

SLC-3-GS3S00300

SafeLogic compact
Sercos Gateway

EN

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1 About this Documentation

These mounting instructions are original mounting instructions.

1.1 SafeLogic compact System Documentations

These mounting instructions describe the mounting of the SafeLogic compact Sercos Gateway SLC-3-GS3S00300.

Mounting of the SafeLogic compact CPUs, the diagnostic gateways, the SafeLogic compact extension modules and the relay output modules is described in separate mounting instructions.

The installation, configuration and commissioning of the SafeLogic compact safety control system are described in the following operating instructions.

Document	Title	Part No.
Operating instructions	IndraControl SafeLogic compact Hardware	R911332746
Operating instructions	IndraControl SafeLogic compact Diagnostic Gateways	R911332752
Operating instructions	IndraControl SafeLogic compact Designer Software	R911332749
Operating instructions	IndraControl SafeLogic compact Sercos Gateway	R911338431
Project Planning Manual	IndraControl SafeLogic compact Sercos Gateway	R911338436
Mounting Instructions	SLC-3-GS3S00300 SafeLogic compact Sercos Gateway	R911339570

Other instructions or mounting instructions can be found on the installation CD of the SafeLogic Designers.

The device description file for the Sercos Gateway (SDDML) is available in the installation of the SafeLogic Designer.

1.2 Function of this Document

These mounting instructions instruct *the technical staff of the machine manufacturer* and/or *of the machine operator* on the safe mounting of the main module of the SafeLogic compact safety control system.

In addition, mounting protective devices also requires specific technical skills which are not detailed in this documentation. These mounting instructions do not provide instructions for operating the machine in which the safety control system is, or will be, integrated. Information of this kind can be found in the operating instructions for the machine.

1.3 EC Declaration of Conformity

The EC Declaration of Conformity is available on request or online under www.boschrexroth.de.

2 On Safety

This chapter deals with your own safety and the safety of the equipment operators.

➤ Please read this chapter carefully, before starting the installation.

2.1 Qualified Safety Personnel

The Flexi Soft modular safety control system may only be installed by qualified safety personnel.

Qualified safety personnel are defined as persons who ...

- have undergone the appropriate technical training and
- who have been instructed by the responsible machine operator in the operation of the machine and the current valid safety guidelines and
- have access to the operating instructions of the SafeLogic compact and have read and familiarized themselves with them and
- have access to the operating instructions for the protective devices (e.g. safety light curtains) connected to the safety control system and have read and familiarized themselves with them

2.2 Range of Uses of the Device

The SafeLogic compact safety control system is a configurable control system for safety applications. It can be used:

- in accordance with IEC 61508 up to SIL3
- in accordance with EN ISO 13849-1 up to Category 4 and Performance Level e

The degree of safety actually attained depends on the external circuitry, the realisation of the wiring, the parameter configuration, the choice of the safety sensors and how they are mounted on the machine.

Opto-electronic and tactile safety sensors (e.g. light curtains, laser scanners, safety switches, sensors, emergency-stop buttons) are connected to the modular safety control system and are linked logically. The corresponding actuators of the machines or systems can be switched off safely via the switching outputs of the safety control system.

2.3 Intended Use

The SafeLogic compact modular safety control system may only be used within specific operating limits (voltage, temperature, etc., refer to the technical data and to chapter 7 “Technical Data”). It may only be used by specialist personnel and only at the machine at which it was installed and initially commissioned by qualified safety personnel in accordance with the SafeLogic compact operating instructions.

The Bosch Rexroth AG accepts no claims for liability if the equipment is used in any other way or if modifications are made to the device, even in the context of mounting and installation.

For UL/CSA applications:

- Use 60 to 75 °C conductors. The maximum operating ambient temperature is 55 °C
- To be used in a Pollution Degree 2 environment only
- The modules shall be supplied by a power source with safe separation protected by an UL248 fuse or UL 489 circuit breaker, rated max. 100/V, where V is the DC supply voltage with the maximum value of 30 Vdc so that the limited voltage/current requirements of UL508 are met
- For use in combination with the Bosch Rexroth SLC- or SICK Flexi Soft-series only

Note: The safety functions are not evaluated by UL. The approval is accomplished according to UL508, general use applications.

2.4 General Warning Notes and Protective Measures



Comply with the warning notes and protective measures!

ATTENTION

Please comply with the following items in order to ensure proper use of the SafeLogic compact control system.

