OPERATING INSTRUCTIONS

ReLy EMSS1

Safety relay

SICK
Sensor Intelligence.

Described product

ReLy EMSS1

Manufacturer

SICK AG
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Germany

Legal information

Original document

This document is an original document of SICK AG.

Contents

1 About this document

1.1 Purpose of this document

These operating instructions contain the information required during the life cycle of the safety relay.

These operating instructions must be made available to everyone who works with the safety relay.

1.2 Scope

This document only applies to a ReLy safety relay with the following type label entries in the Operating Instructions field:

- 8020866

1.3 Target groups and structure of these operating instructions

These operating instructions are intended for the following target groups: project developers (planners, developers, designers), installers, electricians, safety experts (such as CE authorized representatives, compliance officers, people who test and approve the application), operators, and maintenance personnel.

These operating instructions are organized by the life phases of the device: project planning, mounting, electrical installation, commissioning, operation and maintenance.

The table below shows the target groups and how – for many applications – these are typically divided up between the manufacturer and the entity operating the machine in which the device is to be integrated:

Area of responsibility	Target group	Specific chapters of these operating instructions [1]
Manufacturer	Project developers (planners, developers, designers)	"Project planning", page 12 "Technical data", page 26
	Installers	"Mounting", page 17
	Electricians	"Electrical installation", page 20
	Safety experts	"Project planning", page 12 "Commissioning", page 23 "Technical data", page 26
Operating entity	Operators	"Troubleshooting", page 24
	Maintenance personnel	"Troubleshooting", page 24 "Ordering information", page 32

1) Chapters not listed here are intended for all target groups. All target groups must follow all of the safety and warning instructions in all chapters of the operating instructions!

In other applications, the operating organization is also the manufacturer of the equipment with the corresponding allocation of the target groups.

1.4 Additional information

www.sick.com

The following information is available on the Internet:

- This document in other languages
- Data sheets and application examples
- CAD data and dimensional drawings

- Certificates (e.g. EU declaration of conformity)
- Guide for Safe Machinery Six steps to a safe machine

1.5 Symbols and document conventions

The following symbols and conventions are used in this document:

Safety notes and other notes

DANGER
Indicates a situation presenting imminent danger, which will lead to death or serious injuries if not prevented.

WARNING
Indicates a situation presenting possible danger, which may lead to death or serious injuries if not prevented.

CAUTION
Indicates a situation presenting possible danger, which may lead to moderate or minor injuries if not prevented.

NOTICE
Indicates a situation presenting possible danger, which may lead to property damage if not prevented.

NOTE
Indicates useful tips and recommendations.

Instructions to action

▶ The arrow denotes instructions to action.

1. The sequence of instructions for action is numbered.
2. Follow the order in which the numbered instructions are given.

✓ The check mark denotes the result of an instruction.

LED symbols

These symbols indicate the status of an LED:

○ The LED is off.
☼ The LED is flashing.
● The LED is illuminated continuously.

2 Safety information

2.1 General safety notes

DANGER
If the safety component is integrated incorrectly, the dangerous state may be ended to late.

- Plan the integration of the safety component in accordance with the machine requirements, see "Project planning", page 12.

DANGER
Hazard due to lack of effectiveness of the protective device

In the case of non-compliance, it is possible that the dangerous state of the machine may not be stopped or not stopped in a timely manner.

- Please read this document carefully and make sure that you understand the content fully before working with the device.
- Follow all safety notes in this document.

Improper installation or manipulation can lead to serious injuries.

2.2 Intended use

The safety relay is an evaluation unit for emergency stop pushbuttons and safety switches for switching safety-related circuits on and off.

The safety relay complies with class A, group 1 as per 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 itself occurs.

The safety relay must only be used within the limits of the prescribed and specified technical data and operating conditions at all times.

Incorrect use, improper modification or manipulation of the safety relay will invalidate any warranty from SICK; in addition, any responsibility and liability of SICK for damage and secondary damage caused by this is excluded.

UL/CSA applications

If the product is being used in accordance with UL 508 or CSA C22.2 No. 14, the following conditions must also be met:

- To protect the device's 24-volt voltage supply, use a fuse with a maximum voltage of 4 A and a minimum of 30 V DC in accordance with UL 248.

NOTE
The safety functions have not be evaluated by UL. Authorization is in accordance with UL 508, general applications.

2.3 Improper use

The safety relay is **not** suitable for the following applications (this list is not exhaustive):

- At altitudes of over 4,000 m above sea level
- In explosion-hazardous areas

2.4 Requirements for the qualification of personnel

The protective device must be configured, installed, connected, commissioned, and serviced by qualified safety personnel only.

Project planning

For project planning, a person is considered competent when he/she has expertise and experience in the selection and use of protective devices on machines and is familiar with the relevant technical rules and national work safety regulations.

Mechanical mounting, electrical installation, and commissioning

For the task, a person is considered qualified when he/she has the expertise and experience in the relevant field and is sufficiently familiar with the application of the protective device on the machine to be able to assess whether it is in an operationally safe state.

Operation and maintenance

For operation and maintenance, a person is considered competent when he/she has the expertise and experience in the relevant field and is sufficiently familiar with the application of the protective device on the machine and has been instructed by the machine operator in its operation.

3 Product description

3.1 Construction and function

The safety relay ReLy EMSS1 is an electrical switching device with inputs and outputs.

The safety capable inputs of the safety relay are connected to safety sensors or safety switches.

2 safety capable inputs control the internal relays, which are used to reliably switch the enabling current paths.

The enabling current paths close only when the two safety capable inputs close within 3 s of one another.

Actuators with positively guided contacts are connected to the enabling current paths.

