SCHMERSAL

EN Operating instructions. . . . . .pages 1 to 10
Original

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## 1. About this document

### 1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety-monitoring module. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

### 1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

### 1.3 Explanation of the symbols used

**Information, hint, note:**
This symbol is used for identifying useful additional information.

**Caution:** Failure to comply with this warning notice could lead to failures or malfunctions.
**Warning:** Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

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### 1.4 Appropriate use

The Schmersal range of products is not intended for private consumers.

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machine or plant.

The safety-monitoring module must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

### 1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country specific installation standards as well as all prevailing safety regulations and accident prevention rules.

Further technical information can be found in the Schmersal catalogues or in the online catalogue on the Internet: products.schmersal.com.

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.

The entire concept of the control system, in which the safety component is integrated, must be validated to ISO 13849-2.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

### 1.6 Warning about misuse

In case of inadequate or improper use or manipulations of the safety-monitoring module, personal hazards or damage to machinery or plant components cannot be excluded.

**ISO 13856-1:**
1. Range of application (compendium)
This part of ISO 13856-1 is applicable to pressure-sensitive mats and pressure-sensitive floors, regardless of the type of energy used (e.g. electrical, hydraulic, pneumatic or mechanical), designed to detect
• persons weighing more than 35 kg, and
• persons (e.g. children) weighing more than 20 kg.
It is not applicable to detect persons weighing less than 20 kg.

### 1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden, the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

The safety relay module is to be operated in an area in which access by personnel is restricted.

## 2. Product description

### 2.1 Ordering code

This operating instructions manual applies to the following types:

**SRB-E-201ST-①**
**SRB-E-201LC-①**
**SRB-E-301ST-①**

| No. | Option | Description |
|---|---|---|
| ① | | Plug-in screw clamps: single wire (rigid) or fine wire (flexible): 0.2 … 2.5 mm²; fine wire with ferrule: 0.25 … 2.5 mm² |
| | CC | Plug-in cage clamps: single wire (rigid) or fine wire (flexible): 0.2 … 1.5 mm²; fine wire with ferrule: 0.25 … 1.5 mm² |

Only if the action described in these operating instructions is carried out correctly will the safety function be safeguarded, including compliance with the Machinery Directive.

### 2.2 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

### 2.3 Purpose

The safety-monitoring modules for integration in safety circuits are designed for fitting in control cabinets. They are used for the safe evaluation of the signals of positive break position switches for safety functions or safety sensors for safety functions on sliding, hinged and removable safety guards as well as emergency stop control devices, safety mats, magnetic safety switches and AOPDs.

The safety function is defined as the switch-off of outputs Q1, Q2 and 13/14, 23/24, 33/34 with the opening of inputs S12 and/or S22 or with safety mats through a short-circuit between inputs S12 and S22. Taking account of a PFH value assessment, the safety-relevant current paths meet the following requirements (see also chapter 2.6 “Safety classification”):
• Control category 4 - PL e to ISO 13849-1
• SIL 3 to IEC 61508
• SIL CL 3 to IEC 62061

To determine the Performance Level (PL) to ISO 13849-1 of the entire safety function (e.g. sensor, logic, actuator), an assessment of all relevant components is required.

### 2.4 Technical data

**General data**

| | |
|---|---|
| Standards: | EN 60204-1, EN 60947-5-1, ISO 13849-1, IEC 62061, IEC 61508 |
| EMC rating: | to EMC Directive |
| Air clearances and creepage distances: | to EN 60664-1 |
| Mounting: | standard rail to EN 60715 |
| Terminal designations: | EN 60947-1 |
| **Electrical characteristics:** | |
| Rated operating voltage $U_e$: | |
| - SRB-E-201ST/LC: | 24 VDC –20%/+20%, residual ripple max. 10% |
| - SRB-E-301ST: | 24 VDC / 24 VAC –20%/+20% |
| Frequency range SRB-E-301ST: | 50 Hz/60 Hz |
| Mains unit/mains power supply: | An ES1 or PELV/SELV mains adapter must be used as a voltage source or be ensured by means of additional measures so that the output voltage of the power adapter in the event of an error does not exceed 60 V. Mains power supply must harmonise with device safety (characteristic/melting property) so that triggering is ensured. |
| Power consumption: | |
| - SRB-E-201ST/LC: | 2.4 W (+ load of the safety outputs) |
| - SRB-E-301ST: | 3 W, 4 VA |

