

SLC-3-XTDI80302/SLC-3-XTIO84302/
SLC-3-XTDS84302/ SLC-0-STIO68302

SafeLogic compact
Extension modules

EN

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1 About this document

These mounting instructions are the original mounting instructions.

1.1 Documentations for the SafeLogic compact system

These mounting instructions describe the mounting of the SLC-3-XTIO/SLC-3-XTDI extension modules of a SafeLogic compact safety control system.

Mounting of the SafeLogic compact main modules, the SafeLogic compact gateways 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
Mounting Instructions	SLC-3-XTDI80302/SLC-3-XTIO84302/ SLC-3-XTDS84302/SLC-0-STIO68302 SafeLogic compact Extension modules	R911334401

- More instructions and mounting instructions can be found on the installation CD of the SafeLogic Designer. Device description files for the gateways (GSD, GSDML, SDDML) are available in the SafeLogic Designer installation

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 extension module of the SafeLogic compact modular 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 will be found in the operating instructions for the machine.

2 On safety

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

➤ Please read this chapter carefully before beginning with the installation.

2.1 Qualified safety personnel

The SafeLogic compact 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 Curtain) connected to the safety control system and have read and familiarized themselves with them

2.2 Applications of the device

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

- in accordance with IEC 61 508 to SIL3
- in accordance with EN 62 061 to SILCL3
- in accordance with EN ISO 13 849-1 up to Category 4 and Performance Level e

The degree of safety actually attained depends on the external circuitry, the realization 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 Correct 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 the section “Applications of the device”). 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.

If the device is used for any other purposes or modified in any way — also during mounting and installation — any warranty claim against Bosch Rexroth AG shall become void.

UL/ CSA applications

- Use 60°C/75°C conductors. The ambient temperature in operation is 55°C
- The terminal tightening torque must be 5–7 lbs/in
- 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, rated max. 100/V, where V is the DC supply voltage with the maximum value of 42.4 V DC, such that the limited voltage/current requirements of UL 508 are met

Note: The safety functions are not evaluated by UL. The approval is accomplished according to UL 508, general use applications.

2.4 General warning notes and protective measures



Observe the warning notes and protective measures!
Please observe the following items in order to ensure proper use of the SafeLogic compact safety control system.

- When mounting, installing and using the SafeLogic compact safety control system, observe 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 safety control system is used are responsible for obtaining and observing all applicable safety regulations and rules
- It is imperative that the notices, in particular the test notices of the mounting instructions be observed
- The tests must be carried out by qualified safety personnel or specially qualified and authorized 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 55 011. 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 itself occurs



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

Notes:

- The extension modules can only be used in conjunction with a main unit SLC-3-CPUx (see configuration software SafeLogic Designer)
- It is possible to use several extension modules at the same time (in total max. 12 extension modules, see the operating instructions “IndraControl SafeLogic compact Hardware”)

3.1.1 SLC-3-XTIO extension module

The SLC-3-XTIO module is an input/output extension with 8 safety inputs and 4 safety outputs. It fulfills the following tasks:

- monitoring of the connected safety devices
- passing on the input information to the main module
- receiving the control signals from the main module and corresponding switching of the outputs
- Fast shut-off
- ON/OFF selection of test pulse outputs (Q1-Q4) (with firmware version 2.00 and higher, see SafeLogic compact operating instructions)

Voltage for the internal logic and the test outputs is supplied via the FLEXBUS+ internal bus. Voltage for the SCL-3-XTIOs outputs Q1 ... Q4 must be supplied directly via A1/A2 on the respective module.

A SLC-3-XTIO has two test signal generators. Short circuits between test outputs X1 and X2 are recognized.

3.1.2 SLC-3-XTDI extension module

The SLC-3-XTDI module is an input extension with 8 safe inputs. It fulfills the following tasks:

- monitoring of the connected sensor equipment
- passing on the input information to the main module

Voltage is supplied via the FLEXBUS+ internal bus.

