a multiple of 250 μ s.
 - 7: Value not a multiple of 375 μ s.
 - 8: Value not a multiple of 400 μ s.
 - 10: Special restriction of the drive object violated.
 - 20: On a SERVO with a sampling time of 62.5 μ s, more than two drive objects or one drive object of a type other than SERVO have been detected on the same DRIVE-CLiQ line (a maximum of two SERVO type drive objects are permitted).
 - 21: Value can be a multiple of the current controller sampling time of a servo or vector drive in the system (e.g. for TB30, the values of all of the indices should be taken into account).
 - 30: Value less than 31.25 μ s.
 - 31: Value less than 62.5 μ s (31.25 μ s is not supported for SMC10, SMC30, SMI10 and Double Motor Modules).
 - 32: Value less than 125 μ s.
 - 33: Value less than 250 μ s.
 - 40: Nodes have been identified on the DRIVE-CLiQ line whose highest common denominator of the sampling times is less than 125 μ s. Further, none of the nodes has a sampling time of less than 125 μ s.
 - 41: A chassis unit was identified on the DRIVE-CLiQ line as a node. Further, the highest common denominator of the sampling times of all of the nodes connected to the line is less than 250 μ s.
 - 42: An Active Line Module was identified on the DRIVE-CLiQ line as a node. Further, the highest common denominator of the sampling times of all of the nodes connected to the line is less than 125 μ s.
 - 43: A Voltage Sensing Module (VSM) was identified on the DRIVE-CLiQ line as a node. Further, the highest common denominator of the sampling times of all of the nodes connected to the line is not equal to the current controller sampling time of the drive object of the VSM.
 - 44: The highest common denominator of the sampling times of all of the components connected to the DRIVE-CLiQ line is not the same for all components of this drive object (e.g. there are components on different DRIVE-CLiQ lines on which different highest common denominators are generated).
 - 45: A chassis parallel unit was identified on the DRIVE-CLiQ line as a node. Further, the highest common denominator of the sampling times of all of the nodes connected to the line is less than 162.5 μ s or 187.5 μ s (for a 2x or 3x parallel connection).
 - 46: A node has been identified on the DRIVE-CLiQ line whose sampling time is not a multiple of the lowest sampling time on this line.
 - 52: Nodes have been identified on the DRIVE-CLiQ line whose highest common denominator of the sampling times is less than 31.25 μ s.
 - 54: Nodes have been identified on the DRIVE-CLiQ line whose highest common denominator of the sampling times is less than 62.5 μ s.
 - 56: Nodes have been identified on the DRIVE-CLiQ line whose highest common denominator of the sampling times is less than 125 μ s.
 - 58: Nodes have been identified on the DRIVE-CLiQ line whose highest common denominator of the sampling times is less than 250 μ s.
 - 99: Inconsistency of cross drive objects detected.
 - 116: Recommended clock cycle in r0116[0...1].
- General note:
The topology rules should be noted when connecting up DRIVE-CLiQ (refer to the appropriate product documentation).
The parameters of the sampling times can also be changed with automatic calculations.
Example for highest common denominator: 125 s, 125 μ s, 62.5 μ s --> 62.5 μ s
- Remedy:**
- check the DRIVE-CLiQ cables.
 - set a valid sampling time.

A01224 CU: Pulse frequency inconsistent
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: When changing the minimum pulse frequency (p0113) inconsistency between the pulse frequencies was identified.
 Alarm value (r2124, interpret decimal):
 1: Value lower than minimum value.
 2: Value higher than maximum value.
 3: Resulting sampling time is not a multiple of 1.25 µs.
 4: Value does not match isochronous PROFIBUS operation.
 10: Special restriction of the drive object violated.
 99: Inconsistency of cross drive objects detected.
 116: Recommended clock cycle in r0116[0...1].
Remedy: Set a valid pulse frequency.

F01250 CU: CU-EEPROM incorrect read-only data
Message value: %1
Drive object: All objects
Reaction: NONE (OFF2)
Acknowledge: POWER ON
Cause: Error when reading the read-only data of the EEPROM in the Control Unit.
 Fault value (r0949, interpret decimal):
 Only for internal Siemens troubleshooting.
Remedy: - carry out a POWER ON (switch-off/switch-on).
 - replace the Control Unit.

A01251 CU: CU-EEPROM incorrect read-write data
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when reading the read-write data of the EEPROM in the Control Unit.
 Alarm value (r2124, interpret decimal):
 Only for internal Siemens troubleshooting.
Remedy: For alarm value r2124 < 256, the following applies:
 - carry out a POWER ON (switch-off/switch-on).
 - replace the Control Unit.
 For alarm value r2124 >= 256, the following applies:
 - for the drive object with this alarm, clear the fault memory (p0952 = 0).
 - as an alternative, clear the fault memory of all drive objects (p2147 = 1).
 - replace the Control Unit.

F01255 CU: Option Board EEPROM read-only data error
Message value: %1
Drive object: All objects
Reaction: NONE (OFF2)
Acknowledge: POWER ON

13.2 List of faults and alarms

Cause: Error when reading the read-only data of the EEPROM in the Option Board.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: - carry out a POWER ON (switch-off/switch-on).
- replace the Control Unit.

A01256 CU: Option Board EEPROM read-write data error

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Error when reading the read-write data of the EEPROM in the Option Board.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: - carry out a POWER ON (switch-off/switch-on).
- replace the Control Unit.

A01302 Error in the component trace

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: An error has occurred in the component trace.
The message appears in the following cases:
- upload trace data (p7792 = 1).
- change factory setting (p7790, p7791) for missing property "component trace" (r0193.1 = 0).
Alarm value (r2124, interpret decimal):
1: The DRIVE-CLiQ component does not support the component trace (r0193.1 = 0).
101: Data from trace 1 cannot be read.
102: Data from trace 2 cannot be read.
103: Data from trace 3 cannot be read.
104: Data from trace 4 cannot be read.
105: Data from trace 5 cannot be read.

Remedy: For alarm value = 1:
Upgrade the firmware of the DRIVE-CLiQ component involved.

F01303 Component does not support the required function

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

| | |
|----------------|--|
| Cause: | <p>A function requested by the Control Unit is not supported by a DRIVE-CLiQ component.</p> <p>Fault value (r0949, interpret decimal):</p> <p>1: The component does not support the deactivation.</p> <p>101: The Motor Module does not support an internal armature short-circuit.</p> <p>102: The Motor Module does not support the deactivation.</p> <p>201: The Sensor Module does not support actual value inversion (p0410.0 = 1) when using a Hall sensor (p0404.6 = 1) for the commutation.</p> <p>202: The Sensor Module does not support parking/unparking.</p> <p>203: The Sensor Module does not support the deactivation.</p> <p>204: The firmware of this Terminal Module 15 (TM15) does not support the application TM15DI/DO.</p> <p>205: The Sensor Module does not support the selected temperature evaluation (r0458, r0459).</p> <p>206: The firmware of this Terminal Modules TM41/TM31/TM15 refers to an old firmware version. It is urgently necessary to upgrade the firmware to ensure disturbance-free operation.</p> <p>207: The power unit with this hardware version does not support operation with device supply voltages of less than 380 V.</p> <p>208: The Sensor Module does not support de-selection of commutation with zero mark (via p0430.23).</p> <p>211: The Sensor Module does not support single-track encoders (r0459.10).</p> <p>212: The Sensor Module does not support LVDT sensors (p4677.0).</p> <p>213: The Sensor Module does not support the characteristic type (p4662).</p> <p>214: The power unit does not support the temperature evaluation via PT1000 (r0193).</p> <p>215: The Terminal Module does not support the temperature evaluation via PT1000</p> <p>216: The Voltage Sensing Module (VSM) does not support operation with a PT1000 temperature sensor.</p> |
| Remedy: | <p>Upgrade the firmware of the DRIVE-CLiQ component involved.</p> <p>For fault value = 205, 214, 215:</p> <ul style="list-style-type: none"> - check parameter p0600 and p0601 and if required, adapt. <p>For fault value = 207:</p> <ul style="list-style-type: none"> - replace the power unit or if required set the device supply voltage higher (p0210). <p>For fault value = 208:</p> <ul style="list-style-type: none"> - check parameter p0430.23 and reset if necessary. <p>For fault value = 216:</p> <ul style="list-style-type: none"> - check the setting of the sensor type (p3665). - use a Voltage Sensing module that supports operation with PT1000 (MLFB ...-xxx1). |

| | |
|-------------------------|--|
| A01304 (F) | Firmware version of DRIVE-CLiQ component is not up-to-date |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | <p>The non-volatile memory has a more recent firmware version than the one in the connected DRIVE-CLiQ component.</p> <p>Alarm value (r2124, interpret decimal):</p> <p>Component number of the DRIVE-CLiQ component involved.</p> |
| Remedy: | Update the firmware (p7828, p7829 - or commissioning tool). |
| Reaction upon F: | NONE |
| Acknowl. upon F: | IMMEDIATELY |

| | |
|-----------------------|---|
| F01305 | Topology: Component number missing |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |

13.2 List of faults and alarms

Cause: The component number from the topology was not parameterized (p0121 (for power unit, refer to p0107), p0131 (for servo/ vector drives, refer to p0107), p0141, p0151, p0161).
Fault value (r0949, interpret decimal):
Data set number.
Note:
The fault also occurs if encoders have been configured (p0187 to p0189) but no component numbers exist for them.
In this case, the fault value includes the drive data set number plus 100 * encoder number (e.g. 3xx, if a component number was not entered in p0141 for encoder 3 (p0189)).

Remedy: - enter missing component number.
- if required, remove the component and restart commissioning.

A01306 Firmware of the DRIVE-CLiQ component being updated

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Firmware update is active for at least one DRIVE-CLiQ component.
Alarm value (r2124, interpret decimal):
Component number of the DRIVE-CLiQ component.

Remedy: Not necessary.
This alarm is automatically withdrawn after the firmware update has been completed.

A01314 Topology: Component must not be present

Message value: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For a component, "deactivate and not present" is set but this component is still in the topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
aa = component number
bb = component class of the component
cc = connection number
Note:
Component class and connection number are described in F01375.

Remedy: - remove the corresponding component.
- change the setting "deactivate and not present".
Note:
Under "Topology --> Topology view", the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01317 (N) Deactivated component again present

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: If a component of the target topology for an active drive object is inserted and the associated parameter of the component is set to "deactivate" (p0125, p0145, p0155, p0165).
Note:
This is the only message that is displayed for a deactivated component.

Remedy: The alarm is automatically withdrawn for the following actions:
 - activate the components involved (p0125 = 1, p0145 = 1, p0155 = 1, p0165 = 1).
 - again withdraw the component involved.

Reaction upon N: NONE

Acknowl. upon N: NONE

A01318 BICO: Deactivated interconnections present

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: This alarm is used in the following cases:
 - if an inactive/non-operational drive object is active again/ready for operation
 - if there are items in the list of BI/CI parameters (r9498[0...29], r9499[0...29])
 - if the BICO interconnections saved in the list of BI/CI parameters (r9498[0...29], r9499[0...29]) have actually been changed

Remedy: Reset alarm:
 - set p9496 to 1 or 2
 or
 - deactivate the drive object again.

A01319 Inserted component not initialized

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Initialization is required for at least one inserted component.
 This is only possible if the pulses are inhibited for all the drive objects.

Remedy: Activate pulse inhibit for all drive objects.

A01320 Topology: Drive object number does not exist in configuration

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A drive object number is missing in p0978
 Alarm value (r2124, interpret decimal):
 Index of p0101 under which the missing drive object number can be determined.

Remedy: Set p0009 to 1 and change p0978:
 Rules:
 - p0978 must include all of the drive object numbers (p0101).
 - it is not permissible for a drive object number to be repeated.
 - by entering a 0, the drive objects with PZD are separated from those without PZD.
 - only 2 partial lists are permitted. After the second 0, all values must be 0.
 - dummy drive object numbers (255) are only permitted in the first partial list.

A01321 Topology: Drive object number does not exist in configuration

Message value: %1

Drive object: All objects

Reaction: NONE

13.2 List of faults and alarms

Acknowledge: NONE
Cause: p0978 contains a drive object number that does not exist.
Alarm value (r2124, interpret decimal):
Index of p0978 under which the drive object number can be determined.
Remedy: Set p0009 to 1 and change p0978:
Rules:
- p0978 must include all of the drive object numbers (p0101).
- it is not permissible for a drive object number to be repeated.
- by entering a 0, the drive objects with PZD are separated from those without PZD.
- only 2 partial lists are permitted. After the second 0, all values must be 0.
- dummy drive object numbers (255) are only permitted in the first partial list.

A01322 Topology: Drive object number present twice in configuration

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A drive object number is present more than once in p0978.
Alarm value (r2124, interpret decimal):
Index of p0978 under which the involved drive object number is located.
Remedy: Set parameter p0009 = 1 and change p0978:
Rules:
- p0978 must include all of the drive object numbers (p0101).
- it is not permissible for a drive object number to be repeated.
- by entering a 0, the drive objects with PZD are separated from those without PZD.
- only 2 partial lists are permitted. After the second 0, all values must be 0.
- dummy drive object numbers (255) are only permitted in the first partial list.

A01323 Topology: More than two partial lists created

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Partial lists are available more than twice in p0978. After the second 0, all must be 0.
Alarm value (r2124, interpret decimal):
Index of p0978 under which the illegal value is located.
Remedy: Set p0009 to 1 and change p0978:
Rules:
- p0978 must include all of the drive object numbers (p0101).
- it is not permissible for a drive object number to be repeated.
- by entering a 0, the drive objects with PZD are separated from those without PZD.
- only 2 partial lists are permitted. After the second 0, all values must be 0.
- dummy drive object numbers (255) are only permitted in the first partial list.

A01324 Topology: Dummy drive object number incorrectly created

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: In p0978, dummy drive object numbers (255) are only permitted in the first partial list.
Alarm value (r2124, interpret decimal):
Index of p0978 under which the illegal value is located.

Remedy: Set p0009 to 1 and change p0978:
Rules:
- p0978 must include all of the drive object numbers (p0101).
- it is not permissible for a drive object number to be repeated.
- by entering a 0, the drive objects with PZD are separated from those without PZD.
- only 2 partial lists are permitted. After the second 0, all values must be 0.
- dummy drive object numbers (255) are only permitted in the first partial list.

F01325 Topology: Component number not present in target topology

Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The component configured in a parameter (e.g. p0121, p0131, etc.) is not present in the target topology.
Fault value (r0949, interpret decimal):
Configured component number that is not present in target topology.
Remedy: Establish topology and DO configuration consistency.

A01330 Topology: Commissioning not possible

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Unable to carry out commissioning. The actual topology does not fulfill the requirements.
Remedy: - check the OCC cable between the converter and motor.
- carry out a POWER ON (switch-off/switch-on).
Note:
OCC: One Cable Connection (one cable system)

A01331 Topology: At least one component not assigned to a drive object

Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: At least one component is not assigned to a drive object.
- when commissioning, a component was not able to be automatically assigned to a drive object.
- the parameters for the data sets are not correctly set.
Alarm value (r2124, interpret decimal):
Component number of the unassigned component.

13.2 List of faults and alarms

Remedy: This component is assigned to a drive object.
Check the parameters for the data sets.
Examples:
- power unit (p0121).
- motor (p0131, p0186).
- encoder interface (p0140, p0141, p0187 ... p0189).
- encoder (p0140, p0142, p0187 ... p0189).
- Terminal Module (p0151).
- option board (p0161).

F01340 Topology: Too many components on one line

Message value: Component number or connection number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: For the selected communications clock cycle, too many DRIVE-CLiQ components are connected to one line of the Control Unit.
Fault value (r0949, interpret hexadecimal):
xyy hex: x = fault cause, yy = component number or connection number.
1yy:
The communications clock cycle of the DRIVE-CLiQ connection on the Control Unit is not sufficient for all read transfers.
2yy:
The communications clock cycle of the DRIVE-CLiQ connection on the Control Unit is not sufficient for all write transfers.
3yy:
Cyclic communication is fully utilized.
4yy:
The DRIVE-CLiQ cycle starts before the earliest end of the application. An additional dead time must be added to the control. Sign-of-life errors can be expected.
The conditions of operation with a current controller sampling time of 31.25 µs have not been maintained.
5yy:
Internal buffer overflow for net data of a DRIVE-CLiQ connection.
6yy:
Internal buffer overflow for receive data of a DRIVE-CLiQ connection.
7yy:
Internal buffer overflow for send data of a DRIVE-CLiQ connection.
8yy:
The component clock cycles cannot be combined with one another
900:
The lowest common multiple of the clock cycles in the system is too high to be determined.
901:
The lowest common multiple of the clock cycles in the system cannot be generated with the hardware.

Remedy:

- check the DRIVE-CLiQ wiring.
- reduce the number of components on the DRIVE-CLiQ line involved and distribute these to other DRIVE-CLiQ sockets of the Control Unit. This means that communication is uniformly distributed over several lines.

For fault value = 1yy - 4yy in addition:

- increase the sampling times (p0112, p0115, p4099). If necessary, for DCC or FBLOCKS, change the assignment of the run-time group (p21000, p20000) so that the sampling time (r21001, r20001) is increased.
- if necessary, reduce the number of cyclically calculated blocks (DCC) and/or function blocks (FBLOCKS).
- reduce the function modules (r0108).
- establish the conditions for operation with a current controller sampling time of 31.25 µs (at the DRIVE-CLiQ line, only operate Motor Modules and Sensor Modules with this sampling time and only use a permitted Sensor Module (e.g. SMC20, this means a 3 at the last position of the Article No.)).
- For an NX, the corresponding Sensor Module for a possibly existing second measuring system should be connected to a free DRIVE-CLiQ socket of the NX.

For fault value = 8yy in addition:

- check the clock cycles settings (p0112, p0115, p4099). Clock cycles on a DRIVE-CLiQ line must be perfect integer multiples of one another. As clock cycle on a line, all clock cycles of all drive objects in the previously mentioned parameters apply, which have components on the line involved.

For fault value = 9yy in addition:

- check the clock cycles settings (p0112, p0115, p4099). The lower the numerical value difference between two clock cycles, the higher the lowest common multiple. This behavior has a significantly stronger influence, the higher the numerical values of the clock cycles.

F01341 Topology: Maximum number of DRIVE-CLiQ components exceeded

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: Too many DRIVE-CLiQ components were defined in the actual topology.
Note:
Pulse enable is withdrawn and prevented.

Remedy:

- check the DRIVE-CLiQ wiring.
- reduce the number components on the DRIVE-CLiQ line involved in order to maintain the maximum quantity structure.

F01354 Topology: Actual topology indicates an illegal component

Message value: Fault cause: %1, component number: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The actual topology indicates at least one illegal component.
Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = cause.
xx = 1: Component at this Control Unit not permissible.
xx = 2: Component in combination with another component not permissible.
Note:
Pulse enable is prevented.

Remedy: Remove the illegal components and restart the system.

F01355 Topology: Actual topology changed

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: The device target topology (p0099) does not correspond to the device actual topology (r0098).
The fault only occurs if the topology was commissioned using the automatic internal device mechanism and not using the commissioning tool.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: One of the following counter-measures can be selected if no faults have occurred in the topology detection itself:
If commissioning is still not completed:
- carry out a self-commissioning routine (starting from p0009 = 1).
In general:
Set p0099 = r0098, set p0009 = 0; for existing Motor Modules, this results in servo drives being automatically generated (p0107).
Generating servo drives: Set p0097 to 1, set p0009 to 0.
Generating vector drives: Set p0097 to 2, set p0009 to 0.
Generating vector drives with parallel circuit: Set p0097 to 12, set p0009 to 0.
In order to set configurations in p0108, before setting p0009 to 0, it is possible to first set p0009 to 2 and modify p0108. The index corresponds to the drive object (p0107).
If commissioning has already been completed:
- re-establish the original connections and re-connect power to the Control Unit.
- restore the factory setting for the complete equipment (all of the drives) and allow automatic self-commissioning again.
- change the device parameterization to match the connections (this is only possible using the commissioning tool).
Notice:
Topology changes that result in this fault being generated cannot be accepted by the automatic function in the device, but must be transferred using the commissioning tool and parameter download. The automatic function in the device only allows constant topology to be used. Otherwise, when the topology is changed, all of the previous parameter settings are lost and replaced by the factory setting.

F01356 Topology: There is a defective DRIVE-CLiQ component

Message value: Fault cause: %1, Component number: %2, Connection number: %3
Drive object: All objects
Reaction: NONE (OFF2)
Acknowledge: IMMEDIATELY
Cause: The actual topology indicates at least one defective DRIVE-CLiQ component.
Fault value (r0949, interpret hexadecimal):
zzyyxx hex:
zz = connection number of the component at which the defective component is connected
yy = component number of the component at which the defective component is connected
xx = fault cause
xx = 1: Component at this Control Unit not permissible.
xx = 2: component with communication defect.
Note:
Pulse enable is withdrawn and prevented.

Remedy: Replace the defective component and restart the system.

F01357 Topology: Two Control Units identified on the DRIVE-CLiQ line

Message value: component number: %1, connection number: %2
Drive object: All objects
Reaction: NONE (OFF2)
Acknowledge: IMMEDIATELY

Cause: In the actual topology, 2 Control Units are connected with one another through DRIVE-CLiQ.
 As standard, this is not permitted.
 It is only permitted if the Technology Extension OALINK has already been installed and activated on both Control Units.
 Fault value (r0949, interpret hexadecimal):
 yyxx hex:
 yy = connection number of the Control Unit at which the second Control Unit is connected
 xx = component number of the Control Unit at which the second Control Unit is connected
 Note:
 Pulse enable is withdrawn and prevented.

Remedy: In general:
 - remove the connection to the second Control Unit and restart.
 - for the S120M component DRIVE-CLiQ extension, interchange the hybrid cable (IN/OUT).
 When using OALINK:
 - remove the DRIVE-CLiQ connection and restart the systems.
 - install OALINK on both Control Units and activate.
 - check the configuration of the DRIVE-CLiQ ports in OALINK.

A01358 Topology: Line termination not available

Message value: CU connection number: %1, component number: %2, connection number: %3
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: At least one line with distributed drives is not terminated. The last participant on the line must be terminated with a line termination connector.
 This therefore ensures the degree of protection of the distributed drives.
 Alarm value (r2124, interpret hexadecimal):
 zzyyxx hex:
 zz = connection number of the distributed drive where there is no terminating connector
 yy = component number
 xx = CU connection number

Remedy: Install the line terminating connector for the last distributed drive.

F01359 Topology: DRIVE-CLiQ performance not sufficient

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The DRIVE-CLiQ performance is not sufficient at one line in order to identify an inserted component.
 Fault value (r0949, interpret hexadecimal):
 Only for internal Siemens troubleshooting.

Remedy: - carry out a POWER ON (switch-off/switch-on).
 - Distribute components across several DRIVE-CLiQ lines.
 Note:
 For this topology, do not withdraw and insert components in operation.

F01360 Topology: Actual topology not permissible

Message value: Fault cause: %1, preliminary component number: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: The detected actual topology is not permissible.
Fault value (r0949, interpret hexadecimal):
ccccbbaa hex:
cccc = preliminary component number, bb = no significance, aa = fault cause
aa = 01 hex = 1 dec:
Too many components were detected at the Control Unit. A maximum of 199 components is permissible.
aa = 02 hex = 2 dec:
The component type of a component is not known.
aa = 03 hex = 3 dec:
It is illegal to combine ALM and BLM.
aa = 04 hex = 4 dec:
It is illegal to combine ALM and SLM.
aa = 05 hex = 5 dec:
It is illegal to combine BLM and SLM.
aa = 06 hex = 6 dec:
A CX32 was not directly connected to a permitted Control Unit.
aa = 07 hex = 7 dec:
An NX10 or NX15 was not directly connected to a permitted Control Unit.
aa = 08 hex = 8 dec:
A component was connected to a Control Unit that is not permitted for this purpose.
aa = 09 hex = 9 dec:
A component was connected to a Control Unit with out-of-date firmware.
aa = 0A hex = 10 dec:
Too many components of a particular type detected.
aa = 0B hex = 11 dec:
Too many components of a particular type detected on a single line.
Note:
The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy:
For fault cause = 1:
Change the configuration. Connect less than 199 components to the Control Unit.
For fault cause = 2:
Remove the component with unknown component type.
For fault cause = 3, 4, 5:
Establish a valid combination.
For fault cause = 6, 7:
Connect the expansion module directly to a permitted Control Unit.
For fault cause = 8:
Remove component or use a permissible component.
For fault cause = 9:
Upgrade the firmware of the Control Unit to a later version.
For fault cause = 10, 11:
Reduce the number of components.

A01361 **Topology: Actual topology contains SINUMERIK and SIMOTION components**
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The detected actual topology contains SINUMERIK and SIMOTION components.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex: cc = fault cause, bb = component class of the actual topology, aa = component number of the component
 cc = 01 hex = 1 dec:
 An NX10 or NX15 was connected to a SIMOTION control.
 cc = 02 hex = 2 dec:
 A CX32 was connected to a SINUMERIK control.

Remedy: For alarm value = 1:
 Replace all NX10 or NX15 by a CX32.
 For alarm value = 2:
 Replace all CX32 by an NX10 or NX15.

A01362 Topology: Topology rule(s) broken

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: At least one topology rule for the SINAMICS S120 Combi has been broken.
 In the event of a fault, the ramping up of the drive system is aborted and closed-loop drive control is not enabled.
 Alarm value (r2124, interpret decimal):
 The alarm value indicates which rule has been violated.

- 1: The S120 Combi may only be wired via DRIVE-CLiQ socket X200 to X100 on the NCU.
- 2: Only one Single Motor Module (SMM) or one Double Motor Module (DMM) may be connected via X200 to the DRIVE-CLiQ socket X101 on the NCU.
- 3: Only one Terminal Module 54F (TM54F) or one DRIVE-CLiQ Hub Module (Hub) may be connected via X500 to the DRIVE-CLiQ socket X102 on the NCU.
- 4: Only Sensor Modules may be connected to DRIVE-CLiQ sockets X201 up to X203 (3-axis) or X204 (4-axis) on the S120 Combi.
- 5: Only one Sensor Module, type SMC20 or SME20 may be connected to DRIVE-CLiQ socket X205 (X204 is not available for 3-axis).
- 6: If a Single Motor Module is being used as the first expansion axis, only one more Single Motor Module may be connected (via X200 to X201 on the first Single Motor Module).
- 7: Only Sensor Modules may be connected to the corresponding DRIVE-CLiQ socket X202 on any Single Motor Modules which may be present.
- 8: For a second Single Motor Module or for a Double Motor Module, it is not permissible to connect anything at X201.
- 9: If a Double Motor Module is used as an expansion axis, only Sensor Modules may be connected to X202 and X203.
- 10: If a Terminal Module 54F (TM54F) is configured, only one DRIVE-CLiQ Hub Module (DMC20, DME20) may be connected to X501 of the TM54F module via DRIVE-CLiQ socket X500.
- 11: On the DRIVE-CLiQ Hub Module, only Sensor Modules Cabinet (SMC) and Sensor Modules External (SME) may be connected to X501 through X505.
- 12: Only certain Motor Modules may be used for expansion axes.
- 13: For an S120 Combi with 3 axes, nothing must be connected at the DRIVE-CLiQ Hub Module at X503.

Remedy: Evaluate the alarm value and ensure compliance with the corresponding topology rule(s).

F01375 Topology: Connection duplicated between two components

Message value: Component: %1, %2, connection: %3
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: When checking the actual topology, a ring-type connection was detected.

The fault value describes a component contained in the ring.

Fault value (r0949, interpret hexadecimal):

ccbbaaaa hex:

cc = connection number (%3)

bb = component class (% 2)

aaaa = preliminary component number (%1)

Component class:

0: Component unknown.

1: Control Unit

2: Motor Module

3: Line Module

4: Sensor Module

5: Voltage Sensing Module

6: Terminal Module

7: DRIVE-CLiQ Hub Module

8: Controller Extension

9: Filter Module

10: Hydraulic Module.

49: DRIVE-CLiQ component

50: Option slot

60: Encoder

70: DRIVE-CLiQ motor

71: Hydraulic cylinder

72: Hydraulic valve

80: Motor

Connection number:

0: Port 0, 1: Port 1, 2: Port 2, 3: Port 3, 4: Port 4, 5: Port 5

10: X100, 11: X101, 12: X102, 13: X103, 14: X104, 15: X105

20: X200, 21: X201, 22: X202, 23: X203

50: X500, 51: X501, 52: X502, 53: X503, 54: X504, 55: X505

Remedy: Output the fault value and remove the specified connection.

Note:

Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

F01380 Topology: Actual topology EEPROM defective

Message value: Preliminary component number: %1

Drive object: All objects

Reaction: NONE

Acknowledge: POWER ON

Cause: When detecting the actual topology, a component with a defective EEPROM was detected.

Fault value (r0949, interpret hexadecimal):

bbbbaaaa hex:

bbbb = reserved

aaaa = preliminary component number of the defective components

Remedy: Output the fault value and remove the defected component.

A01381 Topology: Motor Module incorrectly inserted

Message value: Component: %1, to %2, %3, connection: %4

Drive object: All objects

Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a Motor Module in the actual topology that has been incorrectly inserted with respect to the target technology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the incorrectly inserted component (% 1)
 Note:
 The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
 Component class and connection number are described in F01375.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 - automatically remove the topology error (p9904).
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01382 Topology: Sensor Module incorrectly inserted

Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a Sensor Module in the actual topology that has been incorrectly inserted with respect to the target technology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the incorrectly inserted component (% 1)
 Note:
 The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
 Component class and connection number are described in F01375.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 - automatically remove the topology error (p9904).
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01383 Topology: Terminal Module incorrectly inserted

Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE

13.2 List of faults and alarms

Acknowledge: NONE

Cause: The topology comparison has detected a Terminal Module in the actual topology that has been incorrectly inserted with respect to the target technology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number (%4)
cc = component number (%3)
bb = component class (% 2)
aa = component number of the incorrectly inserted component (% 1)
Note:
The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
Component class and connection number are described in F01375.
The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
- automatically remove the topology error (p9904).
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01384 **Topology: DRIVE-CLiQ Hub Module incorrectly inserted**

Message value: Component: %1, to %2, %3, connection: %4

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The topology comparison has detected a DRIVE-CLiQ Hub Module in the actual topology that has been incorrectly inserted with respect to the target topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number (%4)
cc = component number (%3)
bb = component class (% 2)
aa = component number of the incorrectly inserted component (% 1)
Note:
The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
Component class and connection number are described in F01375.
The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
- automatically remove the topology error (p9904).
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01385 **Topology: Controller Extension incorrectly inserted**

Message value: Component: %1, to %2, %3, connection: %4

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The topology comparison has detected a controller extension 32 (CX32) in the actual topology that has been incorrectly inserted with respect to the target topology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the incorrectly inserted component (% 1)
 Note:
 The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
 Component class and connection number are described in F01375.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 - automatically remove the topology error (p9904).
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01386 Topology: DRIVE-CLiQ component incorrectly inserted

Message value: Component: %1, to %2, %3, connection: %4

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The topology comparison has detected a DRIVE-CLiQ component in the actual topology that has been incorrectly inserted with respect to the target topology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the incorrectly inserted component (% 1)
 Note:
 The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
 Component class and connection number are described in F01375.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 - automatically remove the topology error (p9904).
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01389 Topology: Motor with DRIVE-CLiQ incorrectly inserted

Message value: Component: %1, to %2, %3, connection: %4

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: The topology comparison has detected a motor with DRIVE-CLiQ in the actual topology that has been incorrectly inserted with respect to the target topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number (%4)
cc = component number (%3)
bb = component class (% 2)
aa = component number of the incorrectly inserted component (% 1)
Note:
The component is described in dd, cc and bb, where the component involved is incorrectly inserted.
Component class and connection number are described in F01375.
The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
- automatically remove the topology error (p9904).
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01416 Topology: Component additionally inserted

Message value: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The topology comparison has found a component in the actual topology which is not specified in the target topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = component class (% 2)
cc = connection number (%4)
bb = component class of the additional component (%1)
aa = component number (%3)
Note:
The component class of the additional component is contained in bb.
The component is described in dd, cc and aa, where the additional component is inserted.
Component class and connection number are described in F01375.

Remedy: Adapting topologies:
- remove the additional component (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01420 Topology: Component different

Message value: Component: %1, target: %2, actual: %3, difference: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The topology comparison has detected differences in the actual topology and target topologies in the electronic rating plate.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex: aa = component number (%1), bb = component class of the target topology (%2), cc = component class of the actual topology (%3), dd = difference (%4)
 dd = 01 hex = 1 dec:
 Different component type.
 dd = 02 hex = 2 dec:
 Different article number.
 dd = 03 hex = 3 dec:
 Different manufacturer.
 dd = 04 hex = 4 dec:
 For a multi-component slave, the incorrect subcomponent (index) is connected (e.g. Double Motor Module X201 instead of X200) - or only a part of a multi-component slave is set to "deactivate and not available".
 dd = 05 hex = 5 dec:
 NX10 or NX15 used instead of CX32.
 dd = 06 hex = 6 dec:
 NX10 or NX15 used instead of CX32.
 dd = 07 hex = 7 dec:
 Different number of connections.
 Note:
 The component class is described in F01375.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
 - connect the expected component (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 Topology comparison - if required, adapt the comparison level:
 - parameterize the topology comparison of all components (p9906).
 - parameterize the topology comparison of one components (p9907, p9908).
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01425 Topology: Serial number different

Message value: Component: %1, %2, differences: %3

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The topology comparison has detected differences in the actual and target topologies in relation to one component. The serial number is different.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = reserved
 cc = number of differences (%3)
 bb = component class (% 2)
 aa = component number (%1)
 Note:
 The component class is described in F01375.
 The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

13.2 List of faults and alarms

Remedy: Adapting topologies:
- change over the actual topology to match the target topology.
- load the target topology that matches the actual topology (commissioning tool).
For byte cc:
cc = 1 --> can be acknowledged using p9904 or p9905.
cc > 1 --> can be acknowledged using p9905 and can be deactivated using p9906 or p9907/p9908.
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01428 Topology: Incorrect connection used

Message value: Component: %1, %2, connection (actual): %3, connection (target): %4

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The topology comparison has detected differences in the actual and target topologies in relation to one component. For a component, another connection was used.
The different connections of a component are described in the alarm value.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number of the target topology (%4)
cc = connection number of the actual topology (%3)
bb = component class (% 2)
aa = component number (%1)

Note:

Component class and connection number are described in F01375.

The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.

Remedy: Adapting topologies:
- reinsert the DRIVE-CLiQ cable to the component (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
- automatically remove the topology error (p9904).

Note:

Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

F01451 Topology: Target topology is invalid

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: An error was detected in the target topology.
The target topology is invalid.
Fault value (r0949, interpret hexadecimal):
ccccbbaa hex: cccc = index error, bb = component number, aa = fault cause
aa = 1B hex = 27 dec: Error not specified.
aa = 1C hex = 28 dec: Value illegal.
aa = 1D hex = 29 dec: Incorrect ID.
aa = 1E hex = 30 dec: Incorrect ID length.
aa = 1F hex = 31 dec: Too few indices left.
aa = 20 hex = 32 dec: component not connected to Control Unit.

Remedy: Download the target topology again using the commissioning tool.

A01481 (N) Topology: Motor Module not connected

Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a Motor Module that is missing in the actual topology with respect to the target topology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the component that has not been inserted (% 1)
 Note:
 The component is described in dd, cc and bb, where the component has not been inserted.
 Component class and connection number are described in F01375.
Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 Check the hardware:
 - check the 24 V supply voltage.
 - check DRIVE-CLiQ cables for interruption and contact problems.
 - check that the component is working properly.
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).
Reaction upon N: NONE
Acknowl. upon N: NONE

A01482 Topology: Sensor Module not connected

Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a Sensor Module that is missing in the actual topology with respect to the target topology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the component that has not been inserted (% 1)
 Note:
 The component is described in dd, cc and bb, where the component has not been inserted.
 Component class and connection number are described in F01375.

13.2 List of faults and alarms

Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
Check the hardware:
- check the 24 V supply voltage.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check that the component is working properly.
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01483 **Topology: Terminal Module not connected**
Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a Terminal Module that is missing in the actual topology with respect to the target topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number (%4)
cc = component number (%3)
bb = component class (% 2)
aa = component number of the component that has not been inserted (% 1)
Note:
The component is described in dd, cc and bb, where the component has not been inserted.
Component class and connection number are described in F01375.
Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
Check the hardware:
- check the 24 V supply voltage.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check that the component is working properly.
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01484 **Topology: DRIVE-CLiQ Hub Module not connected**
Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The topology comparison has detected a DRIVE-CLiQ Hub Module missing in the actual topology with respect to the target topology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the component that has not been inserted (% 1)
 Note:
 The component is described in dd, cc and bb, where the component has not been inserted.
 Component class and connection number are described in F01375.

Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 Check the hardware:
 - check the 24 V supply voltage.
 - check DRIVE-CLiQ cables for interruption and contact problems.
 - check that the component is working properly.
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01485 Topology: Controller Extension not connected

Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The topology comparison has detected a Control Extension (CX32) missing in the actual topology with respect to the target topology.
 Alarm value (r2124, interpret hexadecimal):
 ddccbbaa hex:
 dd = connection number (%4)
 cc = component number (%3)
 bb = component class (% 2)
 aa = component number of the component that has not been inserted (% 1)
 Note:
 The component is described in dd, cc and bb, where the component has not been inserted.
 Component class and connection number are described in F01375.

Remedy: Adapting topologies:
 - insert the components involved at the right connection (correct the actual topology).
 - adapt the project/parameterizing in the commissioning tool (correct the target topology).
 Check the hardware:
 - check the 24 V supply voltage.
 - check DRIVE-CLiQ cables for interruption and contact problems.
 - check that the component is working properly.
 Note:
 Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01486 Topology: DRIVE-CLiQ component not connected

Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a DRIVE-CLiQ component missing in the actual topology with respect to the target topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number (%4)
cc = component number (%3)
bb = component class (% 2)
aa = component number of the component that has not been inserted (% 1)
Note:
The component is described in dd, cc and bb, where the component has not been inserted.
Component class and connection number are described in F01375.
Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
Check the hardware:
- check the 24 V supply voltage.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check that the component is working properly.
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01487 **Topology: Option slot component not inserted**
Message value: Component: %1, to %2, %3, connection: %4
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected an option slot component missing in the actual topology with respect to the target topology.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
dd = connection number (%4)
cc = component number (%3)
bb = component class (% 2)
aa = component number of the component that has not been inserted (% 1)
Note:
The component is described in dd, cc and bb, where the component has not been inserted.
Component class and connection number are described in F01375.
Remedy: Adapting topologies:
- insert the components involved at the right connection (correct the actual topology).
- adapt the project/parameterizing in the commissioning tool (correct the target topology).
Check the hardware:
- check the 24 V supply voltage.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check that the component is working properly.
Note:
Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

| | |
|-----------------------|---|
| A01489 | Topology: motor with DRIVE-CLiQ not connected |
| Message value: | Component: %1, to %2, %3, connection: %4 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | <p>The topology comparison has detected a motor with DRIVE-CLiQ missing in the actual topology with respect to the target topology.</p> <p>Alarm value (r2124, interpret hexadecimal): ddccbbaa hex: dd = connection number (%4) cc = component number (%3) bb = component class (% 2) aa = component number of the component that has not been inserted (% 1)</p> <p>Note: The component is described in dd, cc and bb, where the component has not been inserted. Component class and connection number are described in F01375.</p> |
| Remedy: | <p>Adapting topologies:</p> <ul style="list-style-type: none"> - insert the components involved at the right connection (correct the actual topology). - adapt the project/parameterizing in the commissioning tool (correct the target topology). <p>Check the hardware:</p> <ul style="list-style-type: none"> - check the 24 V supply voltage. - check DRIVE-CLiQ cables for interruption and contact problems. - check that the component is working properly. <p>Note: Under "Topology --> Topology view" the commissioning tool where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).</p> |

| | |
|-------------------------|---|
| A01507 (F, N) | BICO: Interconnections to inactive objects present |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | <p>There are BICO interconnections to an inactive/inoperable drive object.</p> <p>The BI/CI parameters involved are listed in r9498.</p> <p>The associated BO/CO parameters are listed in r9499.</p> <p>The list of the BICO interconnections to other drive objects is displayed in r9491 and r9492 of the deactivated drive object.</p> <p>Note: r9498 and r9499 are only written to, if p9495 is not set to 0.</p> <p>Alarm value (r2124, interpret decimal): Number of BICO interconnections found to inactive drive objects.</p> |
| Remedy: | <ul style="list-style-type: none"> - set all open BICO interconnections centrally to the factory setting with p9495 = 2. - make the non-operational drive object active/operational again (re-insert or activate components). |
| Reaction upon F: | Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2) |
| Acknowl. upon F: | IMMEDIATELY |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

| | |
|-----------------------|--|
| A01508 | BICO: Interconnections to inactive objects exceeded |
| Message value: | - |
| Drive object: | All objects |

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: NONE
Cause: The maximum number of BICO interconnections (signal sinks) when deactivating a drive object was exceeded.
When deactivating a drive object, all BICO interconnections (signal sinks) are listed in the following parameters:
- r9498[0...29]: List of the BI/CI parameters involved.
- r9499[0...29]: List of the associated BO/CO parameters.
Remedy: Not necessary.
This alarm is automatically withdrawn as soon as no BICO interconnection is entered in r9498[29] and r9499[29] (value = 0).
Notice:
When re-activating the drive object, all BICO interconnections should be checked and if required, re-established.

F01510 BICO: Signal source is not float type

Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The requested connector output does not have the correct data type. This interconnection is not established.
Fault value (r0949, interpret decimal):
Parameter number to which an interconnection should be made (connector output).
Remedy: Interconnect this connector input with a connector output having a float data type.

F01511 (A) BICO: Interconnection with different scalings

Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The requested BICO interconnection was established. However, a conversion is made between the BICO output and BICO input using the reference values.
- the BICO output has different normalized units than the BICO input.
- message only for interconnections within a drive object.
Example:
The BICO output has, as normalized unit, voltage and the BICO input has current.
This means that the factor p2002/p2001 is calculated between the BICO output and the BICO input.
p2002: contains the reference value for current
p2001: contains the reference value for voltage
Fault value (r0949, interpret decimal):
Parameter number of the BICO input (signal sink).
Remedy: Not necessary.
Reaction upon A: NONE
Acknowl. upon A: NONE

F01512 BICO: No scaling available

Message value: %1
Drive object: All objects
Reaction: Servo: OFF2
Acknowledge: POWER ON
Cause: An attempt was made to determine a conversion factor for a scaling that does not exist.
Fault value (r0949, interpret decimal):
Unit (e.g. corresponding to SPEED) for which an attempt was made to determine a factor.

Remedy: Apply scaling or check the transfer value.

F01513 (N, A) BICO: Interconnection cross DO with different scalings

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The requested BICO interconnection was established. However, a conversion is made between the BICO output and BICO input using the reference values.

An interconnection is made between different drive objects and the BICO output has different normalized units than the BICO input or the normalized units are the same but the reference values are different.

Example 1:

BICO output with voltage normalized unit, BICO input with current normalized unit, BICO output and BICO input lie in different drive objects. This means that the factor p2002/p2001 is calculated between the BICO output and the BICO input.

p2002: contains the reference value for current

p2001: contains the reference value for voltage

Example 2:

BICO output with voltage normalized unit in drive object 1 (DO1), BICO input with voltage normalized unit in drive object 2 (DO2). The reference values for voltage (p2001) of the two drive objects have different values. This means that the factor p2001(DO1)/p2001(DO2) is calculated between the BICO output and the BICO input.

p2001: contains the reference value for voltage, drive objects 1, 2

Fault value (r0949, interpret decimal):

Parameter number of the BICO input (signal sink).

Remedy: Not necessary.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A01514 (F) BICO: Error when writing during a reconnect

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: During a reconnect operation (e.g. while booting or downloading - but can also occur in normal operation) a parameter was not able to be written to.

Example:

When writing to BICO input with double word format (DWORD), in the second index, the memory areas overlap (e.g. p8861). The parameter is then reset to the factory setting.

Alarm value (r2124, interpret decimal):

Parameter number of the BICO input (signal sink).

Remedy: Not necessary.

Reaction upon F: NONE

Acknowl. upon F: IMMEDIATELY

F01515 (A) BICO: Writing to parameter not permitted as the master control is active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: When changing the number of CDS or when copying from CDS, the master control is active.

13.2 List of faults and alarms

Remedy: If required, return the master control and repeat the operation.

Reaction upon A: NONE

Acknowl. upon A: NONE

A01590 (F) Drive: Motor maintenance interval expired

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The selected service/maintenance interval for this motor was reached.
Alarm value (r2124, interpret decimal):
Motor data set number.

Remedy: carry out service/maintenance and reset the service/maintenance interval (p0651).

Reaction upon F: NONE

Acknowl. upon F: IMMEDIATELY

F01600 SI P1 (CU): STOP A initiated

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function in monitoring channel 1 has detected a fault and initiated a STOP A (STO via the safety switch-off signal path of monitoring channel 1).
- forced checking procedure (test stop) of the safety switch-off signal path of monitoring channel 1 unsuccessful.
- subsequent response to fault F01611 (defect in a monitoring channel).
Fault value (r0949, decimal interpretation):
0: Stop request from monitoring channel 2.
1005: STO active although STO not selected and there is no internal STOP A present.
1010: STO inactive although STO is selected or an internal STOP A is present.
9999: Subsequent response to fault F01611.

Remedy: - select Safe Torque Off and de-select again.
- replace drive.

For fault value = 9999:

- carry out diagnostics for fault F01611.

Note:

SI: Safety Integrated

STO: Safe Torque Off

F01611 (A) SI P1 (CU): Defect in a monitoring channel

Message value: %1

Drive object: All objects

Reaction: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY (POWER ON)

- Cause:** The drive-integrated "Safety Integrated" function on monitoring channel 1 has detected a fault in the crosswise data comparison between the two monitoring channels and has initiated a STOP F.
- As a result of this fault, after the parameterized transition has expired (p9658), fault F01600 (SI CU: STOP A initiated) is output.
- Fault value (r0949, interpret decimal):
- 0: Stop request from the other monitoring channel.
- 1 ... 999:
- Number of the cross-compared data that resulted in this fault. This number is also displayed in r9795.
- 2: SI enable safety functions (p9601). Crosswise data comparison is only carried out for the supported bits.
- 3: SI SGE changeover discrepancy time (p9650).
- 4: SI transition time STOP F to STOP A (p9658).
- 5: SI enable Safe Brake Control (p9602).
- 6: SI Motion enable safety functions (p9501).
- 7: SI delay time of STO for Safe Stop 1 (p9652).
- 8: SI PROFIsafe address (p9610).
- 9: SI debounce time for STO/SBC/SS1 (p9651).
- 14: SI PROFIsafe telegram selection (p9611).
- 15: SI PROFIsafe bus failure response (p9612).
- 1000: Watchdog timer has expired.
- Within the time of approx. 5 x p9650, alternatively, the following was defined:
- the signal at F-DI for STO/SS1 continually changes with time intervals less than or equal to the discrepancy time (p9650).
 - via PROFIsafe, STO (also as subsequent response) was continually selected and deselected with time intervals less than or equal to the discrepancy time (p9650).
- 1001, 1002: Initialization error, change timer / check timer.
- 1900: CRC error in the SAFETY sector.
- 1901: CRC error in the ITCM sector.
- 1902: Overloading in the ITCM sector has occurred in operation.
- 1903: Internal parameterizing error for CRC calculation.
- 2000: Status of the STO selection for both monitoring channels different.
- 2001: Feedback signal of STO shutdown for both monitoring channels different.
- 2002: Status of the delay timer SS1 on both monitoring channels are different (status of the timer in p9650).
- 2003: Status of the STO terminal for both monitoring channels different.
- 6000 ... 6999:
- Error in the PROFIsafe control.
- For these fault values, the fail-safe control signals (fail-safe values) are transferred to the safety functions. If "STOP B after failure of the PROFIsafe communication" (p9612) is parameterized, the transfer of the fail-safe value is delayed.
- 6000: A fatal PROFIsafe communication error has occurred.
- 6064 ... 6071: error when evaluating the F parameter. The values of the transferred F parameters do not match the expected values in the PROFIsafe driver.
- 6064: Destination address and PROFIsafe address are different (F_Dest_Add).
- 6065: Destination address not valid (F_Dest_Add).
- 6066: Source address not valid (F_Source_Add).
- 6067: Watchdog time not valid (F_WD_Time).
- 6068: Incorrect SIL level (F_SIL).
- 6069: Incorrect F-CRC length (F_CRC_Length).
- 6070: Incorrect F parameter version (F_Par_Version).
- 6071: CRC error for the F parameters (CRC1). The transferred CRC value of the F parameters does not match the value calculated in the PROFIsafe driver.
- 6072: F parameterization is inconsistent.
- 6165: A communications error was identified when receiving the PROFIsafe telegram. The fault can also occur if an inconsistent or out-of-date PROFIsafe telegram has been received after switching the drive off and on or after plugging in the PROFINET cable.
- 6166: A time monitoring error (timeout) was identified when receiving the PROFIsafe telegram.

13.2 List of faults and alarms

Remedy:

For fault value = 1 ... 5 and 7 ... 999:

- check the cross data comparison that resulted in a STOP F.
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade the drive software.

For fault value = 6:

- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade the drive software.

For fault value = 1000:

- Check the wiring of the F-DI for STO/SS1 (contact problems).
- PROFIsafe: Resolve contact problems/faults at the PROFINET controller.
 - check the discrepancy time, and if required, increase the value (p9650).

For fault value = 1001, 1002:

- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade the drive software.

For fault value = 1900, 1901, 1902:

- carry out a POWER ON (switch-off/switch-on) for all components.
- replace drive.
- upgrade the drive software.

For fault value = 2000, 2001, 2002, 2003:

- check the discrepancy time, and if required, increase the value (p9650, p9652).
- check the wiring of the safety-relevant inputs (SGE) (contact problems).
- replace drive.

Note:

This fault can be acknowledged after removing the cause of the error and after correct selection/deselection of STO.

For fault value = 6000:

- carry out a POWER ON (switch-off/switch-on) for all components.
- check whether there is a DRIVE-CLiQ communication error between the two monitoring channels and, if required, carry out a diagnostics routine for the faults identified.
- upgrade firmware to later version.
- contact Technical Support.
- replace drive.

For fault value = 6064:

- check the setting of the value in the F parameter F_Dest_Add at the PROFIsafe slave.
- check the setting of the PROFIsafe address (p9610). Using the commissioning tool, copy the safety parameters and confirm the data change.

For fault value = 6065:

- check the setting of the value in the F parameter F_Dest_Add at the PROFIsafe slave. It is not permissible for the destination address to be either 0 or FFFF!

For fault value = 6066:

- check the setting of the value in the F parameter F_Source_Add at the PROFIsafe slave. It is not permissible for the source address to be either 0 or FFFF!

For fault value = 6067:

- check the setting of the value in the F parameter F_WD_Time at the PROFIsafe slave. It is not permissible for the watch time to be 0!

For fault value = 6068:

- check the setting of the value in the F parameter F_SIL at the PROFIsafe slave. The SIL level must correspond to SIL2!

For fault value = 6069:

- check the setting of the value in the F parameter F_CRC_Length at the PROFIsafe slave. The setting of the CRC2 length is 2-byte CRC in the V1 mode and 3-byte CRC in the V2 mode!

For fault value = 6070:

- check the setting of the value in the F parameter F_Par_Version at the PROFIsafe slave. The value for the F parameter version is 0 in the V1 mode and 1 in the V2 mode!

For fault value = 6071:

- check the settings of the values of the F parameters and the F parameter CRC (CRC1) calculated from these at the PROFIsafe slave and, if required, update.

For fault value = 6072:

- check the settings of the values for the F parameters and, if required, correct.

The following combinations are permissible for F parameters F_CRC_Length and F_Par_Version:

F_CRC_Length = 2-byte CRC and F_Par_Version = 0

F_CRC_Length = 3-byte CRC and F_Par_Version = 1

For fault value = 6165:

- if the fault occurs after powering up or after inserting the PROFINET cable, acknowledge the fault.

- check the configuration and communication at the PROFIsafe slave.

- check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.

- check whether there is a DRIVE-CLiQ communication error between the two monitoring channels and, if required, carry out a diagnostics routine for the faults identified.

- check whether all F parameters of the drive match the F parameters of the F host.

For fault value = 6166:

- check the configuration and communication at the PROFIsafe slave.

- check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.

- evaluate diagnostic information in the F host.

- check PROFIsafe connection.

- check whether all F parameters of the drive match the F parameters of the F host.

Note:

CU: Control Unit

F-DI: Fail-safe Digital Input

SGE: Safety-relevant input

SI: Safety Integrated

SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)

STO: Safe Torque Off

Reaction upon A: NONE

Acknowl. upon A: NONE

F01612 SI P1 (CU): STO inputs for power units connected in parallel different

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function on the Control Unit (CU) has identified different states of the AND'ed STO inputs for power units connected in parallel and has initiated a STOP F.

As a result of this fault, after the parameterized transition has expired (p9658), fault F01600 (SI CU: STOP A initiated) is output.

Fault value (r0949, interpret binary):

Binary image of the digital inputs of the Control Unit that are used as signal source for the function "Safe Torque Off".

Remedy: - check the tolerance time SGE changeover and if required, increase the value (p9650).

- check the wiring of the safety-relevant inputs (SGE) (contact problems).

Note:

CU: Control Unit

SGE: Safety-relevant input

SI: Safety Integrated

STO: Safe Torque Off / SH: Safe standstill

N01620 (F, A) SI P1 (CU): Safe Torque Off active

Message value: -

Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: NONE
Cause: The "Safe Torque Off" (STO) function of the basic functions has been selected in monitoring channel 1 using the input terminal and is active.
Note:
- this message does not result in a safety stop response.
- this message is not output when STO is selected using the Extended Functions.
Remedy: Not necessary.
Note:
SI: Safety Integrated
STO: Safe Torque Off
Reaction upon F: OFF2
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon A: NONE
Acknowl. upon A: NONE

N01621 (F, A) SI P1 (CU): Safe Stop 1 active

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The "Safe Stop 1" function (SS1) was selected in monitoring channel 1 and is active.
Note:
This message does not result in a safety stop response.
Remedy: Not necessary.
Note:
SI: Safety Integrated
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
Reaction upon F: NONE (OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon A: NONE
Acknowl. upon A: NONE

F01625 SI P1 (CU): Sign-of-life error in safety data

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive-integrated "Safety Integrated" function in monitoring channel 1 has detected an error in the sign-of-life of the safety data between the two monitoring channels and initiated a STOP A.
- there is either a DRIVE-CLiQ communication error or communication has failed.
- a time slice overflow of the safety software has occurred.
Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting.

Remedy:

- select STO and then de-select again.
- carry out a POWER ON (switch-off/switch-on) for all components.
- check whether there is a DRIVE-CLiQ communication error between the two monitoring channels and, if required, carry out a diagnostics routine for the faults identified.
- de-select all drive functions that are not absolutely necessary.
- check the electrical cabinet design and cable routing for EMC compliance

Note:

SI: Safety Integrated
STO: Safe Torque Off

F01630 SI P1 (CU): Brake control error

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function in monitoring channel 1 has detected a brake control error and initiated a STOP A.

- OCC cable shield is not correctly connected.
- defect in the brake control circuit of the drive.

Fault value (r0949, decimal interpretation):

10, 11:
Fault in "open brake" operation.

- brake not closed or interrupted cable.
- ground fault in brake cable.

20:
Fault in "brake open" state.

- short-circuit in brake winding.

30, 31:
Fault in "close brake" operation.

- brake not closed or interrupted cable.
- short-circuit in brake winding.

40:
Fault in "brake closed" state.

50:
Fault in the brake control of the drive or a communication error (brake control diagnostics).

Remedy:

- select STO and then de-select again.
- check the motor holding brake connection.
- check the function of the motor holding brake.
- carry out a diagnostics routine for the faults involved.
- check for EMC-compliant control cabinet design and cable routing (e.g. shield OCC cable with shield terminal and shield plate, check the connection of the brake conductors).
- replace drive.

Note:

OCC: One Cable Connection (one cable system)
SBC: Safe Brake Control
SI: Safety Integrated
STO: Safe Torque Off
See also: p1215

A01631 (F, N) SI P1 (CU): motor holding brake/SBC configuration not practical

Message value: -

Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: NONE
Cause: A configuration of motor holding brake and SBC was detected that is not practical.
The following configurations can result in this message:
- "No motor holding brake available" (p1215 = 0) and "SBC" enabled (p9602 = 1).
Note:
SBC: Safe Brake Control
Remedy: Check the parameterization of the motor holding brake and SBC and correct.
See also: p1215, p9602
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A01637 (F, N) SI: Safety password not assigned

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Safety Integrated is parameterized and enabled. However, a valid safety password has still not been entered.
See also: r9767 (SI safety password status)
Remedy: - assign a valid safety password.
- carry out data save.
Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

A01638 (F, N) SI: Safety password entered

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A valid safety password has been entered. It is possible to change safety parameters in the safety commissioning mode.
See also: r9767 (SI safety password status)
Remedy: Not necessary.
This alarm is automatically withdrawn with "Delete password" (e.g. after exiting the web server - or after a Power on). The password remains assigned.
Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F01640 (N, A) SI P1 (CU): component replacement identified and acknowledgment/save required

Message value: Fault cause: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

Cause: "Safety Integrated" has identified that a component has been replaced.
 It is no longer possible to operate the particular drive without fault.
 When safety functions are active, after a component has been replaced it is necessary to carry out a partial acceptance test.
 Fault value (r0949, interpret binary):
 Bit 0 = 1:
 It has been identified that the drive has been replaced.
 Bit 3 = 1:
 It has been identified that the Sensor Module has been replaced.
 Bit 5 = 1:
 It has been identified that the sensor has been replaced.

Remedy: - acknowledge component replacement or "Copy RAM to ROM".
 - save all parameters
 - acknowledge fault.

Note:
 In addition to the fault, diagnostics bits r9776.2 and r9776.3 are set.
 See also: r9776 (SI diagnostics)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F01641 (N, A) SI P1 (CU): component replacement identified and save required

Message value: Fault cause: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

Cause: "Safety Integrated" has identified that a component has been replaced.
 No additional fault response is initiated, therefore operation of the particular drive is not restricted.
 When safety functions are active, after a component has been replaced it is necessary to carry out a partial acceptance test.
 Fault value (r0949, interpret binary):
 Bit 0 = 1:
 It has been identified that the drive has been replaced.
 Bit 3 = 1:
 It has been identified that the Sensor Module has been replaced.
 Bit 5 = 1:
 It has been identified that the sensor has been replaced.

Remedy: - save all parameters or "Copy RAM to ROM".
 - acknowledge fault.
 See also: r9776 (SI diagnostics)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F01649 SI P1 (CU): Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: An internal error in the Safety Integrated software in monitoring channel 1 has occurred.

Note:

This fault results in a STOP A that cannot be acknowledged.

Fault value (r0949, interpret hexadecimal):

Only for internal Siemens troubleshooting.

- Remedy:**
- carry out a POWER ON (switch-off/switch-on) for all components.
 - re-commission the "Safety Integrated" function and carry out a POWER ON.
 - upgrade the drive firmware to a later version.
 - contact Technical Support.
 - replace drive.

Note:

SI: Safety Integrated

F01650 SI P1 (CU): Acceptance test required

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function on monitoring channel 1 requires an acceptance test.

Note:

This fault results in a STOP A that can be acknowledged.

Fault value (r0949, interpret decimal):

130: Safety parameters for monitoring channel 2 not available.

Note:

This fault value is always output when Safety Integrated is commissioned for the first time.

1000: Reference and actual checksum on monitoring channel 1 are not identical (booting).

- at least one checksum-checked piece of data is defective.

- safety parameters set offline and loaded to the drive.

2000: Reference and actual checksum on monitoring channel 1 are not identical (commissioning mode).

- when de-activating the safety functions, p9501 or p9503 were not deleted.

2001: Reference and actual checksum on monitoring channel 2 are not identical (commissioning mode).

- when de-activating the safety functions, p9501 or p9503 are not deleted.

2002: Enable of safety-related functions between the two monitoring channels differ.

2003: Acceptance test is required as a safety parameter has been changed.

2004: An acceptance test is required because a project with enabled safety-functions has been downloaded.

2005: The Safety logbook has identified that a functional safety checksum has changed. An acceptance test is required.

2010: Safe brake control enable different between both monitoring channels.

2020: Error when saving the safety parameters for the monitoring channel 2.

3003: Acceptance test is required as a hardware-related safety parameter has been changed.

3005: The Safety logbook has identified that a hardware-related safety checksum has changed. An acceptance test is required.

9999: Subsequent response of another safety-related fault that occurred when booting that requires an acceptance test.

Remedy:

- For fault value = 130:
 - carry out safety commissioning routine.
- For fault value = 1000:
 - again carry out safety commissioning routine.
 - replace the memory card or drive.
- For fault value = 2000:
 - confirm the data change using the commissioning tool.
- For fault value = 2001:
 - confirm the data change using the commissioning tool.
- For fault value = 2002:
 - using the commissioning tool, copy the safety parameters and confirm the data change.
- For fault value = 2003, 2004, 2005:
 - carry out an acceptance test and generate an acceptance report.

Note:

The fault with fault value 2005 can only be acknowledged when the "STO" function is de-selected.

- For fault value = 2010:
 - check that safe brake control is enabled.
 - using the commissioning tool, copy the safety parameters and confirm the data change.
- For fault value = 2020:
 - again carry out safety commissioning routine.
 - replace the memory card or drive.
- For fault value = 3003:
 - carry out the function checks for the modified hardware and generate an acceptance report.
- For fault value = 3005:
 - carry out the function checks for the modified hardware and generate an acceptance report.

The fault with fault value 3005 can only be acknowledged when the "STO" function is de-selected.

- For fault value = 9999:
 - carry out diagnostics for the other safety-related fault that is present.

Note:

CU: Control Unit
 SI: Safety Integrated
 STO: Safe Torque Off

F01651 SI P1 (CU): Synchronization safety time slices unsuccessful

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The "Safety Integrated" function requires a synchronization of the safety time slices between the two monitoring channels and between the drive and the higher-level control. This synchronization routine was unsuccessful.

Note:

This fault results in a STOP A that cannot be acknowledged.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade the drive software.
- upgrade the software of the higher-level control.

Note:

CU: Control Unit
 SI: Safety Integrated

F01652 SI P1 (CU): Illegal monitoring clock cycle

Message value: %1

13.2 List of faults and alarms

Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

- Cause:** One of the Safety Integrated monitoring clock cycles is not permissible.
- the monitoring clock cycle integrated in the drive cannot be maintained due to the communication conditions required in the system.
 - the monitoring clock cycle for safe motion monitoring functions is not permissible (p9500).
 - the actual value sensing clock cycle for safe motion monitoring functions is not permissible (p9511).
 - the sampling time for the current controller (p0112, p0115[0]) cannot be supported.
- Note:
- This fault results in a STOP A that cannot be acknowledged.
- Fault value (r0949, interpret decimal):
- For motion monitoring functions that are not enabled (p9601.2 = p9801.2 = 0, p9501 = 0), the following applies:
- Minimum setting for the monitoring clock cycle (in μ s).
- For motion monitoring functions that are enabled (p9601.2 = p9801.2 = 1 and/or p9501 > 0), the following applies:
- 100:
- no matching monitoring clock cycle was able to be found.
 - an illegal actual value sensing clock cycle was set for S120M (p9511).
- 101:
- the monitoring clock cycle is not an integer multiple of the actual value sensing clock cycle.
 - SINAMICS S120M: the monitoring clock cycle (p9500) is not an integer multiple of 2 ms.
- 102:
- An error has occurred when transferring the actual value sensing clock cycle to the Motor Module.
- 103:
- An error has occurred when transferring the actual value sensing clock cycle to the Sensor Module.
- 104, 105:
- four times the current controller sampling time (p0115[0]) is greater than 1 ms when operating with a non-isochronous PROFIBUS.
 - four times the current controller sampling time (p0115[0]) is greater than the DP clock cycle when operating with an isochronous PROFIBUS.
 - the DP clock cycle is not an integer multiple of the sampling time of the current controller (p0115[0]).
- 106:
- the monitoring clock cycle does not match the monitoring clock cycle of the TM54F.
- 107:
- the actual value sensing clock cycle (p9511) is less than four times the current controller sampling time (p0115[0]).
 - the actual value sensing clock cycle (p9511) is not an integer multiple of the sampling time of the current controller (p0115[0]).
- 108:
- the parameterized actual value sensing clock cycle cannot be set on this component
- 109:
- if the motion monitoring functions have been parameterized as encoderless (p9506), the actual value sensing clock cycle (p9511) and the current controller clock cycle (p0115[0]) must be identical.
 - SINAMICS S110: if the motion monitoring functions have been parameterized as encoderless (p9506), the actual value sensing clock cycle p9511 must be = 250 μ s.
- 110:
- the actual value sensing clock cycle (p9511) for safety with encoder (p9506 = 0) is less than 2 ms for this Control Unit (e.g. CU305).
- 111:
- the monitoring clock cycle is not an integer multiple of the sampling time of the current controller (p0115[0]).
- 112:
- An actual value sensing clock cycle p9511 = 0 on a drive object of a Double Motor Module is not permissible in the existing configuration.
- 200, 201:
- S120M: the monitoring clock cycle cannot be maintained as a result of the conditions required in the system.
- 202:
- the current controller sampling time is set to zero (p0115[0]).

13.2 List of faults and alarms

- Remedy:**
- For enabled SI monitoring integrated in the drive (p9601/p9801 > 0):
- upgrade the firmware of the Control Unit to a later version.
- For enabled motion monitoring function (p9501 > 0):
- correct the monitoring clock cycle (p9500) and carry out POWER ON.
- For fault value = 100:
- for S120M, set the actual value sensing clock cycle to p9511 = 0.
- For fault value = 101:
- actual value sensing clock cycle corresponds to position control clock cycle/DP clock cycle (factory setting).
 - for motion monitoring functions integrated in the drive (p9601/p9801bit 2 = 1) the actual value sensing clock cycle can be directly parameterized in p9511/p9311.
 - SINAMICS S120M: set the monitoring clock cycle (p9500) to an integer multiple of 2 ms.
- For fault value = 104, 105:
- set a separate actual value sensing clock cycle in p9511.
 - restrict operation to a maximum of two vector drives. For the standard setting in p0112, p0115, the current controller sampling time is automatically reduced to 250 μ s. If the standard values were changed, then the current controller sampling time (p0112, p0115) should be appropriately set.
 - increase the DP clock cycle for operation with an isochronous PROFIBUS so that there is a multiple clock cycle ratio of at least 4:1 between the DP clock cycle and the current controller sampling time. A clock cycle ratio of at least 8:1 is recommended.
 - With firmware version 2.5, please ensure that parameter p9510 is set to 1 in the drive (clock cycle synchronous operation).
- For fault value = 106:
- set the parameters for the monitoring clock cycles the same (p10000 and p9500 / p9300).
- For fault value = 107:
- set an actual value sensing clock cycle that matches the current controller clock cycle (p9511 \geq 4 * p0115[0], 8 * p0115[0]) is recommended.
- Note:
- An actual value sensing clock cycle (p9511) that is set too low, can sporadically mean that safety messages C01711/ C30711 are output with message value 1020 or 1021.
- For fault value = 108:
- set a suitable actual value sensing clock cycle in p9511.
 - if the DP clock cycle is used as the actual value sensing clock cycle for operation with isochronous PROFIBUS (p9511 = 0), then a suitable DP clock cycle must be configured. This must be set to less than 8 ms. If this is not possible, then p9511 must be set to the required actual value sensing clock cycle (< 8 ms).
 - For SIMOTION D410-2, a suitable multiple of the DP clock cycle (e.g. 1, 2, 3, 4, 5, 6, 8, 10) must be parameterized. Otherwise, the clock cycle must be set to less than 8 ms.
- For fault value = 109:
- set the actual value sensing clock cycle in p9511 to the same value as the current controller clock cycle (p0115[0]).
 - SINAMICS S110: set the actual value sensing clock cycle to p9511 = 250 μ s.
- For fault value = 110:
- set the actual value sensing clock cycle in p9511 to 2 ms or higher.
- For fault value = 111:
- set the monitoring clock cycle in p9500 as an integer multiple of the sampling time of the current controller (p0115[0]).
- For fault value = 112:
- set the actual value sensing clock cycle p9511 to the required value (not equal to zero).
- For fault value = 200, 201:
- increase the current controller sampling time (p0115[0]).
 - if required, reduce the number of components connected to the corresponding DRIVE-CLiQ line, or distribute the components across several DRIVE-CLiQ sockets.
- For fault value = 202:
- set the current controller sampling time to a sensible value (p0115[0]).
- Note:
- CU: Control Unit
MM: Motor Module
SI: Safety Integrated

| | |
|-----------------------|---|
| F01653 | SI P1 (CU): PROFIBUS/PROFINET configuration error |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE (OFF1, OFF2, OFF3) |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | There is a PROFINET configuration error for using Safety Integrated monitoring functions with a higher-level control (F-PLC). Note: For safety functions that have been enabled, this fault results in a STOP A that cannot be acknowledged. Fault value (r0949, interpret decimal): 200: A safety slot for receive data from the control has not been configured. 210, 220: The configured safety slot for the receive data from the control has an unknown format. 230: The configured safety slot for the receive data from the F-PLC has the incorrect length. 231: The configured safety slot for the receive data from the F-PLC has the incorrect length. 250: A PROFIsafe slot is configured in the higher-level F control, however PROFIsafe is not enabled in the drive. 300: A safety slot for the send data to the control has not been configured. 310, 320: The configured safety slot for the send data to the control has an unknown format. 330: The configured safety slot for the send data to the F-PLC has the incorrect length. 331: The configured safety slot for the send data to the F-PLC has the incorrect length. 400: The telegram number in the F-PLC does not match the parameterization in the drive. |
| Remedy: | The following generally applies: - check and, if necessary, correct the PROFINET configuration of the safety slot on the master side. - upgrade the drive software. For fault value = 250: - remove the PROFIsafe configuring in the higher-level F control or enable PROFIsafe in the drive. For fault value = 231, 331: - in the drive, parameterize the appropriate PROFIsafe telegram (p9611) to be set on the F-PLC. - configure the PROFIsafe telegram matching the parameterization (p9611) in the F-PLC. |

| | |
|-------------------------|---|
| A01654 (F, N) | SI P1 (CU): Deviating PROFIsafe configuration |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | The configuration of a PROFIsafe telegram in the higher-level control (F-PLC) does not match the parameterization in the drive. Note: This message does not result in a safety stop response. Alarm value (r2124, interpret decimal): 1: A PROFIsafe telegram is configured in the higher-level control, however PROFIsafe is not enabled in the drive (p9601.3). 2: PROFIsafe is parameterized in the drive; however, a PROFIsafe telegram has not been configured in the higher-level control. |
| Remedy: | The following generally applies: - check and, if necessary, correct the PROFIsafe configuration in the higher-level control. For alarm value = 1: - remove the PROFIsafe configuring in the higher-level F control or enable PROFIsafe in the drive. For alarm value = 2: - configure the PROFIsafe telegram to match the parameterization in the higher-level F-control. |
| Reaction upon F: | NONE (OFF1, OFF2, OFF3) |

13.2 List of faults and alarms

Acknowl. upon F: IMMEDIATELY (POWER ON)

Reaction upon N: NONE

Acknowl. upon N: NONE

F01655 SI P1 (CU): Align monitoring functions

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: An error has occurred when aligning the Safety Integrated monitoring functions of both monitoring channels. No common set of supported SI monitoring functions was able to be determined.
- there is either a DRIVE-CLiQ communication error or communication has failed.
- no POWER ON after upgrading the firmware.

Note:

This fault results in a STOP A that cannot be acknowledged.

Fault value (r0949, interpret hexadecimal):

Only for internal Siemens troubleshooting.

Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
- check the electrical cabinet design and cable routing for EMC compliance
- upgrade the drive software.

Note:

CU: Control Unit

SI: Safety Integrated

F01656 SI CU: Parameter monitoring channel 2 error

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: When accessing the Safety Integrated parameters for monitoring channel 2 in the non-volatile memory, an error has occurred.

Note:

This fault results in a STOP A that can be acknowledged.

Fault value (r0949, interpret decimal):

129:

- safety parameters for monitoring channel 2 corrupted.

- drive with enabled safety functions was possibly copied offline using the commissioning tool and the project downloaded.

131: Internal software error on monitoring channel 2.

132: Communication errors when uploading or downloading the safety parameters for monitoring channel 2.

255: Internal software error on monitoring channel 1.

Remedy:

- re-commission the safety functions.
- upgrade the drive software.
- replace the memory card or drive.

For fault value = 129:

- activate the safety commissioning mode (p0010 = 95).
- adapt the PROFIsafe address (p9610).
- using the commissioning tool, copy the safety parameters and confirm the data change.
- exit the safety commissioning mode (p0010 = 0).
- save all parameters (copy RAM to ROM).
- carry out a POWER ON (switch-off/switch-on) for all components.

For fault value = 132:

- check the electrical cabinet design and cable routing for EMC compliance

Note:

CU: Control Unit
 SI: Safety Integrated

F01657 SI P1 (CU): PROFIsafe telegram number invalid

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: The PROFIsafe telegram number set in p9611 is not valid.
 When PROFIsafe is enabled (p9601.3 = 1), then a telegram number greater than zero must be entered in p9611.

Note:

This fault does not result in a safety stop response.
 See also: p9611, p60022, r60022

Remedy: Check the telegram number setting (p9611).

F01658 SI P1 (CU): PROFIsafe telegram number differ

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The PROFIsafe telegram number is set differently in p9611 and r60022.
 The telegram number must be identically set in both parameters.

Note:

This fault does not result in a safety stop response.
 See also: p9611, p60022, r60022

Remedy: Align the telegram number in both parameters so that they are the same (p9611, r60022).

F01659 SI P1 (CU): Write request for parameter rejected

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: The write request for one or several Safety Integrated parameters from monitoring channel 1 was rejected.

Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
1: The Safety Integrated password is not set.
14: An attempt was made to enable the PROFIsafe communication - although the version of the PROFIsafe driver used on both monitoring channels is different.
20: An attempt was made to enable the motion monitoring functions integrated in the drive and the STO function, both controlled via F-DI.
23: For ESR, an attempt was made to enable the delay of STO, although this cannot be supported.
25: An attempt was made to parameterize a PROFIsafe telegram although this cannot be supported.
27: An attempt was made to activate the Basic Functions by controlling via TM54F although this is not supported.
28: An attempt was made to enable the "STO via terminals at the Power Module" function although this cannot be supported.
9612: An attempt was made to parameterize STOP B as stop response for PROFIsafe failure, although PROFIsafe is not enabled.

Remedy:
For fault value = 1:
- set the Safety Integrated password.
For fault value = 14, 23, 27:
- check whether there are faults in the safety function alignment between the two monitoring channels (F01655, F30655) and if required, carry out diagnostics for the faults involved.
- upgrade the drive software.
For fault value = 20:
- correct the enable setting (p9601).
For fault value = 25:
- correct the telegram number setting (p9611).
For fault value = 28:
- correct the enable setting (p9601.7 = 0).
For fault value = 9612:
- establish communications with PROFIsafe (p9601).
- parameterize STOP A as the stop response for PROFIsafe failure (p9612 = 0).

Note:
CU: Control Unit
F-DI: Fail-safe Digital Input
SBC: Safe Brake Control
SI: Safety Integrated
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
STO: Safe Torque Off
See also: p9501, p9601, p9612

F01660 SI P1 (CU): Safety-related functions not supported

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The Motor Module/Hydraulic Module does not support the safety-related functions (e.g. the Motor Module/Hydraulic Module version is not the correct one). Safety Integrated cannot be commissioned.
Note:
This fault does not result in a safety stop response.

Remedy:

- use a Motor Module/Hydraulic Module that supports the safety-related functions.
- upgrade the Motor Module/Hydraulic Module software.

Note:

CU: Control Unit
SI: Safety Integrated

F01663 SI P1 (CU): Copying the SI parameters rejected

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: Using the commissioning tool, copy the Safety Integrated parameters - or were entered offline.
This is the reason that when booting, an attempt is made to copy Safety Integrated parameters from monitoring channel 1 to monitoring channel 2. However, no safety-relevant function has been selected in monitoring channel 1 (p9501 = 0, p9601 = 0). Copying was rejected for safety reasons.
As a consequence, inconsistent parameterization can occur in both monitoring channels, which in turn results in additional error messages.
Especially for inconsistent enabling of the safety functions on both monitoring channels, fault F30625 is output.

Note:

This fault does not result in a safety stop response.
SI: Safety Integrated

Remedy:

- check p9501 and p9601 and if required, correct.
- perform copy function using the commissioning tool.
- save all parameters or "Copy RAM to ROM".
- carry out a POWER ON (switch-off/switch-on).

F01664 SI P1 (CU): No automatic firmware update

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: During booting, the system detected that the "Firmware update automatic" function (p7826 = 1) was not activated.
This function must be activated for automatic firmware updates/downgrades to prevent impermissible version combinations when safety functions are enabled.

Note:

This fault does not result in a safety stop response.

Remedy: When safety functions are enabled (p9501 <> 0 and/or p9601 <> 0):

1. Activate the "Firmware update automatic" function (p7826 = 1).
2. Backup the parameters (p0977 = 1) and carry out a POWER ON.

When deactivating the safety functions (p9501 = 0, p9601 = 0), the fault can be acknowledged after exiting the safety commissioning mode.

F01665 SI P1 (CU): System is defective

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A system defect was detected before the last boot or in the actual one. The system might have been rebooted (reset).
Fault value (r0949, interpret hexadecimal):
200000 hex, 400000 hex, 8000yy hex (yy any):
- fault in the actual booting/operation.
800004 hex:
- parameters p9500/p9300 are, under certain circumstances, not the same. In addition, Safety message C01711/C30711 is displayed.
Additional values:
- defect before the last time that the system booted.

Remedy:
- carry out a POWER ON (switch-off/switch-on).
- upgrade firmware to later version.
- contact Technical Support.
For fault value = 200000 hex, 400000 hex, 8000yy hex (yy any):
- ensure that the Control Unit is connected to the Power Module.
For fault value = 800004 hex:
- check that parameters p9500/p9300 are the same.
Note:
PM: Power Module
STO: Safe Torque Off

A01669 (F, N) SI Motion: Unfavorable combination of motor and power unit

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The combination of motor and power unit used is not suitable for using safe motion monitoring functions without an encoder. The ratio between the power unit rated current (r0207[0]) and rated motor current (p0305) is greater than 5.
Alarm value (r2124, interpret decimal):
Number of the motor data set, which caused the fault.
Notice:
If this alarm is not observed, then message C01711 or C30711 – with the value 1041 ... 1044 – can sporadically occur.

Remedy: Use a suitable power unit with a lower power rating or a motor with a higher power rating.
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F01670 SI Motion: Invalid parameterization Sensor Module

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The parameterization of a Sensor Module used for Safety Integrated is not permissible.

Note:
 This fault results in a STOP A that cannot be acknowledged.
 Fault value (r0949, interpret decimal):

- 1: No encoder was parameterized for Safety Integrated.
- 2: An encoder was parameterized for Safety Integrated that does not have an A/B track (sine/cosine).
- 3: The encoder data set selected for Safety Integrated is still not valid.
- 4: A communication error with the encoder has occurred.
- 5: Number of relevant bits in the encoder coarse position invalid.
- 6: DRIVE-CLiQ encoder configuration invalid.
- 8: Parameterized Safety comparison algorithm not supported.

Remedy:

For fault value = 1, 2:
 - use and parameterize an encoder that Safety Integrated supports (encoder with track A/B sine-wave, p0404.4 = 1).

For fault value = 3:
 - check whether the drive or drive commissioning function is active and if required, exit this (p0009 = p00010 = 0), save the parameters (p0971 = 1) and carry out a POWER ON

For fault value = 4:
 - check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Sensor Module involved and if required, carry out a diagnostics routine for the faults identified.

For fault value = 5:
 - p9525 = 0 (not permissible). Check the encoder parameterization on the Sensor Modules involved.

For fault value = 6:
 - check p9515.0 (for DRIVE-CLiQ encoders, the following applies: p9515.0 = 1). Check the encoder parameterization on the Sensor Modules involved.

For fault value = 8:
 - use and parameterize an encoder that implements an algorithm supported by Safety Integrated.

Note:
 SI: Safety Integrated

F01671 **SI Motion: Parameterization encoder error**

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The parameterization of the encoder used by Safety Integrated is different to the parameterization of the standard encoder.

Note:
 This fault does not result in a safety stop response.
 Fault value (r0949, interpret decimal):
 Parameter number of the non-corresponding safety parameter.

Remedy: Align the encoder parameterization between the safety encoder and the standard encoder.

Note:
 SI: Safety Integrated

F01672 **SI P1 (CU): Motor Module software/hardware incompatible**

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: The existing monitoring channel 2 software does not support safe motion monitoring, is not compatible to the software on monitoring channel 1 - or there is a communications error between monitoring channels 1 and 2.

Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, decimal interpretation):
1:
The existing monitoring channel 2 software does not support the safe motion monitoring function.
2, 3, 6, 8:
There is a communication error between monitoring channel 1 and 2.
4, 5, 7:
The software on monitoring channel 2 is not compatible with the software on monitoring channel 1.

Remedy: - check whether there are faults in the safety function alignment between monitoring channel 1 and monitoring channel 2 (F01655, F30655) and if required, carry out diagnostics for the faults involved.
For fault value = 1:
- upgrade the drive software.
For fault value = 2, 3, 6, 8:
- check whether there are communication errors between monitoring channel 1 and monitoring channel 2 - and if required, carry out diagnostics for the faults involved.
For fault value = 4, 5, 7:
- upgrade the drive software.
Note:
SI: Safety Integrated

F01673 **SI Motion: Sensor Module software/hardware incompatible**

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The existing Sensor Module software and/or hardware does not support the safe motion monitoring function with the higher-level control.
Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: - upgrade the Sensor Module software.
- use a Sensor Module that supports the safe motion monitoring function.
Note:
SI: Safety Integrated

F01674 **SI Motion P1 (CU): Safety function not supported by PROFIsafe telegram**

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON

Cause: The monitoring function enabled in p9501 and p9601 is not supported by the currently set PROFIsafe telegram (p9611).
Note:
 This fault results in a STOP A that cannot be acknowledged.
 Fault value (r0949, interpret bitwise binary):
 Bit 18 = 1:
 SS2E via PROFIsafe is not supported (p9501.18).
 Bit 24 = 1:
 Transfer SLS (SG) limit value via PROFIsafe not supported (p9501.24).
 Bit 25 = 1:
 Transfer safe position (SP) via PROFIsafe is not supported (p9501.25).
 Bit 26 = 1:
 Gearbox stage switchover via PROFIsafe is not supported (p9501.26).
 Bit 28 = 1:
 SCA via PROFIsafe is not supported (p9501.28).

Remedy:
 - Deselect the monitoring function involved (p9501, p9601).
 - set the matching PROFIsafe telegram (p9611).
Note:
 SCA: Safe Cam
 SI: Safety Integrated
 SLS: Safely Limited Speed
 SP: Safe Position
 SS2E: Safe Stop 2 external (Safe Stop 2 with external stop, external STOP D)

F01675 SI Motion P1: settings in the PROFIBUS/PROFINET controller not permissible

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: For the "Safe synchronous position via PROFIsafe" function, an incorrect configuration setting was identified.
Note:
 This fault results in a STOP A that can be acknowledged in the following way.
 - select STO and then de-select again.
 - internal event acknowledge (if the "Extended message acknowledgment" is active, p9507.0 = 1).
 Fault value (r0949, decimal interpretation):
 1:
 "Synchronous safe position via PROFIsafe" is enabled (p9501.29 = 1) and is not set according to the rule $Tdp = 2 \times n \times p9500$ ($n = 1, 2, 3, \dots$).
 2:
 "Synchronous safe position via PROFIsafe" is enabled (p9501.29 = 1) and isochronous operation is not set.
Note:
 STO: Safe Torque Off

Remedy:
 For fault value = 1:
 - set Tdp and monitoring clock cycle p9500 according to the rule $Tdp = 2 \times n \times p9500$. ($n = 1, 2, 3, \dots$)
 For fault value = 2:
 - set "Isochronous mode" on the PROFIBUS/PROFINET controller.