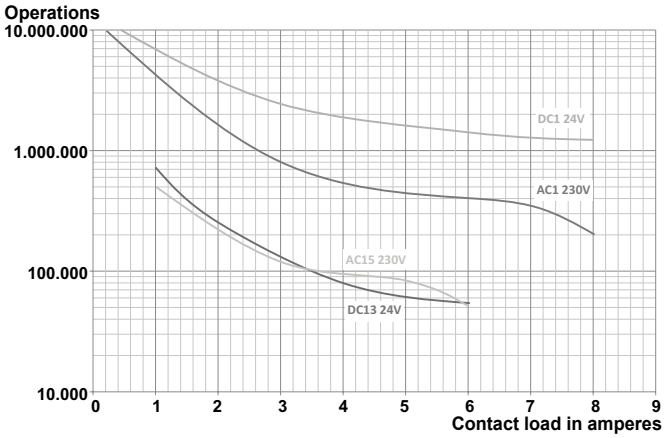
| | |
|---|---|
| Fuse rating for the operating voltage: | we recommend a circuit breaker type Z (max. 16 A) or a fine fuse (max. 15 A, delayed action) |
| UL Rating of external fuse: | max. 16 A, only use fuses in accordance with UL 248 series |
| Insulation values to IEC 60664-1: | |
| Rated insulation voltage $U_i$: | |
| - safety contacts: | 250 V |
| - safety outputs: | 50V |
| Rated impulse withstand voltage $U_{imp}$: | |
| - safety contacts13-14, 23-24: | 6 kV |
| - safety contact 33-34: | 4 kV |
| - safety outputs: | 0.8 kV |
| Overvoltage category: | III |
| Degree of pollution: | 2 |
| Pull-in delay: | < 150 ms |
| Drop-out delay in case of "emergency stop": | < 10 ms |
| Drop-out delay on "supply failure": | < 10 ms |
| Drop-out delay in case of safety mats SMS: | < 100 ms |
| Bridging in case of voltage drops: | typ. 5 ms |
| Readiness after switching on voltage: | < 1.5 s |
| **Control current circuits/inputs:** | |
| Inputs S12, S22: | 24 VDC/8 mA |
| Inputs X2, X3, X7: | 24 VDC/8 mA |
| Clock outputs S11, S21: | > 20 VDC, 10 mA per output |
| Cable length: | 1500 m with 1.5 mm², 2500 m with 2.5 mm² |
| Conduction resistance: | max. 40 Ω |
| **Relay outputs:** | |
| Switching capacity of the safety contacts: | |
| - SRB-E-301ST: | contacts 13-14, 23-24, 33-34: max. 250 V, 6 A ohms, min. 10 VDC / 10 mA (Derating see 2.5) |
| Fuse rating of the safety contacts: | external ($I_k$ = 1000 A) to EN 60947-5-1 Safety fuse 10 A quick blow, 6 A slow blow |
| Utilisation category to EN 60947-5-1: | AC-15: 230 V / 4 A DC-13: 24 V / 4 A |
| Switching capacity of the auxiliary contacts: | 41-42: 24 VDC / 1 A |
| Fuse rating for the auxiliary contact: | safety fuse 2.5 A quick blow, 2 A slow blow |
| Electrical life: | refer to 2.5 |
| Mechanical life: | 10 million operations |
| Safety contact values: | resistance max. 100 mΩ, AgNi, self-cleaning, positive action |
| **Semi-conductor outputs:** | |
| Switching capacity of the safety outputs Q: | |
| - SRB-E-201ST: | max. 5.5 A |
| - SRB-E-201LC: | max. 2 A |
| Voltage drop: | < 0.5 V |
| Leakage current: | < 1 mA |
| Max. fuse rating of the safety outputs: | refer to "Operating voltage" |
| Test impulse to Q1, Q2: | < 1 ms (negative) < 100 µs (positive) |
| Utilisation category as per EN 60947-5-1: | |
| - SRB-E-201ST: | DC-13: 24 V / 3.5 A |
| - SRB-E-201LC: | DC-13: 24 V / 2 A |
| Switching capacity of signaling outputs: | semi-conductor output Y1: 24 VDC/100 mA |
| Fuse rating of the signalling outputs: | internal electronic trip, tripping current > 100 mA |
| Max. switching cycles / minute: | |
| - SRB-E-201ST/LC: | 60 |
| - SRB-E-301ST: | 20 |
| Inductive consumers: | provision is to be made for suitable protective wiring for suppression |
| **Mechanical data:** | |
| Connection type: | refer to 2.1 |
| Cable section: | refer to 2.1 |
| Connecting cable: | rigid or flexible |
| Tightening torque for the terminals: | 0.5 Nm |
| Material of enclosure: | glass-fibre reinforced thermoplastic, ventilated |
| Weight: | |
| - SRB-E-201ST/LC: | 130 g |
| - SRB-E-301ST: | 175 g |
| **Ambient conditions:** | |
| Ambient temperature: | –25°C … +60°C (non condensing) |
| Storage and transport temperature: | –40°C … +85°C (non condensing) |
| Degree of protection: | Enclosure: IP40 Terminals: IP20 Clearance: IP54 |
| Resistance to shock: | 30 g / 11 ms |
| Resistance to vibrations to EN 60068-2-6: | 10 … 55 Hz, amplitude 0.35 mm |
| Altitude: | max. 2,000 m |

### 2.5 Derating / electrical lifespan of safety contacts

No derating with individual installation of modules.

