## Model Number

SB4 Module 4XP

Safety control unit module

Module for Evaluation unit SafeBox - series SB4

Features

- Sensor module
- 4 sensor channels
- Micro-Controller controls
- Operating mode can be selected by means of DIP switches
- Individual module for SLA5(S), SLA20, SLA25, SLA28 and SLA40 security through-beam sensors; for SLP safety light grids, for SLC safety light curtains; for switching pads and emergency stop buttons of categories 2 or 4
- Screw terminals or spring terminals

Dimensions
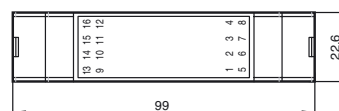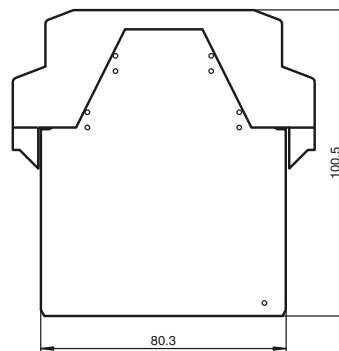
Electrical connection

Terminal	Function	Channel classification	Connection Beam sensor / Light grid safety feature	Connection 2-channel p ON	Connection Switching pad
1	Receiver 2 Input	Input	Receiver output 2	OSSD Output 1.2	Switching pad 1.4
2	Sensor 2 24 V DC +U	Channel 2	24 V Receiver2	24 V Power supply 1	
3	Sensor 2 Mass GND		0 V Receiver 2, Emitter 2	0 V Power supply 1	
4	Emitter 2 Output	Output	Emitter input 2		Switching pad 1.3
5	Receiver 1 Input	Input	Receiver output 1	OSSD Output 1.1	Switching pad 1.2
6	Sensor 1 24 V DC +U	Channel 1	24 V Receiver 1		
7	Sensor 1 Mass GND		0 V Receiver 1, Emitter 1		
8	Emitter 1 Output	Output	Emitter input 1		Switching pad 1.1
9	Emitter 3 Output	Output	Emitter input 3		Switching pad 2.4
10	Sensor 3 Mass GND	Channel 3	0 V Receiver 3, Emitter 3	0 V Power supply 2	
11	Sensor 3 24 V DC +U		24 V Receiver 3	24 V Power supply 2	
12	Receiver 3 Input	Input	Receiver output 3	OSSD Output 2.2	Switching pad 2.3
13	Emitter 4 Output	Output	Emitter input 2		Switching pad 2.2
14	Sensor 4 Mass GND	Channel 4	0 V Receiver 4, Emitter 4		
15	Sensor 4 24 V DC +U		24 V Receiver 4		
16	Receiver 4 Input	Input	Receiver output 4	OSSD Output 2.1	Switching pad 2.1
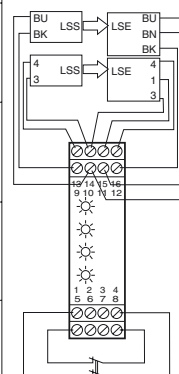
Technical data

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

Actuating voltage	approx. 10 V
Activation current	approx. 4 ... 20 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

General information

Subject to modifications without notice

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411
fa-info@pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

Copyright Pepperl+Fuchs

PEPPERL+FUCHS
SENSING YOUR NEEDS

1

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

This module can only be operated within an evaluation device of the SafeBox SB4 type.

The operating instructions of the SafeBox must be observed.

Function

The 4-channel sensor module -4X* makes possible the connection of the so-called "3-wire" light barriers of the SLA family (for example SLA5) and light grids of type SLP. But also p-switching safety devices with dedicated cross circuit monitoring can be connected, for example safety light curtains from the SLC family. In addition switch-off mats of the 4-wire principle or integrated safety sensors in the 1 or 2 channel version can be connected.

It also contains the microcontroller control of the SafeBox. This module exists only once in a SafeBox SB4 and has to be mounted on position 2.

The module is equipped with a plug-in jumper. If the system features additional components, this plug-in jumper has to be mounted on the last mounting station.

In the assembly is also found a six-way DIP switch with which the sensors to be connected are selected. 2 switches must be activated as a pair for selection. The connection of the safety sensors is done on channels 1 and 2 or 3 and 4.

"3-wire" light barriers and light grids of the SLA and SLP families can be connected to channels 1 to 4.

The cable or the manner it is laid to the light barriers and light grids must be chosen that no short circuit between the receiver and transmitter wires is possible.

Light curtains with semiconductor switch outputs and integrated safety sensors in 2 channel design are monitored for simultaneousness. During simultaneousness monitoring the 2 channel safety devices are monitored for simultaneous opening or changing of the signals. The monitoring time is 2 s.

The connection is done on channels 3 and 4 and/or 1 and 2.

It is necessary that these sensors must have a dedicated cross circuit monitoring, since the module does not perform cross circuit monitoring with these sensors.

Integrated safety sensors, which are connected to the Safebox must work according to the normally closed principle. An open contact means "safe status".

