SCHMERSAL

EN Operating instructions. . . . . .pages 1 to 6
Translation of the original operating instructions

Content

1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning for 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.

1.4 Appropriate use

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 machinery 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: www.schmersal.net.

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

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

08.2014 / Ausgabe E-EN

1.6 Warning about misuse

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

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.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

SE-100 C

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 Destination and use

The safety-monitoring module evaluates the signals of 2 SE safety edges (signal generators). The safety-monitoring module is designed for fitting into control cabinets (IP 54).

The safety-monitoring module only must be used in combination with the SE-R/SE-T transmitter/receiver unit (SE-SET sensor kit) of the signal generator.

The signal generator and the corresponding safety-monitoring module together build the safety edge system to EN ISO 13856-2.

When a safety edge is actuated, the safety contact of the safety-monitoring module is opened.

The manual reset function, if required, is realised by the machine control. Both the manual reset and the auto-reset must comply with the requirements of EN ISO 13856-2 (diagram A2, A3).

The entire concept of the control system, in which the safety component is integrated, must be validated to the relevant standards.

2.4 Technical data

Standards:	EN ISO 13856-2
Start conditions:	Automatic
Feedback circuit (Y/N):	No
Response time:	16 ms
Time to readiness:	max. 300 ms
Closing duration:	max. 300 ms
Opening duration:	typ. 15 ms
Rated operating voltage U_e:	24 VDC (+ 20 % / −10%)
Power consumption:	< 4 W
Fuse rating supply voltage:	0.2 A slow blow
Monitored inputs:	
Cross-wire detection:	yes
Wire breakage detection:	yes
Earth connection detection:	yes
Outputs:	
Stop category 0:	1
Stop category 1:	0
Number of safety contacts:	1
Number of auxiliary contacts:	0
Number of signalling outputs:	1
Max. switching capacity of the safety contacts:	2 A / 230 VAC 2 A / 24 VDC
Utilisation category to EN 60947-5-1:	AC15: 230 V / 2 A DC13: 24 V / 2 A
Max. fuse rating:	6 A gG D-fuse
Mechanical life:	20 million operations
LED display:	Supply voltage, safety edge function
Ambient conditions:	
Environmental temperature:	+5 °C … +55 °C
Protection class:	Enclosure: IP40, Terminals: IP20, Clearance: IP54
Mounting:	Snaps onto standard DIN rail to EN 60715
Connection type:	Screw connection
Cable section:	2.5 mm² wire or 1.5 mm² strand with conductor ferrules
Weight:	164 g
Dimensions (H x W x D):	100 x 22.5 x 120 mm

2.5 Safety classification

Standards:	EN ISO 13849-1
PL:	c
Control Category:	1
PFH-value:	2.24×10^{-6} / h up to max. 5,000 switching cycles/year
Service life:	20 years

The aforementioned safety values are applicable to the combination consisting of the SE-SET sensor kit (SE-T transmitter, SE-R receiver) and the safety-monitoring module. The hollow rubber profile must not be taken into consideration for the safety classification.

3. Mounting

3.1 General mounting instructions

Mounting of the safety switching device in a control cabinet (IP 54).
Mounting: snaps onto standard DIN rails to EN 60715.
The device is equipped with a latching element at the rear for fixing onto a standard DIN rail.

Vibrations exceeding 5 g / 33 Hz, must be avoided.

3.2 Dimensions

Device dimensions (H/W/D): 100 x 22.5 x 120 mm

4. Electrical connection

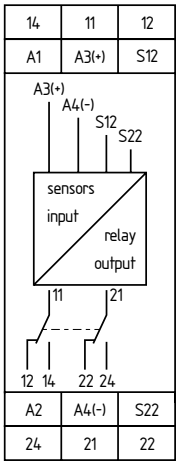
4.1 General information for electrical connection

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

4.2 Connection

Only the output contact 11/14/12 is a safety contact. The output contact 21/24/22 is a signalling contact.

4.3 Pin configuration



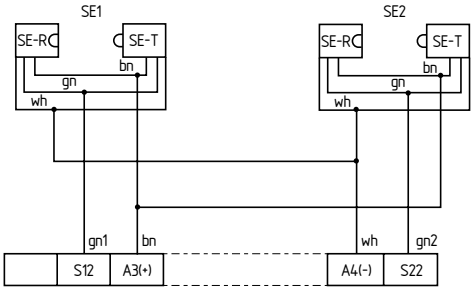
A1 / A2: 24 VAC/DC
The supply voltage is on = LED "power" is on

Terminal connections:

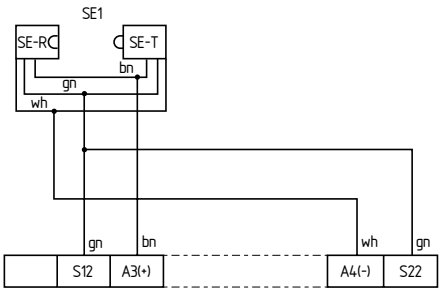
- Cable section: 2 x 1.5 mm²
- Capacity 150 nF/km
- Resistance: 28 Ohm/km
- Switch operating voltage on at terminals A1(+) and A2(-).
- Connect transmitter/receiver: wire the terminals brown, white, green from the transmitter and the receiver according to the wiring example.
- Integrate the safety output in the machine circuit: terminal 11/14.
- Signalling output 21/22 is no safety output and must only be used as signalling contact (relay output).
- When only one safety edge is connected, the safety signal green must be wired to both input terminals (S12 and 22 SS).
- The output contacts must be proceeded by a fuse (6 A slow blow).
- Provide adequate protective wiring of the output contacts in case of capacitive and inductive loads.
- Enabling paths safely separated up to 300 V to DIN EN 60664-1.