F01679 SI CU: Safety parameter settings and topology changed, warm restart/POWER ON required

Message value: -
Drive object: All objects
Reaction: OFF2 (OFF1, OFF3)
Acknowledge: POWER ON

13.2 List of faults and alarms

Cause: Safety parameters have been changed; these will only take effect following a warm restart or POWER ON (see alarm A01693).
A partial power up (boot) with modified configuration was then performed.

Remedy:

- carry out a warm restart
- carry out a POWER ON (switch-off/switch-on).

F01680 SI Motion P1 (CU): Checksum error safety monitoring functions

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The actual checksum over the safety-relevant parameters, calculated and entered by the drive, does not match the reference checksum last saved for the last machine acceptance.
Safety-relevant parameters have been changed or a fault is present.

Note:
This fault results in a STOP A that can be acknowledged.
Fault value (r0949, decimal interpretation):
0: Checksum error for SI parameters for motion monitoring.
1: Checksum error for SI parameters for actual values.
2: Checksum error for SI parameters for component assignment.

Remedy:

- check the safety-relevant parameters and if required, correct.
- execute the function "Copy RAM to ROM".
- perform a POWER ON if safety parameters requiring a POWER ON have been modified.
- carry out an acceptance test.

F01681 SI Motion P1 (CU): Incorrect parameter value

Message value: Parameter: %1, supplementary information: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The parameter cannot be parameterized with this value.

Note:

This message does not result in a safety stop response.

Fault value (r0949, interpret decimal):

yyyyxxx dec: yyyy = supplementary information, xxxx = parameter

yyyy = 0:

No additional information available.

xxxx = 9501:

It is not permissible to enable the function "SSM hysteresis and filtering" (p9501.16) in conjunction with the function "Extended functions without selection" (p9601.5).

xxxx = 9501 and yyyy = 10:

Referencing via SCC (p9501.27 = 1) and epos (r0108.4 = 1) are simultaneously enabled.

xxxx = 9506 and yyyy = 1:

Parameter p9506 differs between the monitoring channels

xxxx = 9522:

The gear stage was set too high.

xxxx = 9547:

The hysteresis tolerance is not permissible.

xxxx = 9601 and yyyy = 1:

If motion monitoring functions integrated in the drive (p9601.2 = 1) and extended functions without selection (p9601.5 = 1) are enabled, then PROFIsafe (p9601.3 = 1) or onboard F-DI (p9601.4 = 1) is not possible.

xxxx = 9601 and yyyy = 2:

Extended functions without selection (p9601.5 = 1) are enabled without enabling motion monitoring functions integrated in the drive (p9601.2).

xxxx = 9601 and yyyy = 3:

Onboard F-DI are enabled without enabling motion monitoring functions integrated in the drive (p9601.2).

xxxx = 9601 and yyyy = 4:

Onboard F-DI are enabled. Then, it is not permissible to simultaneously set PROFIsafe and F-DI via PROFIsafe (p9501.30).

xxxx = 9601 and yyyy = 5:

Transfer of the SLS limit value via PROFIsafe (p9501.24) has been enabled, without enabling PROFIsafe.

xxxx = 9601 and yyyy = 6:

Transfer of the safe position via PROFIsafe (p9501.25) has been enabled, without enabling PROFIsafe.

xxxx = 9601 and yyyy = 7:

Safe switchover of the gearbox stages (p9501.26) has been enabled without enabling PROFIsafe.

xxxx = 9601 and yyyy = 11:

SS2E (p9501.18 = 1) is enabled without PROFIsafe being enabled.

xxxx = 9601 and yyyy = 12:

SCA (p9501.28 = 1) is enabled without enabling PROFIsafe.

xxxx = 9601 and yyyy = 13:

Extended functions (p9601.2 = 1) have been enabled without enabling PROFIsafe (p9601.3).

13.2 List of faults and alarms

Remedy: Correct parameter (if required, also on another monitoring channel, p9801).
If xxxx = 9501:
- de-select extended functions without selection (p9601.5).
If xxxx = 9501 and yyyy = 10:
De-select referencing via SCC (p9501.27).
For xxxx = 9501 and yyyy = 11:
De-select SS2E (p9501.18) - or enable PROFIsafe
For xxxx = 9501 and yyyy = 12:
De-select SCA (p9501.28).
If xxxx = 9507:
Set synchronous motor.
If xxxx = 9506:
Using the commissioning tool, copy the safety parameters, confirm the data change, backup the parameters and carry out a power on.
If xxxx = 9522:
Correct the corresponding parameter.
If xxxx = 9547:
With hysteresis/filtering enabled (p9501.16 = 1), the following applies:
- set parameters p9546 and p9547 according to the following rule: $p9547 \leq 0.75 \times p9546$;
- the following rule must also be adhered to when actual value synchronization (p9501.3 = 1) is enabled: $p9547 \geq p9549$;
If xxxx = 9601:
yyyy = 1:
Only enable motion monitoring functions integrated in the drive (p9601.2 = 1) and PROFIsafe (p9601.3 = 1).
yyyy = 2:
De-select Extended Functions without selection (p9601.5 = 0)
yyyy = 3:
De-select F-DI (p9601.4)
yyyy = 4:
De-select onboard F-DI (p9601.4) and F-DI via PROFIsafe (p9501.30).
yyyy = 5:
To transfer the SLS limit values via PROFIsafe (p9501.24 = 1), also enable PROFIsafe (p9601.3 = 1) and motion monitoring functions integrated in the drive (p9601.2 = 1).
yyyy = 6:
Deselect the transfer of the safe position via PROFIsafe (p9501.25 = 0)
yyyy = 7:
Deselect the safe switchover of gearbox stages (p9501.26 = 1)
yyyy = 13:
Also enable PROFIsafe (p9601.3) for the extended functions (p9601.2)
Note:
SSM: Safe Speed Monitor (safety-relevant feedback signal from the speed monitoring)

F01682 SI Motion P1 (CU): Monitoring function not supported

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

- Cause:** The monitoring function enabled in p9501, p9601, p9507 is not supported in this firmware version.
- Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, interpret decimal):
- 1: Monitoring function SLP not supported (p9501.1).
 - 2: Monitoring function SCA not supported (p9501.7 and p9501.8 ... 15).
 - 3: Monitoring function SLS override not supported (p9501.5).
 - 4: Monitoring function external ESR activation not supported (p9501.4).
 - 5: Monitoring function F-DI in PROFIsafe not supported (p9501.30).
 - 6: Enable actual value synchronization not supported (p9501.3).
 - 9: Monitoring function not supported by the firmware or enable bit not used.
 - 11: Encoderless monitoring functions (p9506.1) only supported for motion monitoring integrated in the drive (p9601.2).
 - 20: Motion monitoring functions integrated in the drive are only supported in conjunction with PROFIsafe (p9501, p9601.1 ... 2 and p9801.1 ... 2).
 - 21: Enable a safe motion monitoring function (in p9501), not supported for enabled basic functions via PROFIsafe (p9601.2 = 0, p9601.3 = 1).
 - 26: Hysteresis and filtering for SSM monitoring function without an encoder not supported (p9501.16).
 - 27: This hardware does not support onboard F-DI and F-DO.
 - 28: Encoderless monitoring functions are not supported for synchronous motors (p9507.2).
 - 33: Safety functions without selection not supported (p9601.5, p9801.5).
 - 34: This module does not support safe position via PROFIsafe.
 - 39: This module or software version of the CU/MM does not support safe gearbox stage switchover (p9501.26).
 - 43: Motion monitoring functions SLP and SP as well as PROFIsafe telegrams 31/901/902 not supported for D410-2 (p9501.1/24/25/30, p9611).
 - 44: This module/this software version does not support referencing via the safety control channel (p9501.27).
 - 45: Deactivating SOS/SLS during an external STOP A is not supported (p9501.23).
 - 46: This software version does not support control of the basis functions via TM54F and the simultaneous enable of the extended functions or ncSI.
 - 54: SCA function not supported (p9501.28).
 - 9612: An attempt was made to parameterize STOP B as stop response for PROFIsafe failure, although PROFIsafe is not enabled.
- See also: p9612
- Remedy:**
- de-select the monitoring functions involved (p9501, p9506, p9601, p9507).
- For fault value = 9612:
- establish communications with PROFIsafe (p9601).
 - parameterize STOP A as the stop response for PROFIsafe failure (p9612 = 0).
- Note:
- ESR: Extended Stop and Retract
 - SBR: Safe Brake Ramp (safe brake ramp monitoring)
 - SCA: Safe Cam
 - SDI: Safe Direction (safe motion direction)
 - SI: Safety Integrated
 - SLP: Safely Limited Position
 - SLS: Safely Limited Speed
 - SP: Safe Position
 - SS1E: Safe Stop 1 External (Safe Stop 1 with external stop)
 - SS2E: Safe Stop 2 external (Safe Stop 2 with external stop, external STOP D)
 - SOS: Safe Operating Stop
- See also: p9501, p9601, p9612

F01683 SI Motion P1 (CU): SOS/SLS enable missing

Message value: -

Drive object: All objects

13.2 List of faults and alarms

Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The safety-relevant basic function "SOS/SLS" is not enabled in p9501 although other safety-relevant monitoring functions are enabled.
Note:
This fault does not result in a safety stop response.
Remedy: Enable the function "SOS/SLS" (p9501.0) and carry out a POWER ON.
Note:
SI: Safety Integrated
SLS: Safely Limited Speed
SOS: Safe Operating Stop
See also: p9501

F01684 SI Motion P1 (CU): Safely limited position limit values interchanged
Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: For the function "Safely Limited Position" (SLP), a lower value is in p9534 than in p9535.
Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
1: Limit values SLP1 interchanged.
2: Limit values SLP2 interchanged.
Remedy: - correct the lower and upper limit values (p9535, p9534).
- carry out a POWER ON (switch-off/switch-on).
Note:
SI: Safety Integrated
SLP: Safely Limited Position / SE: Safe software limit switches

F01685 SI Motion P1 (CU): Safely limited speed limit value too high
Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The limit value for the function "Safely Limited Speed" (SLS) is greater than the speed that corresponds to an encoder limit frequency of 500 kHz.
Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
Maximum permissible speed.
Remedy: Correct the limit values for SLS and carry out a POWER ON.
Note:
SI: Safety Integrated
SLS: Safely Limited Speed
See also: p9531

F01686 SI Motion: Illegal parameterization cam position
Message value: %1
Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: For dbSI:
 - at least one enabled "Safe cam" (SCA) is parameterized in p9536 or p9537 too close to the tolerance range around the modulo position: the minus position value of a cam must be greater than the lower modulo limit + cam tolerance (p9540) + position tolerance (p9542); the plus position value of a cam must be less than the modulo limit - cam tolerance (p9540) - position tolerance (p9542). For a parameterized modulo position (p9505>0), the lower modulo limit = 0, the upper modulo limit = p9505.
 - the cam length of cam x = p9536[x]-p9537[x] is less than the cam tolerance + the position tolerance (= p9540 + p9542). This also means that cams of the minus position value must be less than the plus position value.

For ncSI:
 At least one enabled "Safety Cam" (SCA) is parameterized in p9536 or p9537 too close to the tolerance range around the modulo position.
 The following conditions must be complied with to assign cams to a cam track:
 - the cam length of cam x = p9536[x]-p9537[x] must be greater or equal to the cam tolerance + the position tolerance (= p9540 + p9542). This also means that for cams on a cam track, the minus position value must be less than the plus position value.
 - the distance between 2 cams x and y (minus position value[y] - plus position value[x] = p9537[y] - p9536[x]) on a cam track must be greater than or equal to the cam tolerance + position tolerance (= p9540 + p9542).

Note:
 This fault does not result in a safety stop response.
 Fault value (r0949, interpret decimal):
 Number of the "Safe Cam" with an illegal position.
 See also: p9501

Remedy: Correct the cam position and carry out a POWER ON.

Note:
 SCA: Safe Cam / SN: Safe software cam
 SI: Safety Integrated

F01687 SI Motion: Illegal parameterization modulo value SCA (SN)

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The parameterized modulo value for the "Safe Cam" (SCA) function is not a multiple of 360 000 mDegrees.

Note:
 This fault does not result in a safety stop response.

Remedy: Correct the modulo value for SCA and carry out a POWER ON.

Note:
 SCA: Safe Cam / SN: Safe software cam
 SI: Safety Integrated
 See also: p9505

F01688 SI Motion CU: Actual value synchronization not permissible

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause:

- it is not permissible to enable actual value synchronization for a 1-encoder system.
- it is not permissible to simultaneously enable actual value synchronization and a monitoring function with absolute reference (SCA/SLP).
- it is not permissible to simultaneously enable actual value synchronization and safe position via PROFIsafe.

Note:
This fault results in a STOP A that cannot be acknowledged.

Remedy:

- Either select the "actual value synchronization" function or parameterize a 2-encoder system.
- either deselect the function "actual value synchronization" or the monitoring functions with absolute reference (SCA/SLP) and carry out a POWER ON.
- either deselect the "actual value synchronization" function or do not enable "Safe position via PROFIsafe".

Note:
SCA: Safe Cam / SN: Safe software cam
SI: Safety Integrated
SLP: Safely Limited Position / SE: Safe software limit switches
SP: Safe Position
See also: p9501

C01689 SI Motion: Axis re-configured

Message value: Parameter: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: The axis configuration was changed (e.g. changeover between linear axis and rotary axis).
Parameter p0108.13 is internally set to the correct value.

Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
Parameter number of parameter that initiated the change.

Remedy: The following should be carried out after the changeover:

- exit the safety commissioning mode (p0010).
- save all parameters
- carry out a POWER ON.

Once the drive has been switched on, safety message F01680 or F30680 indicates that the checksums have changed in the drive. The following must, therefore, be carried out:

- activate safety commissioning mode again.
- complete safety commissioning of the drive.
- exit the safety commissioning mode (p0010).
- save all parameters
- carry out a POWER ON.

Note:
For the commissioning tool, the units are only consistently displayed after a project upload.

F01690 SI Motion: Data save problem for the NVRAM

Message value: %1

Drive object: All objects

Reaction: NONE (OFF1, OFF2, OFF3)

Acknowledge: POWER ON

Cause: There is not sufficient memory space in the NVRAM on the drive to save parameters r9781 and r9782 (safety logbook).
Note:
 This fault does not result in a safety stop response.
 Fault value (r0949, interpret decimal):
 1: There is no longer any free memory space in the NVRAM.

Remedy: For fault value = 1:
 - de-select functions that are not required and that take up memory space in the NVRAM.
 - contact Technical Support.
Note:
 NVRAM: Non-Volatile Random Access Memory (non-volatile read and write memory)

A01691 (F) SI Motion: Ti and To unsuitable for PN cycle

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The configured times for PROFINET communication are not permitted and the PN cycle is used as the actual value acquisition cycle for the safe movement monitoring functions:
 Isochronous PROFINET:
 The sum of Ti and To is too high for the selected PN cycle. The PN clock cycle should be at least 1 current controller cycle greater than the sum of Ti and To.
 No isochronous PROFINET:
 The PN clock cycle must be at least 4x the current controller clock cycle.
Notice:
 If this alarm is not observed, then message C01711 or C30711 – with the value 1020 ... 1021 – can sporadically occur.

Remedy: Configure Ti and To low so that they are suitable for the PN cycle or increase the PN cycle time.

Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)

F01692 SI Motion P1 (CU): Parameter value not permitted for encoderless

Message value: Parameter: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The parameter cannot be set to this value if encoderless motion monitoring functions have been selected in p9506.
Note:
 This fault does not result in a safety stop response.
 Fault value (r0949, interpret decimal):
 Parameter number with the incorrect value.
 See also: p9501

Remedy:
 - correct the parameter specified in the fault value.
 - if necessary, de-select encoderless motion monitoring functions (p9506).
 See also: p9501

A01693 (F) SI P1 (CU): Safety parameter setting changed, warm restart/POWER ON required

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: Safety parameters have been changed; these will only take effect following a warm restart or POWER ON.
Alarm value (r2124, interpret decimal):
Parameter number of the safety parameter which has changed, necessitating a warm restart or POWER ON.

Remedy: - carry out a warm restart
- carry out a POWER ON (switch-off/switch-on) for all components.
Note:
Before performing an acceptance test, a POWER ON must be carried out for all components.

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: POWER ON

F01694 (A) SI Motion CU: firmware version monitoring channel 2 older than monitoring channel 1

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The firmware version of monitoring channel 2 is older than that of monitoring channel 1
Note:
This message does not result in a safety stop response.
This message can occur, if after an automatic firmware update, a POWER ON was not carried out (Alarm A01007).

Remedy: A POWER ON must be carried out at the drive.
See also: r9590

Reaction upon A: NONE

Acknowl. upon A: NONE

A01695 (F) SI Motion: Sensor Module was replaced

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A Sensor Module, which is used for safe motion monitoring functions, was replaced. The hardware replacement must be acknowledged. An acceptance test must be subsequently performed.
Note:
This message does not result in a safety stop response.

Remedy: Carry out the following steps using the commissioning tool:
- execute "Acknowledge hardware replacement" and "Copy RAM to ROM".
- carry out a POWER ON (switch-off/switch-on).
Alternative steps:
- start the copy function for the node identifier on the drive.
- confirm the hardware CRC on the drive.
- save all parameters
- carry out a POWER ON (switch-off/switch-on).
- carry out an acceptance test.

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

A01696 (F) SI Motion: Test stop for the motion monitoring functions selected when booting

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The forced checking procedure (test stop) for the safe motion monitoring functions is already selected when booting, which is not permissible.
 This is the reason that the test is only carried out again after first selecting the forced checking procedure.
Note:
 This message does not result in a safety stop response.

Remedy: De-select the forced checking procedure for the safe motion monitoring functions and then select again.
Note:
 The signal source to select the forced checking procedure is set via binector input p9705.
 SI: Safety Integrated

Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)

A01697 (F) SI Motion: Test stop for motion monitoring functions required

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The time set in p9559 for the forced checking procedure (test stop) for the safe motion monitoring functions has been exceeded. A new forced checking procedure is required.
 After the next time the forced checking procedure is selected, the message is withdrawn and the monitoring time is reset.
Note:
 - this message does not result in a safety stop response.
 - As the switch-off signal paths are not automatically checked during booting, an alarm is always issued once booting is complete.
 - the test must be performed within a defined, maximum time interval (p9559, maximum of 9000 hours) in order to comply with the requirements as laid down in the standards for timely fault detection and the conditions to calculate the failure rates of safety functions (PFH value). Operation beyond this maximum time period is permissible if it can be ensured that the forced checking procedure is performed before persons enter the hazardous area and who are depending on the safety functions correctly functioning.
 See also: p9559, r9765

Remedy: Carry out the forced checking procedure of the safety motion monitoring functions.
 The signal source to select the forced checking procedure is set via binector input p9705.
Note:
 SI: Safety Integrated

Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)

A01698 (F) SI P1 (CU): Commissioning mode active

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The commissioning of the "Safety Integrated" function is selected.
 This message is withdrawn after the safety functions have been commissioned.
Note:
 - this message does not result in a safety stop response.
 - in the safety commissioning mode, the "STO" function is internally selected.
 See also: p0010

Remedy: Not necessary.
Note:
 CU: Control Unit
 SI: Safety Integrated

13.2 List of faults and alarms

Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

A01699 (F) SI P1 (CU): Test stop for STO required

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The time set in p9659 for the forced checking procedure (test stop) for the "STO" function has been exceeded. A new forced checking procedure is required.

After the next time the "STO" function is de-selected, the message is withdrawn and the monitoring time is reset.

Note:

- this message does not result in a safety stop response.

- the test must be performed within a defined, maximum time interval (p9659) in order to comply with the requirements as laid down in the standards for timely fault detection and the conditions to calculate the failure rates of safety functions (PFH value). Operation beyond this maximum time period is permissible if it can be ensured that the forced checking procedure is performed before persons enter the hazardous area and who are depending on the safety functions correctly functioning.

See also: p9659, r9660

Remedy: Select STO and then de-select again.

Note:

CU: Control Unit

SI: Safety Integrated

STO: Safe Torque Off / SH: Safe standstill

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

C01700 SI Motion P1 (CU): STOP A initiated

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP A (STO via the safety switch-off signal path of the first monitoring channel).

Possible causes:

- stop request from the second monitoring channel.

- STO not active after a parameterized time (p9557) after test stop selection.

- subsequent response to the message C01706 "SI Motion CU: SAM/SBR limit exceeded".

- subsequent response to the message C01714 "SI Motion CU: Safely Limited Speed exceeded".

- subsequent response to the message C01701 "SI Motion CU: STOP B initiated".

- subsequent response to the message C01716 "SI Motion CU: tolerance for safe motion direction exceeded".

- Remedy:**
- remove the cause of the fault on the second monitoring channel.
 - carry out a diagnostics routine for message C01706.
 - carry out a diagnostics routine for message C01714.
 - carry out a diagnostics routine for message C01701.
 - carry out a diagnostics routine for message C01716.
 - check the value in p9557 (where available), increase the value if necessary, and carry out a POWER ON
 - check the switch-off signal path of monitoring channel 1 (check DRIVE-CLiQ communication if it has been implemented)
 - replace drive.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- PROFIsafe.
- machine control panel.

Note:

SAM: Safe Acceleration Monitor (safe acceleration monitoring)

SBR: Safe Brake Ramp (safe brake ramp monitoring)

SI: Safety Integrated

C01701 SI Motion P1 (CU): STOP B initiated

Message value: -

Drive object: All objects

Reaction: NONE (OFF3)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP B (braking along the OFF3 deceleration ramp).

As a result of this fault, after the time parameterized in p9556 has expired, or the speed threshold parameterized in p9560 has been undershot, message C01700 "STOP A initiated" is output.

Possible causes:

- stop request from the second monitoring channel.
- subsequent response to the message C01714 "SI Motion CU: Safely Limited Speed exceeded".
- subsequent response to the message C01711 "SI Motion CU: Defect in a monitoring channel".
- subsequent response to the message C01707 "SI Motion CU: tolerance for safe operating stop exceeded".
- subsequent response to the message C01716 "SI Motion CU: tolerance for safe motion direction exceeded".

Remedy: - remove the cause of the fault on the second monitoring channel.

- carry out a diagnostics routine for message C01714.
- carry out a diagnostics routine for message C01711.
- carry out a diagnostics routine for message C01707.
- carry out a diagnostics routine for message C01716.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- PROFIsafe.
- machine control panel.

Note:

SI: Safety Integrated

C01706 SI Motion P1 (CU): SAM/SBR limit exceeded

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: Motion monitoring functions with SAM (p9506 = 0):

- after initiating STOP B (SS1) or STOP C (SS2), the speed has exceeded the selected tolerance.

Motion monitoring functions with SBR (p9506 = 2):

- after initiating STOP B (SS1) or SLS changeover to the lower speed stage, the speed has exceeded the selected tolerance.

The drive is shut down by the message C01700 "SI Motion: STOP A initiated".

13.2 List of faults and alarms

Remedy: Check the braking behavior and, if necessary, adapt the parameterization of the parameter settings of the "SAM" or the "SBR" function.
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
- machine control panel.
Note:
SAM: Safe Acceleration Monitor (safe acceleration monitoring)
SBR: Safe Brake Ramp (safe ramp monitoring)
SI: Safety Integrated
See also: p9548, p9581, p9582, p9583

C01707 SI Motion P1 (CU): Tolerance for safe operating stop exceeded

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The actual position has distanced itself further from the target position than the standstill tolerance.
The drive is shut down by the message C01701 "SI Motion: STOP B initiated".
Remedy: - check whether safety faults are present and if required carry out the appropriate diagnostic routines for the particular faults.
- check whether the standstill tolerance matches the accuracy and control dynamic performance of the axis.
- carry out a POWER ON.
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
- machine control panel.
Note:
SI: Safety Integrated
SOS: Safe Operating Stop
See also: p9530

C01708 SI Motion P1 (CU): STOP C initiated

Message value: -
Drive object: All objects
Reaction: STOP2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive is stopped via a STOP C (braking along the OFF3 deceleration ramp).
"Safe Operating Stop" (SOS) is activated after the parameterized time has expired.
Possible causes:
- stop request from the higher-level control.
- subsequent response to the message C01714 "SI Motion CU: Safely Limited Speed exceeded".
- subsequent response to the message C01716 "SI Motion CU: tolerance for safe motion direction exceeded".
See also: p9552
Remedy: - remove the cause of the fault at the control.
- carry out a diagnostics routine for message C01714/C01716.
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
- machine control panel.
Note:
SI: Safety Integrated
SOS: Safe Operating Stop

C01709 SI Motion P1 (CU): STOP D initiated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP D (braking along the path).
 "Safe Operating Stop" (SOS) is activated after the parameterized time has expired.
 Possible causes:
 - stop request from the higher-level control.
 - subsequent response to the message C01714 "SI Motion CU: Safely Limited Speed exceeded".
 - subsequent response to the message C01716 "SI Motion CU: tolerance for safe motion direction exceeded".
 See also: p9553

Remedy: - remove the cause of the fault at the control.
 - carry out a diagnostics routine for message C01714/C01716.
 This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
 - PROFIsafe.
 - machine control panel.
 Note:
 SI: Safety Integrated
 SOS: Safe Operating Stop

C01710 SI Motion P1 (CU): STOP E initiated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP E (retraction motion).
 "Safe Operating Stop" (SOS) is activated after the parameterized time has expired.
 Possible causes:
 - stop request from the higher-level control.
 - subsequent response to the message C01714 "SI Motion CU: Safely Limited Speed exceeded".
 - subsequent response to the message C01715 "SI Motion CU: Safely Limited Position exceeded".
 - subsequent response to the message C01716 "SI Motion CU: tolerance for safe motion direction exceeded".

Remedy: - remove the cause of the fault at the control.
 - carry out a diagnostics routine for message C01714/C01715/C01716.
 This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
 - Terminal Module 54F (TM54F).
 - onboard F-DI (only CU310-2).
 - PROFIsafe.
 - machine control panel.
 Note:
 SI: Safety Integrated
 SOS: Safe Operating Stop / SBH: Safe operating stop

C01711 SI Motion P1 (CU): Defect in a monitoring channel

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: When cross-comparing the two monitoring channels, the drive detected a difference between the input data or results of the monitoring functions and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.

If at least one monitoring function is active, then after the parameterized timer has expired, the message C01701 "SI Motion: STOP B initiated" is output.

The message value that resulted in a STOP F is displayed in r9725.

The following described message values involve the data cross-check between the two monitoring channels (safety functions integrated in the drive).

The message values may also occur in the following cases if the cause that is explicitly mentioned does not apply:

- For message values 3, 44 ... 57, 232 and 1-encoder system, differently set encoder parameters.
- incorrect synchronization.

Message value (r2124, interpret decimal):

0 to 999: number of the cross-compared data that resulted in this fault.

Message values that are not subsequently listed are only for internal Siemens troubleshooting.

0: Stop request from the other monitoring channel.

1: Status image of monitoring functions SOS, SLS, SAM/SBR or SDI (result list 1) (r9710[0], r9710[1]).

2: Status image of monitoring function SSM (result list 2) (r9711[0], r9711[1]).

3: The position actual value differential (r9713[0/1]) between the two monitoring channels is greater than the tolerance in p9542.

4: Error when synchronizing the data cross-check between the two channels.

5: Function enable signals (p9501/p9301) Safety monitoring clock cycle too small (p9500/p9300).

6: Limit value for SLS1 (p9531[0]).

7: Limit value for SLS2 (p9531[1]).

8: Limit value for SLS3 (p9531[2]).

9: Limit value for SLS4 (p9531[3]).

10: Standstill tolerance (p9530).

31: Position tolerance (p9542/p9342) or (p9549/p9349) when actual value synchronization is enabled (p9501.3)

33: Time, speed switchover (p9551)

35: Delay time, STOP A (p9556).

36: Test time, STO (p9557).

37: Transition time, STOP C to SOS (p9552).

38: Transition time STOP D to SOS (p9553)

40: Stop response for SLS (p9561).

42: Shutdown speed STO (p9560).

43: Memory test, stop response (STOP A).

44 ... 57: General

Possible cause 1 (during commissioning or parameter modification)

The tolerance value for the monitoring function is not the same on the two monitoring channels.

Possible cause 2 (during active operation)

The limit values are based on the actual value (r9713[0/1]). If the safe actual values on the two monitoring channels do not match, the limit values, which have been set at a defined interval, will also be different (i.e. corresponding to message value 3). This can be ascertained by checking the safe actual positions.

Permissible deviation between the two monitoring channels: p9542.

44: Position actual value (r9713[0/1]) + limit value SLS1 (p9531[0]) * safety monitoring clock cycle.

45: Position actual value (r9713[0/1]) + limit value SLS1 (p9531[0]) * safety monitoring clock cycle.

46: Position actual value (r9713[0/1]) + limit value SLS2 (p9531[1]) * safety monitoring clock cycle.

47: Position actual value (r9713[0/1]) + limit value SLS2 (p9531[1]) * safety monitoring clock cycle.

48: Position actual value (r9713[0/1]) + limit value SLS3 (p9531[2]) * safety monitoring clock cycle.

49: Position actual value (r9713[0/1]) - limit value SLS3 (p9531[2]) * safety monitoring clock cycle.

50: Position actual value (r9713[0/1]) + limit value SLS4 (p9531[3]) * safety monitoring clock cycle.

51: Position actual value (r9713[0/1]) - limit value SLS4 (p9531[3]) * safety monitoring clock cycle.

52: Standstill position + tolerance (p9530).

53: Standstill position - tolerance (p9530).

- 54: Position actual value (r9713[0/1]) + limit value of SSM (p9546) * safety monitoring clock cycle + tolerance (p9542).
- 55: Position actual value (r9713[0/1]) + limit value of SSM (p9546) * safety monitoring clock cycle.
- 56: Position actual value (r9713[0/1]) - limit value of SSM (p9546) * safety monitoring clock cycle.
- 57: Position actual value (r9713[0/1]) - limit value of SSM (p9546) * safety monitoring clock cycle - tolerance (p9542).
- 58: Actual stop request.
- 75: Velocity limit of SSM (p9546).
- When the function "SSM: hysteresis and filtering" (p9501.16 = 1) is enabled, this message value is also output for a different hysteresis tolerance (p9547).
- 76: Stop response for SLS1 (p9563[0]).
- 77: Stop response for SLS2 (p9563[1]).
- 78: Stop response for SLS3 (p9563[2]).
- 79: Stop response for SLS4 (p9563[3]).
- 81: Velocity tolerance for SAM (p9548).
- 82: SGEs for SLS correction factor.
- 83: Acceptance test timer (p9558).
- 84: Transition time STOP F (p9555).
- 85: Transition time bus failure (p9580).
- 89: Encoder limit frequency.
- 230: Filter time constant for SSM.
- 231: Hysteresis tolerance for SSM.
- 232: Smoothed velocity actual value.
- 233: Limit value of SSM / safety monitoring clock cycle + hysteresis tolerance.
- 234: Limit value of SSM / safety monitoring clock cycle.
- 235: -Limit value of SSM / safety monitoring clock cycle.
- 236: -Limit value of SSM / safety monitoring clock cycle - hysteresis tolerance.
- 237: SGA SSM.
- 238: Speed limit value for SAM (p9568 or p9546).
- 239: Acceleration for SBR (p9581 and p9583).
- 240: Inverse value of acceleration for SBR (p9581 and p9583).
- 241: Deceleration time for SBR (p9582).
- 242: Encoderless safety (p9506).
- 243: Function configuration (p9507).
- 247: SDI tolerance (p9564).
- 248: SDI positive upper limit (7FFFFFFF hex).
- 249: Position actual value (r9713[0/1]) - SDI tolerance (p9564).
- 250: Position actual value (r9713[0/1]) + SDI tolerance (p9564).
- 251: SDI negative lower limit (80000001 hex).
- 252: SDI stop response (p9566).
- 253: SDI delay time (p9565).
- 256: Status image of monitoring functions SOS, SLS, test stop, SBR, SDI (result list 1 ext) (r9710).
- 259: PROFIsafe telegram (p9611) is different between the monitoring channels.
- 261: Scaling factor for acceleration for SBR different.
- 262: Scaling factor for the inverse value of the acceleration for SBR different.
- 265: Status image of all change functions (results list 1) (r9710).
- 268: SLP delay time differs (p9577).
- 270: Screen form for SGE image: all functions, which are not supported/enabled for the actual parameterization (p9501, p9601 and p9506).
- 273: speed limit value for flattening the ramp for SAM/SBR different.
- 1000: Watchdog timer has expired. Too many signal changes have occurred at safety-relevant inputs.
- 1001: Initialization error of watchdog timer.
- 1005: STO already active for test stop selection.
- 1011: Acceptance test status between the monitoring channels differ.
- 1012: Plausibility violation of the actual value from the encoder.

13.2 List of faults and alarms

1020: Cyc. communication failure between the monit. channels.

1021: Cyc. communication failure between the monit. channel and Sensor Module.

1022: Sign-of-life error for DRIVE-CLiQ encoders monitoring channel 1.

1023: Error in the effectiveness test in the DRIVE-CLiQ encoder

1032: Sign-of-life error for DRIVE-CLiQ encoders monitoring channel 2.

1033: Error when checking the offset between POS1 and POS2 for DRIVE-CLiQ encoder monitoring channel 1.

1034: Error checking offset between POS1 and POS2 for DRIVE-CLiQ encoder monitoring channel 2.

1035: offset between POS1 and POS2 for DRIVE-CLiQ encoder on one of the monitoring channels has changed since the last commissioning.

1039: Overflow when calculating the position.

5000 ... 5140:

PROFIsafe message values.

For these message values, the fail-safe control signals (fail-safe values) are transferred to the safety functions.

5000, 5014, 5023, 5024, 5030 ... 5032, 5042, 5043, 5052, 5053, 5068, 5072, 5073, 5082 ... 5087, 5090, 5091, 5122 ... 5125, 5132 ... 5135, 5140:

An internal software error has occurred (only for internal Siemens troubleshooting).

5012: Error when initializing the PROFIsafe driver.

5013: The result of the initialization is different for the two controllers.

5022: Error when evaluating F parameters. The values of the transferred F parameters do not match the expected values in the PROFIsafe driver.

5025: The result of the F parameterization is different for the two controllers.

5026: CRC error for the F parameters. The transferred CRC value of the F parameters does not match the value calculated in the PST.

5065: A communications error was identified when receiving the PROFIsafe telegram.

5066: A time monitoring error (timeout) was identified when receiving the PROFIsafe telegram.

6000 ... 6166:

PROFIsafe message values (PROFIsafe driver for PROFIBUS DP V1/V2 and PROFINET).

For these message values, the fail-safe control signals (fail-safe values) are transferred to the safety functions. If "Stop B after failure of the PROFISafe communication" (p9612) is parameterized, the transfer of the fail-safe value is delayed.

The significance of the individual message values is described in safety fault F01611.

7000: Difference of the safe position is greater than the parameterized tolerance (p9542/p9342).

7002: Cycle counter for transferring the safe position is different in both monitoring channels.

See also: p9555, r9725

- Remedy:**
- For message value = 0:
 - no error was identified in this monitoring channel. Observe the error message of the other monitoring channel (C30711)
 - For message value = 3:
 - Commissioning phase:
 - check encoder parameters, and if required, correct (p9516, p9517, p9518, p9520, p9521, p9522, p9526).
 - In operation:
 - check the mechanical design and the encoder signals.
 - For message value = 232:
 - increase the hysteresis tolerance (p9547). Possibly set the filtering higher (p9545).
 - For message value = 1 ... 999:
 - if the message value is listed under cause: Check the cross-checked parameters to which the message value refers.
 - copy the safety parameters.
 - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade the drive software.
 - correction of the encoder evaluation. The actual values differ as a result of mechanical faults (V belts, travel to a mechanical endstop, wear and window setting that is too narrow, encoder fault, ...).
 - For message value = 1001:
 - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade the drive software.
 - For message value = 1005:
 - check the conditions for deselecting STO.
 - For message value = 1007:
 - check the PLC for the correct operating state (run state, basic program).
 - For message value = 1011:
 - for diagnostics, refer to parameter (r9571).
 - For message value = 1012:
 - upgrade the Sensor Module firmware to a more recent version.
 - check encoder parameters to ensure that they are the same (p9515, p9519, p9523, p9524, p9525, p9529).
 - to correctly copy the encoder parameters from p04xx, p9700 must be set = 46 and p9701 = 172.
 - for DQI encoders the following applies: If required, upgrade the firmware version of the Control Unit to a more recent version, which is released for DQI encoders.
 - check the electrical cabinet design and cable routing for EMC compliance
 - carry out a POWER ON (power off/on) for all components or a warm restart (p0009 = 30, p0976 = 2, 3).
 - replace the hardware.
 - For message value = 1020, 1021:
 - check the communication link.
 - carry out a POWER ON (power off/on) for all components or a warm restart (p0009 = 30, p0976 = 2, 3).
 - replace the hardware.
 - For message value = 1033, 1034:
 - if required, upgrade the firmware version of the Control Unit to a more recent version, which is released for DQI encoders.
 - For message value = 1035, if one of the safety encoders was replaced:
 - acknowledge hardware replacement.
 - save all parameters
 - acknowledge fault (e.g. BI: p2103).
 - For message value = 1039:
 - check the conversion factors such as spindle pitch or gearbox ratios.
 - For message value = 5000, 5014, 5023, 5024, 5030, 5031, 5032, 5042, 5043, 5052, 5053, 5068, 5072, 5073, 5082 ... 5087, 5090, 5091, 5122 ... 5125, 5132 ... 5135, 5140:
 - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.
 - replace drive.
 - For message value = 5012:
 -

13.2 List of faults and alarms

- check the setting of the PROFIsafe address of the drive (p9610). It is not permissible for the PROFIsafe address to be 0 or FFFF!
 - using the commissioning tool, copy the safety parameters and confirm the data change.
 - carry out a POWER ON (switch-off/switch-on) for all components.
- For message value = 5013, 5025:
- carry out a POWER ON (switch-off/switch-on) for all components.
 - check the setting of the PROFIsafe address of the drive (p9610).
- For message value = 5022:
- check the setting of the values of the F parameters at the PROFIsafe slave (F_SIL, F_CRC_Length, F_Par_Version, F_Source_Add, F_Dest_add, F_WD_Time).
- For message value = 5026:
- check the settings of the values of the F parameters and the F parameter CRC (CRC1) calculated from these at the PROFIsafe slave and update.
- For message value = 5065:
- check the configuration and communication at the PROFIsafe slave (cons. No. / CRC).
 - check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.
- For message value = 5066:
- check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.
 - evaluate diagnostic information in the F host.
 - check PROFIsafe connection.
- For message value = 6000 ... 6999:
- Refer to the description of the message values in safety fault F01611.
- For message value = 7000:
- increase the parameterized tolerance (p9542).
 - determine the actual position of CU (r9713[0] and the second channel r9713[1], and check the difference for plausibility.
- For message value = 7002:
- carry out a POWER ON (switch-off/switch-on) for all components.
- This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
 - machine control panel.

| | |
|-----------------------|---|
| C01712 | SI Motion P1 (CU): Defect in F-IO processing |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY (POWER ON) |

Cause: When cross checking and comparing the two monitoring channels, the drive detected a difference between parameters or results of the F-IO processing and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.

The safety message C01711 with message value 0 is also displayed due to initiation of STOP F.

If at least one monitoring function is active, the safety message C01701 "SI Motion: STOP B initiated" is output after the parameterized timer has expired.

Message value (r9749, interpret decimal):

Number of the cross-compared data that resulted in this message.

- 1: SI discrepancy monitoring time inputs (p10002, p10102).
- 2: SI acknowledgment internal event input terminal (p10006, p10106).
- 3: SI STO input terminal (p10022, p10122).
- 4: SI SS1 input terminal (p10023, p10123).
- 5: SI SS2 input terminal (p10024, p10124).
- 6: SI SOS input terminal (p10025, p10125).
- 7: SI SLS input terminal (p10026, p10126).
- 8: SI SLS_Limit(1) input terminal (p10027, p10127).
- 9: SI SLS_Limit(2) input terminal (p10028, p10128).
- 10: SI Safe State signal selection (p10039, p10139).
- 11 SI F-DI input mode (p10040, p10140).
- 12: SI F-DO 0 signal sources (p10042, p10142).
- 13: Different states for static inactive signal sources (p10006, p10022 ... p10031).
- 14: SI discrepancy monitoring time outputs (p10002, p10102).
- 15: SI acknowledgment internal event (p10006, p10106).
- 16: SI test sensor feedback signal test mode selected for test stop (p10046, p10146, p10047, p10147).
- 17: SI delay time for test stop at DOs (p10001).
- 18 ... 25: SI test sensor feedback signal (p10046, p10146, p10047, p10147). Expected state of internal readback signal, generated from the selected test stop mode.
- 26 ... 33: SI test sensor feedback signal (p10046, p10146, p10047, p10147). Expected state of external readback signal, generated from the selected test stop mode.
- 34 ... 41: SI test sensor feedback signal (p10046, p10146, p10047, p10147). Expected state of second internal readback signal, generated from the selected test stop mode.
- 42: Internal data for processing the second internal readback signal, generated from the selected test stop mode (p10047, p10147).
- 43: Internal data for processing the internal readback signal, generated from the selected test stop mode (p10047, p10147).
- 44: Internal data for processing the external readback signal, generated from the selected test stop mode (p10047, p10147).
- 45: Internal data for initialization state of test stop mode, dependent upon test stop parameters.
- 46: SI digital inputs debounce time (p10017, p10117)
- 47: Selection F-DI for PROFIsafe (p10050, p10150)
- 48: Screen form of the F-DIs used (p10006, p10022 ... p10031).
- 49: SI SDI positive input terminal (p10030, p10130).
- 50: SI SDI negative input terminal (p10031, p10131).
- 51: SI SLP input terminal (p10032, p10132).
- 52: SI SLP select input terminal (p10033, p10133).
- 53: Internal data for retraction logic (p10009, p100109).
- 54: SI F-DI for retraction SLP (p10009, p100109).

Remedy:

- check parameterization in the parameters involved and correct if required.
- ensure equality by copying the SI data to the second channel and then carry out an acceptance test.
- check monitoring clock cycle in p9500 and p9300 for equality.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- onboard F-DI (only CU310-2).
- PROFIsafe.
- machine control panel.

13.2 List of faults and alarms

C01714 **SI Motion P1 (CU): Safely Limited Speed exceeded**

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive has moved faster than that specified by the velocity limit value (p9531). The drive is stopped as a result of the configured stop response (p9563).
Message value (r2124, interpret decimal):
100: SLS1 exceeded.
200: SLS2 exceeded.
300: SLS3 exceeded.
400: SLS4 exceeded.
1000: Encoder limit frequency exceeded.

Remedy: - check the traversing/motion program in the control.
- check limits for SLS and if required adapt accordingly (p9531).
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
- machine control panel.
Note:
SI: Safety Integrated
SLS: Safely Limited Speed
See also: p9531, p9563

C01715 **SI Motion P1 (CU): Safely Limited Position exceeded**

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The axis has moved past a parameterized position that is monitored by the "SLP" function.
Message value (r9749, interpret decimal):
10: SLP1 violated.
20: SLP2 violated.

Remedy: - check the traversing/motion program in the control.
- check the limits for "SLP" function and if required, adapt (p9534, p9535).
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
Prerequisite:
- deselect "SLP" function and retract the axis into the permitted position range.
Carry out a safe acknowledgment using one of the following options:
- Terminal Module 54F (TM54F).
- onboard F-DI (only CU310-2).
- PROFIsafe.
- machine control panel.
Note:
SI: Safety Integrated
SLP: Safely Limited Position / SE: Safe software limit switches

C01716 **SI Motion P1 (CU): Tolerance for safe motion direction exceeded**

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The tolerance for the "safe motion direction" function was exceeded. The drive is stopped as a result of the configured stop response (p9566).
 Message value (r2124, interpret decimal):
 0: Tolerance for the "safe motion direction positive" function exceeded.
 1: Tolerance for the "safe motion direction negative" function exceeded.

Remedy: - check the traversing/motion program in the control.
 - check the tolerance for "SDI" function and if required, adapt (p9564).
 This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
 Prerequisite:
 - deselect the "SDI" function and if required select again.
 Carry out a safe acknowledgment using one of the following options:
 - PROFIsafe.
 - machine control panel.
 Note:
 SDI: Safe Direction (safe motion direction)
 SI: Safety Integrated
 See also: p9564, p9565, p9566

C01717 SI Motion P1 (CU): SLA limit exceeded

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The acceleration limit for the "Safely limited acceleration" function was exceeded. The drive is stopped as a result of the configured stop response (p9579).

Remedy: - check the traversing/motion program in the control.
 - check the acceleration limit for the "SLA" function and if required, adapt (p9578).
 - carry out a safe acknowledgment.
 Note:
 SI: Safety Integrated
 SLA: Safely-Limited Acceleration

C01730 SI Motion P1 (CU): Reference block for dynamic safely limited speed invalid

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The reference block transferred via PROFIsafe is negative.
 A reference block is used to generate a referred velocity limit value based on the reference quantity "Velocity limit value SLS1" (p9531[0]).
 The drive is stopped as a result of the configured stop response (p9563[0]).
 Message value (r2124, interpret decimal):
 requested, invalid reference block.

Remedy: In the PROFIsafe telegram, input data S_SLS_LIMIT_IST must be corrected.
 This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
 - PROFIsafe.
 Note:
 SI: Safety Integrated
 SLS: Safely Limited Speed

C01745 SI Motion P1 (CU): Checking braking torque for the brake test

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: POWER ON (IMMEDIATELY)
Cause: The scaling of the brake torque for the brake test can be changed using parameter p2003.
An acceptance test must be carried out again for the braking test. This determines whether the braking test is still carried out with the correct braking torque.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
- repeat the acceptance test for the safe brake test if the brake test is used.
See also: p2003

C01750 SI Motion P1 (CU): Hardware fault safety-relevant encoder

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The encoder that is used for the safety-relevant motion monitoring functions signals a hardware fault.
Message value (r2124, interpret decimal):
Encoder status word 1, encoder status word 2 that resulted in the message.
Remedy: - check the encoder connection.
- replace encoder.
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
- machine control panel.

C01751 SI Motion P1 (CU): Effectivity test fault safety-relevant encoder

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The DRIVE-CLiQ encoder for safe motion monitoring signals an error for the effectivity tests.
Message value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.
Remedy: - check the encoder connection.
- replace encoder.
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
- machine control panel.

C01752 SI Motion P1 (CU): reference position invalid

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The transferred reference position is invalid.
Message value (r9749, interpret decimal):
1: It is not possible to directly transfer the reference position (p9573=89).
2: It is not possible to transfer the reference position into the motion.

Remedy:

- unpark axis/encoder.
- acknowledge encoder fault
- deactivate gearbox stage switchover.
- when referencing via the Safety Control Channel (SCC), enable the function "Referencing via SCC" (p9501.27/9301.27).

This message can be acknowledged as follows:

- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe

A01780 SBT When selected, the brake is closed

Message value: Following brakes are closed: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: When selecting the brake test or starting the brake test, the brake was not open.
 Alarm value (r2124, interpret binary):
 Bit 0 = 1:
 The internal brake is closed.
 Note:
 The alarm is also issued if a brake has not been configured in p10202.
 SBT: Safe Brake Test
 See also: p10202

Remedy: Open the brake and reselect the brake test.

A01781 SBT brake opening time exceeded

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The maximum time (11 s) to open the brake during the brake test was exceeded.
 Possible causes:
 - during the brake test the drive went into a fault condition, and therefore the brake was closed by the drive.
 Alarm value (r2124, interpret binary):
 Bit 0 = 1:
 Internal brake was not able to be opened.
 Note:
 SBT: Safe Brake Test

Remedy:

- carry out a safe acknowledgment.
- restart the brake test.

A01782 SBT brake test incorrect control

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

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Cause: The brake test was canceled as a result of incorrect control.
Alarm value (r2124, evaluate binary):
Alarm value 0:
The brake test was canceled as a result of a fault (brake opening time or brake closing time exceeded).
Bit 0:
The safe brake test was canceled by resetting the brake test selection.
Bit 1:
The safe brake test was canceled by resetting the brake test start.
Bit 2:
The brake is not configured in configured p10202.
There is a brake test configuration error. In this case, alarm A01785 is also output.
Note:
SBT: Safe Brake Test
See also: p10202

Remedy:

- check parameterization of the brake test (p10202).
- check as to whether alarm A01785 is present, and if so, evaluate.
- carry out a safe acknowledgment.
- if required, restart the brake test.

A01783 SBT brake closing time exceeded

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The maximum time (11 s) to close the brake during the brake test was exceeded.
Alarm value (r2124, interpret binary):
Bit 0 = 1:
The brake was not able to be closed.
Note:
SBT: Safe Brake Test

Remedy:

- when using an internal brake with external feedback signal, check whether the feedback signal is correctly interconnected with the extended brake control.
- carry out a safe acknowledgment.
- restart the brake test.

A01784 SBT brake test canceled with fault

Message value: Fault cause: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The safe brake test was canceled as a result of a fault.
 Alarm value (r2124, interpret binary):
 Bit 17 = 1: fault in the brake test sequence (cause, see bits 0 ... 10).
 Bit 20 = 1: the brake is not opened (p10202).
 Bit 21 = 1: axis position during the brake test not valid due to parking axis.
 Bit 22 = 1: internal software error.
 Bit 23 = 1: the permissible position range of the axis was violated with the brake closed (p10212/p10222).
 Bit 24 = 1: the tested internal brake was opened while the brake test was active.
 Bit 26 = 1: during the active brake test, the test torque left its tolerance bandwidth (20 %).
 Cause for alarm value bit 17:
 Bit 0 = 1: operation when selecting the brake test not enabled (r0899.2 = 0).
 Bit 1 = 1: external fault occurred (e.g. the brake test that has already started is canceled by the user).
 Bit 2 = 1: when selecting the brake test a brake is closed.
 Bit 3 = 1: when determining the load torque a brake is closed.
 Bit 4 = 1: a fault with a stop response has occurred (e.g. OFF1, OFF2 or OFF3) - or pulse enable was withdrawn (e.g. STO selected or operation no longer enabled).
 Bit 5 = 1: when selecting the brake test the axis speed setpoint is too high.
 Bit 6 = 1: the actual speed (r0063) of the axis is too high (e.g. brake does not hold during the brake test).
 Bit 8 = 1: closed-loop control not enabled or function generator active.
 Bit 9 = 1: control does not switch over to the brake test (e.g. because PI speed control has not been parameterized).
 Bit 10 = 1: torque limit reached (r1407.7, r1408.8).
 Note:
 SBT: Safe Brake Test

Remedy: - remove the fault cause.
 - carry out a safe acknowledgment.
 - if required, restart the brake test.
 For bit 17 = 1 with bit 6 = 1 or bit 23 = 1:
 If the brake closing time of the motor holding brake (p1217) has been set too low, then at the start of the brake test, the brake is closed too late. The brake closing time should be adapted (p1217).

A01785 SBT brake test configuration error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when parameterizing the brake test.
 In this configuration, the brake test cannot be started or cannot be started without error.
 Alarm value (r2124, interpret decimal):
 1:
 No motion monitoring functions have been enabled.
 4:
 No brake was configured (p10202).
 8:
 The brake test is configured for an internal brake, however the safety brake control is not enabled (p9602).
 16:
 The safe brake test and Safety without encoder are simultaneously enabled (p9306/p9506). This is not permissible.
 Note:
 SBT: Safe Brake Test

Remedy: Check parameterization of the brake test.

F01786 SCC signal source changed

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The signal source in p10235 or p10250 was changed.
The new signal source is effective immediately.
Note:
SCC: Safety Control Channel
Remedy: Acknowledge fault.

F01787 SBT motor type different

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The motor type set for the safe brake test (p10204) does not match the motor type set via the function module (r0108.12).
Remedy: Adapt the motor type set for the safe brake test.
Note:
All of the parameters for the brake test, whose unit depends on the motor type, should be checked.
See also: p10209

A01788 SI: Automatic test stop waits for STO deselection via motion monitoring functions

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The automatic test stop (forced checking procedure) was not able to be carried out after powering up.
Possible causes:
- the STO function is selected via safe motion monitoring functions.
- a safety message is present, that resulted in a STO.
Note:
STO: Safe Torque Off
Remedy: - deselect STO via safe motion monitoring functions.
- remove the cause of the safety messages and acknowledge the messages.
Note:
The automatic test stop is performed after removing the cause.

A01789 SI: Automatic test stop and brake test when test stop is selected not permitted

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The parameterization of the automatic test stop (p9507.6/p9307.6) and the brake test when a test stop is selected (p10203 = 2) are not permissible.
The test stop is not automatically carried out when the powering up.
Remedy: - correct the parameter assignment.
- set p10203 not equal to 2 or deactivate the automatic test stop.
Note:
A warm restart or POWER ON is required to carry out the automatic test stop.

| | |
|-------------------------|---|
| A01794 (N) | SI Motion: check modulo value for safe position via PROFIsafe |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | When parameterizing the modulo value for safe position via PROFIsafe (p9505) the position actual value can jump when the range that can be represented overflows. Range that can be represented: - 32-bit value: +/- 2048 revolutions - 16-bit value: +/- 2048 revolutions (depending on p9574) |
| Remedy: | Correct the parameter assignment. Set p9505 to 2^n revolutions - and to complete revolutions (i.e. a multiple of 360°). Note: This alarm can be hidden for the case that the possible position actual value jump can be tolerated for the particular application, or does not represent a problem; for example because the parameterized modulo range fits "almost as integer number" in the range of +/- 2048 revolutions that can be represented. To re-parameterize the alarm to "NO REPORT", it is not permissible that the alarm is present. As a consequence, the following sequence is required for the re-parameterization: - correct p9505 to " 2^n ". - re-parameterize the alarm using p2118 and p2119. - set p9505 back to the required value. |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

| | |
|-----------------------|---|
| A01795 | SI Motion P1 (CU): Wait time after exiting the safe pulse cancellation expired |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | After exiting safe pulse cancellation, within the wait time of 5 seconds, encoderless actual value sensing was not able to be activated for the extended functions without selection. A change is again made into the "safe pulse cancellation" state. |
| Remedy: | - check missing enable signals, which prevent the drive control from being commissioned (r0046). - evaluate possible fault messages of the encoderless actual value sensing and remove. |

| | |
|-----------------------|---|
| A01796 (F, N) | SI P1 (CU): Wait for communication |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | The drive waits for communication to be established to execute the safety-relevant motion monitoring functions. Note: STO is active in this state. Alarm value (r2124, interpret decimal): 3: Wait for communication to be established to PROFIsafe F-Host. |

13.2 List of faults and alarms

Remedy: If, after a longer period of time, the message is not automatically withdrawn, the following checks have to be made:

- check any other PROFIsafe communication messages/signals present and evaluate them.
- check the operating state of the F-Host.
- check the communication connection to the F Host.

Note:

STO: Safe Torque Off

See also: p9601

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

C01797 SI Motion P1 (CU): Axis not safely referenced

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The standstill position saved before switching off does not match the actual position determined at switch-on.

Message value (r9749, interpret decimal):

1: Axis not safely referenced.

2: User agreement missing.

Remedy: If safe automatic referencing is not possible the user must issue a user agreement for the new position using the softkey. This mean that this position is then designated as safety-relevant.

Note:

SI: Safety Integrated

C01798 SI Motion P1 (CU): Test stop for motion monitoring functions running

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The forced checking procedure (test stop) for the safe motion monitoring functions is currently in progress.

Remedy: Not necessary.

The message is automatically withdrawn when the test stop has been completed.

Note:

SI: Safety Integrated

C01799 SI Motion P1 (CU): Acceptance test mode active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The acceptance test mode is active.

This means the following:

- the setpoint velocity limiting is deactivated (r9733).

Remedy: Not necessary.

The message is withdrawn when exiting the acceptance test mode.

Note:

SI: Safety Integrated

| | |
|-----------------------|---|
| F01800 | DRIVE-CLiQ: Hardware/configuration error |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2) |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | A DRIVE-CLiQ connection fault has occurred. Fault value (r0949, interpret decimal): 100 ... 107: Communication via DRIVE-CLiQ socket X100 ... X107 has not been switched to cyclic operation. The cause may be an incorrect structure or a configuration that results in an impossible bus timing. 10: Loss of the DRIVE-CLiQ connection. The cause may be, for example, that the DRIVE-CLiQ cable was withdrawn from the Control Unit or as a result of a short-circuit for motors with DRIVE-CLiQ. This fault can only be acknowledged in cyclic communication. 11: Repeated faults when detecting the connection. This fault can only be acknowledged in cyclic communication. 12: A connection was detected but the node ID exchange mechanism does not function. The reason is probably that the component is defective. This fault can only be acknowledged in cyclic communication. |
| Remedy: | For fault value = 100 ... 107: - ensure that the DRIVE-CLiQ components have the same firmware versions. - avoid longer topologies for short current controller sampling times. For fault value = 10: - check the DRIVE-CLiQ cables at the Control Unit. - remove any short-circuit for motors with DRIVE-CLiQ. - carry out a POWER ON. For fault value = 11: - check the electrical cabinet design and cable routing for EMC compliance For fault value = 12: - replace the component involved. |

| | |
|-----------------------|--|
| A01839 | DRIVE-CLiQ diagnostics: cable fault to the component |
| Message value: | Component number: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | The fault counter (r9936[0...199]) to monitor the DRIVE-CLiQ connections/cables has been incremented. Alarm value (r2124, interpret decimal): Component number. Note: The component number specifies the component whose feeder cable from the direction of the Control Unit is faulted. The alarm automatically disappears after 5 seconds, assuming that no other data transfer error has occurred. |
| Remedy: | - check the corresponding DRIVE-CLiQ cables. - check the electrical cabinet design and cable routing for EMC compliance |

| | |
|-----------------------|--|
| A01840 | SMI: Component found without motor data |
| Message value: | Component number: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |

13.2 List of faults and alarms

Cause: An SMI/DQI without motor data has been found (e.g. SMI installed as replacement part).
Alarm value (r2124, interpret decimal):
Component number from target topology.

Remedy: 1. Download the SMI/DQI data (motor/encoder data) from the data backup again (p4690, p4691).
2. Carry out a POWER ON (switch-off/switch-on) for this component.

Note:
DQI: DRIVE-CLiQ Sensor Integrated
SMI: SINAMICS Sensor Module Integrated

A01900 (F) PB/PN: Configuration telegram error

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A controller attempts to establish a connection using an incorrect configuring telegram.

Alarm value (r2124, interpret decimal):

1:
Connection established to more drive objects than configured in the device. The drive objects for process data exchange and their sequence are defined in p0978.

2:
Too many PZD data words for output or input to a drive object. The number of possible PZD items in a drive object is determined by the number of indices in r2050/p2051.

3:
Uneven number of bytes for input or output.

4:
Setting data for synchronization not accepted. For more information, see A01902.

211:
Unknown parameterizing block.

223:
Clock synchronization for the PZD interface set in p8815[0] is not permissible.
More than one PZD interface is operated in clock synchronism.

253:
PN Shared Device: Illegal mixed configuration of PROFIsafe and PZD.

254:
PN Shared Device: Illegal double assignment of a slot/subslot.

255:
PN: Configured drive object and existing drive object do not match.

256:
PN: configured telegram cannot be set.

500:
Illegal PROFIsafe configuration for the interface set in p8815[1].
More than one PZD interface is operated with PROFIsafe.

501:
PROFIsafe parameter error (e.g. F_dest).

502:
PROFIsafe telegram does not match.

503:
PROFIsafe connection is rejected as long as there is no isochronous connection (p8969).

Additional values:
Only for internal Siemens troubleshooting.

Remedy: Check the bus configuration on the master and the slave sides.
 For alarm value = 1, 2:
 - check the list of the drive objects with process data exchange (p0978).
 Note:
 With p0978[x] = 0, all of the following drive objects in the list are excluded from the process data exchange.
 For alarm value = 2:
 - check the number of data words for output and input to a drive object.
 For alarm value = 211:
 - Ensure offline version <= online version.
 For alarm value = 223, 500:
 - check the setting in p8839 and p8815.
 - check for inserted but not configured CBE20.
 - ensure that only one PZD interface is operated in clock synchronism or with PROFIsafe.
 For alarm value = 255:
 - check configured drive objects.
 For alarm value = 256:
 - check the configured telegram.
 For alarm value = 501:
 - check the set PROFIsafe address (p9610).
 For alarm value = 502:
 - check the set PROFIsafe telegram (p60022, p9611).

Reaction upon F: NONE (OFF1)
Acknowl. upon F: IMMEDIATELY

A01902 PB/PN: clock cycle synchronous operation parameterization not permissible

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Parameterization for isochronous operation is not permissible.
 Alarm value (r2124, interpret decimal):
 0: Bus cycle time Tdp < 0.5 ms.
 1: Bus cycle time Tdp > 32 ms.
 2: Bus cycle time Tdp is not an integer multiple of the current controller sampling time.
 3: Instant of the actual value sensing Ti > Bus cycle time Tdp or Ti = 0.
 4: Instant of the actual value sensing Ti is not an integer multiple of the current controller sampling time.
 5: Instant of the setpoint acceptance To >= Bus cycle time Tdp or To = 0.
 6: Instant of the setpoint acceptance To is not an integer multiple of the current controller sampling time.
 7: Master application cycle time Tmapc is not an integer multiple of the speed controller sampling time.
 8: Bus reserve bus cycle time Tdp - data exchange time Tdx less than two current controller sampling times.
 10: Instant of the setpoint acceptance To <= data exchange time Tdx + current controller sampling time
 11: Master application cycle time Tmapc > 14 x Tdp or Tmapc = 0.
 12: PLL tolerance window Tpll_w > Tpll_w_max.
 13: Bus cycle time Tdp is not a multiple of all basic clock cycles p0110[x].
 16: For COMM BOARD, the instant in time for the actual value sensing Ti is less than two current controller sampling times.

13.2 List of faults and alarms

Remedy:

- Adapt the bus parameterization Tdp, Ti, To.
- adapt the sampling time for the current controller or speed controller.

For alarm value = 10:

- reduce Tdx by using fewer bus participants or shorter telegrams.

Note:

PB: PROFIBUS
PN: PROFINET

F01911 (N, A) PB/PN: clock cycle synchronous operation clock cycle failure

Message value: -

Drive object: All objects

Reaction: Servo: OFF1 (OFF3)

Acknowledge: IMMEDIATELY

Cause: The global control telegram to synchronize the clock cycles has failed - in cyclic operation - for several DP clock cycles or has violated the time grid specified in the parameterizing telegram over several consecutive DP clock cycles (refer to the bus cycle time, Tdp and Tplw).

Remedy:

- check the physical bus configuration (cable, connector, terminating resistor, shielding, etc.).
- check whether communication was briefly or permanently interrupted.
- check the bus and controller for utilization level (e.g. bus cycle time Tdp was set too short).

PB: PROFIBUS
PN: PROFINET

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F01912 (N, A) PB/PN: clock cycle synchronous operation sign-of-life failure

Message value: -

Drive object: All objects

Reaction: Servo: OFF1 (OFF3)

Acknowledge: IMMEDIATELY

Cause: The maximum permissible number of errors in the controller sign-of-life (clock synchronous operation) has been exceeded in cyclic operation.

Remedy:

- physically check the bus (cables, connectors, terminating resistor, shielding, etc.).
- correct the interconnection of the controller sign-of-life (p2045).
- check whether the controller correctly sends the sign-of-life (e.g. create a trace with STW2.12 ... STW2.15 and trigger signal ZSW1.3).
- check the permissible telegram failure rate (p0925).
- check the bus and controller for utilization level (e.g. bus cycle time Tdp was set too short).

Note:

PB: PROFIBUS
PN: PROFINET

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F01915 (N, A) PB/PN: clock cycle synchronous operation sign-of-life failure drive object 1

Message value: -

Drive object: All objects

Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: Group display for problems with the sign-of-life of the master (isochronous operation) on the drive object 1 (Control Unit). For central measurements, synchronism with the central master is lost.
Remedy: Note:
 PB: PROFIBUS
 PN: PROFINET
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A01921 (F) PROFIBUS: Receive setpoints after To

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Output data of PROFIBUS master (setpoints) received at the incorrect instant in time within the PROFIBUS clock cycle.
Remedy: - check bus configuration.
 - check parameters for clock cycle synchronization (ensure $T_o > T_{dx}$).
 Note:
 To: Time of setpoint acceptance
 Tdx: Data exchange time
Reaction upon F: NONE (OFF1)
Acknowl. upon F: IMMEDIATELY

A01930 PB/PN: current controller sampling time clock cycle synch. not equal

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The current controller sampling time of all drives must be set the same for the clock cycle synchronous operation. Alarm value (r2124, interpret decimal):
 Number of the drive object with different current controller sampling time.
Remedy: Set current controller sampling time to identical values (p0115[0]).
 Note:
 PB: PROFIBUS
 PN: PROFINET

A01931 PB/PN: speed controller sampling time clock cycle synch. not equal

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The speed controller sampling time of all drives must be set the same for the clock cycle synchronous operation. Alarm value (r2124, interpret decimal):
 Number of the drive object with the different speed controller sampling time.

13.2 List of faults and alarms

Remedy: Set the speed controller sampling times to identical values (p0115[1]).
Note:
PB: PROFIBUS
PN: PROFINET

A01932 PB/PN: clock cycle synchronization missing for DSC

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: There is no clock synchronization or clock synchronous sign of life and DSC is selected.
Note:
DSC: Dynamic Servo Control
See also: p0922, r0922
Remedy: Set clock synchronization across the bus configuration and transfer clock synchronous sign-of-life.

A01940 PB/PN: clock cycle synchronism not reached

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram. It was not possible to synchronize to the clock cycle specified by the master.
- the master does not send a clock synchronous global control telegram although clock synchronous operation was selected when configuring the bus.
- the master is using another clock synchronous DP clock cycle than was transferred to the slave in the parameterizing telegram.
- at least one drive object has a pulse enable (not controlled from PROFIBUS/PROFINET either).
Remedy: - check the master application and bus configuration.
- check the consistency between the clock cycle input when configuring the slave and clock cycle setting at the master.
- check that no drive object has a pulse enable. Only enable the pulses after synchronizing the PROFIBUS/PROFINET drives.
Note:
PB: PROFIBUS
PN: PROFINET

A01941 PB/PN: clock cycle signal missing when establishing bus communication

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram. The global control telegram for synchronization is not being received.
Remedy: Check the master application and bus configuration.
Note:
PB: PROFIBUS
PN: PROFINET

A01943 PB/PN: clock cycle signal error when establishing bus communication

Message value: -
Drive object: All objects

Reaction: NONE
Acknowledge: NONE
Cause: The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram.
The global control telegram for synchronization is being irregularly received.
-.the master is sending an irregular global control telegram.
- the master is using another clock synchronous DP clock cycle than was transferred to the slave in the parameterizing telegram.
Remedy: - check the master application and bus configuration.
- check the consistency between the clock cycle input when configuring the slave and clock cycle setting at the master.
Note:
PB: PROFIBUS
PN: PROFINET

A01944 PB/PN: sign-of-life synchronism not reached

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram.
Synchronization with the master sign-of-life (STW2.12 ... STW2.15) could not be completed because the sign-of-life is changing differently to how it was configured in the Tmapc time grid.
Remedy: - ensure that the master correctly increments the sign-of-life in the master application clock cycle Tmapc.
- correct the interconnection of the master sign-of-life (p2045).
Note:
PB: PROFIBUS
PN: PROFINET

A01945 PROFIBUS: Connection to the Publisher failed

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For PROFIBUS peer-to-peer data transfer, the connection to at least one Publisher has failed.
Alarm value (r2124, interpret binary):
Bit 0 = 1: Publisher with address in r2077[0], connection failed.
...
Bit 15 = 1: Publisher with address in r2077[15], connection failed.
Remedy: - check the PROFIBUS cables.
- carry out a first commissioning of the Publisher that has the failed connection.

F01946 (A) PROFIBUS: Connection to the Publisher aborted

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: At this drive object, the connection to at least one Publisher for PROFIBUS peer-to-peer data transfer in cyclic operation has been aborted.
Fault value (r0949, interpret binary):
Bit 0 = 1: Publisher with address in r2077[0], connection aborted.
...
Bit 15 = 1: Publisher with address in r2077[15], connection aborted.

Remedy: - check the PROFIBUS cables.
- check the state of the Publisher that has the aborted connection.

Reaction upon A: NONE
Acknowl. upon A: NONE

F01950 (N, A) PB/PN: clock cycle synchronous operation synchronization unsuccessful

Message value: -

Drive object: All objects

Reaction: OFF1 (NONE)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: Synchronization of the internal clock cycle to the global control telegram has failed. The internal clock cycle exhibits an unexpected shift.

Remedy: Only for internal Siemens troubleshooting.
Note:
PB: PROFIBUS
PN: PROFINET

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F01951 CU SYNC: Synchronization application clock cycle missing

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: If DRIVE-CLiQ components with different application clock cycle are operated on a DRIVE-CLiQ port, this requires synchronization with the Control Unit. This synchronization routine was unsuccessful.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade the software of the DRIVE-CLiQ components.
- upgrade the Control Unit software.
Note:
If a Controller Extension is being used (e.g. CX32, NX10), then the following applies:
Check whether the Controller Extension is issuing error messages, and if required, remove these.

F01952 CU DRIVE-CLiQ: Synchronization of component not supported

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The existing system configuration requires that the connected DRIVE-CLiQ components support the synchronization between the basic clock cycle, DRIVE-CLiQ clock cycle and the application clock cycle.
However, not all DRIVE-CLiQ components have this functionality.
Fault value (r0949, interpret decimal):
Component number of the first faulty DRIVE-CLiQ component.

Remedy: Upgrade the firmware of the component specified in the fault value.
Note:
If required, also upgrade additional components in the DRIVE-CLiQ line.

A01953 CU SYNC: Synchronization not completed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: After the drive system is switched on, the synchronization between the basic clock cycle, DRIVE-CLiQ clock cycle and application clock cycle was started but was not completed within the selected time tolerance.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: Carry out a POWER ON (switch-off/switch-on) for all components.
If the error occurs after the drive sampling times were changed, and if a Terminal Module 31 (TM31) is being used, the sampling times (p0115, p4099) should be set as integer multiples to the drive clock cycles (p0115).

F01954 CU DRIVE-CLiQ: Synchronization unsuccessful

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: Synchronization between the basic clock cycle, DRIVE-CLiQ clock cycle and application clock cycle was started and was not able to be successfully completed (e.g. after switch-on).
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

1. Remove the cause of a possible DRIVE-CLiQ fault.
2. Initiate a new synchronization, e.g. as follows:
 - remove the PROFIBUS master and re-insert again.
 - restart the PROFIBUS master.
 - switch off the Control Unit and switch on again.
 - carry out a Control Unit hardware reset (RESET button, p0972).
 - carry out a parameter reset and download the saved parameters (p0009 = 30, p0976 = 2, 3).

A01955 CU DRIVE-CLiQ: Synchronization DO not completed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: After the drive system is switched on, the synchronization between the basic clock cycle, DRIVE-CLiQ clock cycle and application clock cycle was started but was not completed within the selected time tolerance.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: Carry out a POWER ON (switch-off/switch-on) for all components of the DO.

13.2 List of faults and alarms

A01980 PN: cyclic connection interrupted

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The cyclic connection to the PROFINET controller is interrupted.
See also: r8936 (PN cyclic connection state)
Remedy: Establish the PROFINET connection and activate the PROFINET controller in the cyclic mode.

A01981 PN: Maximum number of controllers exceeded

Message value: Info. 1: %1, info. 2: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A controller attempts to establish a connection to the drive, and as a consequence exceeds the permitted number of PROFINET connections.
The alarm disappears automatically after approx. 30 seconds.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex: yyyy = info. 1, xxxx = info. 2
Info 1 = 0: number of RT connections exceeded
Info 1 > 0: number of IRT connections exceeded
Info 2: permitted number of connections
Remedy: Check the configuration of the PROFINET controllers.

A01982 PN: second controller missing

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Connections to two PROFINET controllers are expected. However, only the connection to a PROFINET controller is present.
- there is only one connection to the F controller.
- system redundancy is activated.
Remedy: Check the configuration of the PROFINET controllers.

A01983 PN: system redundancy switchover running

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The "PROFINET system redundancy" function is configured and the connection between the primary control and drive device is interrupted. The backup controller assumes control of the drive device.
Remedy: Not necessary.
The alarm is automatically withdrawn after switchover has been successfully completed.

A01989 PN: internal cyclic data transfer error

Message value: %1
Drive object: All objects
Reaction: NONE

Acknowledge: NONE
Cause: The cyclic actual values and/or setpoints were not transferred within the specified times.
 Alarm value (r2124, interpret hexadecimal):
 Only for internal Siemens troubleshooting.
Remedy: Correctly set T_io_input or T_io_output.

A02000 Function generator: Start not possible
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The function generator has already been started.
Remedy: Stop the function generator and restart again if necessary.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02005 Function generator: Drive does not exist
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The drive object specified for connection does not exist.
Remedy: Use the existing drive object with the corresponding number.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02006 Function generator: No drive specified for connection
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: No drive specified for connection in p4815.
Remedy: At least one drive to be connected must be specified in p4815.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02007 Function generator: Drive not SERVO / VECTOR / DC_CTRL
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The drive object specified for connection is not a SERVO / VECTOR or DC_CTRL.

13.2 List of faults and alarms

Remedy: Use a SERVO / VECTOR / DC_CTRL drive object with the corresponding number.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02008 Function generator: Drive specified a multiple number of times

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The drive object specified for connection is already specified.
Alarm value (r2124, interpret decimal):
Drive object number of the drive object that is specified a multiple number of times.
Remedy: Specify a different drive object.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02009 Function generator: Illegal mode

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The set operating mode (p1300) of the drive object is not permissible when using the function generator.
Alarm value (r2124, interpret decimal):
Number of the drive object involved.
Remedy: Change the operating mode for this drive object to p1300 = 20 (encoderless speed control) or p1300 = 21 (speed control with encoder).
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02010 Function generator: Speed setpoint from the drive is not zero

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The speed setpoint of a drive selected for connection is greater than the value for the standstill detection set using p1226.
Remedy: For all of the drives specified for connection, set the speed setpoints to zero.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02011 Function generator: The actual drive speed is not zero

Message value: -
Drive object: All objects

Reaction: NONE
Acknowledge: NONE
Cause: The speed actual value of a drive selected for connection is greater than the value for the standstill detection set using p1226.
Remedy: Set the relevant drives to zero speed before starting the function generator.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02015 Function generator: Drive enable signals missing

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The master control and/or enable signals are missing to connect to the specified drive.
Remedy: Fetch the master control to the specified drive object and set all enable signals.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02016 Function generator: Magnetizing running

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Magnetizing has not yet been completed on a drive object specified for connection.
 Alarm value (r2124, interpret decimal):
 Number of the drive object involved.
Remedy: Wait for magnetizing of the motor (r0056.4).
 Note:
 The alarm is reset as follows:
 - restart the function generator.

A02020 Function generator: Parameter cannot be changed

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: This parameter setting cannot be changed when the function generator is active (p4800 = 1).
Remedy: - stop the function generator before parameterizing (p4800 = 0).
 - if required, start the function generator (p4800 = 1).
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02025 Function generator: Period too short

Message value: -

13.2 List of faults and alarms

Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The value for the period is too short.
Remedy: Check and adapt the value for the period.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02026 **Function generator: Pulse width too high**
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected pulse width is too high.
The pulse width must be less than the period duration.
Remedy: Reduce pulse width.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02030 **Function generator: Physical address equals zero**
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The specified physical address is zero.
Remedy: Set a physical address with a value other than zero.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02040 **Function generator: Illegal value for offset**
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The value for the offset is higher than the value for the upper limit or lower than the value for the lower limit.
Remedy: Adjust the offset value accordingly.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02041 **Function generator: Illegal value for bandwidth**
Message value: -

Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The bandwidth referred to the time slice clock cycle of the function generator has either been set too low or too high. Depending on the time slice clock cycle, the bandwidth is defined as follows:
 $\text{Bandwidth_max} = 1 / (2 \times \text{time slice clock cycle})$
 $\text{Bandwidth_min} = \text{Bandwidth_max} / 100000$
 Example:
 Assumption: p4830 = 125 μs
 $\rightarrow \text{Bandwidth_max} = 1 / (2 \times 125 \mu\text{s}) = 4000 \text{ Hz}$
 $\rightarrow \text{Bandwidth_min} = 4000 \text{ Hz} / 100000 = 0.04 \text{ Hz}$
 Note:
 p4823: Function generator bandwidth
 p4830: Function generator time slice clock cycle
Remedy: Check the value for the bandwidth and adapt accordingly.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02047 Function generator: Time slice clock cycle invalid

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The time slice clock cycle selected does not match any of the existing time slices.
Remedy: Enter an existing time slice clock cycle. The existing time slices can be read out via p7901.
 Note:
 The alarm is reset as follows:
 - remove the cause of this alarm.
 - restart the function generator.

A02050 Trace: Start not possible

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The trace has already been started.
Remedy: Stop the trace and, if necessary, start again.

A02051 Trace: recording not possible as a result of know-how protection

Message value: initiating recorder: %1, parameter %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: TRACE recording is not possible as at least one signal or trigger signal being used is under know-how protection.
Alarm value (r2124, interpret hexadecimal):
bbbbaaaa hex:
aaaa = 1: recorder 0
aaaa = 2: recorder 1
aaaa = 3: recorders 0 and 1
bbbb = parameter number (hexadecimal), that was not able to be written to.

Remedy:

- Temporarily activate or deactivate know-how protection (p7766).
- include the signal in the OEM exception list (p7763, p7764).
- Where relevant do not record the signal.

A02055 Trace: Recording time too short

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The trace duration is too short.
The minimum is twice the value of the trace clock cycle.
Remedy: Check the selected recording time and, if necessary, adjust.

A02056 Trace: Recording cycle too short

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected recording cycle is shorter than the selected basic clock cycle 0 (p0110[0]).
Remedy: Increase the value for the trace cycle.

A02057 Trace: Time slice clock cycle invalid

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The time slice clock cycle selected does not match any of the existing time slices.
Remedy: Enter an existing time slice clock cycle. The existing time slices can be read out via p7901.

A02058 Trace: Time slice clock cycle for endless trace not valid

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected time slice clock cycle cannot be used for the endless trace
Remedy: Enter the clock cycle of an existing time slice with a cycle time ≥ 2 ms for up to 4 recording channels or ≥ 4 ms from 5 recording channels per trace.
The existing time slices can be read out via p7901.

A02059 Trace: Time slice clock cycle for 2 x 8 recording channels not valid

Message value: -
Drive object: All objects

Reaction: NONE
Acknowledge: NONE
Cause: The selected time slice clock cycle cannot be used for more than 4 recording channels.
Remedy: Enter the clock cycle of an existing time slice with a cycle time ≥ 4 ms or reduce the number of recording channels to 4 per trace.
 The existing time slices can be read out via p7901.

A02060 Trace: Signal to be traced missing

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: - a signal to be traced was not specified.
 - the specified signals are not valid.
Remedy: - specify the signal to be traced.
 - check whether the relevant signal can be traced.

A02061 Trace: Invalid signal

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: - the specified signal does not exist.
 - the specified signal can no longer be traced (recorded).
Remedy: - specify the signal to be traced.
 - check whether the relevant signal can be traced.

A02062 Trace: Invalid trigger signal

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: - a trigger signal was not specified.
 - the specified signal does not exist.
 - the specified signal is not a fixed-point signal.
 - the specified signal cannot be used as a trigger signal for the trace.
Remedy: Specify a valid trigger signal.

A02063 Trace: Invalid data type

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The specified data type to select a signal using a physical address is invalid.
Remedy: Use a valid data type.

A02070 Trace: Parameter cannot be changed

Message value: -
Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: NONE
Cause: The trace parameter settings cannot be changed when the trace is active.
Remedy: - stop the trace before parameterization.
- if required, start the trace.

A02075 Trace: Pretrigger time too long

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected pretrigger time must be shorter than the trace time.
Remedy: Check the pretrigger time setting and change if necessary.

F02080 Trace: Parameterization deleted due to unit changeover

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The trace parameterization in the drive unit was deleted due to a unit changeover or a change in the reference parameters.
Remedy: Restart trace.

A02085 Message function: Parameterization error

Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A parameterization error was identified when starting the variable message function.
Alarm value (r2124, interpret decimal):
Incorrectly set parameter.
Remedy: Correct the parameter and restart.
Note:
The alarm is automatically withdrawn when stopping, or when successfully starting the variable message function (p3290.0).

A02095 MTrace 0: multiple trace cannot be activated

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The following functions or settings are not permissible in conjunction with a multiple trace (trace recorder 0):
- measuring function
- long-time trace
- trigger condition "immediate recording start" (IMMEDIATE)
- trigger condition "start with function generator" (FG_START)
Remedy: - if required, deactivate the multiple trace (p4840[0] = 0).
- deactivate function or setting that is not permissible

A02096 MTrace 0: cannot be saved

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: It is not possible to save the measurement results of a multiple trace on the memory card (trace recorder 0).
 A multiple trace is not started or is canceled.
 Alarm value (r2124, interpret decimal):
 1: Memory card cannot be accessed.
 - card is not inserted or is blocked by a mounted USB drive.
 3: data save operation to slow.
 - a second trace has been completed before the measurement results of the first trace were able to be saved.
 - writing the measurement result files to the card is blocked by the parameter save.
 4: Data save operation canceled.
 - for instance, the file required for the data save operation was not able to be found.

Remedy:

- insert or remove the memory card.
- use a larger memory card.
- configure a longer trace time or use an endless trace.
- avoid saving parameters while a multiple trace is running.
- check whether other functions are presently accessing measurement result files.

A02097 MTrace 1: multiple trace cannot be activated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The following functions or settings are not permissible in conjunction with a multiple trace (trace recorder 1):
 - measuring function
 - long-time trace
 - trigger condition "immediate recording start" (IMMEDIATE)
 - trigger condition "start with function generator" (FG_START)

Remedy:

- if required, deactivate the multiple trace (p4840[1] = 0).
- deactivate function or setting that is not permissible

A02098 MTrace 1: cannot be saved

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: It is not possible to save the measurement results of a multiple trace on the memory card (trace recorder 1).
 A multiple trace is not started or is canceled.
 Alarm value (r2124, interpret decimal):
 1: Memory card cannot be accessed.
 - card is not inserted or is blocked by a mounted USB drive.
 3: data save operation to slow.
 - a second trace has been completed before the measurement results of the first trace were able to be saved.
 - writing the measurement result files to the card is blocked by the parameter save.
 4: Data save operation canceled.
 - for instance, the file required for the data save operation was not able to be found.