3.2 Product characteristics

3.2.1 Device overview

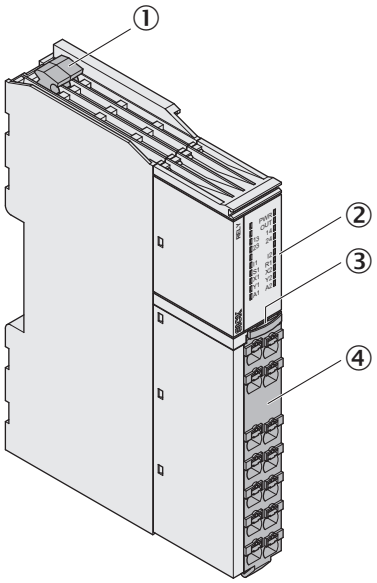

Figure 1: Device overview

① Device unlocking
② LEDs
③ Front connector unlocking
④ Front connector

3.2.2 Interfaces

Inputs

- 2 safety capable inputs
- Input for reset pushbutton or external device monitoring

Outputs

- 2 enabling current paths (safe)
- 2 application diagnostic outputs (not safe)
- 3 test outputs (not safe)

3.2.3 Compatible sensor types

The safety relay is suitable for safety sensors and safety switches with volt-free output contacts, e.g.:

- Dual-channel safety command devices (emergency stop pushbutton, rope pull switch, etc.)
- Dual-channel, contact-based interlocking devices (safety locking devices and safety switches)
- Dual-channel, magnetic safety switches with reed contacts

3.2.4 Restart interlock

A restart interlock can be implemented with a reset pushbutton.

3.2.5 External device monitoring

Permanent external device monitoring can be implemented using external wiring.

3.2.6 Cross-circuit detection

A cross-circuit is detected on the safety capable inputs.

3.2.7 Status indicators

LEDs

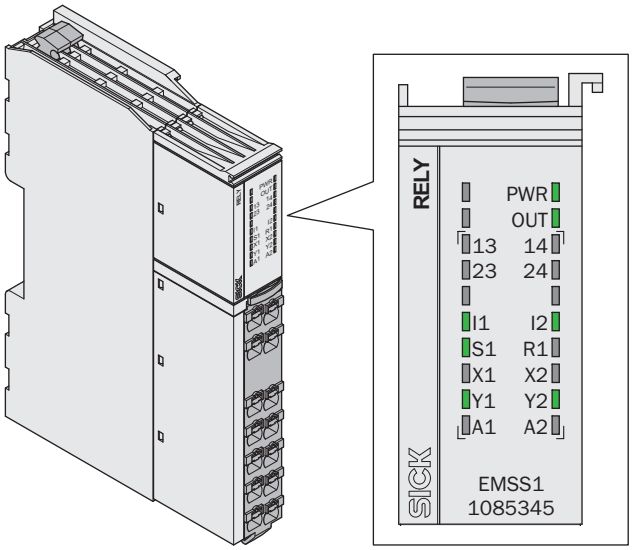

Figure 2: LEDs

The labeled positions are only partially assigned LEDs. The positions and their labeling (except for the upper 2 lines) also show the pin assignment of the terminals on the front connector.

Table 1: Safety relay indicators

Labeling	Color	Function
PWR	Green/Red	Voltage supply
OUT	Green	Enabling current paths
I1	Green	Safety capable input
I2	Green	Safety capable input
S1	Green	Reset pushbutton input, external device monitoring (EDM)

Labeling	Color	Function
Y1	Green	Application diagnostic output
Y2	Green	Application diagnostic output (reset required)

Further topics

- "Status indicator (LED)", page 24

4 Project planning

4.1 Manufacturer of the machine

DANGER
Failure to comply with manufacturer's obligations
Hazard due to lack of effectiveness of the protective device

- Carry out a risk assessment before using the safety relay.
- Do not manipulate, open or modify the components of the safety relay.
- Make sure the safety relay is only repaired by the manufacturer or by someone authorized by the manufacturer. Improper repair can lead to a loss of the protective function.

4.2 Operating entity of the machine

DANGER
Failure to observe operator obligations
Hazard due to lack of effectiveness of the protective device

- Changes to the machine and changes to the mechanical mounting of the safety relay necessitate a new risk assessment. The results of this risk assessment may require the entity operating the machine to meet the obligations of a manufacturer.
- Apart from the procedures described in this document, the components of the safety relay must not be opened or modified.
- Do not carry out any repair work on components. Improper repair of the safety relay can lead to a loss of the protective function.

4.3 Design

The safety relay must be installed in a control cabinet with an enclosure rating of IP54 or higher.

The safety relay must be installed on a mounting rail (35 mm) in accordance with IEC 60715.

Space requirements in the control cabinet

To ensure sufficient air circulation and cooling, sufficient distance must be kept in the control cabinet above and below the safety relay.

Sufficient distance must be kept for the connected cables before the safety relay (front side).

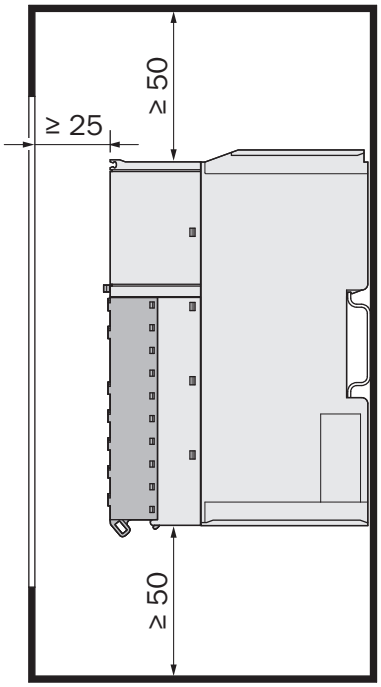

Figure 3: Distances in control cabinet

Required distance:

- Above and below the safety relay: ≥ 50 mm
- In front of the safety relay: ≥ 25 mm

4.4 Electrical integration

Important information

DANGER
Hazard due to lack of effectiveness of the protective device
In the case of non-compliance, it is possible that the dangerous state of the machine may not be stopped or not stopped in a timely manner.

- ▶ Ensure the safety relay is supplied with supply voltage in all operating statuses.
- ▶ Ensure that the supply voltage of the safety relay is not connected via safety sensors or safety switches in order to switch the enabling current paths.

4.4.1 Enabling current paths

DANGER
Hazard due to lack of effectiveness of the protective device

- ▶ Ensure the enabling current paths are supplied by the same voltage supply.