Derating on request if several modules are installed one after the other without spacing and with maximum output load and ambient temperatures.

**Electrical life of the safety contacts**




### 2.6 Safety classification

#### 2.6.1 Safety classification of semi-conductor output

| | |
|---|---|
| Standards: | ISO 13849-1, IEC 61508, IEC 62061 |
| PL: | up to e |
| Control category: | up to 4 |
| $PFH_D$: | ≤ 2.66 x $10^{-9}$ / h |
| $PFD_{avg}$: | ≤ 2.42 x $10^{-5}$ |
| SIL: | suitable for SIL 3 applications |
| Mission time: | 20 years |

#### 2.6.2 Classification of relay output

| | |
|---|---|
| Standards: | ISO 13849-1, IEC 61508, IEC 62061 |
| PL: | up to e |
| Control category: | up to 4 |
| DC: | high |
| CCF: | > 65 points |
| $PFH_D$: | ≤ 1.25 x $10^{-8}$ / h |
| $PFD_{avg}$: | ≤ 5.3 x $10^{-5}$ |
| SIL: | suitable for SIL 3 applications |
| Mission time: | 20 years |

The PFH value of 1.25 × $10^{-8}$/h applies to the combinations of contact load (current through enabling contacts) and number of switching cycles ($n_{op/y}$) mentioned in the table below. At 365 operating days per year and a 24-hours operation, this results in the below-mentioned switching cycle times ($t_{cycle}$) for the relay contacts.
Diverging applications upon request.

| Contact load | $n_{op/y}$ | $t_{cycle}$ |
|---|---|---|
| 20 % | 880,000 | 0.6 min |
| 40 % | 330,000 | 1.6 min |
| 60 % | 110,000 | 5.0 min |
| 80 % | 44,000 | 12.0 min |
| 100 % | 17,600 | 30.0 min |

## 3. Mounting

### 3.1 General mounting instructions

Mounting: snaps onto standard rails to EN 60715.

Hook bottom of enclosure in standard rail and push down until it engages in position.

### 3.2 Dimensions

Device dimensions (H/W/D): 98 x 22.5 x 115 mm

## 4. Electrical connection

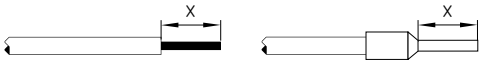
### 4.1 General information for electrical connection

The electrical connection may only be carried out by authorized personnel in a de-energized condition.

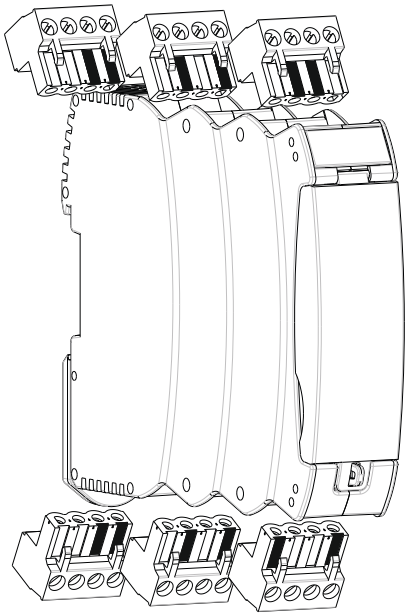
If mains unit is a new installation or a replacement, the connector of the output level must be removed and correct connection of the power supply (A1) must be checked.

To avoid EMC disturbances, the physical ambient and operational conditions at the place where the product is installed, must meet the provisions laid down in the paragraph "Electromagnetic Compatibility (EMC)" of EN 60204-1.

