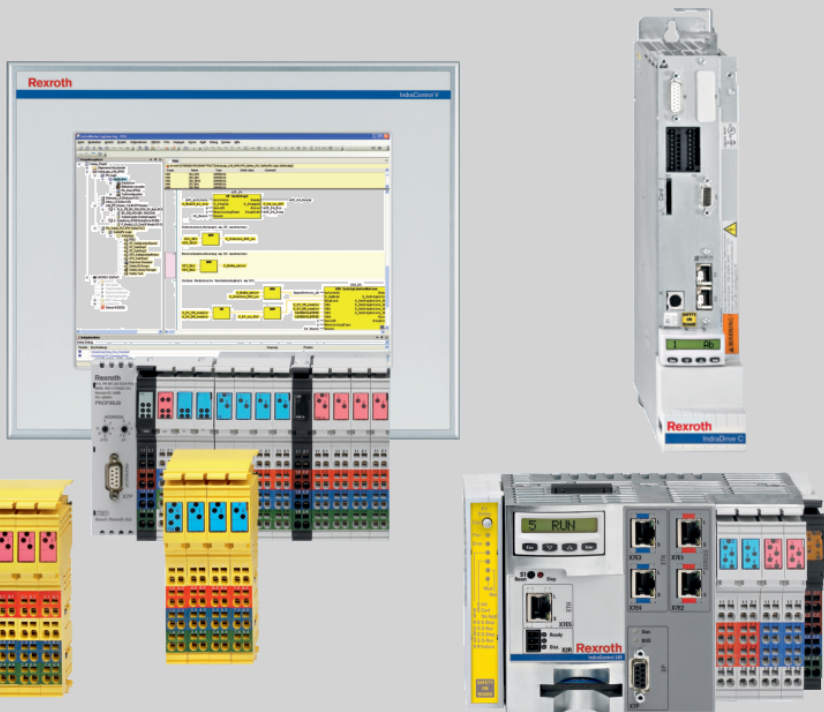


IndraControl CFL01.1-F1

Safety Function Module

Operating Instructions
R911336576

Edition 07



Revision history

Edition 06

2024-07

Refer to [tab. 1-1 "Revision history" on page 1](#)

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Editorial Department

Engineering Automation Systems Solution Integration PLC, Safety and Control
HW HaBu, AnSt (MaKo/MePe)

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1 About this documentation

1.1 Editions of this documentation

Editions of this documentation

Edition	Release date	Note
01	2013-01	First edition
02	2013-08	Corrections in the table "Further documents". Section "Customer feedback" inserted
03	2016-04	Revision
04	2017-06	Revision of the chapter "Safety standards"
05	2021-09	Standards updated
06	2022-06	SD card supplemented, supplements in the table "Further documents"
07	2024-07	Standards adapted

Tab. 1-1: Revision history

1.2 Overview on target groups and product phases

In the following illustration, the framed activities, product phases and target groups refer to the present documentation.

Example: In the product phase "Mounting (assembly/installation)", the "mechanic/electrician" can execute the activity "unpack, mount and install" using this documentation.

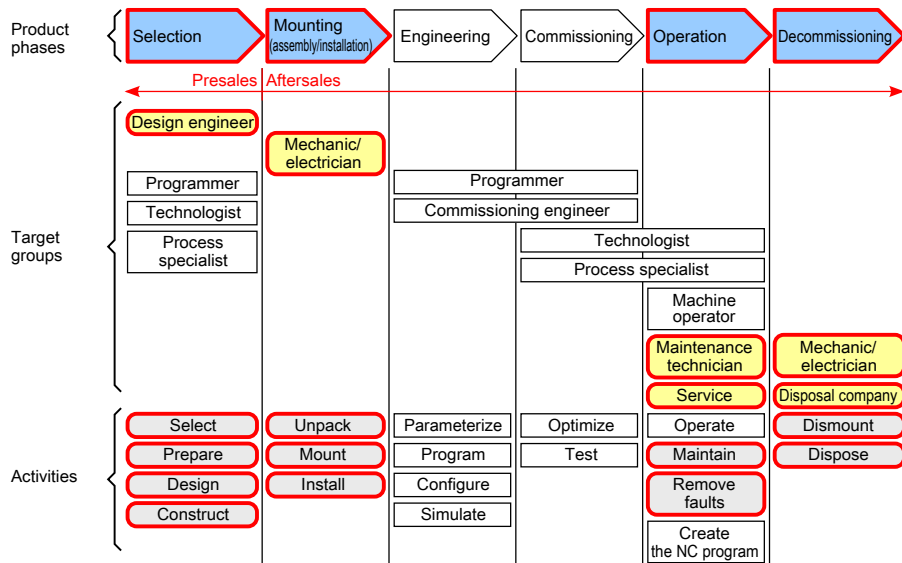


Fig. 1-1: Assigning the present documentation to the target groups, product phases and activities of the target group

1.3 Purpose

This operating instructions provides information on the safe mounting and the electric installation of the Safety function module to the technical employees of the machine manufacturer. This documentation does not provide instructions on the operation of the machine into which the Safety function module IndraControl CFL01.1-F1 is integrated. The operating instructions of the machine contains the information.

1.4 Qualifications

Required qualification: Individual who is able to assess the tasks assigned and to identify possible safety risks owing to qualification in the subject, knowledge and experience. The individual should also be familiar with the standards and regulations.

1.5 Original operating instructions

The German operating instructions is the original operating instructions. Other language versions are translations of the original operating instructions.

1.6 Scope

This operating instructions applies to the Safety function module with the type code "CFL01.1-F1".

The type code specifications are located on the type plate of the function module. Also refer to [chapter 2.1 "Product identification" on page 5](#).