Switch-off mats of the 4-wire principle can be connected to channels 1 and 2 and/or 3 and 4. If there is a faulty contact of the switch-off mat, the system reports Error 9 or Error 8, like the detection of an integrated safety sensor in the two-channel design.

Operating modes

The assembly contains 6 DIP switches for selecting the sensor types and the position. Six possibilities are offered for combining sensors. The desired combination is to be set binary. For function selection, always 2 switches must be actuated, that means DIP switches 1 - 3 have the same switch position as DIP switches 4 - 6.

DIP switch			Operating mode
3 and 6	**2 and 5**	**1 and 4**	
0	0	0	SLA /SLP/ bridge channel 1 + 2 and channel 3 + 4
0	0	1	SLA / SLP / jumper to channel 1 + 2 and SLC channel 3 + 4

Subject to modifications without notice　　　　　　　　　　　　　　　　　　　　　　Copyright Pepperl+Fuchs

Pepperl+Fuchs Group　　　　USA: +1 330 486 0001　　　Germany: +49 621 776-4411　　Singapore: +65 6779 9091
www.pepperl-fuchs.com　　　fa-info@us.pepperl-fuchs.com　　fa-info@de.pepperl-fuchs.com　　fa-info@sg.pepperl-fuchs.com

PEPPERL+FUCHS
SENSING YOUR NEEDS　　**2**

0	1	0	SLC channel 1 + 2 and channel 3 + 4
0	1	1	SLA / SLP / jumper channel 1 + 2 and safety mat channel 3 + 4
1	0	0	Safety mat channel 1 + 2 and channel 3 + 4
1	0	1	SLC channel 1 + 2 and safety mat channel 3 + 4

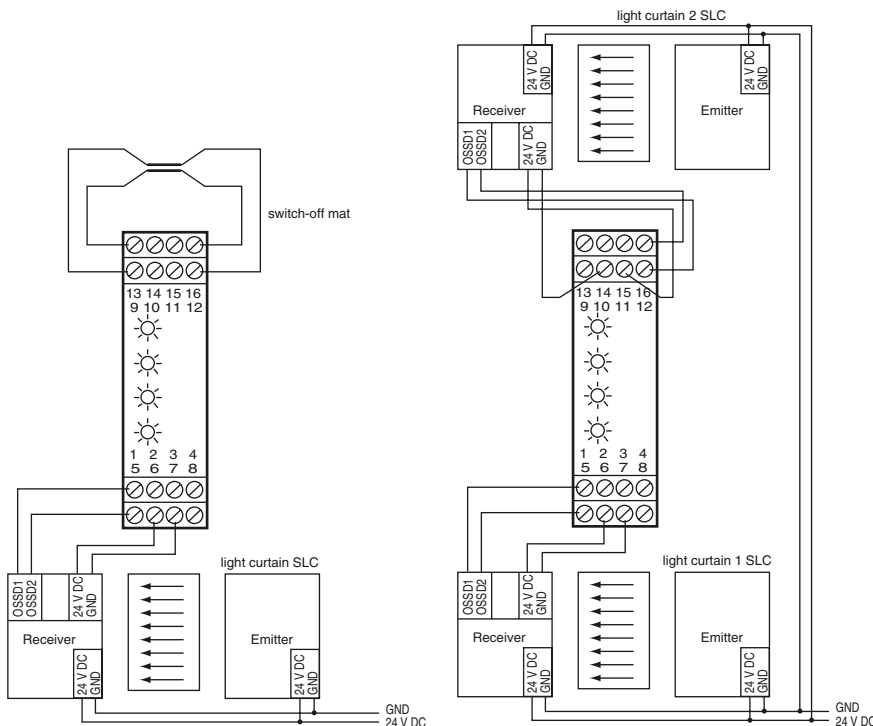### Position of the DIP switches
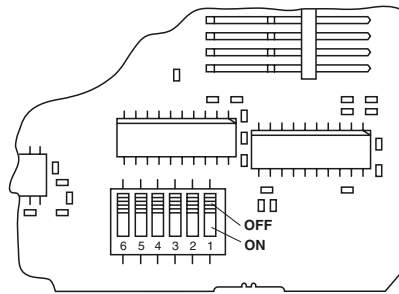
Displays

There is a yellow LED for each channel on the front plate of the module which displays the status of the input channel.

Display	LED	Meaning
R1 - R4 (R1 - R6)	yellow	Status sensor input 1 - 4 OFF: interrupted ON: released Flashing: light beam released, function reserve fallen short of (frequency approx. 2.5 Hz) Flashing rapidly: error (frequency approx. 5 Hz)

Connections

Connections are designed as removable screw terminals. The terminal assignment can be found in the adjoining table.

Up to 4 light barriers or 2 two-channel p-switching safety devices or 2 switch-off mats can be connected to the 4-channel sensor module. Unused channels must be deactivated by means of a bridge between transmitter output and receiver input.

Release date: 2011-06-15 14:41   Date of issue: 2011-06-27   192145_eng.xml

Subject to modifications without notice

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411
fa-info@pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

Copyright Pepperl+Fuchs

PEPPERL+FUCHS
SENSING YOUR NEEDS

3