**Settle length x of the conductor:**
- on screw terminals: 7 mm
- on cage clamps of type s or f: 10 mm



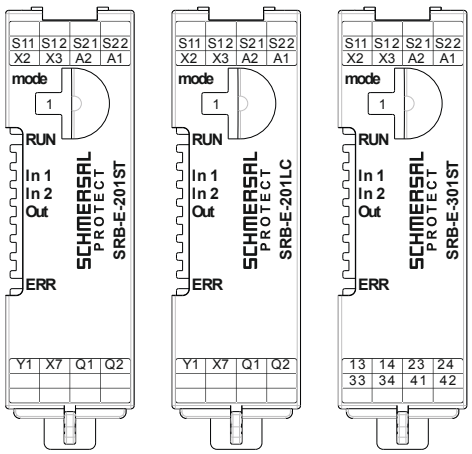

### 4.2 Coding of connecting terminals

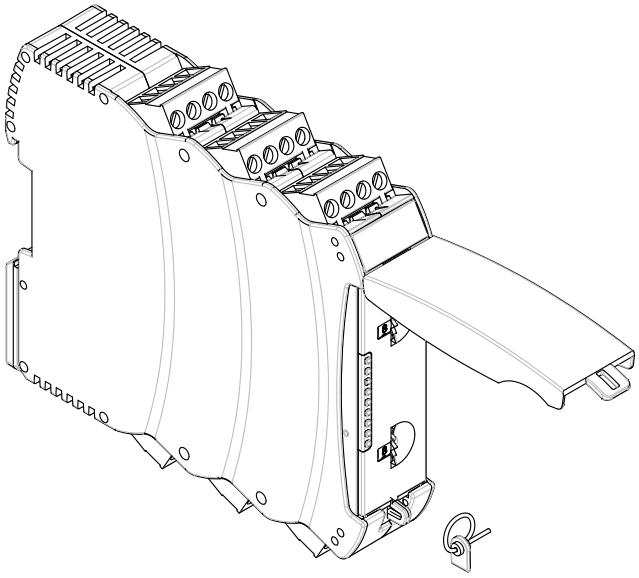


## 5. Operating principle and settings

### 5.1 Description of the terminals and LED indications

| Clip | Function | LED | Function |
|---|---|---|---|
| **A1** | Operating voltage<br>+ 24 VDC<br>24 VAC (SRB-E-301ST) | **RUN** | Operating voltage OK<br>RUN mode<br>For flash code,<br>see section 6.1 |
| **A2** | Operating voltage<br>0 V<br>24 VAC (SRB-E-301ST) | | |
| | | **ERR** | Error code<br>refer to part 6.2 |
| **X2** | Input of start circuit | | |
| **X3** | Input<br>feedback circuit | | |
| **X7** | Input<br>release signal | | |
| **S11/S21** | Test pulse outputs | | |
| **S12** | Input channel 1 | **In 1** | High level at S12<br>For flash code,<br>see section 6.1 |
| **S22** | Input channel 2 | **In 2** | High level at S22<br>For flash code,<br>see section 6.1 |
| **Y1** | Signalling output (NC) | | |
| **41/42** | Signalling contact<br>(NC) | | |
| **Q1/Q2<br>13/14,<br>23/24,<br>33/34** | Safety outputs | **Out** | Outputs activated<br>For flash code,<br>see section 6.1 |





**Adjustment of application using rotary “mode” switch**

- Open front transparent cover (see fig.).
- Opening is carried out by lifting side with lock.
- Select desired application using rotary mode switch (1 … 10) by turning up or down (see 5.3).
- After performing setting, close front cover again.
- Front cover can be secured with a lead seal to protect it from being opened unintentionally

⚠ Only touch the components after electrical discharge!

### 5.2 Adjustable applications

| Rotary knob position | Reset button (detection of the trailing edge) | Cross-wire monitoring active | Input / Sensor configuration | Monitoring of sensor channels for synchronisation (< 5 s) |
|---|---|---|---|---|
| 1 | Yes | Yes | NC / NC | Yes |
| 2 | Yes | Yes | NC / NC | No |
| 3 | Yes | No | NC / NC | Yes |
| 4 | Yes | No | NC / NC | No |
| 5 | Yes | Yes | NC / NO | Yes |
| 6 | Autostart | Yes | NC / NO | No |
| 7 | Autostart | Yes | NC / NC | Yes |
| 8 | Autostart | Yes | NC / NC | No |
| 9 | Autostart | No | NC / NC | Yes |
| 10 | Autostart | No | NC / NC | No |
| 11 | Function two-hand control type IIIC (SRB-E-201ST) | | NC, NO / NC, NO | < 0.5 s (upon actuation of setting elements) |
| **SRB-E-301ST: Evaluation of safety mats SMS** | | | | |
| 12 | Autostart | No | NC / NC | No |
| 13 | Yes | No | NC / NC | No |
| C | **Configuration mode** | | | |

