

# **EUCHNER**

## **Operating Instructions**

Safety Systems  
**MGB-L..B-PN.-... (PROFINET)**  
**With Data Structure Type C (Expanded)**

**EN**

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## 1. About this document

### 1.1. Scope

These operating instructions are valid for all MGB-PN with “expanded” data structure with version number V3.30.X. These operating instructions, the document *Safety information* and any associated data sheet form the complete user information for your device.





#### 1.1.1. Notes on other product versions

Make sure to use the operating instructions valid for your product version. Please contact our Service department if you have any questions.

### 1.2. Target group





Design engineers and installation planners for safety devices on machines, as well as setup and servicing staff possessing special expertise in handling safety components.


### 1.3. Key to symbols

Symbol/depiction	Meaning
	Printed document
	Document is available for download at <a href="http://www.euchner.com">www.euchner.com</a>
 <b>DANGER</b> <b>WARNING</b> <b>CAUTION</b>	Safety precautions <b>Danger</b> of death or severe injuries <b>Warning</b> about possible injuries <b>Caution</b> Slight injuries possible
 <b>NOTICE</b> <b>Important!</b>	<b>Notice</b> about possible device damage <b>Important</b> information
<b>Tip</b>	Useful information

### 1.4. Supplementary documents

The overall documentation for this device consists of the following documents:

Document title (document number)	Contents	
Safety information (2525460)	Basic safety information	
Operating instructions (123622)	(this document)	
Declaration of conformity	Declaration of conformity	
Any associated data sheet	Item-specific information about deviations or additions	

	<b>Important!</b> Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from <a href="http://www.euchner.com">www.euchner.com</a> . For this purpose, enter the doc. no. or the order number for the device in the search box.
-------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## 2. Correct use

The system comprises at least one locking module MGB-L2-... and one handle module MGB-H...

The safety system MGB is an interlocking device with guard locking (type 4). Devices with unicode evaluation possess a high coding level, devices with multicode evaluation possess a low coding level.

In combination with a movable guard and the machine control, this safety component prevents the guard from being opened while a dangerous machine function is being performed.

This means:

- Starting commands that cause a dangerous machine function must become active only when the guard is closed and locked.
- The guard locking must not be released until the dangerous machine function has ended.
- Closing and locking a guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

Locking module MGB-L2B-PN-... is operated as an IO device in the PROFINET (PROFIsafe).

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

- EN ISO 13849-1
- EN ISO 12100
- EN IEC 62061

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

- EN ISO 13849-1
- EN ISO 14119
- EN 60204-1

The safety system MGB can be combined only with the intended modules in the MGB system family. Only handle modules with a version number of V2.0.0 or higher may be used.

On the modification of system components, Euchner provides no warranty for function.

The customer is responsible for the safe overall function, especially for the safe integration into the PROFIsafe environment. Comprehensive information about proper configuration, mounting and setup for PROFINET installations can be found at <http://www.profibus.com/>.



### Important!

- The user is responsible for the proper integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-1.
- Correct use requires observing the permissible operating parameters (see chapter 16. *Technical data on page 38*).
- If a data sheet is included with the product, the information on the data sheet applies.

Table 1: Possible combinations for MGB components

Evaluation unit	Handle module	
	MGB-H... from V2.0.0	
MGB...PN	●	
<b>Key to symbols</b>	●	Combination possible

### 3. Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety regulations are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

### 4. General safety precautions

Safety switches fulfill personnel protection functions. Incorrect installation or tampering can lead to fatal injuries to personnel.

Check the safe function of the guard particularly

- › after any setup work
- › after the replacement of an MGB component
- › after an extended period without use
- › after every fault

Independent of these checks, the safe function of the guard should be checked at suitable intervals as part of the maintenance schedule.



#### **WARNING**

Danger to life due to improper installation or due to bypassing (tampering). Safety components perform a personnel protection function.

- › Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2013, section 7.
- › The switching operation is allowed to be triggered only by the intended handle module MGB-H... that is positively fastened to the guard.
- › Mounting, electrical connection and setup only by authorized personnel possessing the following knowledge:
  - specialist knowledge in handling safety components
  - knowledge about the applicable EMC regulations
  - knowledge about the applicable regulations on operational safety and accident prevention.



#### **Important!**

Prior to use, read the operating instructions and keep these in a safe place. Ensure the operating instructions are always available during mounting, setup and servicing. For this reason you should archive a printed copy of the operating instructions. You can download the operating instructions from [www.euchner.com](http://www.euchner.com).

## 5. Function

### 5.1. Locking module MGB-L2.B-PN.

Together with a handle module, the locking module makes it possible to lock movable guards. The combination also serves as a mechanical door stop at the same time.



#### Important!

To operate the device as guard locking according to EN ISO 14119, the signals for door position (T=PROFIsafe bit S10.2), bolt position (R= PROFIsafe bit S10.3) and guard lock monitoring (Z= PROFIsafe bit S10.4) must be polled in a logical AND operator. This operator is already implemented in the PROFIsafe data block (ÜK=safety bit S11.1).

As an alternative, you can also link the bits S10.2 to S10.4 individually in your control system.

The following switch-on condition applies to safety bit S11.1 (see also chapter 15. System status table on page 37 and chapter 13.9. PROFIsafe data bytes (data block for safe functions) on page 30):

- › Guard closed (T)
- › Bolt tongue inserted into locking module (R)
- › Locking arm in locking position (guard lock monitoring) (Z)

The locking module detects the position of the guard and the position of the bolt tongue. The position of the locking arm is also monitored.