- When mounting, installing and using the SafeLogic compact control system, comply with the standards and directives applicable in your country

- The national/international rules and regulations apply to the installation, use and periodic technical inspection of the SafeLogic compact safety control system, in particular:
 - Machinery Directive 2006/42/EC
 - EMC Directive 2014/30/EU
 - Provision and Use of Work Equipment Directive 2009/104/EC
 - Work safety regulations/safety rules
- Manufacturers and owners of the machine on which a SafeLogic compact control system is used are responsible for obtaining and complying with all applicable safety regulations and rules
- It is imperative that the notices, in particular the test notices of the mounting instructions are complied with
- The tests must be carried out by qualified safety personnel or specially qualified and authorised personnel and must be recorded and documented to ensure that the tests can be reconstructed and retraced at any time by third parties
- The modules of the SafeLogic compact system conform to Class A, Group 1, in accordance with EN 55011. Group 1 encompasses all ISM devices in which intentionally generated and/or used conductor-bound RF energy that is required for the inner function of the device is available



The SafeLogic compact system fulfils the requirements of Class A (industrial applications) in accordance with the “Interference emission” basic specifications!

ATTENTION

The SafeLogic compact system is therefore only suitable for use in an industrial environment and not for private use.

2.5 Disposal

Disposal of unusable or irreparable devices should always occur in accordance with the applicable country-specific waste-disposal regulations (e.g. European Waste Code 16 02 14).

3 Product Description

3.1 Sercos Gateway SLC-3-GS3S00300

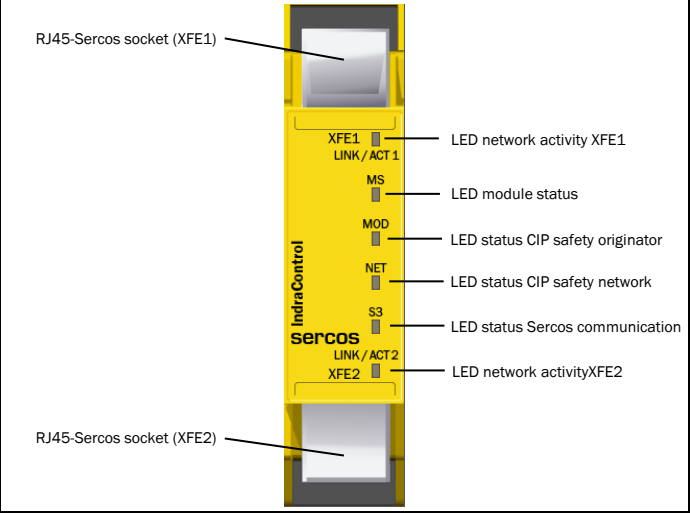
The Sercos Gateway (SLC-3-GS3S00300) is an extension module of the SafeLogic compact system. The SLC-3-GS3S00300 is a Sercos I/O slave, communicating cyclic input and output data. The SLC-3-GS3S00300 can operate Sercos CC connections up to 16 other Sercos devices (CIP Safety on Sercos targets).

GS3S provides the following function extensions in the SafeLogic compact system:

- Communicating safety-related data between a SafeLogic compact and up to 16 CIP Safety on Sercos targets (including group generation for function-identical targets to facilitate programming and to reduce the volume of data between the SafeLogic compact CPU and SLC-3-GS3S00300)
- Communicating non-safety-related data between SafeLogic compact and the Sercos master control (analog to the diagnostic gateway). This communication Includes:
 - Cyclic communication of the user-defined operating data and status information
 - Acyclic communication of the SafeLogic compact module diagnostics and the system CRCs by reading the Sercos parameters via the Sercos service channel
- TCP/IP interface to configure and diagnose the SafeLogic compact systems using TCP/IP communication

The SafeLogic compact Sercos Gateway supports Sercos of the third generation.