### 5.3 Changing setting or application

| Description / procedure | Rotary (mode) switch | System response | LED indications | | | |
|---|---|---|---|---|---|---|
| | | | RUN | In 1 | In 2 | Out |
| Factory setting | Position 1 | Ready for application 1 | - | - | - | - |
| Switch operating voltage on | Position 1 | Without connected sensors! | Lights up | - | - | - |
| | Turn to position C | Application 1 is deleted | Lights up | Flashes | Flashes | Flashes |
| Setting cycle active | | Application 1 is deleted | - | - | - | - |
| | | No valid application stored | Flashes | - | - | - |
| **SRB-E ready for new applications** | | | | | | |
| Select new application | Select desired application (1-11) | New application will be loaded | Lights up | - | - | - |
| Setting cycle active | | | Lights up | Lights up | - | - |
| | | | Lights up | Lights up | Lights up | - |
| | | | Lights up | Lights up | Lights up | Lights up |
| Ready for operation | The desired application is configured | Adopt new application | Lights up | - | - | - |
| **Switch off operating voltage and connect wires according to selected application -> SRB-E... ready for operation** | | | | | | |

## 6. Diagnostic

### 6.1 LED indications

| LED | Function | Display type |
|---|---|---|
| RUN | Ready for operation | Continuously lit |
| | Not a valid application | Flashes |
| In 1 | Input S12 closed | Continuously lit |
| | Time window for synchronicity exceeded | Flashes quickly |
| | Second channel, input S22 has not opened | Flashes slowly |
| In 2 | Input S22 closed | Continuously lit |
| | Time window for synchronicity exceeded | Flashes quickly |
| | Second channel, input S12 has not opened | Flashes slowly |
| Out | Safety outputs ON | Continuously lit |
| | No release signal on input X7 | Flashes quickly |
| | Safety outputs waiting for start (input X2) | Flashes slowly |
| | Feedback circuit not closed (input X3) | Flashes slowly |

Single flashing of all LEDs with mains on

### 6.2 Malfunctions

Malfunctions and fault causes are displayed with the ERR-LEDs via short and long flashing signals

| LED | Error cause | Long flash | Short flash |
|---|---|---|---|
| ERR | Operating voltage too low | 1 | 1 |
| | Operating voltage too high | 1 | 2 |
| | Invalid rotary switch setting | 1 | 3 |
| | External voltage on output Q1 | 1 | 5, 7, 9 |
| | External voltage on output Q2 | 1<br>2 | 6, 8<br>1 |
| | Termination to GND on output Q1 | 2 | 2 |
| | Termination to GND on output Q2 | 2 | 3 |
| | Cross-wire between inputs S12 and S22 | 2 | 4 |
| | **Undefined level on outputs:** | | |
| | X2 | 3 | 4 |
| | X3 | 3 | 5 |
| | X7 | 3 | 9 |
| | S12 | 2 | 9 |
| | S22 | 3 | 1 |
| | Rotary switch > 30 sec. to position C | 6 | 8 |
| | Application changed and activation of operating voltage | LEDs flash quickly: RUN, In 1, In 2, Out | |
| | Application was changed during active operation | LEDs flash quickly: ERR, In 1, In 2, Out | |
| | Other fault codes: Consult technical sales dept. at Schmersal | | |

## 7. Wiring examples

### 7.1 Possible applications

**All applications for 1 or 2-channel safe evaluation for protective equipment as follows:**

- Safety door monitoring to EN ISO 14119
- Position switches with positive break to EN 60947-5-1
- Safety sensors to EN 60947-5-3
- Emergency stop command devices to EN ISO 13850 and EN 60947-5-5
- Magnetic safety sensors to EN 60947-5-3
- Safety light curtain and photoelectric barriers according to EN 61496
- Two-hand control panels to ISO 13851 type IIIC
- Safety mats SMS to ISO 13856-1

Only the operator is protected by the two-hand switching circuit.

### 7.2 Application example

**Dual-channel control, shown for a guard door monitor with two position switches where one has a positive break contact; with external reset button** Ⓡ

- Relay outputs: Suitable for 2-channel control, for increase in capacity or number of contacts by means of contactors or relays with positive-guided contacts
- Ⓗ = Feedback circuit

The connection of magnetic safety switches to the SRB-E-... safety-monitoring module is only admitted when the requirements of the standard EN 60947-5-3 are observed.