An SLC-3-XTDI has two test signal generators. One test signal generator is responsible for the odd-numbered test outputs X1, X3, X5 and X7, the other for the even-numbered test outputs X2, X4, X6 and X8.

3.1.3 SLC-3-XTDS extension module

The SLC-3-XTDS is an extension module with eight safe inputs and four non-safe outputs. It has two optional test signal generators: one for test output XY1 and one for test output XY2. The SLC-3-XTDS module provides the following functions:

- monitoring of the safety devices connected
- forwarding of input information to the main unit
- reception of the control signals from the main unit and corresponding switching of the outputs
- The outputs XY1 and XY2 can be used both as test outputs and as non-safe outputs



Do not use the non-safe outputs for safety functions!
The non-safe outputs XY1, XY2 and Y3 to Y6 on the SLC-3-XTDS are not allowed to be used for safety-related functions. Otherwise the operator of the machine will be in danger.

The voltage supply for the internal logic and the test outputs is provided via the internal FLEXBUS+ bus. The voltage supply for the outputs Y3 ... Y6 on the SLC-3-XTDS must be provided directly via A1/A2 on the related module.

One SLC-3-XTDS has two test pulse generators. Short circuits between the test outputs XY1 and XY2 are detected.

3.1.4 SLC-0-STIO extension module

The SLC-0-STIO is an extension module with six non-safe inputs, six non-safe outputs and two connections that can be used as non-safe inputs or outputs as required. It provides the following functions:

- forwarding of input information to the main unit
- reception of the control signals from the main unit and corresponding switching of the outputs

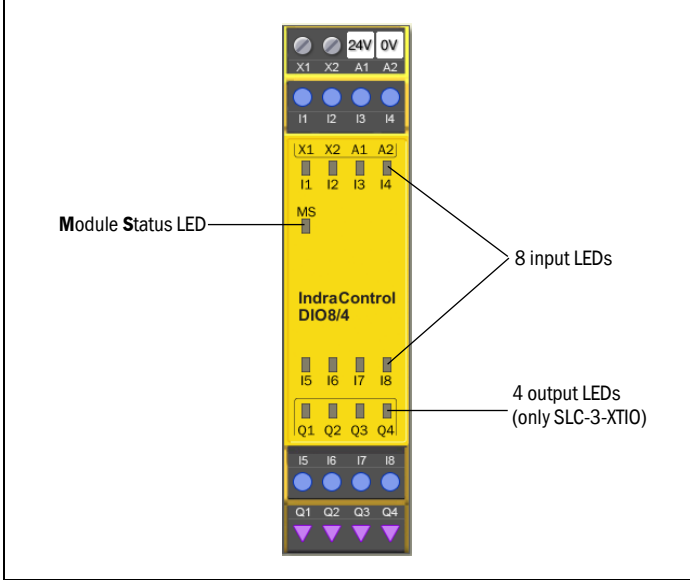


Do not use the SLC-0-STIO for safety functions!
The SLC-0-STIO is not allowed to be used for safety-related functions. Otherwise the operator of the machine will be in danger.