The bolt tongue in the handle module is moved into and out of the locking module by actuating the door handle.

When the bolt tongue is fully inserted into the locking module, the locking arm locks the bolt tongue in this position. Depending on version, this locking is by spring force or solenoid force.

### 5.2. Guard locking for version MGB-L2

(guard locking actuated by power-ON and released by spring force)



#### Important!

- › Guard locking devices according to the open-circuit current principle are not intended for protecting personnel.
- › Use as guard locking for personnel protection is possible only in special cases, after strict assessment of the accident risk (see EN ISO 14119:2013, section 5.7.1)!

The magnetically actuated guard locking operates in accordance with the open-circuit current principle. If the voltage is interrupted at the solenoid, the guard locking is released and the guard can be opened directly!

The guard can be opened as long as no voltage is applied to the guard locking solenoid.

If voltage is present at the guard locking solenoid, the locking arm is held in extended position and the guard is locked.

## 6. Control of guard locking

By changing the parameters in the configuration tool of your control system, it can be set whether bit 0 0.0 (in the safe data block for the MGB locking module) is evaluated as well (see chapter 13.7.4. *Data block for MGB locking module L2 on page 25*).

The guard locking solenoid is controlled if

▸ bit 0 0.0 **OR** bit SO 0.0 = 1

### Truth table:

PROFINET bit 0 0.0	PROFIsafe bit SO 0.0	Guard locking with MGB-L2...
0	0	Inactive
0	1	Active
1	0	Active
1	1	Active



## 7. System overview

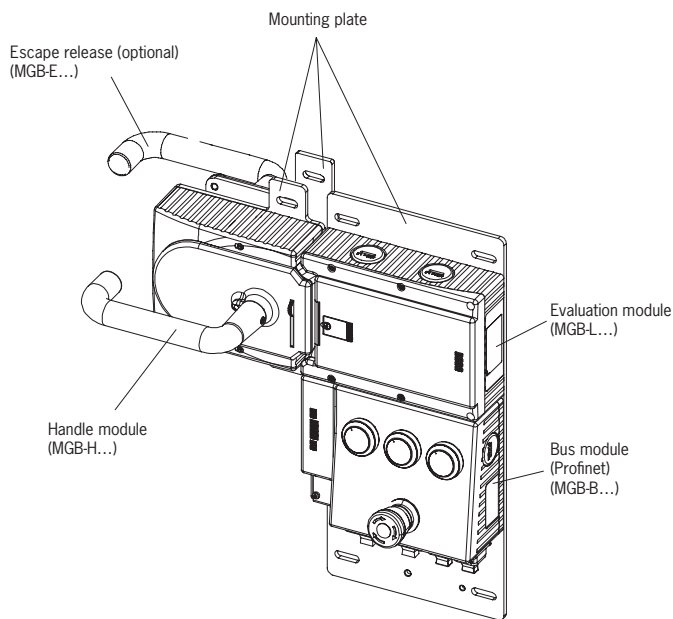


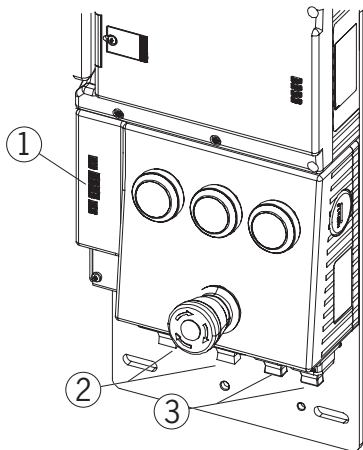
Fig. 1: Components at a glance



### NOTICE

MGB-PN systems are completely factory configured. The configuration must not be changed subsequently. The illustrations in this chapter can deviate from your system and serve only as examples. Refer to the associated data sheet for the configuration of your MGB system.

### 7.1. Bus module MGB-B-...-PN



#### Key:

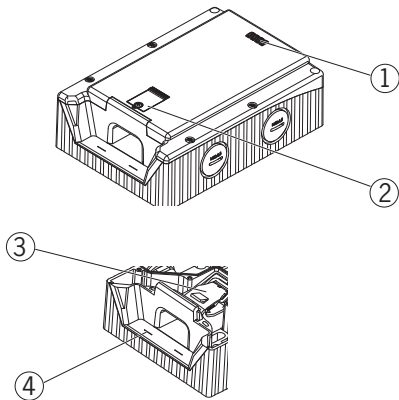
- ① LED indicator
- ② Power supply
- ③ PROFINET connection

#### Notice:

Depending on version, additional controls and indicators may be integrated into the cover. See associated data sheet.

Fig. 2: Bus module MGB-B-...-PN (configuration example)

## 7.2. Evaluation module MGB-L.-



**Key:**

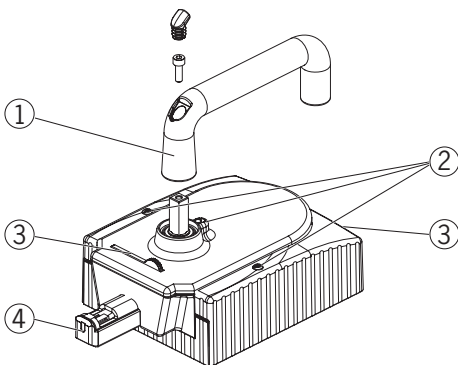
- ① LED indicator
- ② Cover for auxiliary release
- ③ Locking arm (only version with guard locking)
- ④ Auxiliary marking for max. permissible mounting distance

**Notice:**

Depending on version, additional controls and indicators may be integrated into the cover. See associated data sheet.

