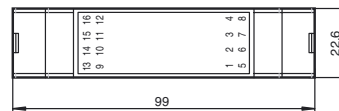
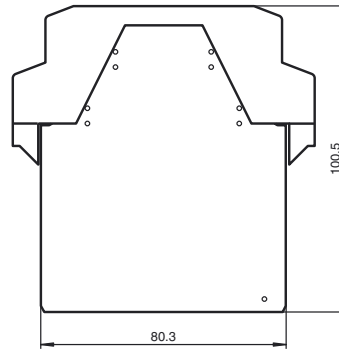


**Dimensions**



**Model Number**

**SB4 Module 2E/165**

Safety control unit module

Module for Evaluation unit SafeBox - series SB4

**Features**

- OSSD-R/E-stop-module
- Safety outputs OSSD, external status displays OSSD
- 2 sensor channels
- Operating mode can be selected by means of DIP switches
- Start/Restart disable
- Relay monitor
- Stop function Cat.0 or Cat.1 and central stop function Cat.0
- Time function
- 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

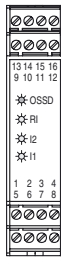
**SB4 Housing 4**  
Empty housing for Evaluation unit SB4

**SB4 Housing 5**  
Empty housing for Evaluation unit SB4

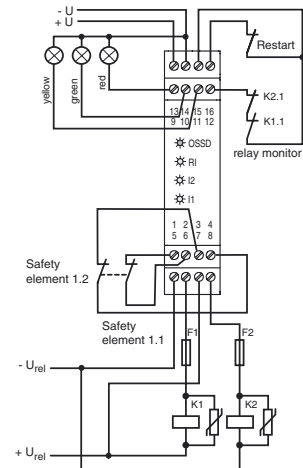
**SB4 Housing 6**  
Empty housing for Evaluation unit SB4

**SB4 Housing 8**  
Empty housing for Evaluation unit SB4

**Electrical connection**



| Terminal | Function   |
|----------|--|
| 1        | Safety element 1.1 Out                                     |
| 2        | Safety element 1.1 In                                      |
| 3        | Safety element 1.2 Out                                     |
| 4        | Safety element 1.2 In                                      |
| 5 - 6    | OSSD1; potential free relay contact; normally open contact |
| 7 - 8    | OSSD2; potential free relay contact; normally open contact |
| 9        | Signal output OSSD off                                     |
| 10       | Signal output OSSD on                                      |
| 11       | Signal output restart                                      |
| 12       | Relay monitor (RM)   |
| 13       | +24 V DC supply voltage                                    |
| 14       | 0 V DC supply voltage                                      |
| 15       | 24 V DC connection restart and RM                          |
| 16       | Restart input (Ri); normally closed contact                |



**Technical data**

**General specifications**

Operating mode Startup/restart disable, relay monitor, emergency off, turn off time

**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 red: OSSD OFF<br>LED green: OSSD ON Yellow LED: start readiness LED yellow (2x): indi |
| Controls         | DIP-switch  |

**Electrical specifications**

Operating voltage U<sub>B</sub> 24 V DC ± 20 % ,  
24 V DC ± 20 % , via SB4 Housing

**Input**

|                    |                             |
|--------------------|-----------------------------|
| Activation current | approx. 7 mA                |
| 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                            |
| Switch power      | max. DC 24 VA , AC 230 VA                              |

**Ambient conditions**

|                     |                               |
|---------------------|-------------------------------|
| Ambient temperature | 0 ... 50 °C (32 ... 122 °F)   |
| Storage temperature | -20 ... 70 °C (-4 ... 158 °F) |

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| 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   |
| Compliance with standards and directives |   |
| Standard conformity                      | (extract)   |
| Standards                                | EN IEC 61496-1<br>EN IEC 61508<br>EN ISO 13849-1  |
| Approvals and certificates               |   |
| SIL classification                       | up to SIL3 acc. to IEC 61508<br>tested and certified by TÜV SÜD according to:<br>IEC 61508:1998 part 1, 3.4<br>IEC 61508: 2000<br>ISO 13849-1:2006<br>EN 50178:1997<br>IEC 61496-1:2004<br>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 SafeBox instruction manual should be observed.