4.4 Wiring examples

Input



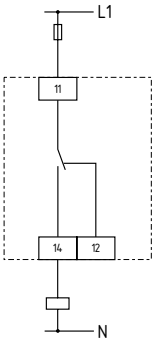
Connection of 2 safety edges (signal generators)



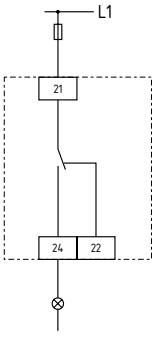
Connection of one safety edge (signal generator)

If only one SE 40 / SE 70 safety edge is connected, the terminals S12 / S22 must be bridged.
Safety edges not actuated = double LED "SE" on

Output level



Safety output: (only contact 11/14)
Safety edges not actuated = safety output enabled
= 11/14 closed
= double LED "SE" on



Signalling output:
NO and NC contact not suitable for safety functions!
Example indicator lamp:
Safety edges actuated= signalling output disabled
= 21/22 closed
= double LED "SE" off

4.5 Commissioning

The safety function of the safety-monitoring module must be tested.
The following conditions must be previously checked and met:
1. Correct fitting of the safety-monitoring module
2. Fitting and integrity of the power cable

When the operating voltage is switched on, safety contact 11/14 is closed; signalling contact 21/22 is opened, when the light path in both profiles is clear. If the light path is interrupted in one or both profiles, the machine enabling circuit 11/14 is interrupted and signalling path 21/22 is closed (linked evaluation of the signal generators). As soon as the light path in both profiles is cleared again, safety path 11/14 is closed and signalling path 21/22 opened.

4.6 Diagnostic / error messages

- The safety-monitoring module detects short-circuits and wire breakage of the connecting cables from the sensors. The output level returns to rest position (safe condition).
- LED's go off: one or both edges have been actuated.
- "POWER" LED go off: no supply voltage

5. Maintenance

5.1 Maintenance of the safety-monitoring module

In the case of correct installation and adequate use
the safety-monitoring module features maintenance-free functionality.
A regular visual inspection and functional test, including the following steps, is recommended:
- Check the correct fixing of the safety monitoring module
- Check the cable for damage.

Under rough operating conditions, we recommend a regular check of the function of the entire system.
(Also refer to the enclosed mounting and inspection protocol.)

Damaged or defective components must be replaced.

5.2 Wear test at the rubber profile

The safety edge must be checked once a year for damages by means of a visual check. In case of damages, the safety edge must be exchanged, as in this case, the safety function no longer is completely guaranteed. The following checks must be performed:
- Check the rubber profile for damages, e.g. cracks
- Check if the elasticity of the rubber profile is not affected, e.g. due to ageing
- Check for damages and correct fixing
- Trigger the safety edge by manually actuating the rubber profile

6. Disassembly and disposal

6.1 Disassembly

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

6.2 Disposal

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

7. Appendix

7.1 EC Declaration of conformity

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EC Declaration of conformity

Translation of the original
Declaration of Conformity

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

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

Name of the safety component / type:	SE-100 C
Description of the safety component:	Safety-monitoring module for monitoring optoelectronic safety edges of the SE 40/70 series with SE-SET sensor kit
Relevant EC-Directives:	2006/42/EC-EC-Machinery Directive 2004/108/EC EMC-Directive
Person authorized for the compilation of the technical documentation:	Oliver Wacker Möddinghofe 30 42279 Wuppertal
Notified body for the prototype test:	TÜV Rheinland Industrie Service GmbH Alboinstraße 56 12103 Berlin ID n°: 0035
EC-prototype test certificate:	01/205/5007.01/14
Place and date of issue:	Wuppertal, November 25, 2013

Authorised signature
Philip Schmersal
Managing Director

SE-100C-E-EN

The currently valid declaration of conformity can be downloaded from the internet at www.schmersal.net.

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7.2 Mounting and inspection protocol

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Mounting and inspection protocol

Check of the safety edge system

Under the scope of the commissioning and the regular maintenance of the machine, the following items of the safety edge system must be checked and inspected by a professional:

Machine/ Construction project		Signal evaluation	
		Profile signal generator	
Date of first putting into operation		Transmitter	
		Receiver	
Name of the fitter		Aluminium profile	

1. Visual check of the signal generator

Inspection of the signal generator's surface and the connections, to ensure the absence of damages preventing correct operation. ☐

2. Visual check of the signal transmission

Check and inspection of the connections and the wiring for defects and changes. ☐

3. Visual check of the signal evaluation

Check and inspection of the enclosure and its electrical connections for defects and changes. ☐

4. Functional test of the safety edge

Actuation of the signal generator at multiple arbitrary positions. The sensitivity of the safety edge must be present throughout the entire active actuating surface. Check of the LED's in the evaluation. The machine must not be restarted if hazards are present. ☐

Please enclose the protocol in the machine documentation.

Date / Signature:

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