Fig. 3: Evaluation module MGB-L.-

## 7.3. Handle module MGB-H-...



**Key:**

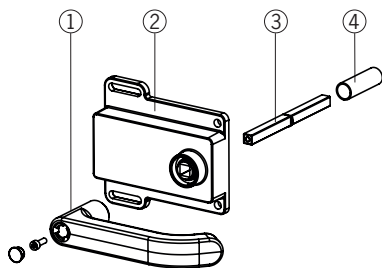
- ① Door handle
- ② Locking screws T10 for housing cover and handle adjustment
- ③ Fold-out lockout mechanism  
(optional: second, automatically extending lockout mechanism)
- ④ Bolt tongue

**Notice:**

Depending on version, a mounting plate can be included. See associated data sheet.

Fig. 4: Handle module MGB-H-...

## 7.4. Escape release MGB-E-... (optional)



**Key:**

- ① Door handle
- ② Housing
- ③ Actuation axis 8 x 8 mm  
(different lengths available)
- ④ Protective sleeve

**Notice:**

Depending on version, a mounting plate can be included. See associated data sheet.

Fig. 5: Escape release MGB-E-...

## 7.5. Dimension drawing

See associated data sheet.

## 7.6. Manual release

Some situations require the guard locking to be released manually (e.g. malfunctions or an emergency). A function test should be performed after release.

More information on this topic can be found in the standard EN ISO 14119:2013, section 5.7.5.1. The device can feature the following release functions:

## 7.7. Auxiliary release

In the event of servicing, the guard locking can be released with the auxiliary release irrespective of the state of the solenoid (see Fig. 6).

<b>i</b>	<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>› The system enters into a latching fault when the auxiliary release is actuated. See <i>System status table, signal sequence incorrect</i> status (DIA red, Lock flashes 1 time).</li> <li>› The system might not enter into a latching fault if the auxiliary release is actuated very slowly.</li> </ul>
<b>i</b>	<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>› The auxiliary release is not a safety function.</li> <li>› The machine manufacturer must select and use a suitable release (escape release, emergency release, etc.) for a specific application. A hazard assessment is required for this purpose. It may be necessary to take specifications from a product standard into account.</li> <li>› The correct function must be checked at regular intervals.</li> <li>› Loss of the release function due to mounting errors or damage during mounting. Check the release function every time after mounting.</li> <li>› Observe the notes on any associated data sheets.</li> </ul>

The locking screw must be screwed back in and sealed (with sealing lacquer, for example) after mounting and after every use of the auxiliary release. Tightening torque 0.5 Nm.

1. Undo locking screw.
2. Lift locking arm using a screwdriver and actuate door handle.

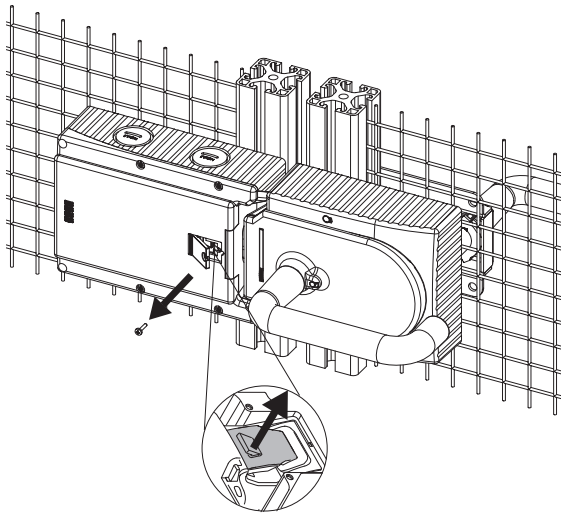


Fig. 6: Auxiliary release

## 7.8. Lockout mechanism

If the lockout mechanism is pivoted out/extended, the bolt tongue cannot be extended. The lockout mechanism can be secured with padlocks (see Fig. 7).

➔ To pivot out, press the grooved part (possible only with bolt tongue retracted).

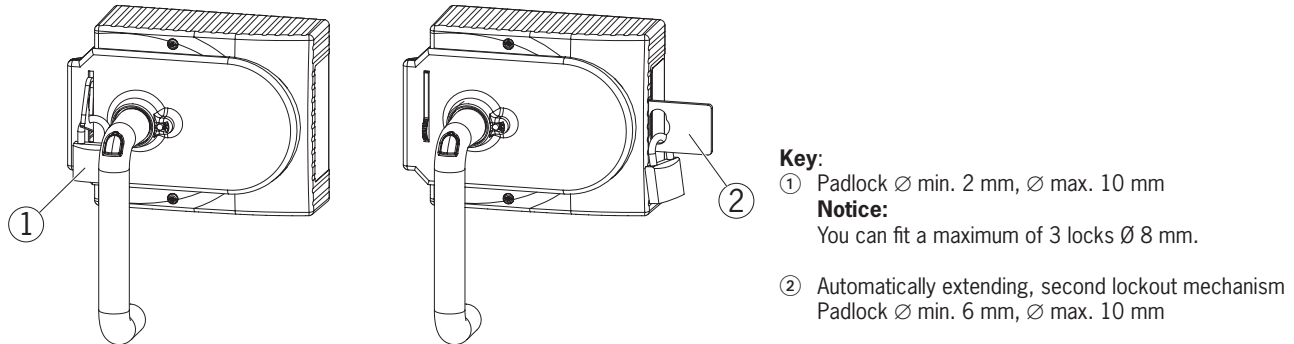


Fig. 7: Lockout mechanism secured with padlock

## 7.9. Escape release (optional)

The escape release is used to open a locked guard from the inside without tools.