4.4.2 Application diagnostic output

Application diagnostic output Y1

The signal of the Y1 application diagnostic output changes as soon as the enabling current paths switch. The application diagnostic output is not safe.

Table 2: Switching behavior of application diagnostic output Y1

State of enabling current paths	State of application diagnostic output Y1
Closed	0 V
Open	24 V

Application diagnostic output Y2

Application diagnostic output Y2 outputs the “Reset required” signal with a frequency of 1 Hz, e.g. for the connection of a signal lamp.

4.4.3 Restart interlock

Important information

DANGER
Hazard due to unexpected starting of the machine

Death or severe injury

If you connect the safety relay to an emergency stop pushbutton, you must use the restart interlock.

Restart interlock

A reset pushbutton must be connected to allow the restart interlock to be used. The reset pushbutton must be attached outside of the hazardous area. It must not be possible to access the reset pushbutton from inside the hazardous area. The entire hazardous area must be highly visible for all operators from the reset pushbutton.

Further topics

- "Device connection", page 20

4.4.4 External device monitoring (EDM)

External device monitoring (EDM)

With static external device monitoring, the safety relay tests whether the controlled actuators (contactors) have dropped out when the device is switched on.

Further topics

- "Device connection", page 20

4.4.5 Connection diagrams

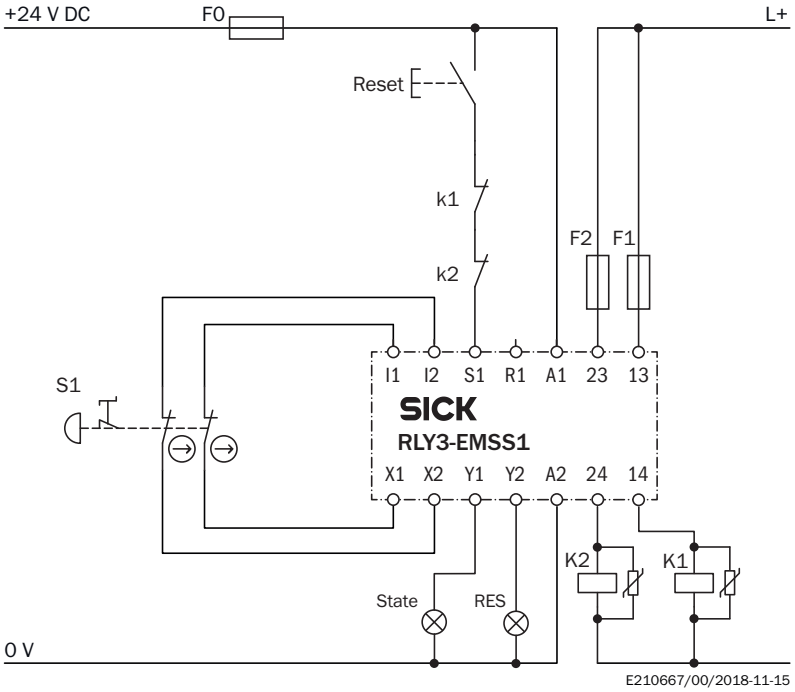

Figure 4: ReLy EMSS1 connection diagram, with restart interlock and external device monitoring (EDM)

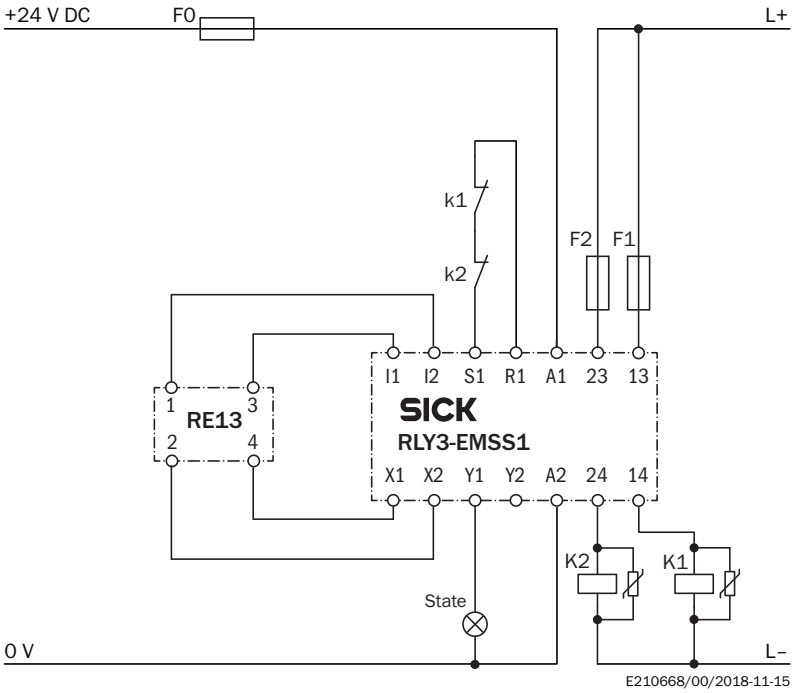

Figure 5: ReLy EMSS1 connection diagram, without restart interlock, with external device monitoring (EDM)

4.5 Testing plan

The safety relay must be thoroughly checked by appropriately qualified safety personnel during commissioning, after modifications, and at regular intervals, see "Thorough check", page 23.

The regular thorough checks serve to assess the effectiveness of the safety relay and to identify defects as a result of modifications or other influences (e.g., damage or manipulation).

The manufacturer and user must define the type and frequency of the thorough checks on the machine on the basis of the application conditions and the risk assessment. Determination of the thorough checks must be documented in a traceable manner.

4.5.1 Minimum requirements for the regular thorough check

The following thorough checks must be carried out at regular intervals:

- Thorough check of the housing for damage
- Thorough check of the cables for damage
- Thorough check of the safety relay for signs of misuse or manipulation
- Thorough check of the safety function

The minimum test interval depends on the applicable safety capability of the overall application, see table 5, page 26.

