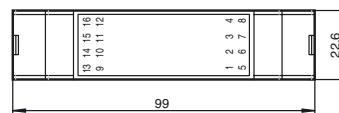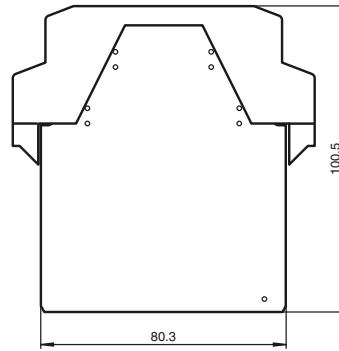## Dimensions

Model Number

SB4 Module 4CG

Safety control unit module

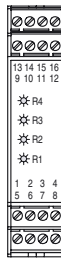Module for Evaluation unit SafeBox - series SB4

Features

- Sensor module
- 4 sensor channels
- Single module for safety thru-beam sensors SLA12 and SLA29 and for 2 channel safety devices (emergency off)
- Micro-Controller controls
- Operating mode can be selected by means of DIP switches
- Connection of a number of separate de-energizing circuits
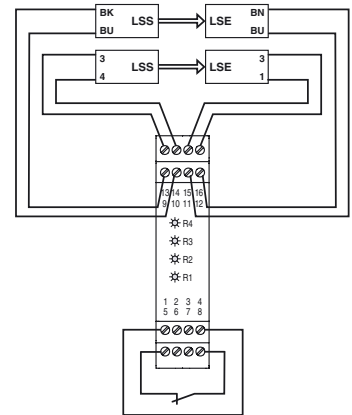- Screw terminals or spring terminals

Electrical connection

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

Connection example
(LSS = transmitter of light barrier;
LSE = receiver of light barrier)

Technical data

General specifications	
Operating mode	simultaneousness, antivalence
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 3
Performance level (PL)	PL e
Category	Cat. 4
Mission Time (T_M)	20 a
Type	4
Indicators/operating means	
Function display	LED yellow (4x): indicator lamp channel 1 ... 4
Pre-fault indication	LED yellow flashing: Indicator lamp channel 1 ... 4
Controls	DIP-switch
Electrical specifications	
Operating voltage U_B	24 V DC ± 20 % , via SB4 Housing
Input	
Activation current	approx. 7 mA
Ambient conditions	
Ambient temperature	0 ... 50 °C (32 ... 122 °F)
Storage temperature	-20 ... 70 °C (-4 ... 158 °F)
Mechanical specifications	
Protection degree	IP20
Connection	screw terminals , lead cross section 0.2 ... 2 mm^2 Option /165: Cage tension spring terminals , Cable cross-section 0.2 ... 1
Material	
Housing	Polyamide (PA)
Mass	approx. 150 g

Subject to modifications without notice

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General information

Ordering information	without Option /165 -> with screw terminals with Option /165 -> spring clamp terminals

Compliance with standards and directives

Standard conformity	(extract)
Standards	EN IEC 61496-1 EN IEC 61508 EN ISO 13849-1

Approvals and certificates

SIL classification	up to SIL3 acc. to IEC 61508 tested and certified by TÜV SÜD according to: IEC 61508:1998 part 1, 3.4 IEC 61508: 2000 ISO 13849-1:2006 EN 50178:1997 IEC 61496-1:2004 IEC 61496-2:2006
UL approval	cULus
TÜV approval	TÜV

The operation of this module is only possible within an interface device Type SB4 SafeBox.

The operating instruction for the SafeBox must be followed.

Function

The 4-channel sensor card module SB4-4CG facilitates the connection of light barriers or light grids and safety sensors with contacts in a single or two-channel version. It also contains the microcontroller control system for the SafeBox. Only one of these modules is contained in a SafeBox SB4 and it must be plugged-in at position 2.

There is a plug-in jumper on the module.If the system contains additional assemblies, then this plug-in jumper must be plugged-in to the last plug-in position.

This module enables a number of separate trip circuits to be installed in one SafeBox.

On switching on the system the software determines whether a light barrier or a safety sensor with contacts is connected on a channel and then monitors its presence during operation.

Safety sensors with contacts, which are connected to the SafeBox, must operate in accordance with the normally-closed principle. An open contact signifies a "Safe condition".
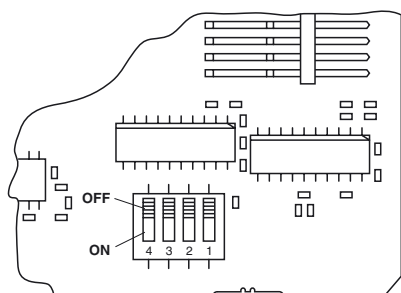
Channels 1 and 2 and 3 and 4 can be monitored for concurrence and antivalence. During activated concurrence monitoring 2-channel safety devices are monitored for simultaneous opening and changeover of the signals. The monitoring is carried out over a period of 2 s.

Antivalence monitoring awaits the normally-closed contact on channel 1 or channel 3 and the normally-open contact on channel 2 or 4. If the antivalence monitoring is operated without concurrence monitoring, then an incorrect contact setting leads to switch off and error signal 7 after approx. 60 s.

Operating modes

The assembly comprises 4 DIP switches for selecting the concurrence of neighbouring channels (1 and 2, 3 and 4) and antivalence evaluation of neighbouring channels (1 and 2, 3 and 4). Function selection always involves the actuation of 2 switches. The functions are not effective with light barriers connected.

Position of the DIP switches

Switch	Position	Operating mode
1 and 3	OFF	No antivalent evaluation
	ON	Antivalent evaluation active
2 and 4	OFF	No concurrence evaluation
	ON	Concurrence evaluation active

Indicators

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A yellow LED is provided for each channel on the front panel of the module.

Indicator	LED	Meaning
R1 - R4	Yellow	Status light barrier 1 ... 4 Off: Broken On: Light beam free Flashing: Light beam free, stability control inadequate (Frequency approx. 2.5 Hz) Fast flashing: Fault (Frequency approx. 5 Hz)

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