As the technical data are regarded, the following minimum requirements must be met:
- Switching capacity: min. 240 mW
- Switching voltage: min. 24 VDC
- switching current: min. 10 mA

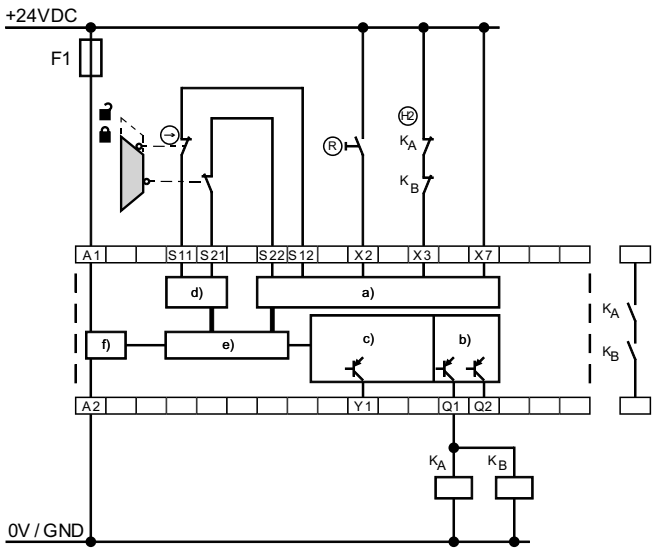
For example, the following safety sensors meet the requirements:
- BNS 36-02Z(G), BNS 36-02/01Z(G)
- BNS 260-02Z(G), BNS 260-02/01Z(G)

When sensors with LED are wired in the control circuit (protective circuit), the following rated operating voltage must be observed and respected:
- 24 VDC with a max. tolerance of –5%/+20%

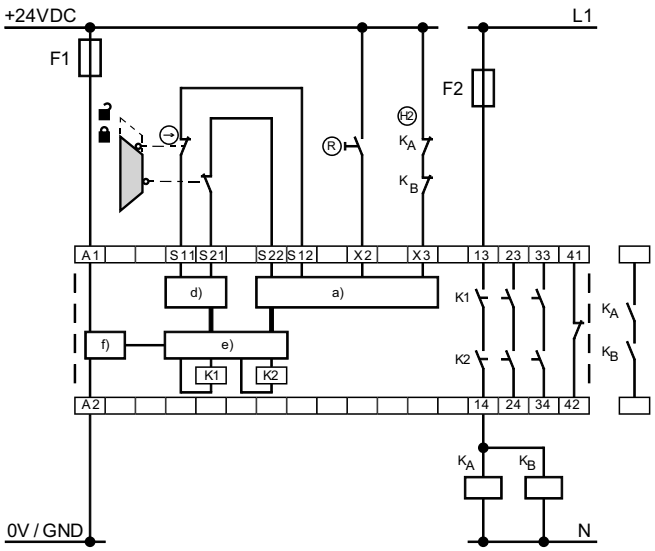
There may be availability problems, particularly in the case of series connection of sensors with a voltage drop in the activation circuit, e.g. one caused by LEDs.

Signalling outputs must not be used in safety circuits.

**Wiring examples SRB-E-201ST and SRB-E-201LC**




**Wiring example SRB-E-301ST**




**Key**
a) Safety inputs
b) Safety outputs
c) Signalling outputs
d) Clock outputs
e) Processing
f) Power

### 7.3 Start configuration

#### 7.3.1 Monitored start

- Manual start or activation of the module occurs when the button is released.

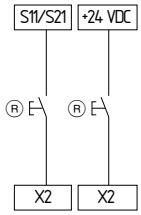
Monitoring of max. actuation time 0.03 s … 3 s.
If the time is exceeded, the module cannot be started!

#### 7.3.2 Reset without monitoring / autostart

- The manual start or the activation of the module occurs when the button is pressed (not when it is released!).
- With autostart, X2 must be bridged to S11, S21 or +24 VDC

Not admitted without additional measure due to the risk of gaining access by stepping behind!

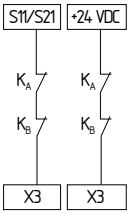
Within the meaning of EN 60204-1 paragraph 9.2.3.4.2, the operating mode "automatic start" is only restrictedly admissible. In particular, any inadvertent restart of the machine must be prevented by other suitable measures.




| Reset button (detection of the trailing edge) | Reset without monitoring / autostart |
|---|---|
| Rotary knob position 1 | Rotary knob position 6 |
| Rotary knob position 2 | Rotary knob position 7 |
| Rotary knob position 3 | Rotary knob position 8 |
| Rotary knob position 4 | Rotary knob position 9 |
| Rotary knob position 5 | Rotary knob position 10 |

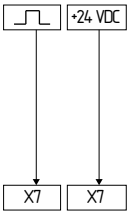
### 7.4 Feedback circuit

- Suitable for increase in capacity or number of contacts by means of contactors or relays with positive-guided contacts. If the feedback circuit is not required, establish a bridge.