5 Mounting

5.1 Safety

DANGER
Hazard due to unexpected starting of the machine
Hazard due to electrical voltage

- ▶ Make sure that the outputs of the safety relay have no effect on the machine during mounting and electrical installation.
- ▶ Make sure that the safety relay and the connected components are isolated from all voltage sources during mounting and electrical installation of the device and during mounting/dismantling of the front connector.

NOTICE
Enclosure rating IP20 only applies if the front connector is mounted.

5.2 Mounting procedure

Prerequisites

- Mounting is done in accordance with EN 50274 and electrical installation in accordance with IEC 60204-1 in the control cabinet with enclosure rating IP54.
- Mounting is done on a 35 mm mounting rail (IEC 60715).
- The mounting rail is connected to the functional earth.
- The safety relay is installed in a vertical orientation (on a horizontal mounting rail).
- There is at least 50 mm of space for air circulation above and below the safety relay.
- There is at least 25 mm of space in front of the safety relay (front side). More space may be needed depending on the connections.

Approach

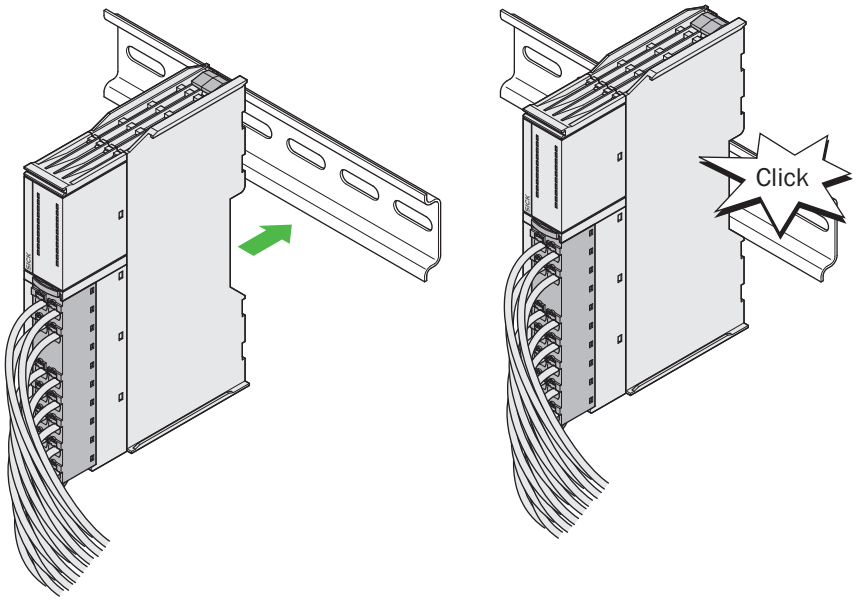

Figure 6: Mounting

- ▶ Attach safety relay to mounting rail.

5.3 Disassembly

Approach

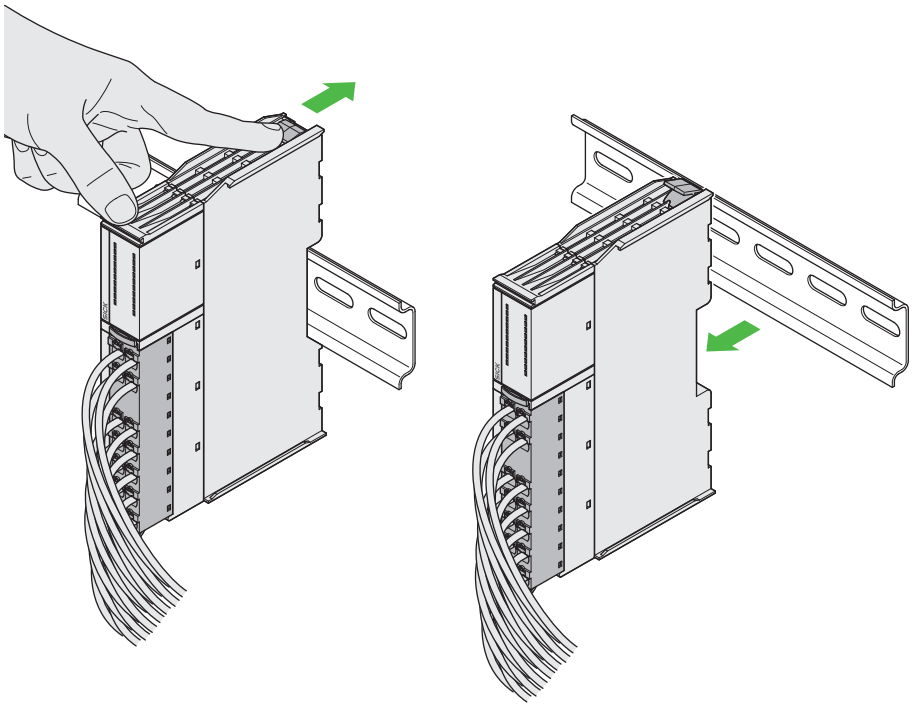

Figure 7: Disassembly

1. Press the unlocking mechanism on the upper side of the safety relay towards the back.
2. Loosen safety relay from the mounting rail.

5.4 Device replacement

Overview

In event of a defect, exchange the device and reuse the front connector with the connected cables.

Approach

1. Disconnect device and the connected components from all voltage sources.
2. Take front connector with connected cables off the defective device: Press the unlocking mechanism of the front connector downwards and pull out the front connector.