1.7 Related documents

Title	Description
IndraWorks 14VRS	R911341694
SafeLogic	Application Description
Project Configuration	This documentation is intended as guideline when creating a safety-related application
IndraWorks 15VRS	R911398635
SafeLogic	Application Description
Project Configuration	This documentation is intended as guideline when creating a safety-related application
IndraWorks	R911341520
SafeLogic 14VRS	Commissioning Manual
First Steps	This documentation contains descriptions about the following topics: • Creation and use of a safety application • Basics of the data exchange between the safety application and the standard application of the IndraLogic XLC/ IndraMotion MLC/IndraMotion MTX 14VRS • Information on diagnostics and troubleshooting • Programming under SafeLogic
IndraWorks	R911400170
SafeLogic 15VRS	Commissioning Manual
First Steps	This documentation contains descriptions about the following topics: • Creation and use of a safety application • Basics of the data exchange between the safety application and the standard application of the IndraLogic XLC/ IndraMotion MLC/IndraMotion MTX 15VRS • Information on diagnostics and troubleshooting • Programming under SafeLogic

Title	Description
IndraLogic XLC	R911341696
IndraMotion MLC 14VRS	Project Planning Manual
SafeLogic System Overview	This documentation describes the project planning of safety-related devices in the systems IndraLogic XLC and IndraMotion MLC
ILC	R911400164
MLC 15VRS	Project Planning Manual
SafeLogic System Overview	This documentation provides an overview on the safety-specific Bosch Rexroth system solutions. This documentation describes the safety control SafeLogic compact and the Safety Extension module.
IndraMotion	R911341698
MTX 14VRS	Project Planning Manual
SafeLogic System Overview	This documentation describes the project planning of safety-related devices in the IndraMotion MTX
MTX 15VRS	R911398637
SafeLogic System Overview	Project Planning Manual This documentation provides an overview on the safety-specific Bosch Rexroth system solutions. This documentation describes the safety control SafeLogic compact and the Safety function module.
IndraControl L25 ¹⁾ , L45, L65, L75 and L85	R911336525
Controls	Operating Instructions This document instructs the technical staff of the machine manufacturer on how to safely perform the mechanical and electrical installation and on how to commission the control

¹⁾ The Safety function module IndraControl CFL01.1-F1 is not supported by the IndraControl L25

Tab. 1-2: Related documents



If a documentation is not available, please contact the Bosch Rexroth Service.

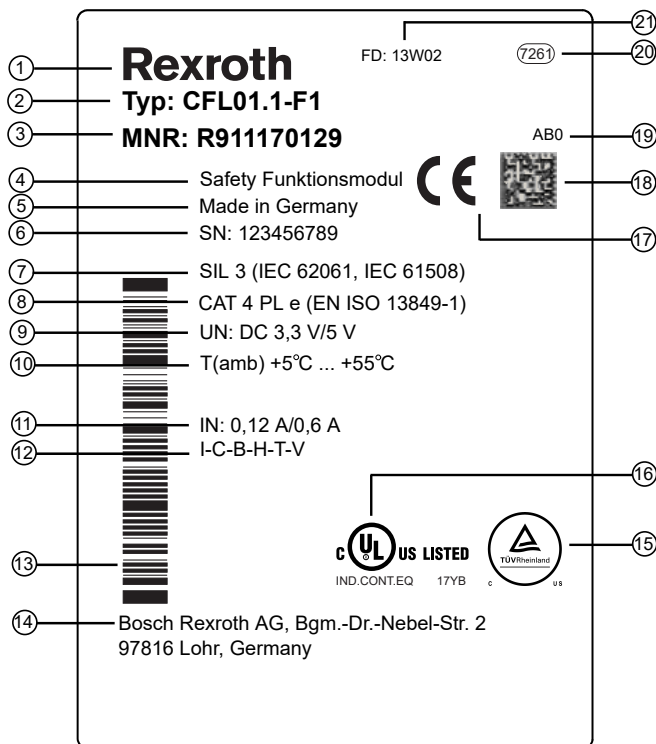
1.8 Customer feedback

Customer requests, comments or suggestions for improvement are of great importance to us. Please email your feedback on the documentations to Feedback.Documentation@boschrexroth.de. Directly insert comments in the electronic PDF document and send the PDF file to Bosch Rexroth.

2 Product identification and scope of delivery

2.1 Product identification

The type plate is located on the left side of the function module.



- | | |
|---------------------------------|------------------------------------|
| 1 Word mark | 12 Test logging |
| 2 Type name (type code) | 13 Serial number as barcode |
| 3 Part number | 14 Company address |
| 4 Device name | 15 TÜV seal |
| 5 Name of origin | 16 UL conformity marking |
| 6 Serial number | 17 CE conformity marking |
| 7 Safety integrity level | 18 QR code |
| 8 Safety integrity level | 19 State of revision |
| 9 Rated voltage | 20 Sector/plant number |
| 10 Ambient temperature | 21 Manufacturing date |
| 11 Rated current | |

Fig. 2-1: Type plate of the Safety function module

2.2 Scope of delivery

- IndraControl CFL01.1-F1

3 Using safety instructions

3.1 Structure of the safety instructions

The safety instructions are structured as follows:

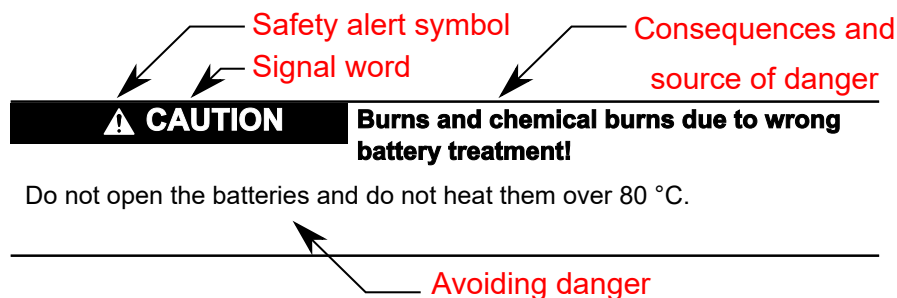


Fig. 3-1: Structure of the safety instructions

3.2 Explaining signal words and safety alert symbol

The safety instructions in this documentation contain specific signal words (danger, warning, caution, notice) and, if necessary, a safety alert symbol (according to ANSI Z535.6-2006).