3.1.1 Display and connection elements



3.1.2 LINK/ACT1 and LINK/ACT2 LED displays

LINK/ACT1 and LINK/ACT2	Description
○	No Ethernet connection
● Green	Ethernet connection active, no data transfer
◐ Green, orange	Ethernet connection active; transfer of data

3.1.3 MS-LED displays

MS-LED	Description
○	Switch on or no communication to the CPU module
● Green	System is in state “RUN”
◐ Green (1 Hz)	System is in state “STOP”
◑ Red (1 Hz)	Configuration is required or configuration is running
◑ Red (2 Hz)	Safety-related error. Cause: Error detection by the SLC-3-GS3S00300 firmware
● Red	Safety-related error. Cause: Communication with CPU
◑ Red, green (1 Hz)	„RUN“, a non-safety-related error was reported

3.1.4 MOD-LED displays

MOD-LED	Description
○	No operating voltage
◑ Red, green (1 Hz)	Self test
◑ Green (1 Hz)	No configuration or application in “STOP”
● Green	Operating state application in “RUN”
◑ Red (1 Hz)	Recoverable error (e. g. configuration error)
● Red	Unrecoverable error, module might have to be replaced (critical error)

3.1.5 NET-LED displays

NET-LED	Description
○	No operating voltage
◑ Green (1 Hz)	Connection to Sercos interface connection established but no cyclic CIP Safety communication takes place
● Green	Cyclic CIP Safety communication (for at least one connection)
◑ Red (1Hz)	One or several CIP Safety connections have an error in the cyclic communication
● Red	No communication possible

3.1.6 S3-LED displays

S3-LED	Description
○	No Sercos communication, NRT mode
● Orange	Communication phase 0
● Orange, green	1 × green, then orange: Communication phase 1 2 × green, then orange: Communication phase 2 3 × green, then orange: Communication phase 3 Green, orange alternately: Hotplug (HP0) 1 × orange, then grün: Hotplug (HP1) 2 × orange, then grün: Hotplug (HP2)
● Green	Communication phase 4
● Green	Fast forward -> Loopback
● Red, green	Telegrams are lost
● Red	Communication error
● Red, orange	Application error
● Orange	Identification
● Red	Watchdog error

Symbol description:

- indicates, the LED is off.
- indicates, the LED continuously blinks red, green or orange.
- indicates, the LED blinks red, green or orange or a combination of these colors.

4 Mounting, Dismantling

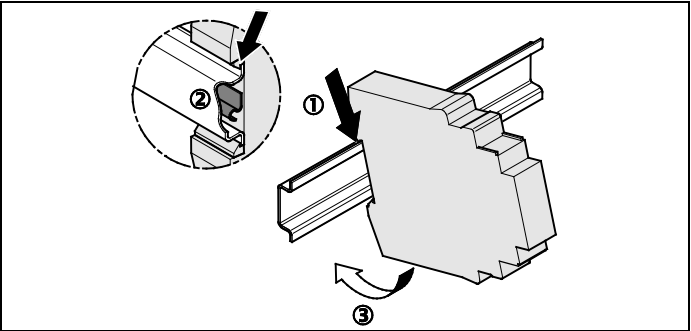
ATTENTION

The SafeLogic compact system must be mounted in a control cabinet with at least IP 54 enclosure rating.

While supply voltage is applied, modules must not be plugged to nor be removed from the SafeLogic compact system.

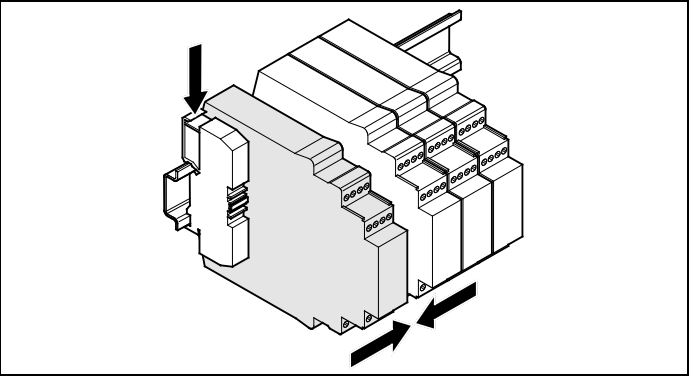
4.1 Mounting the Modules

- In a SafeLogic compact system, the main modules SLC-3-CPU0, SLC-3-CPU1 and SLC-3-CPU3 are mounted at the far left
- Both optional gateways are positioned to the right of the main module
- Connect other SafeLogic compact extension modules (e.g. SLC-3-XTI0 or SLC-3-XTDI) to the right of the gateways or to the right of the main module if no gateway is used
- Connect all additional relay modules (SLC-A-UE410-2R0 or SLC-A-UE410-4R0) to the far right of the entire SafeLogic compact system
- The modules are located in a 22.5 mm wide modular system for 35 mm DIN rails to EN 60 715
- The modules are connected to each other via the FLEXBUS+ plug connection integrated in the housing
- Mount the modules in accordance with EN 50 274
- Ensure that suitable ESD protective measures are taken during mounting. Otherwise, the FLEXBUS+ bus may be damaged
- Take suitable measures to ensure that foreign matter does not enter the connector openings, in particular that of the system plug