The system enters into a latching fault when the escape release is actuated.

See chapter 15. *System status table on page 37, signal sequence incorrect status (DIA red, Lock flashes 1 time).*

The system might not enter into a latching fault if the escape release is actuated very slowly.



### Important!

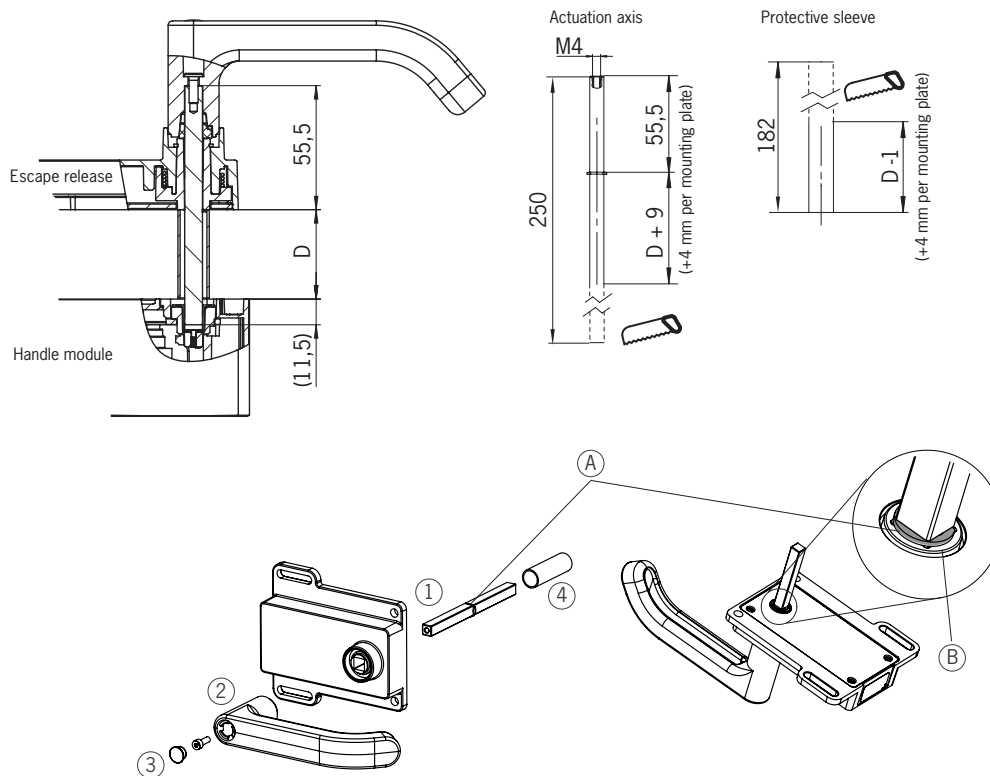
- › It must be possible to actuate the escape release manually from inside the protected area without tools.
- › It must not be possible to reach the escape release from the outside.
- › The actuator must not be under tensile stress during manual release.
- › The escape release meets the requirements of Category B according to EN ISO 13849-1.
- › The correct function must be checked at regular intervals.
- › Observe the notes on any associated data sheets.

- › Fit escape release such that operation, inspection and service are possible.
- › The actuation axis for the escape release must be inserted min. 10 mm into the handle module. Note the information on the different profile widths in the next chapter.
- › Adjust escape release axis at right angles to the handle module. See Fig. 8.

## 7.9.1. Preparing escape release

Profile width	Length required for actuation axis		Which EUCHNER parts are required?	Necessary work steps
	Without mounting plates	With mounting plates (4 mm each)		
D	D+9	D+17		
30 mm	39 mm	47 mm	Standard escape release with 107 mm actuation axis (order no. 100465)	Shorten to required length
40 mm	49 mm	57 mm	Standard escape release with 107 mm actuation axis (order no. 100465) If necessary, extended actuation axis (order no. 106761)	<i>Without mounting plates:</i> None <i>With mounting plates:</i> Use extended actuation axis and protective sleeve and shorten to required length
45 mm	54 mm	62 mm	Standard escape release with 107 mm actuation axis (order no. 100465) <b>and</b> extended actuation axis (order no. 106761)	Use extended actuation axis and protective sleeve and shorten to required length
50 mm	59 mm	67 mm	Standard escape release with 107 mm actuation axis (order no. 100465) <b>and</b> extended actuation axis (order no. 106761)	Use extended actuation axis and protective sleeve and shorten to required length

Example without mounting plates:



- ① Insert actuation axis. The snap ring **A** must be in contact with the escape release **B**.
- ② Fit door handle
- ③ Tighten fixing screw with 2 Nm and push in cap.
- ④ Fit protective sleeve

Fig. 8: Preparing escape release

## 8. Mounting



### WARNING

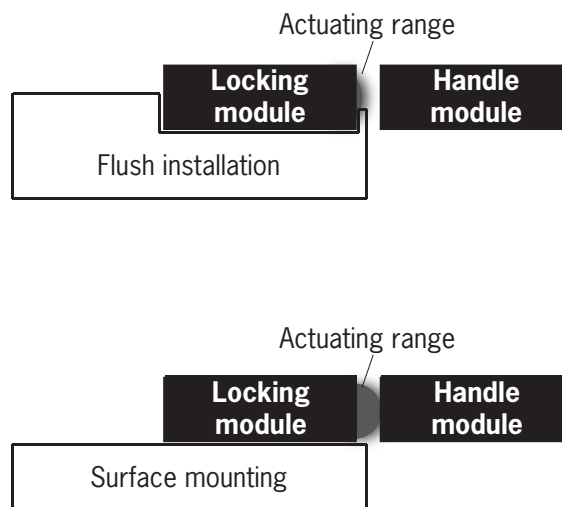
Mounting must be performed only by authorized personnel.