The signal word draws attention to the safety instruction and indicates the risk potential.

The safety alert symbol (triangular safety reflector with exclamation marks), preceding the signal words Danger, Warning, Caution indicates hazards for persons.

DANGER

In case of non-compliance with this safety instruction, death or serious injury **will** occur.

WARNING

In case of non-compliance with this safety instruction, death or serious injury **can** occur.

CAUTION

In case of non-compliance with this safety instruction, minor or moderate injury can occur.

NOTICE

In case of non-compliance with this safety instruction, material damage can occur.

3.3 Symbols used

Pointers are displayed as follows:



This is a note.

Tips are displayed as follows:



This is a tip.

3.4 Explaining the signal alert symbol on the device



If this symbol is on your device, you have to observe the documentation on the device. The respective documentation informs on the type of hazard as well as the steps required to avoid this hazard.

4 Intended use

The Bosch Rexroth Safety function module IndraControl CFL01.1-F1 is a safety component. It becomes only a safety-related control system if used with a Rexroth IndraControl L control (IndraLogic XLC SafeLogic, IndraMotion MLC SafeLogic, IndraMotion MTX SafeLogic). For further documentation, refer to [tab. 1-2 "Related documents" on page 3](#).



The Safety function module is not supported by the IndraControl L25 hardware.

The Safety function module IndraControl CFL01.1-F1 is used to securely process logic signals of periphery components (sensors) according to the sequential program and to provide logic signals for periphery components (actuators). The sequential program can be freely programmed using the Engineering system. Even though the control system was developed, manufactured and tested according

to the safety standards and certified by an accredited test institute, using this component does not automatically ensure a functionally safe machine. The machine manufacturer has to perform a risk analysis and take corresponding protective measures to reduce risks and to validate their effect even though it was accredited and developed according to the safety standards. The functional safety can only be ensured by comprehensively implementing the requirements (e.g. systematic measures, software requirements, integrating the sensors and actuators) according to the applicable standards (EN ISO 13849 and EN 62061).

NOTICE

Risk of damaging the function module if not expressly stated accessories, mounting parts and other components, cables, lines and software and firmware are used

The Safety function module IndraControl CFL01.1-F1 may only be used as intended and combined with the accessories and attachments specified in this documentation. Components that are not expressly mentioned must neither be attached nor connected. It is strictly prohibited to open and operate components (individual parts) as well as using firmware that is not permitted.

The Safety function module IndraControl CFL01.1-F1 may only be operated under the mounting, installation and ambient conditions (such as temperature, protection class, humidity, EMC) specified in this documentation. Also refer to [chapter 6 "Ambient conditions" on page 9](#).

A typical area of application of the Safety function module is the implementation of safety-related controls for:

- Handling and mounting systems
- Food and packaging machines
- Printing and processing machines
- Machine tools
- Compactors
- Foundry and rolling technology
- Conveying engineering
- Building automation
- Special purpose machines
- Wood processing machines
- Hydraulic machines

The operation is not permitted for the following systems according to the following standards and guidelines:

- Lifts (directive 2006/42/EC)
- ATEX (directive 2014/34/EU)

- Burner control systems (EN 298)
- Safety systems for unfired pressure vessels (EN 764-7:2002/AC:2006)

5 Spare parts and accessories

5.1 SD card

Type code	Product description	Part number
MICRO SD 1GB	SD card (cannot be ordered anymore)	1070924212
MICRO SD 1GB 01	SD card	R911416004

Tab. 5-1: Ordering data of the SD card

6 Ambient conditions

	In operation	Storage and transport
Ambient temperature of the control	+5 °C – +55 °C	-25 °C – +70 °C
Relative humidity	10% – 95%, condensing not permitted	10% – 95%, condensing not permitted
Contamination level	2 acc. to EN 61131-2	2 acc. to EN 61131-2
Air pressure	86 kPa – 106 kPa (up to 2,000 m above sea level)	70 kPa – 106 kPa (up to 3,000 m above sea level)
Degree of protection	IP 20 acc. to EN 60529	IP 20 acc. to EN 60529
Warning if internal temperature is low	≤ 5 °C	–
Switch-off if internal temperature is low	≤ 1 °C	–
Warning if internal temperature is high	≥ 86 °C	–
Switch-off if internal temperature is high	≥ 89 °C	–

Tab. 6-1: Climatic ambient conditions and characteristics

	In operation	Storage and transport
Mounting position	Horizontal on the mounting rail	–
Sinusoidal vibrations	5 Hz ≤ f ≤ 9 Hz: 1.75 mm amplitude 9 Hz ≤ f ≤ 150 Hz: 1.0 g Acc. to EN 60068-2-6	–

	In operation	Storage and transport
Shock	15 g peak value, period of 11 ms Acc. to EN 60068-2-27	–
Free fall	–	With product packaging: Height of fall of 300 mm With dispatch packaging: Height of fall of 1,000 mm Acc. to EN 60068-2-32, method 1
Noise-induced oscillation	–	10 Hz – 200 Hz with 1 (m/s ²) 2/Hz 200 Hz – 1500 Hz with 0.3 (m/s ²) 2/Hz Crest factor = 3