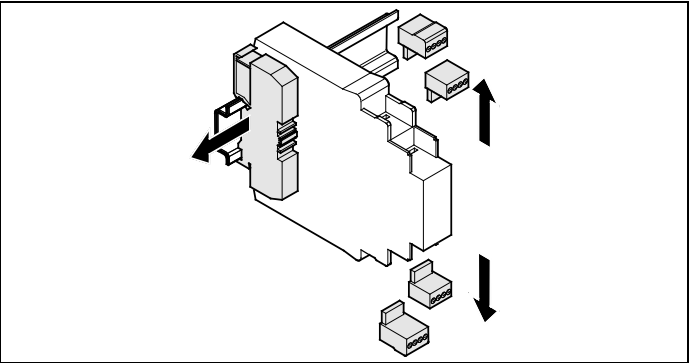
- Make sure that the voltage supply of the SafeLogic compact system is switched off
- Hang the device onto the DIN rail (①).

- Ensure that the earthing spring contact (②).is positioned correctly. The earthing spring contact of the module must contact the DIN rail securely to allow electrical conductivity
- Snap the module onto the DIN rail by pressing it lightly in the direction of the arrow (③).

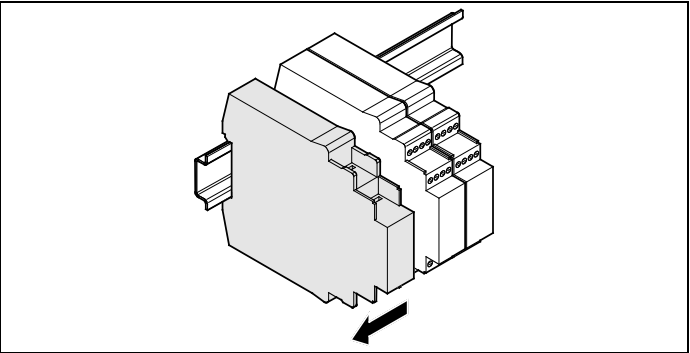


- If there are several modules, slide the modules together individuallyin the direction of the arrow until the side plug connection latches in
- Install end clips on the left and righ.

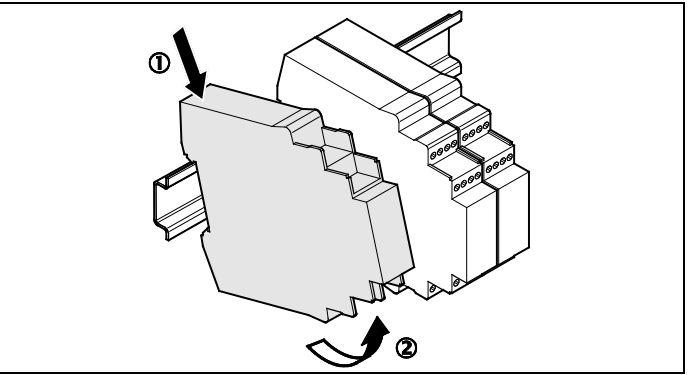
4.2 Dismantling the modules



- Remove the removable terminals with the wiring and the end clips



- If there are several modules, slide the modules away from eachother individually in the direction of the arrow until the side plug connection is separated



- Press the module downwards at the rear (①)and remove it from the DIN rail in the direction of the arrow while keeping it pressed down (②)

5 Electrical Installation

ATTENTION

Switch off the entire machine/system!

The system could start up unexpectedly while you are connecting the devices.

Comply with the safety standards!