With two-leaf hinged doors, one of the two door leaves must also be latched mechanically.  
Use a rod latch (Item) or a double-door lock (Bosch Rexroth) for this purpose, for example.



### Important!

› In case of flush installation, the operating distances change as a function of the installation depth and the guard material.



### Tip!

- › You will find an animation on the mounting process at [www.mgb.euchner.com](http://www.mgb.euchner.com).
- › The color and labeling of pushbuttons and indicators can be modified.

For mounting steps, see *Fig. 9* and *Fig. 10* to *Fig. 15*.

Attach system such that operation of the auxiliary release as well as inspection and service are possible.

The locking screw must be screwed back in and sealed (with sealing lacquer, for example) after mounting and after every use of the auxiliary release. Tightening torque 0.5 Nm.

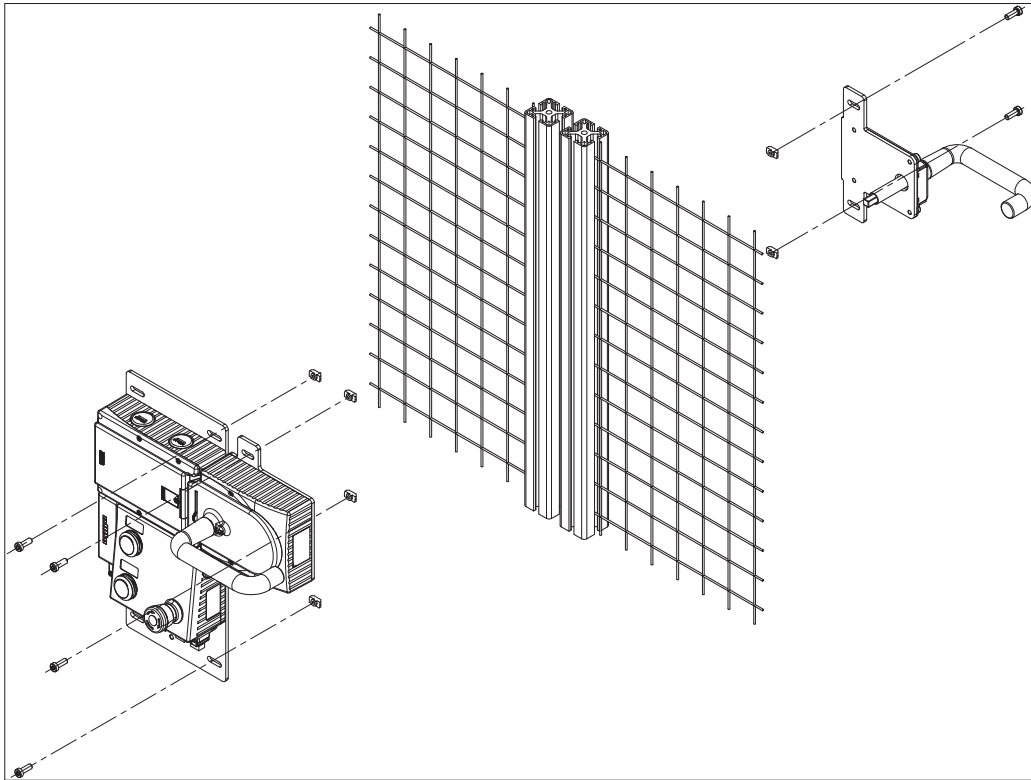
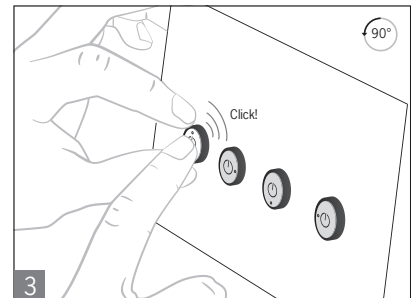
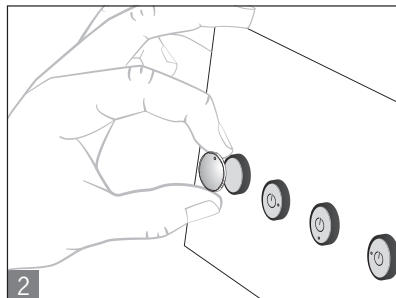
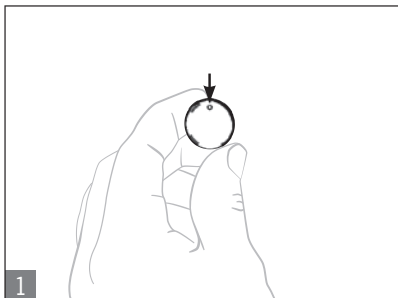