Tab. 6-2: Mechanic ambient conditions and characteristics

	In operation
Emitted interference of the housing Check acc. to EN 55016	30 MHz – 230 MHz: 40 dB (μV/m) Q 230 MHz – 1000 MHz: 40 dB (μV/m) Q
Emitted interference of the mains connection Check acc. to EN 55016	0.15 MHz – 0.5 MHz: 79 dB (μV) Q, 66 dB (μV) M 0.5 MHz – 30 MHz: 73 dB (μV) Q, 60 dB (μV) M

Tab. 6-3: Electromagnetic operating conditions: Testing noise emission acc. to EN 61000-6-4

	In operation
ESD Check acc. to EN 610000-4-2 Standard	Air discharge up to ±8 kV, criterion A Contact discharge up to ±4 kV, criterion A
ESD Increased noise level	Air discharge up to ±8 kV, criterion FS Contact discharge up to ±6 kV, criterion FS
Electromagnetic HF field Check acc. to EN 61000-4-3 Standard	80 MHz – 1,000 MHz: 10 V/m 1.4 GHz – 2.0 GHz: 3 V/m 2.0 GHz – 2.7 GHz: 1 V/m
Electromagnetic HF field Increased noise level	80 MHz – 1,000 MHz: 20 V/m 1.4 GHz – 2.0 GHz: 10 V/m 2.0 GHz – 6 GHz: 3 V/m

	In operation
Fast transients (burst) Check acc. to EN 61000-4-4 Standard	Affected interfaces 1 kV Supply voltage 2 kV
Fast transients (burst) Increased noise level	Affected interfaces 2 kV Supply voltage 4 kV
Surge Check acc. to EN 61000-4-5 Standard	Asymmetric coupling: 0.5 kV (supply lines) 1 kV (signal/data lines) Symmetric coupling: 0.5 kV (supply lines)
Surge Increased noise level	Asymmetric coupling: 2 kV (supply lines) 2 kV (signal/data lines) Symmetric coupling: 1 kV (supply lines)
HF coupling to lines Check acc. to EN 61000-4-6	0.15 MHz – 80 MHz: 10 V _{eff} , criterion A
HF coupling to lines Increased noise level	0.15 MHz – 80 MHz: 20 V _{eff} , criterion FS
Conducted common mode voltage Check acc. to EN 61000-4-16	Conducted asymmetric disturbances between 0 Hz and 150 kHz
Voltage dips, short interruptions and voltage fluctuations at DC mains inputs Check acc. to EN 61000-4-29	DC 24 V supply voltage: 20 interruptions every 10 s, interruption period of 10 ms
Voltage dips, short interruptions and voltage fluctuations at DC mains inputs Increased requirements	DC 24 V supply voltage: 1. 40% UT (rated voltage) for 10 ms 2. 0% UT (rated voltage) for 20 ms Voltage deviation of -15 % / +20 % 3 attempts, period of 10 s

Tab. 6-4: Electromagnetic operating conditions: Testing electromagnetic compatibility acc. to EN 61000-6-2 as well as increased noise level acc. to EN 61326-3-1

NOTICE

The Safety function module IndraControl CFL01.1-F1 goes into a safe state in case of overheating

Provide sufficient ventilation and cooling to ensure that the ambient temperature does not exceed 55°C.

NOTICE

Defective product due to gases jeopardizing functions

Due to the risk of corrosion, avoid sulphurous gases (e.g. sulphur dioxide (SO₂) and hydrogen sulphide (H₂S)). The product is not resistant against these gases.

NOTICE

Failure of the product due to contaminated air

- The ambient air must not contain acids, alkaline solutions, corrosive agents, salts, metal vapors and other electrically conductive contaminants in high concentrations
- The devices to be installed into the housings and installation compartments must at least comply with the degree of protection IP 54 according to EN 60529.
- The device shall be provided in a suitable fire enclosure in the end-use application.

NOTICE

Risk to damage the device due to external influences

Keep the device away from oils and emulsions.



This is a product that corresponds to the limit values of the emitted interference of class A (industrial environments). This is a product that does *not* correspond to the limit values of the emitted interference of class B (residential area and small enterprises)

When using the product in residential areas or small enterprises, the operator has to take actions to prevent radio interferences (also refer to EN 55022).

7 Technical data

7.1 Voltage supply

The internal voltage of the IndraControl L supplies the Safety function module IndraControl CFL01.1-F1 via the function module plug.

The input voltage of the control is DC 24 V (as per the requirements acc. to EN 61131-2). The voltage is supplied from the PELV power supply units with safe separation acc. to EN 50178 and EN 60950-1.

Voltage	Typical current consumption	Typical power consumption
3.3 V	0.12 A	0.4 W
5 V	0.6 A	3 W

Tab. 7-1: Voltage, current and power consumption of the IndraControl CFL01.1-F1

NOTICE

The Safety function module IndraControl CFL01.1-F1 goes into a safe state in case of overvoltage or undervoltage

Ensure that the voltage remains in the specified range.