13.2 List of faults and alarms

- Remedy:**
- insert or remove the memory card.
 - use a larger memory card.
 - configure a longer trace time or use an endless trace.
 - avoid saving parameters while a multiple trace is running.
 - check whether other functions are presently accessing measurement result files.
-

A02099 Trace: Insufficient Control Unit memory

- Message value:** -
- Drive object:** All objects
- Reaction:** NONE
- Acknowledge:** NONE
- Cause:** The memory space still available on the Control Unit is no longer sufficient for the trace function.
- Remedy:** Reduce the memory required, e.g. as follows:
- reduce the trace time.
 - increase the trace clock cycle.
 - reduce the number of signals to be traced.
-

A02100 Drive: Computing dead time current controller too short

- Message value:** %1
- Drive object:** All objects
- Reaction:** NONE
- Acknowledge:** NONE
- Cause:** The value in p0118 produces a dead time of one clock cycle because it is prior to setpoint availability.
Possible causes:
- a parameter backup with a version higher than 4.3 was loaded to a version less than or equal to 4.3.
 - the system properties after replacing a component no longer match the parameter assignment.
- Alarm value (r2134, floating point):
Minimum value for p0118 where dead time no longer occurs.
- Remedy:**
- set p0118 to zero.
 - set p0118 to a value greater than or equal to the alarm value (for p1810.11 = 1)
 - set p0117 (from the device) to an automatic setting (p0117 = 1).
 - check the firmware versions of the components involved.
-

A02150 TEC: Technology Extension cannot be loaded

- Message value:** %1
- Drive object:** All objects
- Reaction:** NONE
- Acknowledge:** NONE
- Cause:** The system was not able to load a Technology Extension.
Alarm value (r2124, interpret hexadecimal):
10 hex (16 dec):
The interface version in the DCB user library is not compatible to the DCC standard library that has been loaded.
12 hex (18 dec):
A technology package was not able to be downloaded to a Control Unit because the warm restart necessary was not able to be performed.
Only for internal Siemens troubleshooting.
-

Remedy:

- carry out a warm restart (p0009 = 30, p0976 = 2, 3).
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.
- contact Technical Support.

For alarm value = 10 hex (16 dec):
Load a compatible DCB user library (compatible to the interface of the DCC standard library).

For alarm value = 12 hex (18 dec):
Carry out a POWER ON (switch-off/switch-on) for all components.

Note:
DCB: Drive Control Block
DCC: Drive Control Chart
TEC: Technology Extension

F02151 (A) TEC: internal software error

Message value: %1

Drive object: All objects

Reaction: Servo: OFF2 (NONE, OFF1, OFF3)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: An internal software error has occurred within a Technology Extension.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.
- contact Technical Support.
- replace the Control Unit.

Note:
TEC: Technology Extension

Reaction upon A: NONE

Acknowl. upon A: NONE

F02152 (A) TEC: insufficient memory

Message value: %1

Drive object: All objects

Reaction: OFF1

Acknowledge: IMMEDIATELY (POWER ON)

Cause: Too many functions have been configured on this Control Unit (e.g. too many drives, function modules, data sets, Technology Extensions, blocks, etc).
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- change the configuration on this Control Unit (e.g. fewer drives, function modules, data sets, Technology Extensions, blocks, etc).
- use an additional Control Unit.

Note:
TEC: Technology Extension

Reaction upon A: NONE

Acknowl. upon A: NONE

F02153 TEC: technology function does not exist

Message value: -

Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A technology function (e.g. Technology Extension, DCB library) does not exist on the drive device.
When configuring, a technology function is activated, which does not exist on the drive device. This can occur when downloading a project or when powering up.
Remedy: - load the required technology function to the drive device.
- if required, deactivate the technology function not required in the configuration.
Note:
DCB: Drive Control Block
TEC: Technology Extension

F03000 NVRAM fault on action

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault occurred during execution of action p7770 = 1 or 2 for the NVRAM data.
Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = fault cause, xx = application ID
yy = 1:
The action p7770 = 1 is not supported by this version if Drive Control Chart (DCC) is activated for the drive object concerned.
yy = 2:
The data length of the specified application is not the same in the NVRAM and the backup.
yy = 3:
The data checksum in p7774 is not correct.
yy = 4:
No data available to load.
Remedy: - Perform the remedy according to the results of the troubleshooting.
- if necessary, start the action again.

F03001 NVRAM checksum incorrect

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A checksum error occurred when evaluating the non-volatile data (NVRAM) on the Control Unit.
The NVRAM data affected was deleted.
Remedy: Carry out a POWER ON (switch-off/switch-on) for all components.

F03500 (A) TM: Initialization

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: When initializing the Terminal Modules, the terminals of the Control Unit or the Terminal Board 30, an internal software error has occurred.
Fault value (r0949, interpret decimal):
yxxx dex
y = Only for internal Siemens troubleshooting
xxx = component number (p0151)

Remedy:

- switch-off/switch-on the power supply for the Control Unit.
- check the DRIVE-CLiQ connection.
- if required, replace the Terminal Module.

The Terminal Module should be directly connected to a DRIVE-CLiQ socket of the Control Unit.
If the fault occurs again, replace the Terminal Module.

Reaction upon A: NONE
Acknowl. upon A: NONE

A03501 TM: Sampling time change

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The sampling times of the inputs/outputs were changed.
This change only becomes valid after the next boot.
Remedy: Carry out a POWER ON.

F03505 (N, A) Analog input wire breakage

Message value: %1
Drive object: All objects
Reaction: OFF1 (NONE, OFF2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The wire-break monitoring for an analog input has responded.
Remedy: Check the wiring for interruptions.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A03506 (F, N) 24 V power supply missing

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The 24 V power supply for the digital outputs (X124) is missing.
Remedy: Check the terminals for the power supply voltage (X124, L1+, M).
Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

A03507 (F, N) Digital output not set

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: Despite specification by the signal source the digital output has not been set.
Possible causes:

- power supply missing.
- the digital output is in current limiting (e.g. due to short-circuit).
- the digital output is being used for Safety Extended Functions.
- the control has authority to access the digital output by means of direct access (see also r0729).

Alarm value (r2124, interpret bitwise binary):
Digital output involved (structured the same as r0747).

Remedy:

- check the 24 V power supply (e.g. X131.7 for CU305, ground is X131.8).
- check the output terminals for short-circuits.
- reset the signal source of the digital output for use by Safety Extended functions.
- carry out a POWER ON (switch-off/switch-on).

Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

A03510 (F, N) Calibration data not plausible

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: During ramp-up, the Terminal Module 31 (TM31) calibration data is read in and checked for plausibility.
At least one calibration data point was determined to be invalid.
Alarm value (r2124, interpret binary):
Bit 1: 10 V value, analog input 0 invalid.
Bit 3: 10 V value, analog input 1 invalid.
Bit 4: Offset, analog output 0 invalid.
Bit 5: 10 V value, analog output 0 invalid.
Bit 6: Offset, analog output 1 invalid.
Bit 7: 10 V value, analog input 1 invalid.

Remedy:

- switch-off/switch-on the power supply for the Control Unit.
- check the DRIVE-CLiQ wiring.

Note:
If it reoccurs, then replace the module.
In principle, operation could continue.
The analog channel involved possibly does not achieve the specified accuracy.

Reaction upon F: NONE (OFF1, OFF2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

A03550 TM: Speed setpoint filter natural frequency > Shannon frequency

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The natural filter frequency of the speed setpoint filter (p1417) is greater than or equal to the Shannon frequency.
The Shannon frequency is calculated according to the following formula:
 $0.5 / p4099[3]$

Remedy: Reduce the natural frequency of the speed setpoint filter (PT2 low pass) (p1417).

F03590 (N, A) TM: Module not ready

Message value: %1

Drive object: All objects

Reaction: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The Terminal Module involved does not send a ready signal and no valid cyclic data.
 Fault value (r0949, interpret decimal):
 Drive object number of the Terminal Module involved.

Remedy:

- check the 24 V power supply.
- check the DRIVE-CLiQ wiring.
- check whether the sampling time of the drive object involved is not equal to zero (p4099[0]).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A05000 (N) Power unit: Overtemperature heat sink AC inverter

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The alarm threshold for overtemperature at the inverter heat sink has been reached. The response is set using p0290.
 If the heat sink temperature exceeds the value set in p0292[0], then fault F30004 is output.

Remedy: Check the following:

- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the cooling failed?

Reaction upon N: NONE

Acknowl. upon N: NONE

A05001 (N) Power unit: Overtemperature depletion layer chip

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Alarm threshold for overtemperature of the power semiconductor in the AC converter has been reached.

Note:

- the response is set using p0290.
- if the temperature of the barrier layer increases by the value set in p0292[1], then fault F30025 is initiated.

Remedy: Check the following:

- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the cooling failed?
- pulse frequency too high?

See also: r0037

Reaction upon N: NONE

Acknowl. upon N: NONE

13.2 List of faults and alarms

A05002 (N) Power unit: Air intake overtemperature

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The alarm threshold for the air intake overtemperature has been reached. For air-cooled power units, the threshold is 42 °C (hysteresis 2 K). The response is set using p0290.

If the air intake temperature increases by an additional 13 K, then fault F30035 is output.

Remedy: Check the following:

- is the ambient temperature within the defined limit values?
- has the fan failed? Check the direction of rotation.

Reaction upon N: NONE

Acknowl. upon N: NONE

A05003 (N) Power unit: Internal overtemperature

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The alarm threshold for internal overtemperature has been reached.

If the temperature inside the power unit increases by an additional 5 K, then fault F30036 is triggered.

Remedy: Check the following:

- is the ambient temperature within the defined limit values?
- has the fan failed? Check the direction of rotation.

Reaction upon N: NONE

Acknowl. upon N: NONE

A05004 (N) Power unit: Rectifier overtemperature

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The alarm threshold for the overtemperature of the rectifier has been reached. The response is set using p0290.

If the temperature of the rectifier increases by an additional 5 K, then fault F30037 is triggered.

Remedy: Check the following:

- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the fan failed? Check the direction of rotation.
- has a phase of the line supply failed?
- is an arm of the supply (incoming) rectifier defective?

Reaction upon N: NONE

Acknowl. upon N: NONE

A05005 Cooling unit: Cooling medium flow rate too low

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Cooling unit: Alarm - flow rate has fallen below the alarm value

Remedy: - check the feedback signals and parameter assignment (p0260 ... p0267).
- check the coolant feed.

A05006 (N) Power unit: Overtemperature thermal model

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature difference between the chip and heat sink has exceeded the permissible limit value (blocksize power units only).
Depending on p0290, an appropriate overload response is initiated.
See also: r0037
Remedy: Not necessary.
This alarm is automatically withdrawn once the limit value has been fallen below.
Note:
If the alarm is not automatically withdrawn and the temperature continues to rise, this can result in fault F30024.
Reaction upon N: NONE
Acknowl. upon N: NONE

N05007 (A) Power unit: Overtemperature thermal model (chassis PU)

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature difference between the chip and heat sink has exceeded the permissible limit value (r0293) (chassis power units only).
Depending on p0290, an appropriate overload response is initiated.
See also: r0037
Remedy: Not necessary.
This alarm is automatically withdrawn once the limit value has been fallen below.
Reaction upon A: NONE
Acknowl. upon A: NONE

A05054 Parallel circuit: Power unit deactivated

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For the drive object involved, fewer power units connected in parallel are active than exist in the target topology. Operation is only possible at reduced power (power derating).
Remedy: Re-activate the deactivated power units if required.

F05055 Parallel connection: Power units with illegal code numbers

Message value: Parameter: %1
Drive object: All objects
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: The code numbers of the power units do not match.
Fault value (r0949, interpret decimal):
Parameter in which the first different power unit code number was detected.

13.2 List of faults and alarms

Remedy: Use power units with the same code number.
For parallel circuit configurations, only power units with identical power unit data may be used.

F05056 Parallel circuit: Power unit EEPROM versions differ

Message value: Parameter: %1

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: The EEPROM versions of the power units do not match.
Fault value (r0949, interpret decimal):
Parameter in which the first different version number was detected.

Remedy: Use power units with the same EEPROM version.
Note:
For parallel circuit configurations, only power units with identical EEPROM versions may be used.

F05057 Parallel circuit: Power unit firmware versions differ

Message value: Parameter: %1

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: The firmware versions of the power units connected in parallel do not match.
Fault value (r0949, interpret decimal):
Parameter in which the first different version number was detected.

Remedy: Use power units with the same firmware version.
For parallel circuit configurations, only power units with identical firmware versions may be used.

F05058 Parallel circuit: VSM EEPROM versions differ

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The EEPROM versions of the Voltage Sensing Modules (VSM) do not match.
Fault value (r0949, interpret decimal):
Parameter in which the first different version number was detected.

Remedy: For parallel circuit configurations, only Voltage Sensing Modules (VSM) with identical EEPROM versions may be used.

F05059 Parallel circuit: VSM firmware versions differ

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The firmware versions of the Voltage Sensing Module (VSM) do not match.
Fault value (r0949, interpret decimal):
Parameter in which the first different version number was detected.

Remedy: For parallel circuit configurations, only Voltage Sensing Modules (VSM) with identical firmware versions may be used.

F05060 Parallel circuit: Power unit firmware version does not match

Message value: Parameter: %1

Drive object: All objects

Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: Firmware from version V02.30.01.00 is required when connecting the power units in parallel.
Remedy: Update the firmware of the power units (at least V02.30.01.00).

F05061 Infeed VSM count

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The number of active Voltage Sensing Modules (VSM) for the drive object infeed with chassis power units is not correct.
 For A_Infeed, each active power unit must be assigned an active VSM also for a parallel circuit configuration.
 For S_Infeed, the active drive object, must be assigned at least one active VSM.
 Fault value (r0949, interpret decimal):
 Number of VSMs that are currently assigned to the drive object.
Remedy: Adapts the number of active Voltage Sensing Modules (VSM).

F05118 (A) Precharging contactor simultaneity monitoring time exceeded

Message value: fault cause: %1, additional information: %2
Drive object: All objects
Reaction: OFF2 (NONE, OFF1)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A feedback signal for the precharging contactor (ALM, SLM, BLM diode) or the line contactor (BLM thyristor) interconnected and the simultaneity monitoring (p0255[4, 6]) activated.
 After opening or closing a contactor of the parallel connection, after a monitoring time has elapsed, not all of the contactors have assumed the same state.
 Fault value (r0949, interpret binary):
 yyyyxxx hex: yyyy = supplementary information, xxxx = fault cause
 Fault cause:
 Bit 0 = 1: simultaneity error when closing the contactors.
 Bit 1 = 1: simultaneity error when opening the contactors.
 Supplementary information:
 Bit 0 = 1: PDS0 contactor is closed.
 Bit 1 = 1: PDS1 contactor is closed.
 Bit 2 = 1: PDS2 contactor is closed.
 Bit 3 = 1: PDS3 contactor is closed.
 Bit 4 = 1: PDS4 contactor is closed.
 Bit 5 = 1: PDS5 contactor is closed.
 Bit 6 = 1: PDS6 contactor is closed.
 Bit 7 = 1: PDS7 contactor is closed.
 Note:
 ALM: Active Line Module
 BLM: Basic Line Module
 PDS: Power unit Data Set
 SLM: Smart Line Module
Remedy:
 - check the monitoring time setting (p0255[4, 6]).
 - check the wiring and control of the contactor.
 - if required, replace the contactor.
Reaction upon A: NONE
Acknowl. upon A: NONE

13.2 List of faults and alarms

F05119 (A) Bypass contactor simultaneity monitoring time exceeded

Message value: fault cause: %1, additional information: %2

Drive object: All objects

Reaction: OFF2 (NONE, OFF1)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: A feedback signal for the bypass contactor is interconnected and the simultaneity monitoring (p0255[5, 7]) activated. After opening or closing a contactor of the parallel connection, after a monitoring time has elapsed, not all of the contactors have assumed the same state.
Fault value (r0949, interpret binary):
yyyyxxxx hex: yyyy = supplementary information, xxxx = fault cause
Fault cause:
Bit 0 = 1: simultaneity error when closing the contactors.
Bit 1 = 1: simultaneity error when opening the contactors.
Supplementary information:
Bit 0 = 1: PDS0 contactor is closed.
Bit 1 = 1: PDS1 contactor is closed.
Bit 2 = 1: PDS2 contactor is closed.
Bit 3 = 1: PDS3 contactor is closed.
Bit 4 = 1: PDS4 contactor is closed.
Bit 5 = 1: PDS5 contactor is closed.
Bit 6 = 1: PDS6 contactor is closed.
Bit 7 = 1: PDS7 contactor is closed.
Note:
PDS: Power unit Data Set

Remedy: - check the monitoring time setting (p0255[5, 7]).
- check the wiring and control of the contactor.
- if required, replace the contactor.

Reaction upon A: NONE

Acknowl. upon A: NONE

F06310 (A) Supply voltage (p0210) incorrectly parameterized

Message value: -

Drive object: All objects

Reaction: NONE (OFF1, OFF2)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: For AC/AC drive units, the measured DC voltage lies outside the tolerance range after precharging has been completed. The following applies for the tolerance range: $1.16 * p0210 < r0070 < 1.6 * p0210$
Note:
The fault can only be acknowledged when the drive is switched off.
See also: p0210

Remedy: - check the parameterized supply voltage and if required change (p0210).
- check the line supply voltage.
See also: p0210

Reaction upon A: NONE

Acknowl. upon A: NONE

F07011 Drive: Motor overtemperature

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE, OFF1, OFF3, STOP2)

| | |
|---------------------|--|
| Acknowledge: | IMMEDIATELY |
| Cause: | <p>KTY84/PT1000:</p> <p>The motor temperature has exceeded the fault threshold (p0605) or the timer (p0606) after the alarm threshold was exceeded (p0604) has expired.</p> <p>PTC, bimetallic NC contact:</p> <p>The response threshold of 1650 Ohm was exceeded (for SME p4600 ... p4603 or for TM120 p4610 ... p4613 = 10, 30), or the timer (p0606) has expired after 1650 Ohm has been exceeded (for SME p4600 ... p4603 or for TM120 p4610 ... p4613 = 12, 32).</p> <p>Motor temperature model:</p> <p>The calculated motor temperature is too high.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> - motor overloaded. - motor ambient temperature too high. - PTC / bimetallic NC contact: Wire breakage or sensor not connected. - motor temperature model incorrectly parameterized. <p>Hysteresis:2K</p> <p>Fault value (r0949, interpret decimal):</p> <p>1, 2, 3, 4:</p> <p>Number of the temperature channel leading to the message (for SME/TM120 (p0601 = 10, 11)).</p> <p>200:</p> <p>Motor temperature model 1 (I2t): temperature too high.</p> <p>300:</p> <p>Motor temperature model 3: after the monitoring time has expired, the temperature is still higher than the alarm threshold.</p> <p>301:</p> <p>Motor temperature model 3: temperature is too high, or the model has not been parameterized.</p> <p>302:</p> <p>Motor temperature model 3: Encoder temperature is not within the valid range.</p> <p>See also: p0613</p> |
| Remedy: | <ul style="list-style-type: none"> - reduce the motor load. - check the ambient temperature and the motor ventilation. - check the wiring and temperature sensor connection. - check monitoring limits. - check the encoder type (p0404). - check the motor type (p0300, p0301). - check activation of the motor temperature model (p0612). - check the motor temperature model parameters. - check the encoder (p0404). |

| | |
|-----------------------|---|
| A07012 (N) | Drive: Motor temperature model 1/3 overtemperature |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | <p>The motor temperature model 1/3 identified that the alarm threshold was exceeded.</p> <p>Hysteresis:2K.</p> <p>Alarm value (r2124, interpret decimal):</p> <p>200:</p> <p>Motor temperature model 1 (I2t): temperature too high.</p> <p>300:</p> <p>Motor temperature model 3: temperature too high.</p> <p>See also: r0034, p0613</p> |

13.2 List of faults and alarms

- Remedy:**
- check the motor load and if required, reduce.
 - check the motor ambient temperature.
 - check activation of the motor temperature model (p0612).
- Motor temperature model 1 (I2t):
- check the thermal time constant (p0611).
 - check alarm threshold.
- Motor temperature model 3:
- check the motor type.
 - check alarm threshold.
 - check the model parameters.
- See also: r0034

Reaction upon N: NONE

Acknowl. upon N: NONE

F07013 Drive: Motor temperature model configuration fault

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE, OFF1, OFF3, STOP2)

Acknowledge: IMMEDIATELY

Cause: A fault has occurred in the configuration of the motor temperature model.

Fault value (r0949, interpret decimal):

300:

Motor temperature model 3: The sensor does not supply the necessary sensor temperature for the thermal model.

301:

Motor temperature model 3: The sensor type is unknown.

302:

Motor temperature model 3: At least one other temperature model was simultaneously activated.

303:

Motor temperature model unknown in the actual firmware version.

- Remedy:**
- check the encoder type.
 - check the motor type.
 - check activation of the motor temperature model (p0612).
 - check the parameters of the motor temperature model (p5350 and following).
-

A07014 (N) Drive: Motor temperature model configuration alarm

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A fault has occurred in the configuration of the motor temperature model.

Alarm value (r2124, interpret decimal):

1:

All motor temperature models: It is not possible to save the model temperature

300:

Motor temperature model 3: Threshold value for alarm (r5398) is higher than the threshold value for fault (r5399).

- Remedy:**
- set the response for motor overtemperature to "Alarm and fault, no reduction of I_{max}" (p0610 = 2).
 - check and correct the threshold values (r5398, r5399).

Reaction upon N: NONE

Acknowl. upon N: NONE

| | |
|-----------------------|---|
| A07015 | Drive: Motor temperature sensor alarm |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | <p>An error was detected when evaluating the temperature sensor set in p0600 and p0601.</p> <p>With the fault, the time in p0607 is started. If the fault is still present after this time has expired, then fault F07016 is output; however, at the earliest, 50 ms after alarm A07015.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> - wire breakage or sensor not connected (KTY: R > 1630 Ohm, PT1000: R > 1720 Ohm). - measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT1000: R < 603 Ohm). <p>Alarm value (r2124, interpret decimal):</p> <ul style="list-style-type: none"> - if SME/TM120 is selected (p0601 = 10, 11), <p>this is the number of the temperature channel leading to the message.</p> |
| Remedy: | <ul style="list-style-type: none"> - make sure that the sensor is connected correctly. - check the parameterization (p0600, p0601). |

| | |
|-----------------------|--|
| F07016 | Drive: Motor temperature sensor fault |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | OFF1 (NONE, OFF2, OFF3, STOP2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | <p>An error was detected when evaluating the temperature sensor set in p0600 and p0601.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> - wire breakage or sensor not connected (KTY: R > 1630 Ohm, PT1000: R > 1720 Ohm). - measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT1000: R < 603 Ohm). <p>Note:</p> <p>If alarm A07015 is present, the time in p0607 is started. If the fault is still present after this time has expired, then fault F07016 is output; however, at the earliest, 50 ms after alarm A07015.</p> <p>Fault value (r0949, interpret decimal):</p> <ul style="list-style-type: none"> - if SME/TM120 is selected (p0601 = 10, 11), <p>this is the number of the temperature channel leading to the message.</p> |
| Remedy: | <ul style="list-style-type: none"> - make sure that the sensor is connected correctly. - check the parameterization (p0600, p0601). - induction motors: Deactivate temperature sensor fault (p0607 = 0). - When TM120 and SMC/SME (p0601 = 10, 11) are being used, set the same sensor type on the drive (p4610 ... p4613) as for TM120. |

| | |
|-----------------------|--|
| F07080 | Drive: Incorrect control parameter |
| Message value: | Parameter: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | <p>The closed-loop control parameters have been parameterized incorrectly (e.g. p0356 = L_spread = 0).</p> <p>Fault value (r0949, interpret decimal):</p> <p>The fault value includes the parameter number involved.</p> <p>See also: p0311, r0311, p0341, r0341, p1082, r1082</p> |
| Remedy: | <p>Modify the parameter indicated in the fault value (r0949) (e.g. p0640 = current limit > 0).</p> <p>See also: p0311, r0311, p0341, r0341, p1082, r1082</p> |

F07082 Macro: Execution not possible

Message value: Fault cause: %1, supplementary information: %2, preliminary parameter number: %3

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The macro cannot be executed.
Fault value (r0949, interpret hexadecimal):
ccccbbaa hex:
cccc = preliminary parameter number, bb = supplementary information, aa = fault cause
Fault causes for the trigger parameter itself:
19: Called file is not valid for the trigger parameter.
20: Called file is not valid for parameter 15.
21: Called file is not valid for parameter 700.
22: Called file is not valid for parameter 1000.
23: Called file is not valid for parameter 1500.
24: Data type of a TAG is incorrect (e.g. Index, number or bit is not U16).
Fault causes for the parameters to be set:
25: Error level has an undefined value.
26: Mode has an undefined value.
27: A value was entered as string in the tag value that is not "DEFAULT".
31: Entered drive object type unknown.
32: A device was not able to be found for the determined drive object number.
34: A trigger parameter was recursively called.
35: It is not permissible to write to the parameter via macro.
36: Check, writing to a parameter unsuccessful, parameter can only be read, not available, incorrect data type, value range or assignment incorrect.
37: Source parameter for a BICO interconnection was not able to be determined.
38: An index was set for a non-indexed (or CDS-dependent) parameter.
39: No index was set for an indexed parameter.
41: A bit operation is only permissible for parameters with the parameter format DISPLAY_BIN.
42: A value not equal to 0 or 1 was set for a BitOperation.
43: Reading the parameter to be changed by the BitOperation was unsuccessful.
51: Factory setting for DEVICE may only be executed on the DEVICE.
61: The setting of a value was unsuccessful.

Remedy: - check the parameter involved.
- check the macro file and BICO interconnection.

F07083 Macro: ACX file not found

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The ACX file (macro) to be executed was not able to be found in the appropriate directory.
Fault value (r0949, interpret decimal):
Parameter number with which the execution was started.

Remedy: - check whether the file is saved in the appropriate directory on the memory card.
Example:
If p0015 is set to 1501, then the selected ACX file must be located in the following directory:
... /PMACROS/DEVICE/P15/PM001501.ACX

| | |
|-----------------------|---|
| F07084 | Macro: Condition for WaitUntil not fulfilled |
| Message value: | Parameter: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | The WaitUntil condition set in the macro was not fulfilled in a certain number of attempts. Fault value (r0949, interpret decimal): Parameter number for which the condition was set. |
| Remedy: | Check and correct the conditions for the WaitUntil loop. |

| | |
|-----------------------|--|
| F07085 | Drive: Open-loop/closed-loop control parameters changed |
| Message value: | Parameter: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | Open-loop/closed-loop control parameters have had to be changed. Possible causes: 1. As a result of other parameters, they have exceeded the dynamic limits. 2. They cannot be used due to the fact that the hardware detected not having certain features. 3. The value is estimated as the thermal time constant is missing. 4. Motor temperature model 1 is activated as thermal motor protection is missing. Fault value (r0949, interpret decimal): Changed parameter number. 340: The motor and control parameters were automatically calculated (p0340 = 1), because the vector control was subsequently activated as configuration (r0108.2). 611: The time constant for thermal motor model 1 was estimated. 612: Thermal motor model 1 was activated (p0612.0 = 1). See also: p1082, r1082 |
| Remedy: | Not necessary. It is not necessary to change the parameters as they have already been correctly limited. |

| | |
|-----------------------|---|
| F07086 | Units changeover: Parameter limit violation due to reference value change |
| Message value: | Parameter: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | A reference parameter was changed in the system. This resulted in the fact that for the parameters involved, the selected value was not able to be written in the per unit notation. The values of the parameters were set to the corresponding violated minimum limit/maximum limit or to the factory setting. Possible causes: - the steady-state minimum limit/maximum limit or that defined in the application was violated. Fault value (r0949, parameter): Diagnostics parameter to display the parameters that were not able to be re-calculated. See also: p0304, r0304, p0305, r0305, p2000, p2003 |
| Remedy: | Check the adapted parameter value and if required correct. |

13.2 List of faults and alarms

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|-----------------------|---|
| F07087 | Drive: Encoderless operation not possible for the selected pulse frequency |
| Message value: | Parameter: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | Encoderless operation is not possible for the selected pulse frequency (p1800). Encoderless operation is activated under the following conditions: - the changeover speed for encoderless operation (p1404) is less than the maximum speed (p0322). - a control type with encoderless operation has been selected (p1300). - encoder faults of the motor encoder result in a fault response with encoderless operation (p0491). |
| Remedy: | Increase the pulse frequency (p1800). Note: In encoderless operation, the pulse frequency must be at least as high as one quarter of the current controller clock cycle frequency (1/p0115[0]). |

| | |
|-----------------------|--|
| F07088 | Units changeover: Parameter limit violation due to units changeover |
| Message value: | Parameter: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | A changeover of units was initiated. This resulted in a violation of a parameter limit Possible causes for the violation of a parameter limit: - When rounding off a parameter corresponding to its decimal places, the steady-state minimum limit or maximum limit was violated. - inaccuracies for the data type "FloatingPoint". In these cases, when the minimum limit is violated then the parameter value is rounded up and when the maximum limited is violated the parameter value is rounded down. Fault value (r0949, interpret decimal): Diagnostics parameter r9451 to display all parameters whose value had to be adapted. |
| Remedy: | Check the adapted parameter values and if required correct. |

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|-----------------------|---|
| A07089 | Changing over units: Function module activation is blocked because the units have been changed over |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | An attempt was made to activate a function module. This is not permissible if the units have already been changed over. |
| Remedy: | Restore units that have been changed over to the factory setting. |

| | |
|-----------------------|---|
| F07090 | Drive: Upper torque limit less than the lower torque limit |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | OFF2 (NONE, OFF1, OFF3) |
| Acknowledge: | IMMEDIATELY |
| Cause: | The upper torque limit is lower than the lower torque limit. |
| Remedy: | P1 must be >= P2 if parameter P1 is connected to p1522 and parameter P2 to p1523. |

| | |
|-----------------------|--|
| A07091 | Drive: determined current controller dynamic response invalid |
| Message value: | %1 |

Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: When one button tuning is activated (p5300 = 1), the current controller is measured after the pulses have been enabled. Evaluation has indicated that the current control loop was not appropriately set.
 Possible causes:
 - incorrectly set current controller.
 - PRBS amplitude set too high (p5296).
 Alarm value (r2124, interpret hexadecimal):
 1: Dynamic response too low.
 2: Current controller unstable.
 Note:
 PRBS: Pseudo Random Binary Signal (binary noise)
Remedy: - the measurement can be repeated with a smaller excitation amplitude (p5296).
 - if required, adapt the current controller proportional gain (p1715).

A07092 Drive: moment of inertia estimator still not ready

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The moment of inertia estimator has still not determined any valid values.
 The acceleration cannot be calculated.
 The moment of inertia estimator has stabilized, if the frictional values (p1563, p1564) as well as the moment of inertia value (p1493) have been determined and the appropriate status signal is set (r1407.26 = 1).
 The following parameters influence the response of the moment of the inertia estimator:
 p1560, p1561, p1562
Remedy: Traverse the axis until the moment of inertia estimator has stabilized.
 This alarm is automatically withdrawn after the moment of inertia estimator has stabilized.

F07093 (A) Drive: Test signal error

Message value: %1
Drive object: All objects
Reaction: OFF3 (NONE, OFF1, OFF2)
Acknowledge: IMMEDIATELY
Cause: An error was identified when executing the "Test signal" function (p5307.1 = 1).
 The function was not executed or was canceled.
 Fault value (r0949, interpret decimal):
 1: No distance limit has been defined (p5308 = 0).
 2: The moment of inertia estimator has not stabilized in the parameterized time (p5309) (r1407.26).
 3: The parameterized distance (p5308) was exceeded.
 4: no motor encoder parameterized (closed-loop speed control without encoder).
 5: Offset (p5297) is too high for the parameterized distance (p5308).
 6: Pulse enable was withdrawn while traversing.
 7: speed setpoint not equal to zero.
 See also: p5308, p5309

13.2 List of faults and alarms

- Remedy:**
- For fault value = 1:
 - Define distance limiting (p5308).
 - For fault value = 2:
 - increase the duration or distance limiting (p5309, p5308).
 - For fault value = 3:
 - check distance limiting (p5308).
 - For fault value = 4:
 - configure speed control with encoder.
 - For fault value = 5:
 - increase distance limit p5308 or reduce offset p5297.
 - the fault can only be acknowledged after p5300 was set = 0.
 - for the factory setting, a test signal duration of approximately 1.3 s is obtained. If an offset (p5297) of 60 rpm is set, for example, then this results in a distance of approximately 1.3 revolutions. As a consequence, a value must be parameterized in parameter p5308, which is longer than this distance + 10% controller reserve (e.g. p5308=515°). Further, the distance depends on the speed controller sampling time (p0115[1] and the controller configuration (p5271).
 - For fault value = 6:
 - keep the drive switched on until the "Test signal" function has been completely exited.
 - For fault value = 7:
 - set the speed setpoint to zero.

Reaction upon A: NONE

Acknowl. upon A: NONE

A07094 General parameter limit violation

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: As a result of the violation of a parameter limit, the parameter value was automatically corrected.
Minimum limit violated --> parameter is set to the minimum value.
Maximum limit violated --> parameter is set to the maximum value.
Alarm value (r2124, interpret decimal):
Parameter number, whose value had to be adapted.

Remedy: Check the adapted parameter values and if required correct.

A07095 (N) Drive: One Button Tuning activated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The One Button Tuning function is active.
One Button Tuning is performed at the next switch-on command.
See also: p5300

Remedy: Not necessary.
The alarm is automatically withdrawn after One Button Tuning has been exited (p5300 = 0).

Reaction upon N: NONE

Acknowl. upon N: NONE

F07097 (A) Drive: Test signal error distance limiting

Message value: Fault cause: %1, traversing distance: %2

Drive object: All objects

Reaction: OFF3 (NONE, OFF1, OFF2)

Acknowledge: IMMEDIATELY

Cause: An error was identified when executing the "Test signal" function (p5307.1 = 1) or auto tuning was selected (p5300 = 1).
The function was not executed or was canceled.
Fault value (r0949, interpret decimal):
yyyyxxx hex: yyyy = error cause, xxxx = traversing distance
See also: p5308, p5309

Remedy:

- enter the traversing path in parameter p5308 - or deselect the function involved in p5301.
- for fault cause = 1, 2, shorter traversing paths may be possible.

For fault cause = 1:

- deselect bit 0 and bit 1 in parameter p5301.

For fault cause = 2:

- deselect bit 2 in parameter p5301.

For fault cause= 3:

- deselect bit 4 and bit 5 in parameter p5301.

Reaction upon A: NONE

Acknowl. upon A: NONE

F07098 (A) Drive: One Button Tuning configuration error

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: OFF3 (NONE, OFF1, OFF2)

Acknowledge: IMMEDIATELY

Cause: The requested One Button Tuning configuration (p5301) is not supported.
Fault value (r0949, interpret binary):
Bit 5:
The function requires that the "Advanced Positioning Control" function module (APC) is activated.
See also: p5301

Remedy:

For bit 5 = 1:

- activate the "APC" function module (r0108.7 = 1).
- activate the "APC without sensor on the load side" function (p3700.2 = 1).

Reaction upon A: NONE

Acknowl. upon A: NONE

F07100 Drive: Sampling times cannot be reset

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: When resetting drive parameter (p0976) sampling times cannot be reset using p0111, p0112, p0115.
Fault value (r0949, interpret decimal):
Parameter whose setting prevents the sampling times being reset.

Remedy:

- continue to work with the set sampling times.
- before resetting the drive parameters, set the basic clock cycle p0110[0] to the original value.

F07110 Drive: Sampling times and basic clock cycle do not match

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

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Cause: The parameterized sampling times do not match the basic clock cycle.
Fault value (r0949, interpret decimal):
The fault value specifies the parameter involved.

Remedy: Enter the current controller sampling times so that they are identical to the basic clock cycle, e.g. by selecting p0112. Note which basic clock cycle is selected in p0111.
The sampling times in p0115 can only be changed manually in the sampling times pre-setting "Expert" (p0112).

A07200 Drive: Master control ON command present

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The ON/OFF1 command is present (no 0 signal).
The command is either influenced via binector input p0840 (current CDS) or control word bit 0 via the master control.
Remedy: Switch the signal via binector input p0840 (current CDS) or control word bit 0 via the master control to 0.

F07220 (N, A) Drive: Master control by PLC missing

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: The "master control by PLC" signal was missing in operation.
- interconnection of the binector input for "master control by PLC" is incorrect (p0854).
- the higher-level control has withdrawn the "master control by PLC" signal.
- data transfer via the fieldbus (master/drive) was interrupted.

Remedy: - check the interconnection of the binector input for "master control by PLC" (p0854).
- check the "master control by PLC" signal and, if required, switch in.
- check the data transfer via the fieldbus (master/drive).
Note:
If the drive should continue to operate after withdrawing "master control by PLC" then fault response must be parameterized to NONE or the message type should be parameterized as alarm.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F07300 (A) Drive: Line contactor feedback signal missing

Message value: -
Drive object: All objects
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: - the line contactor was not able to be closed within the time in p0861.
- the line contactor was not able to be opened within the time in p0861.
- the line contactor dropped out during operation
- the line contactor has closed although the drive converter is switched off.

Remedy: - check the setting of p0860.
- check the feedback circuit from the line contactor.
- increase the monitoring time in p0861.

Reaction upon A: NONE
Acknowl. upon A: NONE

| | |
|-----------------------|---|
| F07320 | Drive: Automatic restart interrupted |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY |
| Cause: | <ul style="list-style-type: none"> - the specified number of restart attempts (p1211) has been completely used up because within the monitoring time (p1213) the faults were not able to be acknowledged. The number of restart attempts (p1211) is decremented at each new start attempt. - the monitoring time for the power unit has expired (p0857). - when exiting commissioning or at the end of the motor identification routine or the speed controller optimization, the drive unit is not automatically switched on again. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting. |
| Remedy: | <ul style="list-style-type: none"> - increase the number of restart attempts (p1211). The actual number of starting attempts is displayed in r1214. - increase the delay time in p1212 and/or the monitoring time in p1213. - either increase or disable the monitoring time of the power unit (p0857). |

| | |
|-----------------------|---|
| A07321 | Drive: Automatic restart active |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | The automatic restart (AR) is active. When the line supply returns and/or the causes of the existing faults are removed the drive is automatically restarted. The pulses are enabled and the motor starts to rotate. |
| Remedy: | <ul style="list-style-type: none"> - the automatic restart (AR) should, if required, be inhibited (p1210 = 0). - an automatic restart can be directly interrupted by withdrawing the switch-on command (BI: p0840). |

| | |
|-----------------------|---|
| A07329 (N) | Drive: kT estimator, kT(iq) characteristic or voltage compensation does not function |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | A function of the function module "extended torque control" (r0108.1) was activated - however the (complete) function is not available. Alarm value (r2124, interpret decimal): 1 ... 3: The kT estimator is active (p1780.3 = 1) without a functioning compensation of the voltage emulation error in the drive converter. This means that the accuracy is severely restricted. 1: The drive converter voltage emulation error "final value" is 0 (p1952). 2: The drive converter voltage emulation error "current offset" is 0 (p1953). 3: The compensation of the voltage emulation error is disabled (p1780.8 = 0). 4: The kT estimator (p1780.3 = 1), the kT(iq) characteristic (p1780.9 = 1) or the compensation of the voltage emulation error (p1780.8 = 1) was activated without activating the function module "extended torque control" (when the function module is activated, the following must apply: r0108.1 = 1). 5: the kT(iq) characteristic has been activated (p1780.9 = 1). However, the kT characteristic value kT1 is 0 (p0645). The function is not active. |

13.2 List of faults and alarms

Remedy: For alarm value = 1, 2:
- carry out an identification of the voltage emulation error in the drive converter (p1909.14 = 1, p1910 = 1).
- set the parameter to compensate the voltage emulation error in the drive converter (p1952, p1953).
For alarm value = 3:
- enable the compensation of the voltage emulation error in the drive converter (p1780.8 = 1).
For alarm value = 4:
- activate the function module "extended torque control" (r0108.1 = 1) or deactivate the corresponding functions (p1780.3 = 0, p1780.8 = 0, p1780.9 = 0).
For alarm value = 5:
- determine the parameters of the kT characteristic (p0645 ... p0648) using the rotating measurement (p1959.6, p1960).
- enter the parameters of the kT characteristic (p0645 ... p0648) (if known).
- if necessary, deactivate the kT characteristic (p1780.9 = 0).

Reaction upon N: NONE
Acknowl. upon N: NONE

A07350 (F) Drive: Measuring probe parameterized to a digital output
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The measuring probe is connected to a bi-directional digital input/output and the terminal is set as output.
Alarm value (r2124, interpret decimal):
8: DI/DO 8 (X122.9/X132.1)
9: DI/DO 9 (X122.10/X132.2)
10: DI/DO 10 (X122.12/X132.3)
11: DI/DO 11 (X122.13/X132.4)
12: DI/DO 12 (X132.9)
13: DI/DO 13 (X132.10)
14: DI/DO 14 (X132.12)
15: DI/DO 15 (X132.13)
Regarding the terminal designation:
The first designation is valid for CU320, the second for CU305.

Remedy: - set the terminal as input (p0728).
- de-select the measuring probe (p0488, p0489, p0580).

Reaction upon F: OFF1
Acknowl. upon F: IMMEDIATELY

A07354 Drive: cogging torque compensation not possible
Message value: Fault cause: %1, drive data set: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: Cogging torque compensation is selected and is not (completely) supported.
 Alarm value (r2124, interpret hexadecimal):
 yyyyxx hex: yyyy = fault cause, xx = drive data set
 yyyy = 1:
 The encoder evaluation does not support this function.
 yyyy = 2:
 The encoder has no absolute information.
 yyyy = 3:
 The motor has no encoder (p0187 = 99).
 yyyy = 3:
 The motor has no encoder (p0187 = 99).
 yyyy = 4:
 Learning was activated (p5251) for closed-loop control without encoder (p1300 = 20 or p1404 < 12 rpm or 12 m/min - or p1317 = 1).
 yyyy = 5:
 The internal table is active; however, period p5253 has not been set equal to 1.

Remedy: If required, deselect the cogging torque compensation (p5250 = 0).
 For fault cause = 1:
 Use an absolute encoder or an encoder evaluation that supports the function (r0459.13 = 1). If required, upgrade the firmware to a newer version (version 04.50.30.01 or higher is required).
 For fault cause = 2:
 Use an encoder with absolute information (absolute track, unique zero mark, resolver with one pole pair). The function cannot be tested as long as the encoder is not reset after learning (encoder fault, parking, POWER ON). Continuous use is not recommended.
 For fault cause = 3:
 Only select cogging torque compensation for operation with motor encoder.
 For fault cause = 4:
 Activate learning, only for operation with encoder (p1300, p1404, p1317).
 For fault cause = 5:
 - set period p5253 = 1.
 - activate the external table and learning (p5250.0 = 1, p5251).

F07355 (N, A) Drive: cogging torque compensation error when learning

Message value: %1
Drive object: All objects
Reaction: OFF1 (NONE, OFF2)
Acknowledge: IMMEDIATELY
Cause: A cogging torque compensation error has occurred while learning.
 Fault value (r0949, interpret decimal):
 1:
 The learning velocity is too high.
 - rotating: absolute value greater than 5 [rpm]
 - linear: absolute value greater than 0.5 [m/min]

Remedy: For fault value = 1:
 Repeat learning with the lower velocity setpoint.
 Recommended speeds:
 - rotating 2 [rpm]
 - linear 0.1 [m/min]

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

13.2 List of faults and alarms

A07400 (N) Drive: DC link voltage maximum controller active

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The DC link voltage controller has been activated because of the upper switch-in threshold (p1244).
A system deviation can occur between the setpoint and actual speed.
Remedy: Not necessary.
This alarm is automatically withdrawn after the upper threshold has been distinctly exceeded.
Otherwise, apply the following measures:
- use a Braking Module or regenerative feedback unit.
- increase the ramp-down times (p1121, p1135).
- shut down the Vdc_max controller (p1240 = 0).
Reaction upon N: NONE
Acknowl. upon N: NONE

A07402 (N) Drive: DC link voltage minimum controller active

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The DC link voltage controller has been activated due to the lower switch-in threshold (p1248).
A system deviation can occur between the setpoint and actual speed.
A possible cause can be e.g. that the line supply has failed.
Remedy: Not necessary.
This alarm is automatically withdrawn after the lower threshold has been distinctly exceeded.
Otherwise, apply the following measures:
- check the line supply and infeed.
- increase the ramp-up times (p1120).
- shut down the Vdc_min controller (p1240 = 0).
Reaction upon N: NONE
Acknowl. upon N: NONE

F07403 (N, A) Drive: Lower DC link voltage threshold reached

Message value: -
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The DC link voltage monitoring is active (p1240 = 5, 6) and the lower DC link voltage threshold (p1248) was reached in the "Operation" state.
Remedy: - check the line supply voltage.
- check the infeed.
- reduce the lower DC link threshold (p1248).
- switch out (disable) the DC link voltage monitoring (p1240 = 0).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F07404 Drive: Upper DC link voltage threshold reached
Message value: -
Drive object: All objects
Reaction: OFF2 (NONE, OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: The DC link voltage monitoring is active (p1240 = 4, 6) and the upper DC link voltage threshold (p1244) was reached in the "Operation" state.
Remedy:

- check the line supply voltage.
- check the infeed unit or the Braking Module.
- increase the upper DC link voltage threshold (p1244).
- if necessary, deactivate the DC link voltage monitoring (p1240 = 0).

F07405 (N, A) Drive: Kinetic buffering minimum speed fallen below
Message value: -
Drive object: All objects
Reaction: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: During kinetic buffering the speed fell below minimum speed (p1257 or p1297 for vector drives with U/f control) and the line supply did not return.
Remedy: Check the speed threshold for the Vdc_min controller (kinetic buffering) (p1257, p1297).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F07410 Drive: Current controller output limited
Message value: -
Drive object: All objects
Reaction: OFF2 (NONE, OFF1)
Acknowledge: IMMEDIATELY
Cause: The condition "I_act = 0 and Uq_set_1 longer than 16 ms at its limit" is present and can be caused by the following:

- motor not connected or motor contactor open.
- no DC link voltage present.
- Motor Module defective.

Remedy:

- connect the motor or check the motor contactor.
- check the DC link voltage (r0070).
- check the Motor Module.

F07411 Drive: Flux controller output limited
Message value: -
Drive object: All objects
Reaction: OFF2 (NONE, OFF1)
Acknowledge: IMMEDIATELY
Cause: The specified flux setpoint cannot be reached, although the set maximum field current is specified (p1603).

- incorrect motor data.
- motor data and motor configuration (star-delta) do not match.
- the current limit has been set too low for the motor (p0640, p0323, p1603).
- induction motor (encoderless, open-loop controlled) in I2t limiting.
- the Motor Module is too small.

13.2 List of faults and alarms

- Remedy:**
- correct the motor data.
 - check the motor configuration.
 - correct the current limits (p0640, p0323, p1603).
 - reduce the induction motor load.
 - if required, use a larger Motor Module.

F07412 Drive: Commutation angle incorrect (motor model)

Message value: %1

Drive object: All objects

Reaction: ENCODER (NONE, OFF2)

Acknowledge: IMMEDIATELY

Cause: An incorrect commutation angle was detected that can result in a positive coupling in the speed controller.

Possible causes:

- the phase sequence of the output phases for the motor is incorrect (e.g. the phases are interchanged).
- the motor encoder is incorrectly adjusted with respect to the magnet position.
- the motor encoder is damaged.
- the angular commutation offset is incorrectly set (p0431).
- data to calculate the motor model has been incorrectly set (p0356 (motor-stator leakage inductance) and/or p0350 (motor-stator resistance) and/or p0352 (cable resistance)).
- the changeover speed for the motor model is too low (p1752). The monitoring function only becomes effective above the changeover speed.
- pole position identification might have calculated an incorrect value when activated (p1982 = 1).
- the motor encoder speed signal is faulted.
- the control loop is instable due to incorrect parameterization.

Fault value (r0949, interpret decimal):

SERVO:

0: The comparison of the pole position angle from the encoder and motor model resulted in an excessively high value (> 80 ° electrical).

1: -

VECTOR:

0: The comparison of the pole position angle from the encoder and motor model resulted in an excessively high value (> 45 ° electrical).

1: The change in the speed signal from the motor encoder has changed by > p0492 within a current controller clock cycle.

Remedy:

- check the phase sequence for the motor, and if required, correct (wiring, p1820).
- if the encoder mounting was changed - re-adjust the encoder.
- replace the defective motor encoder.
- correctly set the angular commutation offset (p0431). If required, determine using p1990.
- correctly set the motor stator resistance, cable resistance and motor-stator leakage inductance (p0350, p0352, p0356). Calculate the cable resistance from the cross-section and length, check the inductance and stator resistance using the motor data sheet, measure the stator resistance, e.g. using a multimeter - and if required, again identify the values using the stationary motor data identification (p1910).
- increase the changeover speed for the motor model (p1752). The monitoring is completely deactivated for p1752 > p1082 (maximum speed).
- with pole position identification activated (p1982 = 1) check the procedure for pole position identification (p1980) and force a new pole position identification procedure by means of de-selection followed by selection (p1982 = 0 -> 1).

Note:

For High Dynamic Motors (1FK7xxx-7xxx), for applications with a higher current, if necessary, the monitoring should be disabled.

F07413 Drive: Commutation angle incorrect (pole position identification)

Message value: -

Drive object: All objects

Reaction: ENCODER (NONE, OFF2)
Acknowledge: IMMEDIATELY
Cause: An incorrect commutation angle was detected that can result in a positive coupling in the speed controller.
 Within the pole position identification routine (p1982 = 2):
 - a difference of > 45 ° electrical to the encoder angle was determined.
 For VECTOR, within the encoder adjustment (p1990 = 2):
 - a difference of > 6 ° electrical to the encoder angle was determined.
Remedy:
 - correctly set the angular commutation offset (p0431).
 - re-adjust the motor encoder after the encoder has been replaced.
 - replace the defective motor encoder.
 - check the pole position identification routine. If the pole position identification routine is not suitable for this motor type, then disable the plausibility check (p1982 = 0).

F07414 (N, A) Drive: Encoder serial number changed

Message value: -
Drive object: All objects
Reaction: ENCODER (NONE, OFF2)
Acknowledge: IMMEDIATELY
Cause: The serial number of the motor encoder of a synchronous motor has changed. The change was only checked for encoders with serial number (e.g. EnDat encoders) and build-in motors (e.g. p0300 = 401) or third-party motors (p0300 = 2).
 Cause 1:
 - the encoder was replaced.
 Cause 2:
 - a third-party, built-in or linear motor was re-commissioned.
 Cause 3:
 - the motor with integrated and adjusted encoder was replaced.
 Cause 4:
 - the firmware was updated to a version that checks the encoder serial number.
 Note:
 With closed-loop position control, the serial number is accepted when starting the adjustment (p2507 = 2).
 When the encoder is adjusted (p2507 = 3), the serial number is checked for changes and if required, the adjustment is reset (p2507 = 1).
 Proceed as follows to hide serial number monitoring:
 - set the following serial numbers for the corresponding Encoder Data Set: p0441= FF, p0442 = 0, p0443 = 0, p0444 = 0, p0445 = 0.
 - parameterize F07414 as message type N (p2118, p2119).
Remedy:
 For causes 1, 2:
 Carry out an automatic adjustment using the pole position identification routine. Acknowledge fault. Initiate the pole position identification routine with p1990 = 1. Then check that the pole position identification routine is correctly executed.
 SERVO:
 If a pole position identification technique is selected in p1980, and if p0301 does not contain a motor type with an encoder adjusted in the factory, then p1990 is automatically activated.
 or
 Set the adjustment via p0431. In this case, the new serial number is automatically accepted.
 or
 Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.
 For causes 3, 4:
 Accept the new serial number with p0440 = 1.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

N07415 (F) Drive: Angular commutation offset transfer running
Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: NONE
Cause: The angular commutation offset was automatically determined using p1990 = 1.
This fault causes the pulses to be suppressed - this is necessary to transfer the angular commutation offset to p0431.
Remedy: The fault can be acknowledged without any additional measures.
Reaction upon F: OFF2
Acknowl. upon F: IMMEDIATELY

F07419 Drive: Current setpoint filter adaptation error
Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: An error has occurred when configuring or when using the "Current setpoint filter adaptation" function.
Fault value (r0949, interpret binary):
Bit 0: a filter has still not been assigned (p5281).
Bit 1: the assigned filter belongs to the "Extended current setpoint filter" function module that has not been activated (r0108.21).
Bit 2: the assigned filter is a type or has a characteristic, which is unsuitable for adaptation.
Bit 3: the assigned filter has not been activated (p1656, p5200).
Bit 4 ... 15: internal fault occurred.
Bit 16 ... 31: number of the drive data set with fault.
Remedy: The message can always be removed by deactivating adaptation (p5280 = 0, -1).
If adaptation is to remain active, then the countermeasure should be applied depending on the particular fault value.
For bit 0:
Assign the filter (p5281).
For bit 1:
activate the "Extended current setpoint filter" function module (r0108.21).
For bit 2:
Set the filter type "General filter 2nd order" and set the characteristic of a bandstop filter.
For bit 3:
Activate filter (p1656, p5200).
For bits 4 ... 15:
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.

F07420 Drive: Current setpoint filter natural frequency > Shannon frequency
Message value: %1
Drive object: All objects
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)

Cause: One of the filter natural frequencies is greater than the Shannon frequency.
 The Shannon frequency is calculated according to the following formula: $0.5 / p0115[0]$
 Fault value (r0949, interpret hexadecimal):
 Bit 0: Filter 1 (p1658, p1660)
 Bit 1: Filter 2 (p1663, p1665)
 Bit 2: Filter 3 (p1668, p1670)
 Bit 3: Filter 4 (p1673, p1675)
 Bit 8 ... 15: Data set number (starting from zero)
 Bit 16: Filter 5 (p5202, p5204) - extended current setpoint filter (r0108.21)
 Bit 17: Filter 6 (p5207, p5209) - extended current setpoint filter (r0108.21)
 Bit 18: Filter 7 (p5212, p5214) - extended current setpoint filter (r0108.21)
 Bit 19: Filter 8 (p5217, p5219) - extended current setpoint filter (r0108.21)
 Bit 20: Filter 9 (p5222, p5224) - extended current setpoint filter (r0108.21)
 Bit 21: Filter 10 (p5227, p5229) - extended current setpoint filter (r0108.21)

Remedy:

- reduce the numerator or denominator natural frequency of the current setpoint filter involved.
- reduce the current controller sampling time (p0115[0]).
- switch out the filter involved (p1656).

F07421 Drive: Speed filter natural frequency > Shannon frequency

Message value: %1
Drive object: All objects
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: One of the filter natural frequencies is greater than the Shannon frequency.
 The Shannon frequency is calculated according to the following formula: $0.5 / p0115[1]$
 Fault value (r0949, interpret hexadecimal):
 Bit 0: Filter 1 (p1417, p1419)
 Bit 1: Filter 2 (p1423, p1425)
 Bit 4: Actual value filter (p1447, p1449)
 Bit 8 ... 15: Data set number (starting from zero)

Remedy:

- reduce the numerator or denominator natural frequency of the speed setpoint filter involved.
- reduce the speed controller sampling time (p0115[1]).
- switch off the filter involved (p1413, p1414).

F07422 Drive: Reference model natural frequency > Shannon frequency

Message value: -
Drive object: All objects
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The natural filter frequency of the PT2 element for the reference model (p1433) is greater than the Shannon frequency.
 The Shannon frequency is calculated according to the following formula: $0.5 / p0115[1]$

Remedy:

- reduce the natural frequency of PT2 element for reference model (p1433).
- reduce the speed controller sampling time (p0115[1]).

F07429 Drive: DSC without encoder not possible

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The function DSC (Dynamic Servo Control) was activated although there is no encoder.

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Remedy: Check the encoder selection configuration (p1192).
Note:
If there is no encoder and connector input p1191 (DSC position controller gain) is interconnected, then connector input p1191 must have a 0 signal.

F07430 Drive: Changeover to open-loop torque controlled operation not possible
Message value: -
Drive object: All objects
Reaction: OFF2 (NONE, OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: For encoderless operation, the converter cannot change over to closed-loop torque-controlled operation (BI: p1501).
Remedy: Do not attempt to cover over to closed-loop torque-controlled operation.

F07431 Drive: Changeover to encoderless operation not possible
Message value: -
Drive object: All objects
Reaction: OFF2 (OFF1)
Acknowledge: IMMEDIATELY
Cause: For closed-loop torque control, the converter cannot change over to encoderless operation (p1404).
Remedy: Do not attempt to change over to encoderless operation.

F07432 Drive: Motor without overvoltage protection
Message value: %1
Drive object: All objects
Reaction: OFF2 (OFF1)
Acknowledge: IMMEDIATELY
Cause: In the case of a fault at maximum speed, the motor can generate an overvoltage that can destroy the drive system.
Fault value (r0949, interpret hexadecimal):
Associated Drive Data Set (DDS).

Remedy: Overvoltage protection can be implemented in the following ways:

1. Limit the maximum speed (p1082) without any additional protection.
The maximum speed without protection is calculated as follows:
Rotary synchronous motors: $p1082 \text{ [rpm]} \leq 11.695 * r0297/p0316 \text{ [Nm/A]}$
Linear motors: $p1082 \text{ [m/min]} \leq 73.484 * r0297/p0316 \text{ [N/A]}$
Rotary synchronous motor connected to the high-frequency converter:
 $p1082 \text{ [rpm]} \leq 4.33165E9 * (-p0316 + \text{root}(p0316^2 + 4.86E-9 * (r0297 * r0313)^2 * (r0377 - p0233) \text{ [mH]} * p0234 \text{ [\mu F]})) / (r0297 * r0313^2 * (r0377 - p0233) \text{ [mH]} * p0234 \text{ [\mu F]})$
Linear motor connected to the high-frequency converter:
 $p1082 \text{ [m/min]} \leq 689.403 * p0315 * (\text{root}(p0316^2 * p0315^2 + 0.191865 * r0297^2 * (r0377 - p0233) \text{ [mH]} * p0234 \text{ [\mu F]})) / (r0297 * (r0377 - p0233) \text{ [mH]} * p0234 \text{ [\mu F]})$
Rotary induction motor connected to the high-frequency converter:
 $p1082 \text{ [rpm]} \leq \text{maximum}(2.11383E5 / (r0313 * \text{root}((r0377 \text{ [mH]} + r0382 \text{ [mH]}) * p0234 \text{ [\mu F]})); 0.6364 * r0297 * p0311 \text{ [rpm]} / p0304)$
2. Use a Voltage Protection Module (VPM) in conjunction with the function "Safe Torque Off" (p9601, p9801 – only for synchronous motors).
When using a synchronous motor with VPM at the high-frequency converter, the following must apply:
 $p1082 \text{ [rpm]} \leq p0348 * (r0377 + p0233) / p0233$
When a fault condition exists, the VPM short-circuits the motors. During the short-circuit, the pulses must be suppressed - this means that the terminals for the function "Safe Torque Off" (STO) must be connected to the VPM.
When using a VPM, p0643 must be set to 1.
3. Activate the internal voltage protection (p1231 = 3, only for synchronous motors).
In so doing, the following hardware preconditions must be fulfilled:
 - the infeed of the group must be capable of energy recovery (Active Line Module, Smart Line Module), and the energy recovery power of the infeed must not be less than the maximum utilized S1 power of the synchronous motor.
 - For Control Unit and infeed, a 24 V power supply other than that for the Motor Module must be used with the voltage protection activated. The 24 V power supply of this Motor Module must be DC link buffered (e.g. CSM).
 - a Braking Module with a correspondingly configured braking resistor must be available at the DC link.
 - the synchronous motor must be short-circuit proof.

F07433 Drive: Closed-loop control with encoder is not possible as the encoder has not been unparked

Message value: %1
Drive object: All objects
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The changeover to closed-loop control with encoder is not possible as the encoder has not been unparked.
Remedy: - check whether the encoder firmware supports the "parking" function (r0481.6 = 1).
 - upgrade the firmware.
Note:
 For long-stator motors (p3870.0 = 1), the following applies:
 The encoder must have completed the unparking procedure (r3875.0 = 1) before a changeover can be made to closed-loop control with encoder. The encoder is unparked using binector input p3876 = 0/1 signal and remains until a 0 signal in this state.

F07434 Drive: It is not possible to change the direction of rotation with the pulses enabled

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A drive data set was selected - with the pulses enabled - which has a different parameterized direction of rotation (p1821). It is only possible to change the motor direction of rotation using p1821 when the pulses are inhibited.

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Remedy:

- change over the drive data set with the pulses inhibited.
- ensure that the changeover to a drive data set does not result in the motor direction of rotation being changed (i.e. for these drive data sets, the same value must be in p1821).

See also: p1821

F07439 Drive: Function not supported

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: The power unit does not support the selected function.

Fault value (r0949, interpret decimal):

1:

The function "Current controller dynamic response higher" is selected (p1810.11 = 1), however, this is not supported by the power unit (r0192.27 = 0).

- firmware of the booksize power unit is not up-to-date.

- blocksize power unit was used.

2:

The function "Current controller dynamic response higher" is selected (p1810.11 = 1), however, this is not supported by the safety technology without encoder (9506 = 1, 3).

3:

The function "DC link voltage compensation in the power unit" is selected (p1810.1 = 1), however, this is not supported by the power unit (r0192.28 = 0).

Remedy: For fault value = 1:

- if necessary, upgrade the firmware of the booksize power unit to a later version (version >= 4.4).

Note:

If the firmware has already been automatically upgraded, then only a POWER ON (switch-off/switch-on) is required.

- Use a booksize power unit (version >= 4.4).

For fault value = 2:

- if an encoder with Safety position actual values sensing is available (r0458[0...2].19 = 1), reparameterize the encoderless safety technology (p9506 = 1, 3) to safety technology with encoder (p9506 = 0).

For fault value = 1, 2:

- Deselect the function "Current controller dynamics higher" (p1810.11 = 0) and if required, set the current, speed and position controller again or calculate (p0340 = 4).

For fault value = 3:

- if necessary, upgrade the firmware of the blocksize power unit to a later version (version >= 4.6).

- deselect the "DC link voltage compensation in the power unit" function (p1810.1 = 0).

See also: p9506

F07447 Load gear: Position tracking, maximum actual value exceeded

Message value: Component number: %1, encoder data set: %2, drive data set: %3

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: When the position tracking of the load gear is configured, the drive/encoder (motor encoder) identifies a maximum possible absolute position actual value (r2723) that can no longer be represented within 32 bits.

Maximum value: $p0408 * p2721 * 2^{p0419}$

Fault value (r0949, interpret hexadecimal):

ccbbaa hex

aa = encoder data set

bb = component number

cc = drive data set

Remedy: - reduce the fine resolution (p0419).
- reduce the multiturn resolution (p2721).

F07448 (A) Load gear: Position tracking, linear axis has exceeded the maximum range

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: For a configured linear axis/no modulo axis, the currently effective motor encoder (encoder 1) has exceeded the maximum possible traversing range.
For the configured linear axis, the maximum traversing range is defined to be 64x (+/- 32x) of p0421. It should be read in p2721 and interpreted as the number of load revolutions.
Note:

Only the motor encoder in the currently effective drive data set is monitored here. The actual effective drive data set is displayed in x = r0051 and the corresponding motor encoder is specified in in p0187[x].

Remedy: The fault should be resolved as follows:
- select encoder commissioning (p0010 = 4).
- reset position tracking, position (p2720.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and the absolute encoder adjusted.

Reaction upon A: NONE
Acknowl. upon A: NONE

F07449 (A) Load gear: Position tracking actual position outside tolerance window

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: When switched off, the currently effective motor encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder.
Note:

Only the motor encoder in the currently effective drive data set is monitored here. The actual effective drive data set is displayed in x = r0051 and the corresponding motor encoder is specified in in p0187[x].

Fault value (r0949, interpret decimal):

Deviation (difference) to the last encoder position in increments of the absolute value after the measuring gear - if one is being used. The sign designates the traversing direction.

Note:

The deviation (difference) found is also displayed in r2724.

Remedy: Reset the position tracking as follows:
- select encoder commissioning (p0010 = 4).
- reset position tracking, position (p2720.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).
See also: p0010

Reaction upon A: NONE
Acknowl. upon A: NONE

F07500 Drive: Power unit data set PDS not configured

Message value: Drive data set: %1
Drive object: All objects
Reaction: NONE

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Acknowledge: IMMEDIATELY
Cause: Only for controlled line supply infeed/regenerative feedback units:
The power unit data set was not configured - this means that a data set number was not entered into the drive data set.
Fault value (r0949, interpret decimal):
Drive data set number of p0185.
Remedy: The index of the power unit data set associated with the drive data set should be entered into p0185.

F07501 Drive: Motor Data Set MDS not configured
Message value: Drive data set: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: Only for power units:
The motor data set was not configured - this means that a data set number was not entered into the associated drive data set.
Fault value (r0949, interpret decimal):
The fault value includes the drive data set number of p0186.
Remedy: The index of the motor data set associated with the drive data set should be entered into p0186.

F07502 Drive: Encoder Data Set EDS not configured
Message value: Drive data set: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: Only for power units:
The encoder data set was not configured - this means that a data set number was not entered into the associated drive data set.
Fault value (r0949, interpret decimal):
The fault value includes the drive data set number of p0187, p0188 and p0189.
The fault value is increased by 100 * encoder number (e.g. for p0189: Fault value 3xx with xx = data set number).
Remedy: The index of the encoder data set associated with the drive data set should be entered into p0187 (1st encoder), p0188 (2nd encoder) and p0189 (3rd encoder).

A07504 Drive: Motor data set is not assigned to a drive data set
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A motor data set is not assigned to a drive object.
All of the existing motor data sets in the drive data sets must be assigned using the MDS number (p0186[0...n]). There must be at least as many drive data sets as motor data sets.
Alarm value (r2124, interpret decimal):
Number of the motor data set that has not been assigned.
Remedy: In the drive data sets, assign the non-assigned motor data set using the MDS number (p0186[0...n]).
- check whether all of the motor data sets are assigned to drive data sets.
- if required, delete superfluous motor data sets.
- if required, set up new drive data sets and assign to the corresponding motor data sets.

F07509 Drive: Component assignment missing
Message value: %1

Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A Drive Data Set (DDS) is assigned to a Motor Data Set (MDS) or Encoder Data Set (EDS) that does not have a component number.
 Fault value (r0949, interpret decimal):
 nnmmmxyyy
 nn: Number of the MDS/EDS.
 mmm: Parameter number of the missing component number.
 xx: Number of the DDS that is assigned to the MDS/EDS.
 yyy: Parameter number that references the MDS/EDS.
 Example:
 p0186[7] = 5: DDS 7 is assigned MDS 5.
 p0131[5] = 0: There is no component number set in MDS 5.
 Alarm value = 0513107186
Remedy: In the drive data sets, no longer assign MDS/EDS using p0186, p0187, p0188, p0189 or set a valid component number.

F07510 Drive: Identical encoder in the drive data set
Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: More than one encoder with identical component number is assigned to a single drive data set. In one drive data set, it is not permissible that identical encoders are operated together.
 Fault value (r0949, interpret decimal):
 $1000 * \text{first identical encoder} + 100 * \text{second identical encoder} + \text{drive data set}$.
 Example:
 Fault value = 1203 means:
 In drive data set 3, the first (p0187[3]) and second encoder (p0188[3]) are identical.
Remedy: Assign the drive data set to different encoders.

F07511 Drive: Encoder used a multiple number of times
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: Each encoder may only be assigned to one drive and within a drive must - in each drive data set - either always be encoder 1, always encoder 2 or always encoder 3. This unique assignment has been violated.
 Fault value (r0949, interpret decimal):
 The two parameters in coded form, that refer to the same component number.
 First parameter:
 Index: First and second decimal place (99 for EDS, not assigned DDS)
 Parameter number: Third decimal place (1 for p0187, 2 for p0188, 3 for p0189, 4 for EDS not assigned DDS)
 Drive number: Fourth and fifth decimal place
 Second parameter:
 Index: Sixth and seventh decimal place (99 for EDS, not assigned DDS)
 Parameter number: Eighth decimal place (1 for p0187, 2 for p0188, 3 for p0189, 4 for EDS, not assigned DDS)
 Drive number: Ninth and tenth decimal place
Remedy: Correct the double use of a component number using the two parameters coded in the fault value.

| | |
|-----------------------|--|
| F07512 | Drive: Encoder data set changeover cannot be parameterized |
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY |
| Cause: | Using p0141, a changeover of the encoder data set is prepared that is illegal. In this firmware release, an encoder data set changeover is only permitted for the components in the actual topology. Fault value (r0949, interpret decimal): Incorrect EDS data set number. |
| Remedy: | Every encoder data set must be assigned its own dedicated DRIVE-CLiQ socket. The component numbers of the encoder interfaces (p0141) must have different values within a drive object. The following must apply: p0141[0] not equal to p0141[1] not equal to ... not equal to p0141[n] |

| | |
|-------------------------|---|
| A07514 (N) | Drive: Data structure does not correspond to the interface module |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | The interface mode "SIMODRIVE 611 universal" was set (p2038 = 1) and the data structure does not correspond to this mode. The following settings are possible, depending on the number of data sets: Number of DDS/MDS (p0180/p0130): p0186 1/1: p0186[0] = 0 2/2: p0186[0] = 0, p0186[1] = 1 4/4: p0186[0] = 0, p0186[1] = 1, p0186[2] = 2, p0186[3] = 3 8/8: p0186[0] = 0, p0186[1] = 1, p0186[2] = 2 ... p0186[7] = 7 16/16: p0186[0] = 0, p0186[1] = 1, p0186[2] = 2 ... p0186[15] = 15 32/32: p0186[0] = 0, p0186[1] = 1, p0186[2] = 2 ... p0186[31] = 31 2/1: p0186[0, 1] = 0 4/2: p0186[0, 1] = 0, p0186[1, 2] = 1 8/4: p0186[0, 1] = 0, p0186[1, 2] = 1, p0186[3, 4] = 2, p0186[5, 6] = 3 16/8: p0186[0, 1] = 0, p0186[1, 2] = 1, p0186[3, 4] = 2 ... p0186[14, 15] = 7 32/16: p0186[0, 1] = 0, p0186[1, 2] = 1, p0186[3, 4] = 2 ... p0186[30, 31] = 15 4/1: p0186[0, 1, 2, 3] = 0 8/2: p0186[0, 1, 2, 3] = 0, p0186[4, 5, 6, 7] = 1 16/4: p0186[0, 1, 2, 3] = 0, p0186[4, 5, 6, 7] = 1, p0186[8, 9, 10, 11] = 2, p0186[12, 13, 14, 15] = 3 32/8: p0186[0, 1, 2, 3] = 0, p0186[4, 5, 6, 7] = 1, p0186[8, 9, 10, 11] = 2 ... p0186[28, 29, 30, 31] = 7 8/1: p0186[0...7] = 0 16/2: p0186[0...7] = 0, p0186[8...15] = 1 32/4: p0186[0...7] = 0, p0186[8...15] = 1, p0186[16...23] = 2, p0186[24...31] = 3 16/1: p0186[0...15] = 0 32/2: p0186[0...15] = 0, p0186[16...31] = 1 32/1: p0186[0...31] = 0 9/2: p0186[0...7] = 0, p0186[8] = 1 10/2: p0186[0...7] = 0, p0186[8, 9] = 1 12/2: p0186[0...7] = 0, p0186[8...11] = 1 |
| Remedy: | - check the data structure according to the possible settings mentioned in the cause. - check the interface mode (p2038). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

F07515 Drive: Power unit and motor incorrectly connected

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A power unit (via PDS) was assigned to a motor (via MDS) in a drive data set that is not connected in the target topology. It is possible that a motor has not been assigned to the power unit (p0131).
 Fault value (r0949, interpret decimal):
 Number of the incorrectly parameterized drive data set.

Remedy:

- assign the drive data set to a combination of motor and power unit permitted by the target topology.
- adapt the target topology.
- if required, for a missing motor, recreate the component (drive Wizard).

F07516 Drive: Re-commission the data set

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The assignment between the drive data set and motor data set (p0186) or between the drive data set and the encoder data set was modified (p0187). This is the reason that the drive data set must re-commissioned.
 Fault value (r0949, interpret decimal):
 Drive data set to be re-commissioned.

Remedy: Commission the drive data set specified in the fault value (r0949).

F07517 Drive: Encoder data set changeover incorrectly parameterized

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: In at least two drive data sets (DDS), the same motor data set (MDS) is assigned different encoder data sets (EDS) for the motor encoder. In various DDSs, it is not permissible for an MDS to have different motor encoders.
 The following parameterization therefore results results in an error:
 DDS0: p0186[0] = 0, p0187[0] = 0
 DDS1: p0186[1] = 0, p0187[1] = 1
 Fault value (r0949, interpret decimal):
 The lower 16 bits indicate the first DDS. The upper 16 bits indicate the second DDS.

Remedy: Create two MDS with the same motor data in order to operate one motor with different motor encoders.
 Example:
 DDS0: p0186[0] = 0, p0187[0] = 0
 DDS1: p0186[1] = 1, p0187[1] = 1

F07518 Drive: Motor data set changeover incorrectly parameterized

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: The system has identified that two motor data sets were incorrectly parameterized. Parameter r0313 (calculated from p0314, p0310, p0311), r0315 and p1982 may only have different values if the motor data sets are assigned different motors. p0827 is used to assign the motors and/contactors. It is not possible to toggle between motor data sets. Fault value (r0949, interpret hexadecimal): xxxxyyyy: xxxx: First DDS with assigned MDS, yyyy: Second DDS with assigned MDS

Remedy: Correct the parameterization of the motor data sets.

A07519 Drive: Motor changeover incorrectly parameterized

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: With the setting p0833.0 = 1, a motor changeover via the application is selected. This is the reason that p0827 must have different values in the appropriate motor data set. Alarm value (r2124, interpret hexadecimal): xxxxyyyy: xxxx: First MDS, yyyy: Second MDS

Remedy: - parameterize the appropriate motor data sets differently (p0827).
- select the setting p0833.0 = 0 (motor changeover via the drive).

A07520 Drive: Motor cannot be changed over

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The motor cannot be changed over. Alarm value (r2124, interpret decimal): 1: The contactor for the motor that is presently active cannot be opened, because for a synchronous motor, the speed (r0063) is greater than the speed at the start of field weakening (p0348). As long as r0063 > p0348, the current in the motor does not decay in spite of the pulses being suppressed. 2: The "contactor opened" feedback signal was not detected within 1 s. 3: The "contactor closed" feedback signal was not detected within 1 s.

Remedy: For alarm value = 1: Set the speed lower than the speed at the start of field weakening (r0063 < p0348). For alarm value = 2, 3: Check the feedback signals of the contactor involved.

A07530 Drive: Drive Data Set DDS not present

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected drive data set is not available (p0837 > p0180). The drive data set was not changed over.

Remedy: - select the existing drive data set.
- set up additional drive data sets.

A07531 Drive: Command Data Set CDS not present

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected command data set is not available (p0836 > p0170). The command data set was not changed over.
Remedy: - select the existing command data set.
 - set up additional command data sets.

A07541 Drive: Data set changeover not possible

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected drive data set changeover and the assigned motor changeover are not possible and are not carried out. For synchronous motors, the motor contactor may only be switched for actual speeds less than the speed at the start of field weakening (r0063 < p0348). See also: r0063
Remedy: Reduce the speed to below the speed at the start of field weakening (r0063 < p0348).

A07550 (F, N) Drive: Not possible to reset encoder parameters

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: When carrying out a factory setting (e.g. using p0970 = 1), it was not possible to reset the encoder parameters. The encoder parameters are directly read out of the encoder via DRIVE-CLiQ. Alarm value (r2124, interpret decimal): Component number of the encoder involved.
Remedy: - repeat the operation.
 - check the DRIVE-CLiQ connection.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F07551 Drive encoder: No commutation angle information

Message value: Fault cause: %1, drive data set: %2
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The commutation angle information is missing. This means that synchronous motors cannot be controlled (closed-loop control) Fault value (r0949, interpret decimal):
 yyyyxxx dec: yyyy = fault cause, xxxx = drive data set
 yyyy = 1 dec:
 The motor encoder used does not supply an absolute commutation angle.
 yyyy = 2 dec:
 The selected ratio of the measuring gear does not match the motor pole pair number.

13.2 List of faults and alarms

Remedy: For fault cause = 1:
- check the encoder parameterization (p0404).
- use an encoder with track C/D, EnDat interface of Hall sensors.
- use an encoder with sinusoidal A/B track for which the motor pole pair number (r0313) multiplied by the gear ratio (p0432/p0433) is less than the encoder pulse number (p0408) – or is an integer multiple of the encoder pulse number (p0408).
- activate the pole position identification routine (p1982 = 1).
For fault cause = 2:
- the quotient of the pole pair number divided by the ratio of the measuring gear must be an integer number: (p0314 * p0433) / p0432.
Note:
For operation with track C/D, this quotient must be less than 8.

F07552 (A) Drive encoder: Encoder configuration not supported

Message value: Fault cause: %1, component number: %2, encoder data set: %3

Drive object: All objects

Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The requested encoder configuration is not supported. Only bits may be requested in p0404 that are signaled as being supported by the encoder evaluation in r0456.

Fault value (r0949, interpret decimal):

ccccbbaa hex: cccc = fault cause, bb = component number, aa = encoder data set

cccc = 1: encoder sin/cos with absolute track (is supported by SME25).

cccc = 3: Squarewave encoder (this is supported by SMC30).

cccc = 4: sin/cos encoder (this is supported by SMC20, SMI20, SME20, SME25).

cccc = 10: DRIVE-CLiQ encoder (is supported by DQI).

cccc = 12: sin/cos encoder with reference mark (this is supported by SME20).

cccc = 15: Commutation with zero mark for separately excited synchronous motors with VECTORMV.

cccc = 23: Resolver (this is supported by SMC10, SMI10).

cccc = 65535: Other function (compare r0456 and p0404).

Remedy: - check the encoder parameterization (p0400, p0404).
- use the matching encoder evaluation (r0456).

Reaction upon A: NONE

Acknowl. upon A: NONE

F07553 (A) Drive encoder: Sensor Module configuration not supported

Message value: Encoder data set: %1, first incorrect bit: %2, incorrect parameter: %3

Drive object: All objects

Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The Sensor Module does not support the requested configuration.
 For incorrect p0430 (cc = 0), the following applies:
 - in p0430 (requested functions), at least 1 bit was set that is not set in r0458 (supported functions) (exception: Bit 19, 28, 29, 30, 31).
 - p1982 > 0 (pole position identification requested), but r0458.16 = 0 (pole position identification not supported).
 For incorrect p0437 (cc = 1), the following applies:
 - in p0437 (requested functions), at least 1 bit was set that is not set in r0459 (supported functions).
 Fault value (r0949, interpret hexadecimal):
 ddccbbaa hex
 aa: encoder data set number
 bb: first incorrect bit
 cc: incorrect parameter
 cc = 0: incorrect parameter is p0430
 cc = 1: incorrect parameter is p0437
 cc = 2: incorrect parameter is r0459
 dd: reserved (always 0)

Remedy:

- check the encoder parameterization (p0430, p0437).
- check the pole position identification routine (p1982).
- use the matching encoder evaluation (r0458, r0459).

Reaction upon A: NONE
Acknowl. upon A: NONE

F07555 (A) Drive encoder: Configuration position tracking

Message value: Component number: %1, encoder data set: %2, drive data set: %3, fault cause: %4
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: For position tracking, the configuration is not supported.
 Position tracking can only be activated for absolute encoders.
 For linear axes, it is not possible to simultaneously activate the position tracking for load and measuring gears.
 Fault value (r0949, interpret hexadecimal):
 ddccbbaa hex
 aa = encoder data set
 bb = component number
 cc = drive data set
 dd = fault cause
 dd = 00 hex = 0 dec
 An absolute encoder is not being used.
 dd = 01 hex = 1 dec
 Position tracking cannot be activated because the memory of the internal NVRAM is not sufficient or a Control Unit does not have an NVRAM.
 dd = 02 hex = 2 dec
 For a linear axis, the position tracking was activated for the load and measuring gear.
 dd = 03 hex = 3 dec
 Position tracking cannot be activated because position tracking with another gear ratio, axis type or tolerance window has already been detected for this encoder data set.
 dd = 04 hex = 4 dec
 A linear encoder is being used.

13.2 List of faults and alarms

Remedy: For fault value 0:
- use an absolute encoder.
For fault value 1:
- use a Control Unit with sufficient NVRAM.
For fault value = 2, 4:
- if necessary, de-select the position tracking (p0411 for the measuring gear, p2720 for the load gear).
For fault value 3:
- Only activate position tracking of the load gear in the same encoder data set if the gear ratio (p2504, p2505), axis type (p2720.1) and tolerance window (p2722) are also the same. These parameters must be the same in all drive data sets, which use the same motor encoder (p187).

Reaction upon A: NONE
Acknowl. upon A: NONE

F07556 **Measuring gear: Position tracking, maximum actual value exceeded**
Message value: Component number: %1, encoder data set: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: When the position tracking of the measuring gear is configured, the drive/encoder identifies a maximum possible absolute position actual value (r0483) that cannot be represented within 32 bits.
Maximum value: $p0408 * p0412 * 2^{p0419}$
Fault value (r0949, interpret decimal):
aaaayyxx hex: yy = component number, xx = encoder data set

Remedy:
- reduce the fine resolution (p0419).
- reduce the multiturn resolution (p0412).

F07560 **Drive encoder: Number of pulses is not to the power of two**
Message value: Encoder data set: %1
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: For rotary absolute encoders, the pulse number in p0408 must be to the power of two.
Fault value (r0949, interpret decimal):
The fault value includes the encoder data set number involved.

Remedy:
- check the parameterization (p0408, p0404.1, r0458.5).
- upgrade the Sensor Module firmware if necessary

F07561 **Drive encoder: Number of multiturn pulses is not to the power of two**
Message value: Encoder data set: %1
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The multiturn resolution in p0421 must be to the power of two.
Fault value (r0949, interpret decimal):
The fault value includes the encoder data set number involved.

Remedy:
- check the parameterization (p0421, p0404.1, r0458.5).
- upgrade the Sensor Module firmware if necessary

F07562 (A) **Drive, encoder: Position tracking, incremental encoder not possible**
Message value: Fault cause: %1, component number: %2, encoder data set: %3

Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The requested position tracking for incremental encoders is not supported.
 Fault value (r0949, interpret hexadecimal):
 ccccbbaa hex
 aa = encoder data set
 bb = component number
 cccc = fault cause
 cccc = 00 hex = 0 dec
 The encoder type does not support the "Position tracking incremental encoder" function.
 cccc = 01 hex = 1 dec
 Position tracking cannot be activated because the memory of the internal NVRAM is not sufficient or a Control Unit does not have an NVRAM.
 cccc = 04 hex = 4 dec
 A linear encoder is used that does not support the "position tracking" function.
Remedy:
 - check the encoder parameterization (p0400, p0404).
 - use a Control Unit with sufficient NVRAM.
 - if required, de-select position tracking for the incremental encoder (p0411.3 = 0).
Reaction upon A: NONE
Acknowl. upon A: NONE

F07563 (A) Drive encoder: XIST1_ERW configuration incorrect

Message value: Fault cause: %1, encoder data set: %2
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: An incorrect configuration was identified for the "Absolute position for incremental encoder" function.
 Fault value (r0949, interpret decimal):
 Fault cause:
 1 (= 01 hex):
 The "Absolute value for incremental encoder" function is not supported (r0459.13 = 0).
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 yyxx dec: yy = fault cause, xx = encoder data set
Remedy:
 For fault value = 1:
 - upgrade the Sensor Module firmware version.
 - check the mode (p4652 = 1, 3 requires the property r0459.13 = 1).
Reaction upon A: NONE
Acknowl. upon A: NONE

A07565 (F, N) Drive: Encoder error in PROFIdrive encoder interface 1

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: An encoder error was signaled for encoder 1 via the PROFIdrive encoder interface (G1_ZSW.15).
Alarm value (r2124, interpret decimal):
Error code from G1_XIST2, refer to the description regarding r0483.
Note:
This alarm is only output if p0480[0] is not equal to zero.
Encoder control word Gn_STW signal source (p0480[0...2], n = encoder 1, 2, 3)
Encoder status word Gn_ZSW (r0481[0...2], n = encoder 1, 2, 3)

Remedy: Acknowledge the encoder error using the encoder control word (G1_STW.15 = 1).

Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A07566 (F, N) Drive: Encoder error in PROFIdrive encoder interface 2

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: An encoder error was signaled for encoder 2 via the PROFIdrive encoder interface (G2_ZSW.15).
Alarm value (r2124, interpret decimal):
Error code from G2_XIST2, refer to the description regarding r0483.
Note:
This alarm is only output if p0480[1] is not equal to zero.
Encoder control word Gn_STW signal source (p0480[0...2], n = encoder 1, 2, 3)
Encoder status word Gn_ZSW (r0481[0...2], n = encoder 1, 2, 3)

Remedy: Acknowledge the encoder error using the encoder control word (G2_STW.15 = 1).

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A07567 (F, N) Drive: Encoder error in PROFIdrive encoder interface 3

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: An encoder error was signaled for encoder 3 via the PROFIdrive encoder interface (G3_ZSW.15).
Alarm value (r2124, interpret decimal):
Error code from G3_XIST2, refer to the description regarding r0483.
Note:
This alarm is only output if p0480[2] is not equal to zero.
Encoder control word Gn_STW signal source (p0480[0...2], n = encoder 1, 2, 3)
Encoder status word Gn_ZSW (r0481[0...2], n = encoder 1, 2, 3)

Remedy: Acknowledge the encoder error using the encoder control word (G3_STW.15 = 1).

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A07569 (F) Enc identification active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: During encoder identification (waiting) with p0400 = 10100, the encoder could still not be identified.
 Either the wrong encoder has been installed or no encoder has been installed, the wrong encoder cable has been connected or no encoder cable has been connected to the Sensor Module, or the DRIVE-CLiQ component has not been connected.

Note:
 Encoder identification must be supported by the encoder and is possible in the following cases:

- Encoder with EnDat interface.
- Encoder with SSI interface.
- Motor with DRIVE-CLiQ.

Remedy:

- check and, if necessary, connect the encoder / encoder cable.
- check and, if necessary, establish the DRIVE-CLiQ connection.
- for SSI encoders, carry out the required operator actions (see the Function Manual).
- in the case of encoders that cannot be identified (e.g. encoders without EnDat interface), enter the correct encoder type in p0400.

Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

N07570 (F) Encoder identification data transfer running

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: NONE

Cause: The encoder type was automatically determined using p0400 = 10100.

Note:
 This fault causes the pulses to be suppressed - this is necessary to transfer the encoder parameterization to p0400 and the following.

Remedy: Acknowledge the fault without taking additional measures.

Reaction upon F: OFF2

Acknowl. upon F: IMMEDIATELY

F07575 Drive: Motor encoder not ready

Message value: -

Drive object: All objects

Reaction: Servo: OFF2 (ENCODER)

Acknowledge: IMMEDIATELY

Cause: The motor encoder signals that it is not ready.

- initialization of encoder 1 (motor encoder) was unsuccessful.
- the function "parking encoder" is active (encoder control word G1_STW.14 = 1).
- the encoder interface (Sensor Module) is deactivated (p0145).
- the Sensor Module is defective.

Remedy: Evaluate other queued faults via encoder 1.

A07576 Drive: Encoderless operation due to a fault active

Message value: -

Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE
Acknowledge: NONE
Cause: Encoderless operation is active due to a fault (r1407.13 = 1).
Note:
The behavior for faults has been set to ENCODER fault response in p0491.
Remedy: - remove the cause of a possible encoder fault.
- carry out a POWER ON (switch-off/switch-on) for all components.

A07580 (F, N) Drive: No Sensor Module with matching component number

Message value: Encoder data set: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A Sensor Module with the component number specified in p0141 was not found.
Alarm value (r2124, interpret decimal):
Encoder data set involved (index of p0141).
Remedy: Correct parameter p0141.
Reaction upon F: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F07754 Drive: Incorrect shutoff valve configuration

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: An incorrect shutoff valve configuration was detected.
Fault value (r0949, interpret decimal):
100:
Enable Safety Integrated (p9601/p9801), but p0218.0 = 0 (shutoff valve not available).
101:
The manipulated variable inhibit time is set less than the wait time to evaluate the feedback signal contacts when switching on the shutoff valve (p0230 < p9625[0]/p9825[0]).
102:
The manipulated variable inhibit time is set less than the wait time to evaluate the feedback signal contacts when switching off the shutoff valve (p0230 < p9625[1]/p9825[1]).
Remedy: For fault value = 100:
Check the enable of Safety Integrated and the shutoff valve (p9601/p9801, p0218.0).
For fault value = 101:
Set the manipulated variable inhibit time higher than the wait time to evaluate the feedback signal contacts when switching on the shutoff valve (p0230 > p9625[0]/p9825[0]).
For fault value = 102:
Set the manipulated variable inhibit time higher than the wait time to evaluate the feedback signal contacts when switching off the shutoff valve (p0230 > p9625[1]/p9825[1]).

F07800 Drive: No power unit present

Message value: -
Drive object: All objects
Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The power unit parameters cannot be read or no parameters are stored in the power unit.
It is possible that the DRIVE-CLiQ cable between the Control Unit and power unit is interrupted or defective.
Note:
This fault also occurs if an incorrect topology was selected in the commissioning tool and this parameterization is then downloaded to the Control Unit.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- check the DRIVE-CLiQ cable between the Control Unit and power unit.
- check the power unit and replace if necessary.
- check the Control Unit, and if required replace it.
- after correcting the topology, the parameters must be again downloaded using the commissioning tool.

F07801 Drive: Motor overcurrent

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE, OFF1, OFF3)

Acknowledge: IMMEDIATELY

Cause: The permissible motor limit current was exceeded.

- effective current limit set too low.
- current controller not correctly set.
- motor was braked with an excessively high stall torque correction factor.
- U/f operation: Up ramp was set too short or the load is too high.
- U/f operation: Short-circuit in the motor cable or ground fault.
- U/f operation: Motor current does not match the current of Motor Module.

Note:
Synchronous motor: Limit current= 1.3 x p0323
Induction motor: Limit current= 1.3 x r0209

Remedy:

- check the current limits (p0323, p0640).
- check the current controller (p1715, p1717).
- reduce the stall torque correction factor (p0326).
- increase the up ramp (p1318) or reduce the load.
- check the motor and motor cables for short-circuit and ground fault.
- check the Motor Module and motor combination.

F07802 Drive: Infeed or power unit not ready

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: After an internal switch-on command, the infeed or drive does not signal ready.

- monitoring time is too short.
- DC link voltage is not present.
- associated infeed or drive of the signaling component is defective.
- supply voltage incorrectly set.

Remedy:

- increase the monitoring time (p0857).
- ensure that there is a DC link voltage. Check the DC link busbar. Enable the infeed.
- replace the associated infeed or drive of the signaling component.
- check the line supply voltage setting (p0210).

13.2 List of faults and alarms

A07805 (N) Drive: Power unit overload I2t

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The alarm threshold for I2t overload (p0294) of the power unit has been exceeded.
The response parameterized in p0290 becomes active.
Remedy:
- reduce the continuous load.
- adapt the load duty cycle.
- check the assignment of the rated currents of the motor and Motor Module.
Reaction upon N: NONE
Acknowl. upon N: NONE

F07808 (A) HF Damping Module: damping not ready

Message value: New message: %1
Drive object: All objects
Reaction: OFF2 (NONE, OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: When switching on or in the switched-on state, the HF Damping Module does not return a ready signal.
Remedy:
- check the DRIVE-CLiQ wiring to the HF Damping Module.
- check the 24 V supply voltage.
- if required, replace the HF Damping Module.
Note:
HF Damping Module
Reaction upon A: NONE
Acknowl. upon A: NONE

F07810 Drive: Power unit EEPROM without rated data

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: No rated data are stored in the power unit EEPROM.
Remedy: Replace the power unit or inform Siemens Customer Service.

F07815 Drive: Power unit has been changed

Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The code number of the actual power unit does not match the saved number. This only occurs if the comparator in p9906 or p9908 is not at 2 (low) or 3 (minimum).
Fault value (r0949, interpret decimal):
Number of the incorrect parameter.

Remedy: Connect the original power unit and switch on the Control Unit again (POWER ON) or set p0201 to r0200 and exit commissioning with p0010 = 0.
 For infeeds, the following applies:
 Line reactors or line filters must be used that are specified for the new power unit. A line supply and DC link identification routine (p3410 = 5) must then be carried out. It is not possible to change the power unit without re-commissioning the system if the type of infeed (A_Infeed, B_Infeed, S_Infeed), the type of construction/design (booksize, chassis) or the voltage class differ between the old and new power units.
 For inverters, the following applies:
 If the new power unit is accepted, then if required, the current limit (p0640) can be reduced by a lower maximum current of the power unit (r0209) (torque limits stay the same).
 If not only the power unit is changed, but also the motor, then the motor must be re-commissioned (e.g. using p0010 = 1). This is also necessary if motor data is still to be downloaded via DRIVE-CLiQ.
 If the comparison stage in p9906 is set to 2, 3, then commissioning can be exited (p0010 = 0) and the fault acknowledged.

A07820 Drive: Temperature sensor not connected

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature sensor for monitoring the motor temperature, specified in p0600, is not available.
 Alarm value (r2124, interpret decimal):
 1: p0601 = 10 (SME), but in p0600 - not evaluated via encoder is selected.
 2: p0600 = 10 (BICO), but the signal source (p0603) is not interconnected.
 3: p0601 = 11 (BICO), but in p0600 - not evaluated via BICO interconnection is selected (20 or 21).
 4: p0601 = 11 (BICO) and p4610-p4613 > 0, but the associated signal source (p0608, p0609) is not interconnected.
 5: Component with sensor evaluation not present or has been removed in the meantime.
 6: Evaluation via Motor Module not possible (r0192.21).

Remedy: For alarm value = 1:
 - in p0600 set an encoder with temperature sensor.
 For alarm value = 2:
 - interconnect p0603 with the temperature signal.
 For alarm value = 3, 4:
 - set the available temperature sensor (p0600, p0601).
 - set p4610 ... p4613 = 0 (no sensor), or interconnect p0608 or p0609 with an external temperature signal.
 For alarm value = 5:
 - connect the component with the temperature sensor. Check the DRIVE-CLiQ connection.
 For alarm value = 6:
 - update the Motor Module firmware. Connect temperature sensor via encoder.

F07840 Drive: Infeed operation missing

Message value: -
Drive object: All objects
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: The signal "infeed operation" is not present although the enable signals for the drive have been present for longer than the parameterized monitoring time (p0857).
 - infeed not operational.
 - interconnection of the binector input for the ready signal is either incorrect or missing (p0864).
 - infeed is presently carrying out a line supply identification routine.

13.2 List of faults and alarms

- Remedy:**
- bring the infeed into an operational state.
 - check the interconnection of the binector input for the signal "infeed operation" (p0864).
 - increase the monitoring time (p0857).
 - wait until the infeed has completed the line supply identification routine.
-

F07841 (A) Drive: Infeed operation withdrawn

Message value: -

Drive object: All objects

Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3)

Acknowledge: IMMEDIATELY

Cause: The signal "infeed operation" was withdrawn in operation.

- interconnection of the binector input for the signal "infeed operation" is either incorrect or missing (p0864).
- the enable signals of the infeed were disabled.
- due to a fault, the infeed withdraws the signal "infeed operation".

- Remedy:**
- check the interconnection of the binector input for the "infeed operation" signal (p0864).
 - check the enable signals of the infeed and if required, enable.
 - remove and acknowledge an infeed fault.

Note:

If this drive is intended to back up the DC link regeneratively, then the fault response must be parameterized for NONE, OFF1 or OFF3. so that the drive can continue to operate even after the infeed fails.

Reaction upon A: NONE

Acknowl. upon A: NONE

A07850 (F) External alarm 1

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The condition for "External alarm 1" is satisfied.

Note:

The "External alarm 1" is initiated by a 1/0 edge via binector input p2112.

Remedy: Eliminate the causes of this alarm.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY (POWER ON)

A07851 (F) External alarm 2

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The condition for "External alarm 2" is satisfied.

Note:

The "External alarm 2" is initiated by a 1/0 edge via binector input p2116.

Remedy: Eliminate the causes of this alarm.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY (POWER ON)

A07852 (F) External alarm 3

Message value: -

Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The condition for "External alarm 3" is satisfied.
Note:
The "External alarm 3" is initiated by a 1/0 edge via binector input p2117.
Remedy: Eliminate the causes of this alarm.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)

F07860 (A) External fault 1

Message value: -
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The condition for "External fault 1" is satisfied.
Note:
The "External fault 1" is initiated by a 1/0 edge via binector input p2106.
See also: p2106 (External fault 1)
Remedy: - eliminate the causes of this fault.
- acknowledge fault.
Reaction upon A: NONE
Acknowl. upon A: NONE

F07861 (A) External fault 2

Message value: -
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The condition for "External fault 2" is satisfied.
Note:
The "External fault 2" is initiated by a 1/0 edge via binector input p2107.
Remedy: - eliminate the causes of this fault.
- acknowledge fault.
Reaction upon A: NONE
Acknowl. upon A: NONE

F07862 (A) External fault 3

Message value: -
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The condition for "External fault 3" is satisfied.
Note:
The "External fault 3" is initiated by a 1/0 edge via the following parameters.
- AND logic operation, binector input p2108, p3111, p3112.
- switch-on delay p3110.
Remedy: - eliminate the causes of this fault.
- acknowledge fault.

13.2 List of faults and alarms

Reaction upon A: NONE

Acknowl. upon A: NONE

F07890 Internal voltage protection / internal armature short-circuit with STO active

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The internal armature short-circuit (p1231 = 4) is not possible as Safe Torque Off (STO) is enabled. The pulses cannot be enabled.

Remedy: Switch out the internal armature short-circuit (p1231=0) or deactivate Safe Torque Off (p9501 = p9561 = 0).

Note:

STO: Safe Torque Off / SH: Safe standstill

F07900 (N, A) Drive: Motor blocked/speed controller at its limit

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE, OFF1, OFF3, STOP2)

Acknowledge: IMMEDIATELY

Cause: Motor has been operating at the torque limit longer than the time specified in p2177 and below the speed threshold in p2175.

This signal can also be initiated if the speed actual value is oscillating and the speed controller output repeatedly goes to its limit.

See also: p2175

Remedy:

- check that the motor can freely move.

- check the effective torque limits (r1538, r1539).

- check the parameter, message "Motor blocked" and if required, correct (p2175, p2177).

- check the inversion of the actual value (p0410).

- check the motor encoder connection.

- check the encoder pulse number (p0408).

- for SERVO with encoderless operation and motors with low power ratings (< 300 W), increase the pulse frequency (p1800).

- after de-selecting the "Basic positioner" (EPOS) function mode, check the motoring (p1528) and regenerative (p1529) torque limit and modify again.

- blocksize device: for encoderless operation and a current controller sampling time p0115[0] < 80 μs, either set the pulse frequency of p1800 = 1 / p0115[0] or increase the switchover speed of the model p1755.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F07901 Drive: Motor overspeed

Message value: -

Drive object: All objects

Reaction: Servo: OFF2 (IASC/DCBRK)

Acknowledge: IMMEDIATELY

Cause: The maximum permissible speed was either positively or negatively exceeded.

The maximum permissible positive speed is formed as follows: Minimum (p1082, CI: p1085) + p2162

The maximum permissible negative speed is formed as follows: Maximum (-p1082, CI: 1088) - p2162

Remedy: The following applies for a positive direction of rotation:
 - check r1084 and if required, correct p1082, CI:p1085 and p2162.
 The following applies for a negative direction of rotation:
 - check r1087 and if required, correct p1082, CI:p1088 and p2162.

F07902 (N, A) Drive: Motor stalled

Message value: %1

Drive object: All objects

Reaction: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)

Acknowledge: IMMEDIATELY

Cause: The system has identified that the motor has stalled for a time longer than is set in p2178.
 Fault value (r0949, interpret decimal):

- 1: Stall detection using r1408.11 (p1744, p0492).
- 2: Stall detection using r1408.12 (p1745) or via the flux difference (r0083 ... r0084).
- 3: Stall detection using r0056.11 (only for separately excited synchronous motors).

Remedy: For closed-loop speed and torque control with speed encoder, the following applies:
 - check the speed signal (interrupted cable, polarity, pulse number, broken encoder shaft).
 - check the speed encoder, if another speed encoder was selected using the data set changeover. This must be connected to the same motor that is controlled for the data set changeover.
 If there is no fault, then the fault tolerance (p1744 and p0492) can be increased.
 For closed-loop speed and torque control without speed encoder, the following applies:
 - check whether the drive in the open-loop controlled mode (r1750.0) stalls under load. If yes, then increase the current setpoint using p1610.
 - check whether the drive stalls due to the load if the speed setpoint is still zero. If yes, then increase the current setpoint using p1610.
 - if the motor excitation (magnetizing) time (r0346) was significantly reduced, then it should be increased again.
 - check the current limits (p0640, r0067). If the current limits are too low, then the drive cannot be magnetized.
 - check the current controller (p1715, p1717) and the speed adaptation controller (p1764, p1767). If the dynamic response was significantly reduced, then this should be increased again.
 - check the speed encoder, if another speed encoder was selected using the data set changeover. This must be connected to the motor that is controlled for the data set changeover.
 If there is no fault, then the fault tolerance (p1745) or the delay time (p2178) can be increased.
 For separately excited synchronous motors (closed-loop control with speed encoder), the following applies:
 - check the speed signal (interrupted cable, polarity, pulse number).
 - ensure the correct motor parameterization (rating plate and equivalent circuit diagram parameters).
 - check the excitation equipment and the interface to the closed-loop control.
 - encoder the highest possible dynamic response of the closed-loop excitation current control.
 - check the speed control for any tendency to oscillate and if resonance effects occur, use a bandstop filter.
 - do not exceed the maximum speed (p2162).
 If there is no fault, then the delay time can be increased (p2178).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A07903 Drive: Motor speed deviation

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: The absolute value of the speed difference from the two setpoints (p2151, p2154) and the speed actual value (r2169) exceeds the tolerance threshold (p2163) longer than tolerated (p2164, p2166).
The alarm is only enabled for p2149.0 = 1.
Possible causes could be:

- the load torque is greater than the torque setpoint.
- when accelerating, the torque/current/power limit is reached. If the limits are not sufficient, then it is possible that the drive has been dimensioned too small.
- for closed-loop torque control, the speed setpoint does not track the speed actual value.
- for active Vdc controller.

For U/f control, the overload condition is detected as the lmax controller is active.

Remedy:

- increase p2163 and/or p2166.
- increase the torque/current/power limits.
- for closed-loop torque control: The speed setpoint should track the speed actual value.
- deactivate alarm with p2149.0 = 0.

F07904 (N, A) External armature short-circuit: Contactor feedback signal "Closed" missing

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: When closing, the contactor feedback signal (p1235) did not issue the signal "Closed" (r1239.1 = 1) within the monitoring time (p1236).

Remedy:

- check that the contactor feedback signal is correctly connected (p1235).
- check the logic of the contactor feedback signal (r1239.1 = 1: "Closed", r1239.1 = 0: "Open").
- increase the monitoring time (p1236).
- if required, set the external armature short-circuit without contactor feedback signal (p1231 = 2).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F07905 (N, A) External armature short-circuit: Contactor feedback signal "Open" missing

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: When opening, the contactor feedback signal (p1235) did not issue the signal "Open" (r1239.1 = 0) within the monitoring time (p1236).

Remedy:

- check that the contactor feedback signal is correctly connected (p1235).
- check the logic of the contactor feedback signal (r1239.1 = 1: "Closed", r1239.1 = 0: "Open").
- increase the monitoring time (p1236).
- if required, set the external armature short-circuit without contactor feedback signal (p1231 = 2).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F07906 Armature short-circuit / internal voltage protection: Parameterization error

Message value: Fault cause: %1, motor data set: %2

Drive object: All objects

| | |
|---------------------|---|
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY |
| Cause: | <p>The armature short-circuit is incorrectly parameterized.</p> <p>Fault value (r0949, interpret decimal):</p> <p>zzzzyyxx: zzzz = fault cause, xx = motor data set</p> <p>zzzz = 0001 hex = 1 dec: A permanent-magnet synchronous motor has not been selected.</p> <p>zzzz = 0002 hex = 2 dec: No induction motor selected.</p> <p>zzzz = 0065 hex = 101 dec: External armature short-circuit: Output (r1239.0) not wired.</p> <p>zzzz = 0066 hex = 102 dec: External armature short-circuit with contactor feedback signal: No feedback signal connected (BI:p1235). The feedback signal must be interconnected in all command data sets (CDS).</p> <p>zzzz = 0067 hex = 103 dec: External armature short-circuit without contactor feedback signal: Wait time when opening (p1237) is 0.</p> <p>zzzz = 00C9 hex = 201 dec: Internal voltage protection: The maximum output current of the Motor Module (r0209) is less than 1.8 x motor short-circuit current (r0331).</p> <p>zzzz = 00CA hex = 202 dec: Internal voltage protection: A Motor Module in booksize or chassis format is not being used.</p> <p>zzzz = 00CB hex = 203 dec: Internal voltage protection: The motor short-circuit current (p0320) is greater than the maximum motor current (p0323).</p> <p>zzzz = 00CC hex = 204 dec: Internal voltage protection: The activation (p1231 = 4) is not given for all motor data sets with synchronous motors (p0300 = 2xx, 4xx).</p> |
| Remedy: | <p>For fault value = 1:</p> <ul style="list-style-type: none"> - an armature short-circuit / voltage protection is only permissible for permanent-magnetic synchronous motors. The highest position of the motor type in p0300 must either be 2 or 4. <p>For fault value = 101:</p> <ul style="list-style-type: none"> - the contactor for the external armature short-circuit configuration should be controlled using output signal r1239.0. For instance, the signal can be connected to an output terminal via binector input p0738. Before this fault can be acknowledged, p1231 must be set again. <p>For fault value = 102:</p> <ul style="list-style-type: none"> - if the external armature short circuit is selected with contactor feedback signal (p1231 = 1), then the feedback signal must be connected to an input terminal (e.g. r0722.x) and then interconnected to binector input p1235. - alternatively, the external armature short-circuit without contactor feedback signal (p1231 = 2) can be selected. <p>For fault value = 103:</p> <ul style="list-style-type: none"> - if the external armature short-circuit without contactor feedback signal (p1231 = 2) is selected, then a delay time must be parameterized in p1237. This time must always be greater than the actual contactor opening time, as otherwise the Motor Module would be short-circuited! <p>For fault value = 201:</p> <ul style="list-style-type: none"> - a Motor Module with a higher maximum current or a motor with a lower short-circuit current must be used. The maximum Motor Module current must be higher than 1.8 x short-circuit current of the motor. <p>For fault value = 202:</p> <ul style="list-style-type: none"> - for internal voltage protection, use a Motor Module in booksize or chassis format. <p>For fault value = 203:</p> <ul style="list-style-type: none"> - for internal voltage protection, only use short-circuit proof motors. <p>For fault value = 204:</p> <ul style="list-style-type: none"> - the internal voltage protection must either be activated for all motor data sets with synchronous motors (p0300 = 2xx, 4xx) (p1231 = 3) or it must be deactivated for all motor data sets (p1231 not equal to 3). This therefore ensures that the protection cannot be accidentally withdrawn as a result of a data set changeover. The fault can only be acknowledged if this condition is fulfilled. |

13.2 List of faults and alarms

F07907 Internal armature short-circuit: Motor terminals are not at zero potential after pulse suppression

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: The function "Internal voltage protection" (p1231 = 3) was activated.
The following must be observed:

- when the internal voltage protection is active, after pulse suppression, all of the motor terminals are at half of the DC link voltage (without an internal voltage protection, the motor terminals are at zero potential)!
- it is only permissible to use motors that are short-circuit proof (p0320 < p0323).
- the Motor Module must be able to continually conduct 180% short-circuit current (r0331) of the motor (r0289).
- the internal voltage protection cannot be interrupted due to a fault response. If an overcurrent condition occurs during the active, internal voltage protection, then this can destroy the Motor Module and/or the motor.
- if the Motor Module does not support the autonomous, internal voltage protection (r0192.10 = 0), in order to ensure safe, reliable functioning when the line supply fails, an external 24 V power supply (UPS) must be used for the components.
- if the Motor Module does support the autonomous, internal voltage protection (r0192.10 = 1), in order to ensure safe, reliable functioning when the line supply fails, the 24 V power supply for the components must be provided through a Control Supply Module.
- if the internal voltage protection is active, it is not permissible that the motor is driven by the load for a longer period of time (e.g. as a result of loads that move the motor or another coupled motor).

Remedy: Not necessary.
This a note for the user.

A07908 Internal armature short-circuit active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The Motor Module signals that the motor is short-circuited through the power semiconductors (r1239.5 = 1). The pulses cannot be enabled. The internal armature short-circuit is selected (p1231 = 4):

Remedy: For synchronous motors, the armature short-circuit braking is activated with binector input p1230 = 1 signal.

F07909 Internal voltage protection: Deactivation only effective after POWER ON

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: POWER ON

Cause: The deactivation of the internal voltage protection (p1231 not equal to 3) only becomes effective after POWER ON.
The status signal r1239.6 = 1 indicates that the internal voltage protection is ready.

Remedy: Not necessary.
This a note for the user.

A07910 (N) Drive: Motor overtemperature

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: KTY84/PT1000:
 The motor temperature has exceeded the alarm threshold (p0604, p0616).
 PTC:
 The response threshold of 1650 Ohm was exceeded.
 Alarm value (r2124, interpret decimal):
 this is the number of the temperature channel leading to the message.

Remedy:

- check the motor load.
- check the motor ambient temperature and cooling.
- check PTC or bimetallic NC contact.
- check the monitoring limits (p0604, p0605).
- activate/check the parameters of the motor temperature model (p0612, p0626 and following).

Reaction upon N: NONE
Acknowl. upon N: NONE

F07913 Excitation current outside the tolerance range

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The difference between the excitation current actual value and setpoint has exceeded the tolerance:
 $\text{abs}(r1641 - r1626) > p3201 + p3202$
 The cause of this fault is again reset for $\text{abs}(r1641 - r1626) < p3201$.

Remedy:

- check the parameterization (p1640, p3201, p3202).
- check the interfaces to the excitation equipment (r1626, p1640).
- check the excitation equipment.

F07914 Flux out of tolerance

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The difference between the flux actual value and setpoint has exceeded the tolerance:
 $\text{abs}(r0084 - r1598) > p3204 + p3205$
 The cause of this fault is again reset for $\text{abs}(r0084 - r1598) < p3204$.
 The fault is only issued after the delay time in p3206 has expired.

Remedy:

- check the parameterization (p3204, p3205).
- check the interfaces to the excitation equipment (r1626, p1640).
- check the excitation equipment.
- check the flux control (p1590, p1592, p1597).
- check the control for oscillation and take the appropriate counter measures (e.g. optimize the speed control loop, parameterize a bandstop filter).

A07918 (N) Three-phase setpoint generator operation selected/active

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: Only for separately excited synchronous motors (p0300 = 5):
The actual open-loop/closed-loop control mode is I/f control (open-loop) with a fixed current (p1300 = 18).
The speed is entered via the setpoint channel and the current setpoint is given by the minimum current (p1620).
It must be ensured that in this mode, the control dynamic performance is very limited. This is the reason that longer ramp-up times should be set for the setpoint speed than for normal operation.

Remedy: Select another open-loop/closed-loop control mode

Reaction upon N: NONE

Acknowl. upon N: NONE

A07927 DC braking active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The motor is braked with DC current. DC braking is active.
1)
A message with response DCBRK is active. The motor is braked with the braking current set in p1232 for the duration set in p1233. If the standstill threshold p1226 is undershot, then braking is prematurely canceled.
2)
DC braking has been activated at binector input p1230 with the DC braking set (p1230 = 4). Braking current p1232 is injected until this binector input becomes inactive.

Remedy: Not necessary.
This alarm is automatically withdrawn after DC braking.

F07928 Internal voltage protection initiated

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The Motor Module signals that the motor is short-circuited through the power semiconductors (r1239.5 = 1). The pulses cannot be enabled. The internal voltage protection is selected (p1231 = 3).

Remedy: If the Motor Module supports the autonomous internal voltage protection (r0192.10 = 1), then the Motor Module automatically decides - using the DC link voltage - as to whether the armature short-circuit should be activated. The armature short-circuit is activated and response OFF2 is initiated if the DC link voltage exceeds 800 V. If the DC link voltage falls below 450 V, then the armature short-circuit is withdrawn.
If the motor is still in a critical speed range, the armature short-circuit is re-activated once the DC link voltage exceeds the threshold of 800 V.
If the autonomous (independent) internal voltage protection is active (r1239.5 = 1) and the line supply returns (450 V < DC link voltage < 800 V), the armature short-circuit is withdrawn after 3 minutes.

F07930 Drive: Brake control error

Message value: %1

Drive object: All objects

Reaction: OFF1 (NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

| | |
|----------------|---|
| Cause: | <p>The drive-integrated "Safety Integrated" function in monitoring channel 2 has detected a brake control error and initiated a STOP A.</p> <ul style="list-style-type: none"> - OCC cable shield is not correctly connected. - defect in the brake control circuit of the drive. <p>Fault value (r0949, interpret decimal):</p> <p>10, 11: Fault in "open holding brake" operation.</p> <ul style="list-style-type: none"> - brake not closed or interrupted cable. - ground fault in brake cable. <p>20: Fault in "brake open" state.</p> <ul style="list-style-type: none"> - short-circuit in brake winding. <p>30, 31: Fault in "close holding brake" operation.</p> <ul style="list-style-type: none"> - brake not closed or interrupted cable. - short-circuit in brake winding. <p>40: Fault in "brake closed" state.</p> <p>50: Fault in the brake control of the drive or a communication error (brake control diagnostics).</p> |
| Remedy: | <ul style="list-style-type: none"> - select STO and then de-select again. - check the motor holding brake connection. - check the function of the motor holding brake. - carry out a diagnostics routine for the faults involved. - check for EMC-compliant control cabinet design and cable routing (e.g. shield OCC cable with shield terminal and shield plate, check the connection of the brake conductors). - replace drive. <p>Note:</p> <p>OCC: One Cable Connection (one cable system) SBC: Safe Brake Control SI: Safety Integrated STO: Safe Torque Off See also: p1215</p> |

F07934 (N) Drive: S120 Combi motor holding brake configuration

| | |
|-----------------------|---|
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE (OFF1, OFF2, OFF3) |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | <p>A connected motor holding brake has been detected with an S120 Combi. However, this brake has not been assigned to just one Combi feed drive and, therefore, brake control is not configured (correctly).</p> <p>Fault value (r0949, interpret decimal):</p> <p>0: No motor holding brake is assigned (p1215 = 0 or 3 on all S120 Combi feed drives).</p> <p>1: More than one motor holding brake has been assigned (p1215 = 1 or 2 on more than one S120 Combi feed drive) - or there is more than one DRIVE-CLiQ motor with motor holding brake.</p> <p>2: Brake was accidentally assigned to the spindle (p1215 = 1); this is not permitted for this software release.</p> <p>3: An attempt was made to enable the function "Safe brake control" (SBC, p9602 = p9802 = 1) for the spindle. This is not permitted for this software release.</p> |
| Remedy: | <p>Check whether the motor holding brake has been assigned to one S120 Combi feed drive exclusively (p1215 = 1 or 2). The fault will only be withdrawn once the motor holding brake has been assigned to just one of the S120 Combi feed drives (p1215 = 1 or 2 for this one drive). From this point, the motor holding brake will be controlled by this drive.</p> <p>See also: p1215</p> |

13.2 List of faults and alarms

Reaction upon N: NONE

Acknowl. upon N: NONE

F07935 (N) Drive: Incorrect motor holding brake configuration

Message value: %1

Drive object: All objects

Reaction: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: An incorrect motor holding brake configuration was detected.

Fault value (r0949, interpret decimal):

0:

A motor holding brake was detected where the brake control has not been configured (p1215 = 0).

The brake control configuration was set to "motor holding brake the same as sequence control" (p1215 = 1) (only when commissioning for the first time).

For a chassis unit with Safe Brake Adapter (SBA), the interconnection p9621 = r9872.3 was established (only when commissioning for the first time).

For a parallel connection, the power unit was set in p7015, to which the motor holding brake is connected (only when commissioning for the first time).

1:

A motor holding brake was detected where the brake control has not been configured (p1215 = 0).

The brake control configuration was left at "No motor holding brake available" (p1215 = 0).

11:

The identification had detected more than one motor holding brake for a parallel connection.

12:

For the parallel connection, in p0121 there is no valid component number for the power unit data set that is set in p7015.

13:

With the "Safe brake control" (SBC) function activated, an attempt was made to change the value in p7015.

14:

For a parallel connection, the power units set in p7015 cannot be addressed.

Remedy:

For fault value = 0:

- no remedy required.

For fault value = 1:

- if required change the motor holding brake configuration (p1215 = 1, 2).

- if this fault value unexpectedly occurs, then the motor connections should be checked in order to rule out that they have been interchanged.

For fault value = 11:

For a parallel connection, only connect one motor holding brake.

For fault value = 12:

Check the setting of the power unit data set for a parallel connection (p7015).

For fault value = 13:

Before changing p7015, deactivate the "Safe brake control" function (SBC) (p9602).

For fault value = 14:

Check whether the power unit supports the brake control for a parallel connection (r9771.14).

Check whether there is a DRIVE-CLiQ communication error between the Control Unit and the power unit involved and, if required, carry out a diagnostics routine for the faults identified.

See also: p1215

Reaction upon N: NONE

Acknowl. upon N: NONE

F07950 (A) Drive: Incorrect motor parameter

Message value: Parameter: %1

Drive object: All objects

Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: - the motor parameters were incorrectly entered while commissioning (e.g. p0300 = 0, no motor)
 - the braking resistor has still not been parameterized - commissioning cannot be completed.
 Fault value (r0949, interpret decimal):
 Parameter number involved.
 300 (CU250S-2):
 For this control mode, the motor type is not supported.
 307:
 The following motor parameters could be incorrect:
 p0304, p0305, p0307, p0308, p0309
 See also: p0304, r0304, p0305, r0305, p0307, r0307, p0311, r0311, p0322, r0322, p0323, r0323
Remedy: Compare the motor data with the rating plate data and if required, correct.
 For fault value = 300 (CU250S-2):
 Operate a motor type supported by the selected control mode.
Reaction upon A: NONE
Acknowl. upon A: NONE

F07955 Drive: Motor has been changed

Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The code number of the actual motor with DRIVE-CLiQ does not match the saved number.
 Fault value (r0949, interpret decimal):
 Number of the incorrect parameter.
 See also: r0302
Remedy: Connect the original motor, switch on the Control Unit again (POWER ON) and exit quick commissioning with p0010 = 0.
 Or set p0300 = 10000 (load the parameters from the motor with DRIVE-CLiQ) and re-commission.
 Quick commissioning (p0010 = 1) is automatically exited with p3900 > 0.
 If quick commissioning was exited with p0010 = 0, then an automatic controller calculation (p0340 = 1) is not carried out.

F07956 (A) Drive: Motor code does not match the list (catalog) motor

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The motor code of the connected motor with DRIVE-CLiQ does not match the possible list motor types (see selection in p0300).
 The connected motor with DRIVE-CLiQ might not be supported by this firmware version.
 Fault value (r0949, interpret decimal):
 Motor code of the connected motor with DRIVE-CLiQ.
 Note:
 The first three digits of the motor code generally correspond to the list motor type.
Remedy: Use a motor with DRIVE-CLiQ and the matching motor code.
Reaction upon A: NONE
Acknowl. upon A: NONE

A07960 Drive: Incorrect friction characteristic

Message value: Parameter: %1

13.2 List of faults and alarms

Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The friction characteristic is incorrect.
Alarm value (r2124, interpret decimal):
1:
Incorrect parameter format.
1538:
The friction torque is greater than the maximum from the upper effective torque limit (p1538) and zero. This is the reason that the output of the friction characteristic (r3841) is limited to this value.
1539:
The friction torque is less than the minimum from the lower effective torque limit (p1539) and zero. This is the reason that the output of the friction characteristic (r3841) is limited to this value.
3820 ... 3829:
Incorrect parameter number. The speeds entered in the parameters for the friction characteristic do not correspond to the following condition:
 $0.0 < p3820 < p3821 < \dots < p3829 \leq p0322$ or $p1082$, if $p0322 = 0$
Therefore the output of the friction characteristic (r3841) is set to zero.
3830 ... 3839:
Incorrect parameter number. The torques entered in the parameters for the friction characteristic do not correspond to the following condition:
 $0 \leq p3830, p3831 \dots p3839 \leq p0333$
Therefore the output of the friction characteristic (r3841) is set to zero.
Remedy: Fulfill the conditions for the friction characteristic.
For alarm value = 1538:
Check the upper effective torque limit (e.g. in the field weakening range).
For alarm value = 1539:
Check the lower effective torque limit (e.g. in the field weakening range).
For alarm value = 3820 ... 3839:
Fulfill the conditions to set the parameters of the friction characteristic.
If the motor data (e.g. the maximum speed p0322) are changed during commissioning ($p0010 = 1, 3$), then the technological limits and threshold values, dependent on this, must be re-calculated by selecting $p0340 = 5$.

A07961 Drive: Friction characteristic record activated

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The automatic friction characteristic record is activated.
The friction characteristic is recorded at the next switch-on command.
When plotting the friction characteristic, it is not possible to save the parameters (p0971, p0977).
Remedy: Not necessary.
The alarm is automatically withdrawn after the friction characteristic recording has been successfully completed or recording has been de-activated ($p3845 = 0$).

F07963 Drive: Friction characteristic record interrupted

Message value: Parameter: %1
Drive object: All objects
Reaction: OFF1
Acknowledge: IMMEDIATELY

| | |
|----------------|--|
| Cause: | <p>The conditions to record the friction characteristic are not fulfilled.</p> <p>Fault value (r0949, interpret decimal):</p> <p>0046: Missing enable signals (r0046).</p> <p>1082: The highest speed value to be approached (p3829) is greater than the maximum speed (p1082).</p> <p>1084: The highest speed value to be approached (p3829) is greater than the maximum speed (r1084, p1083, p1085).</p> <p>1087: The highest speed value to be approached (p3829) is greater than the maximum speed (r1087, p1086, p1088).</p> <p>1110: Friction characteristic record, negative direction selected (p3845) and negative direction inhibited (p1110).</p> <p>1111: Friction characteristic record, positive direction selected (p3845) and positive direction inhibited (p1111).</p> <p>1198: Friction characteristic record selected (p3845 > 0) and negative (p1110) and positive directions (p1111) inhibited (r1198).</p> <p>1300: The control mode (p1300) has not been set to closed-loop speed control.</p> <p>1755: For encoderless closed-loop control (p1300 = 20), the lowest speed value to be approached (p3820) is less than or equal to the changeover speed, open-loop controlled operation (p1755).</p> <p>1910: Motor data identification activated.</p> <p>1960: Speed controller optimization activated.</p> <p>3820 ... 3829: speed (p382x) cannot be approached.</p> <p>3840: Friction characteristic incorrect.</p> <p>3845: Friction characteristic record de-selected.</p> |
| Remedy: | <p>Fulfill the conditions to record the friction characteristic.</p> <p>For fault value = 0046:</p> <ul style="list-style-type: none"> - establish missing enable signals. <p>For fault value = 1082, 1084, 1087:</p> <ul style="list-style-type: none"> - Select the highest speed value to be approached (p3829) less than or equal to the maximum speed (p1082, r1084, r1087). - Re-calculate the speed points along the friction characteristic (p0340 = 5). <p>For fault value = 1110:</p> <ul style="list-style-type: none"> - Select the friction characteristic record, positive direction (p3845). <p>For fault value = 1111:</p> <ul style="list-style-type: none"> - Select the friction characteristic record, negative direction (p3845). <p>For fault value = 1198:</p> <ul style="list-style-type: none"> - Enable the permitted direction (p1110, p1111, r1198). <p>For fault value = 1300:</p> <ul style="list-style-type: none"> - set the control mode (p1300) on the closed-loop speed control (p1300 = 20, 21). <p>For fault value = 1755:</p> <ul style="list-style-type: none"> - For encoderless closed-loop speed control (p1300 = 20) select the lowest speed value to be approached (p3820) greater than the changeover speed of open-loop controlled operation (p1755). - Re-calculate the speed points along the friction characteristic (p0340 = 5). <p>For fault value = 1910:</p> <ul style="list-style-type: none"> - Exit the motor data identification routine (p1910). <p>For fault value = 1960:</p> <ul style="list-style-type: none"> - Exit the speed controller optimization routine (p1960). <p>For fault value 3820 ... 3829:</p> <ul style="list-style-type: none"> - check the load at speed p382x. - check the speed signal (r0063) for oscillation at speed p382x. Check the settings of the speed controller if applicable. <p>For fault value = 3840:</p> <ul style="list-style-type: none"> - Make the friction characteristic error-free (p3820 ... p3829, p3830 ... p3839, p3840). <p>For fault value = 3845:</p> <ul style="list-style-type: none"> - Activate the friction characteristic record (p3845). |

A07965 (N) Drive: Save required

Message value: -

Drive object: All objects

Reaction: NONE

13.2 List of faults and alarms

Acknowledge: NONE
Cause: The angular commutation offset (p0431) was re-defined and has still not been saved.
In order to permanently accept the new value, it must be saved in a non-volatile fashion (p0971, p0977).
Remedy: Not necessary.
This alarm is automatically withdrawn after the data has been saved.
See also: p0977
Reaction upon N: NONE
Acknowl. upon N: NONE

F07966 Drive: Check the commutation angle

Message value: -
Drive object: All objects
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: The speed actual value was inverted and the associated angular commutation offset is not equal to zero and is therefore possibly incorrect.
Remedy: Angular commutation offset after the actual value inversion or determine it again (p1990=1).

A07971 (N) Drive: Angular commutation offset determination activated

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The automatic determination of the angular commutation offset (encoder adjustment) is activated (p1990 = 1).
Note:
The automatic determination is carried out at the next switch-on command.
For SERVO and fault F07414 present, the following applies:
The determination of the angular commutation offset is automatically activated (p1990 = 1), if a pole position identification technique is set in p1980.
Remedy: Not necessary.
The alarm is automatically withdrawn after successful determination or for the setting p1990 = 0.
Reaction upon N: NONE
Acknowl. upon N: NONE

A07979 (F, N) Drive: pole position identification calibration required

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The pole position identification was not successful as the calibration values for the current measurement are not correct.
Remedy: Replace the Motor Module involved.
Reaction upon F: OFF2 (NONE)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A07980 Drive: Rotating measurement activated

Message value: -
Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The rotating measurement is activated. For the rotating measurement, the motor can accelerate up to the maximum speed and with maximum torque. Only the parameterized current limit (p0640) and the maximum speed (p1082) are effective. The behavior of the motor can be influenced using the direction inhibit (p1959.14, p1959.15) and the ramp-up/ramp-down time (p1958).
The rotating measurement is carried out at the next switch-on command.

Remedy: Not necessary.
The alarm is automatically withdrawn after the rotating measurement has been successfully completed or for the setting p1960 = 0.
Note:
If a POWER ON or a warm restart is performed with motor data identification selected, the motor data identification request will be lost. If motor data identification is required, it will need to be selected again manually following ramp-up.

F07990 Drive: Incorrect motor data identification

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE, OFF1)

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

- Cause:** A fault has occurred during the identification routine.
Fault value (r0949, interpret decimal):
- 10: Data set changeover during motor data identification.
 - 101: Voltage amplitude even at 30% maximum current amplitude is too low to measure the inductance.
 - 102, 104: Voltage limiting while measuring the inductance.
 - 103: Maximum frequency exceeded during the rotating inductance measurement.
 - 110: Motor not finely synchronized before the rotating measurement.
 - 111: The zero mark is not received within 2 revolutions.
 - 112: Fine synchronization is not realized within 8 seconds after the zero mark has been passed.
 - 113: The power, torque or current limit is zero.
 - 115: U/f control is active.
 - 120: Error when evaluating the magnetizing inductance.
 - 125: Cable resistance greater than the total resistance.
 - 126: Series inductance greater than the total leakage inductance.
 - 127: Identified leakage inductance negative.
 - 128: Identified stator resistance negative.
 - 129: Identified rotor resistance negative.
 - 130: Drive data set changeover during the motor data identification routine.
 - 140: The setpoint channel inhibits both directions.
 - 160: Accelerating time when determining kT, moment of inertia or reluctance torque too short or too long.
 - 161: When measuring the kT characteristic, constants kT1, kT3, kT5 and kT7 were not able to be determined (p0645 ... p0648), as too few points were measured.
 - 165: The current limit was reduced below the measurement current while determining the reluctance torque.
 - 173: Internal problem.
 - 180: identification speed (maximum speed, rated speed, 0.9 x p0348) less than p1755 or no DC link voltage available.
 - 181: Zero speed at the end of the measurement of periodic position errors.
 - 182: No complete mechanical revolution at to the end of the measurement of periodic position errors.
 - 190: Speed setpoint not equal to zero.
 - 191: An actual speed of zero is not reached.
 - 192: Speed setpoint not reached.
 - 193: Inadmissible motion of the motor when identifying the voltage emulation error.
 - 194: Supplementary torque (r1515) not equal to zero.
 - 195: Closed-loop torque control active.
 - 200, 201: Not possible to identify the voltage emulation error characteristic of the drive converter (p1952, p1953).

Remedy:

For fault value = 10:

- do not initiate a data set changeover during the motor data identification.

For fault value = 101:

- increase current limit (p0640) or torque limit (p1520, p1521).
- check current controller gain (p1715).
- reduce current controller sampling time (p0115).

It may be impossible to completely identify the L characteristic, as required current amplitude is too high.

- suppress meas. (p1909, p1959).

For fault value = 102, 104:

- reduce current limit (p0640).
- check current controller P gain.
- suppress meas. (p1909, p1959).

For fault value = 103:

- increase external moment of inertia (if possible).
- reduce current controller sampling time (p0115).
- suppress meas. (p1909, p1959).

For fault value = 110:

- before rotating measurement, traverse motor over zero mark.

For fault value = 111:

- it is possible that encoder does not have zero mark. Correct setting in p0404.15.
- encoder pulse number was incorrectly entered. Correct setting in p0408.
- if zero mark signal is defective, replace encoder.

For fault value = 112:

- upgrade encoder software.

For fault value = 113:

- check the limits (p0640, p1520, p1521, p1530, p1531), correct the zero values.

For fault value = 115:

- de-select U/f control (p1317 = 0).

For fault value = 120:

- check current controller P gain (p1715) and if required, reduce.
- increase the pulse frequency (p1800).

For fault value = 125:

- reduce cable resistance (p0352).

For fault value = 126:

- reduce series inductance (p0353).

For fault = 127, 128, 129:

- it is possible that current controller is oscillating. Reduce the P gain (p1715).
- if required, reduce the current limit (p0640).

For fault value = 130:

- do not initiate a drive data set changeover during motor ident. routine.

For fault value = 140:

- before the measurement, enable at least one direction (p1110 = 0 or p1111 = 0 or p1959.14 = 1 or p1959.15 = 1).

For fault value = 160:

- extend accelerating time when determining kT, moment of inertia and reluctance torque, e.g. by increasing max. speed (p1082), increasing moment of inertia or reducing max. current (p0640).
- in encoderless operation with load moment of inertia, parameterize the load moment of inertia (p1498).
- reduce the ramp-up time (p1958).
- increase speed controller P-gain (p1460).
- suppress meas. (p1959).

For fault value = 161:

- reduce the ramp-up time (p1958).
- increase max. speed (p1082).

13.2 List of faults and alarms

- reduce current limit (p0640).
- if required, do not activate the kT characteristic (p1780.9 = 0).

For fault value = 165:

- decrease max. current (p0640).

For fault value = 173:

-

For fault value = 180:

- switch-on the infeed
- increase max. speed (p1082).
- reduce p1755.
- suppress meas. (p1909, p1959).

For fault value = 181, 182:

- increase max. speed (p1082).
- if required, deactivate the measurement (p1959.0 = 0).

Note:

- to measure periodic position errors, the encoder must have absolute position information (unique zero mark, distance-coded zero marks, absolute encoder, 1-pole resolver p5263.10).

For fault value = 190:

- set speed setpoint to zero.

For fault value = 191:

- do not start motor data identification routine while motor is still rotating.

For fault value = 192:

- check closed-loop speed control (motor rotor may be locked or closed-loop speed control is not functioning).
- for p1215 = 1, 3 (brake the same as the sequence control) check the control sense (p0410.0).
- ensure that enable signals are present during measurement.
- remove any pulling loads from motor.
- increase max. current (p0640).
- reduce max. speed (p1082).
- suppress meas. (p1959).

For fault value = 193:

- the motor has moved through more than 5 ° electrical (r0093). Lock motor rotor at one of these pole position angles (r0093): 90 °, 210 ° or 330 ° (+/-5 °) and then start identification.

For fault value = 194:

- switch out all supplementary torques (e.g. CI: p1511).
- for hanging/suspended axes: Lock motor rotor at one of these pole position angles (r0093): 90 °, 210 ° or 330 ° (+/-1 °) and then start identification.

For fault value = 195:

- de-select closed-loop torque control (p1300 = 21 or 20, or set the signal source in p1501 to a 0 signal).

For fault value = 200, 201:

- set pulse frequency to 0.5 x current controller frequency (e.g. 4 kHz for a current controller sampling time = 125 us).
- reduce cable length between Motor Module and motor.
- read-out measured values (r1950, r1951) and therefore determine suitable values for p1952, p1953 according to your own estimation.

A07991 (N) Drive: Motor data identification activated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The motor data identification routine is activated.

The motor data identification routine is carried out at the next switch-on command.

Remedy: Not necessary.
 The alarm is automatically withdrawn after the motor data identification routine has been successfully completed or for the setting p1910 = 0 or p1960 = 0.
 If a POWER ON or a warm restart is performed with motor data identification selected, the motor data identification request will be lost. If motor data identification is required, it will need to be selected again manually following ramp-up.

Reaction upon N: NONE

Acknowl. upon N: NONE

F07993 Drive: Incorrect direction of rotation of the field or encoder actual value inversion

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: IMMEDIATELY

Cause: Either the direction of the rotating field or the encoder actual value has an incorrect sign. The motor data identification automatically changed the actual value inversion (p0410) in order to correct the control sense. This can result in a direction of rotation change.

Note:

To acknowledge this fault, the correctness of the direction of rotation must first be acknowledged with p1910 = -2.

Remedy: Check the direction of rotation (also for the position controller, if one is being used).

If the direction of rotation is correct, the following applies:

No additional measures are required (except set p1910 = -2 and acknowledge fault).

If the direction of rotation is incorrect, the following applies:

To change the direction of rotation, two phases must be interchanged and the motor identification routine must be repeated.

F07995 Drive: Pole position identification not successful

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

- Cause:** The pole position identification routine was unsuccessful.
Fault value (r0949, interpret decimal):
- 1: No current is established.
 - 2: The starting current is not zero.
 - 3: The selected max. distance was exceeded (p1981).
 - 4x: The measuring signal does not permit a clear evaluation.
 - 5: The max. current was exceeded during the measurement.
 - 6: The current measurement must be re-calibrated.
 - 7x: The Sensor Module does not support the pole position identification routine.
 - 8: The pole position identification routine current required is greater than the max. current.
 - 9: The set pole position identification routine current is zero.
 - 10: Data set changeover during the pole position identification.
 - 11: The encoder adjustment to determine the commutation angle is active (p1990 = 1) and the encoder without zero mark is not finely synchronized or does not have any valid data.
 - 100: motion-based pole position identification, 1st and 2nd Measurements differ. Motor blocked or current (p1993) too low.
 - 101: Motion-based position position identification, insufficient motion, motor blocked or current (p1993) too low.
 - 102: Motion-based pole position identification, brake is being used and is closed. The motion-based position position identification in conjunction with the brake is not permitted.
 - 103: Motion-based pole position identification without encoder.
 - 104: Motion-based pole position identification, speed actual value not zero after stabilizing time.
 - 200: Elasticity-based pole position identification, internal error in the arctan calculation (0/0).
 - 201: Elasticity-based pole position identification, too few measuring points that can be evaluated.
 - 202: Elasticity-based pole position identification, outliers in the measurement series.
 - 203: Elasticity-based pole position identification, maximum rotation without current.
 - 204: Elasticity-based pole position identification, no positive edge found.
 - 205: Elasticity-based pole position identification, the result of the Fourier transformation differs by more than 480 ° electrical / p3093 from the rough estimate.
 - 206: Elasticity-based pole position identification, plausibility test unsuccessful.
 - 207: Elasticity-based pole position identification, no negative measured value found.
It is possible that all measured values are identical. The expected deflection was not able to be reached, either because the expectation is too high or not enough current was able to be established.
 - 208: Elasticity-based pole position identification, measuring current is 0.
 - 209: Elasticity-based pole position identification, the selected max. distance was exceeded (p3095).
 - 210: Elasticity-based pole position identification without encoder.
 - 250 ... 260:
Elasticity-based pole position identification, more than 3 attempts have been made and fault value 200 ... 210 output.
Example:
Fault value= 253 --> more than 3 attempts have been made and fault value 203 output.

Remedy:

For fault value = 1:

- check the motor connection and DC link voltage.
- for the following parameters, set practical values that are not zero (p0325, p0329).

For fault value = 1, 2:

- in the case of a large computing time load (e.g. 6 drives with Safety Integrated), set the computing dead time of the current controller to late transfers (p0117 = 3).

For fault value = 3:

- increase the max. distance (p1981).
- reduce the currents for the pole position identification routine (p0325, p0329).
- stop the motor in order to carry out the pole position identification routine.

For fault value = 5:

- reduce the currents for the pole position identification routine (p0325, p0329).

For fault value = 6:

- re-calibrate the Motor Module.

For fault value = 8:

- reduce the currents for the pole position identification routine (p0329, p0325, p1993).
- the power unit cannot provide the necessary pole position identification routine current (p0209 < p0329, p0325, p1993), replace the power unit with a power unit with a higher max. current.

For fault value = 9:

- enter a value not equal to zero in the pole position identification routine current (p0329, p0325, p1993).

For fault value = 10:

- do not initiate a data set changeover during the pole position identification.

For fault value = 11:

- for incremental encoders without commutation with zero mark (p0404.15 = 0), it does not make sense to adjust the encoder to determine the commutation angle (p1990 = 1). In this case, the function should be de-selected (p1990 = 0) or, for an encoder with suitable zero mark, commutation with zero mark should be selected (p0404.15 = 1).
- for absolute encoders, only adjust the encoder to determine the commutation angle (p1990 = 1) if the encoder supplies commutation information and is finely synchronized (p1992.8 = 1 and p1992.10 = 1). The encoder is possibly parked, deactivated (p0145), not ready for operation or signals a fault condition.
- de-select the encoder adjustment to determine the commutation angle (set p1990 to 0).

For fault value = 40 ... 49:

- increase the currents for the pole position identification routine (p0325, p0329).
- stop the motor in order to carry out the pole position identification routine.
- select another technique for pole position identification routine (p1980).
- use another motor, absolute encoder or Hall sensors.

For fault value = 70 ... 79:

- upgrade the software in the Sensor Module.

For fault value = 100, 101:

- check and ensure that the motor is free to move.
- increase the current for motion-based pole position identification (p1993).

For fault value = 102:

- if the motor is to be operated with a brake: Select a different technique to identify the pole position (p1980).
- if the motor can be operated without a brake: Open the brake (p1215 = 2).

For fault value = 103:

- the motion-based pole position identification can only be carried out using an encoder. Connect an encoder or select another technique for pole position identification routine (p1980).

For fault value = 104:

- pole position identification, increase the smoothing time, motion-based (p1997).
- pole position identification, increase the rise time, motion-based (p1994).
- pole position identification, check the gain, motion-based (p1995).
- pole position identification, check the integral time, motion-based (p1996).
- for motor encoders with track A/B sq-wave (p0404.3 = 1) and flank time measurement (p0430.20 = 0), disable the integral time (p1996 = 0).

For fault value = 200:

13.2 List of faults and alarms

- check parameter setting (p3090 ... p3096).
- For fault value = 201:
 - check parameter setting (p3090 ... p3096).
 - reduce p3094.
- For fault value = 202:
 - check parameter setting (p3090 ... p3096).
 - fault has occurred during the identification. Repeat the measurement.
 - check the brake or brake control.
- For fault value = 203:
 - check the brake or brake control.
 - check the measuring current (p3096).
 - increase p3094.
- For fault value = 204:
 - check parameter setting (p3090 ... p3096).
- For fault value = 205:
 - check parameter setting (p3090 ... p3096).
- For fault value = 206:
 - check parameter setting (p3090 ... p3096).
 - fault has occurred during the identification. Repeat the measurement.
 - check the brake or brake control.
- For fault value = 207:
 - reduce the expected deflection (p3094).
 - increase the measuring current (p3096).
- For fault value = 208:
 - set the measuring current (p3096).
- For fault value = 209:
 - check parameter setting p3095.
 - check the brake or brake control.
- For fault value = 210:
 - the elasticity-based pole position identification can only be carried out using an encoder. Connect an encoder or select another technique for pole position identification routine (p1980).
- For fault value = 250 ... 260:
 - check parameter setting (p3090 ... p3096, p1980).

| | |
|-----------------------|--|
| F07996 | Drive: Pole position identification routine not carried out |
| Message value: | - |
| Drive object: | All objects |
| Reaction: | ENCODER (OFF2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | <p>In operation, the operating mode that requires a pole position identification was changed over, which is not possible in this state.</p> <ul style="list-style-type: none">- the drive was changed over, flying, from encoderless operation to operation with encoder without having previously carried out a pole position identification for the encoder. p1404 is then at a value between zero and the max. speed and the pulses in the speed range above p1404 were enabled without a pole position ident. routine having been previously carried out in operation with encoder.- in operation, an EDS changeover was made to an encoder where it is necessary to carry out a pole position identification. However, this has still not been carried out (p1982 = 1 or 2 and p1992.7 = 0). |
| Remedy: | <ul style="list-style-type: none">- for a flying changeover between operation with and without encoder with pole position identification after POWER ON or commissioning (p0010 not equal to zero) enable the pulses once at zero speed. This means that the pole position identification routine is carried out and the result is available for operation.- carry out the EDS changeover with the pulses inhibited, or, before the changeover, carry out a pole position identification using this data set. |

A07998 Drive: Motor data identification active on another drive

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The motor data identification is activated on the drive object specified in the alarm value, and interlocks the other drive objects so they cannot be switched on.
 Alarm value (r2124, interpret decimal):
 Drive object with the active motor data identification.
Remedy: - wait for the complete execution of the motor data identification of the drive object designated in the alarm value.
 - deselect the motor data identification for the drive object designated in the alarm value (p1910 = 0 or p1960 = 0).

A07999 Drive: Motor data identification cannot be activated

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Closed-loop control is enabled on a SERVO drive object type. To select motor data identification, pulses must be suppressed for all SERVO drive objects.
 Alarm value (r2124, interpret decimal):
 Drive object with enabled closed-loop control.
Remedy: Withdraw the pulse enable on all drives and re-activate the motor data identification.

F08000 (N, A) TB: +/-15 V power supply faulted

Message value: %1
Drive object: All objects
Reaction: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: Terminal Board 30 detects an incorrect internal power supply voltage.
 Fault value (r0949, interpret decimal):
 0: Error when testing the monitoring circuit.
 1: Fault in normal operation.
Remedy: - replace Terminal Board 30.
 - replace Control Unit.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F08010 (N, A) TB: Analog-digital converter

Message value: -
Drive object: All objects
Reaction: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The analog/digital converter on Terminal Board 30 has not supplied any converted data.
Remedy: - check the power supply.
 - replace Terminal Board 30.
Reaction upon N: NONE
Acknowl. upon N: NONE

13.2 List of faults and alarms

Reaction upon A: NONE

Acknowl. upon A: NONE

A08550 PZD Interface Hardware assignment error

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The assignment of the hardware to the PZD interface has been incorrectly parameterized.

Alarm value (r2124, interpret decimal):

- 1: Only one of the two indices is not equal to 99 (automatic).
- 2: Both PZD interfaces are assigned to the same hardware.
- 3: Assigned COMM BOARD missing.
- 4: CBC10 is assigned to interface 1.

Remedy: Check the parameterization and if required, correct (p8839).

A08560 IE: Syntax error in configuration file

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A syntax error has been detected in the ASCII configuration file for the Industrial Ethernet interface (X127). The saved configuration file has not been loaded.

Note:

IE: Industrial Ethernet

Remedy: - Check the interface configuration (p8900 and following), correct if necessary, and activate (p8905 = 1).
- Save the parameters for interface configuration (e.g. p8905 = 2)
or
- reinitialize the station using the "Edit Ethernet node" screen form (e.g. with STARTER commissioning tool).

A08561 IE: Consistency error affecting adjustable parameters

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A consistency error was detected when activating the configuration (p8905) for the Industrial Ethernet interface (X127).

Alarm value (r2124, interpret decimal):

- 0: general consistency error
- 1: error in the IP configuration (IP address, subnet mask or standard gateway).
- 2: Error in the station names.
- 5: standard gateway is also set at the PROFINET onboard interface.
- 6: the station name is also set at the PROFINET onboard interface.
- 7: IP address is located in the same subnet as the IP address of the PROFINET onboard interface.

Note:

For alarm value = 0, 1, 2, 5, 7 the following applies: the configuration was not changed.

For alarm value = 6 the following applies: The new configuration was however activated.

IE: Industrial Ethernet

Remedy: - check the required interface configuration (p8900 and following), correct if necessary, and activate (p8905).
or
- reinitialize the station using the "Edit Ethernet node" screen form (e.g. with STARTER commissioning tool).

A08562 PROFINET: Syntax error in configuration file

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A syntax error has been detected in the ASCII configuration file for the onboard PROFINET interface. The saved configuration file has not been loaded.

Remedy:

- Check the interface configuration (p8920 and following), correct if necessary, and activate (p8925 = 1).
- Save the parameters for interface configuration (e.g. p8925 = 2).

or

- reinitialize the station using the "Edit Ethernet node" screen form (e.g. with STARTER commissioning tool).

A08563 PROFINET: Consistency error affecting adjustable parameters

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: A consistency error was detected when activating the configuration (p8925) for the PROFINET interface.
Alarm value (r2124, interpret decimal):

- 0: general consistency error
- 1: error in the IP configuration (IP address, subnet mask or standard gateway).
- 2: Error in the station names.
- 3: DHCP was not able to be activated, as a cyclic PROFINET connection already exists.
- 4: a cyclic PROFINET connection is not possible as DHCP is activated.
- 5: standard gateway is also set at the Industrial Ethernet interface (X127).
- 6: standard station name is also set at the Industrial Ethernet interface (X127).
- 7: IP address is located in the same subnet as the IP address of the Industrial Ethernet interface (X127).

Note:

For alarm value = 0, 1, 2, 3, 4, 5, 7, the following applies: the configuration was not changed.

For alarm value = 6 the following applies: The new configuration was however activated.

DHCP: Dynamic Host Configuration Protocol

Remedy:

- check the required interface configuration (p8940 and following), correct if necessary, and activate (p8945).

or

- reinitialize the station using the "Edit Ethernet node" screen form (e.g. with STARTER commissioning tool).

A08800 PROFlenergy energy-saving mode active

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The PROFlenergy energy-saving mode is active
Alarm value (r2124, interpret decimal):
Mode ID of the active PROFlenergy energy-saving mode.
See also: r5600 (Pe energy-saving mode ID)

Remedy: The alarm is automatically withdrawn when the energy-saving mode is exited.

Note:

The energy-saving mode is exited after the following events:

- the PROFlenergy command end_pause is received from the higher-level control.
- the higher-level control has changed into the STOP operating state.
- the PROFINET connection to the higher-level control has been disconnected.

13.2 List of faults and alarms

A09000 Webservice security: password not set for administrator
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A password must be allocated to activate an "Administrator" as user in the web server with extended rights. There is no password for the "Administrator".
Remedy: Enter the password for user "Administrator"

F13000 License not adequate
Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: - for the drive unit, the options that require a license are being used but the licenses are not sufficient.
- an error occurred when checking the existing licenses.
Fault value (r0949, decimal interpretation):
0:
The existing license is not sufficient.
1:
An adequate license was not able to be determined as the memory card with the required licensing data was withdrawn in operation.
2:
An adequate license was not able to be determined as there is no licensing data available on the memory card.
3:
An adequate license was not able to be determined as there is a checksum error in the license key.
4:
An internal error occurred when checking the license.
Remedy: For fault value = 0:
Additional licenses are required and these must be activated (p9920, p9921).
For fault value = 1:
With the system powered down, re-insert the memory card that matches the system.
For fault value = 2:
Enter and activate the license key (p9920, p9921).
For fault value = 3:
Compare the license key (p9920) entered with the license key on the certificate of license.
Re-enter the license key and activate (p9920, p9921).
For fault value = 4:
- carry out a POWER ON.
- upgrade firmware to later version.
- contact Technical Support.

A13001 Error in license checksum
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: When checking the checksum of the license key, an error was detected.
Remedy: Compare the license key (p9920) entered with the license key on the certificate of license.
Re-enter the license key and activate (p9920, p9921).

F13009 Licensing Technology Extension not licensed

Message value: %1
Drive object: All objects
Reaction: OFF1
Acknowledge: IMMEDIATELY
Cause: At least one Technology Extension that requires a license does not have a license.
 Note:
 Refer to r4955 and p4955 for information about the installed Technology Extensions.
Remedy: - enter and activate the license key for Technology Extensions that require a license (p9920, p9921).
 - if necessary, deactivate Technology Extensions that are not licensed (p4956).

F13010 Licensing function module not licensed

Message value: %1
Drive object: All objects
Reaction: OFF1
Acknowledge: IMMEDIATELY
Cause: At least one function module requiring a license is not licensed.
 Fault value (r0949, interpret hexadecimal):
 Bit x = 1: The corresponding function module does not have a license.
 Note:
 Assigning bit number to function module, see p0108 or r0108.
Remedy: - enter and activate the license key for function modules that require a license license (p9920, p9921).
 - if necessary, deactivate unlicensed function modules (p0108, r0108).

A13021 License for 600 Hz is not sufficient

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: You have parameterized speeds that result in output frequencies >550Hz. For SINAMICS drives, output frequencies >550Hz are only possible after enabling the corresponding high output frequency license. Without license, the SINAMICS output frequencies are limited to 550 Hz (independent of any other parameterization).
Remedy: - enter and activate the license key for 600Hz.
 - if required deactivate use of 600 Hz

F13100 Know-how protection: Copy protection error

Message value: %1
Drive object: All objects
Reaction: OFF1
Acknowledge: IMMEDIATELY
Cause: The know-how protection with copy protection for the memory card is active.
 An error has occurred when checking the memory card.
 Fault value (r0949, interpret decimal):
 0: A memory card is not inserted.
 2: An invalid memory card is inserted.
 3: The memory card is being used in another Control Unit.
 12: An invalid memory card is inserted (OEM input incorrect, p7769).
 13: The memory card is being used in another Control Unit (OEM input incorrect, p7759).

13.2 List of faults and alarms

Remedy: For fault value = 0:
- insert the correct memory card and carry out POWER ON.
For fault value = 2, 3, 12, 13:
- contact the responsible OEM.
- Deactivate copy protection (p7765) and acknowledge the fault (p3981).
- Deactivate know-how protection (p7766 ... p7768) and acknowledge the fault (p3981).
Note:
In general, the copy protection can only be changed when know-how protection is deactivated.
KHP: Know-How Protection

F13101 Know-how protection: Copy protection cannot be activated

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: An error occurred when attempting to activate the copy protection for the memory card.
Fault value (r0949, interpret decimal):
0: A memory card is not inserted.
Note:
KHP: Know-How Protection
Remedy: - insert the memory card and carry out POWER ON.
- Try to activate copy protection again (p7765).

F13102 Know-how protection: Consistency error of the protected data

Message value: %1
Drive object: All objects
Reaction: OFF1
Acknowledge: IMMEDIATELY
Cause: An error was identified when checking the consistency of the protected files. As a consequence, the project on the memory card cannot be run.
Fault value (r0949, interpret hexadecimal):
yyyyxxx hex: yyyy = object number, xxx = fault cause
xxx = 1:
A file has a checksum error.
xxx = 2:
The files are not consistent with one another.
xxx = 3:
The project files, which were loaded into the file system via load (download from the memory card), are inconsistent.
Note:
KHP: Know-How Protection
Remedy: - Replace the project on the memory card or replace project files for download from the memory card.
- Restore the factory setting and download again.

F30001 Power unit: Overcurrent

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

- Cause:**
- The power unit has detected an overcurrent condition.
 - closed-loop control is incorrectly parameterized.
 - motor has a short-circuit or fault to ground (frame).
 - U/f operation: Up ramp set too low.
 - U/f operation: Rated motor current is significantly greater than that of the Motor Module.
 - infeed: High discharge and post-charging currents for voltage dip.
 - infeed: High post-charging currents for overload when motoring and DC link voltage dip.
 - infeed: Short-circuit currents at switch-on due to the missing line reactor.
 - power cables are not correctly connected.
 - the power cables exceed the maximum permissible length.
 - power unit defective.
 - line phase interrupted.
- Additional causes for a parallel switching device (r0108.15 = 1):
- a power unit has tripped (switched off) due to a ground fault.
 - the closed-loop circulating current control is either too slow or has been set too fast.
- Fault value (r0949, interpret bitwise binary):
- Bit 0: Phase U.
 - Bit 1: Phase V.
 - Bit 2: Phase W.
 - Bit 3: Overcurrent in the DC link.
- Note:
- Fault value = 0 means that the phase with overcurrent is not recognized (e.g. for blocksize device).
- Remedy:**
- check the motor data - if required, carry out commissioning.
 - check the motor circuit configuration (star/delta).
 - U/f operation: Increase up ramp.
 - U/f operation: Check the assignment of the rated currents of the motor and Motor Module.
 - infeed: Check the line supply quality.
 - infeed: Reduce the motor load.
 - infeed: Check the correct connection of the line filter and the line commutating reactor.
 - check the power cable connections.
 - check the power cables for short-circuit or ground fault.
 - check the length of the power cables.
 - replace power unit.
 - check the line supply phases.
- For a parallel switching device (r0108.15 = 1) the following additionally applies:
- check the ground fault monitoring thresholds (p0287).
 - check the setting of the closed-loop circulating current control (p7036, p7037).

F30002 Power unit: DC link voltage overvoltage

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

- Cause:**
- The power unit has detected overvoltage in the DC link.
 - motor regenerates too much energy.
 - device connection voltage too high.
 - when operating with a Voltage Sensing Module (VSM), the phase assignment L1, L2, L3 at the VSM differs from the phase assignment at the power unit.
 - line phase interrupted.
- Fault value (r0949, interpret decimal):
- DC link voltage at the time of trip [0.1 V].

13.2 List of faults and alarms

- Remedy:**
- increase the ramp-down time
 - activate the DC link voltage controller (p1240)
 - use a brake resistor or Active Line Module
 - increase the current limit of the infeed or use a larger module (for the Active Line Module)
 - check the device supply voltage
 - check and correct the phase assignment at the VSM and at the power unit
 - check the line supply phases.
- See also: p0210
-

F30003 Power unit: DC link voltage undervoltage

- Message value:** -
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY
- Cause:** The power unit has detected an undervoltage condition in the DC link.
- line supply failure
 - line supply voltage below the permissible value.
 - line supply infeed failed or interrupted.
 - line phase interrupted.

Note:

The monitoring threshold for undervoltage in the DC link is indicated in r0296.

- Remedy:**
- check the line supply voltage
 - check the line supply infeed and observe the fault messages relating to it (if there are any)
 - check the line supply phases.
 - check the line supply voltage setting (p0210).
 - booksized units: check the setting of p0278.

Note:

The ready signal for the infeed (r0863) must be interconnected to the associated drive inputs (p0864).

See also: p0210

F30004 Power unit: Overtemperature heat sink AC inverter

- Message value:** %1
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY
- Cause:** The temperature of the power unit heat sink has exceeded the permissible limit value.
- insufficient cooling, fan failure.
 - overload.
 - ambient temperature too high.
 - pulse frequency too high.

Fault value (r0949, interpret decimal):

Temperature [0.01 °C].

- Remedy:**
- check whether the fan is running.
 - check the fan elements.
 - check whether the ambient temperature is in the permissible range.
 - check the motor load.
 - reduce the pulse frequency if this is higher than the rated pulse frequency.

Notice:

This fault can only be acknowledged after the alarm threshold for alarm A05000 has been undershot.

F30005 Power unit: Overload I2t

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The power unit was overloaded (r0036 = 100 %).
 - the permissible rated power unit current was exceeded for an inadmissibly long time.
 - the permissible load duty cycle was not maintained.
 Fault value (r0949, interpret decimal):
 I2t [100 % = 16384].
Remedy:
 - reduce the continuous load.
 - adapt the load duty cycle.
 - check the motor and power unit rated currents.
 See also: p0307, r0307

F30006 Power unit: Thyristor Control Board

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The Thyristor Control Board (TCB) of the Basic Line Module signals a fault.
 - there is no line supply voltage.
 - the line contactor is not closed.
 - the line supply voltage is too low.
 - line supply frequency outside the permissible range (45 ... 66 Hz).
 - there is a DC link short-circuit.
 - there is a DC link short-circuit (during the precharging phase).
 - the motor either has a short-circuit or insulation fault (from an inverter connected to the DC link).
 - voltage supply for the Thyristor Control Board outside the nominal range (5 ... 18 V) and line voltage >30 V.
 - there is an internal fault in the Thyristor Control Board.
Remedy: The faults must be saved in the Thyristor Control Board and must be acknowledged. To do this, the supply voltage of the Thyristor Control Board must be switched out for at least 10 s!
 - check the line supply voltage
 - check or energize the line contactor.
 - check the monitoring time and, if required, increase (p0857).
 - if required, observe additional power unit messages/signals.
 - check the DC link regarding short-circuit or ground fault.
 - check the motor regarding short-circuit or ground fault.
 - evaluate diagnostic LEDs for the Thyristor Control Board.

F30008 Power unit: Sign-of-life error cyclic data

Message value: -
Drive object: All objects
Reaction: Servo: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The Control Unit has not punctually updated the cyclic setpoint telegram to the power unit. The number of consecutive tolerated sign of life errors has exceeded the fault threshold (p7789) set in the power unit.
Remedy:
 - for projects with the VECTOR drive object, check whether p0117 = 6 has been set on the Control Unit.
 - increase the fault threshold (p7789).
 - check the Motor Module, and if required replace.

13.2 List of faults and alarms

A30010 (F) Power unit: Sign-of-life error cyclic data

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A DRIVE-CLiQ communication error has occurred between the Control Unit and the power unit involved.
The cyclic setpoint telegrams of the Control Unit were not received on time by the power unit for at least one clock cycle.
Remedy: Check the Motor Module and if required, replace.
Reaction upon F: Servo: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)

F30011 Power unit: Line phase failure in main circuit

Message value: %1
Drive object: All objects
Reaction: OFF2 (OFF1)
Acknowledge: IMMEDIATELY
Cause: At the power unit, the DC link voltage ripple has exceeded the permissible limit value.
Possible causes:
- a line phase has failed.
- the 3 line phases are inadmissibly asymmetrical.
- the capacitance of the DC link capacitor forms a resonance frequency with the line inductance and the reactor integrated in the power unit.
- the fuse of a phase of a main circuit has ruptured.
- a motor phase has failed.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
Remedy:
- check the main circuit fuses.
- check whether a single-phase load is distorting the line voltages.
- Detune the resonant frequency with the line inductance by using an upstream line reactor.
- Dampen the resonant frequency with the line inductance by switching over the DC link voltage compensation in the software (see p1810) – or increase the smoothing (see p1806). However, this can have a negative impact on the torque ripple at the motor output.
- check the motor feeder cables.

F30012 Power unit: Temperature sensor wire breakage

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY

Cause: The connection to a temperature sensor in the power unit is interrupted.
 Fault value (r0949, interpret hexadecimal):
 Bit 0: Module slot (electronics slot)
 Bit 1: Air intake
 Bit 2: Inverter 1
 Bit 3: Inverter 2
 Bit 4: Inverter 3
 Bit 5: Inverter 4
 Bit 6: Inverter 5
 Bit 7: Inverter 6
 Bit 8: Rectifier 1
 Bit 9: Rectifier 2
 Bit14: capacitor air discharge
 Bit15: liquid intake

Remedy: Contact Technical Support.

F30013 Power unit: Temperature sensor short circuit

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: A temperature sensor in the power unit is short-circuited.
 Fault value (r0949, interpret hexadecimal):
 Bit 0: Module slot (electronics slot)
 Bit 1: Air intake
 Bit 2: Inverter 1
 Bit 3: Inverter 2
 Bit 4: Inverter 3
 Bit 5: Inverter 4
 Bit 6: Inverter 5
 Bit 7: Inverter 6
 Bit 8: Rectifier 1
 Bit 9: Rectifier 2
 Bit14: capacitor air discharge
 Bit15: liquid intake

Remedy: Contact Technical Support.

F30015 (N, A) Power unit: Phase failure motor cable

Message value: -
Drive object: All objects
Reaction: OFF2 (NONE, OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: A phase failure in the motor feeder cable was detected.
 The signal can also be output in the following case:
 - the motor is correctly connected, however the closed-speed control is instable and therefore an oscillating torque is generated.
 Note:
 Chassis power units do not feature phase failure monitoring.

Remedy: - check the motor feeder cables.
 - check the speed controller settings.

Reaction upon N: NONE

13.2 List of faults and alarms

Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A30016 (N) Power unit: Load supply switched out

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The DC link voltage is too low.
Alarm value (r2124, interpret decimal):
DC link voltage at the time of trip [0.1 V].
Remedy: - switch on load supply.
- check the line supply if necessary.
Reaction upon N: NONE
Acknowl. upon N: NONE

F30017 Power unit: Hardware current limit has responded too often

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The hardware current limitation in the relevant phase (see A30031, A30032, A30033) has responded too often. The number of times the limit has been exceeded depends on the design and type of power unit.
For infeed units, the following applies:
- closed-loop control is incorrectly parameterized.
- load on the infeed is too high.
- Voltage Sensing Module incorrectly connected.
- line reactor missing or the incorrect type.
- power unit defective.
The following applies to Motor Modules:
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.
Fault value (r0949, interpret binary):
Bit 3: phase U
Bit 4: phase V
Bit 5: phase W
Additional bits:
Only for internal Siemens troubleshooting.
Note:
Fault value = 0 means that the phase with current limiting is not recognized (e.g. for blocksize device).

- Remedy:** For infeed units, the following applies:
- check the controller settings and reset and identify the controller if necessary (p0340 = 2, p3410 = 5)
 - reduce the load and increase the DC link capacitance or use a higher-rating infeed if necessary
 - check the connection of the optional Voltage Sensing Module
 - check the connection and technical data of the line reactor
 - check the power cables for short-circuit or ground fault.
 - replace power unit.
- The following applies to Motor Modules:
- check the motor data and if required, recalculate the controller parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
 - check the motor circuit configuration (star-delta).
 - check the motor load.
 - check the power cable connections.
 - check the power cables for short-circuit or ground fault.
 - check the length of the power cables.
 - replace power unit.

F30020 Power unit: Configuration not supported

- Message value:** fault cause: %1, additional information: %2
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY
- Cause:** A configuration is requested that is not supported by the power unit.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxx hex: xxxx = fault cause, yyyy = additional information (internal Siemens)
 xxxx = 0: Autonomous operation is requested but is not supported.
 xxxx = 1: The requested DRIVE-CLiQ timing is not permissible.
 xxxx = 2: A PM260 has been detected with PS-ASIC version 2. This combination is not supported.
 xxxx = 3: Initialization was not able to be successfully completed. It is possible that the Control Unit was withdrawn from the Power Module before or during power up.
 xxxx = 4: The combination of power unit and Control Unit or Control Unit Adapter is not supported.
 xxxx = 5: The higher current controller dynamic performance is not supported.
- Remedy:** For fault cause = 0:
 If required, deactivate an active internal voltage protection (p1231).
 For fault cause = 1:
 Update the Control Unit firmware or change the DRIVE-CLiQ topology.
 For fault cause = 2:
 Replace the power unit with a PM260 with PS-ASIC version 3 (or higher).
 For fault cause = 3, 4:
 Insert a Control Unit or Control Unit Adapter (CUAxx) on an appropriate Power Module and perform a POWER ON for the Control Unit or the Control Units Adapter.
 For fault cause = 5:
 - use a booksize format power unit.
 - for a Double Motor Module operate the two drive controls with the same current controller sampling time (p0115[0]). Otherwise, the higher current controller dynamics can only be activated on the drive with the longer sampling time.
 - if required, de-select the higher current controller dynamic performance (p1810.11 = 0). After deselecting the computing dead time, recalculate the controller gains (p0340 = 4). If required, optimize the speed controller.

F30021 Power unit: Ground fault

- Message value:** %1
- Drive object:** All objects
- Reaction:** OFF2

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY

Cause: The power has detected a ground fault.
Possible causes:

- ground fault in the power cables.
- ground fault at the motor.
- CT defective.
- when the brake closes, this causes the hardware DC current monitoring to respond.
- short-circuit at the braking resistor.
- the closed-loop circulating current control for devices connected in parallel ($r0108.15 = 1$) is either too slow or has been set too fast.

Note:
For power units, a ground fault is also emulated in $r3113.5$.
Fault value ($r0949$, interpret decimal):

0:

- the hardware DC current monitoring has responded.
- short-circuit at the braking resistor.

> 0:
Absolute value, total current amplitude [$20479 = r0209 * 1.4142$].

Remedy:

- check the power cable connections.
- check the motor.
- check the CT.
- check the cables and contacts of the brake connection (a wire is possibly broken).
- check the braking resistor.

For parallel switching devices ($r0108.15 = 1$) the following additionally applies:

- check the ground fault monitoring thresholds ($p0287$).
- check the setting of the closed-loop circulating current control ($p7036$, $p7037$).

F30022 Power unit: Monitoring U_{ce}

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: In the power unit, the monitoring of the collector-emitter voltage (U_{ce}) of the semiconductor has responded.
Possible causes:

- fiber-optic cable interrupted.
- power supply of the IGBT gating module missing.
- short-circuit at the power unit output.
- defective semiconductor in the power unit.

Fault value ($r0949$, interpret binary):

Bit 0: Short-circuit in phase U
Bit 1: Short circuit in phase V
Bit 2: Short-circuit in phase W
Bit 3: Light transmitter enable defective
Bit 4: U_{ce} group fault signal interrupted
See also: $r0949$ (Fault value)

Remedy:

- check the fiber-optic cable and if required, replace.
- check the power supply of the IGBT gating module (24 V).
- check the power cable connections.
- select the defective semiconductor and replace.

F30024 Power unit: Overtemperature thermal model

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The temperature difference between the heat sink and chip has exceeded the permissible limit value.

- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.

See also: r0037

Remedy:

- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

F30025 Power unit: Chip overtemperature

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The chip temperature of the semiconductor has exceeded the permissible limit value.

- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.

Fault value (r0949, interpret decimal):
Temperature difference between the heat sink and chip [0.01 °C].

Remedy:

- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

Notice:
This fault can only be acknowledged after the alarm threshold for alarm A05001 has been undershot.
See also: r0037

F30027 Power unit: Precharging DC link time monitoring

Message value: Enable signals: %1, Status: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: The power unit DC link was not able to be precharged within the expected time.