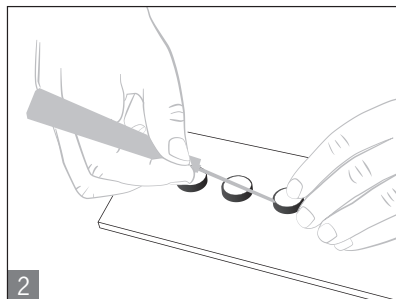
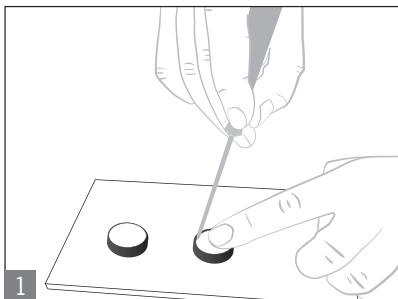
Fig. 9: Installation example for door hinged on the right (general view)

## 8.1. Mounting lens

### Mounting



### Removal



## 9. Changing actuating direction

(here: from right to left)



**Important!**

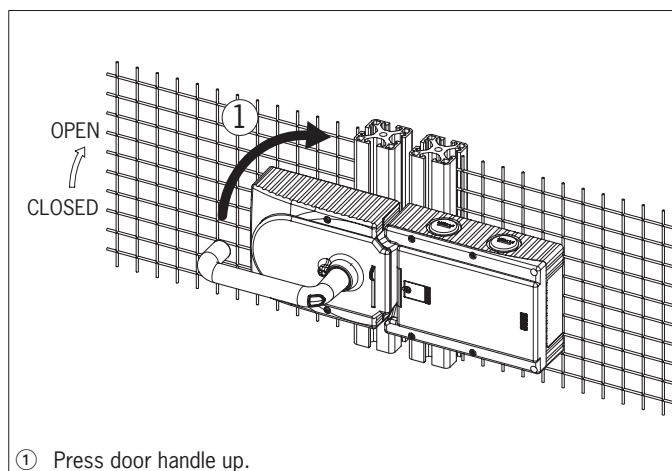
It is possible to make this change only when the bolt tongue is not extended and an escape release is not yet mounted.

In the delivery state, the handle module is set either for doors hinged on the right or for doors hinged on the left.

Based on the example of a handle module for doors hinged on the right this means:

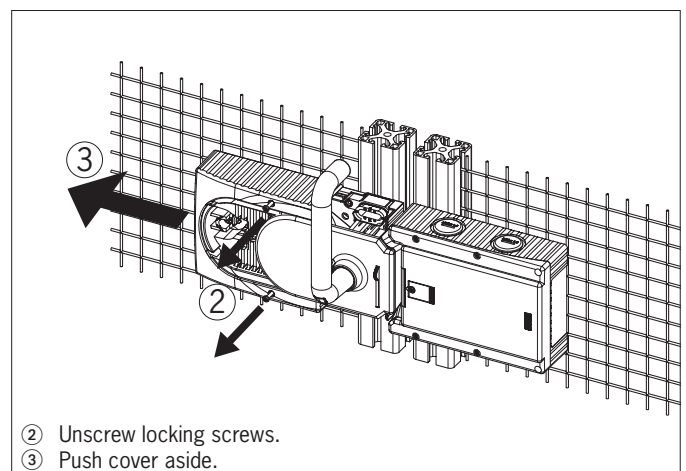
- The guard opens by pressing down the door handle.
- The system is mounted the other way around for doors hinged on the left. In other words, the guard opens by pressing up the door handle (see Fig. 10). For this reason the actuating direction of the door handle must be changed (see Fig. 10 to Fig. 15).

(Similarly on handle modules for doors hinged on the left)



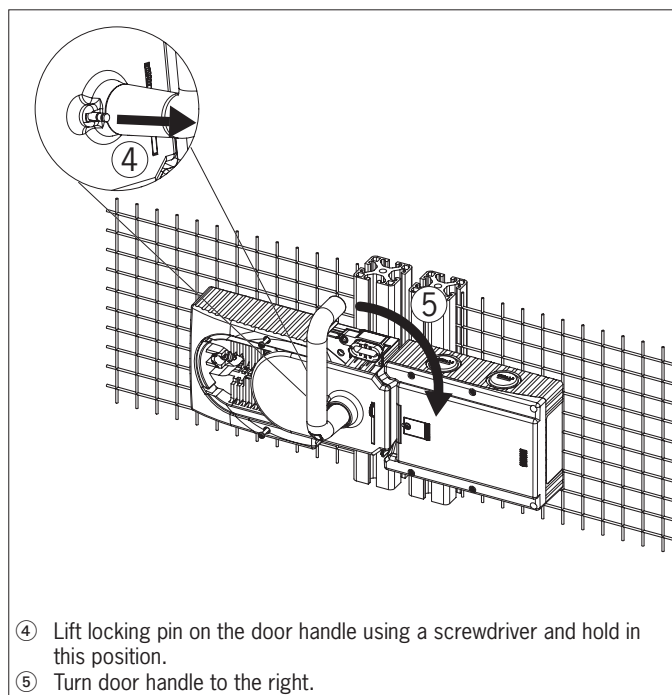
① Press door handle up.