7.2 Safety-related characteristic values

Safety integrity level SIL	SIL3 (EN 61508 and EN 61131-6)
Performance level PL	PL e (EN ISO 13849-1)
Hardware error tolerance	HFT = 1
Category	Category 4 (EN ISO 13849-1)
PFH (average frequency of a dangerous failure per hour)	4.5×10^{-10} 1/h
PFD _{avg} (average probability of a dangerous failure in case of request)	3.9×10^{-5}
Service life T _M	20 years (EN ISO 13849); no proof test required
MTTF _d (mean time to failure)	2,500 years
DC _{avg} (average diagnostic coverage)	99 % $\triangleq$ high
Types of failure	If the internal diagnostics of the Safety function module IndraControl CFL01.1-F1 detects an error, the module goes into the safe state, that is, no more safe bus telegrams are sent

7.3 Dimensions and weight

Dimensions (W × H × D)	22 × 122 × 76 mm
Weight (without packaging)	120 g

8 Standards

8.1 Standards used

The Safety function module IndraControl CFL01.1-F1 was developed according to the following standards.

8.1.1 General standards

EN IEC 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Noise immunity for industrial environments
IEC EN 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN 60204-1	Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN 61131-1	Programmable controllers – Part 1: General information
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
EN 61131-3	Programmable controllers – Part 3: Programming languages

Tab. 8-1: General standards

8.1.2 Safety standards

EN 61131-6	Programmable controllers – Part 6: Functional safety
EN 61511-1	Functional safety – Safety-instrumented systems for the process industry sector – Part 1: Framework, definitions, system, hardware and software requirements

EN 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems Part 1-7
EN ISO 13849-1	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
EN ISO 13849-2	Safety of machinery – Safety-related parts of control systems – Part 2: Validation
EN 61326-3-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications

Tab. 8-2: Safety standards

8.2 TÜV certificate

EC Type-Examination Certificate



Product Safety
Functional
Safety
www.tuv.com
ID: 0600000000

Reg.-No.: 01/205/5272.02/21

Product tested	Safety-related programmable electronic system	Certificate holder	Bosch Rexroth AG Bgm.-Dr.-Nebel-Str. 2 97816 Lohr am Main Germany
Type designation	SafeLogic Control, Details see actual "Revision List SafeLogic Control Bosch Rexroth AG"		
Codes and standards	EN ISO 13849-1:2015 EN 62061:2005 + AC:2010 + A1:2013 + A2:2015 IEC 61508 Parts 1-7:2010 EN 61508 Parts 1-7:2010 EN 61131-6:2012 EN 61131-2:2007 IEC 61131-2:2017 EN 61326-3-1:2017		
Intended application	The programmable electronic safety system complies with the requirements of the relevant standards (Cat. 4 / PL e according to EN ISO 13849-1, SIL CL 3 according to EN 62061 / EN 61508 / EN 61131-6) and can be used in applications up to PL e according to EN ISO 13849-1 and SIL 3 according to EN 62061 / EN 61508. The product was also reviewed in reference to the requirements of EN 61511-1:2017 + A1:2017 and EN 60204-1:2018 applicable during a type examination and can be used in application as such.		
Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.		

It is confirmed, that the product tested complies with the requirements for machines defined in Annex I of the EC Directive 2006/42/EC.

Valid until 2026-08-31

The issue of this certificate is based upon an evaluation in accordance with the Certification Program TM 31 V1.0:2017 in its actual version, whose results are documented in Report No. 906/EZ 574.17/21 dated 2021-08-31. This certificate is valid only for products, which are identical with the product tested.

Köln, 2021-08-31



Jelena Stenzel
Dipl.-Ing. Jelena Stenzel

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Fig. 8-1: TÜV certificate for IndraControl SafeLogic

Bosch Rexroth AG R911336576_Edition 07

8.3 CE marking

8.3.1 EU declaration of conformity



The Safety function module IndraControl CFL01.1-F1 as safety component corresponds to the following directives:

- Machinery directive 2006/42/EC
- EMC directive 2014/30/EU



For the declaration of conformity, go to the Bosch Rexroth media directory: <https://www.boschrexroth.com/MediaDirectory>, search term "DCTC-30131-001".

8.4 UL/CSA-certified



The Safety function module IndraControl CFL01.1-F1 is certified according to:

- **UL 61010-2-201** (Industrial Control Equipment) and
- **C22.2 no. 61010-2-201** (CSA)

Approved under UL file no. E210730.



Loss of UL/CSA conformity due to modifications at the device

UL and CSA marking applies only to the device upon delivery. After modifying the device, verify the UL and the CSA conformity.

9 Interfaces

The Safety function module IndraControl CFL01.1-F1 is provided with a function module plug on the right. Via the function module plug, the function module can either be connected directly to the IndraControl L or to a preceding function module. The Safety function module IndraControl CFL01.1-F1 is always located at the outermost position. Thus, it is not provided with an address switch for the slot selection. The internal function module bus is not lead to the outside. Thus, no further function modules can be connected in series to the module. There are no further interfaces on the function module.

For a detailed description of the operating elements and displays, refer to [chapter 12.3 "Operating and error displays" on page 24](#).

9.1 SD card slot

There is an SD card slot with an equipped SD card on the Safety function module IndraControl CFL01.1-F1. This memory card is used to save user-specific data [boot application, logbooks (devices and application) as well as user management data].

The position of the function module plug as well as of the SD card slot can be seen in [fig. 10-1 "Dimension drawing of the Safety function module IndraControl CFL01.1-F1 \(dimensions in mm\)"](#) on page 19.