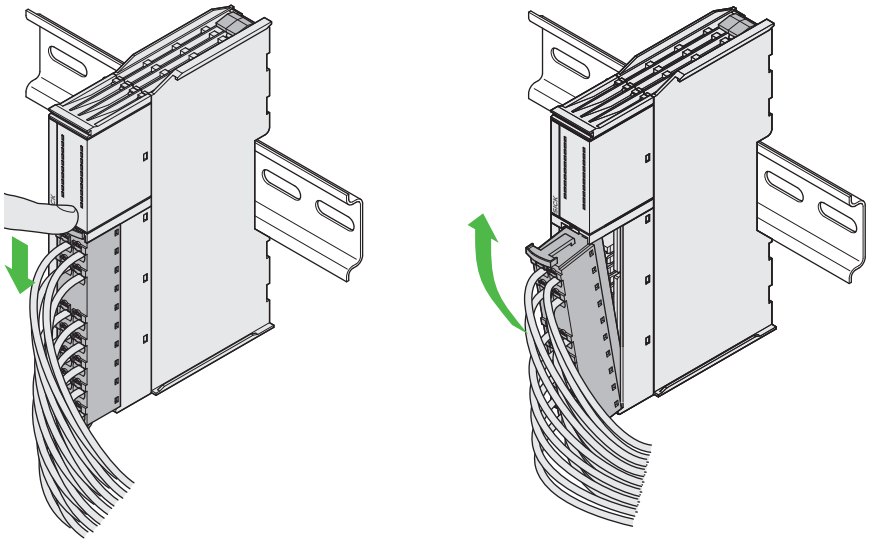

Figure 8: Dismantling front connector

3. Remove the defective device.
4. Mount new device.
5. Mount front connector with connected cables to the new device: First mount in the device with bent hook and then engage in the housing.

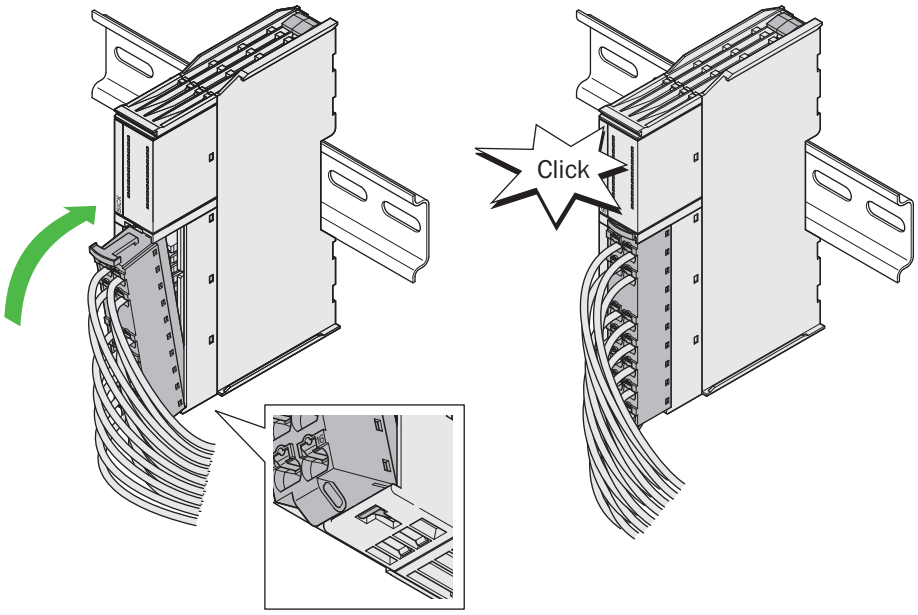

Figure 9: Mounting the front connector

✓ The front connector engages with an audible click.

6 Electrical installation

6.1 Device connection

Important information

DANGER
Hazard due to lack of effectiveness of the protective device
In the case of non-compliance, it is possible that the dangerous state of the machine may not be stopped or not stopped in a timely manner.

- ▶ Ensure the safety relay is supplied with supply voltage in all operating statuses.
- ▶ Ensure that the supply voltage of the safety relay is not connected via safety sensors or safety switches in order to switch the enabling current paths.

DANGER
Hazard due to unexpected starting of the machine
Hazard due to electrical voltage

- ▶ Make sure that the outputs of the safety relay have no effect on the machine during mounting and electrical installation.
- ▶ Make sure that the safety relay and the connected components are isolated from all voltage sources during mounting and electrical installation of the device and during mounting/dismantling of the front connector.

NOTICE
Enclosure rating IP20 only applies if the front connector is mounted.

Prerequisites

- Electrical installation is done in conformity with IEC 60204-1.
- The mounting rail is connected to the functional earth.
- The voltage supply and connected signals meet the requirements for safety extra-low voltage (EN 61140) or NEC Class 2 (UL 1310).
- The external voltage supply must be capable of bridging a brief power failure of 20 ms as specified in IEC 60204-1. Suitable power supply units are available as accessories from SICK.
- The safety outputs and external device monitoring (EDM) must be wired within the control cabinet.
- When using the safety relay with voltages larger than the safety extra-low voltage: The N/C contacts of the controlled contactors must be safely isolated from the other contactor contacts.
- Contact fuse with safety fuse gG or circuit breaker C: 6 A, maximum short-circuit protection I ≤ 400 A.
- The ground connection of all connected devices must have the same potential as A2.
- All connected devices and the reset pushbutton comply with the required category in accordance with ISO 13849-1 and SILCL in accordance with IEC 62061 (e.g. shielded single sheathed cables, separate installation).

Pin assignment

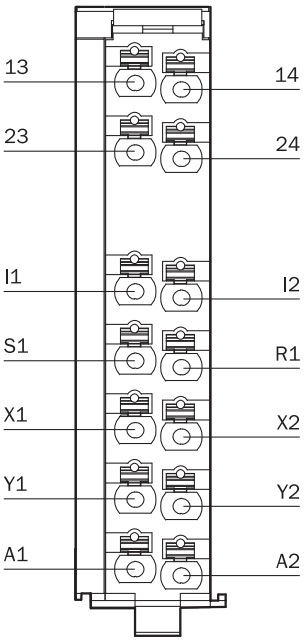

Figure 10: Terminals on front connector

Table 3: Pin assignment of the terminals

Terminal	Description
13, 14 [1) 2)]	Enabling current path
23, 24 [1) 2)]	Enabling current path
I1 [3)]	Safety capable input
I2 [3)]	Safety capable input
S1 [2) 4)]	Reset pushbutton input, external device monitoring (EDM)
R1	Test pulse output
X1 [3)]	Test pulse output
X2 [3)]	Test pulse output
Y1	Application diagnostic output (NC)
Y2	Application diagnostic output (reset required)
A1	Voltage supply 24 V DC
A2	Voltage supply 0 V DC

1) The enabling current paths must be supplied by the same voltage supply.
2) The enabling current path and external device monitoring (EDM) must be wired within the control cabinet.
3) Connect dual-channel switching elements of the safety sensors between X1 and I1 or X2 and I2.
4)
- Use with restart interlock, with external device monitoring (EDM): Connect the N/C contacts of the actuators between voltage supply U_V, the N/O contact of the reset pushbutton and S1.
- Use with restart interlock, without external device monitoring (EDM): Connect the N/O contact of the reset pushbutton between S1 and voltage supply U_V.
- Use without restart interlock, with external device monitoring (EDM): Connect the N/C contacts of the actuators between R1 and S1.
- Use without restart interlock, without external device monitoring (EDM): Connect R1 and S1 with a wire jumper.