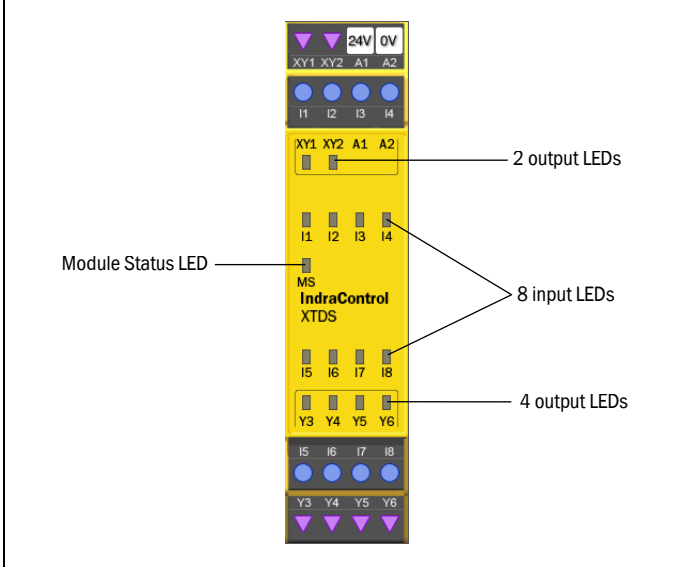
Warning

The voltage supply for the internal logic is provided via the internal FLEXBUS+ bus. The voltage supply for the outputs Y1 ... Y6 as well as the connections IY7 and IY8 on the SLC-0-STIO must be provided directly via A1/A2 on the related module.

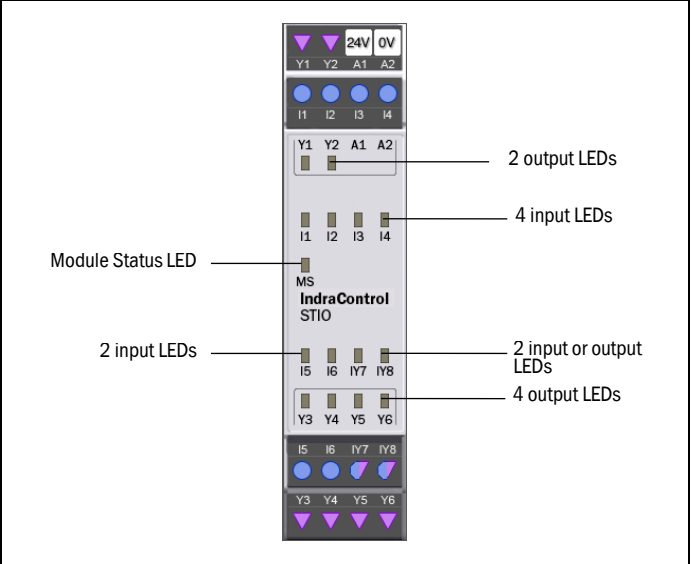
3.2 Status Indicator SLC-3-XTIO and SLC-3-XTDI



3.3 Status indicators FX3-XTDS



3.4 Status indicators FX0-STIO



3.4.1 Indications of the MS LED (all modules)

MS LED	Meaning
○	Supply voltage is outside range
● Red/green (1 Hz)	Recoverable external error
● Green (1 Hz)	System is in Stop state
● Green	System is in Run state
● Red (1 Hz)	Invalid configuration
● Red (2 Hz)	Critical error in the system, possibly in the main module. Application is stopped. All outputs are switched off
● Red	Critical error in the system, possibly in an extension module. Application is stopped. All outputs are switched off

3.4.2 Indications of the input and Output LEDs (all modules)

LEDs Ix, IYx, Qx, XYx und Yx	Meaning
○	Input/output is inactive
● Green	Input/output is active
● Green (1 Hz) synchronous with the red MS LED	Input/output is inactive and there is an error that can be rectified
● Green (1 Hz) alternating with the red MS LED	Input/output is active and there is an error that can be rectified

3.5 Terminal assignment

3.5.1 Terminal assignment SLC-3-XTIO

Module	Terminal	Assignment
	X1/X2	Test output 1 / Test output 2
	A1	24 V
	A2	GND
	I1 ... I4	Inputs 1 to 4
	I5 ... I8	Inputs 5 to 8
	Q1 ... Q4	Outputs 1 to 4
	MS	

3.5.2 Terminal assignment SLC-3-XTDI

Module	Terminal	Assignment
	X1/X3	Test output 1
	X2/X4	Test output 2
	I1 ... I4	Inputs 1 to 4
	I5 ... I8	Inputs 5 to 8
	X5/X7	Test output 1
	X6/X8	Test output 2
	MS	

3.5.3 Terminal assignment SLC-3-XTDS

Module	Terminal	Assignment
	XY1/XY2	Non-safe outputs 1 and 2
	A1	24 V
	A2	GND
	I1 ... I4	Inputs 1 to 4
	I5 ... I8	Inputs 5 to 8
	Y3 ... Y6	Non-safe outputs 3 to 6
	MS	

