



**Model Number**

**SB4 Module 4C/165**  
 Safety control unit module  
 Module for Evaluation unit SafeBox - series SB4

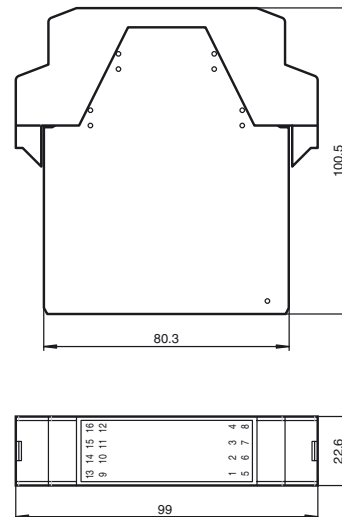
**Features**

- Sensor module
- 4 sensor channels
- Single module for safety thru-beam sensors SLA12 and SLA29 and for 2 channel safety devices (emergency off)
- Operating mode can be selected by means of DIP switches
- Screw terminals or spring terminals

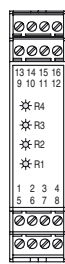
**Accessories**

- SB4 Cape**  
cover sheet
- SB4 Housing 2**  
Empty housing for Evaluation unit SB4
- SB4 Housing 3**  
Empty housing for Evaluation unit SB4
- SB4 Housing 4**  
Empty housing for Evaluation unit SB4
- SB4 Housing 5**  
Empty housing for Evaluation unit SB4
- SB4 Housing 6**  
Empty housing for Evaluation unit SB4
- SB4 Housing 8**  
Empty housing for Evaluation unit SB4

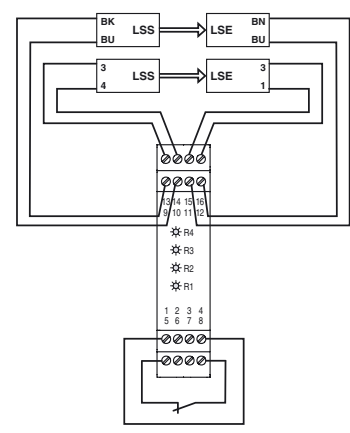
**Dimensions**



**Electrical connection**



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



**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 <sub>M</sub> )	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 <sub>B</sub> 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	Cage tension spring terminals , Cable cross-section 0.2 ... 1.5 mm <sup>2</sup>
Material	
Housing	Polyamide (PA)
Mass	approx. 150 g

Release date: 2011-06-15 14:41 Date of issue: 2011-06-27 206757\_eng.xml

**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 possible only within a control unit of the type SafeBox SB4.

The operating instruction of the SafeBox has to be observed.

**Function**

The 4-channel sensor card module SB4-4C makes it possible to connect light barriers or light grids or contact safety sensors in a one or two-channel version.

When the system is switched on, the software determines whether a light barrier or a contact safety sensor is switched on at a channel and monitors its presence during operation. Safety sensors with switching contacts, which are connected to the Safe-Box, must operate in the switching mode "normally closed". An open contact means "safe status".

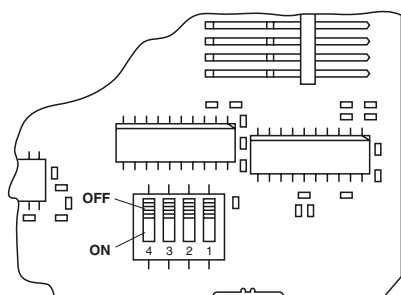
The channels 1 and 2 as well as 3 and 4 can be monitored for simultaneousness or antivalence. If simultaneousness monitoring is activated, 2 channel safety equipment is monitored for simultaneous opening or changing of the signals. The monitoring time is 2 s.

Antivalence monitoring expects the normally closed contact at channel 1 or 3 and the normally open contact at channel 2 or 4. If antivalence monitoring is performed without simultaneousness monitoring, an incorrect contact position causes a switch-off and the error message 7 after approx. 60 s .

**Operation types**

The assembly contains 4 DIP switches for selecting the simultaneousness functions of neighbouring channels (1 and 2, 3 and 4) and for an antivalent evaluation of neighbouring channels (1 and 2, 3 and 4). For selecting functions, 2 selector switches must always be actuated. The functions are not effective if light barriers are connected.

**Position of the DIP switches**



Switch	Position	Operation type
1 and 3	OFF	No antivalent evaluation
	ON	Antivalent evaluation active
2 and 4	OFF	No simultaneousness evaluation
	ON	Simultaneousness evaluation active

**Display**

For each channel, there is a yellow LED on the front panel of the module.

Display	LED	Meaning
R1 - R4	yellow	Status of light barrier 1 ... 4  Off: light beam interrupted On: light beam released  Flashing (2.5 Hz): light beam released, function reserve fallen short of  Flashing (5 Hz): error

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