

# Safety control unit

## SB4-OR-4CP-B-B-B-B-B

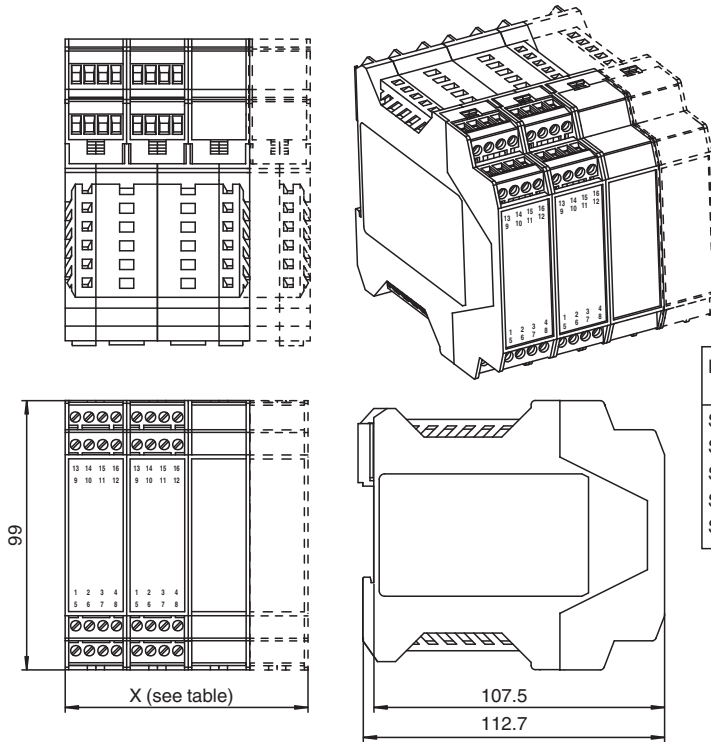


- Evaluation device for safety thru-beam sensors SLA12 and SLA29 and for 2 channel safety devices (emergency off)
- Expansion slots for SB4 modules for optional enhanced functionality
- Self-monitoring (type 4 according to IEC/EN 61496-1)
- Operating mode can be selected by means of DIP switches
- 7-segment diagnostic display
- Safety outputs OSSD, external status displays OSSD

SB4 series safety control unit with optional module slots for functional enhancement



### Dimensions



Model number	Number of optional slots	Housing width X [mm]
SB4-OR-4CP-B	1	67.8
SB4-OR-4CP-B-B	2	90.4
SB4-OR-4CP-B-B-B	3	113
SB4-OR-4CP-B-B-B-B	4	135.6
SB4-OR-4CP-B-B-B-B-B	5	180.8

### Technical Data

#### General specifications

Operating mode Start/restart disable, relay monitor,

#### Functional safety related parameters

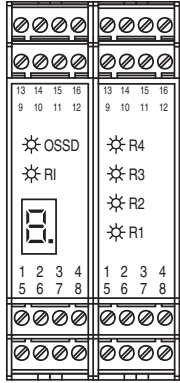
Safety Integrity Level (SIL)	SIL 3
Performance level (PL)	PL e
Category	Cat. 4
Mission Time (T <sub>M</sub> )	20 a
PFH <sub>d</sub>	see instruction manuals
B <sub>10d</sub>	see instruction manuals
Type	4

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## Technical Data

Indicators/operating means		
Diagnostics indicator		7-segment display
Function indicator		LED red: OSSD OFF LED green: OSSD ON Yellow LED: start readiness channel 1 - 4 LED yellow: switching state (receiver)
Stability alarm indicator		LED yellow flashing: Indicator lamp channel 1 ... 4
Electrical specifications		
Operating voltage	$U_B$	24 V DC, $\pm 20\%$
No-load supply current	$I_0$	max. 500 mA
Protection class		no identification ; see instruction manuals
Power dissipation		If additional modules are used, max. 50 W
Input		
Activation current		approx. 7 mA
Activation time		0.4 ... 1.2 s
Test input		Reset-input for system test
Output		
Safety output		2 relay outputs, force-guided NO-contact
Signal output		Output for displaying the switching state of the OSSDs
Switching voltage		10 V ... 250 V AC/DC
Switching current		min. 10 mA , max. 6 A AC/DC
Switching power		DC: max. 24 VA AC: max. 230 VA
Response time		30 ms
Conformity		
Functional safety		ISO 13849-1 ; EN 61508 part1-4
Product standard		EN 61496-1
Approvals and certificates		
CE conformity		CE
UKCA conformity		UKCA
UL approval		cULus
TÜV approval		TÜV
Ambient conditions		
Ambient temperature		0 ... 50 °C (32 ... 122 °F)
Storage temperature		-20 ... 70 °C (-4 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Shock resistance		see instruction manuals
Vibration resistance		see instruction manuals
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals , lead cross section 0.2 ... 2 mm <sup>2</sup>
Material		
Housing		Polyamide (PA)
Mass		545 g