Fig. 10: Changing actuating direction, step ①



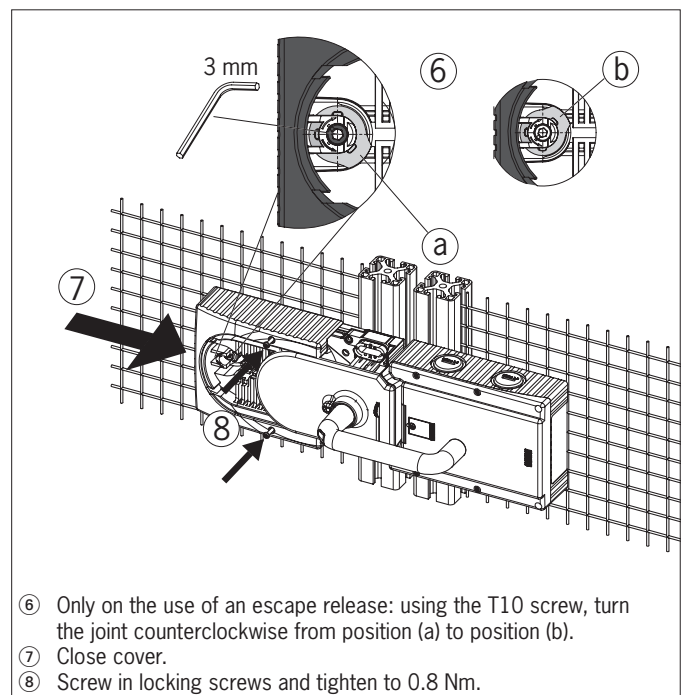
② Unscrew locking screws.  
③ Push cover aside.

Fig. 11: Changing actuating direction, steps ② and ③



④ Lift locking pin on the door handle using a screwdriver and hold in this position.  
⑤ Turn door handle to the right.

Fig. 12: Changing actuating direction, steps ④ and ⑤



⑥ Only on the use of an escape release: using the T10 screw, turn the joint counterclockwise from position (a) to position (b).  
⑦ Close cover.  
⑧ Screw in locking screws and tighten to 0.8 Nm.

Fig. 13: Changing actuating direction, steps ⑥ to ⑧



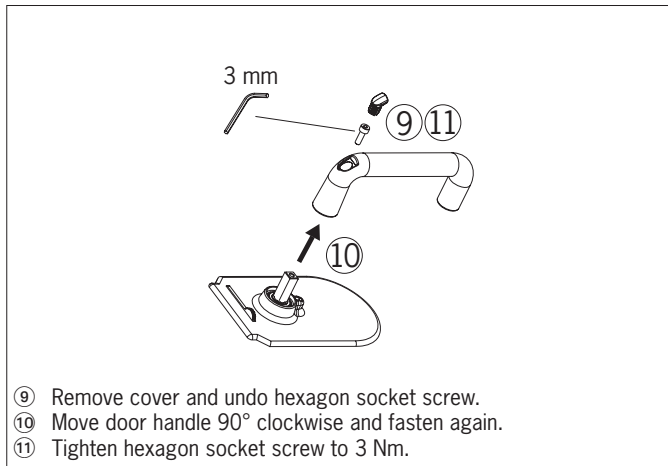


Fig. 14: Changing actuating direction, steps ⑨ to ⑪

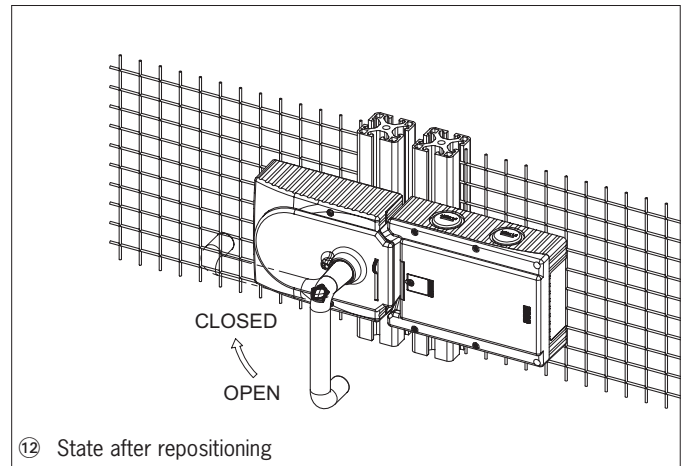


Fig. 15: Changing actuating direction, final state

## 10. Protection against environmental effects

Lasting and correct safety function requires that the system must be protected against foreign bodies such as swarf, sand, blasting shot, etc., which can become lodged in the locking and handle modules. For this purpose a suitable installation position should be selected.

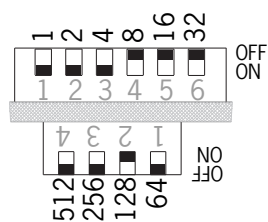
Cover device during painting work!

## 11. Controls and indicators

### LEDs on the bus module

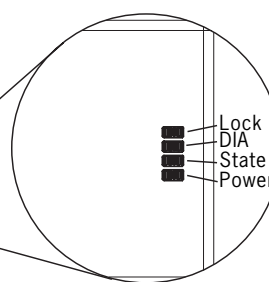
LED	Color	Description
Link 1 and Link 2	green	Bus connector inserted: statically on
Data 1 and Data 2	yellow	Data transfer: flashing
SF	red	System error: statically on (see chapter on diagnostic messages of the MGB system)
BF	red	Bus error: statically on (see chapter on diagnostic messages of the MGB system)
ON	green	Self-test OK: statically on Device passivated: flashing
UB	green	Power supply OK: statically on