Complementary information

To protect and increase the service life of contact outputs, equip all connected loads with varistors or RC elements. The response times will increase depending on the suppressor used.

Further topics

- "Connection diagrams", page 15

7 Commissioning

7.1 Safety

DANGER
Dangerous state of the machine

During commissioning, the machine or the protective device may not yet behave as you have planned.

▶ Make sure that there is no-one in the hazardous area during commissioning.

7.2 Thorough check

Requirements for the thorough check during commissioning and in certain situations

The device and its application must be thoroughly checked in the following situations:

- Before commissioning
- After changes to the configuration or the safety function
- After changes to the mounting or the electrical installation
- After exceptional events, such as after manipulation has been detected, after modification of the machine, or after replacing components

The thorough check ensures the following:

- All relevant regulations are complied with and the device is effective in all of the machine's operating modes.
- The documentation accurately reflects the state/condition of the machine, including the protective device.

The thorough checks must be carried out by qualified safety personnel or specially qualified and authorized personnel, and must be documented in a traceable manner.

8 Troubleshooting

8.1 Safety

DANGER
Hazard due to lack of effectiveness of the protective device

In the case of non-compliance, it is possible that the dangerous state of the machine may not be stopped or not stopped in a timely manner.

- Immediately shut the machine down if the behavior of the machine cannot be clearly identified.
- If a machine fault cannot be definitively determined or safely rectified, immediately shut the machine down.
- Secure the machine so that it cannot switch on unintentionally.

NOTE
Additional information on troubleshooting can be found at the responsible SICK subsidiary.

8.2 Status indicator (LED)

Table 4: Fault indicators and operational statuses

LED	Status	Possible cause
PWR	○	No supply voltage
All LEDs	☼ All colors	Initialization with LED test
PWR	● Green	No fault
PWR	☼ Red	• Supply voltage too low temporarily or permanently • Internal error
PWR	☼ Red/green	Error Additional LEDs flash for accurate diagnosis.
OUT	○	Enabling current paths open
OUT	● Green	Enabling current paths closed
OUT	☼ Green	Error in enabling current path
S1	☼ Green	When using without restart interlock: Input error (e.g. stuck at HIGH)
S1	● Green	Reset pushbutton actuated, N/C contact of the actuator closed
I1 and I2	☼ Green, alternate	Input error: discrepancy time expired
I1 and I2	☼ Green, simultaneous	Input error: cross-circuit, process error
Y1	○	Enabling current paths closed
Y1	● Green	Enabling current paths open
Y2	○	Output with LOW status
Y2	☼ Green	Reset required
Y2	● Green	Reset pushbutton actuated

9 Decommissioning

9.1 Protecting the environment

The device has been designed to minimize its impact on the environment. It consumes only a minimum of energy and natural resources.

- Always act in an environmentally responsible manner at work. For this reason, please note the following information regarding disposal.

Always dispose of serviceableness devices in compliance with local/national rules and regulations with respect to waste disposal.

NOTE
We will be glad to help you dispose of these devices on request.

10 Technical data

10.1 Data sheet

Table 5: Safety-related parameters

	Desired safety integrity level (IEC 61508) [1]		
	SIL3	**SIL2**	**SIL1**
SIL claim limit (IEC 62061)	SILCL3	SILCL2	SILCL1
Category (ISO 13849-1)	4	3	3
Performance level (ISO 13849-1)	PL e	PL d	PL c
Hardware error tolerance	1		
Maximum test interval of the safety function	1 month	1 year	–
$MTTF_D$ (single channel) (ISO 13849-1)	300 years	100 years	100 years
PFH_D (mean probability of a dangerous failure per hour) [2]			
For operating heights ≤ 2,000 m above sea level	1×10^{-9}	1×10^{-8}	1×10^{-7}
For operating heights 2,000… 4,000 m above sea level	5×10^{-9}	5×10^{-8}	1×10^{-7}
PFD_{avg} (mean probability of a dangerous failure on demand) [2]			
For operating heights ≤ 2,000 m above sea level	5×10^{-5}	5×10^{-4}	5×10^{-3}
For operating heights 2,000… 4,000 m above sea level	2.5×10^{-4}	2.5×10^{-3}	5×10^{-3}
T_M (mission time)	20 years (ISO 13849-1)		
Safe status when a fault occurs	The normally open is open; in other words, the safety-related enabling current paths are interrupted.		
Stop category	0 (IEC 60204-1)		

1) The required safety integration level depends on your application.
2) If service life curve is adhered to, see figure 12, page 30.

Table 6: Mechanical data

Weight	130 g
Mounting	Mounting rail (IEC 60715)
Connection type	Spring terminals
Stripping length	8 mm
Wire cross-section	
Single wire (1×)	0.2 mm² … 1.5 mm²
Fine wire (1×)	0.2 mm² … 1.5 mm²

Fine wire with ferrule with plastic collar (2×, same cross-section)	≤ 0.5 mm²
Fine wire with ferrules with or without collar (1×)	0.25 mm² ... 1.0 mm²
For UL and CSA applications	26 AWG ... 14 AWG (use only copper wire (60/75 °C))

Table 7: Electrical data - operating data

Supply voltage U_V	24 V DC (16,8 V DC ... 30 V DC) (safety extra-low voltage) [1) 2)]
Rated voltage	24 V DC
Residual ripple U_{ss}	2.4 V
Power consumption	≤ 1.3 W
Power-up delay after supply voltage applied	≤ 5 s

1) The external voltage supply must be capable of bridging a brief power failure of 20 ms as specified in IEC 60204-1. Suitable power supply units are available as accessories from SICK.
Protect supply voltage against short-circuit.
2) For use according to the requirements of ANSI/UL 508, ANSI/UL 60947-5-1 and ANSI/UL 60947-1, voltage supply U_V must be protected with 4 A.