### 7.5 Release signal SRB-E-201..

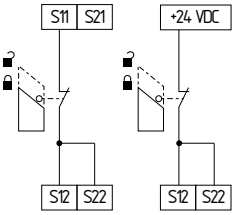
- The safety outputs Q1 and Q2 can be switched during operation via the safety input X7 with the guard system closed.
- For safety-orientated use, a fault in the wiring (short circuit to 24 V potential) must be able to be excluded!
- If no deactivation during operation is required, this input must be switched to + 24 VDC.




= control signal

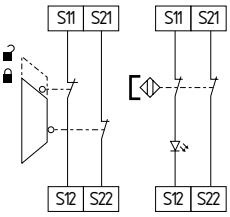
### 7.6 Sensor configuration

**Single channel signal processing**



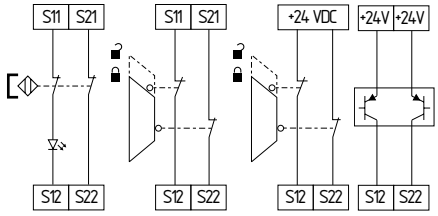

| Rotary knob position | Function |
|---|---|
| 4 | Reset button (detection of the trailing edge) |
| 10 | Reset without monitoring / autostart |

**Dual channel signal processing NC / NC**
**With cross-wire monitoring**
(Category 4 – PL e to ISO 13849-1 possible)



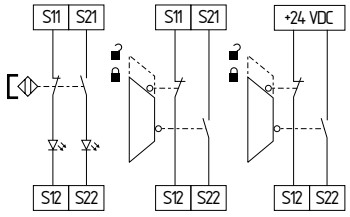

| Rotary knob position | Cross-wire monitoring | Synchronisation |
|---|---|---|
| 1 | Yes | Yes |
| 2 | Yes | No |
| 7 | Yes | Yes |
| 8 | Yes | No |

**Without cross-wire monitoring**
(Cat. 4 – PL e to ISO 13849-1 only possible with protective wiring)



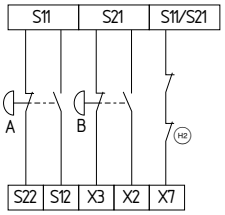

| Rotary knob position | Cross-wire monitoring | Synchronisation |
|---|---|---|
| 3 | No | Yes |
| 4 | No | No |
| 9 | No | Yes |
| 10 | No | No |

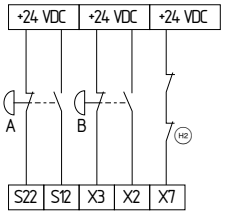
**Dual channel signal processing NC / NO**
(Category 4 – PL e to ISO 13849-1 possible)




| Rotary knob position | Function |
|---|---|
| 5 | Reset button (detection of the trailing edge) |
| 6 | Reset without monitoring / autostart |

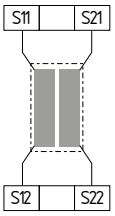
**Two hand switch (only with SRB-E-201ST)**
- Malfunctions of every contact as well as earth leakages and cross-wire shorts are detected.
- The feedback circuit (H2) is integrated as shown. The safety-technical function of external positive-guided contactors is monitored by a series-wiring of the NC contacts with the input X7. In idle state, this circuit must be closed.
- If the feedback circuit is not required, establish a bridge.




| Rotary knob position | Function |
|---|---|
| 11 | Function two-hand control type IIIC |

**Safety mat according to ISO 13856-1 (only with SRB-E-301ST)**
- In combination with SMS safety mat (from Schmersal)
- Without reset function
- The connection of the inputs is realised through the safety mat here.
- When the safety mat is actuated, the potentials of both inputs are connected, so that a cross-wire short is created and the device is safely shut down.
- Category 3 – PL d to ISO 13849-1 possible.




| Rotary knob position | Function |
|---|---|
| 12 | Safety mat, Autostart |
| 13 | Safety mat, reset button |

## 8. Set-up and maintenance

### 8.1 Commissioning

The safety relay module features protection class IP54 for installation in a switch cabinet.

The safety relay module is delivered ready for operation.
**Application 1 is preset in the factory.**

### 8.2 Functional testing

The safety function of the safety-monitoring module must be tested.
The following conditions must be previously checked and met:
1. Correct fixing
2. Check the integrity of the cable entry and connections
3. Check the safety-monitoring module's enclosure for damage
4. Check the electrical function of the connected sensor technology and their influence on the safety-monitoring module and the downstream actuators

The safety relay module features self-test functions.
If a fault is detected, the system adopts a safe mode and leads, if necessary, to undelayed deactivation of all safety outputs.

### 8.3 Behaviour in the case of faults

In the event of a fault the following procedure is recommended:
1. Identify faults according to flash codes from chapter 6.2.
2. Rectify the fault if it is described in the table.
3. Switch operating voltage off and on and erase fault mode.