- 1) There is no line supply voltage connected.
- 2) The line contactor/line side switch has not been closed.
- 3) The line supply voltage is too low.
- 4) Line supply voltage incorrectly set (p0210).
- 5) The precharging resistors are overheated as there were too many precharging operations per time unit.
- 6) The precharging resistors are overheated as the DC link capacitance is too high.
- 7) The precharging resistors are overheated because when there is no "ready for operation" (r0863.0) of the infeed unit, power is taken from the DC link.
- 8) The precharging resistors are overheated as the line contactor was closed during the DC link fast discharge through the Braking Module.
- 9) The DC link has either a ground fault or a short-circuit.
- 10) The precharging circuit is possibly defective (only for chassis units).
- 11) Infeed is defective and/or fuse has ruptured in the Motor Module (only Booksize units).

Fault value (r0949, interpret binary):
yyyyxxxx hex:
yyyy = power unit state

- 0: Fault status (wait for OFF and fault acknowledgment).
- 1: Restart inhibit (wait for OFF).
- 2: Overvoltage condition detected -> change into the fault state.
- 3: Undervoltage condition detected -> change into the fault state.
- 4: Wait for bridging contactor to open -> change into the fault state.
- 5: Wait for bridging contactor to open -> change into restart inhibit.
- 6: Wait for bypass contactor to open
- 7: Commissioning.
- 8: Ready for precharging.
- 9: Precharging started, DC link voltage lower than the minimum switch-on voltage
- 10: Precharging, DC link voltage end of precharging still not detected
- 11: Wait for the end of the de-bounce time of the main contactor after precharging has been completed.
- 12: Precharging completed, ready for pulse enable.
- 13: It was detected that the STO terminal was energized at the power unit

xxxx = Missing internal enable signals, power unit (inverted bit-coded, FFFF hex -> all internal enable signals available)

Bit 0: Power supply of the IGBT gating shut down.
Bit 1: Ground fault detected.
Bit 2: Peak current intervention.
Bit 3: I2t exceeded.
Bit 4: Thermal model overtemperature calculated.
Bit 5: (heat sink, gating module, power unit) overtemperature measured.
Bit 6: Reserved.
Bit 7: Overvoltage detected.
Bit 8: Power unit has completed precharging, ready for pulse enable.
Bit 9: STO terminal missing.
Bit 10: Overcurrent detected.
Bit 11: Armature short-circuit active.
Bit 12: DRIVE-CLiQ fault active.
Bit 13: Vce fault detected, transistor de-saturated due to overcurrent/short-circuit.
Bit 14: Undervoltage detected.

See also: p0210

Remedy: In general:

- check the line supply voltage at the input terminals.
- check the line supply voltage setting (p0210).

For booksize drive units, the following applies:

- wait (approx. 8 minutes) until the precharging resistors have cooled down. For this purpose, preferably disconnect the infeed unit from the line supply.

For 5):

- carefully observe the permissible precharging frequency (refer to the appropriate Equipment Manual).

For 6):

- check the total capacitance of the DC link and reduce in accordance with the maximum permissible DC link capacitance if necessary (refer to the appropriate Equipment Manual)

For 7):

- interconnect the ready-for-operation signal from the infeed unit (r0863.0) in the enable logic of the drives connected to this DC link

For 8):

- check the connections of the external line contactor. The line contactor must be open during DC link fast discharge.

For 9):

- check the DC link for ground faults or short circuits.

For 11):

- check the DC link voltage of the infeed (r0070) and Motor Modules (r0070).

If the DC link voltage generated by the infeed (or external) is not displayed for the Motor Modules (r0070), then a fuse has ruptured in the Motor Module.

See also: p0210

A30030 Power unit: Internal overtemperature alarm

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The temperature inside the drive converter has exceeded the permissible temperature limit.

- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.

Alarm value (r2124, interpret decimal):

Only for internal Siemens troubleshooting.

Remedy:

- possibly use an additional fan.
- check whether the ambient temperature is in the permissible range.

Notice:

This alarm is automatically withdrawn once the permissible temperature limit value has been fallen below minus 5 K.

A30031 Power unit: Hardware current limiting in phase U

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: Hardware current limit for phase U responded. The pulsing in this phase is inhibited for one pulse period.

- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

Remedy:

- check the motor data and if required, recalculate the control parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star/delta).
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

A30032 Power unit: Hardware current limiting in phase V

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Hardware current limit for phase V responded. The pulsing in this phase is inhibited for one pulse period.

- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

Remedy:

- Check the motor data and if required, recalculate the control parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star/delta).
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

A30033 Power unit: Hardware current limiting in phase W

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Hardware current limit for phase W responded. The pulsing in this phase is inhibited for one pulse period.

- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

- Remedy:**
- check the motor data and if required, recalculate the control parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
 - check the motor circuit configuration (star/delta).
 - check the motor load.
 - check the power cable connections.
 - check the power cables for short-circuit or ground fault.
 - check the length of the power cables.

A30034 Power unit: Internal overtemperature

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The alarm threshold for internal overtemperature has been reached.
 If the temperature inside the unit continues to increase, fault F30036 may be triggered.

- ambient temperature might be too high.
- insufficient cooling, fan failure.

Alarm value (r2124, interpret decimal):
 Only for internal Siemens troubleshooting.

- Remedy:**
- check the ambient temperature.
 - check the fan for the inside of the unit.

F30035 Power unit: Air intake overtemperature

Message value: %1

Drive object: All objects

Reaction: OFF1 (OFF2)

Acknowledge: IMMEDIATELY

Cause: The air intake in the power unit has exceeded the permissible temperature limit.
 For air-cooled power units, the temperature limit is at 55 °C.

- ambient temperature too high.
- insufficient cooling, fan failure.

Fault value (r0949, interpret decimal):
 Temperature [0.01 °C].

- Remedy:**
- check whether the fan is running.
 - check the fan elements.
 - check whether the ambient temperature is in the permissible range.
- Notice:
 This fault can only be acknowledged after the alarm threshold for alarm A05002 has been undershot.

F30036 Power unit: Internal overtemperature

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The temperature inside the drive converter has exceeded the permissible temperature limit.

- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.

Fault value (r0949, interpret decimal):
 Only for internal Siemens troubleshooting.

13.2 List of faults and alarms

Remedy:

- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.

Notice:
This fault can only be acknowledged once the permissible temperature limit minus 5 K has been fallen below.

F30037 Power unit: Rectifier overtemperature

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The temperature in the rectifier of the power unit has exceeded the permissible temperature limit.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- line supply phase failure.
Fault value (r0949, interpret decimal):
Temperature [0.01 °C].

Remedy:

- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- check the line supply phases.

Notice:
This fault can only be acknowledged after the alarm threshold for alarm A05004 has been undershot.

F30040 Power unit: Undervolt 24/48 V

Message value: Channel: %1, voltage: %2 [0.1 V]
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The undervoltage threshold of the 24 V power supply for the power unit was fallen below for longer than 3 ms.
Note:
- for booksize power units, the undervoltage threshold is 15 V.
- for CU310-2, CUA31 and CUA32 the undervoltage threshold is 16 V.
- for all other power units (e.g. S120M), the undervoltage threshold depends on the power unit, and is not displayed.
Fault value (r0949, interpret hexadecimal):
yyxxxx hex: yy = channel, xxxx = voltage [0.1 V]
yy = 0: 24 V power supply
yy = 1: 48 V power supply

Remedy:

- check the power supply of the power unit.
- carry out a POWER ON (switch-off/switch-on) for the component.

A30041 (F) Power unit: Undervolt 24/48 V alarm

Message value: Channel: %1, voltage: %2 [0.1 V]
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: For the power unit power supply, the lower threshold has been violated.

Alarm value (r2124, interpret hexadecimal):

yyxxxx hex: yy = channel, xxxx = voltage [0.1 V]

yy = 0: 24 V power supply

yy = 1: 48 V power supply

Remedy: - check the power supply of the power unit.

- carry out a POWER ON (switch-off/switch-on) for the component.

Reaction upon F: NONE (OFF1, OFF2)

Acknowl. upon F: IMMEDIATELY (POWER ON)

A30042 Power unit: Fan has reached the maximum operating hours

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The maximum operating time of at least one fan will soon be reached, or has already been exceeded.

Alarm value (r2124, interpret binary):

Bit 0 = 1:

The operating hours counter of the heat sink fan will reach the maximum operating time in 500 hours.

Bit 1 = 1:

The wear counter of the heat sink fan has reached 99 %. The remaining service life is 1%.

Bit 2 = 1:

The operating hours counter of the heat sink fan has exceeded the maximum operating time - and/or the wear counter has exceeded 100%.

Bit 8 = 1:

The operating hours counter of the fan inside the device will reach the maximum operating time in 500 hours.

Bit 10 = 1:

The operating hours counter of the fan inside the device has exceeded the maximum operating time.

Remedy: For the fan involved, carry out the following:

- replace the fan.

- reset the operating hours counter (p0251, p0254).

F30043 Power unit: Overvolt 24/48 V

Message value: Channel: %1, voltage: %2 [0.1 V]

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: For the power unit power supply, the upper threshold has been violated.

Fault value (r0949, interpret hexadecimal):

yyxxxx hex: yy = channel, xxxx = voltage [0.1 V]

yy = 0: 24 V power supply

yy = 1: 48 V power supply

Remedy: Check the power supply of the power unit.

A30044 (F) Power unit: Overvolt 24/48 V alarm

Message value: Channel: %1, voltage: %2 [0.1 V]

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: For the power unit power supply, the upper threshold has been violated.
Alarm value (r2124, interpret hexadecimal):
yyxxxx hex: yy = channel, xxxx = voltage [0.1 V]
yy = 0: 24 V power supply
yy = 1: 48 V power supply

Remedy: Check the power supply of the power unit.

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

F30045 Power unit: Supply undervoltage

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: Power supply fault in the power unit.
- the voltage monitor signals an undervoltage fault on the module.
The following applies for CU31x:
- the voltage monitoring on the DAC board signals an undervoltage fault on the module.
For S120M, the following applies:
- this message is displayed for undervoltage or overvoltage.

Remedy:
- check the power supply of the power unit.
- carry out a POWER ON (switch-off/switch-on) for the component.
- replace the module if necessary.

A30046 (F) Power unit: Undervoltage alarm

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Before the last restart, a problem occurred at the power unit power supply.
The voltage monitor in the internal FPGA of the PSA signals an undervoltage fault on the module.
Alarm value (r2124, interpret decimal):
Register value of the voltage fault register.

Remedy:
- check the 24 V DC voltage supply to power unit.
- carry out a POWER ON (switch-off/switch-on) for the component.
- replace the module if necessary.

Reaction upon F: Servo: NONE (OFF1, OFF2)

Acknowl. upon F: IMMEDIATELY (POWER ON)

A30048 Power unit: fan defective

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The feedback signal from a fan indicates a fault.

- fan defective.
- fan blocked.
- feedback signal inaccurate.

Alarm value (r2124, interpret binary):

Bit 0 = 1: heat sink fan

Bit 1 = 1: fan inside the device

Note:

- for firmware version < 5.1 of the power unit, the alarm value is always 0. The alarm then refers to the heat sink fan.
- for r0193.13 = 1, fault F30058 is output instead of this alarm for heat sink fans, if the pulses are inhibited or the fault occurs within 10 s after the fan runs up when the pulses are enabled.
- for r0193.13 = 1, fault F30059 is output instead of this alarm for fans inside the unit, if the air intake temperature (r0037[3]) has exceeded a specific threshold.

Remedy:

- check the fan involved.
- if required, replace the fan.

A30049 Power unit: Internal fan faulty

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The internal fan has failed.

Remedy: Check the internal fan and replace if necessary.

F30050 Power unit: 24 V supply overvoltage

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: The voltage monitor signals an overvoltage fault on the module.

Remedy:

- check the 24 V power supply.
- replace the module if necessary.

F30052 EEPROM data error

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: EEPROM data error of the power unit module.

Fault value (r0949, interpret decimal):

0, 2, 3, 4:

The EEPROM data read in from the power unit module are incorrect.

1:

EEPROM data is not compatible to the firmware of the power unit application.

Additional values:

Only for internal Siemens troubleshooting.

13.2 List of faults and alarms

Remedy: For fault value = 0, 2, 3, 4:
Replace the power unit module or update the EEPROM data.
For fault value = 1:
The following applies for CU31x and CUA31:
Update the firmware \SIEMENS\SINAMICS\CODE\SAC\cu31xi.ufw (cua31.ufw)

F30053 FPGA data faulty

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: POWER ON
Cause: The FPGA data of the power unit are faulty. This can be caused, for example, if a firmware update is interrupted.
Remedy: Replace the power unit or update of the FPGA data by updating the firmware.
Note:
If this fault occurs after a firmware update, then update the firmware again.

A30054 (F, N) Power unit: Undervoltage when opening the brake

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: When the brake is being opened, it is detected that the power supply voltage is less than 21.4 V
Alarm value (r2124, interpret decimal):
Supply voltage fault [0.1 V].
Example:
Alarm value = 195 --> voltage = 19.5 V
Remedy: Check the 24 V voltage for stability and value.
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F30055 Power unit: Braking chopper overcurrent

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: An overcurrent condition has occurred in the braking chopper.
Remedy: - check whether the braking resistor has a short circuit.
- for an external braking resistor, check whether the resistor may have been dimensioned too small.
Note:
The braking chopper is only enabled again at pulse enable after the fault has been acknowledged.

A30057 Power unit: Line asymmetry

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: Frequencies have been detected on the DC link voltage that would suggest line asymmetry or failure of a line phase.
 It is also possible that a motor phase has failed.
 Fault F30011 is output if the alarm is present and at the latest after 5 minutes.
 The precise duration depends on the power unit type and the particular frequencies. For booksize and chassis power units, the duration also depends on how long the alarm has been active.
 Alarm value (r2124, interpret decimal):
 Only for internal Siemens troubleshooting.

Remedy: - check the line phase connection.
 - check the motor feeder cable connections.
 If there is no phase failure of the line or motor, then line asymmetry is involved.
 - reduce the power in order to avoid fault F30011.

F30058 (N, A) Power unit: heat sink fan defective

Message value: -

Drive object: All objects

Reaction: OFF2 (NONE, OFF1)

Acknowledge: IMMEDIATELY

Cause: The feedback signal from the heat sink fan signals a fault.
 - fan defective.
 - fan blocked.
 - feedback signal inaccurate.

Remedy: - check the heat sink fan and replace if necessary.
 - if you are using an external fan with feedback signal, check its wiring (X12.2 or X13.2).
 Note:
 If you are using an external fan without feedback signal, check that the feedback terminal wiring at the power unit is connected to ground and make this connection if necessary (X12.1/2 or X13.1/2).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F30059 Power unit: Internal fan faulty

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The internal power unit fan has failed and is possibly defective.

Remedy: Check the internal fan and replace if necessary.

F30060 (A) Precharge contactor state monitoring

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: OFF2 (NONE, OFF1)

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: A feedback signal for the precharging contactor (ALM, SLM, BLM diode) or the line contactor (BLM thyristor) interconnected and the monitoring activated.
After switching-in/switching-out the contactor, a correct feedback signal was not received within the monitoring time set in p0255[0, 2].
Fault value (r0949, interpret binary):
Bit 0: The time set in p0255[0, 2] was exceeded when switching-in/switching-out the contactor.
Bit 1: The precharging contactor was opened while precharging or in the infeed mode (BLM thyristor).
Bit 2: The precharging contactor was switched-in in the OFF state or during infeed operation.

Remedy:

- check the monitoring time setting (p0255[0, 2]).
- check the contactor wiring and activation.
- replace the contactor.

Reaction upon A: NONE
Acknowl. upon A: NONE

F30061 (A) Bridging contactor monitoring

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: OFF2 (NONE, OFF1)
Acknowledge: IMMEDIATELY (POWER ON)

Cause: A feedback signal for the bypass contactor is interconnected and the monitoring activated.
After switching-in/switching-out the contactor, a correct feedback signal was not received within the monitoring time set in p0255[1, 3].
Fault value (r0949, interpret binary):
Bit 0: The time set in p0255[1, 3] was exceeded when switching-in/switching-out the contactor.
Bit 1: The bypass contactor was opened in operation.
Bit 2: The bypass contactor was switched-in in the OFF state or during precharging.

Remedy:

- check the monitoring time setting (p0255[1, 3]).
- check the contactor wiring and activation.
- replace the contactor.

Reaction upon A: NONE
Acknowl. upon A: NONE

A30066 (N) Power unit: overtemperature, alarm capacitor air discharge

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The air discharged from the DC link capacitor has exceeded the alarm threshold.
- ambient temperature too high.
- insufficient cooling, fan failure.
Alarm value (r2124, interpret decimal):
Temperature when reaching the alarm threshold [0.01 °C].
Note:
If operation is unchanged, then the permissible limit value can be exceeded. In this case, fault F30067 is output and the pulses inhibited.

Remedy:

- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.

Note:
This alarm is only withdrawn after the alarm threshold has been fallen below - and the corresponding hysteresis.

Reaction upon N: NONE

Acknowl. upon N: NONE

F30067 Power unit: overtemperature, fault capacitor air discharge

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The air discharged from the DC link capacitor has exceeded the permissible limit.

- ambient temperature too high.

- insufficient cooling, fan failure.

Fault value (r0949, interpret decimal):

Temperature when reaching the limit value [0.01 °C].

Remedy: - check whether the fan is running.

- check the fan elements.

- check whether the ambient temperature is in the permissible range.

Note:

This fault can only be acknowledged after the limit value has been fallen below, and the corresponding hysteresis (5 K).

F30070 Cycle requested by the power unit module not supported

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A cycle is requested that is not supported by the power unit.

Fault value (r0949, interpret hexadecimal):

0: The current control cycle is not supported.

1: The DRIVE-CLiQ cycle is not supported.

2: Internal timing problem (clearance between RX and TX instants too low).

3: Internal timing problem (TX instant too early).

Remedy: The power unit only supports the following cycles:

62.5 µs, 125 µs, 250 µs and 500 µs

For fault value = 0:

Set a permitted current control cycle.

For fault value = 1:

Set a permitted DRIVE-CLiQ cycle.

For fault value = 2, 3:

Contact the manufacturer (you may have an incompatible firmware version).

F30071 No new actual values received from the power unit

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The number of actual value telegrams from the power unit module that have failed has exceeded the permissible number.

Remedy: Check the interface (adjustment and locking) to the power unit module.

F30072 Setpoints can no longer be transferred to the power unit

Message value: -

Drive object: All objects

Reaction: OFF2

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY
Cause: The following applies for CU31x and CUA31:
More than one setpoint telegram was not able to be transferred to the power unit module.
Remedy: The following applies for CU31x and CUA31:
Check the interface (adjustment and locking) to the power unit module.

A30073 (N) Actual value/setpoint preprocessing no longer synchronous

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Communication with the power unit module is no longer in synchronism with the current control cycle.
Remedy: Wait until synchronization is re-established.
Reaction upon N: NONE
Acknowl. upon N: NONE

F30074 (A) Communication error between the Control Unit and Power Module

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: Communications between the Control Unit (CU) and Power Module (PM) via the interface no longer possible. The CU may have been withdrawn or is incorrectly inserted.
Fault value (r0949, interpret hexadecimal):
0 hex:
- a Control Unit with external 24 V supply was withdrawn from the Power Module during operation.
- with the Power Module switched off, the external 24 V supply for the Control Unit was interrupted for some time.
1 hex:
The Control Unit was withdrawn from the Power Module during operation, although the encoderless safe motion monitoring functions are enabled. This is not supported. After re-inserting the Control Unit in operation, communications to the Power Module no longer possible.
20A hex:
The Control Unit was inserted on a Power Module, which has another code number.
20B hex:
The Control Unit was inserted on a Power Module, which although it has the same code number, has a different serial number.
601 hex:
The Control Unit was inserted on a Power Module, whose power/performance class (chassis unit) is not supported.
Remedy: Reinsert the Control Unit (CU) or the Control Unit Adapter (CUAxx) onto the original Power Module and continue operation. If required, carry out a POWER ON for the CU and/or the CUA.
Reaction upon A: NONE
Acknowl. upon A: NONE

F30080 Power unit: Current increasing too quickly

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

- Cause:** The power unit has detected an excessive rate of rise in the overvoltage range.
- closed-loop control is incorrectly parameterized.
 - motor has a short-circuit or fault to ground (frame).
 - U/f operation: Up ramp set too low.
 - U/f operation: rated current of motor much greater than that of power unit.
 - infeed: High discharge and post-charging currents for voltage dip.
 - infeed: High post-charging currents for overload when motoring and DC link voltage dip.
 - infeed: Short-circuit currents at switch-on due to the missing line reactor.
 - power cables are not correctly connected.
 - power cables exceed the maximum permissible length.
 - power unit defective.
- Additional causes for a parallel switching device (r0108.15 = 1):
- a power unit has tripped (switched off) due to a ground fault.
 - the closed-loop circulating current control is either too slow or has been set too fast.
- Fault value (r0949, interpret bitwise binary):
- Bit 0: Phase U.
 Bit 1: Phase V.
 Bit 2: Phase W.
- Remedy:**
- check the motor data - if required, carry out commissioning.
 - check the motor circuit configuration (star-delta)
 - U/f operation: Increase up ramp.
 - U/f operation: Check assignment of rated currents of motor and power unit.
 - infeed: Check the line supply quality.
 - infeed: Reduce the motor load.
 - infeed: Correct connection of the line reactor.
 - check the power cable connections.
 - check the power cables for short-circuit or ground fault.
 - check the length of the power cables.
 - replace power unit.
- For a parallel switching device (r0108.15 = 1) the following additionally applies:
- check the ground fault monitoring thresholds (p0287).
 - check the setting of the closed-loop circulating current control (p7036, p7037).

F30081 Power unit: Switching operations too frequent

- Message value:** Fault cause: %1 bin
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY

13.2 List of faults and alarms

Cause: The power unit has executed too many switching operations for current limitation.

- closed-loop control is incorrectly parameterized.
- motor has a short-circuit or fault to ground (frame).
- U/f operation: Up ramp set too low.
- U/f operation: rated current of motor much greater than that of power unit.
- infeed: High discharge and post-charging currents for voltage dip.
- infeed: High post-charging currents for overload when motoring and DC link voltage dip.
- infeed: Short-circuit currents at switch-on due to the missing line reactor.
- power cables are not correctly connected.
- power cables exceed the maximum permissible length.
- power unit defective.

Additional causes for a parallel switching device (r0108.15 = 1):

- a power unit has tripped (switched off) due to a ground fault.
- the closed-loop circulating current control is either too slow or has been set too fast.

Fault value (r0949, interpret bitwise binary):

Bit 0: Phase U.
Bit 1: Phase V.
Bit 2: Phase W.

Remedy:

- check the motor data - if required, carry out commissioning.
- check the motor circuit configuration (star-delta)
- U/f operation: Increase up ramp.
- U/f operation: Check assignment of rated currents of motor and power unit.
- infeed: Check the line supply quality.
- infeed: Reduce the motor load.
- infeed: Correct connection of the line reactor.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.
- replace power unit.

For a parallel switching device (r0108.15 = 1) the following additionally applies:

- check the ground fault monitoring thresholds (p0287).
- check the setting of the closed-loop circulating current control (p7036, p7037).

F30105 PU: Actual value sensing fault

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: At least one incorrect actual value channel was detected on the Power Stack Adapter (PSA).
The incorrect actual value channels are displayed in the following diagnostic parameters.

Remedy: Evaluate the diagnostic parameters.
If the actual value channel is incorrect, check the components and if required, replace.

F30314 Power unit: 24 V power supply overloaded by PM

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The 24 V power supply through the Power Module (PM) is overloaded.
An external 24 V power supply via X124 on the Control Unit is not connected.

Remedy: Connect an external 24 V power supply via X124 at the Control Unit.

A30315 (F) Power unit: 24 V power supply overloaded by PM

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The 24 V power supply through the Power Module (PM) is overloaded.
 An external 24 V power supply via X124 on the Control Unit is not connected.
Remedy: Connect an external 24 V power supply via X124 at the Control Unit.
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)

A30502 Power unit: DC link overvoltage

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The power unit has detected overvoltage in the DC link on a pulse inhibit.
 - device connection voltage too high.
 - line reactor incorrectly dimensioned.
 Alarm value (r0949, interpret decimal):
 DC link voltage [1 bit = 100 mV].
 See also: r0070
Remedy: - check the device supply voltage (p0210).
 - check the dimensioning of the line reactor.
 See also: p0210

F30600 SI P2: STOP A initiated

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive-integrated "Safety Integrated" function in monitoring channel 2 has detected a fault and initiated a STOP A (STO via the safety switch-off signal path of monitoring channel 2).
 - forced checking procedure (test stop) of the safety switch-off signal path of monitoring channel 2 unsuccessful.
 - subsequent response to fault F30611 (defect in a monitoring channel).
 Fault value (r0949, decimal interpretation):
 0: Stop request from the Control Unit.
 1005: STO active although STO not selected and there is no internal STOP A present.
 1010: STO inactive although STO is selected or an internal STOP A is present.
 1011: internal error for STO deselected in monitoring channel 2.
 9999: Subsequent response to fault F30611.
Remedy: - select Safe Torque Off and de-select again.
 - carry out a POWER ON (switch-off/switch-on) for all components.
 - replace drive.
 For fault value = 9999:
 - carry out diagnostics for fault F30611.
 Note:
 CU: Control Unit
 SI: Safety Integrated
 STO: Safe Torque Off

F30611 (A) SI P2: Defect in a monitoring channel

Message value: %1

Drive object: All objects

Reaction: NONE (OFF1, OFF2, OFF3)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function on monitoring channel 2 has detected a fault in the crosswise data comparison between the two monitoring channels and has initiated a STOP F.
As a result of this fault, after the parameterized transition has expired (p9658), fault F30600 is output (SI second channel: STOP A initiated).

Fault value (r0949, interpret decimal):

0: Stop request from the other monitoring channel.

1 ... 999:

Number of the cross-compared data that resulted in this fault. This number is also displayed in r9895.

2: SI enable safety functions (p9601). Crosswise data comparison is only carried out for the supported bits.

3: SI SGE changeover discrepancy time (p9650).

4: SI transition time STOP F to STOP A (p9658).

5: SI enable Safe Brake Control (p9602, p9802).

6: SI Motion enable safety functions (p9501).

7: SI delay time of STO for Safe Stop 1 (p9652).

8: SI PROFIsafe address (p9610).

9: SI debounce time for STO/SBC/SS1 (p9651).

14: SI PROFIsafe telegram selection (p9611).

15: SI PROFIsafe bus failure response (p9612).

1000: Watchdog timer has expired.

Within the time of approx. 5 x p9650, alternatively, the following was defined:

- the signal at F-DI for STO continually changes with time intervals less than or equal to the discrepancy time (p9650).

- via PROFIsafe, STO (also as subsequent response) was continually selected and deselected with time intervals less than or equal to the discrepancy time (p9650).

1001, 1002: Initialization error, change timer / check timer.

1950: Module temperature outside the permissible temperature range.

1951: Module temperature not plausible.

2000: Status of the STO selection for both monitoring channels different.

2001: Feedback signal of STO shutdown for both monitoring channels different.

2002: Status of the delay timer SS1 on both monitoring channels are different (status of the timer in p9650).

2003: Status of the STO terminal for both monitoring channels different.

6000 ... 6999:

Error in the PROFIsafe control.

For these fault values, the fail-safe control signals (fail-safe values) are transferred to the safety functions. If "STOP B after failure of the PROFIsafe communication" (p9612) is parameterized, the transfer of the fail-safe value is delayed.

The significance of the individual message values is described in safety message C01611.

Remedy:

For fault value = 1 ... 5 and 7 ... 999:

- check the cross data comparison that resulted in a STOP F.
- upgrade the drive software.
- carry out a POWER ON (switch-off/switch-on).

For fault value = 1000:

- check the wiring of the safety-relevant inputs (SGE) in the first monitoring channel (contact problems).
- PROFIsafe: Resolve contact problems/faults at the PROFINET controller.
- check the discrepancy time, and if required, increase the value (p9650).

For fault value = 1001, 1002:

- carry out a POWER ON (switch-off/switch-on).
- upgrade the drive software.

For fault value = 1950:

- operate the module in the permissible range.
- test module fan, replace drive.

For fault value = 1951:

- operate the module in the permissible range.
- replace drive.

For fault value = 2000, 2001, 2002, 2003:

- check the discrepancy time, and if required, increase the value (p9650, p9652).
- check the wiring of the F-DI for STO/SBC/SS1 (contact problems).
- replace drive.

Note:

This fault can be acknowledged after removing the cause of the error and after correct selection/deselection of STO.

For fault value = 6000 ... 6999:

Refer to the description of the message values in safety message C01611.

Note:

CU: Control Unit
 SGE: Safety-relevant input
 F-DI: Fail-safe Digital Input
 SI: Safety Integrated
 SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
 STO: Safe Torque Off

Reaction upon A: NONE
Acknowl. upon A: NONE

N30620 (F, A) SI P2: Safe Torque Off active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The "Safe Torque Off" (STO) function of the basic functions has been selected in monitoring channel 2 using the input terminal and is active.

Note:

- this message does not result in a safety stop response.
- this message is not output when STO is selected using the Extended Functions.

Remedy: Not necessary.

Note:

SI: Safety Integrated
 STO: Safe Torque Off

Reaction upon F: OFF2
Acknowl. upon F: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Reaction upon A: NONE

Acknowl. upon A: NONE

N30621 (F, A) SI P2: Safe Stop 1 active

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The "Safe Stop 1" function (SS1) was selected in monitoring channel 2 and is active.

Note:

This message does not result in a safety stop response.

Remedy: Not necessary.

Note:

SI: Safety Integrated

SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)

Reaction upon F: NONE (OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

Reaction upon A: NONE

Acknowl. upon A: NONE

F30625 SI P2: Sign-of-life error in safety data

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function in monitoring channel 2 has detected an error in the sign-of-life of the safety data between the two monitoring channels and initiated a STOP A.

- there is either a DRIVE-CLiQ communication error or communication has failed.

- a time slice overflow of the safety software has occurred.

- the enable of the safety functions in both monitoring channels is inconsistent

Fault value (r0949, interpret decimal):

Only for internal Siemens troubleshooting.

Remedy: - select Safe Torque Off and de-select again.

- carry out a POWER ON (switch-off/switch-on) for all components.

- check whether there is a DRIVE-CLiQ communication error between the two monitoring channels and, if required, carry out a diagnostics routine for the faults identified.

- de-select all drive functions that are not absolutely necessary.

- check the electrical cabinet design and cable routing for EMC compliance

- check whether the safety functions are enabled (p9601), copy the safety parameters using the commissioning tool, and confirm the data change.

Note:

P2: processor 2

SI: Safety Integrated

F30630 SI P2: Brake control error

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function in monitoring channel 2 has detected a brake control error and initiated a STOP A.

- OCC cable shield is not correctly connected.
- defect in the brake control circuit of the drive.

Fault value (r0949, decimal interpretation):

100, 101, 102:
Fault in "open brake" operation.

- brake not closed or interrupted cable.
- ground fault in brake cable.

300, 301, 302:
Fault in "close brake" operation.

- brake not closed or interrupted cable.

200:
Fault in the "Brake open" state.

- short-circuit in brake winding.

201, 202:
Fault in the "Brake open" state.

- defective hardware.

400, 401, 402:
Fault in "brake closed" state.

60, 70:
Fault in the brake control of the drive or a communication error between the monitoring channels (brake control diagnostics).

Remedy:

- select STO and then de-select again.
- check the motor holding brake connection.
- check the function of the motor holding brake.
- carry out a diagnostics routine for the faults involved.
- check for EMC-compliant control cabinet design and cable routing (e.g. shield OCC cable with shield terminal and shield plate, check the connection of the brake conductors).
- replace drive.

Note:
OCC: One Cable Connection (one cable system)
SBC: Safe Brake Control
SI: Safety Integrated
STO: Safe Torque Off

F30631 Brake control: External release active

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: For mounting purposes, the brake is supplied with voltage via terminal X4.1 and released.

Remedy: If required, again remove the power supply at X4.1.

A30640 (F) SI P2: Fault in the switch-off signal path of the second channel

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: The Motor Module has detected a communication error with the higher-level control or the TM54F to transfer the safety-relevant information or there is a communication error between Motor Modules connected in parallel.

Note:
This fault results in a STOP A that can be acknowledged.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy: For the higher-level control, the following applies:
- check the PROFIsafe address in the higher-level control and Motor Modules and if required, align.
- save all parameters (p0977 = 1).
- carry out a POWER ON (switch-off/switch-on) for all components.
For TM54F, carry out the following steps:
- start the copy function for the node identifier (p9700 = 1D hex).
- acknowledge hardware CRC (p9701 = EC hex).
- save all parameters (p0977 = 1).
- carry out a POWER ON (switch-off/switch-on) for all components.
For a parallel connection, the following applies:
- check the PROFIsafe address in both monitoring channels and if required, align.
- save all parameters (p0977 = 1).
- carry out a POWER ON (switch-off/switch-on) for all components.
The following generally applies:
- upgrade the Motor Module software.

Note:
MM: Motor Module
SI: Safety Integrated

Reaction upon F: NONE (OFF2)
Acknowl. upon F: IMMEDIATELY (POWER ON)

F30649 SI P2: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: An internal error in the Safety Integrated software in monitoring channel 2 has occurred.

Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

Remedy:
- carry out a POWER ON (switch-off/switch-on).
- re-commission the Safety Integrated function and carry out a POWER ON.
- upgrade the drive software.
- contact Technical Support.
- replace drive.

Note:
SI: Safety Integrated

F30650 SI P2: Acceptance test required

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The "Safety Integrated" function on monitoring channel 2 requires an acceptance test.

Note:
 This fault results in a STOP A that can be acknowledged.
 Fault value (r0949, interpret decimal):
 130: Safety parameters for monitoring channel 2 not available.

Note:
 This fault value is always output when Safety Integrated is commissioned for the first time.
 1000: Reference and actual checksum in monitoring channel 2 are not identical (booting).
 - safety parameters set offline and loaded to the drive.
 - at least one checksum-checked piece of data is defective.
 2000: Reference and actual checksum in monitoring channel 2 are not identical (commissioning mode).
 2003: Acceptance test is required as a safety parameter has been changed.
 2005: The safety logbook has identified that the safety checksums have changed. An acceptance test is required.
 3003: Acceptance test is required as a hardware-related safety parameter has been changed.
 9999: Subsequent response of another safety-related fault that occurred when booting that requires an acceptance test.

Remedy:
 For fault value = 130:
 - carry out safety commissioning routine.
 For fault value = 1000:
 - again carry out safety commissioning routine.
 - replace the memory card or drive.
 For fault value = 2000:
 - confirm the data change using the commissioning tool
 For fault value = 2003, 2005:
 - carry out an acceptance test and generate an acceptance report.
 The procedure when carrying out an acceptance test as well as an example of the acceptance report are provided in the following literature:
 SINAMICS Function Manual Safety Integrated
 For fault value = 3003:
 - carry out the function checks for the modified hardware and generate an acceptance report.
 The procedure when carrying out an acceptance test as well as an example of the acceptance report are provided in the following literature:
 SINAMICS Function Manual Safety Integrated
 For fault value = 9999:
 - carry out diagnostics for the other safety-related fault that is present.
Note:
 SI: Safety Integrated

F30651 **SI P2: synchronization with monitoring channel 1 unsuccessful**

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive-integrated "Safety Integrated" function requires synchronization of the safety time slices in both monitoring channels. This synchronization routine was unsuccessful.

Note:
 This fault results in a STOP A that cannot be acknowledged.
 Fault value (r0949, interpret decimal):
 Only for internal Siemens troubleshooting.

Remedy:
 - carry out a POWER ON (switch-off/switch-on).
 - upgrade the drive software.
Note:
 SI: Safety Integrated

F30652 **SI P2: Illegal monitoring clock cycle**

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The Safety Integrated monitoring clock cycle cannot be maintained due to the communication conditions requested in the system.
Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
Remedy:
- if fault F01652 simultaneously occurs, apply the remedy/countermeasure described there.
- upgrade the firmware of the Motor Module/Hydraulic Module to a later version.
Note:
MM: Motor Module
P2: processor 2
SI: Safety Integrated

F30655 **SI P2: Align monitoring functions**

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: An error has occurred when aligning the Safety Integrated monitoring functions of both monitoring channels. No common set of supported SI monitoring functions was able to be determined.
- there is either a DRIVE-CLiQ communication error or communication has failed.
Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade the Control Unit software.
- check the electrical cabinet design and cable routing for EMC compliance
Note:
CU: Control Unit
SI: Safety Integrated

F30656 **SI P2: parameter monitoring channel 2 incorrect**

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: When accessing the Safety Integrated parameters for monitoring channel 2 in the non-volatile memory, an error has occurred.
Note:
This fault results in a STOP A that can be acknowledged.
Fault value (r0949, interpret decimal):
129:
- safety parameters for monitoring channel 2 corrupted.
131: Internal software error on monitoring channel 1.
255: Internal software error on monitoring channel 2

Remedy:

- re-commission the safety functions.
- upgrade the drive software.
- replace the memory card or drive.

For fault value = 129:

- activate the Safety Integrated commissioning mode.
- adapt the PROFIsafe address.
- copy the safety parameters and confirm the data change.
- exit the Safety Integrated commissioning mode.
- save all parameters or "Copy RAM to ROM".
- carry out a POWER ON (switch-off/switch-on).

Note:

SI: Safety Integrated

F30657 SI P2: PROFIsafe telegram number invalid

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: The PROFIsafe telegram number that has been set is not valid.
When PROFIsafe is enabled (p9601.3 = 1), then a telegram number greater than zero must be used.
The copy function was not used.

Note:

This fault does not result in a safety stop response.
See also: p9611, p60022, r60022

Remedy: Enter a valid PROFIsafe telegram number (p9611), then using the commissioning tool, copy the safety parameters and confirm the data change.

F30659 SI P2: Write request for parameter rejected

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The write request for one or several Safety Integrated parameters in monitoring channel 2 was rejected.

Note:

See also fault F01659.

Remedy: Upgrade the firmware to later version.

F30664 Error while booting

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: An error has occurred during booting.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- upgrade firmware to later version.
- contact Technical Support.

F30665 SI P2: System is defective

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A system defect was detected before the last boot or in the actual one. The system might have been rebooted (reset).
Fault value (r0949, interpret hexadecimal):
2 hex:
- parameters p9500 and p9300 are not the same (if Safety message C30711 is displayed at the same time).
200000 hex, 400000 hex:
- fault in the actual booting/operation.
Additional values:
- defect before the last time that the system booted.
Remedy: - carry out a POWER ON (switch-off/switch-on).
- upgrade firmware to later version.
- contact Technical Support.
For fault value = 2:
- check parameters p9500 and p9300 to see if they are the same (if Safety message C30711 is displayed at the same time).
For fault value = 400000 hex:
- ensure that the Control Unit is connected to the Power Module.

A30666 (F) SI Motion P2: Steady-state (static) 1 signal at the F-DI for safe acknowledgment

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A logical 1 signal is present at the F-DI configured in p10106 for more than 10 seconds.
If, at the F-DI no acknowledgment was performed for safe acknowledgment, then a steady-state logical and 0 signal must be present. This avoids unintentional safety-relevant acknowledgment (or the "Internal Event Acknowledge" signal) if a wire breaks or one of the two digital inputs bounces.
Remedy: Set the fail-safe digital input (F-DI) to a logical 0 signal (p10106).
Note:
F-DI: Fail-safe Digital Input
Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY

F30672 SI P2: Control Unit software incompatible

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The existing Control Unit software does not support the safe drive-based motion monitoring function.
Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- check whether there are faults in the safety function alignment between the two monitoring channels (F01655, F30655) and if required, carry out diagnostics for the faults involved.
- use a Control Unit that supports the safe motion monitoring function.
- upgrade the Control Unit software.

Note:

SI: Safety Integrated

F30674 SI Motion P2: Safety function not supported by PROFIsafe telegram

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: The monitoring function enabled in p9501 and p9601 is not supported by the currently set PROFIsafe telegram (p9611).

Note:

This fault does not result in a safety stop response.

Fault value (r0949, interpret bitwise binary):

Bit 18 = 1:
SS2E via PROFIsafe is not supported (p9501.18).

Bit 24 = 1:
Transfer SLS limit value via PROFIsafe not supported (p9501.24).

Remedy:

- Deselect the monitoring function involved (p9501, p9601).
- set the matching PROFIsafe telegram (p9611).
- using the commissioning tool, copy the safety parameters and confirm the data change.

Note:

SI: Safety Integrated

SLS: Safely Limited Speed

SS2E: Safe Stop 2 external (Safe Stop 2 with external stop, external STOP D)

F30680 SI Motion P2: Checksum error safety monitoring functions

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The actual checksum over the safety-relevant parameters calculated by monitoring channel 2 does not match the reference checksum saved at the last machine acceptance.

Safety-relevant parameters have been changed or a fault is present.

Note:

This fault results in a STOP A that can be acknowledged.

Fault value (r0949, decimal interpretation):

0: Checksum error for SI parameters for motion monitoring.

1: Checksum error for SI parameters for component assignment.

Remedy:

- check the safety-relevant parameters and if required, correct.
- execute the function "Copy RAM to ROM".
- perform a POWER ON if safety parameters requiring a POWER ON have been modified.
- carry out an acceptance test.

F30681 SI Motion P1: Incorrect parameter value

Message value: Parameter: %1, supplementary information: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause: The parameter cannot be parameterized with this value.
Note:
This message does not result in a safety stop response.
Fault value (r0949, interpret decimal):
yyyyxxxx dec: yyyy = supplementary information, xxxx = parameter
yyyy = 0:
No additional information available.
xxxx = 9301:
It is not permissible to enable the function "SSM hysteresis and filtering" (p9501.16) in conjunction with the function "Extended functions without selection" (p9601.5).
xxxx = 9347:
The hysteresis tolerance is not permissible.
xxxx = 9801 and yyyy = 1:
If motion monitoring functions integrated in the drive (p9601.2 = 1) and extended functions without selection (p9601.5 = 1) are activated, then PROFIsafe (p9601.3 = 1) is not possible.
xxxx = 9801 and yyyy = 2:
Extended functions without selection (p9601.5 = 1) are enabled without enabling motion monitoring functions integrated in the drive (p9601.2).
xxxx = 9801 and yyyy = 3:
Onboard F-DI are enabled without enabling motion monitoring functions integrated in the drive (p9601.2).
xxxx = 9801 and yyyy = 5:
Transfer of the SLS limit value via PROFIsafe (p9501.24) has been enabled, without enabling PROFIsafe.
xxxx = 9801 and yyyy = 11:
SS2E (p9501.18 = 1) is enabled without PROFIsafe being enabled.
xxxx = 9801 and yyyy = 12:
SCA (p9501.28 = 1) is enabled without enabling PROFIsafe.

Remedy: Correct parameter (if required, also on another monitoring channel, p9601).
Note:
For different values in the two monitoring channels: using the commissioning tool, copy the safety parameters and confirm the data change.
For xxxx = 9301:
De-select Extended Functions without selection (p9601.5).
For xxxx = 9317:
Further, p9516.0 should be checked.
For xxxx = 9347:
Using the commissioning tool, copy the safety parameters and confirm the data change.
For xxxx = 9801:
Using the commissioning tool, copy the safety parameters, confirm the data change and carry out a power on.

F30682 SI Motion P2: Monitoring function not supported

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The monitoring function enabled in p9501, p9601, p9506, p9507 is not supported in this firmware version.

Note:
 This message does not result in a safety stop response.
 Fault value (r0949, decimal interpretation):

- 1: Monitoring function SLP not supported (p9501.1).
- 2: Monitoring function SCA not supported (p9501.7 and p9501.8..15).
- 3: Monitoring function SLS override not supported (p9501.5).
- 4: Monitoring function external ESR activation not supported (p9501.4).
- 5: Monitoring function F-DI in PROFIsafe not supported (p9501.30).
- 6: Enable actual value synchronization not supported (p9501.3).
- 9: Monitoring function not supported by the firmware or enable bit not used.
- 12: This drive does not support operation of safety functions with a higher-level control.
- 26: Hysteresis and filtering for SSM monitoring function without an encoder not supported (p9501.16).
- 27: This hardware does not support onboard F-DI and F-DO.
- 30: The firmware version of the Motor Module is older than the version of the Control Unit.
- 33: Safety functions without selection not supported (p9601.5).
- 34: This module does not support safe position via PROFIsafe.
- 39: This module or software version of the CU/MM does not support safe gearbox stage switchover (p9501.26).
- 44: This module/this software version does not support referencing via the safety control channel (p9501.27).
- 45: Deactivating SOS/SLS during an external STOP A is not supported (p9501.23).
- 54: SCA function not supported (p9501.28).

Remedy:

- de-select the monitoring function involved (p9501, p9601, p9507, p9506).
- Upgrade the Motor Module firmware.

Note:
 ESR: Extended Stop and Retract
 F-DI: Fail-safe Digital Input
 SBR: Safe Brake Ramp (safe brake ramp monitoring)
 SCA: Safe Cam
 SDI: Safe Direction (safe motion direction)
 SI: Safety Integrated
 SLP: Safely Limited Position
 SLS: Safely Limited Speed
 SP: Safe Position
 SS1E: Safe Stop 1 External (Safe Stop 1 with external stop)
 SS2E: Safe Stop 2 external (Safe Stop 2 with external stop, external STOP D)
 See also: p9501, p9601

F30683 SI Motion P2: SOS/SLS enable missing

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The safety-relevant basic function "SOS/SLS" is not enabled, although other safety-relevant monitoring functions are enabled.

Note:
 This message does not result in a safety stop response.

Remedy: Using the commissioning tool, copy the safety parameters, confirm the data change and carry out a power on.

Note:
 SI: Safety Integrated
 SLS: Safely Limited Speed
 SOS: Safe Operating Stop

13.2 List of faults and alarms

F30684 SI Motion P2: Safely limited position limit values interchanged

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: For the function "Safely Limited Position" (SLP), a lower value is in p9334 than in p9335.
Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
1: Limit values SLP1 interchanged.
2: Limit values SLP2 interchanged.
Remedy:
- correct the lower and upper limit values (p9335, p9334).
- carry out a POWER ON (switch-off/switch-on).
Note:
SI: Safety Integrated
SLP: Safely Limited Position / SE: Safe software limit switches

F30685 SI Motion P2: Safely Limited Speed limit value too high

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The limit value for the function "Safely Limited Speed" (SLS) is greater than the speed that corresponds to an encoder limit frequency of 500 kHz.
Note:
This message does not result in a safety stop response.
Fault value (r0949, interpret decimal):
Maximum permissible speed.
Remedy:
Correct the limit values for SLS and carry out a POWER ON.
Note:
SI: Safety Integrated
SLS: Safely Limited Speed

F30686 SI Motion: Illegal parameterization cam position

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)

Cause: At least one enabled "Safety Cam" (SCA) is parameterized in p9336 or p9337 too close to the tolerance range around the modulo position.

- the minus position value of a cam must be greater than the lower modulo limit + cam tolerance (p9340) + position tolerance (p9342).
- the plus position value of a cam must be less than the upper modulo limit - cam tolerance (p9340) - position tolerance (p9342).
- when the modulo position is parameterized (p9305 > 0), the lower modulo limit = 0, the upper modulo limit = p9305.
- the cam length of cam x = p9336[x] - p9337[x] is less than the cam tolerance + position tolerance (= p9340 + p9342).

This also means that cams of the minus position value must be less than the plus position value.

Note:
This fault does not result in a safety stop response.
Fault value (r0949, interpret decimal):
Number of the "Safe Cam" with an illegal position.
See also: p9501

Remedy: Correct the cam position and carry out a POWER ON.

Note:
SCA: Safe Cam
SI: Safety Integrated

F30688 SI Motion P2: Actual value synchronization not permissible

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause:

- it is not permissible to enable actual value synchronization for a 1-encoder system.
- it is not permissible to simultaneously enable actual value synchronization and a monitoring function with absolute reference (SCA/SLP).
- it is not permissible to simultaneously enable actual value synchronization and safe position via PROFIsafe.

Note:
This fault results in a STOP A that cannot be acknowledged.

Remedy:

- either deselect the "actual value synchronization" function or parameterize a 2-encoder system.
- either deselect the function "actual value synchronization" or the monitoring functions with absolute reference (SCA/SLP) and carry out a POWER ON.
- either deselect the "actual value synchronization" function or do not enable "Safe position via PROFIsafe".

Note:
SCA: Safe Cam / SN: Safe software cam
SI: Safety Integrated
SLP: Safely Limited Position / SE: Safe software limit switches
SP: Safe Position
See also: p9501

F30692 SI Motion P2: Parameter value not permitted for encoderless

Message value: Parameter: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The parameter cannot be parameterized with this value if encoderless motion monitoring functions have been parameterized in p9306.

Note:
This message does not result in a safety stop response.
Fault value (r0949, interpret decimal):
Parameter number with the incorrect value.

13.2 List of faults and alarms

Remedy:

- correct the parameter specified in the fault value.
- if necessary, deselect encoderless motion monitoring functions (p9306).

See also: p9501

A30693 (F) SI P2: Safety parameter settings changed, warm restart/POWER ON required

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Safety parameters have been changed; these will only take effect following a warm restart or POWER ON.
Alarm value (r2124, interpret decimal):
Parameter number of the safety parameter which has changed, necessitating a warm restart or POWER ON.

Remedy:

- carry out a warm restart.
- carry out a POWER ON (switch-off/switch-on) for all components.

Note:
Before performing an acceptance test, a POWER ON must be carried out for all components.

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: POWER ON

C30700 SI Motion P2: STOP A initiated

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP A (STO via the safety switch-off signal path of the first monitoring channel).
Possible causes:

- stop request from the first monitoring channel.
- STO not active after a parameterized time after test stop selection.
- subsequent response to the message C30706 "SI Motion MM: SAM/SBR limit exceeded".
- subsequent response to the message C30714 "SI Motion MM: Safely Limited Speed exceeded".
- subsequent response to the message C30701 "SI Motion MM: STOP B initiated".
- subsequent response to the message C30716 "SI Motion MM: tolerance for safe motion direction exceeded".

Remedy:

- remove the cause of the fault on the first monitoring channel.
- check the switch-off signal path of the first of monitoring channel (check DRIVE-CLiQ communication).
- carry out a diagnostics routine for message C30706.
- carry out a diagnostics routine for message C30714.
- carry out a diagnostics routine for message C30701.
- carry out a diagnostics routine for message C30716.
- replace drive.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- PROFIsafe.
- machine control panel.

Note:
SAM: Safe Acceleration Monitor (safe acceleration monitoring)
SBR: Safe Brake Ramp (safe brake ramp monitoring)
SI: Safety Integrated

C30701 SI Motion P2: STOP B initiated

Message value: -

Drive object: All objects

Reaction: NONE (OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive is stopped via a STOP B (braking along the OFF3 ramp).
 As a result of this fault, after the time parameterized in p9556 has expired or after the speed threshold parameterized in p9560 has been fallen below, message C30700 "SI Motion MM: STOP A initiated" is output.
 Possible causes:
 - stop request from the first monitoring channel.
 - subsequent response to the message C30714 "SI Motion MM: Safely Limited Speed exceeded".
 - subsequent response to the message C30711 "SI Motion MM: Defect in a monitoring channel".
 - subsequent response to the message C30707 "SI Motion MM: tolerance for safe operating stop exceeded".
 - subsequent response to the message C30716 "SI Motion MM: tolerance for safe motion direction exceeded".
Remedy:
 - remove the cause of the fault on the first monitoring channel.
 - carry out a diagnostics routine for message C30714.
 - carry out a diagnostics routine for message C30711.
 - carry out a diagnostics routine for message C30707.
 - carry out a diagnostics routine for message C30716.
 This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
 - PROFIsafe.
 - machine control panel.
 Note:
 SI: Safety Integrated

C30706 SI Motion P2: SAM/SBR limit exceeded

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: Motion monitoring functions with encoder (SAM, p9506 = 0):
 - after initiating STOP B (SS1) or STOP C (SS2), the speed has exceeded the selected tolerance.
 Motion monitoring functions with encoder (SBR, p9506 = 2):
 - after initiating STOP B (SS1) or SLS changeover to the lower speed stage, the speed has exceeded the selected tolerance.
 The drive is shut down by the message C30700 "SI Motion MM: STOP A initiated".
Remedy: Check the braking behavior and, if necessary, adapt the parameterization of the parameter settings of the "SAM" or the "SBR" function.
 This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
 - PROFIsafe.
 - machine control panel.
 Note:
 SAM: Safe Acceleration Monitor (safe acceleration monitoring)
 SBR: Safe Brake Ramp (safe ramp monitoring)
 SI: Safety Integrated
 See also: p9548

C30707 SI Motion P2: Tolerance for safe operating stop exceeded

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The actual position has distanced itself further from the target position than the standstill tolerance.
 The drive is shut down by the message C30701 "SI Motion MM: STOP B initiated".

13.2 List of faults and alarms

Remedy:

- check whether safety faults are present and if required carry out the appropriate diagnostic routines for the particular faults.
- check whether the standstill tolerance matches the accuracy and control dynamic performance of the axis.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- PROFIsafe.
- machine control panel.

Note:

SI: Safety Integrated
SOS: Safe Operating Stop

See also: p9530

C30708 SI Motion P2: STOP C initiated

Message value: -

Drive object: All objects

Reaction: STOP2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP C (braking along the OFF3 ramp).
"Safe Operating Stop" (SOS) is activated after the parameterized time has expired.
Possible causes:

- stop request from the higher-level control.
- subsequent response to the message C30714 "SI Motion MM: Safely Limited Speed exceeded".
- subsequent response to the message C30716 "SI Motion MM: tolerance for safe motion direction exceeded".

See also: p9552

Remedy:

- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C30714, C30716.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- PROFIsafe.
- machine control panel.

Note:

SI: Safety Integrated
SOS: Safe Operating Stop

C30709 SI Motion P2: STOP D initiated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP D (braking along the path).
"Safe Operating Stop" (SOS) is activated after the parameterized time has expired.
Possible causes:

- stop request from the Control Unit.
- subsequent response to the message C30714 "SI Motion MM: Safely Limited Speed exceeded".
- subsequent response to the message C30716 "SI Motion MM: tolerance for safe motion direction exceeded".

See also: p9553

Remedy:

- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C30714, C30716.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- PROFIsafe.
- machine control panel.

Note:

SI: Safety Integrated
SOS: Safe Operating Stop

C30710 SI Motion P2: STOP E initiated

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP E (retraction motion).
"Safe Operating Stop" (SOS) is activated after the parameterized time has expired.
Possible causes:

- stop request from the higher-level control.
- subsequent response to the message C30714 "SI Motion MM: Safely Limited Speed exceeded".
- subsequent response to the message C01715 "SI Motion CU: Safely Limited Position exceeded".
- subsequent response to the message C30716 "SI Motion MM: tolerance for safe motion direction exceeded".

Remedy:

- remove the cause of the fault at the control.
- carry out a diagnostics routine for messages C30714, C30715, C30716.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

- Terminal Module 54F (TM54F).
- onboard F-DI (only CU310-2).
- PROFIsafe.
- machine control panel.

Note:

SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop

C30711 SI Motion P2: Defect in a monitoring channel

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

13.2 List of faults and alarms

Cause:

When cross-comparing the two monitoring channels, the drive detected a difference between the input data or results of the monitoring functions and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.

If at least one monitoring function is active, then after the parameterized timer has expired, the message C30701 "SI Motion: STOP B initiated" is output.

The following message values may also occur in the following cases if the cause that is explicitly mentioned does not apply:

- incorrect synchronization.

Message value (r2124, interpret decimal):

0 ... 999:

Number of the cross-compared data that resulted in this message.

The significance of the individual message values is described in safety message C01711.

1000: Watchdog timer has expired. Too many signal changes have occurred at safety-relevant inputs.

1001: Initialization error of watchdog timer.

1005: STO already active for test stop selection.

1011: Acceptance test status between the monitoring channels differ.

1012: Plausibility violation of the actual value from the encoder.

1020: Cyc. communication failure between the monit. channels.

1021: Cyc. communication failure between the monit. channel and Sensor Module.

1023: Error in the effectiveness test in the DRIVE-CLiQ encoder

1030: Encoder fault detected from another monitoring channel.

1045: CRC of the standstill position incorrect.

5000 ... 5140:

PROFIsafe message values.

For these message values, the fail-safe control signals (fail-safe values) are transferred to the safety functions.

The significance of the individual message values is described in safety message C01711.

6000 ... 6166:

PROFIsafe message values (PROFIsafe driver for PROFIBUS DP V1/V2 and PROFINET).

For these message values, the fail-safe control signals (fail-safe values) are transferred to the safety functions. If "Stop B after failure of the PROFISafe communication" is parameterized, the transfer of the fail-safe value is delayed.

The significance of the individual message values is described in safety fault F01611.

7000 ... 7002:

Message values of the "Safe position via PROFIsafe" function.

See also: p9555, r9725

- Remedy:**
- For message value = 1005:
 - check the conditions for deselecting STO.
 - For message value = 1012:
 - upgrade the Sensor Module firmware to a more recent version.
 - check encoder parameters to ensure that they are the same (p9515, p9519, p9523, p9524, p9525, p9529).
 - start the copy function for encoder parameters.
 - check the electrical cabinet design and cable routing for EMC compliance
 - POWER ON (switch-off/switch-on) for all components - or carry out a warm restart.
 - replace the hardware.
 - For message value = 1024:
 - check the communication link.
 - carry out a POWER ON (switch-off/switch-on) for all components.
 - replace the hardware.
 - For message value = 1030:
 - check the encoder connection.
 - if required, replace the encoder.
- Adapt the encoder parameterization for the second channel as follows:
- set the encoder type (p0400).
 - activate the safety commissioning mode (p0010 = 95).
 - start the copy function for encoder parameters.
 - exit the safety commissioning mode (p0010 = 0).
 - save parameter in a non-volatile fashion (copy RAM to ROM).
 - carry out a POWER ON (switch-off/switch-on) for all components.
- The following always applies:
- check the encoder connection.
 - if required, replace the encoder.
- For message value = 6000 ... 6999:
- the significance of the individual message values is described in safety fault F01611 of the Control Unit.
- For other message values:
- the significance of the individual message values is described in safety message C01711.
- This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
 - machine control panel.

C30712 SI Motion P2: Defect in F-IO processing

- Message value:** %1
- Drive object:** All objects
- Reaction:** NONE
- Acknowledge:** IMMEDIATELY (POWER ON)
- Cause:** When cross checking and comparing the two monitoring channels, the drive detected a difference between parameters or results of the F-IO processing and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.
- The safety message C30711 with message value 0 is also displayed due to initiation of STOP F.
- If at least one monitoring function is active, the safety message C30701 "SI Motion: STOP B initiated" is output after the parameterized timer has expired.
- Message value (r9749, interpret decimal):
- Number of the cross-compared data that resulted in this message.
- Refer to the description of the message values in safety message C01712.

13.2 List of faults and alarms

- Remedy:**
- check parameterization in the parameters involved and correct if required.
 - ensure equality by copying the SI data to the second channel and then carry out an acceptance test.
 - check monitoring clock cycle for equality (p9500, p9300).
- This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- onboard F-DI (only CU310-2).
 - PROFIsafe.
 - machine control panel.
-

C30714 SI Motion P2: Safely Limited Speed exceeded

- Message value:** %1
- Drive object:** All objects
- Reaction:** NONE
- Acknowledge:** IMMEDIATELY (POWER ON)
- Cause:** The drive had moved faster than that specified by the velocity limit value. The drive is stopped as a result of the configured stop response.
- Message value (r2124, interpret decimal):
- 100: SLS1 exceeded.
 - 200: SLS2 exceeded.
 - 300: SLS3 exceeded.
 - 400: SLS4 exceeded.
 - 1000: Encoder limit frequency exceeded.
- Remedy:**
- check the traversing/motion program in the control.
 - check the limits for the "SLS" function and if required adapt.
- This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
 - machine control panel.
- Note:
- SI: Safety Integrated
 - SLS: Safely Limited Speed
-

C30715 SI Motion P2: Safely Limited Position exceeded

- Message value:** %1
- Drive object:** All objects
- Reaction:** NONE
- Acknowledge:** IMMEDIATELY (POWER ON)
- Cause:** The axis has moved past a parameterized position that is monitored by the "SLP" function.
- Message value (r9749, interpret decimal):
- 10: SLP1 violated.
 - 20: SLP2 violated.

Remedy:

- check the traversing/motion program in the control.
- check the limits for "SLP" function and if required, adapt (p9534, p9535).

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

Prerequisite:

- deselect "SLP" function and retract the axis into the permitted position range.

Carry out a safe acknowledgment using one of the following options:

- Terminal Module 54F (TM54F).
- onboard F-DI (only CU310-2).
- PROFIsafe.
- machine control panel.

Note:

SI: Safety Integrated
SLP: Safely Limited Position / SE: Safe software limit switches

C30716 SI Motion P2: Tolerance for safe motion direction exceeded

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The tolerance for the "safe motion direction" function was exceeded. The drive is stopped as a result of the configured stop response.

Message value (r2124, interpret decimal):

0: Tolerance for the "safe motion direction positive" function exceeded.

1: Tolerance for the "safe motion direction negative" function exceeded.

Remedy:

- check the traversing/motion program in the control.
- check the tolerance for the "SDI" function and adapt if necessary.

This message can be acknowledged without a POWER ON as follows (safe acknowledgment):

Prerequisite:

- deselect the "SDI" function and if required select again.

Carry out a safe acknowledgment using one of the following options:

- PROFIsafe.
- machine control panel.

Note:

SDI: Safe Direction (safe motion direction)
SI: Safety Integrated

C30717 SI Motion P2: SLA limit exceeded

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The acceleration limit for the "Safely limited acceleration" function was exceeded. The drive is stopped as a result of the configured stop response (p9379).

Remedy:

- check the traversing/motion program in the control.
- check the acceleration limit for the "SLA" function and if required, adapt (p9378).
- carry out a safe acknowledgment.

Note:

SI: Safety Integrated
SLA: Safely-Limited Acceleration

C30730 **SI Motion P2: Reference block for dynamic safely limited speed invalid**

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The reference block transferred via PROFIsafe is negative.
A reference block is used to generate a referred velocity limit value based on the reference quantity "Velocity limit value SLS1" (p9531[0]).
The drive is stopped as a result of the configured stop response (p9563[0]).
Message value (r2124, interpret decimal):
requested, invalid reference block.

Remedy: In the PROFIsafe telegram, input data S_SLS_LIMIT_IST must be corrected.
This message can be acknowledged without a POWER ON as follows (safe acknowledgment):
- PROFIsafe.
Note:
SI: Safety Integrated
SLS: Safely Limited Speed

A30788 **Automatic test stop: wait for STO deselection via SMM**

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The automatic test stop was not able to be carried out after powering up.
Possible causes:
- the STO function is selected via Safety Extended Functions.
- a safety message is present, that resulted in a STO.

Remedy: - Deselect STO via Safety Extended Functions.
- remove the cause of the safety messages and acknowledge the messages.
The automatic test stop is performed after removing the cause.

C30797 **SI Motion P2: Axis not safely referenced**

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The standstill position saved before switching off does not match the actual position determined at switch-on.
Message value (r9749, interpret decimal):
1: Axis not safely referenced.
2: User agreement missing.

Remedy: If safe automatic referencing is not possible the user must issue a user agreement for the new position using the softkey.
This mean that this position is then designated as safety-relevant.
Note:
SI: Safety Integrated

C30798 **SI Motion P2: Test stop for motion monitoring functions running**

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The forced checking procedure (test stop) for the safe motion monitoring functions is currently in progress.
Remedy: Not necessary.
 The message is automatically withdrawn when the test stop has been completed.
Note:
 SI: Safety Integrated

C30799 SI Motion P2: Acceptance test mode active

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The acceptance test mode is active.
 This means the following:
 - the setpoint velocity limiting is deactivated (r9733).
Remedy: Not necessary.
 The message is automatically withdrawn when exiting the acceptance test mode.
Note:
 SI: Safety Integrated

N30800 (F) Power unit: Group signal

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: NONE
Cause: The power unit has detected at least one fault.
Remedy: Evaluate the other messages that are presently available.
Reaction upon F: OFF2
Acknowl. upon F: IMMEDIATELY

F30801 Power unit DRIVE-CLiQ: Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the power unit concerned.
 The computing time load might be too high.
Fault cause:
 10 (= 0A hex):
 The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy:
 - deselect functions that are not required.
 - if required, increase the sampling times (p0112, p0115).
 - replace the component involved (power unit, Control Unit).

F30802 Power unit: Time slice overflow

Message value: %1
Drive object: All objects

13.2 List of faults and alarms

Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A time slice overflow has occurred.
Fault value (r0949, interpret decimal):
xx: time slice number
Remedy:
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.
- contact Technical Support.

F30804 (N, A) Power unit: CRC

Message value: %1
Drive object: All objects
Reaction: Servo: OFF2 (OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: A checksum error (CRC error) has occurred for the power unit.
Remedy:
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.
- contact Technical Support.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F30805 Power unit: EEPROM checksum error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: Internal parameter data is corrupted.
Fault value (r0949, interpret hexadecimal):
01: EEPROM access error.
02: Too many blocks in the EEPROM.
Remedy: Replace the module.

F30809 Power unit: Switching information not valid

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: For 3P gating unit, the following applies:
The last switching status word in the setpoint telegram is identified by the end ID. Such an end ID was not found.
Remedy:
- carry out a POWER ON (switch-off/switch-on) for all components.
- upgrade firmware to later version.
- contact Technical Support.

A30810 (F) Power unit: Watchdog timer

Message value: -
Drive object: All objects
Reaction: NONE

Acknowledge: NONE
Cause: When booting it was detected that the cause of the previous reset was an SAC watchdog timer overflow.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.
Reaction upon F: NONE (OFF2)
Acknowl. upon F: IMMEDIATELY

F30820 Power unit DRIVE-CLiQ: Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the power unit concerned.
 Fault cause:
 1 (= 01 hex):
 Checksum error (CRC error).
 2 (= 02 hex):
 Telegram is shorter than specified in the length byte or in the receive list.
 3 (= 03 hex):
 Telegram is longer than specified in the length byte or in the receive list.
 4 (= 04 hex):
 The length of the receive telegram does not match the receive list.
 5 (= 05 hex):
 The type of the receive telegram does not match the receive list.
 6 (= 06 hex):
 The address of the component in the telegram and in the receive list do not match.
 7 (= 07 hex):
 A SYNC telegram is expected - but the received telegram is not a SYNC telegram.
 8 (= 08 hex):
 No SYNC telegram is expected - but the received telegram is one.
 9 (= 09 hex):
 The error bit in the receive telegram is set.
 16 (= 10 hex):
 The receive telegram is too early.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy: - carry out a POWER ON (switch-off/switch-on).
 - check the electrical cabinet design and cable routing for EMC compliance
 - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

F30835 Power unit DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the power unit concerned. The nodes do not send and receive in synchronism.
Fault cause:
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:
- carry out a POWER ON.
- replace the component involved (power unit, Control Unit).

F30836 Power unit DRIVE-CLiQ: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the power unit concerned. Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

F30837 Power unit DRIVE-CLiQ: Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

- Remedy:**
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
 - check the electrical cabinet design and cable routing for EMC compliance
 - if required, use another DRIVE-CLiQ socket (p9904).
 - replace the component involved.

F30845 Power unit DRIVE-CLiQ: Cyclic data transfer error

- Message value:** Component number: %1, fault cause: %2
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY
- Cause:** A DRIVE-CLiQ communication error has occurred from the Control Unit to the power unit concerned.
 Fault cause:
 11 (= 0B hex):
 Synchronization error during alternating cyclic data transfer.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
- Remedy:** Carry out a POWER ON (switch-off/switch-on).

F30850 Power unit: Internal software error

- Message value:** %1
- Drive object:** All objects
- Reaction:** Servo: OFF1 (NONE, OFF2, OFF3)
- Acknowledge:** POWER ON
- Cause:** An internal software error has occurred in the power unit.
 Fault value (r0949, interpret decimal):
 Only for internal Siemens troubleshooting.
- Remedy:**
- replace power unit.
 - if required, upgrade the firmware in the power unit.
 - contact Technical Support.

F30851 Power unit DRIVE-CLiQ (CU): Sign-of-life missing

- Message value:** Component number: %1, fault cause: %2
- Drive object:** All objects
- Reaction:** Servo: OFF2 (NONE, OFF1, OFF3)
- Acknowledge:** IMMEDIATELY
- Cause:** A DRIVE-CLiQ communication error has occurred from the power unit to the Control Unit involved.
 The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
 Fault cause:
 10 (= 0A hex):
 The sign-of-life bit in the receive telegram is not set.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
- Remedy:**
- deselect functions that are not required.
 - if required, increase the sampling times (p0112, p0115).
 - replace the component involved (power unit, Control Unit).

A30853 Power unit: Sign-of-life error cyclic data

- Message value:** -

13.2 List of faults and alarms

Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The power unit has detected that the cyclic setpoint telegrams of the Control Unit have not been updated on time. At least two sign-of-life errors have occurred within the window set in p7788.
Remedy:
- reduce the size of the window (p7788) for monitoring.
- check the Motor Module, and if required replace.

F30860 Power unit DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the power unit to the Control Unit involved.
Fault cause:
1 (= 01 hex):
Checksum error (CRC error).
2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.
3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.
4 (= 04 hex):
The length of the receive telegram does not match the receive list.
5 (= 05 hex):
The type of the receive telegram does not match the receive list.
6 (= 06 hex):
The address of the power unit in the telegram and in the receive list do not match.
9 (= 09 hex):
The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
16 (= 10 hex):
The receive telegram is too early.
17 (= 11 hex):
CRC error and the receive telegram is too early.
18 (= 12 hex):
The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.
19 (= 13 hex):
The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.
20 (= 14 hex):
The length of the receive telegram does not match the receive list and the receive telegram is too early.
21 (= 15 hex):
The type of the receive telegram does not match the receive list and the receive telegram is too early.
22 (= 16 hex):
The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.
25 (= 19 hex):
The error bit in the receive telegram is set and the receive telegram is too early.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy:
- carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

F30875 Power unit: power supply voltage failed

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
 Fault cause:
 9 (= 09 hex):
 The power supply voltage for the components has failed.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

F30885 CU DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the power unit to the Control Unit involved.
 The nodes do not send and receive in synchronism.
 Fault cause:
 26 (= 1A hex):
 Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
 33 (= 21 hex):
 The cyclic telegram has not been received.
 34 (= 22 hex):
 Timeout in the telegram receive list.
 64 (= 40 hex):
 Timeout in the telegram send list.
 98 (= 62 hex):
 Error at the transition to cyclic operation.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

F30886 PU DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A DRIVE-CLiQ communication error has occurred from the power unit to the Control Unit involved.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

F30887 Power unit DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component (power unit) involved. Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
96 (= 60 hex):
Response received too late during runtime measurement.
97 (= 61 hex):
Time taken to exchange characteristic data too long.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

F30895 PU DRIVE-CLiQ (CU): Alternating cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the power unit to the Control Unit involved.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

F30896 Power unit DRIVE-CLiQ (CU): Inconsistent component properties

Message value: Component number: %1

Drive object: All objects

Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)

Acknowledge: IMMEDIATELY

Cause: The properties of the DRIVE-CLiQ component (power unit), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
 Fault value (r0949, interpret decimal):
 Component number.

Remedy:

- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).

F30899 (N, A) Power unit: Unknown fault

Message value: New message: %1

Drive object: All objects

Reaction: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowledge: IMMEDIATELY (POWER ON)

Cause: A fault occurred on the power unit that cannot be interpreted by the Control Unit firmware.
 This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
 Fault value (r0949, interpret decimal):
 Fault number.
 Note:
 If required, the significance of this new fault can be read about in a more recent description of the Control Unit.

Remedy:

- replace the firmware on the power unit by an older firmware version (r0128).
- upgrade the firmware on the Control Unit (r0018).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F30903 Power unit: I2C bus error occurred

Message value: %1

Drive object: All objects

Reaction: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowledge: IMMEDIATELY

Cause: Communications error with an EEPROM or an analog/digital converter.
 Fault value (r0949, interpret hexadecimal):
 80000000 hex:
 - internal software error.
 00000001 hex ... 0000FFFF hex:
 - module fault.

Remedy:

- For fault value = 80000000 hex:
 - upgrade firmware to later version.
- For fault value = 00000001 hex ... 0000FFFF hex:
 - replace the module.

13.2 List of faults and alarms

F30907 Power unit: FPGA configuration unsuccessful

Message value: -
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: During initialization within the power unit, an internal software error has occurred.
Remedy: - if required, upgrade the firmware in the power unit.
- replace power unit.
- contact Technical Support.

A30919 Power unit: Temperature monitoring failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature monitoring in the power unit has failed.
Fault-free operation of the drive system is no longer guaranteed.
Alarm value (r2124, interpret hexadecimal):
Bit 0: Sensor 1 for the internal temperature can no longer be evaluated.
Bit 1: Sensor 2 for the internal temperature can no longer be evaluated.
Remedy: Replace the power unit immediately.

A30920 (F) Power unit: Temperature sensor fault

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: When evaluating the temperature sensor, an error occurred.
Alarm value (r2124, interpret decimal):
1: Wire breakage or sensor not connected.
KTY: R > 1630 Ohm, PT100: R > 375 Ohm, PT1000: R > 1720 Ohm
2: Measured resistance too low.
PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT100: R < 30 Ohm, PT1000: R < 603 Ohm
Note:
A temperature sensor is connected to the following terminals:
- "Booksize" format: X21.1/.2 or X22.1/.2
- "Chassis" format: X41.4/.3
Information on temperature sensors is provided in the following literature for example:
SINAMICS S120 Function Manual Drive Functions
Remedy: - make sure that the sensor is connected correctly.
- replace the sensor.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY

A30930 (N) Power unit: Component trace has saved data

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: Trace data was saved in the component.
Remedy: Not necessary.
Note:
 For p7792= 1, the trace data of the component can be written to the memory card.
Reaction upon N: NONE
Acknowl. upon N: NONE

F30950 Power unit: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: An internal software error has occurred.
 Fault value (r0949, interpret decimal):
 Information about the fault source.
 Only for internal Siemens troubleshooting.
Remedy: - if necessary, upgrade the firmware in the power unit to a later version.
 - contact Technical Support.

A30999 (F, N) Power unit: Unknown alarm

Message value: New message: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm occurred on the power unit that cannot be interpreted by the Control Unit firmware.
 This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
 Alarm value (r2124, interpret decimal):
 Alarm number.
Note:
 If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.
Remedy: - replace the firmware on the power unit by an older firmware version (r0128).
 - upgrade the firmware on the Control Unit (r0018).
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F31100 (N, A) Encoder 1: Zero mark distance error

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
 For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.
 The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
 Fault value (r0949, interpret decimal):
 Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
 The sign designates the direction of motion when detecting the zero mark distance.

13.2 List of faults and alarms

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - check the encoder type (encoder with equidistant zero marks).
 - adapt the parameter for the distance between zero marks (p0424, p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).
 - replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31101 (N, A) Encoder 1: Zero mark failed

Message value: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: The 1.5 x parameterized zero mark distance was exceeded.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - check the encoder type (encoder with equidistant zero marks).
 - adapt the parameter for the clearance between zero marks (p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).
 - when p0437.1 is active, check p4686.
 - replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31103 (N, A) Encoder 1: Signal level zero mark (track R) outside tolerance

Message value: R track: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

- Cause:** The zero mark signal level (track R) does not lie within the tolerance bandwidth for encoder 1.
 The fault can be initiated when the unipolar voltage level is exceeded (RP/RN) or if the differential amplitude is undershot.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxx hex: yyyy = 0, xxxx = Signal level, track R (16 bits with sign)
 The response thresholds of the unipolar signal levels of the encoder are between < 1400 mV and > 3500 mV.
 The response threshold for the differential signal level of the encoder is < -1600 mV.
 A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
 Note:
 The analog value of the amplitude error is not measured at the same time with the hardware fault output by the Sensor Module.
 The fault value can only be represented between -32768 ... 32767 dec (-770 ... 770 mV).
 The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
 - monitoring active (p0437.31 = 1).
- Remedy:**
- check the speed range; frequency characteristic (amplitude characteristic) of the measuring equipment might not be sufficient for the speed range
 - check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections and contacts of the encoder cable.
 - check the encoder type (encoder with zero marks).
 - check whether the zero mark is connected and the signal cables RP and RN have been connected correctly (not connected with the incorrect polarity).
 - replace the encoder cable.
 - if the coding disk is soiled or the lighting aged, replace the encoder.
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31110 (N, A) Encoder 1: Serial communications error

- Message value:** Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: Serial communication protocol transfer error between the encoder and evaluation module.
Fault value (r0949, interpret binary):
Bit 0: Alarm bit in the position protocol.
Bit 1: Incorrect quiescent level on the data line.
Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
Bit 4: Encoder acknowledgment error: The encoder incorrectly understood the task (request) or cannot execute it.
Bit 5: Internal error in the serial driver: An illegal mode command was requested.
Bit 6: Timeout when cyclically reading.
Bit 7: Timeout for the register communication.
Bit 8: Protocol is too long (e.g. > 64 bits).
Bit 9: Receive buffer overflow.
Bit 10: Frame error when reading twice.
Bit 11: Parity error.
Bit 12: Data line signal level error during the monoflop time.
Bit 13: Data line incorrect.
Bit 14: Fault for the register communication.
Bit 15: Internal communication error.

Note:

For an EnDat 2.2 encoder, the significance of the fault value for F3x135 (x = 1, 2, 3) is described.

Remedy:

For fault value, bit 0 = 1:
- Enc defect F31111 may provide additional details.
For fault value, bit 1 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 2 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 3 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable.
For fault value, bit 4 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 5 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 6 = 1:
- Update Sensor Module firmware.
For fault value, bit 7 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 8 = 1:
- check parameterization (p0429.2).
For fault value, bit 9 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 10 = 1:
- check parameterization (p0429.2, p0449).
For fault value, bit 11 = 1:
- check parameterization (p0436).
For fault value, bit 12 = 1:
- check parameterization (p0429.6).
For fault value, bit 13 = 1:
- check data line.
For fault value, bit 14 = 1:
- incorrect encoder type / replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31111 (N, A) Encoder 1: Encoder signals an internal error (detailed information)

Message value: Fault cause: %1 bin, additional information: %2

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The encoder error word provides detailed information (error bit).
 For p0404.8 = 0, the following applies:
 Fault value for internal Siemens troubleshooting.
 For p0404.8 = 1, the following applies:
 Fault value (r0949, interpret binary):
 yyyyxxxx hex: yyyy = supplementary information, xxxx = fault cause
 yyyy = 0:
 Bit 0: Lighting system failed.
 Bit 1: Signal amplitude too low.
 Bit 2: Position value incorrect.
 Bit 3: Encoder power supply overvoltage condition.
 Bit 4: Encoder power supply undervoltage condition.
 Bit 5: Encoder power supply overcurrent condition.
 Bit 6: The battery must be changed.

Remedy: For yyyy = 0:
 For fault value, bit 0 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 1 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 2 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 3 = 1:
 5 V power supply voltage fault.
 When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
 When a motor encoder with a direct DRIVE-CLiQ connection is used: Replace the motor.
 For fault value, bit 4 = 1:
 5 V power supply voltage fault.
 When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
 When using a motor with DRIVE-CLiQ: Replace the motor.
 For fault value, bit 5 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 6 = 1:
 The battery must be changed (only for encoders with battery back-up).
 For yyyy = 1:
 Encoder is defective. Replace encoder.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31112 (N, A) Encoder 1: Encoder signals an internal error

Message value: %1

Drive object: All objects

13.2 List of faults and alarms

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The encoder signals an internal error via serial protocol.
Fault value (r0949, interpret binary):
Bit 0: Fault bit in the position protocol.
Remedy: For fault value, bit 0 = 1:
In the case of an EnDat encoder, F31111 may provide further details.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31115 (N, A) Encoder 1: Signal level track A or B too low

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The signal level (root from $A^2 + B^2$) of the encoder falls below the permissible limit value.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response threshold is < 170 mV (input frequency <= 256 kHz) or < 120 mV (input frequency > 256 kHz).
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1070 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- check the Sensor Module (e.g. contacts).
The following applies to measuring systems without their own bearing system:
- adjust the scanning head and check the bearing system of the measuring wheel.
The following applies for measuring systems with their own bearing system:
- ensure that the encoder housing is not subject to any axial force.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31116 (N, A) Encoder 1: Signal level track A or B too low

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY

- Cause:** The signal level of the rectified encoder signals A and B of the encoder fall below the permissible limit value.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxxx hex:
 yyyy = Signal level, track B (16 bits with sign).
 xxxx = Signal level, track A (16 bits with sign).
 The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
 The response threshold is < 130 mV.
 A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
 Note:
 The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
- Remedy:**
- check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31117 (N, A) Encoder 1: Inversion error signals A/B/R

- Message value:** Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
- Cause:** For a square-wave encoder (bipolar, double ended) signals A*, B* and R* are not inverted with respect to signals A, B and R.
 Fault value (r0949, interpret binary):
 Bits 0 ... 15: Only for internal Siemens troubleshooting.
 Bit 16: Error track A.
 Bit 17: Error track B.
 Bit 18: Error track R.
 Note:
 For SMC30 (only Article No. 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1), CUA32, and CU310, the following applies:
 A square-wave encoder without track R is used and track monitoring (p0405.2 = 1) is activated.
- Remedy:**
- check the encoder/cable.
 - Does the encoder supply signals and the associated inverted signals?
- Note:
 For SMC30 (only Article Number 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1), the following applies:
 - check the setting of p0405 (p0405.2 = 1 is only possible if the encoder is connected at X520).
 For a square-wave encoder without track R, the following jumpers must be set for the connection at X520 (SMC30) or X23 (CUA32, CU310):
- pin 10 (reference signal R) <--> pin 7 (encoder power supply, ground)
 - pin 11 (reference signal R inverted) <--> pin 4 (encoder power supply)
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31118 (N, A) Encoder 1: Speed change not plausible

Message value: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: For an HTL/TTL encoder, the speed change has exceeded the value in p0492 over several sampling cycles. The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time. Encoder 1 is used as motor encoder and can be effective has fault response to change over to encoderless operation. Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the maximum speed difference per sampling cycle (p0492).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31120 (N, A) Encoder 1: Encoder power supply fault

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: An encoder power supply fault was detected. Fault value (r0949, interpret binary):
Bit 0: Undervoltage condition on the sense line.
Bit 1: Overcurrent condition for the encoder power supply.
Bit 2: Overcurrent condition for encoder power supply on cable resolver excitation negative.
Bit 3: Overcurrent condition for encoder power supply on cable resolver excitation positive.
Bit 4: The 24 V power supply through the Power Module (PM) is overloaded.
Bit 5: Overcurrent at the EnDat connection of the converter.
Bit 6: Overvoltage at the EnDat connection of the converter.
Bit 7: Hardware fault at the EnDat connection of the converter.
Note:
If the encoder cables 6FX2002-2EQ00-.... and 6FX2002-2CH00-.... are interchanged, this can result in the encoder being destroyed because the pins of the operating voltage are reversed.