**Connection**



Position 1 Position 2

Terminal position 1

Terminal	Function
1	Reset input; NC contact
2	Restart input (RI); NC contact
3	24 V DC connection for reset, restart and RM
4	Relay monitor (RM)
5 - 6	OSSD1; floating relay contact; NO contact
7 - 8	OSSD2; floating relay contact; NO contact
9	Signal output OSSD OFF
10	Signal output OSSD ON
11	Signal output Restart
12	Reserved (n.c.)
13	+24 V DC supply voltage
14	0 V DC supply voltage
15	Functional ground
16	Reserved (n.c.)

Terminal position 2

Terminal	Function	Channel assignment
1	Receiver 2 input	Channel 2
2	Receiver 2 +U	
3	Transmitter 2 +U	Channel 1
4	Transmitter 2 output	
5	Receiver 1 input	Channel 1
6	Receiver 1 +U	
7	Transmitter 1 +U	Channel 3
8	Transmitter 1 output	
9	Transmitter 3 output	Channel 3
10	Transmitter 3 +U	
11	Receiver 3 +U	Channel 4
12	Receiver 3 input	
13	Transmitter 4 output	Channel 4
14	Transmitter 4 +U	
15	Receiver 4 +U	Channel 4
16	Receiver 4 input	

These specifications only apply to the basic device. If additional SB4 modules are used, the operating instructions that accompany the device must be observed during planning, installation and operation.

**Matching System Components**

	<b>SLA12/115</b>	Safety thru-beam sensor
	<b>SLA12-LAS-T/124</b>	Safety thru-beam sensor with laser
	<b>SLA12-LAS-T/35/124</b>	Safety thru-beam sensor with laser
	<b>SLA12/124</b>	Safety thru-beam sensor
	<b>SLA29/105/106</b>	Safety thru-beam sensor
	<b>SLA29/116</b>	Safety thru-beam sensor
	<b>SLA29/35/116 R=65m</b>	Safety thru-beam sensor
	<b>SLA29/35/73c R=65m</b>	Safety thru-beam sensor
	<b>SLA29/73c</b>	Safety thru-beam sensor

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## Function

The operating instructions that accompany the unit must be observed during planning, installation and operation.

The SB4 evaluation system is a type 4 (EN 61496-1 or IEC 61496-1) and category 4 (EN 954-1) AOPD. This system has also been designed and tested in accordance with IEC 61508. The system meets the requirements of SIL3.

At most 4 safety thru-beam sensors can be connected to the control interface in the default setting. Other contact-equipped safety devices can be connected instead of the thru-beam sensors.

The control interface has empty slots. They are used for individual function extensions with SB4 modules.

The following SB4 modules can be employed:

- SB4 modules 4C: SB4 modules 4C in various versions.  
SB4 module for connecting four 2-wire sensors
- SB4 modules 4X: SB4 modules 4X in various versions.  
SB4 module for connecting 3-wire sensors and safety devices with semiconductor switching outputs
- SB4 modules 6C: SB4 modules 6C in various versions.  
SB4 module for connecting six 2-wire sensors
- SB4 modules 2E: SB4 modules 2E in various versions.  
Additional 2 OSSDs, relay monitoring, restart connection and 2 connections for contact-equipped safety signals (e.g. emergency off switch), timer functions
- SB4 modules 4M: SB4 modules 4M in various versions.  
Muting module for connecting up to 4 muting sensors

## Operating modes

The startup/restart interlock is activated by default.

All groups feature DIP switches to select the functions. Two switches DIP must always be actuated in order to select a function.

Switches on the first group:

Switch	Position	Operating mode
1 and 3	OFF	Without startup/restart interlock (restart, RI)
	ON	With startup/restart interlock (restart, RI)
2 and 4	OFF	Without relay monitor (RM)
	ON	With relay monitor (RM)

Switches on the second group:

Switch	Position	Operating mode
1 and 3	OFF	No complementary evaluation
	ON	Complementary evaluation active
2 and 4	OFF	No simultaneous evaluation
	ON	Simultaneous evaluation active

## Indicators

The OSSD-R/supply module in position 1 features a red/green LED to signal the OSSD off/on statuses, a yellow LED to indicate the "Ready for startup" status and a 7-segment display for system diagnostics.

The 7-segment display signals the system status and error codes.

Display	7-segment display
1	DIP switch setting not identical
2	Incorrect configuration
3	Time-out of one or more muting sensors
4	Transmitter fault
6	Muting lamp fault
7	Simultaneous monitoring fault
8	Receiver fault
9	Sensor channel fault
E	System fault
F	Relay monitor fault
H	Selection chain fault
U	Under/overvoltage detected

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