10 Mounting, dismantling and electric installation

10.1 Housing dimensions

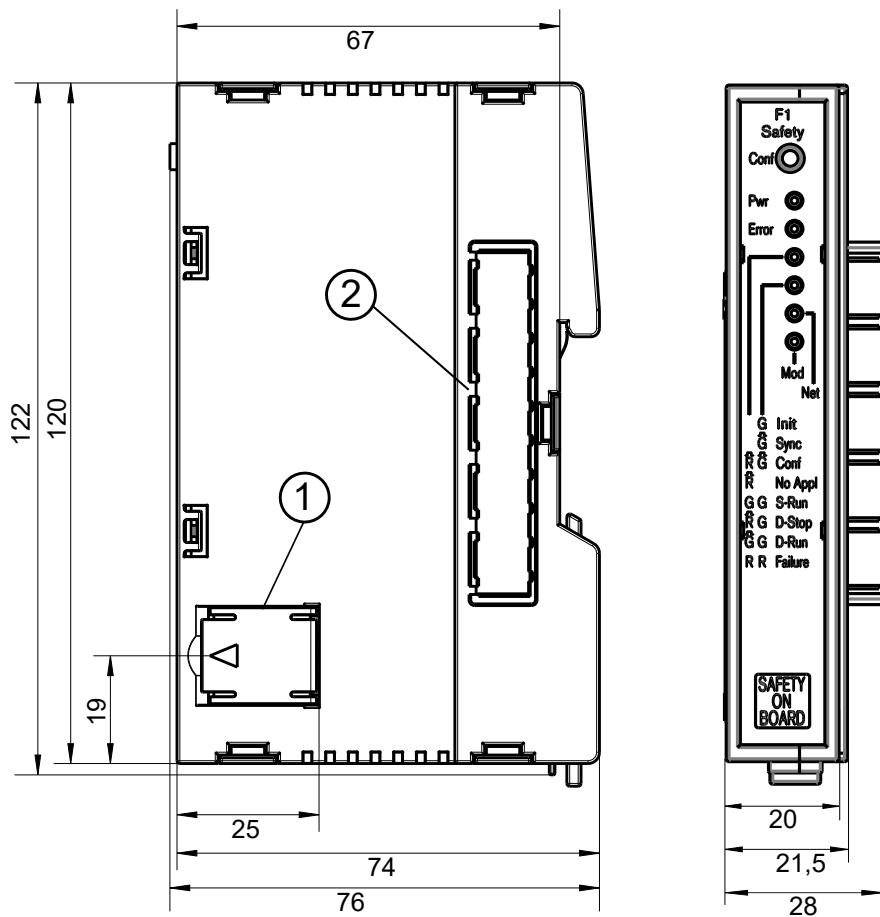


Fig. 10-1: Dimension drawing of the Safety function module IndraControl CFL01.1-F1 (dimensions in mm)

10.2 Mounting

⚠ CAUTION

Interrupted program sequence due to an incorrect protection class and installation position!

Install the Safety function module in a control cabinet with at least the degree of protection IP 54 acc. to EN 60529.

The function module IndraControl CFL01.1-F1 has to be installed on a horizontally mounted mounting rail (refer to [fig. 10-2 "Mounting the Safety function module IndraControl CFL01.1-F1" on page 20](#)).

⚠ WARNING

Do not mount the control, modules or plugs under voltage. The system might start accidentally!

Disconnect the complete station and the components from voltage before mounting the components! Connect the voltage only again after the entire station has been set up.

For the mounting steps of the Safety function module IndraControl CFL01.1-F1, refer to following figure and the mounting steps.

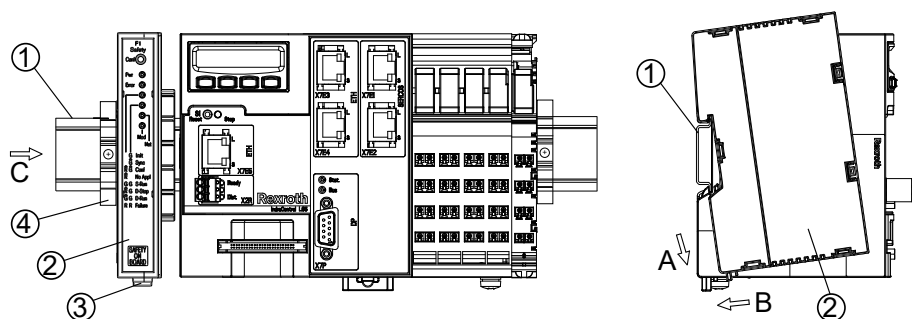


Fig. 10-2: Mounting the Safety function module IndraControl CFL01.1-F1

Mount the Safety function module:

1. Hang the function module ② onto the mounting rail ①, ④.
2. Tilt the function module ③ down against the mounting rail until the locking ③ is engaged.



Ensure that the function module is completely engaged on the top-hat rail before plugging the plug of the function module into the adjacent neighboring socket. Otherwise, the plug connection could be damaged.

3. Insert the function module ②, ② into the left 120-pin socket of the IndraControl L control or the neighboring function module.
4. Fix the function module with the end clamp ④ on the mounting rail ①.



Ensure that are mounted on the left and right of the control components to avoid any disengagement due to vibration.

10.3 Dismounting

⚠ WARNING

Do not dismantle the control, modules or plugs under voltage. The system might start accidentally!

Disconnect the complete station and the components before dismantling the components! Connect the voltage only again after dismantling.

For the dismantling steps of the Safety function module, refer to following figure and the dismantling steps.