All safety related parts of the installation (cabling, connected sensors and actuators, configuration settings) must be according to the relevant safety standards (e.g. IEC 62061 or ISO EN 13 849-1)

- The SafeLogic compact safety control system fulfils the EMC requirements in accordance with the basic specification EN EN 61 000-6-2 for industrial use
- Electrical installation in accordance with EN 60204-1
- To ensure full electromagnetic compatibility (EMC), the DIN rail has to be connected to functional earth (FE). Additionally, connect all shieldings with a mutal functional earth ground lead directly at the lead-in to the equipment cabinet
- The voltage supply of the devices must be capable of buffering brief mains voltage failures of 20 ms acc. to EN 60204-1
- The voltage supply has to fulfil the regulations for extra-low voltages with safe separation (SELV, PELV) in accordance with EN 60664 and EN 50178 (equipment of electrical power installation with electronic devices)
- You must connect all modules of the Flexi Soft system, the connected protective devices and the voltage supply/ies with the same 0 V DC (GND)
- All connected safety sensors and actuators as well as wiring and installation have to fulfil the required safety characteristics
- If a module is replaced the correct terminal assignment has to be guaranteed, for example by labelling or suitable cable routing
- More information that is to be taken into consideration when using the SafeLogic compact safety control, please refer to the operating instructions “IndraControl SafeLogic compact Hardware” and “IndraControl SafeLogic compact Designer Software”

6 Configuration and Commissioning

ATTENTION

Do not commission without a check by specialized personnel!

Before the initial commissioning of the system in which you are using a SafeLogic compact system, it must bechecked and released by qualified safety personnel. The results of this check must be documented.

The SafeLogic compact system is configured using the configura-tion software SafeLogic Designer either via the RS-232 interface of the SLC-3-CPUx module or via the Ethernet interface of a SafeLogic compact Ethernet gateway. A detailed description of the configura-tion can be found in the operating instructions of the SafeLogic Designer.

Notes:

- To configure and commission a SafeLogic compact system with Sercos gateway, the software SafeLogic Designer with at least version V1.4.0 is required
- Following a module replacement, it is not required to configure the SafeLogic compact system again as the configuration is saved in the SafeLogic system plug

7 Technical Data

Sercos Gateway	
Safety Integrity Level	SIL3 (IEC 61 508)
Category	Category 4 (EN ISO 13 849-1)
Performance Level	PL e (EN ISO 13 849-1)

Sercos Gateway	
PFH _d (mean probability of a dangerous failure per hour)	0.4 × 10 ⁻⁹ 1/h
PFD _{avg} (mean probability of a dangerous failure upon request)	3.5 x 10 ⁻⁵
Hardware error tolerance (HFT)	1
T _M (mission time)	20 years (EN ISO 13 849) The manufacturing date can be taken from the imprinted type code: MD: Year/calender week
Protection class	III (EN 61 140)
Degree of pollution	2 (EN 61131-2)
Degree of protection	Terminals and housing: IP 20 (EN 60 529)
Mounting position	Vertical mounting with vent slots at the top/bottom (horizontal standard mounting rail)
Ambient temperature in operation	-25 °C ... +55 °C
Storage temperature	-40 °C ... +70 °C
Air humidity	10% ... 95%, noncondensing
Climatic conditions	55 °C, 95% relative air humidity (EN 61 131-2)
Operating altitude	2000 m above msl (80 kPa)
Fatigue limit	3.5mm (5 Hz-8.4 Hz) (EN 60 068-2-6) 1g (8.4 Hz – 150 Hz) (EN 60 068-2-6)
Fatigue limit (broadband)	10 – 500 Hz / 3 g (EN 60 068-2-64)
Shock resistance Repetitive shock Single shock	10 g, 16 ms (EN 60 068-2-29) 30 g, 11 ms (EN 60 068-2-27)
Electromagnetic compatibility (EMC)	Class A (EN 61 000-6-2, EN 55 011)
Dimensions (W x D x H)	22.5 × 96.5 × 120.8 mm
Weight	130 g (+/- 5 %)

Supply circuit via SafeLogic compact CPUx	
Supply voltage	DC 24 V (DC 16.8 ... 30 V)
Rated current	Typ. 110 mA (for rated voltage 24 V)
Type of supply voltage	PELV or SELV For power supply unit requirements, see operating instructions “IndraControl SafeLogic compact Hardware“
Power consumption	Max. 2.7 W

Field bus (Sercos 3 rd generation)	
Number of connections	2
Wiring technique	RJ-45 socket
Transfer rate	100 Mbit/s (100 Base-TX)
MAC address	Refer to the electronic rating plate

8 Ordering Information

Device type	Part	Part no.
SLC-3-GS3S00300	Sercos Gateway	R911172765

For more modules and accessories, please see the “IndraControl SafeLogic compact Hardware” operating instructions.