Remedy:

- For fault value, bit 0 = 1:
 - correct encoder cable connected?
 - check the plug connections of the encoder cable.
 - SMC30: Check the parameterization (p0404.22).
- For fault value, bit 1 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 2 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 3 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 5 = 1:
 - Measuring unit correctly connected at the converter?
 - Replace the measuring unit or the cable to the measuring unit.
- For fault value, bit 6, 7 = 1:
 - Replace the defective EnDat 2.2 converter.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31121 (N, A) Encoder 1: Determined commutation position incorrect

Message value: -
Drive object: All objects
Reaction: Servo: ENCODER (NONE)
Acknowledge: PULSE INHIBIT
Cause: A commutation position actual value sensing error was detected.
Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31122 Encoder 1: Sensor Module hardware fault

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER
Acknowledge: IMMEDIATELY
Cause: An internal Sensor Module hardware fault was detected.
 Fault value (r0949, interpret decimal):
 1: Reference voltage error.
 2: Internal undervoltage.
 3: Internal overvoltage.
Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

F31123 (N, A) Encoder 1: Signal level A/B outside tolerance

Message value: Fault cause: %1 bin
Drive object: All objects

13.2 List of faults and alarms

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The unipolar level (AP/AN or BP/BN) for encoder 1 is outside the permissible tolerance.
Fault value (r0949, interpret binary):
Bit 0 = 1: Either AP or AN outside the tolerance.
Bit 16 = 1: Either BP or BN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note:
The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).
Remedy:
- make sure that the encoder cables and shielding are installed in an EMC-compliant manner.
- check the plug connections and contacts of the encoder cable.
- check the short-circuit of a signal cable with mass or the operating voltage.
- replace the encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31125 (N, A) Encoder 1: Signal level track A or B too high

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The signal level (root from $A^2 + B^2$) of the encoder exceeds the permissible limit value.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response threshold is > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms).
The response threshold is > 3582 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31126 (N, A) Encoder 1: Signal level track A or B too high

Message value: Amplitude: %1, Angle: %2

Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The signal level ($|A| + |B|$) of the encoder exceeds the permissible limit value.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxx hex:
 yyyy = Angle
 xxxx = amplitude, i.e. root of $A^2 + B^2$ (16 bits without sign)
 The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
 The response threshold for ($|A| + |B|$) is > 1120 mV or the root of $(A^2 + B^2) > 955$ mV.
 A signal level of 500 mV peak value corresponds to the numerical value of 299A hex = 10650 dec.
 The angle 0 ... FFFF hex corresponds to 0 ... 360 degrees of the fine position. Zero degrees is present at the negative zero crossover of track B.
 Note:
 The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy: - check that the encoder cables and shielding are routed in compliance with EMC.
 - replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31129 (N, A) Encoder 1: Position difference hall sensor/track C/D and A/B too large

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The error for track C/D is greater than $\pm 15^\circ$ mechanical or $\pm 60^\circ$ electrical or the error for the Hall signals is greater than $\pm 60^\circ$ electrical.
 One period of track C/D corresponds to 360° mechanical.
 One period of the Hall signal corresponds to 360° electrical.
 The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
 After the fine synchronization using one reference mark or 2 reference marks for distance-coded encoders, this fault is no longer initiated, but instead, Alarm A31429.
 Fault value (r0949, interpret decimal):
 For track C/D, the following applies:
 Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1°).
 For Hall signals, the following applies:
 Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1°).
Remedy: - track C or D not connected.
 - correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
 - check that the encoder cables are routed in compliance with EMC.
 - check the adjustment of the Hall sensor.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31130 (N, A) Encoder 1: Zero mark and position error from the coarse synchronization

Message value: Angular deviation, electrical: %1, angle, mechanical: %2

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: After initializing the pole position using track C/D, Hall signals or pole position identification routine, the zero mark was detected outside the permissible range. For distance-coded encoders, the test is carried out after passing 2 zero marks. Fine synchronization was not carried out.

When initializing via track C/D (p0404) then it is checked whether the zero mark occurs in an angular range of +/-18 ° mechanical.

When initializing via Hall sensors (p0404) or pole position identification (p1982) it is checked whether the zero mark occurs in an angular range of +/-60 ° electrical.

Fault value (r0949, interpret hexadecimal):

yyyyxxxx hex

yyyy: Determined mechanical zero mark position (can only be used for track C/D).

xxxx: Deviation of the zero mark from the expected position as electrical angle.

Scaling: 32768 dec = 180 °

- Remedy:**
- check p0431 and, if necessary, correct (trigger via p1990 = 1 if necessary).
 - check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - if the Hall sensor is used as an equivalent for track C/D, check the connection.
 - check the connection of track C or D.
 - replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31131 (N, A) Encoder 1: Position deviation incremental/absolute too high

Message value: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: Absolute encoder:

When cyclically reading the absolute position, an excessively high difference to the incremental position was detected. The absolute position that was read is rejected.

Limit value for the deviation:

- EnDat encoder: Is supplied from the encoder and is a minimum of 2 quadrants (e.g. EQI 1325 > 2 quadrants, EQN 1325 > 50 quadrants).

- other encoders: 15 pulses = 60 quadrants.

Incremental encoder:

When the zero pulse is passed, a deviation in the incremental position was detected.

For equidistant zero marks, the following applies:

- the first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.

For distance-coded zero marks, the following applies:

- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.

Fault value (r0949, interpret decimal):

Deviation in quadrants (1 pulse = 4 quadrants).

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check whether the coding disk is dirty or there are strong ambient magnetic fields.
 - adapt the parameter for the clearance between zero marks (p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31135 Encoder 1: Fault when determining the position (single turn)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: The encoder has identified a position determination fault (singleturn) and supplies status information bit by bit in an internal status/fault word.

Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.

Note regarding the bit designation:

The first designation is valid for DRIVE-CLiQ encoders, the second for EnDat 2.2 encoders.

Fault value (r0949, interpret binary):

Bit 0: F1 (safety status display).

Bit 1: F2 (safety status display).

Bit 2: Reserved (lighting).

Bit 3: Reserved (signal amplitude).

Bit 4: Reserved (position value).

Bit 5: Reserved (overvoltage).

Bit 6: Reserved (undervoltage)/hardware fault EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 7: Reserved (overcurrent)/EnDat encoder withdrawn when not in the parked state (--> F3x110, x = 1, 2, 3).

Bit 8: Reserved (battery)/overcurrent EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 9: Reserved/overvoltage EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 11: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 12: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 13: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 14: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 15: Internal communication error (--> F3x110, x = 1, 2, 3).

Bit 16: Lighting (--> F3x135, x = 1, 2, 3).

Bit 17: Signal amplitude (--> F3x135, x = 1, 2, 3).

Bit 18: Singleturn position 1 (--> F3x135, x = 1, 2, 3).

Bit 19: Overvoltage (--> F3x135, x = 1, 2, 3).

Bit 20: Undervoltage (--> F3x135, x = 1, 2, 3).

Bit 21: Overcurrent (--> F3x135, x = 1, 2, 3).

Bit 22: Temperature exceeded (--> F3x405, x = 1, 2, 3).

Bit 23: Singleturn position 2 (safety status display).

Bit 24: Singleturn system (--> F3x135, x = 1, 2, 3).

Bit 25: Singleturn power down (--> F3x135, x = 1, 2, 3).

Bit 26: Multiturn position 1 (--> F3x136, x = 1, 2, 3).

Bit 27: Multiturn position 2 (--> F3x136, x = 1, 2, 3).

Bit 28: Multiturn system (--> F3x136, x = 1, 2, 3).

Bit 29: Multiturn power down (--> F3x136, x = 1, 2, 3).

Bit 30: Multiturn overflow/underflow (--> F3x136, x = 1, 2, 3).

Bit 31: Multiturn battery (reserved).

Remedy: - determine the detailed cause of the fault using the fault value.

- replace the encoder if necessary.

Note:

An EnDat 2.2 encoder may only be removed and inserted in the "Park" state.

If an EnDat 2.2 encoder was removed when not in the "Park" state, then after inserting the encoder, a POWER ON (switch-off/switch-on) is necessary to acknowledge the fault.

F31136 Encoder 1: Fault when determining the position (multiturn)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The encoder has identified a position determination fault (multiturn) and supplies status information bit by bit in an internal status/fault word.
 Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.
 Note regarding the bit designation:
 The first designation is valid for DRIVE-CLiQ encoders, the second for EnDat 2.2 encoders.
 Fault value (r0949, interpret binary):
 Bit 0: F1 (safety status display).
 Bit 1: F2 (safety status display).
 Bit 2: Reserved (lighting).
 Bit 3: Reserved (signal amplitude).
 Bit 4: Reserved (position value).
 Bit 5: Reserved (overvoltage).
 Bit 6: Reserved (undervoltage)/hardware fault EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 7: Reserved (overcurrent)/EnDat encoder withdrawn when not in the parked state (--> F3x110, x = 1, 2, 3).
 Bit 8: Reserved (battery)/overcurrent EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 9: Reserved/overvoltage EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 11: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 12: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 13: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 14: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 15: Internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 16: Lighting (--> F3x135, x = 1, 2, 3).
 Bit 17: Signal amplitude (--> F3x135, x = 1, 2, 3).
 Bit 18: Singleturn position 1 (--> F3x135, x = 1, 2, 3).
 Bit 19: Overvoltage (--> F3x135, x = 1, 2, 3).
 Bit 20: Undervoltage (--> F3x135, x = 1, 2, 3).
 Bit 21: Overcurrent (--> F3x135, x = 1, 2, 3).
 Bit 22: Temperature exceeded (--> F3x405, x = 1, 2, 3).
 Bit 23: Singleturn position 2 (safety status display).
 Bit 24: Singleturn system (--> F3x135, x = 1, 2, 3).
 Bit 25: Singleturn power down (--> F3x135, x = 1, 2, 3).
 Bit 26: Multiturn position 1 (--> F3x136, x = 1, 2, 3).
 Bit 27: Multiturn position 2 (--> F3x136, x = 1, 2, 3).
 Bit 28: Multiturn system (--> F3x136, x = 1, 2, 3).
 Bit 29: Multiturn power down (--> F3x136, x = 1, 2, 3).
 Bit 30: Multiturn overflow/underflow (--> F3x136, x = 1, 2, 3).
 Bit 31: Multiturn battery (reserved).

Remedy: - determine the detailed cause of the fault using the fault value.
 - replace the encoder if necessary.
 Note:
 An EnDat 2.2 encoder may only be removed and inserted in the "Park" state.
 If an EnDat 2.2 encoder was removed when not in the "Park" state, then after inserting the encoder, a POWER ON (switch-off/switch-on) is necessary to acknowledge the fault.

F31137 Encoder 1: Fault when determining the position (single turn)
Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: A position determination fault has occurred in the DRIVE-CLiQ encoder.
Fault value (r0949, interpret binary):
yyxxxxx hex: yy = encoder version, xxxxxx = bit coding of the fault cause

For yy = 8 (0000 1000 bin), the following applies:

- Bit 1: Signal monitoring (sin/cos).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: LED monitoring.
- Bit 17: Fault when determining the position (multiturn).
- Bit 23: Temperature outside the limit values.

For yy = 11 (0000 1011 bin), the following applies:

- Bit 0: Position word 1 difference between rotation counter and software counter (XC_ERR).
- Bit 1: Position word 1 track error of the incremental signals (LIS_ERR).
- Bit 2: Position word 1 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 3: Maximum permissible temperature exceeded (TEMP_ERR).
- Bit 4: Power supply overvoltage (MON_OVR_VOLT).
- Bit 5: Power supply overcurrent (MON_OVR_CUR).
- Bit 6: Power supply undervoltage (MON_UND_VOLT).
- Bit 7: Rotation error counter (MT_ERR).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 11: Position word 1 status bit: singleturn position OK (ADC_ready).
- Bit 12: Position word 1 status bit: rotation counter OK (MT_ready).
- Bit 13: Position word 1 memory error (MEM_ERR).
- Bit 14: Position word 1 absolute position error (MLS_ERR).
- Bit 15: position word 1 LED error, lighting unit error (LED_ERR).
- Bit 18: Position word 2 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 21: Position word 2 memory error (MEM_ERR).
- Bit 22: Position word 2 absolute position error (MLS_ERR).
- Bit 23: position word 2 LED error, lighting unit error (LED_ERR).

For yy = 12 (0000 1100 bin), the following applies:

- Bit 8: encoder fault.
- Bit 10: error in the internal position data transport.

For yy = 14 (0000 1110 bin), the following applies:

- Bit 0: Position word 1 temperature outside limit value.
- Bit 1: Position word 1 position determination error (multiturn).
- Bit 2: Position word 1 FPGA error.
- Bit 3: Position word 1 velocity error.
- Bit 4: Position word 1 communication error between FPGAs/error in the incremental signal.
- Bit 5: Position word 1 timeout absolute value/error when determining the position (singleturn).
- Bit 6: Position word 1 internal hardware fault (clock/power monitor IC/power).
- Bit 7: Position word 1 internal error (FPGA communication/FPGA parameterization/self-test/software).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: Position word 2 temperature outside limit value.
- Bit 17: Position word 2 position determination error (multiturn).
- Bit 18: Position word 2 FPGA error.
- Bit 19: Position word 2 velocity error.

Bit 20: Position word 2 communication error between FPGAs.
 Bit 21: Position word 2 position determination error (singleturn).
 Bit 22: Position word 2 internal hardware fault (clock/power monitor IC/power).
 Bit 23: Position word 2 internal error (self-test/software).

Note:

For an encoder version that is not described here, please contact the encoder manufacturer for more detailed information on the bit coding.

Remedy:

- determine the detailed cause of the fault using the fault value.
- if required, replace the DRIVE-CLiQ encoder.

F31138 Encoder 1: Fault when determining the position (multiturn)

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: A position determination fault has occurred in the DRIVE-CLiQ encoder.
Fault value (r0949, interpret binary):
yyxxxxx hex: yy = encoder version, xxxxxx = bit coding of the fault cause

For yy = 8 (0000 1000 bin), the following applies:

- Bit 1: Signal monitoring (sin/cos).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: LED monitoring.
- Bit 17: Fault when determining the position (multiturn).
- Bit 23: Temperature outside the limit values.

For yy = 11 (0000 1011 bin), the following applies:

- Bit 0: Position word 1 difference between rotation counter and software counter (XC_ERR).
- Bit 1: Position word 1 track error of the incremental signals (LIS_ERR).
- Bit 2: Position word 1 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 3: Maximum permissible temperature exceeded (TEMP_ERR).
- Bit 4: Power supply overvoltage (MON_OVR_VOLT).
- Bit 5: Power supply overcurrent (MON_OVR_CUR).
- Bit 6: Power supply undervoltage (MON_UND_VOLT).
- Bit 7: Rotation error counter (MT_ERR).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 11: Position word 1 status bit: singleturn position OK (ADC_ready).
- Bit 12: Position word 1 status bit: rotation counter OK (MT_ready).
- Bit 13: Position word 1 memory error (MEM_ERR).
- Bit 14: Position word 1 absolute position error (MLS_ERR).
- Bit 15: position word 1 LED error, lighting unit error (LED_ERR).
- Bit 18: Position word 2 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 21: Position word 2 memory error (MEM_ERR).
- Bit 22: Position word 2 absolute position error (MLS_ERR).
- Bit 23: position word 2 LED error, lighting unit error (LED_ERR).

For yy = 14 (0000 1110 bin), the following applies:

- Bit 0: Position word 1 temperature outside limit value.
- Bit 1: Position word 1 position determination error (multiturn).
- Bit 2: Position word 1 FPGA error.
- Bit 3: Position word 1 velocity error.
- Bit 4: Position word 1 communication error between FPGAs/error in the incremental signal.
- Bit 5: Position word 1 timeout absolute value/error when determining the position (singleturn).
- Bit 6: Position word 1 internal hardware fault (clock/power monitor IC/power).
- Bit 7: Position word 1 internal error (FPGA communication/FPGA parameterization/self-test/software).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: Position word 2 temperature outside limit value.
- Bit 17: Position word 2 position determination error (multiturn).
- Bit 18: Position word 2 FPGA error.
- Bit 19: Position word 2 velocity error.
- Bit 20: Position word 2 communication error between FPGAs.
- Bit 21: Position word 2 position determination error (singleturn).
- Bit 22: Position word 2 internal hardware fault (clock/power monitor IC/power).
- Bit 23: Position word 2 internal error (self-test/software).

Note:

For an encoder version that is not described here, please contact the encoder manufacturer for more detailed information on the bit coding.

Remedy: - determine the detailed cause of the fault using the fault value.
- if required, replace the DRIVE-CLiQ encoder.

F31142 (N, A) Encoder 1: Battery voltage fault

Message value: -
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: When switched-off, the encoder uses a battery to back up the multiturn information. The battery voltage is no longer sufficient to check the multiturn information.
Remedy: Replace battery.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31150 (N, A) Encoder 1: Initialization error

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: Encoder functionality selected in p0404 cannot be executed.
 Fault value (r0949, interpret hexadecimal):
 Encoder malfunction.
 The bit assignment corresponds to that of p0404 (e.g. bit 5 set: Error track C/D).
Remedy: - check that p0404 is correctly set.
 - check the encoder type used (incremental/absolute) and for SMCxx, the encoder cable.
 - if relevant, note additional fault messages that describe the fault in detail.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31151 (N, A) Encoder 1: Encoder speed for initialization AB too high

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The encoder speed is too high while initializing the Sensor Module.
Remedy: Reduce the speed of the encoder accordingly during initialization.
 If necessary, deactivate monitoring (p0437.29).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31152 (N, A) Encoder 1: Max. signal frequency (track A/B) exceeded

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The maximum signal frequency of the encoder evaluation has been exceeded.
Fault value (r0949, interpret decimal):
Actual signal frequency in Hz.
Remedy:
- reduce the speed.
- Use an encoder with a lower pulse number (p0408).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31153 (N, A) Encoder 1: Identification error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: An error has occurred when identifying the encoder (waiting) p0400 = 10100.
The connected encoder was not able to be identified.
Fault value (r0949, interpret hexadecimal):
Bit 0: Data length incorrect.
Remedy: Manually configure the encoder according to the data sheet.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31160 (N, A) Encoder 1: Analog sensor channel A failed

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the measuring range set in (p4673).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy:
For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4673).
For fault value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE

Acknowl. upon A: NONE

F31161 (N, A) Encoder 1: Analog sensor channel B failed

Message value: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the selected measuring range (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).

Remedy: For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4675).
For fault value = 3:
- check the range limit setting and increase it if necessary (p4676).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31163 (N, A) Encoder 1: Analog sensor position value exceeds limit value

Message value: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
Fault value (r0949, interpret decimal):
1: Position value from the LVDT sensor.
2: Position value from the encoder characteristic.

Remedy: For fault value = 1:
- check the LVDT ratio (p4678).
- check the reference signal connection at track B.
For fault value = 2:
- check the coefficients of the characteristic (p4663 ... p4666).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A31400 (F, N) Encoder 1: Zero mark distance error (alarm threshold exceeded)

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Alarm value (r2124, interpret decimal):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31401 (F, N) Encoder 1: Zero mark failed (alarm threshold exceeded)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The 1.5x parameterized zero mark distance was exceeded without a zero mark being detected.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Alarm value (r2124, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the clearance between zero marks (p0425).
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F31405 (N, A) Encoder 1: Temperature in the encoder evaluation exceeded

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The encoder evaluation for a motor with DRIVE-CLiQ has detected an excessively high temperature.
The fault threshold is 125 ° C.
Fault value (r0949, interpret decimal):
Measured module temperature [0.1 °C].

Remedy: Reduce the ambient temperature for the DRIVE-CLiQ connection of the motor.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A31407 (F, N) Encoder 1: Function limit reached

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The encoder has reached one of its function limits. A service is recommended.
 Alarm value (r2124, interpret decimal):
 1: Incremental signals
 3: Absolute track
 4: Code connection
Remedy: Perform service. Replace the encoder if necessary.
 Note:
 The actual functional reserve of an encoder can be displayed via r4651.
Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31410 (F, N) Encoder 1: Communication error (encoder and Sensor Module)

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Serial communication protocol transfer error between the encoder and evaluation module.
 Alarm value (r2124, interpret binary):
 Bit 0: Alarm bit in the position protocol.
 Bit 1: Incorrect quiescent level on the data line.
 Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
 Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
 Bit 4: Encoder acknowledgment error: The encoder incorrectly understood the task (request) or cannot execute it.
 Bit 5: Internal error in the serial driver: An illegal mode command was requested.
 Bit 6: Timeout when cyclically reading.
 Bit 8: Protocol is too long (e.g. > 64 bits).
 Bit 9: Receive buffer overflow.
 Bit 10: Frame error when reading twice.
 Bit 11: Parity error.
 Bit 12: Data line signal level error during the monoflop time.
Remedy:
 - check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace encoder.
Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31411 (F, N) Encoder 1: Encoder signals an internal alarm (detailed information)

Message value: Fault cause: %1 bin, additional information: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: The absolute encoder fault word includes alarm bits that have been set.
Alarm value (r2124, interpret binary):
yyyyxxxx hex: yyyy = supplementary information, xxxx = fault cause
yyyy = 0:
Bit 0: Frequency exceeded (speed too high).
Bit 1: Temperature exceeded.
Bit 2: Control reserve, lighting system exceeded.
Bit 3: Battery discharged.
Bit 4: Reference point passed.
yyyy = 1:
Bit 0: Signal amplitude outside the control range.
Bit 1: Error multiturn interface
Bit 2: Internal data error (singleturn/multiturn not with single steps).
Bit 3: Error EEPROM interface.
Bit 4: SAR_converter error.
Bit 5: Fault for the register data transfer.
Bit 6: Internal error identified at the error pin (nErr).
Bit 7: Temperature threshold exceeded or fallen below.

Remedy: Replace encoder.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31412 (F, N) Encoder 1: Encoder signals an internal alarm

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The encoder signals an internal alarm via serial protocol.
Alarm value (r2124, interpret binary):
Bit 0: Fault bit in the position protocol.
Bit 1: Alarm bit in the position protocol.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace encoder.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31414 (F, N) Encoder 1: Signal level track C or D out of tolerance

Message value: C track: %1, D track: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

- Cause:** The signal level ($C^2 + D^2$) of track C or D of the encoder or from the Hall signals, is not within the tolerance bandwidth.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track D (16 bits with sign).
xxxx = Signal level, track C (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV $-25/+20$ %).
The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note:
If the amplitude is not within the tolerance bandwidth, then it cannot be used to initialize the start position.
- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
 - check the Hall sensor box.
- Reaction upon F:** Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

N31415 (F, A) Encoder 1: Signal level track A or B outside tolerance (alarm)

- Message value:** Amplitude: %1, Angle: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
- Cause:** The signal level (root from $A^2 + B^2$) of the encoder is outside the permissible tolerance.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Angle
xxxx = amplitude, i.e. root of $A^2 + B^2$ (16 bits without sign)
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV $-25/+20$ %).
The response threshold is < 230 mV (observe the frequency response of the encoder).
A signal level of 500 mV peak value corresponds to the numerical value 299A hex = 10650 dec.
The angle 0 ... FFFF hex corresponds to 0 ... 360 degrees of the fine position. Zero degrees is present at the negative zero crossover of track B.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1414 mV (1.0 Vrms).
A signal level of 2900 mV peak value corresponds to the numerical value 3333 hex = 13107 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
- Remedy:**
- check the speed range, frequency characteristic (amplitude characteristic) of the measuring equipment is not sufficient for the speed range.
 - check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
 - if the coding disk is soiled or the lighting aged, replace the encoder.
- Reaction upon F:** Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon A: NONE

Acknowl. upon A: NONE

A31418 (F, N) Encoder 1: Speed change not plausible (alarm)

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: For an HTL/TTL encoder, the speed change has exceeded the value in p0492 over several sampling cycles.
The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the setting of p0492.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A31419 (F, N) Encoder 1: Track A or B outside tolerance

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The amplitude/phase/offset correction for track A or B is at the limit.
Amplitude error correction: Amplitude B / Amplitude A = 0.78 ... 1.27
Phase: <84 degrees or >96 degrees
SMC20: Offset correction: +/-140 mV
SMC10: Offset correction: +/-650 mV
Alarm value (r2124, interpret hexadecimal):
xxxx1: Minimum of the offset correction, track B
xxxx2: Maximum of the offset correction, track B
xxx1x: Minimum of the offset correction, track A
xxx2x: Maximum of the offset correction, track A
xx1xx: Minimum of the amplitude correction, track B/A
xx2xx: Maximum of the amplitude correction, track B/A
x1xxx: Minimum of the phase error correction
x2xxx: Maximum of the phase error correction
1xxxx: Minimum of the cubic correction
2xxxx: Maximum of the cubic correction

Remedy:

- check mechanical mounting tolerances for encoders without their own bearings (e.g. toothed-wheel encoders).
- check the plug connections (also the transition resistance).
- check the encoder signals.
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A31421 (F, N) Encoder 1: Determined commutation position incorrect (alarm)

| | |
|-------------------------|--|
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | A commutation position actual value sensing error was detected. Alarm value (r2124, interpret decimal): 3: The absolute position of the serial protocol and track A/B differ by half an encoder pulse. The absolute position must have its zero position in the quadrants in which both tracks are negative. In the case of a fault, the position can be incorrect by one encoder pulse. |
| Remedy: | For alarm value = 3: - For a standard encoder with cable, contact the manufacturer where relevant. - correct the assignment of the tracks to the position value that is serially transferred. To do this, the two tracks must be connected, inverted, at the Sensor Module (interchange A with A* and B with B*) or, for a programmable encoder, check the zero offset of the position. |
| Reaction upon F: | Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2) |
| Acknowl. upon F: | IMMEDIATELY |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

A31422 (F, N) Encoder 1: Pulses per revolution square-wave encoder outside tolerance bandwidth

| | |
|-------------------------|--|
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | The measured zero mark distance does not correspond to the parameterized zero mark distance. This alarm is triggered with active square-wave encoder PPR correction and re-parameterized fault 31131 if the accumulator contains larger values than p4683 or p4684. The zero mark distance for zero mark monitoring is set in p0425 (rotary encoder). Alarm value (r2124, interpret decimal): accumulated differential pulses in encoder pulses. |
| Remedy: | - check that the encoder cables are routed in compliance with EMC. - check the plug connections. - check the encoder type (encoder with equidistant zero marks). - adapt the parameter for the distance between zero marks (p0424, p0425). - replace the encoder or encoder cable. |
| Reaction upon F: | Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2) |
| Acknowl. upon F: | IMMEDIATELY |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

A31429 (F, N) Encoder 1: Position difference hall sensor/track C/D and A/B too large

| | |
|-----------------------|-------------|
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | NONE |

13.2 List of faults and alarms

Cause: The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical.
One period of track C/D corresponds to 360 ° mechanical.
One period of the Hall signal corresponds to 360 ° electrical.
The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
Alarm value (r2124, interpret decimal):
For track C/D, the following applies:
Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).
For Hall signals, the following applies:
Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °).

Remedy:

- track C or D not connected.
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
- check that the encoder cables are routed in compliance with EMC.
- check the adjustment of the Hall sensor.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31431 (F, N) Encoder 1: Position deviation incremental/absolute too high (alarm)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: When the zero pulse is passed, a deviation in the incremental position was detected.
For equidistant zero marks, the following applies:
- the first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.
For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.
Alarm value (r2124, interpret decimal):
Deviation in quadrants (1 pulse = 4 quadrants).

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- Clean coding disk or remove strong magnetic fields.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31432 (F, N) Encoder 1: Rotor position adaptation corrects deviation

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: On track A/B, pulses have been lost or too many have been counted. These pulses are presently being corrected.
Alarm value (r2124, interpret decimal):
Last measured deviation of zero mark in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- check encoder limit frequency.
- adapt the parameter for the distance between zero marks (p0424, p0425).

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A31442 (F, N) Encoder 1: Battery voltage alarm threshold reached

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: When switched-off, the encoder uses a battery to back up the multiturn information. The multiturn information can no longer be buffered if the battery voltage drops even further.

Remedy: Replace battery.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A31443 (F, N) Encoder 1: Signal level track C/D outside tolerance (alarm)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The unipolar level (CP/CN or DP/DN) for encoder 1 is outside the permissible tolerance.
Alarm value (r2124, interpret binary):
Bit 0 = 1: Either CP or CN outside the tolerance.
Bit 16 = 1: Either DP or DN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note:
The signal level is not evaluated unless the following conditions are satisfied:

- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).

Remedy:

- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections and contacts of the encoder cable.
- are the C/D tracks connected correctly (have the signal cables CP and CN or DP and DN been interchanged)?
- replace the encoder cable.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A31460 (N) Encoder 1: Analog sensor channel A failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside measuring range set in p4673.
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For alarm value = 1:
- check the output voltage of the analog sensor.
For alarm value = 2:
- check the voltage setting for each encoder period (p4673).
For alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE

A31461 (N) Encoder 1: Analog sensor channel B failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the selected measuring range (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For alarm value = 1:
- check the output voltage of the analog sensor.
For alarm value = 2:
- check the voltage setting for each encoder period (p4675).
For alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE

A31462 (N) Encoder 1: Analog sensor no channel active

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Channel A and B are not activated for the analog sensor.
Remedy: - activate channel A and/or channel B (p4670).
- check the encoder configuration (p0404.17).
Reaction upon N: NONE
Acknowl. upon N: NONE

A31463 (N) Encoder 1: Analog sensor position value exceeds limit value

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
 Alarm value (r2124, interpret decimal):
 1: Position value from the LVDT sensor.
 2: Position value from the encoder characteristic.
Remedy: For alarm value = 1:
 - check the LVDT ratio (p4678).
 - check the reference signal connection at track B.
 For alarm value = 2:
 - check the coefficients of the characteristic (p4663 ... p4666).
Reaction upon N: NONE
Acknowl. upon N: NONE

A31470 (F, N) Encoder 1: Encoder signals an internal error (X521.7)

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For the Sensor Module Cabinet 30 (SMC30), a dirty encoder is signaled via a 0 signal at terminal X521.7.
Remedy: - check the plug connections.
 - replace the encoder or encoder cable.
Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F31500 (N, A) Encoder 1: Position tracking traversing range exceeded

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: For a configured linear axis without modulo correction, the drive/encoder has exceeded the maximum possible traversing range. The value should be read in p0412 and interpreted as the number of motor revolutions.
 For p0411.0 = 1, the maximum traversing range for the configured linear axis is defined to be 64x (+/- 32x) of p0421.
 For p0411.3 = 1, the maximum traversing range for the configured linear axis is preset (default value) to the highest possible value and is +/-p0412/2 (rounded off to complete revolutions). The highest possible value depends on the pulse number (p0408) and the fine resolution (p0419).
Remedy: The fault should be resolved as follows:
 - select encoder commissioning (p0010 = 4).
 - reset the position tracking as follows (p0411.2 = 1).
 - deselect encoder commissioning (p0010 = 0).
 The fault should then be acknowledged and the absolute encoder adjusted.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31501 (N, A) Encoder 1: Position tracking encoder position outside tolerance window

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: When switched off, the drive/encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder.
Fault value (r0949, interpret decimal):
Deviation (difference) to the last encoder position in increments of the absolute value.
The sign designates the traversing direction.
Note:
The deviation (difference) found is also displayed in r0477.
Remedy: Reset the position tracking as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).
See also: p0010
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31502 (N, A) Encoder 1: Encoder with measuring gear without valid signals

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The encoder with measuring gear no longer provides any valid signals.
Remedy: It must be ensured that all of the encoders, with mounted measuring gear, provide valid actual values in operation.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31503 (N, A) Encoder 1: Position tracking cannot be reset

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The position tracking for the measuring gear cannot be reset.
Remedy: The fault should be resolved as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and the absolute encoder adjusted.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE

Acknowl. upon A: NONE

A31700 Encoder 1: Functional safety monitoring initiated

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Functional safety was activated. Self-test of the DRIVE-CLiQ encoder has detected a fault.
Alarm value (r2124, interpret binary):
Bit x = 1: Effectivity test x unsuccessful.
Remedy: Replace encoder.

N31800 (F) Encoder 1: Group signal

Message value: -
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: NONE
Cause: The motor encoder has detected at least one fault.
Remedy: Evaluate the other messages that are presently available.
Reaction upon F: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowl. upon F: IMMEDIATELY

F31801 (N, A) Encoder 1 DRIVE-CLiQ: Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy:
- check the electrical cabinet design and cable routing for EMC compliance
- replace the component involved.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31802 (N, A) Encoder 1: Time slice overflow

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A time slice overflow has occurred in encoder 1.
Fault value (r0949, interpret hexadecimal):
yx hex: y = function involved (Siemens-internal fault diagnostics), x = time slice involved
x = 9:
Time slice overflow of the fast (current controller clock cycle) time slice.
x = A:
Time slice overflow of the average time slice.
x = C:
Time slice overflow of the slow time slice.
yx = 3E7:
Timeout when waiting for SYNO (e.g. unexpected return to non-cyclic operation).

Remedy: Increase the current controller sampling time
Note:
For a current controller sampling time = 31.25 µs, use an SMx20 with Article No. 6SL3055-0AA00-5xA3.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31804 (N, A) Encoder 1: Sensor Module checksum error

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: POWER ON (IMMEDIATELY)
Cause: A checksum error has occurred when reading-out the program memory on the Sensor Module.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex
yyyy: Memory area involved.
xxxx: Difference between the checksum at POWER ON and the actual checksum.

Remedy: - carry out a POWER ON (switch-off/switch-on).
- upgrade firmware to later version (>= V2.6 HF3, >= V4.3 SP2, >= V4.4).
- check whether the permissible ambient temperature for the component is maintained.
- replace the Sensor Module.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31805 (N, A) Encoder 1: EEPROM checksum error

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: Data in the EEPROM corrupted .
Fault value (r0949, interpret hexadecimal):
01: EEPROM access error.
02: Too many blocks in the EEPROM.

Remedy: Replace the module.

Reaction upon N: NONE
Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F31806 (N, A) Encoder 1: Initialization error

Message value: %1

Drive object: All objects

Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The encoder was not successfully initialized.

Fault value (r0949, interpret hexadecimal):

Bit 0, 1: Encoder initialization with the motor rotating has failed (deviation involving coarse and fine position in encoder pulses/4).

Bit 2: Mid-voltage matching for track A unsuccessful.

Bit 3: Mid-voltage matching for track B unsuccessful.

Bit 4: Mid-voltage matching for acceleration input unsuccessful.

Bit 5: Mid-voltage matching for track safety A unsuccessful.

Bit 6: Mid-voltage matching for track safety B unsuccessful.

Bit 7: Mid-voltage matching for track C unsuccessful.

Bit 8: Mid-voltage matching for track D unsuccessful.

Bit 9: Mid-voltage matching for track R unsuccessful.

Bit 10: The difference in mid-voltages between A and B is too great (> 0.5 V)

Bit 11: The difference in mid-voltages between C and D is too great (> 0.5 V)

Bit 12: The difference in mid-voltages between safety A and safety B is too great (> 0.5 V)

Bit 13: The difference in mid-voltages between A and safety B is too great (> 0.5 V)

Bit 14: The difference in mid-voltages between B and safety A is too great (> 0.5 V)

Bit 15: The standard deviation of the calculated mid-voltages is too great (> 0.3 V)

Bit 16: Internal fault - fault when reading a register (CAFE)

Bit 17: Internal fault - fault when writing a register (CAFE)

Bit 18: Internal fault: No mid-voltage matching available

Bit 19: Internal error - ADC access error.

Bit 20: Internal error - no zero crossover found.

Bit 28: Error while initializing the EnDat 2.2 measuring unit.

Bit 29: Error when reading out the data from the EnDat 2.2 measuring unit.

Bit 30: EEPROM checksum of the EnDat 2.2 measuring unit incorrect.

Bit 31: Data of the EnDat 2.2 measuring unit inconsistent.

Note:

Bit 0, 1: Up to 6SL3055-0AA00-5*A0

Bits 2 ... 20: 6SL3055-0AA00-5*A1 and higher

Remedy: Acknowledge fault.

If the fault cannot be acknowledged:

Bits 2 ... 9: Check encoder power supply.

Bits 2 ... 14: Check the corresponding cable.

Bit 15 with no other bits: Check track R, check settings in p0404.

Bit 28: Check the cable between the EnDat 2.2 converter and the measuring unit.

Bit 29 ... 31: Replace the defective measuring unit.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A31811 (F, N) Encoder 1: Encoder serial number changed

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The serial number of the motor encoder of a synchronous motor has changed. The change was only checked for encoders with serial number (e.g. EnDat encoders) and build-in motors (e.g. p0300 = 401) or third-party motors (p0300 = 2).
Cause 1:
- the encoder was replaced.
Cause 2:
- a third-party, built-in or linear motor was re-commissioned.
Cause 3:
- the motor with integrated and adjusted encoder was replaced.
Cause 4:
- the firmware was updated to a version that checks the encoder serial number.
Note:
With closed-loop position control, the serial number is accepted when starting the adjustment (p2507 = 2).
When the encoder is adjusted (p2507 = 3), the serial number is checked for changes and if required, the adjustment is reset (p2507 = 1).
Proceed as follows to hide serial number monitoring:
- set the following serial numbers for the corresponding Encoder Data Set: p0441= FF, p0442 = 0, p0443 = 0, p0444 = 0, p0445 = 0.
- parameterize F07414 as message type N (p2118, p2119).

Remedy: For causes 1, 2:
Carry out an automatic adjustment using the pole position identification routine. Acknowledge fault. Initiate the pole position identification routine with p1990 = 1. Then check that the pole position identification routine is correctly executed.
SERVO:
If a pole position identification technique is selected in p1980, and if p0301 does not contain a motor type with an encoder adjusted in the factory, then p1990 is automatically activated.
or
Set the adjustment via p0431. In this case, the new serial number is automatically accepted.
or
Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.
For causes 3, 4:
Accept the new serial number with p0440 = 1.

Reaction upon F: Servo: NONE (ENCODER, OFF2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

F31812 (N, A) Encoder 1: Requested cycle or RX-/TX timing not supported

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A cycle requested from the Control Unit or RX/TX timing is not supported.
Fault value (r0949, interpret decimal):
0: Application cycle is not supported.
1: DRIVE-CLiQ cycle is not supported.
2: Distance between RX and TX instants in time too low.
3: TX instant in time too early.

Remedy: Carry out a POWER ON (switch-off/switch-on) for all components.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31813 Encoder 1: Hardware logic unit failed

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The logic unit of the DRIVE-CLiQ encoder has failed.
 Fault value (r0949, interpret binary):
 Bit 0: ALU watchdog has responded.
 Bit 1: ALU has detected a sign-of-life error.
Remedy: When the error reoccurs, replace the encoder.

F31820 (N, A) Encoder 1 DRIVE-CLiQ: Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned.
 Fault cause:
 1 (= 01 hex):
 Checksum error (CRC error).
 2 (= 02 hex):
 Telegram is shorter than specified in the length byte or in the receive list.
 3 (= 03 hex):
 Telegram is longer than specified in the length byte or in the receive list.
 4 (= 04 hex):
 The length of the receive telegram does not match the receive list.
 5 (= 05 hex):
 The type of the receive telegram does not match the receive list.
 6 (= 06 hex):
 The address of the component in the telegram and in the receive list do not match.
 7 (= 07 hex):
 A SYNC telegram is expected - but the received telegram is not a SYNC telegram.
 8 (= 08 hex):
 No SYNC telegram is expected - but the received telegram is one.
 9 (= 09 hex):
 The error bit in the receive telegram is set.
 16 (= 10 hex):
 The receive telegram is too early.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy:
 - carry out a POWER ON (switch-off/switch-on).
 - check the electrical cabinet design and cable routing for EMC compliance
 - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

13.2 List of faults and alarms

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31835 (N, A) Encoder 1 DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned. The nodes do not send and receive in synchronism.
Fault cause:
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy:
- carry out a POWER ON.
- replace the component involved.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31836 (N, A) Encoder 1 DRIVE-CLiQ: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: Carry out a POWER ON.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31837 (N, A) Encoder 1 DRIVE-CLiQ: Component fault

Message value: Component number: %1, fault cause: %2

| | |
|-------------------------|--|
| Drive object: | All objects |
| Reaction: | Servo: ENCODER (IASC/DCBRK, NONE) |
| Acknowledge: | IMMEDIATELY |
| Cause: | Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded. Fault cause: 32 (= 20 hex): Error in the telegram header. 35 (= 23 hex): Receive error: The telegram buffer memory contains an error. 66 (= 42 hex): Send error: The telegram buffer memory contains an error. 67 (= 43 hex): Send error: The telegram buffer memory contains an error. Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause |
| Remedy: | - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). - check the electrical cabinet design and cable routing for EMC compliance - if required, use another DRIVE-CLiQ socket (p9904). - replace the component involved. |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F31845 (N, A) Encoder 1 DRIVE-CLiQ: Cyclic data transfer error

| | |
|-------------------------|--|
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | Servo: ENCODER (IASC/DCBRK, NONE) |
| Acknowledge: | IMMEDIATELY |
| Cause: | A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Fault cause: 11 (= 0B hex): Synchronization error during alternating cyclic data transfer. Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause |
| Remedy: | Carry out a POWER ON (switch-off/switch-on). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F31850 (N, A) Encoder 1: Encoder evaluation internal software error

| | |
|-----------------------|-----------------------------------|
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | Servo: ENCODER (IASC/DCBRK, NONE) |
| Acknowledge: | POWER ON |

13.2 List of faults and alarms

Cause: An internal software error has occurred in the Sensor Module of encoder 1.
Fault value (r0949, interpret decimal):
1: Background time slice is blocked.
2: Checksum over the code memory is not OK.
10000: OEM memory of the EnDat encoder contains data that cannot be interpreted.
11000 ... 11499: Descriptive data from EEPROM incorrect.
11500 ... 11899: Calibration data from EEPROM incorrect.
11900 ... 11999: Configuration data from EEPROM incorrect.
12000 ... 12008: communication with analog/digital converter faulted.
16000: DRIVE-CLiQ encoder initialization application error.
16001: DRIVE-CLiQ encoder initialization ALU error.
16002: DRIVE-CLiQ encoder HISI / SISI initialization error.
16003: DRIVE-CLiQ encoder safety initialization error.
16004: DRIVE-CLiQ encoder internal system error.

Remedy: - replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31851 (N, A) Encoder 1 DRIVE-CLiQ (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit.
The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - Upgrade the firmware of the component involved.
- carry out a POWER ON (switch-off/switch-on) for the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31860 (N, A) Encoder 1 DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY

| | |
|-------------------------|--|
| Cause: | <p>A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit.</p> <p>Fault cause:</p> <p>1 (= 01 hex): Checksum error (CRC error).</p> <p>2 (= 02 hex): Telegram is shorter than specified in the length byte or in the receive list.</p> <p>3 (= 03 hex): Telegram is longer than specified in the length byte or in the receive list.</p> <p>4 (= 04 hex): The length of the receive telegram does not match the receive list.</p> <p>5 (= 05 hex): The type of the receive telegram does not match the receive list.</p> <p>6 (= 06 hex): The address of the power unit in the telegram and in the receive list do not match.</p> <p>9 (= 09 hex): The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.</p> <p>16 (= 10 hex): The receive telegram is too early.</p> <p>17 (= 11 hex): CRC error and the receive telegram is too early.</p> <p>18 (= 12 hex): The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>19 (= 13 hex): The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>20 (= 14 hex): The length of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>21 (= 15 hex): The type of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>22 (= 16 hex): The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.</p> <p>25 (= 19 hex): The error bit in the receive telegram is set and the receive telegram is too early.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |
| Remedy: | <ul style="list-style-type: none"> - carry out a POWER ON (switch-off/switch-on). - check the electrical cabinet design and cable routing for EMC compliance - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F31875 (N, A) Encoder 1: power supply voltage failed

| | |
|-----------------------|---------------------------------------|
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | Servo: ENCODER (IASC/DCBRK, NONE) |
| Acknowledge: | IMMEDIATELY |

13.2 List of faults and alarms

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31885 (N, A) Encoder 1 DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit.
The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31886 (N, A) Encoder 1 DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:
- carry out a POWER ON.
- check whether the firmware version of the encoder (r0148) matches the firmware version of Control Unit (r0018).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31887 (N, A) Encoder 1 DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component involved (Sensor Module for encoder 1). Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
96 (= 60 hex):
Response received too late during runtime measurement.
97 (= 61 hex):
Time taken to exchange characteristic data too long.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31895 (N, A) Encoder 1 DRIVE-CLiQ (CU): Alternating cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: Carry out a POWER ON.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31896 (N, A) Encoder 1 DRIVE-CLiQ (CU): Inconsistent component properties

Message value: Component number: %1
Drive object: All objects
Reaction: Servo: OFF2 (ENCODER, IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: The properties of the DRIVE-CLiQ component (Sensor Module for encoder 1), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
Fault value (r0949, interpret decimal):
Component number.
Remedy:
- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31899 (N, A) Encoder 1: Unknown fault

Message value: New message: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A fault occurred on the Sensor Module for encoder 1 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Fault value (r0949, interpret decimal):
Fault number.
Note:
If required, the significance of this new fault can be read about in a more recent description of the Control Unit.
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A31902 (F, N) Encoder 1: SPI-BUS error occurred

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal SPI bus.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.
Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31903 (F, N) Encoder 1: I2C-BUS error occurred

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal I2C bus.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.
Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F31905 (N, A) Encoder 1: Encoder parameterization error

Message value: Parameter: %1, supplementary information: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An error was identified in the encoder parameterization.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, interpret decimal):
yyyyxxxx dec: yyyy = supplementary information, xxxx = parameter
xxxx = 421:
For an EnDat/SSI encoder, the absolute position in the protocol must be less than or equal to 30 bits.
yyyy = 0:
No additional information available.
yyyy = 1:
The component does not support HTL level (p0405.1 = 0) combined with track monitoring A/B <-> -A/B (p0405.2 = 1).
yyyy = 2:
A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please start a new encoder identification.
yyyy = 3:
A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please select a listed encoder in p0400 with a code number < 10000.
yyyy = 4:
This component does not support SSI encoders (p0404.9 = 1) without track A/B.
yyyy = 5:
For SQW encoder, value in p4686 greater than in p0425.
yyyy = 6:
DRIVE-CLiQ encoder cannot be used with this firmware version.
yyyy = 7:
For an SQW encoder, the XIST1 correction (p0437.2) is only permitted for equidistant zero marks.
yyyy = 8:
The motor pole pair width is not supported by the linear scale being used.
yyyy = 9:
The length of the position in the EnDat protocol may be a maximum of 32 bits.
yyyy = 10:
The connected encoder is not supported.
yyyy = 11:
The hardware does not support track monitoring.

Remedy: - check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.
- re parameter number = 314:
- check the pole pair number and measuring gear ratio. The quotient of the "pole pair number" divided by the "measuring gear ratio" must be less than or equal to 1000 ((r0313 * p0433) / p0432 <= 1000).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31912 Encoder 1: Device combination is not permissible

Message value: %1
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT

Cause: The selected device combination is not supported.
 Fault value (r0949, interpret decimal):
 1003:
 The connected measuring unit cannot be operated with the EnDat 2.2 converter. For instance, the measuring unit has a pulse number/resolution of 2^n .
 1005:
 The type of measuring unit (incremental) is not supported by the EnDat 2.2 converter.
 1006:
 The maximum duration of the EnDat transfer (31.25 μ s) was exceeded.
 2001:
 The set combination of current controller cycle, DP cycle and Safety cycle is not supported by the EnDat 2.2 converter.
 2002:
 The resolution of the linear measuring unit does not match the pole pair width of the linear motor
 Pole pair width, minimum = $p0422 * 2^{20}$

Remedy: For fault value = 1003, 1005, 1006:
 - Use a measuring unit that is permissible.
 For fault value = 2001:
 - set a permissible cycle combination (if required, use standard settings).
 For fault value = 2002:
 - Use a measuring unit with a lower resolution (p0422).

A31915 (F, N) Encoder 1: Encoder configuration error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The configuration for encoder 1 is incorrect.
 Alarm value (r2124, interpret decimal):
 1:
 Re-parameterization between fault/alarm is not permissible.
 419:
 When the fine resolution Gx_XIST2 is configured, the encoder identifies a maximum possible absolute position actual value (r0483) that can no longer be represented within 32 bits.

Remedy: For alarm value = 1:
 No re-parameterization between fault/alarm.
 For alarm value = 419:
 Reduce the fine resolution (p0419) or deactivate the monitoring (p0437.25), if the complete multiturn range is not required.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F31916 (N, A) Encoder 1: Encoder parameterization error

Message value: Parameter: %1, supplementary information: %2
Drive object: All objects
Reaction: Servo: ENCODER (IASC/DCBRK, NONE, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An encoder parameter was detected as being incorrect.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, interpret decimal):
Parameter number.

Remedy: - check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A31920 (F, N) Encoder 1: Temperature sensor fault (motor)

Message value: Fault cause: %1, channel number: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The motor detected a fault when evaluating the temperature sensor.
Fault cause:
1 (= 01 hex):
Wire breakage or sensor not connected.
KTY: R > 1630 Ohm, PT1000: R > 1720 Ohm
2 (= 02 hex):
Measured resistance too low.
PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT1000: R < 603 Ohm
Additional values:
Only for internal Siemens troubleshooting.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = channel number, xx = error cause

Remedy: - check that the encoder cable is the correct type and is correctly connected.
- check the temperature sensor selection in p0600 to p0603.
- replace the Sensor Module (hardware defect or incorrect calibration data).

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31930 (N) Encoder 1: Data logger has saved data

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: For the activated function "Data logger" (p0437.0 = 1) a fault has occurred with the Sensor Module. This alarm indicates that the diagnostics data corresponding to the fault was saved on the memory card.
 The diagnostics data is saved in the following folder:
 /USER/SINAMICS/DATA/SMTRC00.BIN
 ...
 /USER/SINAMICS/DATA/SMTRC07.BIN
 /USER/SINAMICS/DATA/SMTRCIDX.TXT
 The following information is contained in the TXT file:
 - Display of the last written BIN file.
 - Number of write operations that are still possible (from 10000 downwards).
Note:
 Only Siemens can evaluate the BIN files.

Remedy: Not necessary.
 This alarm is automatically withdrawn.
 The data logger is ready to record the next fault case.

Reaction upon N: NONE
Acknowl. upon N: NONE

A31940 (F, N) Encoder 1: Spindle sensor S1 voltage incorrect

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The voltage of analog sensor S1 is outside the permissible range.
 Alarm value (r2124, interpret decimal):
 Signal level from sensor S1.
Note:
 A signal level of 500 mV corresponds to the numerical value 500 dec.

Remedy:
 - check the clamped tool.
 - check the tolerance and if required, adapt (p5040).
 - check the thresholds and if required, adapt (p5041).
 - check analog sensor S1 and connections.

Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F31950 Encoder 1: Internal software error

Message value: %1
Drive object: All objects
Reaction: ENCODER (OFF2)
Acknowledge: POWER ON
Cause: An internal software error has occurred.
 Fault value (r0949, interpret decimal):
 The fault value contains information regarding the fault source.
 Only for internal Siemens troubleshooting.

Remedy:
 - if necessary, upgrade the firmware in the Sensor Module to a later version.
 - contact Technical Support.

A31999 (F, N) Encoder 1: Unknown alarm

Message value: New message: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A alarm has occurred on the Sensor Module for encoder 1 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Alarm value (r2124, interpret decimal):
Alarm number.
Note:
If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon F: Servo: NONE (ENCODER, IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F32100 (N, A) Encoder 2: Zero mark distance error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, interpret decimal):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.
Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).
- replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32101 (N, A) Encoder 2: Zero mark failed

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The 1.5 x parameterized zero mark distance was exceeded.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - check the encoder type (encoder with equidistant zero marks).
 - adapt the parameter for the clearance between zero marks (p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).
 - when p0437.1 is active, check p4686.
 - replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32103 (N, A) Encoder 2: Signal level zero track (track R) outside tolerance

Message value: R track: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: The zero mark signal level (track R) does not lie within the tolerance bandwidth for encoder 2.
The fault can be initiated when the unipolar voltage level is exceeded (RP/RN) or if the differential amplitude is undershot.
Fault value (r0949, interpret hexadecimal):

yyyyxxx hex: yyyy = 0, xxxx = Signal level, track R (16 bits with sign)

The response thresholds of the unipolar signal levels of the encoder are between < 1400 mV and > 3500 mV.

The response threshold for the differential signal level of the encoder is < -1600 mV.

A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.

Note:

The analog value of the amplitude error is not measured at the same time with the hardware fault output by the Sensor Module.

The fault value can only be represented between -32768 ... 32767 dec (-770 ... 770 mV).

The signal level is not evaluated unless the following conditions are satisfied:

- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).

- Remedy:**
- check the speed range; frequency characteristic (amplitude characteristic) of the measuring equipment might not be sufficient for the speed range
 - check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections and contacts of the encoder cable.
 - check the encoder type (encoder with zero marks).
 - check whether the zero mark is connected and the signal cables RP and RN have been connected correctly (not connected with the incorrect polarity).
 - replace the encoder cable.
 - if the coding disk is soiled or the lighting aged, replace the encoder.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32110 (N, A) Encoder 2: Serial communications error

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: Serial communication protocol transfer error between the encoder and evaluation module.
Fault value (r0949, interpret binary):
Bit 0: Alarm bit in the position protocol.
Bit 1: Incorrect quiescent level on the data line.
Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
Bit 4: Encoder acknowledgment error: The encoder incorrectly understood the task (request) or cannot execute it.
Bit 5: Internal error in the serial driver: An illegal mode command was requested.
Bit 6: Timeout when cyclically reading.
Bit 7: Timeout for the register communication.
Bit 8: Protocol is too long (e.g. > 64 bits).
Bit 9: Receive buffer overflow.
Bit 10: Frame error when reading twice.
Bit 11: Parity error.
Bit 12: Data line signal level error during the monoflop time.
Bit 13: Data line incorrect.
Bit 14: Fault for the register communication.
Bit 15: Internal communication error.

Note:

For an EnDat 2.2 encoder, the significance of the fault value for F3x135 (x = 1, 2, 3) is described.

Remedy:

For fault value, bit 0 = 1:
- Enc defect F31111 may provide additional details.
For fault value, bit 1 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 2 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 3 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable.
For fault value, bit 4 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 5 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 6 = 1:
- Update Sensor Module firmware.
For fault value, bit 7 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 8 = 1:
- check parameterization (p0429.2).
For fault value, bit 9 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 10 = 1:
- check parameterization (p0429.2, p0449).
For fault value, bit 11 = 1:
- check parameterization (p0436).
For fault value, bit 12 = 1:
- check parameterization (p0429.6).
For fault value, bit 13 = 1:
- check data line.
For fault value, bit 14 = 1:
- incorrect encoder type / replace the encoder or encoder cable.

Reaction upon N: NONE
Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32111 (N, A) Encoder 2: Encoder signals an internal error (detailed information)

Message value: Fault cause: %1 bin, additional information: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The encoder error word provides detailed information (error bit).
 For p0404.8 = 0, the following applies:
 Fault value for internal Siemens troubleshooting.
 For p0404.8 = 1, the following applies:
 Fault value (r0949, interpret binary):
 yyyyxxx hex: yyyy = supplementary information, xxx = fault cause
 yyyy = 0:
 Bit 0: Lighting system failed.
 Bit 1: Signal amplitude too low.
 Bit 2: Position value incorrect.
 Bit 3: Encoder power supply overvoltage condition.
 Bit 4: Encoder power supply undervoltage condition.
 Bit 5: Encoder power supply overcurrent condition.
 Bit 6: The battery must be changed.

Remedy: For yyyy = 0:
 For fault value, bit 0 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 1 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 2 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 3 = 1:
 5 V power supply voltage fault.
 When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
 When a motor encoder with a direct DRIVE-CLiQ connection is used: Replace the motor.
 For fault value, bit 4 = 1:
 5 V power supply voltage fault.
 When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
 When using a motor with DRIVE-CLiQ: Replace the motor.
 For fault value, bit 5 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 6 = 1:
 The battery must be changed (only for encoders with battery back-up).
 For yyyy = 1:
 Encoder is defective. Replace encoder.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32112 (N, A) Encoder 2: Encoder signals an internal error

Message value: %1

Drive object: All objects

13.2 List of faults and alarms

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The encoder signals a set error bit via the serial protocol.
Fault value (r0949, interpret binary):
Bit 0: Fault bit in the position protocol.
Remedy: For fault value, bit 0 = 1:
In the case of an EnDat encoder, F31111 may provide further details.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32115 (N, A) Encoder 2: Signal level track A or B too low

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The signal level (root from $A^2 + B^2$) of the encoder falls below the permissible limit value.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response threshold is < 170 mV (input frequency <= 256 kHz) or < 120 mV (input frequency > 256 kHz).
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1070 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- check the Sensor Module (e.g. contacts).
The following applies to measuring systems without their own bearing system:
- adjust the scanning head and check the bearing system of the measuring wheel.
The following applies for measuring systems with their own bearing system:
- ensure that the encoder housing is not subject to any axial force.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32116 (N, A) Encoder 2: Signal level track A or B too low

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

- Cause:** The signal level of the rectified encoder signals A and B of the encoder fall below the permissible limit value.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxxx hex:
 yyyy = Signal level, track B (16 bits with sign).
 xxxx = Signal level, track A (16 bits with sign).
 The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
 The response threshold is < 130 mV.
 A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
 Note:
 The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
- Remedy:**
- check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32117 (N, A) Encoder 2: Inversion error signals A/B/R

- Message value:** Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
- Cause:** For a square-wave encoder (bipolar, double ended) signals A*, B* and R* are not inverted with respect to signals A, B and R.
 Fault value (r0949, interpret binary):
 Bits 0 ... 15: Only for internal Siemens troubleshooting.
 Bit 16: Error track A.
 Bit 17: Error track B.
 Bit 18: Error track R.
 Note:
 For SMC30 (only Article No. 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1), CUA32, and CU310, the following applies:
 A square-wave encoder without track R is used and track monitoring (p0405.2 = 1) is activated.
- Remedy:**
- check the encoder/cable.
 - Does the encoder supply signals and the associated inverted signals?
- Note:
 For SMC30 (only Article Number 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1), the following applies:
 - check the setting of p0405 (p0405.2 = 1 is only possible if the encoder is connected at X520).
 For a square-wave encoder without track R, the following jumpers must be set for the connection at X520 (SMC30) or X23 (CUA32, CU310):
- pin 10 (reference signal R) <--> pin 7 (encoder power supply, ground)
 - pin 11 (reference signal R inverted) <--> pin 4 (encoder power supply)
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32118 (N, A) Encoder 2: Speed change not plausible

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: For an HTL/TTL encoder, the speed change has exceeded the value in p0492 over several sampling cycles. The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time. Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
Remedy:
- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the maximum speed difference per sampling cycle (p0492).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32120 (N, A) Encoder 2: Encoder power supply fault

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: An encoder power supply fault was detected. Fault value (r0949, interpret binary):
Bit 0: Undervoltage condition on the sense line.
Bit 1: Overcurrent condition for the encoder power supply.
Bit 2: Overcurrent condition for encoder power supply on cable resolver excitation negative.
Bit 3: Overcurrent condition for encoder power supply on cable resolver excitation positive.
Bit 4: The 24 V power supply through the Power Module (PM) is overloaded.
Bit 5: Overcurrent at the EnDat connection of the converter.
Bit 6: Overvoltage at the EnDat connection of the converter.
Bit 7: Hardware fault at the EnDat connection of the converter.
Note:
If the encoder cables 6FX2002-2EQ00-.... and 6FX2002-2CH00-.... are interchanged, this can result in the encoder being destroyed because the pins of the operating voltage are reversed.

Remedy:

- For fault value, bit 0 = 1:
 - correct encoder cable connected?
 - check the plug connections of the encoder cable.
 - SMC30: Check the parameterization (p0404.22).
- For fault value, bit 1 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 2 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 3 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 5 = 1:
 - Measuring unit correctly connected at the converter?
 - Replace the measuring unit or the cable to the measuring unit.
- For fault value, bit 6, 7 = 1:
 - Replace the defective EnDat 2.2 converter.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32121 (N, A) Encoder 2: Determined commutation position incorrect

Message value: -

Drive object: All objects

Reaction: OFF1 (NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: A commutation position actual value sensing error was detected.

Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32122 Encoder 2: Sensor Module hardware fault

Message value: %1

Drive object: All objects

Reaction: OFF1

Acknowledge: IMMEDIATELY

Cause: An internal Sensor Module hardware fault was detected.
 Fault value (r0949, interpret decimal):
 1: Reference voltage error.
 2: Internal undervoltage.
 3: Internal overvoltage.

Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

F32123 (N, A) Encoder 2: Signal level A/B outside tolerance

Message value: Fault cause: %1 bin

Drive object: All objects

13.2 List of faults and alarms

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The unipolar level (AP/AN or BP/BN) for encoder 2 is outside the permissible tolerance.
Fault value (r0949, interpret binary):
Bit 0 = 1: Either AP or AN outside the tolerance.
Bit 16 = 1: Either BP or BN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note:
The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).
Remedy:
- make sure that the encoder cables and shielding are installed in an EMC-compliant manner.
- check the plug connections and contacts of the encoder cable.
- check the short-circuit of a signal cable with mass or the operating voltage.
- replace the encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32125 (N, A) Encoder 2: Signal level track A or B too high

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The signal level (root from $A^2 + B^2$) of the encoder exceeds the permissible limit value.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response threshold is > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms).
The response threshold is > 3582 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32126 (N, A) Encoder 2: Signal level track A or B too high

Message value: Amplitude: %1, Angle: %2

| | |
|-------------------------|--|
| Drive object: | All objects |
| Reaction: | Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2) |
| Acknowledge: | PULSE INHIBIT |
| Cause: | <p>The signal level ($A + B$) of the encoder exceeds the permissible limit value.</p> <p>Fault value (r0949, interpret hexadecimal): yyyyxxx hex: yyyy = Angle xxxx = amplitude, i.e. root of $A^2 + B^2$ (16 bits without sign)</p> <p>The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).</p> <p>The response threshold for ($A + B$) is > 1120 mV or the root of ($A^2 + B^2$) > 955 mV.</p> <p>A signal level of 500 mV peak value corresponds to the numerical value of 299A hex = 10650 dec.</p> <p>The angle 0 ... FFFF hex corresponds to 0 ... 360 degrees of the fine position. Zero degrees is present at the negative zero crossover of track B.</p> <p>Note: The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.</p> |
| Remedy: | <ul style="list-style-type: none"> - check that the encoder cables and shielding are routed in compliance with EMC. - replace the encoder or encoder cable. |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F32129 (N, A) Encoder 2: Position difference hall sensor/track C/D and A/B too large

| | |
|-------------------------|---|
| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3) |
| Acknowledge: | PULSE INHIBIT |
| Cause: | <p>The error for track C/D is greater than $\pm 15^\circ$ mechanical or $\pm 60^\circ$ electrical or the error for the Hall signals is greater than $\pm 60^\circ$ electrical.</p> <p>One period of track C/D corresponds to 360° mechanical.</p> <p>One period of the Hall signal corresponds to 360° electrical.</p> <p>The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.</p> <p>After the fine synchronization using one reference mark or 2 reference marks for distance-coded encoders, this fault is no longer initiated, but instead, Alarm A32429.</p> <p>Fault value (r0949, interpret decimal): For track C/D, the following applies: Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1°).</p> <p>For Hall signals, the following applies: Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1°).</p> |
| Remedy: | <ul style="list-style-type: none"> - track C or D not connected. - correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D. - check that the encoder cables are routed in compliance with EMC. - check the adjustment of the Hall sensor. |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F32130 (N, A) Encoder 2: Zero mark and position error from the coarse synchronization

Message value: Angular deviation, electrical: %1, angle, mechanical: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: After initializing the pole position using track C/D, Hall signals or pole position identification routine, the zero mark was detected outside the permissible range. For distance-coded encoders, the test is carried out after passing 2 zero marks. Fine synchronization was not carried out.

When initializing via track C/D (p0404) then it is checked whether the zero mark occurs in an angular range of +/-18 ° mechanical.

When initializing via Hall sensors (p0404) or pole position identification (p1982) it is checked whether the zero mark occurs in an angular range of +/-60 ° electrical.

Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex
yyyy: Determined mechanical zero mark position (can only be used for track C/D).
xxxx: Deviation of the zero mark from the expected position as electrical angle.
Scaling: 32768 dec = 180 °

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- if the Hall sensor is used as an equivalent for track C/D, check the connection.
- check the connection of track C or D.
- replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32131 (N, A) Encoder 2: Position deviation incremental/absolute too high

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: Absolute encoder:
When cyclically reading the absolute position, an excessively high difference to the incremental position was detected. The absolute position that was read is rejected.

Limit value for the deviation:
- EnDat encoder: Is supplied from the encoder and is a minimum of 2 quadrants (e.g. EQI 1325 > 2 quadrants, EQN 1325 > 50 quadrants).
- other encoders: 15 pulses = 60 quadrants.

Incremental encoder:
When the zero pulse is passed, a deviation in the incremental position was detected.

For equidistant zero marks, the following applies:
- the first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.

For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.

Fault value (r0949, interpret decimal):
Deviation in quadrants (1 pulse = 4 quadrants).

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check whether the coding disk is dirty or there are strong ambient magnetic fields.
 - adapt the parameter for the clearance between zero marks (p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32135 Encoder 2: Fault when determining the position (single turn)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: The encoder has identified a position determination fault (singleturn) and supplies status information bit by bit in an internal status/fault word.

Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.

Note regarding the bit designation:

The first designation is valid for DRIVE-CLiQ encoders, the second for EnDat 2.2 encoders.

Fault value (r0949, interpret binary):

Bit 0: F1 (safety status display).

Bit 1: F2 (safety status display).

Bit 2: Reserved (lighting).

Bit 3: Reserved (signal amplitude).

Bit 4: Reserved (position value).

Bit 5: Reserved (overvoltage).

Bit 6: Reserved (undervoltage)/hardware fault EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 7: Reserved (overcurrent)/EnDat encoder withdrawn when not in the parked state (--> F3x110, x = 1, 2, 3).

Bit 8: Reserved (battery)/overcurrent EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 9: Reserved/overvoltage EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 11: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 12: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 13: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 14: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 15: Internal communication error (--> F3x110, x = 1, 2, 3).

Bit 16: Lighting (--> F3x135, x = 1, 2, 3).

Bit 17: Signal amplitude (--> F3x135, x = 1, 2, 3).

Bit 18: Singleturn position 1 (--> F3x135, x = 1, 2, 3).

Bit 19: Overvoltage (--> F3x135, x = 1, 2, 3).

Bit 20: Undervoltage (--> F3x135, x = 1, 2, 3).

Bit 21: Overcurrent (--> F3x135, x = 1, 2, 3).

Bit 22: Temperature exceeded (--> F3x405, x = 1, 2, 3).

Bit 23: Singleturn position 2 (safety status display).

Bit 24: Singleturn system (--> F3x135, x = 1, 2, 3).

Bit 25: Singleturn power down (--> F3x135, x = 1, 2, 3).

Bit 26: Multiturn position 1 (--> F3x136, x = 1, 2, 3).

Bit 27: Multiturn position 2 (--> F3x136, x = 1, 2, 3).

Bit 28: Multiturn system (--> F3x136, x = 1, 2, 3).

Bit 29: Multiturn power down (--> F3x136, x = 1, 2, 3).

Bit 30: Multiturn overflow/underflow (--> F3x136, x = 1, 2, 3).

Bit 31: Multiturn battery (reserved).

Remedy: - determine the detailed cause of the fault using the fault value.

- replace the encoder if necessary.

Note:

An EnDat 2.2 encoder may only be removed and inserted in the "Park" state.

If an EnDat 2.2 encoder was removed when not in the "Park" state, then after inserting the encoder, a POWER ON (switch-off/switch-on) is necessary to acknowledge the fault.

F32136 Encoder 2: Fault when determining the position (multiturn)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

- Cause:** The encoder has identified a position determination fault (multiturn) and supplies status information bit by bit in an internal status/fault word.
 Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.
 Note regarding the bit designation:
 The first designation is valid for DRIVE-CLiQ encoders, the second for EnDat 2.2 encoders.
 Fault value (r0949, interpret binary):
 Bit 0: F1 (safety status display).
 Bit 1: F2 (safety status display).
 Bit 2: Reserved (lighting).
 Bit 3: Reserved (signal amplitude).
 Bit 4: Reserved (position value).
 Bit 5: Reserved (overvoltage).
 Bit 6: Reserved (undervoltage)/hardware fault EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 7: Reserved (overcurrent)/EnDat encoder withdrawn when not in the parked state (--> F3x110, x = 1, 2, 3).
 Bit 8: Reserved (battery)/overcurrent EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 9: Reserved/overvoltage EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 11: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 12: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 13: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 14: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 15: Internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 16: Lighting (--> F3x135, x = 1, 2, 3).
 Bit 17: Signal amplitude (--> F3x135, x = 1, 2, 3).
 Bit 18: Singleturn position 1 (--> F3x135, x = 1, 2, 3).
 Bit 19: Overvoltage (--> F3x135, x = 1, 2, 3).
 Bit 20: Undervoltage (--> F3x135, x = 1, 2, 3).
 Bit 21: Overcurrent (--> F3x135, x = 1, 2, 3).
 Bit 22: Temperature exceeded (--> F3x405, x = 1, 2, 3).
 Bit 23: Singleturn position 2 (safety status display).
 Bit 24: Singleturn system (--> F3x135, x = 1, 2, 3).
 Bit 25: Singleturn power down (--> F3x135, x = 1, 2, 3).
 Bit 26: Multiturn position 1 (--> F3x136, x = 1, 2, 3).
 Bit 27: Multiturn position 2 (--> F3x136, x = 1, 2, 3).
 Bit 28: Multiturn system (--> F3x136, x = 1, 2, 3).
 Bit 29: Multiturn power down (--> F3x136, x = 1, 2, 3).
 Bit 30: Multiturn overflow/underflow (--> F3x136, x = 1, 2, 3).
 Bit 31: Multiturn battery (reserved).
- Remedy:** - determine the detailed cause of the fault using the fault value.
 - replace the encoder if necessary.
 Note:
 An EnDat 2.2 encoder may only be removed and inserted in the "Park" state.
 If an EnDat 2.2 encoder was removed when not in the "Park" state, then after inserting the encoder, a POWER ON (switch-off/switch-on) is necessary to acknowledge the fault.

| | |
|-----------------------|---|
| F32137 | Encoder 2: Fault when determining the position (single turn) |
| Message value: | Fault cause: %1 bin |
| Drive object: | All objects |
| Reaction: | Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3) |
| Acknowledge: | PULSE INHIBIT |

13.2 List of faults and alarms

Cause: A position determination fault has occurred in the DRIVE-CLiQ encoder.
Fault value (r0949, interpret binary):
yyxxxxx hex: yy = encoder version, xxxxxx = bit coding of the fault cause

For yy = 8 (0000 1000 bin), the following applies:

- Bit 1: Signal monitoring (sin/cos).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: LED monitoring.
- Bit 17: Fault when determining the position (multiturn).
- Bit 23: Temperature outside the limit values.

For yy = 11 (0000 1011 bin), the following applies:

- Bit 0: Position word 1 difference between rotation counter and software counter (XC_ERR).
- Bit 1: Position word 1 track error of the incremental signals (LIS_ERR).
- Bit 2: Position word 1 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 3: Maximum permissible temperature exceeded (TEMP_ERR).
- Bit 4: Power supply overvoltage (MON_OVR_VOLT).
- Bit 5: Power supply overcurrent (MON_OVR_CUR).
- Bit 6: Power supply undervoltage (MON_UND_VOLT).
- Bit 7: Rotation error counter (MT_ERR).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 11: Position word 1 status bit: singleturn position OK (ADC_ready).
- Bit 12: Position word 1 status bit: rotation counter OK (MT_ready).
- Bit 13: Position word 1 memory error (MEM_ERR).
- Bit 14: Position word 1 absolute position error (MLS_ERR).
- Bit 15: position word 1 LED error, lighting unit error (LED_ERR).
- Bit 18: Position word 2 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 21: Position word 2 memory error (MEM_ERR).
- Bit 22: Position word 2 absolute position error (MLS_ERR).
- Bit 23: position word 2 LED error, lighting unit error (LED_ERR).

For yy = 12 (0000 1100 bin), the following applies:

- Bit 8: encoder fault.
- Bit 10: error in the internal position data transport.

For yy = 14 (0000 1110 bin), the following applies:

- Bit 0: Position word 1 temperature outside limit value.
- Bit 1: Position word 1 position determination error (multiturn).
- Bit 2: Position word 1 FPGA error.
- Bit 3: Position word 1 velocity error.
- Bit 4: Position word 1 communication error between FPGAs/error in the incremental signal.
- Bit 5: Position word 1 timeout absolute value/error when determining the position (singleturn).
- Bit 6: Position word 1 internal hardware fault (clock/power monitor IC/power).
- Bit 7: Position word 1 internal error (FPGA communication/FPGA parameterization/self-test/software).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: Position word 2 temperature outside limit value.
- Bit 17: Position word 2 position determination error (multiturn).
- Bit 18: Position word 2 FPGA error.
- Bit 19: Position word 2 velocity error.

Bit 20: Position word 2 communication error between FPGAs.
 Bit 21: Position word 2 position determination error (singleturn).
 Bit 22: Position word 2 internal hardware fault (clock/power monitor IC/power).
 Bit 23: Position word 2 internal error (self-test/software).

Note:

For an encoder version that is not described here, please contact the encoder manufacturer for more detailed information on the bit coding.

Remedy:

- determine the detailed cause of the fault using the fault value.
- if required, replace the DRIVE-CLiQ encoder.

F32138 Encoder 2: Fault when determining the position (multiturn)

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: A position determination fault has occurred in the DRIVE-CLiQ encoder.
Fault value (r0949, interpret binary):
yyxxxxx hex: yy = encoder version, xxxxxx = bit coding of the fault cause

For yy = 8 (0000 1000 bin), the following applies:

- Bit 1: Signal monitoring (sin/cos).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: LED monitoring.
- Bit 17: Fault when determining the position (multiturn).
- Bit 23: Temperature outside the limit values.

For yy = 11 (0000 1011 bin), the following applies:

- Bit 0: Position word 1 difference between rotation counter and software counter (XC_ERR).
- Bit 1: Position word 1 track error of the incremental signals (LIS_ERR).
- Bit 2: Position word 1 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 3: Maximum permissible temperature exceeded (TEMP_ERR).
- Bit 4: Power supply overvoltage (MON_OVR_VOLT).
- Bit 5: Power supply overcurrent (MON_OVR_CUR).
- Bit 6: Power supply undervoltage (MON_UND_VOLT).
- Bit 7: Rotation error counter (MT_ERR).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 11: Position word 1 status bit: singleturn position OK (ADC_ready).
- Bit 12: Position word 1 status bit: rotation counter OK (MT_ready).
- Bit 13: Position word 1 memory error (MEM_ERR).
- Bit 14: Position word 1 absolute position error (MLS_ERR).
- Bit 15: position word 1 LED error, lighting unit error (LED_ERR).
- Bit 18: Position word 2 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 21: Position word 2 memory error (MEM_ERR).
- Bit 22: Position word 2 absolute position error (MLS_ERR).
- Bit 23: position word 2 LED error, lighting unit error (LED_ERR).

For yy = 14 (0000 1110 bin), the following applies:

- Bit 0: Position word 1 temperature outside limit value.
- Bit 1: Position word 1 position determination error (multiturn).
- Bit 2: Position word 1 FPGA error.
- Bit 3: Position word 1 velocity error.
- Bit 4: Position word 1 communication error between FPGAs/error in the incremental signal.
- Bit 5: Position word 1 timeout absolute value/error when determining the position (singleturn).
- Bit 6: Position word 1 internal hardware fault (clock/power monitor IC/power).
- Bit 7: Position word 1 internal error (FPGA communication/FPGA parameterization/self-test/software).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: Position word 2 temperature outside limit value.
- Bit 17: Position word 2 position determination error (multiturn).
- Bit 18: Position word 2 FPGA error.
- Bit 19: Position word 2 velocity error.
- Bit 20: Position word 2 communication error between FPGAs.
- Bit 21: Position word 2 position determination error (singleturn).
- Bit 22: Position word 2 internal hardware fault (clock/power monitor IC/power).
- Bit 23: Position word 2 internal error (self-test/software).

Note:

For an encoder version that is not described here, please contact the encoder manufacturer for more detailed information on the bit coding.

Remedy: - determine the detailed cause of the fault using the fault value.
- if required, replace the DRIVE-CLiQ encoder.

F32142 (N, A) Encoder 2: Battery voltage fault

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: When switched-off, the encoder uses a battery to back up the multiturn information. The battery voltage is no longer sufficient to check the multiturn information.
Remedy: Replace battery.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32150 (N, A) Encoder 2: Initialization error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: Encoder functionality selected in p0404 cannot be executed.
 Fault value (r0949, interpret hexadecimal):
 Encoder malfunction.
 The bit assignment corresponds to that of p0404 (e.g. bit 5 set: Error track C/D).
Remedy: - check that p0404 is correctly set.
 - check the encoder type used (incremental/absolute) and for SMCxx, the encoder cable.
 - if relevant, note additional fault messages that describe the fault in detail.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32151 (N, A) Encoder 2: Encoder speed for initialization AB too high

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The encoder speed is too high while initializing the Sensor Module.
Remedy: Reduce the speed of the encoder accordingly during initialization.
 If necessary, deactivate monitoring (p0437.29).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32152 (N, A) Encoder 2: Max. signal frequency (track A/B) exceeded

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The maximum signal frequency of the encoder evaluation has been exceeded.
Fault value (r0949, interpret decimal):
Actual input frequency in Hz.
Remedy: - reduce the speed.
- Use an encoder with a lower pulse number (p0408).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32153 (N, A) Encoder 2: Identification error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: An error has occurred when identifying the encoder (waiting) p0400 = 10100.
The connected encoder was not able to be identified.
Fault value (r0949, interpret hexadecimal):
Bit 0: Data length incorrect.
Remedy: Manually configure the encoder according to the data sheet.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32160 (N, A) Encoder 2: Analog sensor channel A failed

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the measuring range set in (p4673).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4673).
For fault value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE

Acknowl. upon A: NONE

F32161 (N, A) Encoder 2: Analog sensor channel B failed

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the selected measuring range (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).

Remedy: For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4675).
For fault value = 3:
- check the range limit setting and increase it if necessary (p4676).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32163 (N, A) Encoder 2: Analog sensor position value exceeds limit value

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
Fault value (r0949, interpret decimal):
1: Position value from the LVDT sensor.
2: Position value from the encoder characteristic.

Remedy: For fault value = 1:
- check the LVDT ratio (p4678).
- check the reference signal connection at track B.
For fault value = 2:
- check the coefficients of the characteristic (p4663 ... p4666).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A32400 (F, N) Encoder 2: Zero mark distance error (alarm threshold exceeded)

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Alarm value (r2124, interpret decimal):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32401 (F, N) Encoder 2: Zero mark failed (alarm threshold exceeded)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The 1.5x parameterized zero mark distance was exceeded without a zero mark being detected.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Alarm value (r2124, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the clearance between zero marks (p0425).
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F32405 (N, A) Encoder 2: Temperature in the encoder evaluation exceeded

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The encoder evaluation for a motor with DRIVE-CLiQ has detected an excessively high temperature.
The fault threshold is 125 ° C.
Fault value (r0949, interpret decimal):
Measured module temperature [0.1 °C].

Remedy: Reduce the ambient temperature for the DRIVE-CLiQ connection of the motor.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A32407 (F, N) Encoder 2: Function limit reached

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The encoder has reached one of its function limits. A service is recommended.
 Alarm value (r2124, interpret decimal):
 1: Incremental signals
 3: Absolute track
 4: Code connection
Remedy: Perform service. Replace the encoder if necessary.
 Note:
 The actual functional reserve of an encoder can be displayed via r4651.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32410 (F, N) Encoder 2: Communication error (encoder and Sensor Module)

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Serial communication protocol transfer error between the encoder and evaluation module.
 Alarm value (r2124, interpret binary):
 Bit 0: Alarm bit in the position protocol.
 Bit 1: Incorrect quiescent level on the data line.
 Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
 Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
 Bit 4: Encoder acknowledgment error: The encoder incorrectly understood the task (request) or cannot execute it.
 Bit 5: Internal error in the serial driver: An illegal mode command was requested.
 Bit 6: Timeout when cyclically reading.
 Bit 8: Protocol is too long (e.g. > 64 bits).
 Bit 9: Receive buffer overflow.
 Bit 10: Frame error when reading twice.
 Bit 11: Parity error.
 Bit 12: Data line signal level error during the monoflop time.
Remedy:
 - check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace encoder.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32411 (F, N) Encoder 2: Encoder signals an internal alarm (detailed information)

Message value: Fault cause: %1 bin, additional information: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: The absolute encoder fault word includes alarm bits that have been set.
Alarm value (r2124, interpret binary):
yyyyxxxx hex: yyyy = supplementary information, xxxx = fault cause
yyyy = 0:
Bit 0: Frequency exceeded (speed too high).
Bit 1: Temperature exceeded.
Bit 2: Control reserve, lighting system exceeded.
Bit 3: Battery discharged.
Bit 4: Reference point passed.
yyyy = 1:
Bit 0: Signal amplitude outside the control range.
Bit 1: Error multiturn interface
Bit 2: Internal data error (singleturn/multiturn not with single steps).
Bit 3: Error EEPROM interface.
Bit 4: SAR converter error.
Bit 5: Fault for the register data transfer.
Bit 6: Internal error identified at the error pin (nErr).
Bit 7: Temperature threshold exceeded or fallen below.

Remedy: Replace encoder.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32412 (F, N) Encoder 2: Encoder signals an internal alarm

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The encoder signals an internal alarm via serial protocol.
Alarm value (r2124, interpret binary):
Bit 0: Fault bit in the position protocol.
Bit 1: Alarm bit in the position protocol.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace encoder.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32414 (F, N) Encoder 2: Signal level track C or D out of tolerance

Message value: C track: %1, D track: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

- Cause:** The signal level ($C^2 + D^2$) of track C or D of the encoder or from the Hall signals, is not within the tolerance bandwidth.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track D (16 bits with sign).
xxxx = Signal level, track C (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV $-25/+20$ %).
The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note:
If the amplitude is not within the tolerance bandwidth, then it cannot be used to initialize the start position.
- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
 - check the Hall sensor box.
- Reaction upon F:** Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

N32415 (F, A) Encoder 2: Signal level track A or B outside tolerance (alarm)

- Message value:** Amplitude: %1, Angle: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
- Cause:** The signal level (root from $A^2 + B^2$) of the encoder is outside the permissible tolerance.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Angle
xxxx = amplitude, i.e. root of $A^2 + B^2$ (16 bits without sign)
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV $-25/+20$ %).
The response threshold is < 230 mV (observe the frequency response of the encoder).
A signal level of 500 mV peak value corresponds to the numerical value 299A hex = 10650 dec.
The angle 0 ... FFFF hex corresponds to 0 ... 360 degrees of the fine position. Zero degrees is present at the negative zero crossover of track B.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1414 mV (1.0 Vrms).
A signal level of 2900 mV peak value corresponds to the numerical value 3333 hex = 13107 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
- Remedy:**
- check the speed range, frequency characteristic (amplitude characteristic) of the measuring equipment is not sufficient for the speed range.
 - check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
 - if the coding disk is soiled or the lighting aged, replace the encoder.
- Reaction upon F:** Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon A: NONE

Acknowl. upon A: NONE

A32418 (F, N) Encoder 2: Speed change not plausible (alarm)

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: For an HTL/TTL encoder, the speed change has exceeded the value in p0492 over several sampling cycles.
The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the setting of p0492.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A32419 (F, N) Encoder 2: Track A or B outside tolerance

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The amplitude/phase/offset correction for track A or B is at the limit.
Amplitude error correction: Amplitude B / Amplitude A = 0.78 ... 1.27
Phase: <84 degrees or >96 degrees
SMC20: Offset correction: +/-140 mV
SMC10: Offset correction: +/-650 mV
Alarm value (r2124, interpret hexadecimal):
xxxx1: Minimum of the offset correction, track B
xxxx2: Maximum of the offset correction, track B
xxx1x: Minimum of the offset correction, track A
xxx2x: Maximum of the offset correction, track A
xx1xx: Minimum of the amplitude correction, track B/A
xx2xx: Maximum of the amplitude correction, track B/A
x1xxx: Minimum of the phase error correction
x2xxx: Maximum of the phase error correction
1xxxx: Minimum of the cubic correction
2xxxx: Maximum of the cubic correction

Remedy:

- check mechanical mounting tolerances for encoders without their own bearings (e.g. toothed-wheel encoders).
- check the plug connections (also the transition resistance).
- check the encoder signals.
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A32421 (F, N) Encoder 2: Determined commutation position incorrect (alarm)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A commutation position actual value sensing error was detected.
 Alarm value (r2124, interpret decimal):
 3: The absolute position of the serial protocol and track A/B differ by half an encoder pulse. The absolute position must have its zero position in the quadrants in which both tracks are negative. In the case of a fault, the position can be incorrect by one encoder pulse.
Remedy: For alarm value = 3:
 - For a standard encoder with cable, contact the manufacturer where relevant.
 - correct the assignment of the tracks to the position value that is serially transferred. To do this, the two tracks must be connected, inverted, at the Sensor Module (interchange A with A* and B with B*) or, for a programmable encoder, check the zero offset of the position.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32422 (F, N) Encoder 2: Pulses per revolution square-wave encoder outside tolerance bandwidth

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
 This alarm is triggered with active square-wave encoder PPR correction and re-parameterized fault 31131 if the accumulator contains larger values than p4683 or p4684.
 The zero mark distance for zero mark monitoring is set in p0425 (rotary encoder).
 Alarm value (r2124, interpret decimal):
 accumulated differential pulses in encoder pulses.
Remedy:
 - check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - check the encoder type (encoder with equidistant zero marks).
 - adapt the parameter for the distance between zero marks (p0424, p0425).
 - replace the encoder or encoder cable.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32429 (F, N) Encoder 2: Position difference hall sensor/track C/D and A/B too large

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical.
One period of track C/D corresponds to 360 ° mechanical.
One period of the Hall signal corresponds to 360 ° electrical.
The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
Alarm value (r2124, interpret decimal):
For track C/D, the following applies:
Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).
For Hall signals, the following applies:
Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °).