3.5.4 Terminal assignment SLC-0-STIO

Module	Terminal	Assignment
	Y1/Y2	Non-safe outputs 1 and 2
	A1	24 V
	A2	GND
	I1 ... I4	Non-safe inputs 1 to 4
	I5/I6	Non-safe inputs 5 and 6
	IY7/IY8	Non-safe inputs 7 and 8 or non-safe outputs 7 and 8 (configurable)
	Y3 ... Y6	Non-safe outputs 3 to 6

4 Mounting and Demounting

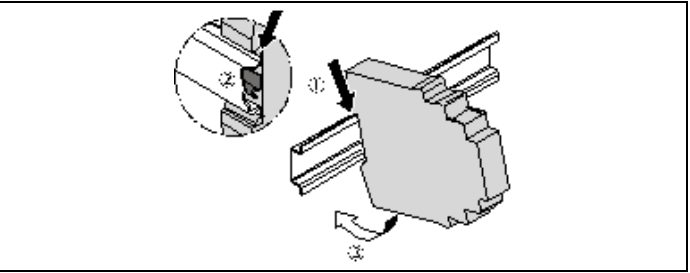
ATTENTION

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

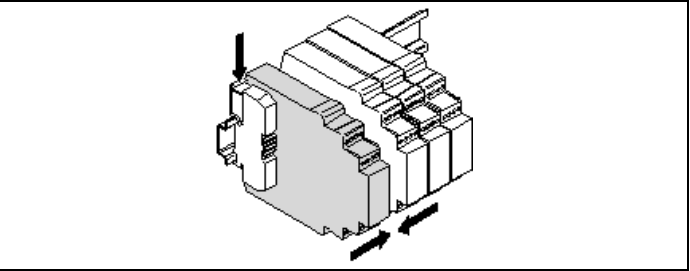
While supply voltage is applied, modules must not be plugged to nor be removed from the SafeLogic compact system.

4.1 Mounting the modules

- In a SafeLogic compact system the main module SLC-3-CPU0 or SLC-3-CPU1 is positioned at the far left
- The two optional gateways follow directly to the right of the main module
- Connect further SafeLogic compact extension modules (e.g. SLC-3-XTIO or SLC-3-XTDI) on the right side of the gateways or on the right side of the main module, if no gateway is used
- Connect any additional relay modules (UE410-2R0 or UE410-4R0) on 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

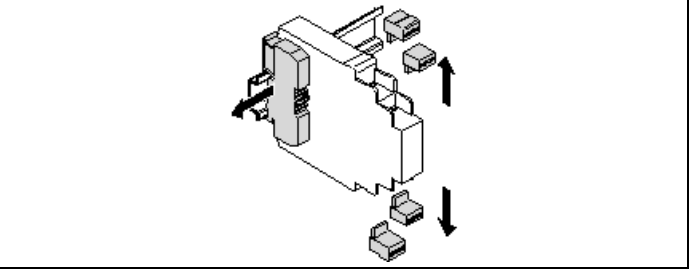


- Make sure that the voltage supply of the SafeLogic compact system is switched off.
- Hang the device onto the DIN rail (①).
- Ensure that the earthing spring contact (②) is positioned correctly. The earthing spring contact of the module must contact the DIN rail securely to allow electrical conductivity.
- Snap the module onto the DIN rail by pressing it lightly in the direction of the arrow (③).

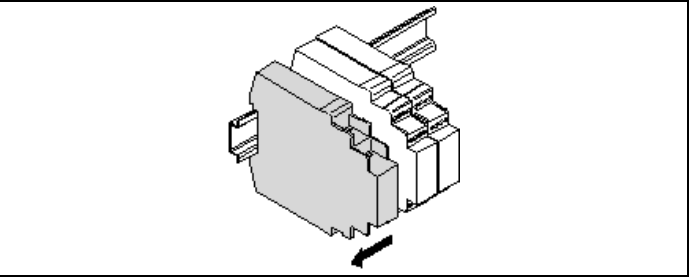


- If there are several modules, slide the modules together individually in the direction of the arrow until the side plug connection latches in.
- Install end clips on the left and right.