## Function

The OSSD-R/E stop module contains 2 OSSDs, the relay monitor, the restart connection and 2 connections for contact safety signals, (e.g. emergency off button). From position 3 on, this module may exist several times in the SafeBox and may perform different functions depending on the switch position.

The OSSDs are designed as potential free connection NO contacts. The module can be operated with or without restart interlock. Also, monitoring of the externally connected switching elements can be activated (relay monitor). The OSSD On or Off statuses are indicated via a short-circuit-proof pnp signal output. The restart output is used for indication of the start readiness status. In the case of an error, this output oscillates with 1 Hz.

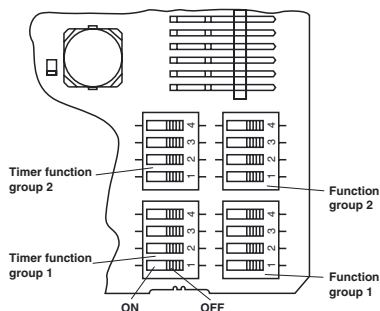
If the inputs remain unused of the OSSD-R/E stop module, a bridge is to be created, this also applies to the set Stop 1 function.

The module can work in stop function cat. 0 or cat.1 or it work in central emergency-stop function cat. 0.

## Settings

The assembly contains 16 DIP switches for selecting the functions restart, relay monitor, central emergency-stop, OSSD assignment and time function. For selecting functions, 2 selector switches must always be actuated.

### Position of the DIP switches



| Switch                | Position | Operation type                                       |
|-----------------------|----------|--|
| 1<br>Group 1<br>and 2 | OFF      | Emergency-Stop 0 or 1, effective locally             |
|                       | ON       | Function as central Emergency-Stop                   |
| 2<br>Group 1<br>and 2 | OFF      | Without restart interlock (restart, RI)              |
|                       | ON       | With restart interlock (restart, RI) for stop cat. 0 |
| 3<br>Group 1<br>and 2 | OFF      | Without relay monitor (RM)                           |
|                       | ON       | With relay monitor (RM)                              |
| 4<br>Group 1<br>and 2 | OFF      | Stop function cat. 0                                 |
|                       | ON       | Stop function cat. 1                                 |

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| Time value / s | Switch 1<br>Group 1 and 2 | Switch 2<br>Group 1 and 2 | Switch 3<br>Group 1 and 2 | Switch 4<br>Group 1 and 2 |
|----------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 0.0            | OFF                       | OFF                       | OFF                       | OFF                       |
| 0.3            | ON                        | OFF                       | OFF                       | OFF                       |
| 0.4            | OFF                       | ON                        | OFF                       | OFF                       |
| 0.5            | ON                        | ON                        | OFF                       | OFF                       |
| 0.63           | OFF                       | OFF                       | ON                        | OFF                       |
| 0.8            | ON                        | OFF                       | ON                        | OFF                       |
| 1.0            | OFF                       | ON                        | ON                        | OFF                       |
| 1.3            | ON                        | ON                        | ON                        | OFF                       |
| 1.6            | OFF                       | OFF                       | OFF                       | ON                        |
| 2.0            | ON                        | OFF                       | OFF                       | ON                        |
| 2.5            | OFF                       | ON                        | OFF                       | ON                        |
| 3.2            | ON                        | ON                        | OFF                       | ON                        |
| 4.0            | OFF                       | OFF                       | ON                        | ON                        |
| 5.0            | ON                        | OFF                       | ON                        | ON                        |
| 6.3            | OFF                       | ON                        | ON                        | ON                        |
| 8.0            | ON                        | ON                        | ON                        | ON                        |

## Displays

The OSSD assembly has a red/green LED for indicating the OSSD on/off statuses, a yellow LED for the start-ready status and 2 LEDs for the sensor channels.

If there is an error on the OSSD assembly itself, only the displays on this assembly are flashing.

| Display | LED    | Meaning   |
|---------|--------|---|
| OSSD    | red    | OSSD outputs switched off   |
|         | green  | OSSD outputs switched on  |
| RI      | yellow | Continuous light: protected area free, OSSD off, start readiness, actuate restart push button |
|         |        | Flashing (5 Hz): error on the card, in the switch group or system error                       |
| I1, I2  | yellow | Continuous light: sensor channel closed   |
|         |        | Flashing (5 Hz): sensor channel error   |