Remedy:

- track C or D not connected.
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
- check that the encoder cables are routed in compliance with EMC.
- check the adjustment of the Hall sensor.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32431 (F, N) Encoder 2: Position deviation incremental/absolute too high (alarm)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: When the zero pulse is passed, a deviation in the incremental position was detected.
For equidistant zero marks, the following applies:
- the first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.
For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.
Alarm value (r2124, interpret decimal):
Deviation in quadrants (1 pulse = 4 quadrants).

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- Clean coding disk or remove strong magnetic fields.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32432 (F, N) Encoder 2: Rotor position adaptation corrects deviation

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: On track A/B, pulses have been lost or too many have been counted. These pulses are presently being corrected.
 Alarm value (r2124, interpret decimal):
 Last measured deviation of zero mark in increments (4 increments = 1 encoder pulse).
 The sign designates the direction of motion when detecting the zero mark distance.

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- check encoder limit frequency.
- adapt the parameter for the distance between zero marks (p0424, p0425).

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32442 (F, N) Encoder 2: Battery voltage alarm threshold reached

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: When switched-off, the encoder uses a battery to back up the multiturn information. The multiturn information can no longer be buffered if the battery voltage drops even further.

Remedy: Replace battery.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32443 (F, N) Encoder 2: Signal level track C/D outside tolerance (alarm)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The unipolar level (CP/CN or DP/DN) for encoder 2 is outside the permissible tolerance.
 Alarm value (r2124, interpret binary):
 Bit 0 = 1: Either CP or CN outside the tolerance.
 Bit 16 = 1: Either DP or DN outside the tolerance.
 The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
 The response thresholds are < 1700 mV and > 3300 mV.
 Note:
 The signal level is not evaluated unless the following conditions are satisfied:

- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).

Remedy:

- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections and contacts of the encoder cable.
- are the C/D tracks connected correctly (have the signal cables CP and CN or DP and DN been interchanged)?
- replace the encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32460 (N) Encoder 2: Analog sensor channel A failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside measuring range set in p4673.
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For alarm value = 1:
- check the output voltage of the analog sensor.
For alarm value = 2:
- check the voltage setting for each encoder period (p4673).
For alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE

A32461 (N) Encoder 2: Analog sensor channel B failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the selected measuring range (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For alarm value = 1:
- check the output voltage of the analog sensor.
For alarm value = 2:
- check the voltage setting for each encoder period (p4675).
For alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE

A32462 (N) Encoder 2: Analog sensor no channel active

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Channel A and B are not activated for the analog sensor.
Remedy: - activate channel A and/or channel B (p4670).
- check the encoder configuration (p0404.17).
Reaction upon N: NONE
Acknowl. upon N: NONE

A32463 (N) Encoder 2: Analog sensor position value exceeds limit value

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
 Alarm value (r2124, interpret decimal):
 1: Position value from the LVDT sensor.
 2: Position value from the encoder characteristic.
Remedy: For alarm value = 1:
 - check the LVDT ratio (p4678).
 - check the reference signal connection at track B.
 For alarm value = 2:
 - check the coefficients of the characteristic (p4663 ... p4666).
Reaction upon N: NONE
Acknowl. upon N: NONE

A32470 (F, N) Encoder 2: Encoder signals an internal error (X521.7)

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For the Sensor Module Cabinet 30 (SMC30), a dirty encoder is signaled via a 0 signal at terminal X521.7.
Remedy: - check the plug connections.
 - replace the encoder or encoder cable.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F32500 (N, A) Encoder 2: Position tracking traversing range exceeded

Message value: -
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: For a configured linear axis without modulo correction, the drive/encoder has exceeded the maximum possible traversing range. The value should be read in p0412 and interpreted as the number of motor revolutions.
 For p0411.0 = 1, the maximum traversing range for the configured linear axis is defined to be 64x (+/- 32x) of p0421.
 For p0411.3 = 1, the maximum traversing range for the configured linear axis is preset (default value) to the highest possible value and is +/-p0412/2 (rounded off to complete revolutions). The highest possible value depends on the pulse number (p0408) and the fine resolution (p0419).
Remedy: The fault should be resolved as follows:
 - select encoder commissioning (p0010 = 4).
 - reset the position tracking as follows (p0411.2 = 1).
 - deselect encoder commissioning (p0010 = 0).
 The fault should then be acknowledged and the absolute encoder adjusted.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32501 (N, A) Encoder 2: Position tracking encoder position outside tolerance window

Message value: %1
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: When switched off, the drive/encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder.
Fault value (r0949, interpret decimal):
Deviation (difference) to the last encoder position in increments of the absolute value.
The sign designates the traversing direction.
Note:
The deviation (difference) found is also displayed in r0477.
Remedy: Reset the position tracking as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).
See also: p0010
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32502 (N, A) Encoder 2: Encoder with measuring gear without valid signals

Message value: -
Drive object: All objects
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The encoder with measuring gear no longer provides any valid signals.
Remedy: It must be ensured that all of the encoders, with mounted measuring gear, provide valid actual values in operation.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32503 (N, A) Encoder 2: Position tracking cannot be reset

Message value: -
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The position tracking for the measuring gear cannot be reset.
Remedy: The fault should be resolved as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and the absolute encoder adjusted.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE

Acknowl. upon A: NONE

A32700 Encoder 2: Effectivity test does not supply the expected value

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The DRIVE-CLiQ encoder fault word supplies fault bits that have been set.
Alarm value (r2124, interpret binary):
Bit x = 1: Effectivity test x unsuccessful.
Remedy: Replace encoder.

N32800 (F) Encoder 2: Group signal

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: NONE
Cause: The motor encoder has detected at least one fault.
Remedy: Evaluates other actual messages.
Reaction upon F: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

F32801 (N, A) Encoder 2 DRIVE-CLiQ: Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: - check the electrical cabinet design and cable routing for EMC compliance
- replace the component involved.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32802 (N, A) Encoder 2: Time slice overflow

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A time slice overflow has occurred in encoder 2.
Fault value (r0949, interpret hexadecimal):
yx hex: y = function involved (Siemens-internal fault diagnostics), x = time slice involved
x = 9:
Time slice overflow of the fast (current controller clock cycle) time slice.
x = A:
Time slice overflow of the average time slice.
x = C:
Time slice overflow of the slow time slice.
yx = 3E7:
Timeout when waiting for SYNO (e.g. unexpected return to non-cyclic operation).

Remedy: Increase the current controller sampling time
Note:
For a current controller sampling time = 31.25 µs, use an SMx20 with Article No. 6SL3055-0AA00-5xA3.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32804 (N, A) Encoder 2: Sensor Module checksum error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: POWER ON (IMMEDIATELY)
Cause: A checksum error has occurred when reading-out the program memory on the Sensor Module.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex
yyyy: Memory area involved.
xxxx: Difference between the checksum at POWER ON and the actual checksum.

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- upgrade firmware to later version (>= V2.6 HF3, >= V4.3 SP2, >= V4.4).
- check whether the permissible ambient temperature for the component is maintained.
- replace the Sensor Module.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32805 (N, A) Encoder 2: EEPROM checksum error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: Data in the EEPROM corrupted .
Fault value (r0949, interpret hexadecimal):
01: EEPROM access error.
02: Too many blocks in the EEPROM.

Remedy: Replace the module.

Reaction upon N: NONE
Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32806 (N, A) Encoder 2: Initialization error

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The encoder was not successfully initialized.

Fault value (r0949, interpret hexadecimal):

Bit 0, 1: Encoder initialization with the motor rotating has failed (deviation involving coarse and fine position in encoder pulses/4).

Bit 2: Mid-voltage matching for track A unsuccessful.

Bit 3: Mid-voltage matching for track B unsuccessful.

Bit 4: Mid-voltage matching for acceleration input unsuccessful.

Bit 5: Mid-voltage matching for track safety A unsuccessful.

Bit 6: Mid-voltage matching for track safety B unsuccessful.

Bit 7: Mid-voltage matching for track C unsuccessful.

Bit 8: Mid-voltage matching for track D unsuccessful.

Bit 9: Mid-voltage matching for track R unsuccessful.

Bit 10: The difference in mid-voltages between A and B is too great (> 0.5 V)

Bit 11: The difference in mid-voltages between C and D is too great (> 0.5 V)

Bit 12: The difference in mid-voltages between safety A and safety B is too great (> 0.5 V)

Bit 13: The difference in mid-voltages between A and safety B is too great (> 0.5 V)

Bit 14: The difference in mid-voltages between B and safety A is too great (> 0.5 V)

Bit 15: The standard deviation of the calculated mid-voltages is too great (> 0.3 V)

Bit 16: Internal fault - fault when reading a register (CAFE)

Bit 17: Internal fault - fault when writing a register (CAFE)

Bit 18: Internal fault: No mid-voltage matching available

Bit 19: Internal error - ADC access error.

Bit 20: Internal error - no zero crossover found.

Bit 28: Error while initializing the EnDat 2.2 measuring unit.

Bit 29: Error when reading out the data from the EnDat 2.2 measuring unit.

Bit 30: EEPROM checksum of the EnDat 2.2 measuring unit incorrect.

Bit 31: Data of the EnDat 2.2 measuring unit inconsistent.

Note:

Bit 0, 1: Up to 6SL3055-0AA00-5*A0

Bits 2 ... 20: 6SL3055-0AA00-5*A1 and higher

Remedy: Acknowledge fault.

If the fault cannot be acknowledged:

Bits 2 ... 9: Check encoder power supply.

Bits 2 ... 14: Check the corresponding cable.

Bit 15 with no other bits: Check track R, check settings in p0404.

Bit 28: Check the cable between the EnDat 2.2 converter and the measuring unit.

Bit 29 ... 31: Replace the defective measuring unit.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A32811 (F, N) Encoder 2: Encoder serial number changed

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The encoder serial number has changed. The change is only checked for encoders with serial number (e.g. EnDat encoders).
- the encoder was replaced.
Note:
With closed-loop position control, the serial number is accepted when starting the adjustment (p2507 = 2).
When the encoder is adjusted (p2507 = 3), the serial number is checked for changes and if required, the adjustment is reset (p2507 = 1).
Proceed as follows to hide serial number monitoring:
- set the following serial numbers for the corresponding Encoder Data Set: p0441= FF, p0442 = 0, p0443 = 0, p0444 = 0, p0445 = 0.

Remedy: Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

F32812 (N, A) Encoder 2: Requested cycle or RX-/TX timing not supported

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A cycle requested from the Control Unit or RX/TX timing is not supported.
Fault value (r0949, interpret decimal):
0: Application cycle is not supported.
1: DRIVE-CLiQ cycle is not supported.
2: Distance between RX and TX instants in time too low.
3: TX instant in time too early.

Remedy: Carry out a POWER ON (switch-off/switch-on) for all components.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32813 Encoder 2: Hardware logic unit failed

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The logic unit of the DRIVE-CLiQ encoder has failed.
Fault value (r0949, interpret binary):
Bit 0: ALU watchdog has responded.
Bit 1: ALU has detected a sign-of-life error.

Remedy: When the error reoccurs, replace the encoder.

F32820 (N, A) Encoder 2 DRIVE-CLiQ: Telegram error

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned.

Fault cause:

1 (= 01 hex):
Checksum error (CRC error).

2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.

3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.

4 (= 04 hex):
The length of the receive telegram does not match the receive list.

5 (= 05 hex):
The type of the receive telegram does not match the receive list.

6 (= 06 hex):
The address of the component in the telegram and in the receive list do not match.

7 (= 07 hex):
A SYNC telegram is expected - but the received telegram is not a SYNC telegram.

8 (= 08 hex):
No SYNC telegram is expected - but the received telegram is one.

9 (= 09 hex):
The error bit in the receive telegram is set.

16 (= 10 hex):
The receive telegram is too early.

Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F32835 (N, A) Encoder 2 DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned. The nodes do not send and receive in synchronism.
Fault cause:
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - carry out a POWER ON.
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32836 (N, A) Encoder 2 DRIVE-CLiQ: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32837 (N, A) Encoder 2 DRIVE-CLiQ: Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
 Fault cause:
 32 (= 20 hex):
 Error in the telegram header.
 35 (= 23 hex):
 Receive error: The telegram buffer memory contains an error.
 66 (= 42 hex):
 Send error: The telegram buffer memory contains an error.
 67 (= 43 hex):
 Send error: The telegram buffer memory contains an error.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32845 (N, A) Encoder 2 DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved.
 Fault cause:
 11 (= 0B hex):
 Synchronization error during alternating cyclic data transfer.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON (switch-off/switch-on).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32850 (N, A) Encoder 2: Encoder evaluation internal software error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: POWER ON

13.2 List of faults and alarms

Cause: An internal software error has occurred in the Sensor Module of encoder 2.
Fault value (r0949, interpret decimal):
1: Background time slice is blocked.
2: Checksum over the code memory is not OK.
10000: OEM memory of the EnDat encoder contains data that cannot be interpreted.
11000 ... 11499: Descriptive data from EEPROM incorrect.
11500 ... 11899: Calibration data from EEPROM incorrect.
11900 ... 11999: Configuration data from EEPROM incorrect.
12000 ... 12008: communication with analog/digital converter faulted.
16000: DRIVE-CLiQ encoder initialization application error.
16001: DRIVE-CLiQ encoder initialization ALU error.
16002: DRIVE-CLiQ encoder HISI / SISI initialization error.
16003: DRIVE-CLiQ encoder safety initialization error.
16004: DRIVE-CLiQ encoder internal system error.

Remedy: - replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32851 (N, A) Encoder 2 DRIVE-CLiQ (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.
The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - Upgrade the firmware of the component involved.
- carry out a POWER ON (switch-off/switch-on) for the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32860 (N, A) Encoder 2 DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

| | |
|-------------------------|--|
| Cause: | <p>A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.</p> <p>Fault cause:</p> <p>1 (= 01 hex): Checksum error (CRC error).</p> <p>2 (= 02 hex): Telegram is shorter than specified in the length byte or in the receive list.</p> <p>3 (= 03 hex): Telegram is longer than specified in the length byte or in the receive list.</p> <p>4 (= 04 hex): The length of the receive telegram does not match the receive list.</p> <p>5 (= 05 hex): The type of the receive telegram does not match the receive list.</p> <p>6 (= 06 hex): The address of the power unit in the telegram and in the receive list do not match.</p> <p>9 (= 09 hex): The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.</p> <p>16 (= 10 hex): The receive telegram is too early.</p> <p>17 (= 11 hex): CRC error and the receive telegram is too early.</p> <p>18 (= 12 hex): The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>19 (= 13 hex): The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>20 (= 14 hex): The length of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>21 (= 15 hex): The type of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>22 (= 16 hex): The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.</p> <p>25 (= 19 hex): The error bit in the receive telegram is set and the receive telegram is too early.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |
| Remedy: | <ul style="list-style-type: none"> - carry out a POWER ON (switch-off/switch-on). - check the electrical cabinet design and cable routing for EMC compliance - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F32875 (N, A) Encoder 2: power supply voltage failed

| | |
|-----------------------|--|
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3) |
| Acknowledge: | IMMEDIATELY |

13.2 List of faults and alarms

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32885 (N, A) Encoder 2 DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.
The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32886 (N, A) Encoder 2 DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32887 (N, A) Encoder 2 DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component involved (Sensor Module for encoder 2). Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
96 (= 60 hex):
Response received too late during runtime measurement.
97 (= 61 hex):
Time taken to exchange characteristic data too long.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32895 (N, A) Encoder 2 DRIVE-CLiQ (CU): Alternating cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: Carry out a POWER ON.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32896 (N, A) Encoder 2 DRIVE-CLiQ (CU): Inconsistent component properties

Message value: Component number: %1
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: The properties of the DRIVE-CLiQ component (Sensor Module for encoder 2), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
Fault value (r0949, interpret decimal):
Component number.
Remedy:
- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32899 (N, A) Encoder 2: Unknown fault

Message value: New message: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A fault occurred on the Sensor Module for encoder 2 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Fault value (r0949, interpret decimal):
Fault number.
Note:
If required, the significance of this new fault can be read about in a more recent description of the Control Unit.
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A32902 (F, N) Encoder 2: SPI-BUS error occurred

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal SPI bus.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32903 (F, N) Encoder 2: I2C-BUS error occurred

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal I2C bus.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F32905 (N, A) Encoder 2: Encoder parameterization error

Message value: Parameter: %1, supplementary information: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An error was identified in the encoder parameterization.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, interpret decimal):
yyyyxxxx dec: yyyy = supplementary information, xxxx = parameter
xxxx = 421:
For an EnDat/SSI encoder, the absolute position in the protocol must be less than or equal to 30 bits.
yyyy = 0:
No additional information available.
yyyy = 1:
The component does not support HTL level (p0405.1 = 0) combined with track monitoring A/B <-> -A/B (p0405.2 = 1).
yyyy = 2:
A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please start a new encoder identification.
yyyy = 3:
A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please select a listed encoder in p0400 with a code number < 10000.
yyyy = 4:
This component does not support SSI encoders (p0404.9 = 1) without track A/B.
yyyy = 5:
For SQW encoder, value in p4686 greater than in p0425.
yyyy = 6:
DRIVE-CLiQ encoder cannot be used with this firmware version.
yyyy = 7:
For an SQW encoder, the XIST1 correction (p0437.2) is only permitted for equidistant zero marks.
yyyy = 8:
The motor pole pair width is not supported by the linear scale being used.
yyyy = 9:
The length of the position in the EnDat protocol may be a maximum of 32 bits.
yyyy = 10:
The connected encoder is not supported.
yyyy = 11:
The hardware does not support track monitoring.

Remedy: - check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.
- re parameter number = 314:
- check the pole pair number and measuring gear ratio. The quotient of the "pole pair number" divided by the "measuring gear ratio" must be less than or equal to 1000 ((r0313 * p0433) / p0432 <= 1000).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32912 Encoder 2: Device combination is not permissible
Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT

Cause: The selected device combination is not supported.
 Fault value (r0949, interpret decimal):
 1003:
 The connected measuring unit cannot be operated with the EnDat 2.2 converter. For instance, the measuring unit has a pulse number/resolution of 2^n .
 1005:
 The type of measuring unit (incremental) is not supported by the EnDat 2.2 converter.
 1006:
 The maximum duration of the EnDat transfer (31.25 μ s) was exceeded.
 2001:
 The set combination of current controller cycle, DP cycle and Safety cycle is not supported by the EnDat 2.2 converter.
 2002:
 The resolution of the linear measuring unit does not match the pole pair width of the linear motor
 Pole pair width, minimum = $p0422 * 2^{20}$

Remedy:
 For fault value = 1003, 1005, 1006:
 - Use a measuring unit that is permissible.
 For fault value = 2001:
 - set a permissible cycle combination (if required, use standard settings).
 For fault value = 2002:
 - Use a measuring unit with a lower resolution (p0422).

A32915 (F, N) Encoder 2: Encoder configuration error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The configuration for encoder 2 is incorrect.
 Alarm value (r2124, interpret decimal):
 1:
 Re-parameterization between fault/alarm is not permissible.
 419:
 When the fine resolution Gx_XIST2 is configured, the encoder identifies a maximum possible absolute position actual value (r0483) that can no longer be represented within 32 bits.

Remedy:
 For alarm value = 1:
 No re-parameterization between fault/alarm.
 For alarm value = 419:
 Reduce the fine resolution (p0419) or deactivate the monitoring (p0437.25), if the complete multiturn range is not required.

Reaction upon F: Servo: NONE (IASC/DCBRK)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F32916 (N, A) Encoder 2: Encoder parameterization error

Message value: Parameter: %1, supplementary information: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An encoder parameter was detected as being incorrect.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, interpret decimal):
Parameter number.

Remedy: - check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A32920 (F, N) Encoder 2: Temperature sensor fault (motor)

Message value: Fault cause: %1, channel number: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The motor detected a fault when evaluating the temperature sensor.
Fault cause:
1 (= 01 hex):
Wire breakage or sensor not connected.
KTY: R > 1630 Ohm, PT1000: R > 1720 Ohm
2 (= 02 hex):
Measured resistance too low.
PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT1000: R < 603 Ohm
Additional values:
Only for internal Siemens troubleshooting.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = channel number, xx = error cause

Remedy: - check that the encoder cable is the correct type and is correctly connected.
- check the temperature sensor selection in p0600 to p0603.
- replace the Sensor Module (hardware defect or incorrect calibration data).

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32930 (N) Encoder 2: Data logger has saved data

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: For the activated function "Data logger" (p0437.0 = 1) a fault has occurred with the Sensor Module. This alarm indicates that the diagnostics data corresponding to the fault was saved on the memory card.
 The diagnostics data is saved in the following folder:
 /USER/SINAMICS/DATA/SMTRC00.BIN
 ...
 /USER/SINAMICS/DATA/SMTRC07.BIN
 /USER/SINAMICS/DATA/SMTRCIDX.TXT
 The following information is contained in the TXT file:
 - Display of the last written BIN file.
 - Number of write operations that are still possible (from 10000 downwards).
Note:
 Only Siemens can evaluate the BIN files.

Remedy: Not necessary.
 This alarm is automatically withdrawn.
 The data logger is ready to record the next fault case.

Reaction upon N: NONE
Acknowl. upon N: NONE

A32940 (F, N) Encoder 2: Spindle sensor S1 voltage incorrect

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The voltage of analog sensor S1 is outside the permissible range.
 Alarm value (r2124, interpret decimal):
 Signal level from sensor S1.
Note:
 A signal level of 500 mV corresponds to the numerical value 500 dec.

Remedy:
 - check the clamped tool.
 - check the tolerance and if required, adapt (p5040).
 - check the thresholds and if required, adapt (p5041).
 - check analog sensor S1 and connections.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F32950 Encoder 2: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: POWER ON

Cause: An internal software error has occurred.
 Fault value (r0949, interpret decimal):
 Information about the fault source.
 Only for internal Siemens troubleshooting.

Remedy:
 - if necessary, upgrade the firmware in the Sensor Module to a later version.
 - contact Technical Support.

A32999 (F, N) Encoder 2: Unknown alarm

Message value: New message: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A alarm has occurred on the Sensor Module for encoder 2 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Alarm value (r2124, interpret decimal):
Alarm number.
Note:
If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F33100 (N, A) Encoder 3: Zero mark distance error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, interpret decimal):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.
Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).
- replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33101 (N, A) Encoder 3: Zero mark failed

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The 1.5 x parameterized zero mark distance was exceeded.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - check the encoder type (encoder with equidistant zero marks).
 - adapt the parameter for the clearance between zero marks (p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).
 - when p0437.1 is active, check p4686.
 - replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33103 (N, A) Encoder 3: Signal level zero track (track R) outside tolerance

Message value: R track: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: The zero mark signal level (track R) does not lie within the tolerance bandwidth for encoder 1.
The fault can be initiated when the unipolar voltage level is exceeded (RP/RN) or if the differential amplitude is undershot.
Fault value (r0949, interpret hexadecimal):

yyyyxxx hex: yyyy = 0, xxxx = Signal level, track R (16 bits with sign)

The response thresholds of the unipolar signal levels of the encoder are between < 1400 mV and > 3500 mV.

The response threshold for the differential signal level of the encoder is < -1600 mV.

A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.

Note:

The analog value of the amplitude error is not measured at the same time with the hardware fault output by the Sensor Module.

The fault value can only be represented between -32768 ... 32767 dec (-770 ... 770 mV).

The signal level is not evaluated unless the following conditions are satisfied:

- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).

- Remedy:**
- check the speed range; frequency characteristic (amplitude characteristic) of the measuring equipment might not be sufficient for the speed range
 - check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections and contacts of the encoder cable.
 - check the encoder type (encoder with zero marks).
 - check whether the zero mark is connected and the signal cables RP and RN have been connected correctly (not connected with the incorrect polarity).
 - replace the encoder cable.
 - if the coding disk is soiled or the lighting aged, replace the encoder.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33110 (N, A) Encoder 3: Serial communications error

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: Serial communication protocol transfer error between the encoder and evaluation module.
Fault value (r0949, interpret binary):
Bit 0: Alarm bit in the position protocol.
Bit 1: Incorrect quiescent level on the data line.
Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
Bit 4: Encoder acknowledgment error: The encoder incorrectly understood the task (request) or cannot execute it.
Bit 5: Internal error in the serial driver: An illegal mode command was requested.
Bit 6: Timeout when cyclically reading.
Bit 7: Timeout for the register communication.
Bit 8: Protocol is too long (e.g. > 64 bits).
Bit 9: Receive buffer overflow.
Bit 10: Frame error when reading twice.
Bit 11: Parity error.
Bit 12: Data line signal level error during the monoflop time.
Bit 13: Data line incorrect.
Bit 14: Fault for the register communication.
Bit 15: Internal communication error.

Note:

For an EnDat 2.2 encoder, the significance of the fault value for F3x135 (x = 1, 2, 3) is described.

Remedy:
For fault value, bit 0 = 1:
- Enc defect F31111 may provide additional details.
For fault value, bit 1 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 2 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 3 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable.
For fault value, bit 4 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 5 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 6 = 1:
- Update Sensor Module firmware.
For fault value, bit 7 = 1:
- incorrect encoder type / replace the encoder or encoder cable.
For fault value, bit 8 = 1:
- check parameterization (p0429.2).
For fault value, bit 9 = 1:
- EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
For fault value, bit 10 = 1:
- check parameterization (p0429.2, p0449).
For fault value, bit 11 = 1:
- check parameterization (p0436).
For fault value, bit 12 = 1:
- check parameterization (p0429.6).
For fault value, bit 13 = 1:
- check data line.
For fault value, bit 14 = 1:
- incorrect encoder type / replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33111 (N, A) Encoder 3: Encoder signals an internal error (detailed information)

Message value: Fault cause: %1 bin, additional information: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The encoder error word provides detailed information (error bit).
 For p0404.8 = 0, the following applies:
 Fault value for internal Siemens troubleshooting.
 For p0404.8 = 1, the following applies:
 Fault value (r0949, interpret binary):
 yyyyxxx hex: yyyy = supplementary information, xxx = fault cause
 yyyy = 0:
 Bit 0: Lighting system failed.
 Bit 1: Signal amplitude too low.
 Bit 2: Position value incorrect.
 Bit 3: Encoder power supply overvoltage condition.
 Bit 4: Encoder power supply undervoltage condition.
 Bit 5: Encoder power supply overcurrent condition.
 Bit 6: The battery must be changed.

Remedy: For yyyy = 0:
 For fault value, bit 0 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 1 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 2 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 3 = 1:
 5 V power supply voltage fault.
 When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
 When a motor encoder with a direct DRIVE-CLiQ connection is used: Replace the motor.
 For fault value, bit 4 = 1:
 5 V power supply voltage fault.
 When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
 When using a motor with DRIVE-CLiQ: Replace the motor.
 For fault value, bit 5 = 1:
 Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
 For fault value, bit 6 = 1:
 The battery must be changed (only for encoders with battery back-up).
 For yyyy = 1:
 Encoder is defective. Replace encoder.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33112 (N, A) Encoder 3: Encoder signals an internal error

Message value: %1

Drive object: All objects

13.2 List of faults and alarms

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The encoder signals a set error bit via the serial protocol.
Fault value (r0949, interpret binary):
Bit 0: Fault bit in the position protocol.
Remedy: For fault value, bit 0 = 1:
In the case of an EnDat encoder, F31111 may provide further details.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33115 (N, A) Encoder 3: Signal level track A or B too low

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The signal level (root from $A^2 + B^2$) of the encoder falls below the permissible limit value.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response threshold is < 170 mV (input frequency <= 256 kHz) or < 120 mV (input frequency > 256 kHz).
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1070 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- check the Sensor Module (e.g. contacts).
The following applies to measuring systems without their own bearing system:
- adjust the scanning head and check the bearing system of the measuring wheel.
The following applies for measuring systems with their own bearing system:
- ensure that the encoder housing is not subject to any axial force.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33116 (N, A) Encoder 3: Signal level track A or B too low

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

- Cause:** The signal level of the rectified encoder signals A and B of the encoder fall below the permissible limit value.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxxx hex:
 yyyy = Signal level, track B (16 bits with sign).
 xxxx = Signal level, track A (16 bits with sign).
 The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
 The response threshold is < 130 mV.
 A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
 Note:
 The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
- Remedy:**
- check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33117 (N, A) Encoder 3: Inversion error signals A/B/R

- Message value:** Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
- Cause:** For a square-wave encoder (bipolar, double ended) signals A*, B* and R* are not inverted with respect to signals A, B and R.
 Fault value (r0949, interpret binary):
 Bits 0 ... 15: Only for internal Siemens troubleshooting.
 Bit 16: Error track A.
 Bit 17: Error track B.
 Bit 18: Error track R.
 Note:
 For SMC30 (only Article No. 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1), CUA32, and CU310, the following applies:
 A square-wave encoder without track R is used and track monitoring (p0405.2 = 1) is activated.
- Remedy:**
- check the encoder/cable.
 - Does the encoder supply signals and the associated inverted signals?
- Note:
 For SMC30 (only Article Number 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1), the following applies:
 - check the setting of p0405 (p0405.2 = 1 is only possible if the encoder is connected at X520).
 For a square-wave encoder without track R, the following jumpers must be set for the connection at X520 (SMC30) or X23 (CUA32, CU310):
- pin 10 (reference signal R) <--> pin 7 (encoder power supply, ground)
 - pin 11 (reference signal R inverted) <--> pin 4 (encoder power supply)
- Reaction upon N:** NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33118 (N, A) Encoder 3: Speed change not plausible

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: For an HTL/TTL encoder, the speed change has exceeded the value in p0492 over several sampling cycles. The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time. Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
Remedy:
- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the maximum speed difference per sampling cycle (p0492).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33120 (N, A) Encoder 3: Encoder power supply fault

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: An encoder power supply fault was detected. Fault value (r0949, interpret binary):
Bit 0: Undervoltage condition on the sense line.
Bit 1: Overcurrent condition for the encoder power supply.
Bit 2: Overcurrent condition for encoder power supply on cable resolver excitation negative.
Bit 3: Overcurrent condition for encoder power supply on cable resolver excitation positive.
Bit 4: The 24 V power supply through the Power Module (PM) is overloaded.
Bit 5: Overcurrent at the EnDat connection of the converter.
Bit 6: Overvoltage at the EnDat connection of the converter.
Bit 7: Hardware fault at the EnDat connection of the converter.
Note:
If the encoder cables 6FX2002-2EQ00-.... and 6FX2002-2CH00-.... are interchanged, this can result in the encoder being destroyed because the pins of the operating voltage are reversed.

Remedy:

- For fault value, bit 0 = 1:
 - correct encoder cable connected?
 - check the plug connections of the encoder cable.
 - SMC30: Check the parameterization (p0404.22).
- For fault value, bit 1 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 2 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 3 = 1:
 - correct encoder cable connected?
 - replace the encoder or encoder cable.
- For fault value, bit 5 = 1:
 - Measuring unit correctly connected at the converter?
 - Replace the measuring unit or the cable to the measuring unit.
- For fault value, bit 6, 7 = 1:
 - Replace the defective EnDat 2.2 converter.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33121 (N, A) Encoder 3: Determined commutation position incorrect

Message value: -

Drive object: All objects

Reaction: OFF1 (NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: A commutation position actual value sensing error was detected.

Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33122 Encoder 3: Sensor Module hardware fault

Message value: %1

Drive object: All objects

Reaction: OFF1

Acknowledge: IMMEDIATELY

Cause: An internal Sensor Module hardware fault was detected.
 Fault value (r0949, interpret decimal):
 1: Reference voltage error.
 2: Internal undervoltage.
 3: Internal overvoltage.

Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

F33123 (N, A) Encoder 3: Signal level A/B outside tolerance

Message value: Fault cause: %1 bin

Drive object: All objects

13.2 List of faults and alarms

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The unipolar level (AP/AN or BP/BN) for encoder 3 is outside the permissible tolerance.
Fault value (r0949, interpret binary):
Bit 0 = 1: Either AP or AN outside the tolerance.
Bit 16 = 1: Either BP or BN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note:
The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).
Remedy:
- make sure that the encoder cables and shielding are installed in an EMC-compliant manner.
- check the plug connections and contacts of the encoder cable.
- check the short-circuit of a signal cable with mass or the operating voltage.
- replace the encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33125 (N, A) Encoder 3: Signal level track A or B too high

Message value: A track: %1, B-track: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The signal level (root from $A^2 + B^2$) of the encoder exceeds the permissible limit value.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response threshold is > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms).
The response threshold is > 3582 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33126 (N, A) Encoder 3: Signal level track A or B too high

Message value: Amplitude: %1, Angle: %2

Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The signal level ($|A| + |B|$) of the encoder exceeds the permissible limit value.
 Fault value (r0949, interpret hexadecimal):
 yyyyxxxx hex:
 yyyy = Angle
 xxxx = amplitude, i.e. root of $A^2 + B^2$ (16 bits without sign)
 The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
 The response threshold for ($|A| + |B|$) is > 1120 mV or the root of $(A^2 + B^2) > 955$ mV.
 A signal level of 500 mV peak value corresponds to the numerical value of 299A hex = 10650 dec.
 The angle 0 ... FFFF hex corresponds to 0 ... 360 degrees of the fine position. Zero degrees is present at the negative zero crossover of track B.
 Note:
 The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
Remedy: - check that the encoder cables and shielding are routed in compliance with EMC.
 - replace the encoder or encoder cable.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33129 (N, A) Encoder 3: Position difference hall sensor/track C/D and A/B too large

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The error for track C/D is greater than $\pm 15^\circ$ mechanical or $\pm 60^\circ$ electrical or the error for the Hall signals is greater than $\pm 60^\circ$ electrical.
 One period of track C/D corresponds to 360° mechanical.
 One period of the Hall signal corresponds to 360° electrical.
 The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
 After the fine synchronization using one reference mark or 2 reference marks for distance-coded encoders, this fault is no longer initiated, but instead, Alarm A33429.
 Fault value (r0949, interpret decimal):
 For track C/D, the following applies:
 Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1°).
 For Hall signals, the following applies:
 Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1°).
Remedy: - track C or D not connected.
 - correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
 - check that the encoder cables are routed in compliance with EMC.
 - check the adjustment of the Hall sensor.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33130 (N, A) Encoder 3: Zero mark and position error from the coarse synchronization

Message value: Angular deviation, electrical: %1, angle, mechanical: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: After initializing the pole position using track C/D, Hall signals or pole position identification routine, the zero mark was detected outside the permissible range. For distance-coded encoders, the test is carried out after passing 2 zero marks. Fine synchronization was not carried out.

When initializing via track C/D (p0404) then it is checked whether the zero mark occurs in an angular range of +/-18 ° mechanical.

When initializing via Hall sensors (p0404) or pole position identification (p1982) it is checked whether the zero mark occurs in an angular range of +/-60 ° electrical.

Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex
yyyy: Determined mechanical zero mark position (can only be used for track C/D).
xxxx: Deviation of the zero mark from the expected position as electrical angle.
Scaling: 32768 dec = 180 °

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- if the Hall sensor is used as an equivalent for track C/D, check the connection.
- check the connection of track C or D.
- replace the encoder or encoder cable.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33131 (N, A) Encoder 3: Position deviation incremental/absolute too high

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)

Acknowledge: PULSE INHIBIT

Cause: Absolute encoder:
When cyclically reading the absolute position, an excessively high difference to the incremental position was detected. The absolute position that was read is rejected.

Limit value for the deviation:
- EnDat encoder: Is supplied from the encoder and is a minimum of 2 quadrants (e.g. EQI 1325 > 2 quadrants, EQN 1325 > 50 quadrants).
- other encoders: 15 pulses = 60 quadrants.

Incremental encoder:
When the zero pulse is passed, a deviation in the incremental position was detected.

For equidistant zero marks, the following applies:
- the first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.

For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.

Fault value (r0949, interpret decimal):
Deviation in quadrants (1 pulse = 4 quadrants).

- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check whether the coding disk is dirty or there are strong ambient magnetic fields.
 - adapt the parameter for the clearance between zero marks (p0425).
 - if message output above speed threshold, reduce filter time if necessary (p0438).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33135 Encoder 3: Fault when determining the position (singleturn)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: The encoder has identified a position determination fault (singleturn) and supplies status information bit by bit in an internal status/fault word.

Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.

Note regarding the bit designation:

The first designation is valid for DRIVE-CLiQ encoders, the second for EnDat 2.2 encoders.

Fault value (r0949, interpret binary):

Bit 0: F1 (safety status display).

Bit 1: F2 (safety status display).

Bit 2: Reserved (lighting).

Bit 3: Reserved (signal amplitude).

Bit 4: Reserved (position value).

Bit 5: Reserved (overvoltage).

Bit 6: Reserved (undervoltage)/hardware fault EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 7: Reserved (overcurrent)/EnDat encoder withdrawn when not in the parked state (--> F3x110, x = 1, 2, 3).

Bit 8: Reserved (battery)/overcurrent EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 9: Reserved/overvoltage EnDat supply (--> F3x110, x = 1, 2, 3).

Bit 11: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 12: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 13: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 14: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).

Bit 15: Internal communication error (--> F3x110, x = 1, 2, 3).

Bit 16: Lighting (--> F3x135, x = 1, 2, 3).

Bit 17: Signal amplitude (--> F3x135, x = 1, 2, 3).

Bit 18: Singleturn position 1 (--> F3x135, x = 1, 2, 3).

Bit 19: Overvoltage (--> F3x135, x = 1, 2, 3).

Bit 20: Undervoltage (--> F3x135, x = 1, 2, 3).

Bit 21: Overcurrent (--> F3x135, x = 1, 2, 3).

Bit 22: Temperature exceeded (--> F3x405, x = 1, 2, 3).

Bit 23: Singleturn position 2 (safety status display).

Bit 24: Singleturn system (--> F3x135, x = 1, 2, 3).

Bit 25: Singleturn power down (--> F3x135, x = 1, 2, 3).

Bit 26: Multiturn position 1 (--> F3x136, x = 1, 2, 3).

Bit 27: Multiturn position 2 (--> F3x136, x = 1, 2, 3).

Bit 28: Multiturn system (--> F3x136, x = 1, 2, 3).

Bit 29: Multiturn power down (--> F3x136, x = 1, 2, 3).

Bit 30: Multiturn overflow/underflow (--> F3x136, x = 1, 2, 3).

Bit 31: Multiturn battery (reserved).

Remedy: - determine the detailed cause of the fault using the fault value.

- replace the encoder if necessary.

Note:

An EnDat 2.2 encoder may only be removed and inserted in the "Park" state.

If an EnDat 2.2 encoder was removed when not in the "Park" state, then after inserting the encoder, a POWER ON (switch-off/switch-on) is necessary to acknowledge the fault.

F33136 Encoder 3: Fault when determining the position (multiturn)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The encoder has identified a position determination fault (multiturn) and supplies status information bit by bit in an internal status/fault word.
 Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.
 Note regarding the bit designation:
 The first designation is valid for DRIVE-CLiQ encoders, the second for EnDat 2.2 encoders.
 Fault value (r0949, interpret binary):
 Bit 0: F1 (safety status display).
 Bit 1: F2 (safety status display).
 Bit 2: Reserved (lighting).
 Bit 3: Reserved (signal amplitude).
 Bit 4: Reserved (position value).
 Bit 5: Reserved (overvoltage).
 Bit 6: Reserved (undervoltage)/hardware fault EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 7: Reserved (overcurrent)/EnDat encoder withdrawn when not in the parked state (--> F3x110, x = 1, 2, 3).
 Bit 8: Reserved (battery)/overcurrent EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 9: Reserved/overvoltage EnDat supply (--> F3x110, x = 1, 2, 3).
 Bit 11: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 12: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 13: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 14: Reserved/internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 15: Internal communication error (--> F3x110, x = 1, 2, 3).
 Bit 16: Lighting (--> F3x135, x = 1, 2, 3).
 Bit 17: Signal amplitude (--> F3x135, x = 1, 2, 3).
 Bit 18: Singleturn position 1 (--> F3x135, x = 1, 2, 3).
 Bit 19: Overvoltage (--> F3x135, x = 1, 2, 3).
 Bit 20: Undervoltage (--> F3x135, x = 1, 2, 3).
 Bit 21: Overcurrent (--> F3x135, x = 1, 2, 3).
 Bit 22: Temperature exceeded (--> F3x405, x = 1, 2, 3).
 Bit 23: Singleturn position 2 (safety status display).
 Bit 24: Singleturn system (--> F3x135, x = 1, 2, 3).
 Bit 25: Singleturn power down (--> F3x135, x = 1, 2, 3).
 Bit 26: Multiturn position 1 (--> F3x136, x = 1, 2, 3).
 Bit 27: Multiturn position 2 (--> F3x136, x = 1, 2, 3).
 Bit 28: Multiturn system (--> F3x136, x = 1, 2, 3).
 Bit 29: Multiturn power down (--> F3x136, x = 1, 2, 3).
 Bit 30: Multiturn overflow/underflow (--> F3x136, x = 1, 2, 3).
 Bit 31: Multiturn battery (reserved).

Remedy: - determine the detailed cause of the fault using the fault value.
 - replace the encoder if necessary.
 Note:
 An EnDat 2.2 encoder may only be removed and inserted in the "Park" state.
 If an EnDat 2.2 encoder was removed when not in the "Park" state, then after inserting the encoder, a POWER ON (switch-off/switch-on) is necessary to acknowledge the fault.

F33137 Encoder 3: Fault when determining the position (singleturn)
Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: A position determination fault has occurred in the DRIVE-CLiQ encoder.
Fault value (r0949, interpret binary):
yyxxxxx hex: yy = encoder version, xxxxxx = bit coding of the fault cause

For yy = 8 (0000 1000 bin), the following applies:

- Bit 1: Signal monitoring (sin/cos).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: LED monitoring.
- Bit 17: Fault when determining the position (multiturn).
- Bit 23: Temperature outside the limit values.

For yy = 11 (0000 1011 bin), the following applies:

- Bit 0: Position word 1 difference between rotation counter and software counter (XC_ERR).
- Bit 1: Position word 1 track error of the incremental signals (LIS_ERR).
- Bit 2: Position word 1 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 3: Maximum permissible temperature exceeded (TEMP_ERR).
- Bit 4: Power supply overvoltage (MON_OVR_VOLT).
- Bit 5: Power supply overcurrent (MON_OVR_CUR).
- Bit 6: Power supply undervoltage (MON_UND_VOLT).
- Bit 7: Rotation error counter (MT_ERR).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 11: Position word 1 status bit: singleturn position OK (ADC_ready).
- Bit 12: Position word 1 status bit: rotation counter OK (MT_ready).
- Bit 13: Position word 1 memory error (MEM_ERR).
- Bit 14: Position word 1 absolute position error (MLS_ERR).
- Bit 15: position word 1 LED error, lighting unit error (LED_ERR).
- Bit 18: Position word 2 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 21: Position word 2 memory error (MEM_ERR).
- Bit 22: Position word 2 absolute position error (MLS_ERR).
- Bit 23: position word 2 LED error, lighting unit error (LED_ERR).

For yy = 12 (0000 1100 bin), the following applies:

- Bit 8: encoder fault.
- Bit 10: error in the internal position data transport.

For yy = 14 (0000 1110 bin), the following applies:

- Bit 0: Position word 1 temperature outside limit value.
- Bit 1: Position word 1 position determination error (multiturn).
- Bit 2: Position word 1 FPGA error.
- Bit 3: Position word 1 velocity error.
- Bit 4: Position word 1 communication error between FPGAs/error in the incremental signal.
- Bit 5: Position word 1 timeout absolute value/error when determining the position (singleturn).
- Bit 6: Position word 1 internal hardware fault (clock/power monitor IC/power).
- Bit 7: Position word 1 internal error (FPGA communication/FPGA parameterization/self-test/software).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: Position word 2 temperature outside limit value.
- Bit 17: Position word 2 position determination error (multiturn).
- Bit 18: Position word 2 FPGA error.
- Bit 19: Position word 2 velocity error.

Bit 20: Position word 2 communication error between FPGAs.
 Bit 21: Position word 2 position determination error (singleturn).
 Bit 22: Position word 2 internal hardware fault (clock/power monitor IC/power).
 Bit 23: Position word 2 internal error (self-test/software).

Note:

For an encoder version that is not described here, please contact the encoder manufacturer for more detailed information on the bit coding.

Remedy:

- determine the detailed cause of the fault using the fault value.
- if required, replace the DRIVE-CLiQ encoder.

F33138 Encoder 3: Fault when determining the position (multiturn)

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT

13.2 List of faults and alarms

Cause: A position determination fault has occurred in the DRIVE-CLiQ encoder.
Fault value (r0949, interpret binary):
yyxxxxx hex: yy = encoder version, xxxxxx = bit coding of the fault cause

For yy = 8 (0000 1000 bin), the following applies:

- Bit 1: Signal monitoring (sin/cos).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: LED monitoring.
- Bit 17: Fault when determining the position (multiturn).
- Bit 23: Temperature outside the limit values.

For yy = 11 (0000 1011 bin), the following applies:

- Bit 0: Position word 1 difference between rotation counter and software counter (XC_ERR).
- Bit 1: Position word 1 track error of the incremental signals (LIS_ERR).
- Bit 2: Position word 1 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 3: Maximum permissible temperature exceeded (TEMP_ERR).
- Bit 4: Power supply overvoltage (MON_OVR_VOLT).
- Bit 5: Power supply overcurrent (MON_OVR_CUR).
- Bit 6: Power supply undervoltage (MON_UND_VOLT).
- Bit 7: Rotation error counter (MT_ERR).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 11: Position word 1 status bit: singleturn position OK (ADC_ready).
- Bit 12: Position word 1 status bit: rotation counter OK (MT_ready).
- Bit 13: Position word 1 memory error (MEM_ERR).
- Bit 14: Position word 1 absolute position error (MLS_ERR).
- Bit 15: position word 1 LED error, lighting unit error (LED_ERR).
- Bit 18: Position word 2 error when aligning between incremental track signals and absolute value (ST_ERR).
- Bit 21: Position word 2 memory error (MEM_ERR).
- Bit 22: Position word 2 absolute position error (MLS_ERR).
- Bit 23: position word 2 LED error, lighting unit error (LED_ERR).

For yy = 14 (0000 1110 bin), the following applies:

- Bit 0: Position word 1 temperature outside limit value.
- Bit 1: Position word 1 position determination error (multiturn).
- Bit 2: Position word 1 FPGA error.
- Bit 3: Position word 1 velocity error.
- Bit 4: Position word 1 communication error between FPGAs/error in the incremental signal.
- Bit 5: Position word 1 timeout absolute value/error when determining the position (singleturn).
- Bit 6: Position word 1 internal hardware fault (clock/power monitor IC/power).
- Bit 7: Position word 1 internal error (FPGA communication/FPGA parameterization/self-test/software).
- Bit 8: F1 (safety status display) error position word 1.
- Bit 9: F2 (safety status display) error position word 2.
- Bit 16: Position word 2 temperature outside limit value.
- Bit 17: Position word 2 position determination error (multiturn).
- Bit 18: Position word 2 FPGA error.
- Bit 19: Position word 2 velocity error.
- Bit 20: Position word 2 communication error between FPGAs.
- Bit 21: Position word 2 position determination error (singleturn).
- Bit 22: Position word 2 internal hardware fault (clock/power monitor IC/power).
- Bit 23: Position word 2 internal error (self-test/software).

Note:

For an encoder version that is not described here, please contact the encoder manufacturer for more detailed information on the bit coding.

Remedy: - determine the detailed cause of the fault using the fault value.
- if required, replace the DRIVE-CLiQ encoder.

F33142 (N, A) Encoder 3: Battery voltage fault

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: When switched-off, the encoder uses a battery to back up the multiturn information. The battery voltage is no longer sufficient to check the multiturn information.
Remedy: Replace battery.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33150 (N, A) Encoder 3: Initialization error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: Encoder functionality selected in p0404 cannot be executed.
 Fault value (r0949, interpret hexadecimal):
 Encoder malfunction.
 The bit assignment corresponds to that of p0404 (e.g. bit 5 set: Error track C/D).
Remedy: - check that p0404 is correctly set.
 - check the encoder type used (incremental/absolute) and for SMCxx, the encoder cable.
 - if relevant, note additional fault messages that describe the fault in detail.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33151 (N, A) Encoder 3: Encoder speed for initialization AB too high

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The encoder speed is too high while initializing the Sensor Module.
Remedy: Reduce the speed of the encoder accordingly during initialization.
 If necessary, deactivate monitoring (p0437.29).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33152 (N, A) Encoder 3: Max. signal frequency (track A/B) exceeded

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The maximum signal frequency of the encoder evaluation has been exceeded.
Fault value (r0949, interpret decimal):
Actual input frequency in Hz.
Remedy: - reduce the speed.
- Use an encoder with a lower pulse number (p0408).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33153 (N, A) Encoder 3: Identification error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: An error has occurred when identifying the encoder (waiting) p0400 = 10100.
The connected encoder was not able to be identified.
Fault value (r0949, interpret hexadecimal):
Bit 0: Data length incorrect.
Remedy: Manually configure the encoder according to the data sheet.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33160 (N, A) Encoder 3: Analog sensor channel A failed

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT
Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the measuring range set in (p4673).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4673).
For fault value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE

Acknowl. upon A: NONE

F33161 (N, A) Encoder 3: Analog sensor channel B failed

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the selected measuring range (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).

Remedy: For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4675).
For fault value = 3:
- check the range limit setting and increase it if necessary (p4676).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33163 (N, A) Encoder 3: Analog sensor position value exceeds limit value

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE)

Acknowledge: PULSE INHIBIT

Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
Fault value (r0949, interpret decimal):
1: Position value from the LVDT sensor.
2: Position value from the encoder characteristic.

Remedy: For fault value = 1:
- check the LVDT ratio (p4678).
- check the reference signal connection at track B.
For fault value = 2:
- check the coefficients of the characteristic (p4663 ... p4666).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A33400 (F, N) Encoder 3: Zero mark distance error (alarm threshold exceeded)

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

13.2 List of faults and alarms

Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Alarm value (r2124, interpret decimal):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33401 (F, N) Encoder 3: Zero mark failed (alarm threshold exceeded)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The 1.5x parameterized zero mark distance was exceeded without a zero mark being detected.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Alarm value (r2124, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the clearance between zero marks (p0425).
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F33405 (N, A) Encoder 3: Temperature in the encoder evaluation exceeded

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)

Cause: The encoder evaluation for a motor with DRIVE-CLiQ has detected an excessively high temperature.
The fault threshold is 125 ° C.
Fault value (r0949, interpret decimal):
Measured module temperature [0.1 °C].

Remedy: Reduce the ambient temperature for the DRIVE-CLiQ connection of the motor.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A33407 (F, N) Encoder 3: Function limit reached

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The encoder has reached one of its function limits. A service is recommended.
 Alarm value (r2124, interpret decimal):
 1: Incremental signals
 3: Absolute track
 4: Code connection
Remedy: Perform service. Replace the encoder if necessary.
 Note:
 The actual functional reserve of an encoder can be displayed via r4651.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33410 (F, N) Encoder 3: Communication error (encoder and Sensor Module)

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Serial communication protocol transfer error between the encoder and evaluation module.
 Alarm value (r2124, interpret binary):
 Bit 0: Alarm bit in the position protocol.
 Bit 1: Incorrect quiescent level on the data line.
 Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
 Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
 Bit 4: Encoder acknowledgment error: The encoder incorrectly understood the task (request) or cannot execute it.
 Bit 5: Internal error in the serial driver: An illegal mode command was requested.
 Bit 6: Timeout when cyclically reading.
 Bit 8: Protocol is too long (e.g. > 64 bits).
 Bit 9: Receive buffer overflow.
 Bit 10: Frame error when reading twice.
 Bit 11: Parity error.
 Bit 12: Data line signal level error during the monoflop time.
Remedy:
 - check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace encoder.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33411 (F, N) Encoder 3: Encoder signals an internal alarm (detailed information)

Message value: Fault cause: %1 bin, additional information: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: The absolute encoder fault word includes alarm bits that have been set.
Alarm value (r2124, interpret binary):
yyyyxxxx hex: yyyy = supplementary information, xxxx = fault cause
yyyy = 0:
Bit 0: Frequency exceeded (speed too high).
Bit 1: Temperature exceeded.
Bit 2: Control reserve, lighting system exceeded.
Bit 3: Battery discharged.
Bit 4: Reference point passed.
yyyy = 1:
Bit 0: Signal amplitude outside the control range.
Bit 1: Error multiturn interface
Bit 2: Internal data error (singleturn/multiturn not with single steps).
Bit 3: Error EEPROM interface.
Bit 4: SAR converter error.
Bit 5: Fault for the register data transfer.
Bit 6: Internal error identified at the error pin (nErr).
Bit 7: Temperature threshold exceeded or fallen below.

Remedy: Replace encoder.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33412 (F, N) Encoder 3: Encoder signals an internal alarm

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The encoder signals an internal alarm via serial protocol.
Alarm value (r2124, interpret binary):
Bit 0: Fault bit in the position protocol.
Bit 1: Alarm bit in the position protocol.

Remedy:

- carry out a POWER ON (switch-off/switch-on) for all components.
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace encoder.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33414 (F, N) Encoder 3: Signal level track C or D out of tolerance

Message value: C track: %1, D track: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

- Cause:** The signal level ($C^2 + D^2$) of track C or D of the encoder or from the Hall signals, is not within the tolerance bandwidth.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track D (16 bits with sign).
xxxx = Signal level, track C (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV $-25/+20$ %).
The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note:
If the amplitude is not within the tolerance bandwidth, then it cannot be used to initialize the start position.
- Remedy:**
- check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
 - check the Hall sensor box.
- Reaction upon F:** Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

N33415 (F, A) Encoder 3: Signal level track A or B outside tolerance (alarm)

- Message value:** Amplitude: %1, Angle: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
- Cause:** The signal level (root from $A^2 + B^2$) of the encoder is outside the permissible tolerance.
Alarm value (r2124, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Angle
xxxx = amplitude, i.e. root of $A^2 + B^2$ (16 bits without sign)
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV $-25/+20$ %).
The response threshold is < 230 mV (observe the frequency response of the encoder).
A signal level of 500 mV peak value corresponds to the numerical value 299A hex = 10650 dec.
The angle 0 ... FFFF hex corresponds to 0 ... 360 degrees of the fine position. Zero degrees is present at the negative zero crossover of track B.
Note for Sensor Modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1414 mV (1.0 Vrms).
A signal level of 2900 mV peak value corresponds to the numerical value 3333 hex = 13107 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
- Remedy:**
- check the speed range, frequency characteristic (amplitude characteristic) of the measuring equipment is not sufficient for the speed range.
 - check that the encoder cables and shielding are routed in compliance with EMC.
 - check the plug connections.
 - replace the encoder or encoder cable.
 - check the Sensor Module (e.g. contacts).
 - if the coding disk is soiled or the lighting aged, replace the encoder.
- Reaction upon F:** Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon A: NONE

Acknowl. upon A: NONE

A33418 (F, N) Encoder 3: Speed change not plausible (alarm)

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: For an HTL/TTL encoder, the speed change has exceeded the value in p0492 over several sampling cycles.
The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the setting of p0492.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A33419 (F, N) Encoder 3: Track A or B outside tolerance

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The amplitude/phase/offset correction for track A or B is at the limit.
Amplitude error correction: $\text{Amplitude B} / \text{Amplitude A} = 0.78 \dots 1.27$
Phase: <84 degrees or >96 degrees
SMC20: Offset correction: +/-140 mV
SMC10: Offset correction: +/-650 mV
Alarm value (r2124, interpret hexadecimal):
xxxx1: Minimum of the offset correction, track B
xxxx2: Maximum of the offset correction, track B
xxx1x: Minimum of the offset correction, track A
xxx2x: Maximum of the offset correction, track A
xx1xx: Minimum of the amplitude correction, track B/A
xx2xx: Maximum of the amplitude correction, track B/A
x1xxx: Minimum of the phase error correction
x2xxx: Maximum of the phase error correction
1xxxx: Minimum of the cubic correction
2xxxx: Maximum of the cubic correction

Remedy:

- check mechanical mounting tolerances for encoders without their own bearings (e.g. toothed-wheel encoders).
- check the plug connections (also the transition resistance).
- check the encoder signals.
- replace the encoder or encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

A33421 (F, N) Encoder 3: Determined commutation position incorrect (alarm)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A commutation position actual value sensing error was detected.
 Alarm value (r2124, interpret decimal):
 3: The absolute position of the serial protocol and track A/B differ by half an encoder pulse. The absolute position must have its zero position in the quadrants in which both tracks are negative. In the case of a fault, the position can be incorrect by one encoder pulse.
Remedy: For alarm value = 3:
 - For a standard encoder with cable, contact the manufacturer where relevant.
 - correct the assignment of the tracks to the position value that is serially transferred. To do this, the two tracks must be connected, inverted, at the Sensor Module (interchange A with A* and B with B*) or, for a programmable encoder, check the zero offset of the position.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33422 (F, N) Encoder 3: Pulses per revolution square-wave encoder outside tolerance bandwidth

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
 This alarm is triggered with active square-wave encoder PPR correction and re-parameterized fault 31131 if the accumulator contains larger values than p4683 or p4684.
 The zero mark distance for zero mark monitoring is set in p0425 (rotary encoder).
 Alarm value (r2124, interpret decimal):
 accumulated differential pulses in encoder pulses.
Remedy:
 - check that the encoder cables are routed in compliance with EMC.
 - check the plug connections.
 - check the encoder type (encoder with equidistant zero marks).
 - adapt the parameter for the distance between zero marks (p0424, p0425).
 - replace the encoder or encoder cable.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33429 (F, N) Encoder 3: Position difference hall sensor/track C/D and A/B too large

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

13.2 List of faults and alarms

Cause: The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical.
One period of track C/D corresponds to 360 ° mechanical.
One period of the Hall signal corresponds to 360 ° electrical.
The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
Alarm value (r2124, interpret decimal):
For track C/D, the following applies:
Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).
For Hall signals, the following applies:
Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °).

Remedy:

- track C or D not connected.
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
- check that the encoder cables are routed in compliance with EMC.
- check the adjustment of the Hall sensor.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33431 (F, N) Encoder 3: Position deviation incremental/absolute too high (alarm)

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: When the zero pulse is passed, a deviation in the incremental position was detected.
For equidistant zero marks, the following applies:
- the first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.
For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.
Alarm value (r2124, interpret decimal):
Deviation in quadrants (1 pulse = 4 quadrants).

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- Clean coding disk or remove strong magnetic fields.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33432 (F, N) Encoder 3: Rotor position adaptation corrects deviation

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: On track A/B, pulses have been lost or too many have been counted. These pulses are presently being corrected.
 Alarm value (r2124, interpret decimal):
 Last measured deviation of zero mark in increments (4 increments = 1 encoder pulse).
 The sign designates the direction of motion when detecting the zero mark distance.

Remedy:

- check that the encoder cables are routed in compliance with EMC.
- check the plug connections.
- replace the encoder or encoder cable.
- check encoder limit frequency.
- adapt the parameter for the distance between zero marks (p0424, p0425).

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33442 (F, N) Encoder 3: Battery voltage alarm threshold reached

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: When switched-off, the encoder uses a battery to back up the multiturn information. The multiturn information can no longer be buffered if the battery voltage drops even further.

Remedy: Replace battery.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33443 (F, N) Encoder 3: Signal level track C/D outside tolerance (alarm)

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The unipolar level (CP/CN or DP/DN) for encoder 3 is outside the permissible tolerance.
 Alarm value (r2124, interpret binary):
 Bit 0 = 1: Either CP or CN outside the tolerance.
 Bit 16 = 1: Either DP or DN outside the tolerance.
 The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
 The response thresholds are < 1700 mV and > 3300 mV.
 Note:
 The signal level is not evaluated unless the following conditions are satisfied:

- Sensor Module properties available (r0459.31 = 1).
- monitoring active (p0437.31 = 1).

Remedy:

- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections and contacts of the encoder cable.
- are the C/D tracks connected correctly (have the signal cables CP and CN or DP and DN been interchanged)?
- replace the encoder cable.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33460 (N) Encoder 3: Analog sensor channel A failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside measuring range set in p4673.
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For alarm value = 1:
- check the output voltage of the analog sensor.
For alarm value = 2:
- check the voltage setting for each encoder period (p4673).
For alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE

A33461 (N) Encoder 3: Analog sensor channel B failed

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the selected measuring range (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For alarm value = 1:
- check the output voltage of the analog sensor.
For alarm value = 2:
- check the voltage setting for each encoder period (p4675).
For alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).
Reaction upon N: NONE
Acknowl. upon N: NONE

A33462 (N) Encoder 3: Analog sensor no channel active

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Channel A and B are not activated for the analog sensor.
Remedy: - activate channel A and/or channel B (p4670).
- check the encoder configuration (p0404.17).
Reaction upon N: NONE
Acknowl. upon N: NONE

A33463 (N) Encoder 3: Analog sensor position value exceeds limit value

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
 Alarm value (r2124, interpret decimal):
 1: Position value from the LVDT sensor.
 2: Position value from the encoder characteristic.
Remedy: For alarm value = 1:
 - check the LVDT ratio (p4678).
 - check the reference signal connection at track B.
 For alarm value = 2:
 - check the coefficients of the characteristic (p4663 ... p4666).
Reaction upon N: NONE
Acknowl. upon N: NONE

A33470 (F, N) Encoder 3: Encoder signals an internal error (X521.7)

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For the Sensor Module Cabinet 30 (SMC30), a dirty encoder is signaled via a 0 signal at terminal X521.7.
Remedy: - check the plug connections.
 - replace the encoder or encoder cable.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F33500 (N, A) Encoder 3: Position tracking traversing range exceeded

Message value: -
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: For a configured linear axis without modulo correction, the drive/encoder has exceeded the maximum possible traversing range. The value should be read in p0412 and interpreted as the number of motor revolutions.
 For p0411.0 = 1, the maximum traversing range for the configured linear axis is defined to be 64x (+/- 32x) of p0421.
 For p0411.3 = 1, the maximum traversing range for the configured linear axis is preset (default value) to the highest possible value and is +/-p0412/2 (rounded off to complete revolutions). The highest possible value depends on the pulse number (p0408) and the fine resolution (p0419).
Remedy: The fault should be resolved as follows:
 - select encoder commissioning (p0010 = 4).
 - reset the position tracking as follows (p0411.2 = 1).
 - deselect encoder commissioning (p0010 = 0).
 The fault should then be acknowledged and the absolute encoder adjusted.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33501 (N, A) Encoder 3: Position tracking encoder position outside tolerance window

Message value: %1
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: When switched off, the drive/encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder.
Fault value (r0949, interpret decimal):
Deviation (difference) to the last encoder position in increments of the absolute value.
The sign designates the traversing direction.
Note:
The deviation (difference) found is also displayed in r0477.
Remedy: Reset the position tracking as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).
See also: p0010
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33502 (N, A) Encoder 3: Encoder with measuring gear without valid signals

Message value: -
Drive object: All objects
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The encoder with measuring gear no longer provides any valid signals.
Remedy: It must be ensured that all of the encoders, with mounted measuring gear, provide valid actual values in operation.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33503 (N, A) Encoder 3: Position tracking cannot be reset

Message value: -
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The position tracking for the measuring gear cannot be reset.
Remedy: The fault should be resolved as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- deselect encoder commissioning (p0010 = 0).
The fault should then be acknowledged and the absolute encoder adjusted.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE

Acknowl. upon A: NONE

A33700 Encoder 3: Effectivity test does not supply the expected value

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The DRIVE-CLiQ encoder fault word supplies fault bits that have been set.
Alarm value (r2124, interpret binary):
Bit x = 1: Effectivity test x unsuccessful.
Remedy: Replace encoder.

N33800 (F) Encoder 3: Group signal

Message value: -
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: NONE
Cause: The motor encoder has detected at least one fault.
Remedy: Evaluate the other messages that are presently available.
Reaction upon F: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

F33801 (N, A) Encoder 3 DRIVE-CLiQ: Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy:
- check the electrical cabinet design and cable routing for EMC compliance
- replace the component involved.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33802 (N, A) Encoder 3: Time slice overflow

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A time slice overflow has occurred in encoder 3.
Fault value (r0949, interpret hexadecimal):
yx hex: y = function involved (Siemens-internal fault diagnostics), x = time slice involved
x = 9:
Time slice overflow of the fast (current controller clock cycle) time slice.
x = A:
Time slice overflow of the average time slice.
x = C:
Time slice overflow of the slow time slice.
yx = 3E7:
Timeout when waiting for SYNO (e.g. unexpected return to non-cyclic operation).

Remedy: Increase the current controller sampling time
Note:
For a current controller sampling time = 31.25 µs, use an SMx20 with Article No. 6SL3055-0AA00-5xA3.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33804 (N, A) Encoder 3: Sensor Module checksum error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: POWER ON (IMMEDIATELY)
Cause: A checksum error has occurred when reading-out the program memory on the Sensor Module.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex
yyyy: Memory area involved.
xxxx: Difference between the checksum at POWER ON and the actual checksum.

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- upgrade firmware to later version (>= V2.6 HF3, >= V4.3 SP2, >= V4.4).
- check whether the permissible ambient temperature for the component is maintained.
- replace the Sensor Module.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33805 (N, A) Encoder 3: EEPROM checksum error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: Data in the EEPROM corrupted .
Fault value (r0949, interpret hexadecimal):
01: EEPROM access error.
02: Too many blocks in the EEPROM.

Remedy: Replace the module.

Reaction upon N: NONE
Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33806 (N, A) Encoder 3: Initialization error

Message value: %1

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The encoder was not successfully initialized.

Fault value (r0949, interpret hexadecimal):

Bit 0, 1: Encoder initialization with the motor rotating has failed (deviation involving coarse and fine position in encoder pulses/4).

Bit 2: Mid-voltage matching for track A unsuccessful.

Bit 3: Mid-voltage matching for track B unsuccessful.

Bit 4: Mid-voltage matching for acceleration input unsuccessful.

Bit 5: Mid-voltage matching for track safety A unsuccessful.

Bit 6: Mid-voltage matching for track safety B unsuccessful.

Bit 7: Mid-voltage matching for track C unsuccessful.

Bit 8: Mid-voltage matching for track D unsuccessful.

Bit 9: Mid-voltage matching for track R unsuccessful.

Bit 10: The difference in mid-voltages between A and B is too great (> 0.5 V)

Bit 11: The difference in mid-voltages between C and D is too great (> 0.5 V)

Bit 12: The difference in mid-voltages between safety A and safety B is too great (> 0.5 V)

Bit 13: The difference in mid-voltages between A and safety B is too great (> 0.5 V)

Bit 14: The difference in mid-voltages between B and safety A is too great (> 0.5 V)

Bit 15: The standard deviation of the calculated mid-voltages is too great (> 0.3 V)

Bit 16: Internal fault - fault when reading a register (CAFE)

Bit 17: Internal fault - fault when writing a register (CAFE)

Bit 18: Internal fault: No mid-voltage matching available

Bit 19: Internal error - ADC access error.

Bit 20: Internal error - no zero crossover found.

Bit 28: Error while initializing the EnDat 2.2 measuring unit.

Bit 29: Error when reading out the data from the EnDat 2.2 measuring unit.

Bit 30: EEPROM checksum of the EnDat 2.2 measuring unit incorrect.

Bit 31: Data of the EnDat 2.2 measuring unit inconsistent.

Note:

Bit 0, 1: Up to 6SL3055-0AA00-5*A0

Bits 2 ... 20: 6SL3055-0AA00-5*A1 and higher

Remedy: Acknowledge fault.

If the fault cannot be acknowledged:

Bits 2 ... 9: Check encoder power supply.

Bits 2 ... 14: Check the corresponding cable.

Bit 15 with no other bits: Check track R, check settings in p0404.

Bit 28: Check the cable between the EnDat 2.2 converter and the measuring unit.

Bit 29 ... 31: Replace the defective measuring unit.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

A33811 (F, N) Encoder 3: Encoder serial number changed

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The encoder serial number has changed. The change is only checked for encoders with serial number (e.g. EnDat encoders).
- the encoder was replaced.
Note:
With closed-loop position control, the serial number is accepted when starting the adjustment (p2507 = 2).
When the encoder is adjusted (p2507 = 3), the serial number is checked for changes and if required, the adjustment is reset (p2507 = 1).
Proceed as follows to hide serial number monitoring:
- set the following serial numbers for the corresponding Encoder Data Set: p0441= FF, p0442 = 0, p0443 = 0, p0444 = 0, p0445 = 0.

Remedy: Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

F33812 (N, A) Encoder 3: Requested cycle or RX-/TX timing not supported

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A cycle requested from the Control Unit or RX/TX timing is not supported.
Fault value (r0949, interpret decimal):
0: Application cycle is not supported.
1: DRIVE-CLiQ cycle is not supported.
2: Distance between RX and TX instants in time too low.
3: TX instant in time too early.

Remedy: Carry out a POWER ON (switch-off/switch-on) for all components.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33813 Encoder 3: Hardware logic unit failed

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The logic unit of the DRIVE-CLiQ encoder has failed.
Fault value (r0949, interpret binary):
Bit 0: ALU watchdog has responded.
Bit 1: ALU has detected a sign-of-life error.

Remedy: When the error reoccurs, replace the encoder.

F33820 (N, A) Encoder 3 DRIVE-CLiQ: Telegram error

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned.

Fault cause:

1 (= 01 hex):
Checksum error (CRC error).

2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.

3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.

4 (= 04 hex):
The length of the receive telegram does not match the receive list.

5 (= 05 hex):
The type of the receive telegram does not match the receive list.

6 (= 06 hex):
The address of the component in the telegram and in the receive list do not match.

7 (= 07 hex):
A SYNC telegram is expected - but the received telegram is not a SYNC telegram.

8 (= 08 hex):
No SYNC telegram is expected - but the received telegram is one.

9 (= 09 hex):
The error bit in the receive telegram is set.

16 (= 10 hex):
The receive telegram is too early.

Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F33835 (N, A) Encoder 3 DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned. The nodes do not send and receive in synchronism.
Fault cause:
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - carry out a POWER ON.
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33836 (N, A) Encoder 3 DRIVE-CLiQ: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33837 (N, A) Encoder 3 DRIVE-CLiQ: Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
 Fault cause:
 32 (= 20 hex):
 Error in the telegram header.
 35 (= 23 hex):
 Receive error: The telegram buffer memory contains an error.
 66 (= 42 hex):
 Send error: The telegram buffer memory contains an error.
 67 (= 43 hex):
 Send error: The telegram buffer memory contains an error.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33845 (N, A) Encoder 3 DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved.
 Fault cause:
 11 (= 0B hex):
 Synchronization error during alternating cyclic data transfer.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON (switch-off/switch-on).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33850 (N, A) Encoder 3: Encoder evaluation internal software error

Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: POWER ON

13.2 List of faults and alarms

Cause: An internal software error has occurred in the Sensor Module of encoder 3.
Fault value (r0949, interpret decimal):
1: Background time slice is blocked.
2: Checksum over the code memory is not OK.
10000: OEM memory of the EnDat encoder contains data that cannot be interpreted.
11000 ... 11499: Descriptive data from EEPROM incorrect.
11500 ... 11899: Calibration data from EEPROM incorrect.
11900 ... 11999: Configuration data from EEPROM incorrect.
12000 ... 12008: communication with analog/digital converter faulted.
16000: DRIVE-CLiQ encoder initialization application error.
16001: DRIVE-CLiQ encoder initialization ALU error.
16002: DRIVE-CLiQ encoder HISI / SISI initialization error.
16003: DRIVE-CLiQ encoder safety initialization error.
16004: DRIVE-CLiQ encoder internal system error.

Remedy: - replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33851 (N, A) Encoder 3 DRIVE-CLiQ (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 3) involved to the Control Unit.
The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - Upgrade the firmware of the component involved.
- carry out a POWER ON (switch-off/switch-on) for the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33860 (N, A) Encoder 3 DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

| | |
|-------------------------|--|
| Cause: | <p>A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 3) involved to the Control Unit.</p> <p>Fault cause:</p> <p>1 (= 01 hex): Checksum error (CRC error).</p> <p>2 (= 02 hex): Telegram is shorter than specified in the length byte or in the receive list.</p> <p>3 (= 03 hex): Telegram is longer than specified in the length byte or in the receive list.</p> <p>4 (= 04 hex): The length of the receive telegram does not match the receive list.</p> <p>5 (= 05 hex): The type of the receive telegram does not match the receive list.</p> <p>6 (= 06 hex): The address of the power unit in the telegram and in the receive list do not match.</p> <p>9 (= 09 hex): The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.</p> <p>16 (= 10 hex): The receive telegram is too early.</p> <p>17 (= 11 hex): CRC error and the receive telegram is too early.</p> <p>18 (= 12 hex): The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>19 (= 13 hex): The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>20 (= 14 hex): The length of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>21 (= 15 hex): The type of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>22 (= 16 hex): The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.</p> <p>25 (= 19 hex): The error bit in the receive telegram is set and the receive telegram is too early.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |
| Remedy: | <ul style="list-style-type: none"> - carry out a POWER ON (switch-off/switch-on). - check the electrical cabinet design and cable routing for EMC compliance - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

F33875 (N, A) Encoder 3: power supply voltage failed

| | |
|-----------------------|--|
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3) |
| Acknowledge: | IMMEDIATELY |

13.2 List of faults and alarms

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33885 (N, A) Encoder 3 DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 3) involved to the Control Unit.
The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33886 (N, A) Encoder 3 DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 3) involved to the Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33887 (N, A) Encoder 3 DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY

Cause: Fault detected on the DRIVE-CLiQ component involved (Sensor Module for encoder 3). Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
96 (= 60 hex):
Response received too late during runtime measurement.
97 (= 61 hex):
Time taken to exchange characteristic data too long.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33895 (N, A) Encoder 3 DRIVE-CLiQ (CU): Alternating cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 3) involved to the Control Unit.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: Carry out a POWER ON.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33896 (N, A) Encoder 3 DRIVE-CLiQ (CU): Inconsistent component properties

Message value: Component number: %1
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: The properties of the DRIVE-CLiQ component (Sensor Module for encoder 3), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
Fault value (r0949, interpret decimal):
Component number.
Remedy:
- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33899 (N, A) Encoder 3: Unknown fault

Message value: New message: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A fault occurred on the Sensor Module for encoder 3 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Fault value (r0949, interpret decimal):
Fault number.
Note:
If required, the significance of this new fault can be read about in a more recent description of the Control Unit.
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A33902 (F, N) Encoder 3: SPI-BUS error occurred

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal SPI bus.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33903 (F, N) Encoder 3: I2C-BUS error occurred

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal I2C bus.
Alarm value (r2124, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact Technical Support.
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F33905 (N, A) Encoder 3: Encoder parameterization error

Message value: Parameter: %1, supplementary information: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An error was identified in the encoder parameterization.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, interpret decimal):
yyyyxxxx dec: yyyy = supplementary information, xxxx = parameter
xxxx = 421:
For an EnDat/SSI encoder, the absolute position in the protocol must be less than or equal to 30 bits.
yyyy = 0:
No additional information available.
yyyy = 1:
The component does not support HTL level (p0405.1 = 0) combined with track monitoring A/B <-> -A/B (p0405.2 = 1).
yyyy = 2:
A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please start a new encoder identification.
yyyy = 3:
A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please select a listed encoder in p0400 with a code number < 10000.
yyyy = 4:
This component does not support SSI encoders (p0404.9 = 1) without track A/B.
yyyy = 5:
For SQW encoder, value in p4686 greater than in p0425.
yyyy = 6:
DRIVE-CLiQ encoder cannot be used with this firmware version.
yyyy = 7:
For an SQW encoder, the XIST1 correction (p0437.2) is only permitted for equidistant zero marks.
yyyy = 8:
The motor pole pair width is not supported by the linear scale being used.
yyyy = 9:
The length of the position in the EnDat protocol may be a maximum of 32 bits.
yyyy = 10:
The connected encoder is not supported.
yyyy = 11:
The hardware does not support track monitoring.

Remedy: - check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.
- re parameter number = 314:
- check the pole pair number and measuring gear ratio. The quotient of the "pole pair number" divided by the "measuring gear ratio" must be less than or equal to 1000 ((r0313 * p0433) / p0432 <= 1000).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F33912 **Encoder 3: Device combination is not permissible**
Message value: %1
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE)
Acknowledge: PULSE INHIBIT

Cause: The selected device combination is not supported.
 Fault value (r0949, interpret decimal):
 1003:
 The connected measuring unit cannot be operated with the EnDat 2.2 converter. For instance, the measuring unit has a pulse number/resolution of 2^n .
 1005:
 The type of measuring unit (incremental) is not supported by the EnDat 2.2 converter.
 1006:
 The maximum duration of the EnDat transfer (31.25 μ s) was exceeded.
 2001:
 The set combination of current controller cycle, DP cycle and Safety cycle is not supported by the EnDat 2.2 converter.
 2002:
 The resolution of the linear measuring unit does not match the pole pair width of the linear motor
 Pole pair width, minimum = $p0422 * 2^{20}$

Remedy: For fault value = 1003, 1005, 1006:
 - Use a measuring unit that is permissible.
 For fault value = 2001:
 - set a permissible cycle combination (if required, use standard settings).
 For fault value = 2002:
 - Use a measuring unit with a lower resolution (p0422).

A33915 (F, N) Encoder 3: Encoder configuration error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The configuration for encoder 3 is incorrect.
 Alarm value (r2124, interpret decimal):
 1:
 Re-parameterization between fault/alarm is not permissible.
 419:
 When the fine resolution Gx_XIST2 is configured, the encoder identifies a maximum possible absolute position actual value (r0483) that can no longer be represented within 32 bits.

Remedy: For alarm value = 1:
 No re-parameterization between fault/alarm.
 For alarm value = 419:
 Reduce the fine resolution (p0419) or deactivate the monitoring (p0437.25), if the complete multiturn range is not required.

Reaction upon F: Servo: NONE (IASC/DCBRK)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F33916 (N, A) Encoder 3: Encoder parameterization error

Message value: Parameter: %1, supplementary information: %2
Drive object: All objects
Reaction: Servo: OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: An encoder parameter was detected as being incorrect.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, interpret decimal):
Parameter number.

Remedy: - check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A33920 (F, N) Encoder 3: Temperature sensor fault (motor)

Message value: Fault cause: %1, channel number: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The motor detected a fault when evaluating the temperature sensor.
Fault cause:
1 (= 01 hex):
Wire breakage or sensor not connected.
KTY: R > 1630 Ohm, PT1000: R > 1720 Ohm
2 (= 02 hex):
Measured resistance too low.
PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT1000: R < 603 Ohm
Additional values:
Only for internal Siemens troubleshooting.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = channel number, xx = error cause

Remedy: - check that the encoder cable is the correct type and is correctly connected.
- check the temperature sensor selection in p0600 to p0603.
- replace the Sensor Module (hardware defect or incorrect calibration data).

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A33930 (N) Encoder 3: Data logger has saved data

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: For the activated function "Data logger" (p0437.0 = 1) a fault has occurred with the Sensor Module. This alarm indicates that the diagnostics data corresponding to the fault was saved on the memory card.
 The diagnostics data is saved in the following folder:
 /USER/SINAMICS/DATA/SMTRC00.BIN
 ...
 /USER/SINAMICS/DATA/SMTRC07.BIN
 /USER/SINAMICS/DATA/SMTRCIDX.TXT
 The following information is contained in the TXT file:
 - Display of the last written BIN file.
 - Number of write operations that are still possible (from 10000 downwards).
Note:
 Only Siemens can evaluate the BIN files.

Remedy: Not necessary.
 This alarm is automatically withdrawn.
 The data logger is ready to record the next fault case.

Reaction upon N: NONE
Acknowl. upon N: NONE

A33940 (F, N) Encoder 3: Spindle sensor S1 voltage incorrect

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The voltage of analog sensor S1 is outside the permissible range.
 Alarm value (r2124, interpret decimal):
 Signal level from sensor S1.
Note:
 A signal level of 500 mV corresponds to the numerical value 500 dec.

Remedy:
 - check the clamped tool.
 - check the tolerance and if required, adapt (p5040).
 - check the thresholds and if required, adapt (p5041).
 - check analog sensor S1 and connections.

Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F33950 Encoder 3: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: POWER ON
Cause: An internal software error has occurred.
 Fault value (r0949, interpret decimal):
 Information about the fault source.
 Only for internal Siemens troubleshooting.

Remedy:
 - if necessary, upgrade the firmware in the Sensor Module to a later version.
 - contact Technical Support.

A33999 (F, N) Encoder 3: Unknown alarm

Message value: New message: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A alarm has occurred on the Sensor Module for encoder 3 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Alarm value (r2124, interpret decimal):
Alarm number.
Note:
If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.
Remedy: - replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon F: Servo: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F34851 VSM DRIVE-CLiQ (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: NONE (OFF1, OFF2)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communications error has occurred from the Voltage Sensing Module involved (VSM) to the Control Unit. The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: Upgrade the firmware of the component involved.