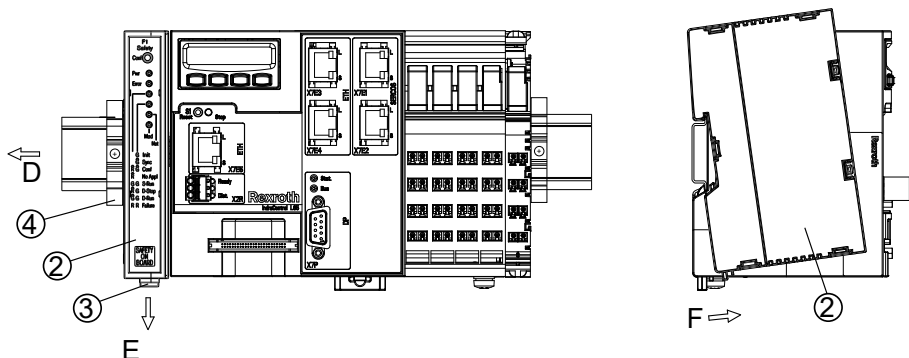


Fig. 10-3: Dismounting the Safety function module IndraControl CFL01.1-F1

Dismount the Safety function module:

1. Remove the end clamp ④.
2. Remove the function module ② by moving it to the left ② away from the control or the neighboring function module.
3. Pull the mounting rail locking ③, ③ downwards using a flat tip screwdriver.
4. Tilt the function module ② to the front ②.



Do not open the housing of the Safety function module IndraControl CFL01.1-F1!

10.4 Electric installation

As the Safety function module is supplied via the IndraControl L, follow the specifications on the electric installation given in the operating instructions "IndraControl L25, L45, L65 and L85 Controls" (refer to [tab. 1-2 "Related documents" on page 3](#)).

WARNING

The electric installation of the control and the function module is not allowed under voltage, since the system could start accidentally!

Disconnect the complete station and the components before mounting or dismounting the components! Connect the voltage only after the entire station has been set up.

All safety-related parts of the installation (cabling, connected sensors and actuators, configuration settings, EDM) have to correspond to the relevant safety standards (e.g. EN 60204 or EN ISO 13 849-1).



The voltage of the IndraControl L is supplied from the PELV power supply units with safe separation acc. to EN 50178 and EN 60950-1.

11 Commissioning

11.1 General information

The product cannot be operated upon delivery. It has to be parameterized or programmed.

The documentations providing information on the commissioning and project configuration are listed in [tab. 1-2 "Related documents" on page 3](#).

WARNING

An incorrect commissioning can cause fatal injury and material damages!

Ensure that a qualified person checks, documents and releases the system in which the Safety extension card IndraControl CFL01.1-F1 is used before its initial commissioning.

Before the commissioning, ensure that there is no person in the danger zone.

Ensure that the danger zone cannot be accessed.

11.2 IT security

The operation of installations, systems and machines requires the implementation of an integral concept for state-of-the-art IT security. Bosch Rexroth products are part of this integral concept. Bosch Rexroth product characteristics

have to be taken into consideration in an integral IT security concept. The relevant characteristics are documented in the IT security guideline ([R911342562](#)).

12 Device description

12.1 General information



The Safety function module IndraControl CFL01.1-F1 is not supported by the IndraControl L25 hardware.

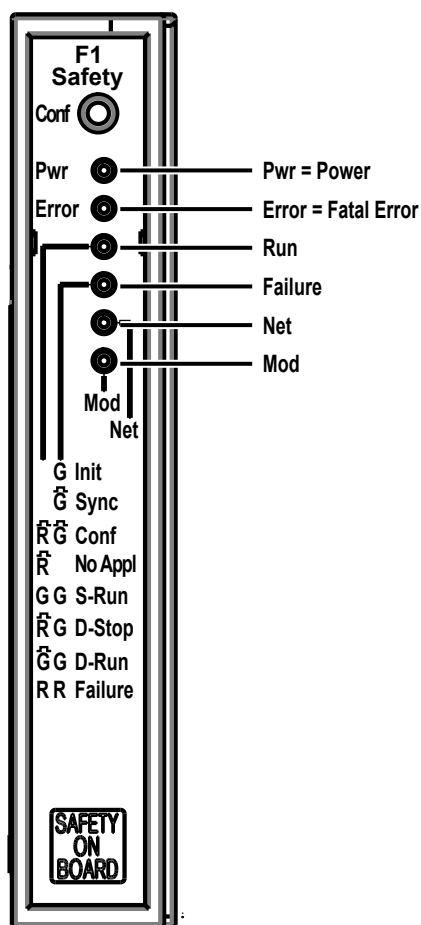


Fig. 12-1: Display and operating elements

12.2 SD card

The application program (boot application), user management data as well as two logbooks (devices and application) are stored on a D-card and also remain if the power supply fails.

12.3 Operating and error displays

12.3.1 "Conf" pushbutton

Press the "Conf" pushbutton once to confirm the established communication between the programming system and the Safety function module upon initial login. This confirmation ensures that you are only connected to your selected Safety function module.

12.3.2 LED display

The display LED indicates the following:

LED	Color and status	Description
Pwr	Off	No power supply from the standard control present
	Red	Error: The voltage monitoring of the Safety function module switched off the safe logic voltage
	Green	All internal voltages of the Safety function module are within the permitted range
Error	Off	The Safety function module is ready
	Red	The Safety function module is not ready. This LED is on during the initialization phase. If the LED is still on after the initialization (approx. 1 min) or if the LED is permanently switched on at runtime, integrated self-tests determined a "fatal error" (e.g. hardware error). The Safety function module is then probably defective and has to be replaced. Contact the Bosch Rexroth Service

Tab. 12-1: LED for operational readiness

LED "Run" (Color and status)	LED "Failure" (Color and status)	Operating state of the Safety function module IndraControl CFL01.1-F1
Off	Off	No power supply provided or hardware reset triggered
Off	Green	Initialization phase; first part (ca. 30 s) is running
Red	Off	Initialization phase; second part (ca. 10 s) is running