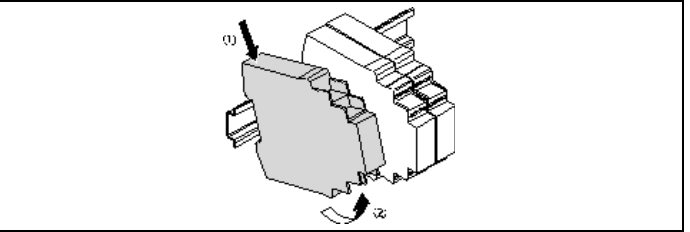
4.2 Demounting the modules



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



- If there are several modules, slide the modules away from each other 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.

Observe the relevant 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 62 061 or ISO EN 13 849-1). This may mean that safety related signals need to be redundant or that single channel signals need protected wiring or short circuit detection by using test outputs and/or periodical function tests.

- Take into account that short circuits between test outputs and the corresponding input cannot be detected.
- Consider if protected or separate cabling is required for these signals.

- The SafeLogic compact safety control system fulfils the EMC requirements in accordance with the basic specification EN 61 000-6-2 for industrial use
- Electrical installation in accordance with EN 60 204-1
- To ensure full electromagnetic compatibility (EMC), the DIN rail has to be connected to functional earth (FE)
- The voltage supply of the devices must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60 204-1

- The voltage supply has to fulfill the regulations for extra-low voltages with safe separation (SELV, PELV) in accordance with EN 60 664 and EN 50 178 (equipment of electrical power installation with electronic devices)
- You must connect all modules of the SafeLogic compact system, the connected protective devices and the voltage supply/ies with the same 0 V DC (GND)
- All safety sensors and actuators connected as well as wiring and installation have to fulfill the required safety characteristics. Depending on the external loads, especially for inductive loads, additional external protective elements, e.g. varistors or RC elements may be necessary in order to protect the safety outputs. Take into account that the response times may increase, depending on the type of protective element
- On the replacement of a module, it must be ensured the connections are made correctly, e.g. by marking or laying in a suitable manner. For further information that is to be taken into consideration when the SafeLogic compact safety control system is used, please refer to the "IndraControl SafeLogic compact Hardware" and "IndraControl SafeLogic compact Designer Software" operating instructions

6 Configuration and commissioning

ATTENTION

Do not commission without a check by specialist personnel!
Before the initial commissioning of the system in which you are using a SafeLogic compact system, it must be checked and released by qualified safety personnel. The results of this check must be documented.

The SafeLogic compact can be configured using the SafeLogic Designer Software via the SLC-3-CPUx module's RS-232 interface or via the Ethernet interface of a SafeLogic compact Ethernet Gateway. A detailed description of the configuration can be found in the operating instructions for the SafeLogic Designer Software.

Notes:

- For configuration and commissioning the SafeLogic Designer Software with at least version V1.7.0 is required
- After a module exchange it is not necessary to configure the SafeLogic compact system again since the configuration is stored in the SafeLogic compact memory plug

7 Technical data

Please refer to the "IndraControl SafeLogic compact Hardware" instructions.

8 Ordering information

Device type	Part	Part no.
SLC-3-XTIO84302	Input/output extension 8 safe inputs 4 safe outputs Dual level spring clamp terminals	R911172291
SLC-3-XTDI80302	Input extension 8 safe inputs Dual level spring clamp terminals	R911172292
SLC-3-XTDS84302	Extension module 8 safe inputs 4 or 6 non-safe outputs Dual level spring clamp terminals	R911173404
SLC-0-STIO68302	Extension module 6 or 8 non-safe inputs 6 or 8 non-safe outputs Dual level spring clamp terminals	R911173405

For further modules, please refer to the "IndraControl SafeLogic compact Hardware" instructions.