F34860 VSM DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: NONE (OFF1, OFF2)
Acknowledge: IMMEDIATELY

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| Cause: | <p>A DRIVE-CLiQ communications error has occurred from the Voltage Sensing Module involved (VSM) to the Control Unit.</p> <p>Fault cause:</p> <p>1 (= 01 hex): Checksum error (CRC error).</p> <p>2 (= 02 hex): Telegram is shorter than specified in the length byte or in the receive list.</p> <p>3 (= 03 hex): Telegram is longer than specified in the length byte or in the receive list.</p> <p>4 (= 04 hex): The length of the receive telegram does not match the receive list.</p> <p>5 (= 05 hex): The type of the receive telegram does not match the receive list.</p> <p>6 (= 06 hex): The address of the power unit in the telegram and in the receive list do not match.</p> <p>9 (= 09 hex): The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.</p> <p>16 (= 10 hex): The receive telegram is too early.</p> <p>17 (= 11 hex): CRC error and the receive telegram is too early.</p> <p>18 (= 12 hex): The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>19 (= 13 hex): The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>20 (= 14 hex): The length of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>21 (= 15 hex): The type of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>22 (= 16 hex): The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.</p> <p>25 (= 19 hex): The error bit in the receive telegram is set and the receive telegram is too early.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |
| Remedy: | <ul style="list-style-type: none"> - carry out a POWER ON (switch-off/switch-on). - check the electrical cabinet design and cable routing for EMC compliance - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). |

| | |
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| F34875 | VSM: power supply voltage failed |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY |

13.2 List of faults and alarms

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

F34885 VSM DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: NONE (OFF1, OFF2)
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communications error has occurred from the Voltage Sensing Module involved (VSM) to the Control Unit. The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

F34886 VSM DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: Servo: NONE (OFF1, OFF2)
Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communications error has occurred from the Voltage Sensing Module involved (VSM) to the Control Unit. Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

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| F34887 | VSM DRIVE-CLiQ (CU): Component fault |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | Servo: NONE (OFF1, OFF2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | Fault detected on the DRIVE-CLiQ component (Voltage Sensing Module) involved. Faulty hardware cannot be excluded. Fault cause: 32 (= 20 hex): Error in the telegram header. 35 (= 23 hex): Receive error: The telegram buffer memory contains an error. 66 (= 42 hex): Send error: The telegram buffer memory contains an error. 67 (= 43 hex): Send error: The telegram buffer memory contains an error. 96 (= 60 hex): Response received too late during runtime measurement. 97 (= 61 hex): Time taken to exchange characteristic data too long. Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause |
| Remedy: | - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). - check the electrical cabinet design and cable routing for EMC compliance - if required, use another DRIVE-CLiQ socket (p9904). - replace the component involved. |

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| F34895 | VSM DRIVE-CLiQ (CU): Alternating cyclic data transfer error |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | Servo: NONE (OFF1, OFF2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | A DRIVE-CLiQ communications error has occurred from the Voltage Sensing Module involved (VSM) to the Control Unit. Fault cause: 11 (= 0B hex): Synchronization error during alternating cyclic data transfer. Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause |
| Remedy: | Carry out a POWER ON. |

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| F34896 | VSM DRIVE-CLiQ (CU): Inconsistent component properties |
| Message value: | Component number: %1 |
| Drive object: | All objects |
| Reaction: | Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | The properties of the DRIVE-CLiQ component (Voltage Sensing Module), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced. Fault value (r0949, interpret decimal): Component number. |

13.2 List of faults and alarms

Remedy:

- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).

F34950 VSM: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: An internal software error in the Voltage Sensing Module (VSM) has occurred.
Fault value (r0949, interpret decimal):
Information about the fault source.
Only for internal Siemens troubleshooting.

Remedy:

- if necessary, upgrade the firmware in the Voltage Sensing Module to a later version.
- contact Technical Support.

F35005 TM54F:parallel connection not supported

Message value: Fault cause: %1 bin
Drive object: All objects
Reaction: NONE
Acknowledge: POWER ON
Cause: The TM54F function with Basic Safety Functions is used. This function is not supported when power units are connected in parallel.
All drives of the TM54F assume fail safe values, and are not enabled.

Remedy:

- deactivate parallel connection or TM54F with Basic Safety Functions.
- copy RAM to ROM.
- carry out a POWER ON (switch-off/switch-on).

F35851 TM DRIVE-CLiQ (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Terminal Module involved (TM) to the Control Unit.
The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Upgrade the firmware of the component involved.

F35860 TM DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY

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|----------------|---|
| Cause: | <p>A DRIVE-CLiQ communication error has occurred from the Terminal Module involved (TM) to the Control Unit.</p> <p>Fault cause:</p> <p>1 (= 01 hex): Checksum error (CRC error).</p> <p>2 (= 02 hex): Telegram is shorter than specified in the length byte or in the receive list.</p> <p>3 (= 03 hex): Telegram is longer than specified in the length byte or in the receive list.</p> <p>4 (= 04 hex): The length of the receive telegram does not match the receive list.</p> <p>5 (= 05 hex): The type of the receive telegram does not match the receive list.</p> <p>6 (= 06 hex): The address of the power unit in the telegram and in the receive list do not match.</p> <p>9 (= 09 hex): The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.</p> <p>16 (= 10 hex): The receive telegram is too early.</p> <p>17 (= 11 hex): CRC error and the receive telegram is too early.</p> <p>18 (= 12 hex): The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>19 (= 13 hex): The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>20 (= 14 hex): The length of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>21 (= 15 hex): The type of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>22 (= 16 hex): The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.</p> <p>25 (= 19 hex): The error bit in the receive telegram is set and the receive telegram is too early.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |
| Remedy: | <ul style="list-style-type: none"> - carry out a POWER ON (switch-off/switch-on). - check the electrical cabinet design and cable routing for EMC compliance - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). |

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| F35875 | TM: power supply voltage failed |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | OFF1 (OFF2) |
| Acknowledge: | IMMEDIATELY |

13.2 List of faults and alarms

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

F35885 TM DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Terminal Module involved (TM) to the Control Unit.
The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

F35886 TM DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Terminal Module involved (TM) to the Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

F35887 TM DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component (Terminal Module) involved. Faulty hardware cannot be excluded.
 Fault cause:
 32 (= 20 hex):
 Error in the telegram header.
 35 (= 23 hex):
 Receive error: The telegram buffer memory contains an error.
 66 (= 42 hex):
 Send error: The telegram buffer memory contains an error.
 67 (= 43 hex):
 Send error: The telegram buffer memory contains an error.
 96 (= 60 hex):
 Response received too late during runtime measurement.
 97 (= 61 hex):
 Time taken to exchange characteristic data too long.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy:
 - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
 - check the electrical cabinet design and cable routing for EMC compliance
 - if required, use another DRIVE-CLiQ socket (p9904).
 - replace the component involved.

F35895 TM DRIVE-CLiQ (CU): Alternating cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Terminal Module involved (TM) to the Control Unit.
 Fault cause:
 11 (= 0B hex):
 Synchronization error during alternating cyclic data transfer.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy: Carry out a POWER ON.

F35896 TM DRIVE-CLiQ (CU): Inconsistent component properties

Message value: Component number: %1
Drive object: All objects
Reaction: Servo: OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: The properties of the DRIVE-CLiQ component (Terminal Module), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
 Fault value (r0949, interpret decimal):
 Component number.

13.2 List of faults and alarms

Remedy:

- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).

F35950 TM: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2 (NONE)
Acknowledge: POWER ON
Cause: An internal software error has occurred.
Fault value (r0949, interpret decimal):
Information about the fault source.
Only for internal Siemens troubleshooting.

Remedy:

- if necessary, upgrade the firmware in the Terminal Module to a later version.
- contact Technical Support.

F36851 Hub DRIVE-CLiQ (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: DRIVE-CLiQ communication error from DRIVE-CLiQ Hub Module in question to Control Unit.
The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Upgrade the firmware of the component involved.

F36860 Hub DRIVE-CLiQ (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

Cause: DRIVE-CLiQ communication error from DRIVE-CLiQ Hub Module in question to Control Unit.

Fault cause:

1 (= 01 hex):
Checksum error (CRC error).

2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.

3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.

4 (= 04 hex):
The length of the receive telegram does not match the receive list.

5 (= 05 hex):
The type of the receive telegram does not match the receive list.

6 (= 06 hex):
The address of the power unit in the telegram and in the receive list do not match.

9 (= 09 hex):
The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.

16 (= 10 hex):
The receive telegram is too early.

17 (= 11 hex):
CRC error and the receive telegram is too early.

18 (= 12 hex):
The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.

19 (= 13 hex):
The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.

20 (= 14 hex):
The length of the receive telegram does not match the receive list and the receive telegram is too early.

21 (= 15 hex):
The type of the receive telegram does not match the receive list and the receive telegram is too early.

22 (= 16 hex):
The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.

25 (= 19 hex):
The error bit in the receive telegram is set and the receive telegram is too early.

Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

F36875 HUB: power supply voltage failed

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: OFF1 (OFF2)

Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

F36885 Hub DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: DRIVE-CLiQ communication error from DRIVE-CLiQ Hub Module in question to the Control Unit.
The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

F36886 Hub DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: DRIVE-CLiQ communication error from DRIVE-CLiQ Hub Module in question to Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.

| | |
|-----------------------|---|
| F36887 | Hub DRIVE-CLiQ (CU): Component fault |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | Fault detected on the DRIVE-CLiQ component (DRIVE-CLiQ Hub Module) involved. Faulty hardware cannot be excluded. Fault cause: 32 (= 20 hex): Error in the telegram header. 35 (= 23 hex): Receive error: The telegram buffer memory contains an error. 66 (= 42 hex): Send error: The telegram buffer memory contains an error. 67 (= 43 hex): Send error: The telegram buffer memory contains an error. 96 (= 60 hex): Response received too late during runtime measurement. 97 (= 61 hex): Time taken to exchange characteristic data too long. Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause |
| Remedy: | - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). - check the electrical cabinet design and cable routing for EMC compliance - if required, use another DRIVE-CLiQ socket (p9904). - replace the component involved. |

| | |
|-----------------------|--|
| F36895 | Hub DRIVE-CLiQ (CU): Alternating cyclic data transfer error |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | DRIVE-CLiQ communication error from DRIVE-CLiQ Hub Module in question to Control Unit. Fault cause: 11 (= 0B hex): Synchronization error during alternating cyclic data transfer. Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause |
| Remedy: | Carry out a POWER ON. |

| | |
|-----------------------|---|
| F36896 | Hub DRIVE-CLiQ (CU): Inconsistent component properties |
| Message value: | Component number: %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | The properties of the DRIVE-CLiQ component (DRIVE-CLiQ Hub Module), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced. Fault value (r0949, interpret decimal): Component number. |

13.2 List of faults and alarms

Remedy:

- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).

F36950 Hub: Internal software error

Message value: %1

Drive object: All objects

Reaction: OFF2 (NONE)

Acknowledge: POWER ON

Cause: An internal software error has occurred.
Fault value (r0949, interpret decimal):
Information about the fault source.
Only for internal Siemens troubleshooting.

Remedy:

- if required, upgrade the firmware in the DRIVE-CLiQ Hub Module to a more recent version.
- contact Technical Support.

F37001 HF Damping Module: overcurrent

Message value: Fault cause: %1 bin

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The power unit has detected an overcurrent condition.
- HF Choke Module or HF Damping Module defective.
- Resonance frequency of the output filter was excited.
Fault value (r0949, interpret bitwise binary):
Bit 0: Phase U.
Bit 1: Phase V.
Bit 2: Phase W.

Remedy:

- check HF Choke Module and HF Damping Module and if required, replace.
- reduce the motor power in the proximity of the fault-generating frequency.

Note:
HF Choke Module (reactor module)
HF Damping Module

F37002 HF Damping Module: Damping voltage too high

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The damping voltage has reached an inadmissibly high value.
- a motor harmonic with a high amplitude has coincided with the resonance frequency of the output filter.
- the current controller excessively excites the resonance of the output filter.
Fault value (r0949, interpret decimal):
Damping voltage in the case of a fault [mV].

Remedy:

- reduce the motor power in the proximity of the fault-generating frequency.
- check the current controller and if required, adapt.
- if required, use another motor.

Note:
HF Damping Module

F37003 HF Damping Module: Damping voltage not established

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A damping voltage was not able to be established.
 Fault value (r0949, interpret decimal):
 Damping voltage in the case of a fault [mV].
Remedy: Check the HF Damping Module wiring.

F37004 HF Damping Module: Heat sink overtemperature

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The temperature of the heat sink in the HF Damping Module has exceeded the permissible limit value.
 - insufficient cooling, fan failure.
 - overload.
 - ambient temperature too high.
 Fault value (r0949, interpret decimal):
 Temperature [0.01 °C].
Remedy:
 - check whether the fan is running.
 - check the fan elements.
 - check whether the ambient temperature is in the permissible range.
 Notice:
 This fault can only be acknowledged after the alarm threshold for alarm A05000 has been undershot.
 Note:
 HF Damping Module

F37005 HF Damping Module: I2t overload

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The filter capacitor of the HF Damping Module was overloaded (r5173 = 100 %).
 - the filter resonance frequency was excessively excited.
 - the HF Choke Module is defective.
 Fault value (r0949, interpret decimal):
 I2t [100 % = 16384].
Remedy:
 - reduce the motor power in the proximity of the fault-generating frequency.
 - the system should not stay in a steady-state condition in the vicinity of the fault-generating frequency.
 - check the HF Choke Module and if required replace.
 Note:
 HF Choke Module (reactor module)
 HF Damping Module

F37012 HF Damping Module: Heat sink temperature sensor wire breakage

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY
Cause: The connection to one of the heat sink temperature sensors in the HF Damping Module is interrupted.
Fault value (r0949, interpret hexadecimal):
Bit 0: HF Damping Module
Bit 1: HF Choke Module
Remedy: Contact the manufacturer.
Note:
HF Choke Module (reactor module)
HF Damping Module

F37013 HF Damping Module: Heat sink temperature sensor short-circuit

Message value: %1
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: The heat sink temperature sensor in the HF Damping Module is short-circuited.
Fault value (r0949, interpret hexadecimal):
Bit 0: HF Damping Module
Bit 1: HF Choke Module
Remedy: Contact the manufacturer.
Note:
HF Choke Module (reactor module)
HF Damping Module

F37024 HF Damping Module: Overtemperature thermal model

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The temperature difference between the heat sink and chip has exceeded the permissible limit value.
- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.
See also: r0037
Remedy:
- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

F37025 HF Damping Module: Chip overtemperature

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause: The chip temperature has exceeded the permissible limit value.

- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.

Fault value (r0949, interpret decimal):
Temperature difference between the heat sink and chip [0.01 °C].

Remedy:

- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

Note:
HF Damping Module
See also: r0037

A37034 HF Damping Module: Internal overtemperature

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE

Cause: The alarm threshold for internal overtemperature has been reached.
If the temperature inside the unit continues to increase, fault F37036 may be triggered.

- ambient temperature might be too high.
- insufficient cooling, fan failure.

Fault value (r0949, interpret binary):
 Bit 0 = 1: Control electronics range.
 Bit 1 = 1: Power electronics range.

Remedy:

- check the ambient temperature.
- check the fan for the inside of the unit.

Note:
HF Damping Module

F37036 HF Damping Module: Internal overtemperature

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause: The temperature inside the HF Damping Module has exceeded the permissible temperature limit.

- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.

Fault value (r0949, interpret binary):
 Bit 0 = 1: Control electronics range.
 Bit 1 = 1: Power electronics range.

13.2 List of faults and alarms

Remedy:

- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.

Notice:
This fault can only be acknowledged once the permissible temperature limit minus 5 K has been undershot.

Note:
HF Damping Module

F37040 HF Damping Module: 24 V undervoltage

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: Failure of the 24 V power supply for the HF Damping Module.

- the undervoltage threshold was undershot for longer than 3 ms.

Fault value (r0949, interpret decimal):
24 V voltage [0.1 V].

Remedy:

- check the 24 V DC voltage supply of the HF Damping Module.
- carry out a POWER ON (switch-off/switch-on) for the component.

Note:
HF Damping Module

A37041 (F) HF Damping Module: 24 V undervoltage alarm

Message value: %1

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: Fault in the 24 V power supply for the HF Damping Module.

- the 16 V threshold was undershot..

Alarm value (r2124, interpret decimal):
24 V voltage [0.1 V].

Remedy:

- check the 24 V DC voltage supply of the HF Damping Module.
- carry out a POWER ON (switch-off/switch-on) for the component.

Note:
HF Damping Module

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

F37043 HF Damping Module: 24 V overvoltage

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: POWER ON

Cause: Overvoltage of the 24 V power supply for the HF Damping Module.

- the 31.5 V threshold was exceeded for more than 3 ms.

Remedy: Check the 24 V DC voltage supply of the HF Damping Module.

Note:
HF Damping Module

A37044 (F) HF Damping Module: 24 V overvoltage alarm

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Fault in the 24 V power supply for the HF Damping Module.
 - the 32.0 V threshold was exceeded.
Remedy: Check the 24 V DC voltage supply of the HF Damping Module.
 Note:
 HF Damping Module
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)

F37045 HF Damping Module: Supply undervoltage

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: Power supply fault in the HF Damping Module.
 - the voltage monitor signals an undervoltage fault on the module.
 Fault value (r0949, interpret decimal):
 24 V voltage [0.1 V].
Remedy: - check the 24 V DC voltage supply of the HF Damping Module.
 - carry out a POWER ON (switch-off/switch-on) for the component.
 - replace the module if necessary.
 Note:
 HF Damping Module

A37049 HF Damping Module: Internal fan defective

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The internal fan of the HF Damping Module has failed.
Remedy: Check the internal fan of the HF Damping Module and replace if necessary.

F37050 HF Damping Module: 24 V overvoltage fault

Message value: -
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: The voltage monitor signals an overvoltage fault on the module.
Remedy: - check the 24 V power supply.
 - replace the module if necessary.

F37052 HF Damping Module: EEPROM data error

Message value: %1
Drive object: All objects
Reaction: NONE

13.2 List of faults and alarms

Acknowledge: POWER ON
Cause: EEPROM data error of the HF Damping Module.
Fault value (r0949, interpret hexadecimal):
0: The EEPROM data read in from the HF Damping Module is inconsistent.
1: EEPROM data is not compatible to the firmware of the HF Damping Module.
Additional values:
Only for internal Siemens troubleshooting.
Remedy: For fault value = 0:
Replace the HF Damping Module or update the EEPROM data.
For fault value = 1:
If necessary, upgrade the firmware to a later version.
Note:
HF Damping Module

A37056 (F) HF Damping Module: Heat sink overtemperature

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature of the HF Damping Module heat sink has exceeded the permissible limit value.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
Alarm value (r2124, interpret decimal):
Temperature [0.01 °C].
Remedy: - check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
Notice:
This fault can only be acknowledged after the alarm threshold for alarm A05000 has been undershot.
Note:
HF Damping Module
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

A37310 (F) HF Choke Module: Overtemperature

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature of the HF Choke Module heat sink has exceeded the permissible limit value.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
Alarm value (r2124, interpret decimal):
Temperature [0.01 °C].

Remedy:

- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.

Notice:
This fault can only be acknowledged after the alarm threshold for alarm A05000 has been undershot.

Note:
HF Choke Module (reactor module)

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY

F37311 HF Choke Module: Heat sink overtemperature

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: The temperature of the HF Choke Module heat sink has exceeded the permissible limit value.

- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.

Fault value (r0949, interpret decimal):
Temperature [0.01 °C].

Remedy:

- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.

Notice:
This fault can only be acknowledged after this alarm threshold for alarm A05000 has been undershot.

Note:
HF Choke Module (reactor module)

A37312 (F) HF Choke Module: Overtemperature or fan failure

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The HF Choke Module signals an overtemperature or fan failure.
Fault F37313 is output if the alarm is present for longer than 30 s.

Remedy:

- the cable between the HF Choke Module and the HF Damping Module has been withdrawn or is defective (X21).
- check the fan of the HF Choke Module and replace if necessary.
- check whether the ambient temperature is in the permissible range.

Note:
HF Choke Module (reactor module)
HF Damping Module

Reaction upon F: NONE (OFF1, OFF2, OFF3)

Acknowl. upon F: IMMEDIATELY (POWER ON)

F37313 HF Choke Module: Overtemperature or fan failure

Message value: -

Drive object: All objects

Reaction: OFF2

13.2 List of faults and alarms

Acknowledge: IMMEDIATELY (POWER ON)
Cause: Alarm A37312 to display overtemperature or fan failure in the HF Choke Module was signaled for longer than 30 s.
Remedy: - the cable between the HF Choke Module and the HF Damping Module has been withdrawn or is defective (X21).
- check the fan of the HF Choke Module and replace if necessary.
- check whether the ambient temperature is in the permissible range.
Note:
HF Choke Module (reactor module)
HF Damping Module

A37502 (F) HF Damping Module: Damping voltage too high

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The damping voltage has exceeded the alarm threshold.
- a motor harmonic with a high amplitude has coincided with the resonance frequency of the output filter.
- the current controller excessively excites the resonance of the output filter.
If the damping voltage exceeds an inadmissibly high value, F37002 is output.
Alarm value (r2124, interpret decimal):
Damping voltage in the case of a fault [mV].
Remedy: - reduce the motor power in the proximity of the fault-generating frequency.
- check the current controller and if required, adapt.
- if required, use another motor.
Note:
HF Damping Module
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

N37800 (F) HF Damping Module: Group signal

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The HF Damping Module has detected at least one fault.
Remedy: Evaluates other actual messages.
Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY

A37801 (F, N) HF Damping Module: Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: There is a DRIVE-CLiQ communication error between the Control Unit and the HF Damping Module.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - check the DRIVE-CLiQ connection.
 - replace the component involved.
Note:
 HF Damping Module

Reaction upon F: NONE

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

F37802 (N, A) HF Damping Module: time slice overflow

Message value: -

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A time slice overflow has occurred.

Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F37804 (N, A) HF Damping Module: CRC

Message value: %1

Drive object: All objects

Reaction: OFF2 (OFF1, OFF3)

Acknowledge: IMMEDIATELY

Cause: A checksum error (CRC error) has occurred for the HF Damping Module.

Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - upgrade firmware to later version.
 - contact Technical Support.

Note:

HF Damping Module

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

F37805 HF Damping Module: EEPROM checksum incorrect

Message value: %1

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: Internal parameter data is corrupted.
 Fault value (r0949, interpret hexadecimal):
 01: EEPROM access error.
 02: Too many blocks in the EEPROM.

13.2 List of faults and alarms

Remedy: Replace the module.
Note:
HF Damping Module

F37820 HF Damping Module: Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the damping module.
Fault cause:
1 (= 01 hex):
Checksum error (CRC error).
2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.
3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.
4 (= 04 hex):
The length of the receive telegram does not match the receive list.
5 (= 05 hex):
The type of the receive telegram does not match the receive list.
6 (= 06 hex):
The address of the component in the telegram and in the receive list do not match.
7 (= 07 hex):
A SYNC telegram is expected - but the received telegram is not a SYNC telegram.
8 (= 08 hex):
No SYNC telegram is expected - but the received telegram is one.
9 (= 09 hex):
The error bit in the receive telegram is set.
16 (= 10 hex):
The receive telegram is too early.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
Note:
HF Damping Module

F37835 HF Damping Module: Cyclic data transmission error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

Cause: There is a DRIVE-CLiQ communication error between the Control Unit and the HF Damping Module. The nodes do not send and receive in synchronism.
 Fault cause:
 33 (= 21 hex):
 The cyclic telegram has not been received.
 34 (= 22 hex):
 Timeout in the telegram receive list.
 64 (= 40 hex):
 Timeout in the telegram send list.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:
 - carry out a POWER ON.
 - replace the component involved.
 Note:
 HF Damping Module

F37836 HF Damping Module: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

Cause: There is a DRIVE-CLiQ communication error between the Control Unit and the HF Damping Module. Data were not able to be sent.
 Fault cause:
 65 (= 41 hex):
 Telegram type does not match send list.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.
 Note:
 HF Damping Module

F37837 HF Damping Module: Component faulted

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Note:
HF Damping Module

F37845 HF Damping Module: Cyclic data transmission error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: There is a DRIVE-CLiQ communication error between the Control Unit and the HF Damping Module.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.
Note:
HF Damping Module

F37850 HF Damping Module: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: POWER ON
Cause: An internal software error in the HF Damping Module has occurred.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.

Remedy:

- Replace the HF Damping Module
- if required, upgrade the firmware in the HF Damping Module.
- contact Technical Support.

Note:
HF Damping Module

F37851 HF Damping Module (CU): Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: DRIVE-CLiQ communication error from the HF Damping Module to the Control Unit.
 The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
 Fault cause:
 10 (= 0A hex):
 The sign-of-life bit in the receive telegram is not set.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy: Upgrade the firmware of the component involved.
 Note:
 HF Damping Module

F37860 HF Damping Module (CU): Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: DRIVE-CLiQ communication error from the HF Damping Module to the Control Unit.
Fault cause:
1 (= 01 hex):
Checksum error (CRC error).
2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.
3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.
4 (= 04 hex):
The length of the receive telegram does not match the receive list.
5 (= 05 hex):
The type of the receive telegram does not match the receive list.
6 (= 06 hex):
The address of the power unit in the telegram and in the receive list do not match.
9 (= 09 hex):
The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
16 (= 10 hex):
The receive telegram is too early.
17 (= 11 hex):
CRC error and the receive telegram is too early.
18 (= 12 hex):
The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.
19 (= 13 hex):
The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.
20 (= 14 hex):
The length of the receive telegram does not match the receive list and the receive telegram is too early.
21 (= 15 hex):
The type of the receive telegram does not match the receive list and the receive telegram is too early.
22 (= 16 hex):
The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.
25 (= 19 hex):
The error bit in the receive telegram is set and the receive telegram is too early.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:
- carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
Note:
HF Damping Module

F37875 HF Damping Module: power supply voltage failed
Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
 Fault cause:
 9 (= 09 hex):
 The power supply voltage for the components has failed.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the power supply voltage wiring for the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the power supply for the DRIVE-CLiQ component.

F37885 HF Damping Module (CU): Cyclic data transmission error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: DRIVE-CLiQ communication error from the damping module to the Control Unit.
 The nodes do not send and receive in synchronism.
 Fault cause:
 26 (= 1A hex):
 Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
 33 (= 21 hex):
 The cyclic telegram has not been received.
 34 (= 22 hex):
 Timeout in the telegram receive list.
 64 (= 40 hex):
 Timeout in the telegram send list.
 98 (= 62 hex):
 Error at the transition to cyclic operation.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.

Note:
 HF Damping Module

F37886 HF Damping Module (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: DRIVE-CLiQ communication error from the HF Damping Module to the Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.
Note:
HF Damping Module

F37887 HF Damping Module (CU): Component faulted

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component (HF Damping Module) involved. Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
96 (= 60 hex):
Response received too late during runtime measurement.
97 (= 61 hex):
Time taken to exchange characteristic data too long.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.
Note:
HF Damping Module

F37895 HF Damping Module (CU): Alternating cyclic data transmission error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY

Cause: DRIVE-CLiQ communication error from the HF Damping Module to the Control Unit.
 Fault cause:
 11 (= 0B hex):
 Synchronization error during alternating cyclic data transfer.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON.
 Note:
 HF Damping Module

F37896 HF Damping Module (CU): Component properties inconsistent

Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The properties of the DRIVE-CLiQ component (HF Damping Module), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
 Fault value (r0949, interpret decimal):
 Component number.

Remedy: - carry out a POWER ON.
 - when a component is replaced, the same component type and if possible the same firmware version should be used.
 - when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).
 Note:
 HF Damping Module

F37899 (N, A) HF Damping Module: Unknown fault

Message value: New message: %1
Drive object: All objects
Reaction: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A fault has occurred on the HF Damping Module that cannot be interpreted by the Control Unit firmware.
 This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
 Fault value (r0949, interpret decimal):
 Fault number.
 Note:
 If required, the significance of this new fault can be read about in a more recent description of the Control Unit.

Remedy: - replace the firmware on the HF Damping Module by an older firmware version (r0168).
 - upgrade the firmware on the Control Unit (r0018).
 Note:
 HF Damping Module

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F37903 HF Damping Module: I2C bus error occurred

Message value: %1
Drive object: All objects

13.2 List of faults and alarms

Reaction: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowledge: IMMEDIATELY
Cause: Communications error with an EEPROM or an analog/digital converter.
Fault value (r0949, interpret hexadecimal):
80000000 hex:
- internal software error.
00000001 hex ... 0000FFFF hex:
- module fault.
Remedy: For fault value = 80000000 hex:
- upgrade firmware to later version.
For fault value = 00000001 hex ... 0000FFFF hex:
- replace the module.
Note:
HF Damping Module

F37950 HF Damping Module: Internal software error

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: POWER ON
Cause: An internal software error has occurred.
Fault value (r0949, interpret decimal):
Information about the fault source.
Only for internal Siemens troubleshooting.
Remedy: - if necessary, upgrade the firmware in the HF Damping Module to a later version.
- contact Technical Support.
Note:
HF Damping Module

A37999 (F, N) HF Damping Module: Unknown alarm

Message value: New message: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred on the HF Damping Module that cannot be interpreted by the Control Unit firmware.
This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Alarm value (r2124, interpret decimal):
Alarm number.
Note:
If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.
Remedy: - replace the firmware on the HF Damping Module by an older firmware version (r0168).
- upgrade the firmware on the Control Unit (r0018).
Note:
HF Damping Module
Reaction upon F: NONE (IASC/DCBRK, OFF1, OFF2, OFF3, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F40000 **Fault at DRIVE-CLiQ socket X100**
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault has occurred at the drive object at the DRIVE-CLiQ socket X100.
 Fault value (r0949, interpret decimal):
 First fault that has occurred for this drive object.
Remedy: Evaluate the fault buffer of the specified object.

F40001 **Fault at DRIVE-CLiQ socket X101**
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault has occurred at the drive object at the DRIVE-CLiQ socket X101.
 Fault value (r0949, interpret decimal):
 First fault that has occurred for this drive object.
Remedy: Evaluate the fault buffer of the specified object.

F40002 **Fault at DRIVE-CLiQ socket X102**
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault has occurred at the drive object at the DRIVE-CLiQ socket X102.
 Fault value (r0949, interpret decimal):
 First fault that has occurred for this drive object.
Remedy: Evaluate the fault buffer of the specified object.

F40003 **Fault at DRIVE-CLiQ socket X103**
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault has occurred at the drive object at the DRIVE-CLiQ socket X103.
 Fault value (r0949, interpret decimal):
 First fault that has occurred for this drive object.
Remedy: Evaluate the fault buffer of the specified object.

F40004 **Fault at DRIVE-CLiQ socket X104**
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault has occurred at the drive object at the DRIVE-CLiQ socket X104.
 Fault value (r0949, interpret decimal):
 First fault that has occurred for this drive object.
Remedy: Evaluate the fault buffer of the specified object.

13.2 List of faults and alarms

F40005 Fault at DRIVE-CLiQ socket X105

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A fault has occurred at the drive object at the DRIVE-CLiQ socket X105.
Fault value (r0949, interpret decimal):
First fault that has occurred for this drive object.
Remedy: Evaluate the fault buffer of the specified object.

A40100 Alarm at DRIVE-CLiQ socket X100

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred at the drive object at the DRIVE-CLiQ socket X100.
Alarm value (r2124, interpret decimal):
First alarm that has occurred for this drive object.
Remedy: Evaluate the alarm buffer of the specified object.

A40101 Alarm at DRIVE-CLiQ socket X101

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred at the drive object at the DRIVE-CLiQ socket X101.
Alarm value (r2124, interpret decimal):
First alarm that has occurred for this drive object.
Remedy: Evaluate the alarm buffer of the specified object.

A40102 Alarm at DRIVE-CLiQ socket X102

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred at the drive object at the DRIVE-CLiQ socket X102.
Alarm value (r2124, interpret decimal):
First alarm that has occurred for this drive object.
Remedy: Evaluate the alarm buffer of the specified object.

A40103 Alarm at DRIVE-CLiQ socket X103

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred at the drive object at the DRIVE-CLiQ socket X103.
Alarm value (r2124, interpret decimal):
First alarm that has occurred for this drive object.
Remedy: Evaluate the alarm buffer of the specified object.

A40104 Alarm at DRIVE-CLiQ socket X104

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred at the drive object at the DRIVE-CLiQ socket X104.
 Alarm value (r2124, interpret decimal):
 First alarm that has occurred for this drive object.
Remedy: Evaluate the alarm buffer of the specified object.

A40105 Alarm at DRIVE-CLiQ socket X105

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An alarm has occurred at the drive object at the DRIVE-CLiQ socket X105.
 Alarm value (r2124, interpret decimal):
 First alarm that has occurred for this drive object.
Remedy: Evaluate the alarm buffer of the specified object.

F40799 CX32: Configured transfer end time exceeded

Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The configured transfer end time when transferring the cyclic actual values was exceeded.
Remedy: - carry out a POWER ON (switch-off/switch-on) for all components.
 - contact Technical Support.

F40801 CX32 DRIVE-CLiQ: Sign-of-life missing

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communications error has occurred from the Control Unit to the controller extension involved.
 Fault cause:
 10 (= 0A hex):
 The sign-of-life bit in the receive telegram is not set.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause
Remedy: - carry out a POWER ON (switch-off/switch-on).
 - replace the component involved.

F40820 CX32 DRIVE-CLiQ: Telegram error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

13.2 List of faults and alarms

Cause: A DRIVE-CLiQ communications error has occurred from the Control Unit to the controller extension involved.
Fault cause:
1 (= 01 hex):
Checksum error (CRC error).
2 (= 02 hex):
Telegram is shorter than specified in the length byte or in the receive list.
3 (= 03 hex):
Telegram is longer than specified in the length byte or in the receive list.
4 (= 04 hex):
The length of the receive telegram does not match the receive list.
5 (= 05 hex):
The type of the receive telegram does not match the receive list.
6 (= 06 hex):
The address of the component in the telegram and in the receive list do not match.
7 (= 07 hex):
A SYNC telegram is expected - but the received telegram is not a SYNC telegram.
8 (= 08 hex):
No SYNC telegram is expected - but the received telegram is one.
9 (= 09 hex):
The error bit in the receive telegram is set.
16 (= 10 hex):
The receive telegram is too early.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).

F40825 CX32 DRIVE-CLiQ: Supply voltage failed

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: OFF1 (OFF2)

Acknowledge: IMMEDIATELY

Cause: The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.
Fault cause:
9 (= 09 hex):
The power supply voltage for the components has failed.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- carry out a POWER ON (switch-off/switch-on).
- check the supply voltage wiring of the DRIVE-CLiQ component (interrupted cable, contacts, ...).
- check the dimensioning of the DRIVE-CLiQ component power supply.

F40835 CX32 DRIVE-CLiQ: Cyclic data transfer error

Message value: Component number: %1, fault cause: %2

Drive object: All objects

Reaction: OFF2

Acknowledge: IMMEDIATELY

Cause: A DRIVE-CLiQ communications error has occurred from the Control Unit to the controller extension involved. The nodes do not send and receive in synchronism.
 Fault cause:
 33 (= 21 hex):
 The cyclic telegram has not been received.
 34 (= 22 hex):
 Timeout in the telegram receive list.
 64 (= 40 hex):
 Timeout in the telegram send list.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy:
 - carry out a POWER ON (switch-off/switch-on).
 - replace the component involved.

F40836 CX32 DRIVE-CLiQ: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communications error has occurred from the Control Unit to the controller extension involved. Data were not able to be sent.
 Fault cause:
 65 (= 41 hex):
 Telegram type does not match send list.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON (switch-off/switch-on).

F40837 CX32 DRIVE-CLiQ: Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
 Fault cause:
 32 (= 20 hex):
 Error in the telegram header.
 35 (= 23 hex):
 Receive error: The telegram buffer memory contains an error.
 66 (= 42 hex):
 Send error: The telegram buffer memory contains an error.
 67 (= 43 hex):
 Send error: The telegram buffer memory contains an error.
 Note regarding the message value:
 The individual information is coded as follows in the message value (r0949/r2124):
 0000yyxx hex: yy = component number, xx = error cause

13.2 List of faults and alarms

- Remedy:**
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
 - check the electrical cabinet design and cable routing for EMC compliance
 - if required, use another DRIVE-CLiQ socket (p9904).
 - replace the component involved.
-

F40845 CX32 DRIVE-CLiQ: Cyclic data transfer error

- Message value:** Component number: %1, fault cause: %2
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY
- Cause:** A DRIVE-CLiQ communications error has occurred from the Control Unit to the controller extension involved.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
- Remedy:** Carry out a POWER ON (switch-off/switch-on).
-

F40851 CX32 DRIVE-CLiQ (CU): Sign-of-life missing

- Message value:** Component number: %1, fault cause: %2
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY
- Cause:** A DRIVE-CLiQ communications error has occurred from the controller extension involved to the Control Unit.
The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault cause:
10 (= 0A hex):
The sign-of-life bit in the receive telegram is not set.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
- Remedy:** Upgrade the firmware of the component involved.
-

F40860 CX32 DRIVE-CLiQ (CU): Telegram error

- Message value:** Component number: %1, fault cause: %2
- Drive object:** All objects
- Reaction:** OFF2
- Acknowledge:** IMMEDIATELY

| | |
|----------------|--|
| Cause: | <p>A DRIVE-CLiQ communications error has occurred from the controller extension involved to the Control Unit.</p> <p>Fault cause:</p> <p>1 (= 01 hex): Checksum error (CRC error).</p> <p>2 (= 02 hex): Telegram is shorter than specified in the length byte or in the receive list.</p> <p>3 (= 03 hex): Telegram is longer than specified in the length byte or in the receive list.</p> <p>4 (= 04 hex): The length of the receive telegram does not match the receive list.</p> <p>5 (= 05 hex): The type of the receive telegram does not match the receive list.</p> <p>6 (= 06 hex): The address of the power unit in the telegram and in the receive list do not match.</p> <p>9 (= 09 hex): The error bit in the receive telegram is set.</p> <p>16 (= 10 hex): The receive telegram is too early.</p> <p>17 (= 11 hex): CRC error and the receive telegram is too early.</p> <p>18 (= 12 hex): The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>19 (= 13 hex): The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.</p> <p>20 (= 14 hex): The length of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>21 (= 15 hex): The type of the receive telegram does not match the receive list and the receive telegram is too early.</p> <p>22 (= 16 hex): The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.</p> <p>25 (= 19 hex): The error bit in the receive telegram is set and the receive telegram is too early.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |
| Remedy: | <ul style="list-style-type: none"> - carry out a POWER ON (switch-off/switch-on). - check the electrical cabinet design and cable routing for EMC compliance - check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...). |

| | |
|-----------------------|---|
| F40875 | CX32 DRIVE-CLiQ (CU): Supply voltage failed |
| Message value: | Component number: %1, fault cause: %2 |
| Drive object: | All objects |
| Reaction: | OFF1 (OFF2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | <p>The DRIVE-CLiQ communication from the DRIVE-CLiQ component involved to the Control Unit signals that the supply voltage has failed.</p> <p>Fault cause:</p> <p>9 (= 09 hex): The power supply voltage for the components has failed.</p> <p>Note regarding the message value: The individual information is coded as follows in the message value (r0949/r2124): 0000yyxx hex: yy = component number, xx = error cause</p> |

13.2 List of faults and alarms

- Remedy:**
- carry out a POWER ON (switch-off/switch-on).
 - check the supply voltage wiring of the DRIVE-CLiQ component (interrupted cable, contacts, ...).
 - check the dimensioning of the DRIVE-CLiQ component power supply.

F40885 CX32 DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communications error has occurred from the controller extension involved to the Control Unit.
The nodes do not send and receive in synchronism.
Fault cause:
26 (= 1A hex):
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
33 (= 21 hex):
The cyclic telegram has not been received.
34 (= 22 hex):
Timeout in the telegram receive list.
64 (= 40 hex):
Timeout in the telegram send list.
98 (= 62 hex):
Error at the transition to cyclic operation.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy:

- check the power supply voltage of the component involved.
- carry out a POWER ON (switch-off/switch-on).
- replace the component involved.

F40886 CX32 DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communications error has occurred from the controller extension involved to the Control Unit.
Data were not able to be sent.
Fault cause:
65 (= 41 hex):
Telegram type does not match send list.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause
Remedy: Carry out a POWER ON (switch-off/switch-on).

F40887 CX32 DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
Fault cause:
32 (= 20 hex):
Error in the telegram header.
35 (= 23 hex):
Receive error: The telegram buffer memory contains an error.
66 (= 42 hex):
Send error: The telegram buffer memory contains an error.
67 (= 43 hex):
Send error: The telegram buffer memory contains an error.
96 (= 60 hex):
Response received too late during runtime measurement.
97 (= 61 hex):
Time taken to exchange characteristic data too long.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy:

- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

F40895 CX32 DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communications error has occurred from the controller extension involved to the Control Unit.
Fault cause:
11 (= 0B hex):
Synchronization error during alternating cyclic data transfer.
Note regarding the message value:
The individual information is coded as follows in the message value (r0949/r2124):
0000yyxx hex: yy = component number, xx = error cause

Remedy: Carry out a POWER ON (switch-off/switch-on).

Appendix

A.1 Communication telegrams

The converter supports the telegrams listed below.

The bit assignments of the individual process data can be found in Section Bit assignments of the process data (Page 740).

A.1.1 Standard telegrams

Telegram 3

Telegram 3 transfers the control words 1 and 2 (STW1, STW2), the status words 1 and 2 (ZSW1, ZSW2), the speed setpoint and actual value (NSOLL_B, NIST_B), control word and status word of encoder 1 (G1_STW, G1_ZSW), and the actual position value 1 and 2 of encoder 1 (G1_XIST1, G1_XIST2).

| PZD01 | PZD02 | PZD03 | PZD04 | PZD05 | PZD06 | PZD07 | PZD08 | PZD09 |
|-------|---------|-------|-------|--------|----------|-------|----------|-------|
| STW1 | NSOLL_B | | STW2 | G1_STW | --- | | | |
| ZSW1 | NIST_B | | ZSW2 | G1_ZSW | G1_XIST1 | | G1_XIST2 | |

Telegram 5

In addition to the values of telegram 3, telegram 5 transfers the values for position deviation (XERR) and gain factor for the position controller (KPC).

| PZD01 | PZD02 | PZD03 | PZD04 | PZD05 | PZD06 | PZD07 | PZD08 | PZD09 |
|-------|---------|-------|-------|--------|----------|-------|----------|-------|
| STW1 | NSOLL_B | | STW2 | G1_STW | XERR | | KPC | |
| ZSW1 | NIST_B | | ZSW2 | G1_ZSW | G1_XIST1 | | G1_XIST2 | |

Telegram 102

In addition to the values of telegram 3, telegram 102 transfers the value for the torque reduction (MOMRED) and the alarm word (MELDW).

| PZD01 | PZD02 | PZD03 | PZD04 | PZD05 | PZD06 | PZD07 | PZD08 | PZD09 | PZD10 |
|-------|---------|-------|-------|--------|--------|----------|-------|----------|-------|
| STW1 | NSOLL_B | | STW2 | MOMRED | G1_STW | --- | | | |
| ZSW1 | NIST_B | | ZSW2 | MELDW | G1_ZSW | G1_XIST1 | | G1_XIST2 | |

Telegram 105

In addition to the values of telegram 3, telegram 105 transfers the value for the torque reduction (MOMRED), the alarm word (MELDW), the values for the position deviation (XERR) and the gain factor for the position controller (KPC).

| PZD01 | PZD02 | PZD03 | PZD04 | PZD05 | PZD06 | PZD07 | PZD08 | PZD09 | PZD10 |
|-------|---------|-------|-------|------------|-----------|----------------|-------|----------------|-------|
| STW1 | NSOLL_B | | STW2 | MOM RED | G1 STW | XERR | | KPC | |
| ZSW1 | NIST_B | | ZSW2 | MELDW | G1 ZSW | z.B.: G1_XIST1 | | z.B.: G1_XIST2 | |

A.1.2 Supplementary telegrams

In addition to the main telegram, you can configure one or two supplementary telegrams. The supported supplementary telegrams are listed below.

Telegram 700

Using the Safety Info Channel (SIC), telegram 700 transfers the safety status word 1B (S_ZSW1B) and the value for the limitation of the setpoint velocity (S_V_LIMIT_B).

| PZD01 | PZD02 | PZD03 |
|---------|-------------|-------|
| --- | | |
| S_ZSW1B | S_V_LIMIT_B | |

Telegram 701

In addition to telegram 700, telegram 701 transfers the following data:

- Via the Safety Control Channel (SCC) the safety control word 1B (S_STW1B) and the safety control word 3B (S_STW3B).
- Via the Safety Info Channel (SIC) the safety status word 2B (S_ZSW2B) and the safety status word 3B (S_ZSW3B).

| PZD01 | PZD02 | PZD03 | PZD04 | PZD05 |
|---------|---------|-------------|---------|-------|
| S_STW1B | S_STW3B | --- | | |
| S_ZSW1B | S_ZSW2B | S_V_LIMIT_B | S_ZSW3B | |

Telegram 750

Telegram 750 is a supplementary telegram for the torque control with the following data:

- The controller sends the additional torque (M_ADD) and the positive and negative torque limit (M_LIMIT_POS, M_LIMIT_NEG) to the converter.
- The converter sends the actual torque (M_ACT) to the controller.

| PZD01 | PZD02 | PZD03 |
|-------|-------------|-------------|
| M_ADD | M_LIMIT_POS | M_LIMIT_NEG |
| M_ACT | --- | |

Telegram 750 can be transferred in addition to telegram 700 or 701. The order can be set in HW Config.

A.1.3 PROFIsafe telegrams

The converter supports PROFIsafe telegrams 30 and 901.

Telegram 30

Telegram 30 transfers safety control word 1 (S_STW1) and safety status word 1 (S_ZSW1).

| |
|-----------|
| PZD01 |
| S STW1 |
| S ZSW1 |

Telegram 901

Telegram 901 will be needed in the future for the Extended Safety Functions and is meaningless in this version.

A.1.4 Bit assignments of the process data

Note

Representation of the sending direction Controller -> Converter and Converter -> Controller

The left column always shows the process data that is sent from the controller to the converter (control words and setpoints).

The process data that is sent from the converter to the controller is displayed in the right column (status words and actual values).

A.1.4.1 Control word 1 and status word 1

Control word 1 (STW1)

| Bit | Meaning |
|-----|------------------------|
| 00 | ON / OFF1 |
| 01 | OFF2 |
| 02 | OFF3 |
| 03 | Enable operation |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Enable speed setpoint |
| 07 | Acknowledge fault |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Master control by PLC |
| 11 | Reserved |
| 12 | Open holding brake |
| 13 | Reserved |
| 14 | Torque / speed control |
| 15 | Reserved |

Status word 1 (ZSW1)

| Bit | Meaning |
|-----|-----------------------------------|
| 00 | Ready for switching on |
| 01 | Ready |
| 02 | Operation enabled |
| 03 | Fault active |
| 04 | No coast down active |
| 05 | No quick stop active |
| 06 | Switching-on inhibited active |
| 07 | Alarm active |
| 08 | Controller release |
| 09 | Control requested |
| 10 | Comparison value reached/exceeded |
| 11 | Alarm class bit 0 |
| 12 | Alarm class bit 1 |
| 13 | Reserved |
| 14 | Closed-loop torque control active |
| 15 | Reserved |

A.1.4.2 Control word 2 and status word 2

Control word 2 (STW2)

| Bit | Meaning |
|-----|----------------------------------|
| 00 | Reserved |
| 01 | Reserved |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Integrator lock speed controller |
| 07 | Parking axis selection |
| 08 | Travel to fixed stop |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Controller sign-of-life bit 0 |
| 13 | Controller sign-of-life bit 1 |
| 14 | Controller sign-of-life bit 2 |
| 15 | Controller sign-of-life bit 3 |

Status word 2 (ZSW2)

| Bit | Meaning |
|-----|----------------------------------|
| 00 | Reserved |
| 01 | Reserved |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Open holding brake |
| 06 | Integrator lock speed controller |
| 07 | Parking axis active |
| 08 | Travel to fixed stop |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Device sign-of-life bit 0 |
| 13 | Device sign-of-life bit 1 |
| 14 | Device sign-of-life bit 2 |
| 15 | Device sign-of-life bit 3 |

A.1.4.3 Encoder 1 - control word and status word

Encoder 1 control word (G1_STW)

| Bit | Meaning |
|-----|---------------------------|
| 00 | Request function 1 |
| 01 | Request function 2 |
| 02 | Request function 3 |
| 03 | Request function 4 |
| 04 | Value 1 |
| 05 | Value 2 |
| 06 | Value 3 |
| 07 | Value 4 |
| 08 | Probe 1 |
| 09 | Probe 2 |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Acknowledge encoder fault |
| 13 | Cyclic absolute value |
| 14 | Parking encoder active |
| 15 | Acknowledge encoder fault |

Encoder 1 status word (G1_ZSW)

| Bit | Meaning |
|-----|-------------------|
| 00 | Function 1 active |
| 01 | Function 2 active |
| 02 | Function 3 active |
| 03 | Function 4 active |
| 04 | Value 1 |
| 05 | Value 2 |
| 06 | Value 3 |
| 07 | Value 4 |
| 08 | Probe 1 |
| 09 | Probe 2 |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Encoder fault |
| 13 | Absolute value |
| 14 | Parking encoder |
| 15 | Encoder fault |

A.1.4.4 Safety control word and status word 1

Safety control word 1 (S_STW1)

| Bit | Meaning |
|-----|--------------|
| 00 | Deselect STO |
| 01 | Deselect SS1 |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Acknowledge |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Reserved |

Safety status word 1 (S_ZSW1)

| Bit | Meaning |
|-----|----------------|
| 00 | STO active |
| 01 | SS1 active |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Internal event |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Reserved |

A.1.4.5 Safety control word and status word 1B

Safety control word 1B (S_STW1B)

| Bit | Meaning |
|-----|----------|
| 00 | Reserved |
| 01 | Reserved |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Reserved |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Reserved |

Safety status word 1B (S_ZSW1B)

| Bit | Meaning |
|-----|--------------------|
| 00 | STO active |
| 01 | SS1 active |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Internal event |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Safety alarm valid |

A.1.4.6 Safety status word 2B

Safety status word 2B (S_ZSW2B)

| Bit | Meaning |
|-----|---------------------|
| 00 | Reserved |
| 01 | Reserved |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Reserved |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Test stop active |
| 13 | Test stop requested |
| 14 | Reserved |
| 15 | Reserved |

A.1.4.7 Safety control word and status word 3B

Safety control word 3B (S_STW3B)

| Bit | Meaning |
|-----|----------|
| 00 | Reserved |
| 01 | Reserved |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Reserved |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Reserved |

Safety status word 3B (S_ZSW3B)

| Bit | Meaning |
|-----|------------------------|
| 00 | Reserved |
| 01 | Reserved |
| 02 | Reserved |
| 03 | Reserved |
| 04 | Reserved |
| 05 | Reserved |
| 06 | Reserved |
| 07 | Reserved |
| 08 | Reserved |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Acceptance test active |

A.1.4.8 Message word

Message word (MELDW)

| Bit | Meaning |
|-----|--|
| 00 | Ramp-up ended |
| 01 | Torque utilization < threshold 2 |
| 02 | nact < speed threshold 3 |
| 03 | nact < speed threshold 2 |
| 04 | Reserved |
| 05 | Variable signal functions |
| 06 | No warning motor overtemperature |
| 07 | No warning converter overtemperature |
| 08 | Actual/setpoint deviation within the tolerance |
| 09 | Reserved |
| 10 | Reserved |
| 11 | Servo enable |
| 12 | Drives ready |
| 13 | Pulses enabled |
| 14 | Reserved |
| 15 | Reserved |

A.2 What is the difference between the Emergency Off and Emergency Stop functions?

A.2 What is the difference between the Emergency Off and Emergency Stop functions?

"Emergency Off" and "Emergency Stop" are commands that minimize different risks in the machine or plant.

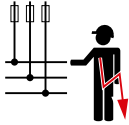
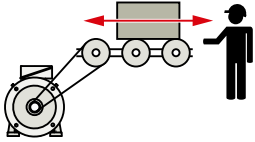
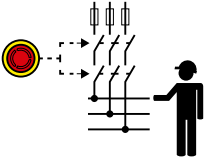
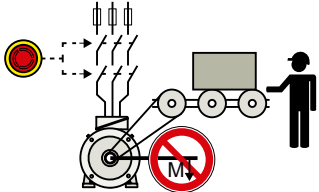
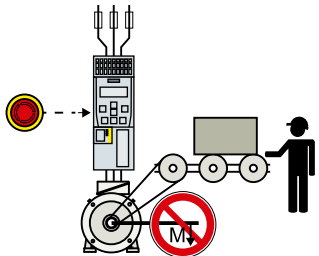
| | |
|---|--|
| <p>Emergency Off Risk of electric shock.</p>  | <p>Emergency Stop Risk of unexpected motion.</p>  |
|---|--|

Table A-1 Measures and solutions

| Command | Emergency Off | Emergency Stop |
|---|---|---|
| Measure to minimize risk | <p>Safe switch off Switching off the electric power supply for the installation, either completely or partially.</p> | <p>Safely stop and safely prevent restarting Stopping or preventing the dangerous movement</p> |
| Classic solution | <p>Switch off the power supply.</p>  | <p>Switch off the drive power supply.</p>  |
| Solution with the STO safety function integrated in the drive | <p>STO is not suitable for safely switching off a voltage.</p> | <p>Select STO.</p>  <p>It is permissible that you switch off the converter power supply as well. However, switching off the voltage is not required as a risk-reduction measure.</p> |

A.3 Directives and standards

A.3.1 Directives, standards and certificates for the converter

Directives and standards that are complied with

The converters comply with the following directives and standards:



European Low-Voltage Directive

The converter fulfills the requirements stipulated in the Low-Voltage Directive 2014/35/EU, if they are covered by the field of application of this directive.

European Machinery Directive

The converter fulfills the requirements stipulated in the Machinery Directive 2006/42/EU, if they are covered by the field of application of this directive.

However, the use of the converter in a typical machine application has been fully assessed for compliance with the main regulations in this directive concerning health and safety.

European EMC Directive

By completely complying with IEC/EN 61800-3, it has been proven that the converter is in compliance with directive 2004/108/EC or 2014/30/EU.

Safety Integrated

The converters comply with the requirements relating to functional safety/safety of machinery.

RoHS

The converters comply with directive 2011/65/EU regarding limiting the use of certain hazardous substances.



Underwriters Laboratories (North American market)

Converters provided with one of the test symbols displayed on the left fulfill the requirements stipulated for the North American market as a component of drive applications, and are appropriately listed.



Eurasian conformity

The converter complies with the requirements of the Russia/Belarus/Kazakhstan customs union (EAC).



Australia and New Zealand (RCM formerly C-Tick)

The converters showing the test symbols fulfill the EMC requirements for Australia and New Zealand.

Certificates for download



- EC declaration of conformity: (<https://support.industry.siemens.com/cs/de/de/view/60438382>)
- Certificates for the relevant directives, prototype test certificates, manufacturers declarations and test certificates for functions relating to functional safety ("Safety Integrated"): (<https://support.industry.siemens.com/cs/ww/en/ps/13229/cert>)
- Certificates of products that were certified by UL: (<http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.html>)

Standards that are not relevant



China Compulsory Certification

The converter does not fall in the area of validity of the China Compulsory Certification (CCC).

A.3.2 Directives, standards and certificates for the motor

Standards that are complied with

The motors of the series SIMOTICS S, SIMOTICS M, SIMOTICS L, SIMOTICS T, SIMOTICS A, called "SIMOTICS motor series" below, fulfill the requirements of the following directives and standards:

- EN 60034-1 - Rotating electrical machines – Dimensioning and operating behavior
- EN 60204-1 - Safety of machinery – Electrical equipment of machines; general requirements

Where applicable, the SIMOTICS motor series are in conformance with the following parts of IEC / EN 60034:

| Feature | Standard |
|---|-------------------|
| Degree of protection | IEC / EN 60034-5 |
| Cooling ¹⁾ | IEC / EN 60034-6 |
| Type of construction | IEC / EN 60034-7 |
| Connection designations | IEC / EN 60034-8 |
| Noise levels ¹⁾ | IEC / EN 60034-9 |
| Temperature monitoring | IEC / EN 60034-11 |
| Vibration severity levels ¹⁾ | IEC / EN 60034-14 |

¹⁾ Standard component, e.g. cannot be applied to built-in motors

Relevant directives

The following directives are relevant for SIMOTICS motors.



European Low-Voltage Directive

SIMOTICS motors comply with the Low-Voltage Directive 2014/35/EU.

European Machinery Directive

SIMOTICS motors do not fall within the area of validity covered by the Machinery Directive.

However, the use of the products in a typical machine application has been fully assessed for compliance with the main regulations in this directive concerning health and safety.

European EMC Directive

SIMOTICS motors do not fall within the area of validity covered by the EMC Directive. The products are not considered as devices in the sense of the directive. Installed and operated with a converter, the motor - together with the Power Drive System - must comply with the requirements laid down in the applicable EMC Directive.

Eurasian conformity

SIMOTICS motors comply with the requirements of the customs union Russia/Belarus/Kazakhstan (EAC).



China Compulsory Certification

SIMOTICS motors do not fall within the area of validity covered by the China Compulsory Certification (CCC).



CCC negative certification:

CCC product certification (<https://support.industry.siemens.com/cs/products?search=CCC&ctp=Certificate&mf=ps&o=DefaultRankingDesc&pnid=13347&lc>)

Underwriters Laboratories

SIMOTICS motors are generally in compliance with UL and cUL as components of motor applications, and are appropriately listed.



Specifically developed motors and functions are the exceptions in this case. Here, it is important that you carefully observe the contents of the quotation and that there is a cUL mark on the rating plate!

Quality systems

Siemens AG employs a quality management system that meets the requirements of ISO 9001 and ISO 14001.

Certificates for SIMOTICS motors can be downloaded from the Internet at the following link:

Certificates for SIMOTICS motors (<https://support.industry.siemens.com/cs/ww/de/ps/13347/cert>)

European RoHS Directive

The SIMOTICS motor series complies with the Directive 2011/65/EU regarding limiting the use of certain hazardous substances.

A.4 Certifications

The safety functions of the SINAMICS S drive system meet the following requirements:

- Category 3 to DIN EN ISO 13849-1
- Performance level (PL) d according to DIN EN ISO 13849-1
- Safety integrity level 2 (SIL 2) according to IEC 61508 and EN 61800-5-2

In addition, most of the safety functions of the SINAMICS S have been certified by independent institutes. A list of currently certified components is available on request from your local Siemens office.

A.5 Certificates for the secure data transfer

A.5.1 Overview

The "Transport Layer Security" (TLS) protocol enables encrypted data transfer between a client and the SINAMICS drive. HTTPS access of the browser to the drive is based on the "Transport Layer Security" protocol. This section informs you which steps you need to follow to enable encrypted data transfer between a browser (client) and the SINAMICS (server).

You will find information on the configuration or your IP connection in Section:

 "Configuring the IP connection (Page 158)" .

Protecting the HTTPS access

The encrypted variant of the communication between the browser and the Web server using HTTPS requires the creation and installation of certificates.

Basically, there are three ways of creating a server certificate:

- Use the default configuration
- Use self-created certificates (by means of certificate software, such as OpenSSL)
- Use a server certificate from a certificate authority

You can only use the default configuration for SINAMICS S210, firmware version 5.1.

Delivery state

A private key is generated as a file on the device as default configuration when you first use HTTPS so that you can access the drive via HTTPS in the SINAMICS delivery state. During an HTTPS access using this key, a warning is issued in the browser that the certificate is unknown.

Duration of validity

The certificates are valid up to 2030.

After expiration of the validity period, install new valid certificates on all the relevant drives.

A.5.2 Using the certificate default configuration

Note

Security

The use of a default configuration described in the following is not the most secure way of transferring data using the HTTPS protocol to your drive with the Web server.

For this reason, it should only be used in secure networks (e.g. your PROFINET below a PLC) or for direct point-to-point connections on the Service interface X127.

Procedure

1. First open an HTTPS Web server connection to your drive in the browser.
2. The firmware then creates a new server certificate and a private server key from the root certificate and the private key, if they are not already available. This certificate is individualized for the IP address of the interface used for the communication.
3. Following this, a warning is issued on the standard browser that the certificate is unknown.
4. Import the server certificate into your standard browser or deactivate the security warnings for the SINAMICS Websites.
The exact procedure for the import can be found in the online help of the used browser.

Deactivating warnings in the most important browsers

You can deactivate warnings in the most important browser as follows:

Opera

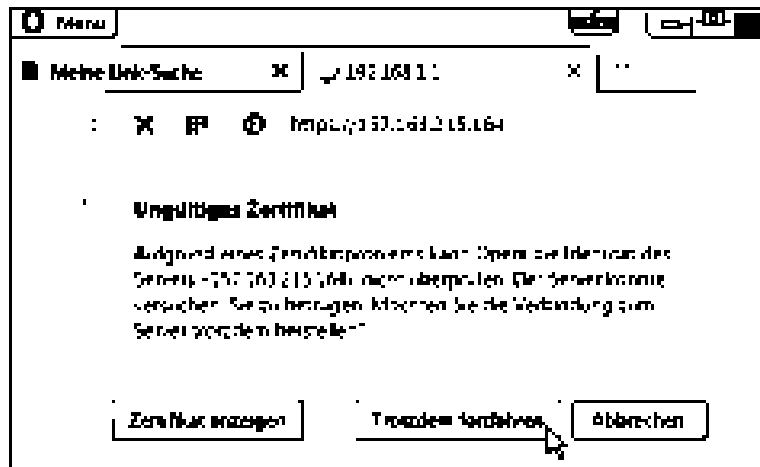


Figure A-1 Opera1

Click "Still continue" in order to be able to communicate via a secure HTTPS connection.

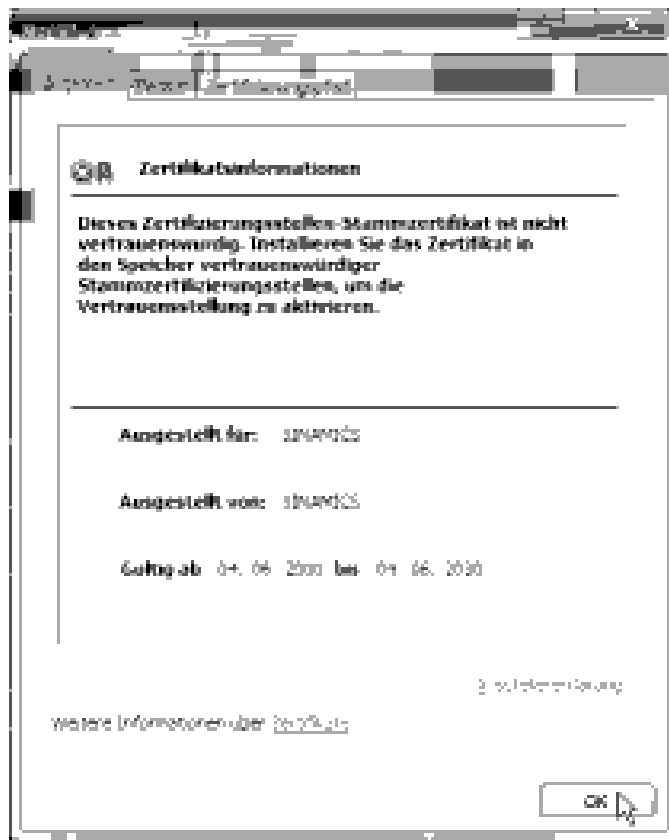


Figure A-2 Opera2

Mozilla Firefox

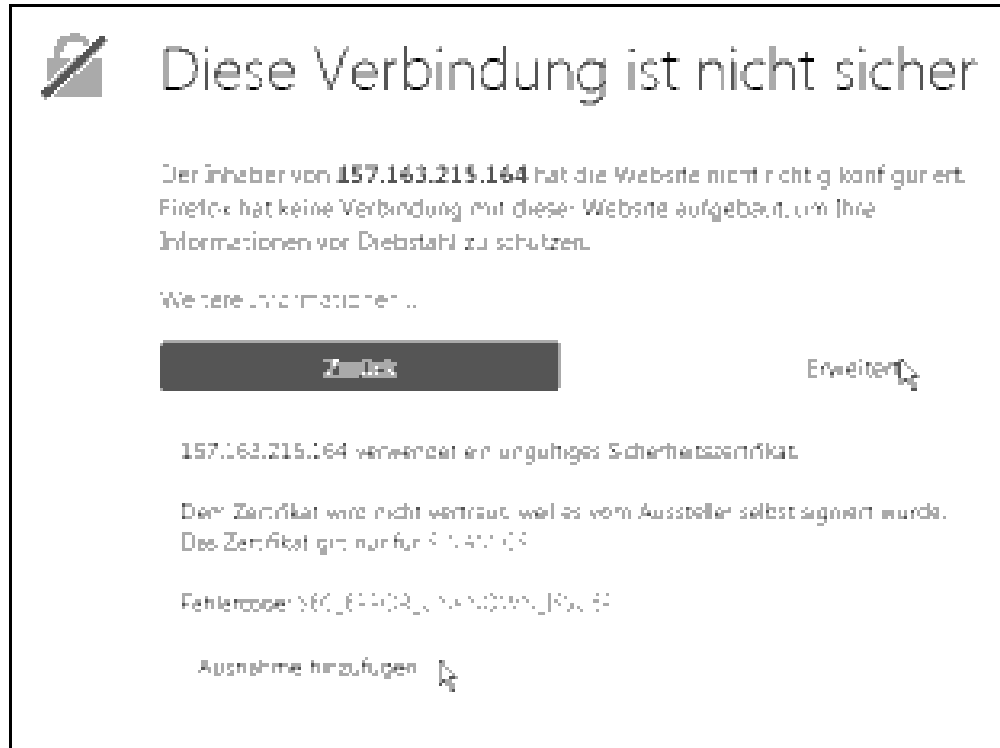


Figure A-3 Mozilla

1. Click "Extended".
The information for the security certificate is displayed.
2. Click "Add exception" in order to be able to communicate via a secure HTTPS connection.

Microsoft Internet Explorer 11

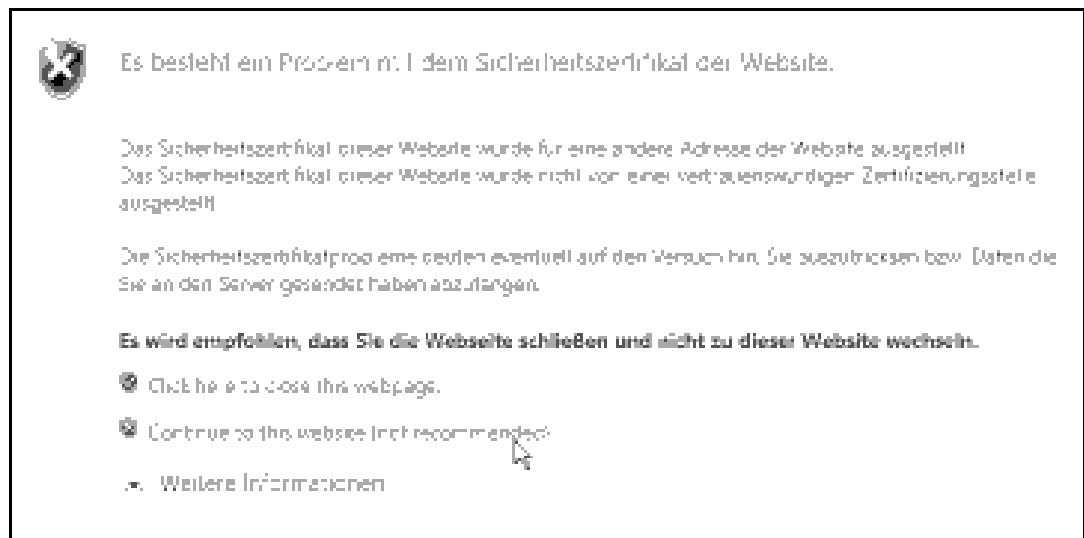


Figure A-4 Internet Explorer 11

Click "Continue to this website" in order to be able to communicate via a secure HTTPS connection.

Google Chrome

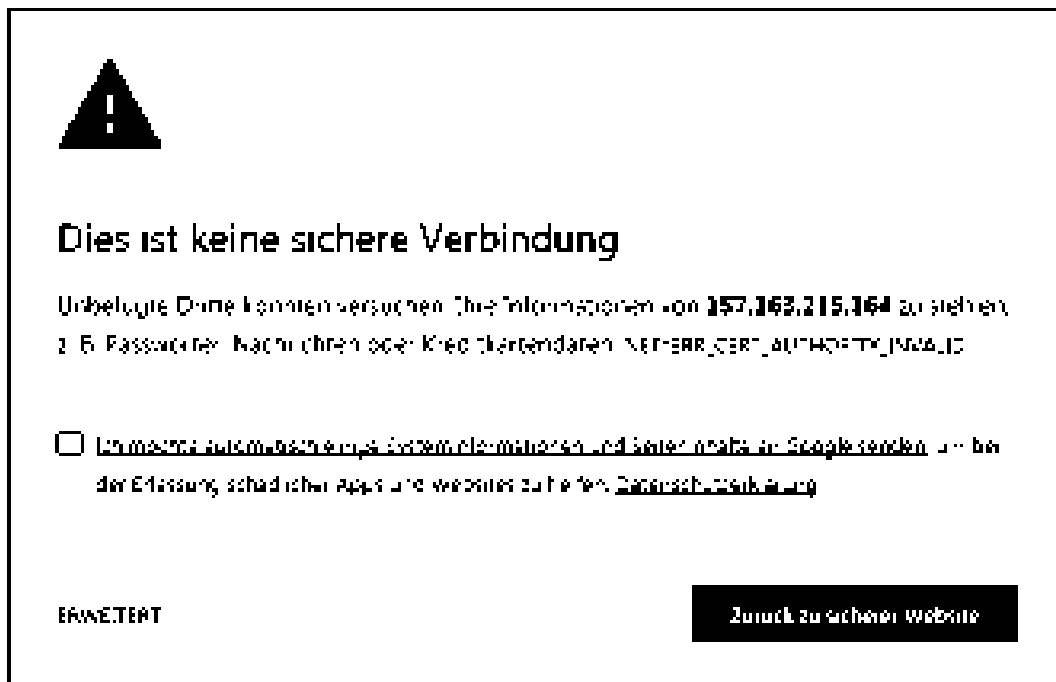


Figure A-5 Google 1

1. Click "EXTENDED".
The information for the security certificate is displayed.
2. Click "Continue to <IP address>" in order to be able to communicate via a secure HTTPS connection.

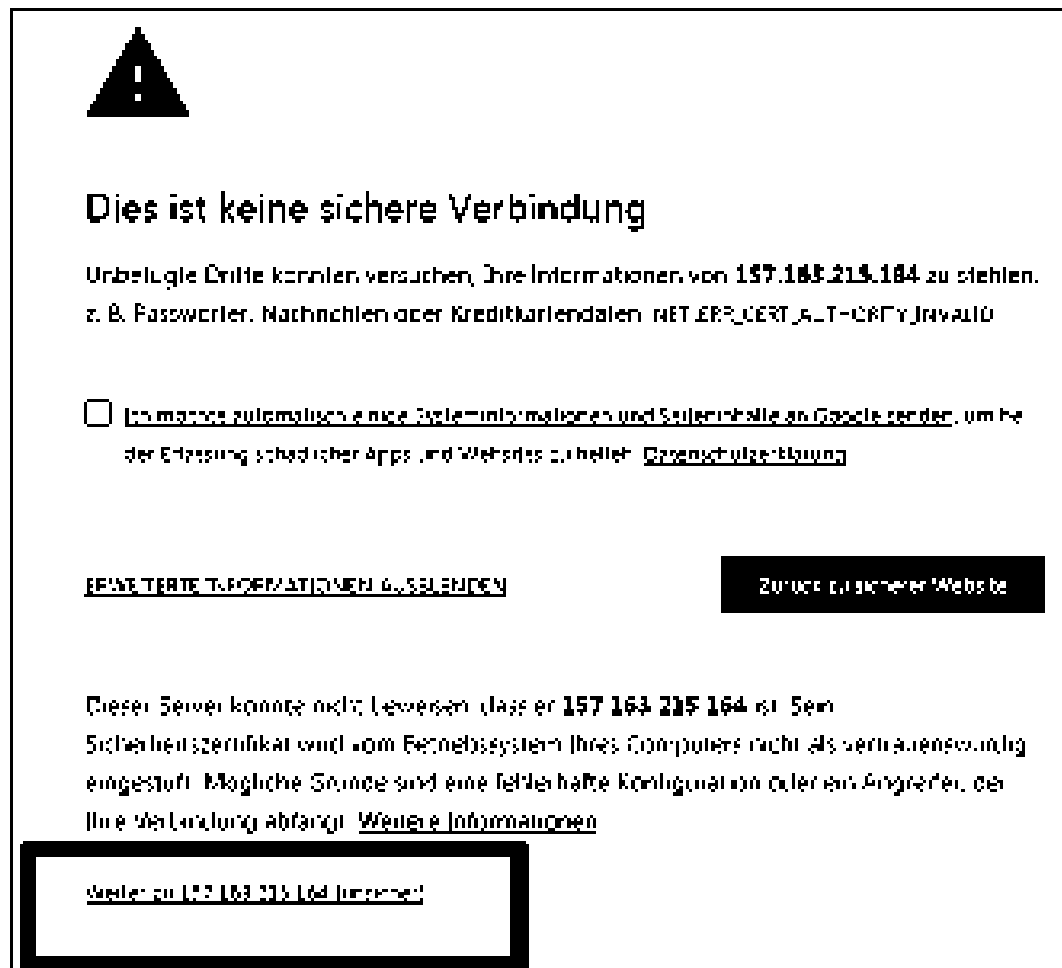


Figure A-6 Google 2

A.6 List of abbreviations

Note

The following list of abbreviations includes the abbreviations and meanings as used for the SINAMICS.

| Abbreviation | Derivation of abbreviation | Meaning |
|--------------|---|---|
| A... | Alarm | Alarm |
| AC | Alternating Current | Alternating current |
| ADC | Analog Digital Converter | Analog digital converter |
| C... | - | Safety message |
| CF Card | CompactFlash Card | CompactFlash card |
| CoL | Certificate of License | Certificate of License |
| COM | Communication LED | Status display of the communication |
| COM | Common contact of a change-over relay | Center contact of a change-over contact |
| COMM | Commissioning | Commissioning |
| CPU | Central Processing Unit | Central processing unit |
| CU | Control Unit | Control Unit |
| DAC | Digital Analog Converter | Digital analog converter |
| DC | Direct Current | Direct current |
| DI | Digital Input | Digital input |
| DO | Digital Output | Digital output |
| DO | Drive Object | Drive object |
| DP | Decentralized Peripherals | Distributed I/O |
| DQ | DRIVE-CLiQ | DRIVE-CLiQ |
| DRIVE-CLiQ | Drive Component Link with IQ | Drive Component Link with IQ |
| DSC | Dynamic Servo Control | Dynamic servo control |
| DTC | Digital Time Clock | Timer |
| EEPROM | Electrically Erasable Programmable Read-Only Memory | Electrically Erasable Programmable Read-Only Memory |
| EMC | Electromagnetic Compatibility | Electromagnetic compatibility |
| EMF | Electromotive Force | Electromotive force |
| EMV | Elektromagnetische Verträglichkeit | Electromagnetic compatibility |
| EN | Europäische Norm | European standard |
| EnDat | Encoder-Data-Interface | Encoder interface |
| ESR | Extended Stop and Retract | Extended stop and retract |
| F... | Fault | Fault |
| FAQ | Frequently Asked Questions | Frequently asked questions |
| FCC | Function Control Chart | Function control chart |
| FCC | Flux Current Control | Flux current control |
| F-DI | Failsafe Digital Input | Fail-safe digital input |

| Abbreviation | Derivation of abbreviation | Meaning |
|----------------|---|---|
| FI | - | Fault current |
| FP | Funktionsplan | Function diagram |
| FW | Firmware | Firmware |
| GB | Gigabyte | Gigabyte |
| GC | Global Control | Global control telegram (broadcast telegram) |
| GSD | Gerätstammdatei | Generic station description file: Describes the features of a PROFIBUS slave |
| GUID | Globally Unique Identifier | Globally unique identifier |
| HF | High frequency | High frequency |
| HFD | Hochfrequenzdrossel | Radio frequency reactor |
| HTL | High-Threshold Logic | Logic with high interference threshold |
| HW | Hardware | Hardware |
| I/O | Input/Output | Input/output |
| I2C | Inter-Integrated Circuit | Internal serial data bus |
| IASC | Internal Armature Short-Circuit | Internal armature short-circuit |
| IBN | Inbetriebnahme | Commissioning |
| ID | Identifier | Identification |
| IE | Industrial Ethernet | Industrial Ethernet |
| IEC | International Electrotechnical Commission | International Electrotechnical Commission |
| IF | Interface | Interface |
| IL | Impulslöschung | Pulse suppression |
| IP | Internet Protocol | Internet protocol |
| IVP | Internal Voltage Protection | Internal voltage protection |
| JOG | Jogging | Jogging |
| K _p | - | Proportional gain |
| L | - | Symbol for inductance |
| LED | Light Emitting Diode | Light emitting diode |
| LIN | Linearmotor | Linear motor |
| LU | Length Unit | Length unit |
| M | - | Symbol for torque |
| M | Masse | Reference potential for all signal and operating voltages, usually defined as 0 V (also referred to as GND) |
| MB | Megabyte | Megabyte |
| MCC | Motion Control Chart | Motion Control Chart |
| MDI | Manual Data Input | Manual data input |
| MLFB | Maschinenlesbare Fabrikatebezeichnung | Article number |
| MRCDD | Modular Residual Current Device | Modular residual current device |
| MSR | Motorstromrichter | Motor-side converter |
| MT | Messtaster | Measuring input |
| N. C. | Not Connected | Not connected |

| Abbreviation | Derivation of abbreviation | Meaning |
|--------------|--|--|
| N... | No Report | No message or internal message (only as part of the alarm list) |
| NAMUR | Normenarbeitsgemeinschaft für Mess- und Regeltechnik in der chemischen Industrie | Standardization association for measurement and control in chemical industries |
| NC | Normally Closed (contact) | NC contact |
| NC | Numerical Control | Numerical control |
| NEMA | National Electrical Manufacturers Association | Standardization association in USA (United States of America) |
| NM | Nullmarke | Zero mark |
| NO | Normally Open (contact) | NO contact |
| NSR | Netzstromrichter | Line-side converter |
| NTP | Network Time Protocol | Synchronizes the clocks in computer systems and networks |
| NVRAM | Non-Volatile Random Access Memory | Non-volatile read/write memory |
| OA | Open Architecture | Software component which provides additional functions for the SINAMICS drive system |
| OAIF | Open Architecture Interface | Version of the SINAMICS firmware from which the OA application can be used |
| OASP | Open Architecture Support Package | Expands the STARTER commissioning tool by the corresponding OA application |
| OC | Operating Condition | Operation condition |
| OCC | One Cable Connection | One cable technology |
| OEM | Original Equipment Manufacturer | Original Equipment Manufacturer |
| OMI | Option Module Interface | Option Module Interface |
| p... | - | Adjustable parameters |
| PD | PROFIdrive | PROFIdrive |
| PDC | Precision Drive Control | Precision drive control |
| PDS | Power Drive System | Drive system |
| PE | Protective Earth | Protective ground |
| PELV | Protective Extra Low Voltage | Safety extra-low voltage |
| PFH | Probability of dangerous failure per hour | Probability of dangerous failure per hour |
| PG | Programmiergerät | Programming device |
| PID | Proportional Integral Differential | Proportional integral differential |
| PLC | Programmable Logical Controller | Programmable logic controller |
| PLL | Phase-Locked Loop | Phase-locked loop |
| PM | Power Module | Power Module |
| PN | PROFINET | PROFINET |
| PS | Power Supply | Power supply |
| PSA | Power Stack Adapter | Power stack adapter |
| PT1000 | - | Temperature sensor |
| PTC | Positive Temperature Coefficient | Positive temperature coefficient |
| PWM | Pulse Width Modulation | Pulse width modulation |

| Abbreviation | Derivation of abbreviation | Meaning |
|--------------|--------------------------------------|--|
| PZD | Prozessdaten | Process data |
| r... | - | Display parameters (read-only) |
| RAM | Random Access Memory | Memory for reading and writing |
| RCCB | Residual Current Circuit Breaker | Residual current operated circuit breaker |
| RCD | Residual Current Device | Residual current device |
| RESM | Reluctance synchronous motor | Synchronous reluctance motor |
| RFG | Ramp-Function Generator | Ramp-function generator |
| RJ45 | Registered Jack 45 | Term for an 8-pin socket system for data transmission with shielded or non-shielded multi-wire copper cables |
| RLM | Renewable Line Module | Renewable Line Module |
| RO | Read Only | Read-only |
| ROM | Read-Only Memory | Read-only memory |
| S1 | - | Continuous operation |
| S3 | - | Intermittent duty |
| SAM | Safe Acceleration Monitor | Safe acceleration monitoring |
| SBC | Safe Brake Control | Safe brake control |
| SBH | Sicherer Betriebshalt | Safe operating stop |
| SBR | Safe Brake Ramp | Safe brake ramp monitoring |
| SBT | Safe Brake Test | Safe brake test |
| SCA | Safe Cam | Safe cam |
| SCC | Safety Control Channel | Safety control channel |
| SD Card | SecureDigital Card | Secure digital memory card |
| SDC | Standard Drive Control | Standard Drive Control |
| SDI | Safe Direction | Safe motion direction |
| SE | Sicherer Software-Endschalter | Safe software limit switch |
| SESM | Separately-excited synchronous motor | Separately-excited synchronous motor |
| SG | Sicher reduzierte Geschwindigkeit | Safely reduced speed |
| SGA | Sicherheitsgerichteter Ausgang | Safety-related output |
| SGE | Sicherheitsgerichteter Eingang | Safety-related input |
| SH | Sicherer Halt | Safe stop |
| SI | Safety Integrated | Safety Integrated |
| SIC | Safety Info Channel | Safety info channel |
| SIL | Safety Integrity Level | Safety integrity level |
| SITOP | - | Siemens power supply system |
| SLP | Safely-Limited Position | Safely-limited position |
| SLS | Safely-Limited Speed | Safely-limited speed |
| SM | Sensor Module | Sensor Module |
| SMI | SINAMICS Sensor Module Integrated | SINAMICS Sensor Module Integrated |
| SN | Sicherer Software-Nocken | Safe software cam |
| SOS | Safe Operating Stop | Safe operating stop |
| SP | Service Pack | Service pack |

| Abbreviation | Derivation of abbreviation | Meaning |
|--------------|-------------------------------------|---|
| SP | Safe Position | Safe position |
| SPC | Setpoint Channel | Setpoint channel |
| SPI | Serial Peripheral Interface | Serial peripheral interface |
| SPS | Speicherprogrammierbare Steuerung | Programmable logic controller |
| SS1 | Safe Stop 1 | Safe stop 1 (monitored for time and ramp) |
| SS1E | Safe Stop 1 External | Safe stop 1 with external stop |
| SS2 | Safe Stop 2 | Safe stop 2 |
| SS2E | Safe Stop 2 External | Safe stop 2 with external stop |
| SSI | Synchronous Serial Interface | Synchronous serial interface |
| SSM | Safe Speed Monitor | Safe feedback from speed monitor |
| SSP | SINAMICS Support Package | SINAMICS support package |
| STO | Safe Torque Off | Safe torque off |
| STW | Steuerwort | Control word |
| TEC | Technology Extension | Software component which is installed as an additional technology package and which expands the functionality of SINAMICS (previously OA application) |
| TIA | Totally Integrated Automation | Totally Integrated Automation |
| TM | Terminal Module | Terminal Module |
| Tn | - | Integral time |
| TTL | Transistor-Transistor-Logic | Transistor-transistor logic |
| UL | Underwriters Laboratories Inc. | Underwriters Laboratories Inc. |
| USV | Unterbrechungsfreie Stromversorgung | Uninterruptible power supply |
| U TC | Universal Time Coordinated | Universal time coordinated |
| Vdc | - | DC-link voltage |
| VDE | Verband Deutscher Elektrotechniker | Association of German Electrical Engineers |
| VDI | Verein Deutscher Ingenieure | Association of German Engineers |
| XML | Extensible Markup Language | Extensible markup language (standard language for Web publishing and document management) |
| ZK | Zwischenkreis | DC link |
| ZM | Zero Mark | Zero mark |
| ZSW | Zustandswort | Status word |

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www.siemens.com

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www.siemens.com/online-support

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