If fault could not be rectified, please contact the manufacturer.

### 8.4 Setting report

This report regarding the setting of the device must be completed accordingly by the customer and enclosed in the technical documentation of the machine.

The setting report must be available whenever a safety check is performed.

Company: _____

The safety-monitoring module is used in the following machine:

| _____ | _____ | _____ |
|---|---|---|
| Machine n° | Machine type | Module n° |

Configured application (mode): _____

| _____ | _____ |
|---|---|
| Set on (date) | Signature of the responsible person |

### 8.5 Maintenance

A regular visual inspection and functional test, including the following steps, is recommended:
1. Check the correct fixing of the safety-monitoring module
2. Check the cable for damages
3. Check electrical function



If a manual functional check is necessary to detect a possible accumulation of faults, then this must take place during the intervals noted as follows:
- at least every month for PL e with category 3 or category 4 (according to ISO 13849-1) or SIL 3 with HFT (hardware fault tolerance) = 1 (according to IEC 62061);
- at least every 12 months for PL d with category 3 (according to ISO 13849-1) or SIL 2 with HFT (hardware fault tolerance) = 1 (according to IEC 62061).

**Damaged or defective components must be replaced.**

## 9. Disassembly and disposal

### 9.1 Disassembly

The safety-monitoring module must be disassembled in a de-energised condition only.

### 9.2 Disposal

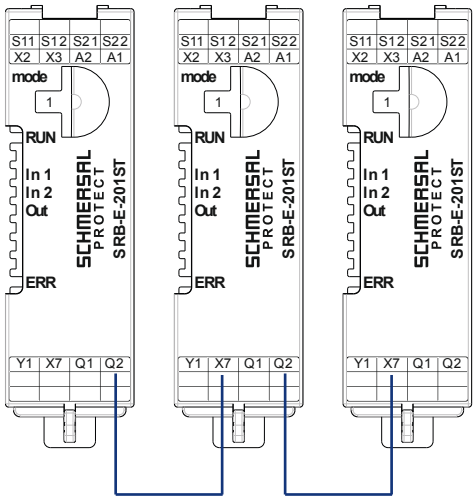
The safety-monitoring module must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.

## 10. Appendix

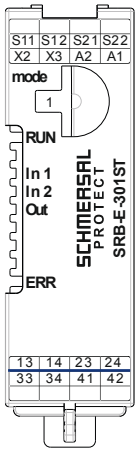
### 10.1 Wiring/circuit information

**Wiring example SRB-E-201.. for cascading via safety input X7:**
Safety outputs of following SRB-E modules can be switched off in each case via input X7.

For safety-orientated application, a fault in the wiring (short circuit to 24 V potential) must be able to be excluded!




**Air clearances and creepage distances of the safety contacts:**




Against all other connection terminals, the safety contacts 13-14 and 23-24 comply without additional measures with the requirements for double insulation in accordance with EN 60664-1 and are to be used with switch voltages > 50 V. The safety contacts 33-34 comply with the requirements for basic insulation.

## 11. EU Declaration of conformity

# EU Declaration of conformity

SCHMERSAL

Original

K.A. Schmersal GmbH & Co. KG
Möddinghofe 30
42279 Wuppertal
Germany
Internet: www.schmersal.com

We hereby certify that the hereafter described components both in their basic design and construction conform to the applicable European Directives.

**Name of the component:**
SRB-E-201LC
SRB-E-201ST
SRB-E-301ST

**Type:**
See ordering code

**Description of the component:**
Relay safety combination for emergency-stop circuits, safety guard monitoring, magnetic safety switches, safety mats, two-hand controls and AOPDs.

**Relevant Directives:**

| | |
|---|---|
| Machinery Directive | 2006/42/EC |
| EMC-Directive | 2014/30/EU |
| RoHS-Directive | 2011/65/EU |

**Applied standards:**
ISO 13851:2019,
ISO 13849-1:2015,
ISO 13849-2:2012,
IEC 61508 parts 1-7:2010,
IEC 62061:2015

**Notified body, which approved the full quality assurance system, referred to in Appendix X, 2006/42/EC:**
TÜV Rheinland Industrie Service GmbH
Am Grauen Stein, 51105 Köln
ID n°: 0035

**Person authorised for the compilation of the technical documentation:**
Oliver Wacker
Möddinghofe 30
42279 Wuppertal

**Place and date of issue:**
Wuppertal, May 11, 2022

Authorised signature
**Philip Schmersal**
Managing Director

SRB-E-201ST-G-EN

The currently valid declaration of conformity can be downloaded from the internet at products.schmersal.com.

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