Table 8: Electrical data - inputs (I1, I2, S1)

Input voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Input voltage LOW	0 V DC (–3 V DC ... 5 V DC)
Input capacity	≤ 15 nF
Input current	4 mA ... 6 mA
Reset time	
Manual	≤ 250 ms
Automatic	≤ 250 ms
Actuation time of reset button	140 ms ... 30 s
Minimum power-up delay [1)]	80 ms
Minimum switch-off time [2)]	5 ms
Concurrence monitoring	≤ 3,000 ms
Length of cable (single)	≤ 100 m

1) Time in which an input signal must have the HIGH status before the outputs switch.
2) Time in which an input signal must have the LOW status before the outputs switch.

Table 9: Electrical data - test pulse outputs (X1, X2, R1)

Type of output	PNP semiconductor output, short-circuit protected
Output voltage	(U_V – 3 V) ... U_V
Test pulse interval	40 ms
Test pulse width	2 ms
Length of cable (single)	≤ 100 m
Cable resistance	≤ 10 Ω

Table 10: Electrical data - application diagnostic output (Y1, Y2)

Type of output	PNP semiconductor output, short-circuit protected

Output voltage	(U_V – 3 V) ... U_V
Output current	≤ 120 mA

Table 11: Electrical data - enabling current paths (13, 14, 23, 24)

Response time	
Dual-channel switch-off with positive opening normally closed contacts	10 ms
Dual-channel switch off (without positive opening, e.g. reed switch)	14 ms [1]
Minimum switch-off time [2]	100 ms
Number of enabling current paths (normally open, safe)	2
Contact type	Positively guided
Contact material	Silver alloy, gold flash plated
Switching voltage	
At altitudes up to 2,000 m above sea level	10 V DC ... 250 V DC 10 V AC ... 250 V AC
At altitudes 2,000 m above sea level ... 4,000 m above sea level	10 V DC ... 150 V DC 10 V AC ... 150 V AC
Switching current	10 mA ... 6 A, see figure 11, page 29, see figure 12, page 30
Sum current:	≤ 12 A
Utilization category	AC-15: 230 V, 5 A (IEC 60947-5-1) DC-13 (0.1 Hz): 24 V, 4 A (IEC 60947-5-1)
DC switching capacity	0.1 W ... 200 W, see figure 11, page 29
AC switching capacity	0.1 VA ... 1,500 VA
Switching frequency	≤ 1 Hz
Mechanical service life	10 × 10^6 Switching operations
Contact fuse with safety fuse gG or circuit breaker C	6 A
Max. short-circuit protection	≤ 400 A
Rated insulation voltage	
At altitudes up to 2,000 m above sea level	250 V AC
At altitudes up to 2,000 m above sea level ... 4,000 m above sea level	150 V AC
Overvoltage category	III
Contamination degree	2
Rated impulse withstand voltage U_{imp}	6 kV

1) Applies to devices with version ≥ V1.10.0 in the “HW” type label entry.
With devices with smaller version numbers or without the “HW” type label entry: Response time ≤ 12 ms; response time with simultaneous dual-channel switch-off = 10 ms.

2) Time the enabling current paths of the safety relay remain open before closing again.

Table 12: Ambient data

Enclosure rating	IP20 (IEC 60529)
Ambient operating temperature	
At altitudes up to 2,000 m above sea level (UL/CSA: surrounding air temperature)	–25 °C ... +55 °C

At altitudes 2,000 m above sea level ... 3,000 m above sea level	–25 °C to 50 °C
At altitudes 3,000 m above sea level ... 4,000 m above sea level	–25 °C ... +45 °C
Storage temperature	–25 °C ... +70 °C
Permissible operating height	≤ 4,000 m
Air humidity	10% ... 95%, non-condensing for climatic conditions according to IEC 61131-2
Emitted interference	In accordance with IEC 61000-6-4
Immunity to interference	In accordance with IEC 61326-3-1 In accordance with IEC 61000-6-2 In accordance with IEC 60947-5-1