LED "Run" (Color and status)	LED "Failure" (Color and status)	Operating state of the Safety function module IndraControl CFL01.1-F1
Red, flashing	Off	Ready for download. There is either no valid application in the Safety function module or a download is not yet completed
Red	Green, flashing	Request to press the "Conf" pushbutton
Red	Green	SAFETY STOP
Green	Green	SAFETY RUN
Red, flashing	Green	DEBUG STOP
Green, flashing	Green	DEBUG RUN or SERVICE RUN
Red	Red	FAILURE STOP
Red	Red, flashing	Exceptional state of the Safety function module due to an internal error. The different displays are used to pinpoint errors
Red, flashing	Red, flashing	
Red, flashing	Green, flashing	Firmware update is running
Green, flashing	Red, flashing	Special operating mode for the Bosch Rexroth service employees

Tab. 12-2: Display of the operating state of the Safety function module IndraControl CFL01.1-F1

LED	Color and status	Description
Mod	Off	No power supply present or no CSos configuration loaded
	Green, flashing	Standby state
	Green	Normal mode
	Red, flashing	Error that can be eliminated
	Red	Error that cannot be eliminated
	Red/green, flashing	Self-test or configuration
Net	Off	No power supply present or no CSos configuration loaded
	Green, flashing	No valid bus connection
	Green	Bus connection OK
	Red, flashing	Timeout
	Red	Critical connection error
	Red/green, flashing	Communication error

Tab. 12-3: Special displays for CIP Safety on Sercos

13 Troubleshooting and debugging

For information on the display LED and the pushbutton, refer to [chapter 12.3 "Operating and error displays"](#) on page 24.



Repairs at the device by the customer are not permitted. Exceptions are maintenance works listed in the chapter "Maintenance".

For further information in the event of repair, please contact the Bosch Rexroth Service.

14 Maintenance



Only the maintenance works at the device listed in this chapter are permitted.

For further information in the event of repair, please contact the Bosch Rexroth Service.

14.1 Cleaning notes

NOTICE

The foil surface is dissolved by solvents!

- Do not use any solvents (e. g. diluents)!

14.2 Maintenance notes

The Safety function module runs without maintenance. Check the Safety function module IndraControl CFL01.1-F1 at least annually. The check includes:

- Correct position
- Damage or rupture
- Tight screw connection of the end brackets on the left and right of the control

Replace the function module IndraControl CFL01.1-F1 immediately if it is damaged. In case of damages, please contact the Bosch Rexroth Service.

14.3 Replacing SD card

NOTICE

Unintended exchange of the SD card can damage the Safety function module IndraControl CFL01.1-F1

Only qualified service personnel is allowed to exchange the SD card.



- Approved SD cards may be used, see [tab. 5-1 "Ordering data of the SD card" on page 9!](#)
- Formatting: 1 GB, FAT (standard), size of the allocation units: 16 kilobytes
- For the position of the SD card, refer to [fig. 10-1 "Dimension drawing of the Safety function module IndraControl CFL01.1-F1 \(dimensions in mm\)" on page 19.](#)

To replace the SD card, proceed as follows:

1. Disconnect the complete system from voltage. This includes the IndraControl L control. The Safety function module IndraControl CFL01.1-F1 is connected to this control.
2. Secure the system against restart.
3. Remove the Safety function module IndraControl CFL01.1-F1 from the top-hat rail as described in [chapter 10.3 "Dismounting" on page 21.](#)
4. Carefully open the housing of the SD card slot.
5. Move the SD card lock forward towards the protective cap until stop.
6. Flap the SD card lock up.
7. Remove the SD card from the slot.
8. Insert the new SD card into the slot with the labeling up.
9. Move the SD card lock backward until stop.
10. Close the cover until it engages audibly.
11. Connect the Safety function module IndraControl CFL01.1-F1 again to the IndraControl L control as described in [fig. 10-2 "Mounting the Safety function module IndraControl CFL01.1-F1" on page 20.](#)
12. Commission the system again.

15 Ordering information

15.1 Accessories and spare parts

For ordering information on accessories and spare parts, refer to [chapter 5 "Spare parts and accessories" on page 9.](#)

15.2 Hardware prerequisites

For IndraControl L controls supporting the Safety function module IndraControl CFL01.1-F1, refer to the documentation "IndraControl L25, L45, L65, L75 and L85 Controls" in [tab. 1-2 "Related documents" on page 3.](#)

15.3 Ordering data

Type code	Product description	Part number
CFL01.1-F1	Safety Function Module	R911170129

16 Disposal

16.1 Return

For disposal, our products can be returned free of charge. However, the products must be free of remains like oil and grease or other impurities.

Furthermore, the products returned for disposal must not contain any undue foreign substances or components.

Send the products free of charge to the following address:

Bosch Rexroth AG
Electric Drives and Controls
Bürgermeister-Dr.-Nebel-Straße 2
97816 Lohr, Germany

16.2 Packaging

The packaging material consists of cardboard, plastics, wood or styrofoam. Packaging material can be recycled anywhere.

For ecological reasons, please do not return empty packages.

17 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts offer you advice and assistance should you have any queries. You can contact us **24/7**.

Service Germany

Our technology-oriented Competence Center in Lohr, Germany, is responsible for all your service-related queries for electric drive and controls.

Contact the **Service Hotline** and **Service Helpdesk** under:

Phone:	+49 9352 40 5060
Fax:	+49 9352 18 4941
E-mail:	service.svc@boschrexroth.de
Internet:	http://www.boschrexroth.com

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

Service worldwide

Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

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Notes

Bosch Rexroth AG

P.O. Box 13 57

97803 Lohr a.Main, Germany

Bgm.-Dr.-Nebel-Str. 2

97816 Lohr a.Main, Germany

Phone +49 9352 18 0

Fax +49 9352 18 8400

www.boschrexroth.com/electrics



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