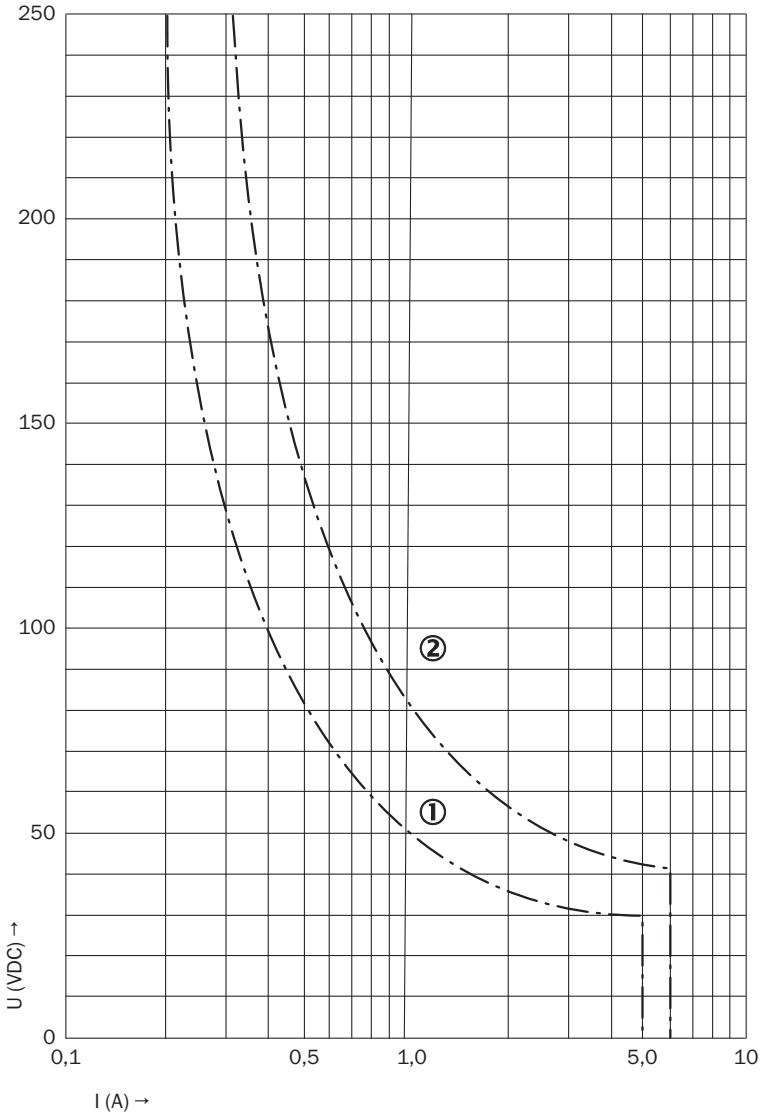

Figure 11: Switch-off delay without continuous arcing

① Inductive load L/R 40 ms

② Resistive load

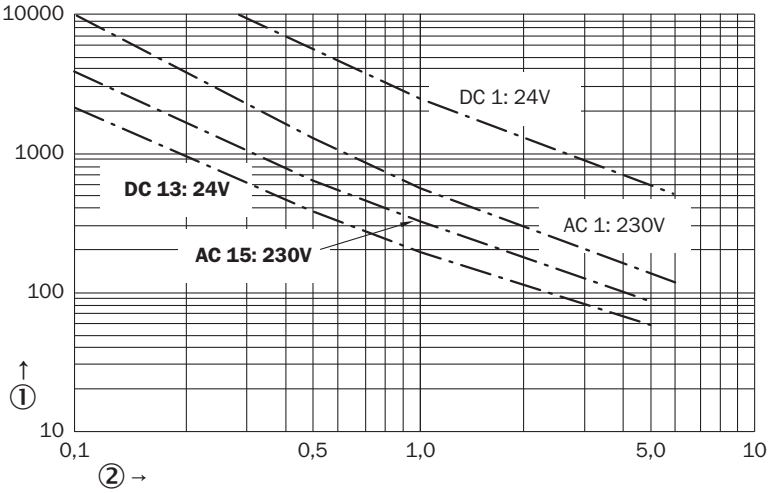

Figure 12: Electrical service life

① Switching operations × 1,000

② Switching current (A)

10.2 Dimensional drawings

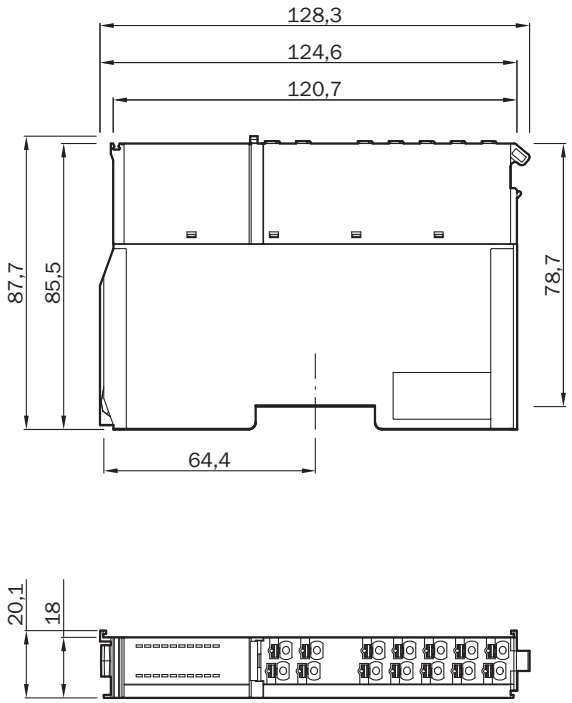

Figure 13: Dimensional drawing

10.3 Internal circuitry

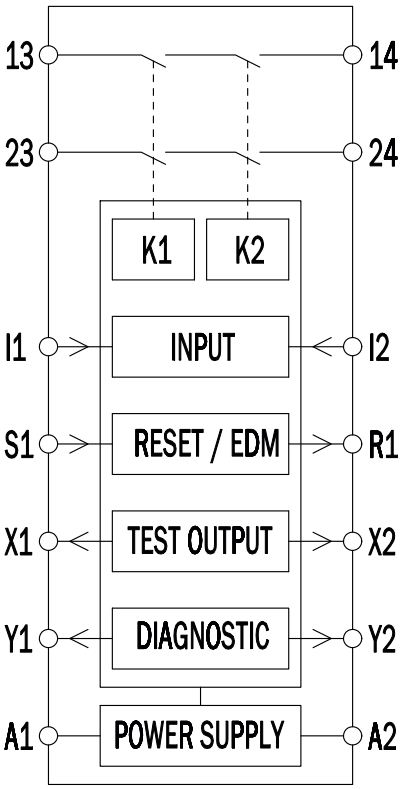

Figure 14: Internal circuitry

11 Ordering information

11.1 Ordering information for ReLy

Table 13: Ordering information

Part	Usage	Type code	Part number
ReLy EMSS1	Interlock safety switch	RLY3-EMSS1	1085345

12 Annex

12.1 Compliance with EU directives

EU declaration of conformity (extract)

The undersigned, representing the manufacturer, herewith declares that the product is in conformity with the provisions of the following EU directive(s) (including all applicable amendments), and that the standards and/or technical specifications stated in the EU declaration of conformity have been used as a basis for this.

Complete EU declaration of conformity for download

You can call up the EU declaration of conformity and the current operating instructions for the protective device by entering the part number in the search field at www.sick.com (part number: see the type label entry in the “Ident. no.” field).

13 List of figures

14 List of tables

8020868/ZX84/2018-11-15/en

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