Binary coding of the DIP switches for PROFI-safe address (factory setting: 135)



default address:  
 $128 + 4 + 2 + 1 = 135$

**LEDs on evaluation module**  
see System status table



Cover for DIP switches

**DIP switches for PROFI-safe address**  
For coding, see above

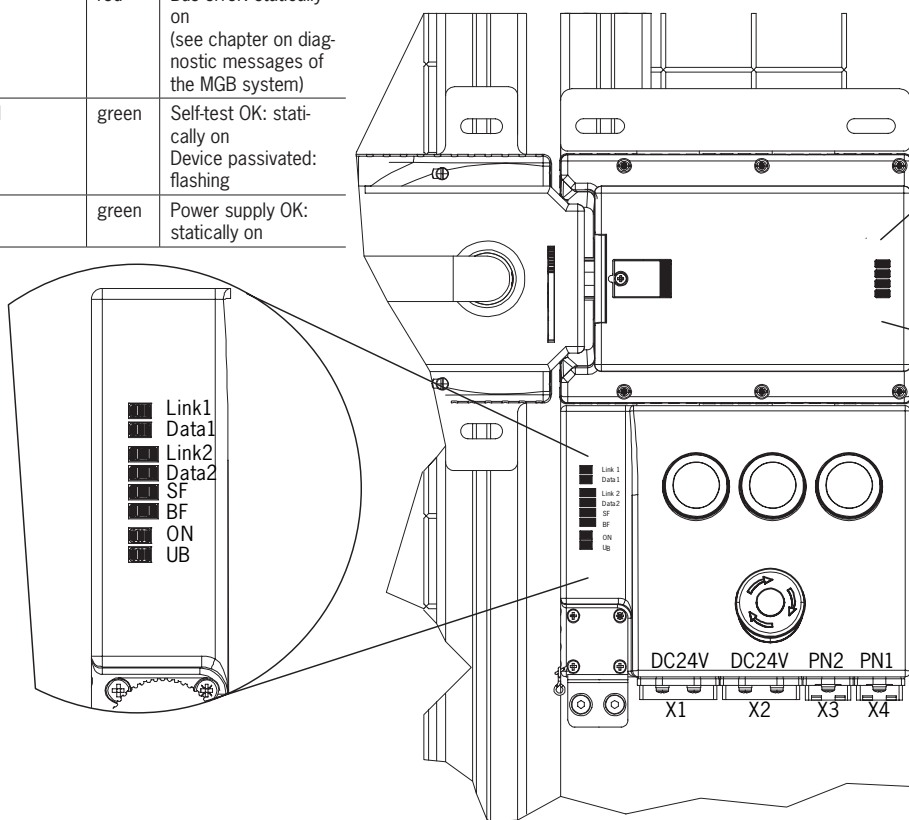
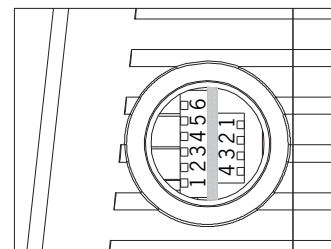


Fig. 16: Indicators and controls/binary coding of the DIP switches for PROFI-safe address (factory setting: 135)

## 12. Electrical connection

	<p><b>WARNING</b></p> <p>In the event of a fault, loss of the safety function due to incorrect connection.</p> <ul style="list-style-type: none"> <li>› Mounting must be performed only by authorized personnel.</li> </ul>
	<p><b>CAUTION</b></p> <p>Risk of damage to equipment or malfunctions as a result of incorrect connection.</p> <ul style="list-style-type: none"> <li>› All the electrical connections must either be isolated from the mains supply by a safety transformer according to EN IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent insulation measures.</li> <li>› Power devices which are a powerful source of interference must be installed in a separate location away from the input and output circuits for signal processing. The cable routing for safety circuits should be as far away as possible from the cables of the power circuits.</li> <li>› In order to avoid EMC interference, follow the EMC notes on devices in the immediate vicinity of the MGB system and its cables.</li> <li>› In order to avoid EMC interference, the physical environmental and operating conditions at the installation site of the device must comply with the requirements according to the standard DIN EN 60204-1:2006, section 4.4.2/EMC).</li> </ul>
	<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>› The supply for further devices on the bus may be forwarded via the Euchner MGB system. The entire supply current through the MGB must not be higher than specified in chapter 16. <i>Technical data on page 38.</i></li> <li>› The functional earth <math>\sphericalangle</math> must be connected. An M6 thread hole is available on the mounting plate for this purpose.</li> <li>› If the device does not appear to function when operating voltage is applied (e.g. UB LED does not illuminate), the safety switch must be returned unopened to the manufacturer.</li> <li>› To ensure the stated degree of protection is achieved, the cover screws must be tightened to a tightening torque of 1 Nm.</li> <li>› Tighten screw for the cover for the auxiliary release to 0.5 Nm.</li> </ul>

### 12.1. Notes about

	<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>› This device is intended to be used with a Class 2 power source in accordance with UL1310 <sup>1)</sup>. As an alternative an LV/C (Limited Voltage/Current) power source with the following properties can be used:             <ul style="list-style-type: none"> <li>- This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248. The fuse shall be rated max. 3.3 A and be installed in the max. 30 V DC power supply to the device in order to limit the available current to comply with the UL requirements. Please note possibly lower connection ratings for your device (refer to the technical data).</li> </ul> </li> </ul> <p><small>1) Note on the scope of the UL approval: only for applications as per NFPA 79 (Industrial Machinery). The devices have been tested as per the requirements of UL508 (protection against electric shock and fire).</small></p>
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## 12.2. Connections on the bus module

The bus module includes the PROFINET connections (X3 and X4) and the power supply connections (X1 and X2). Connection is performed via push-pull plugs according to EN IEC 61076-3-117, variant 14.

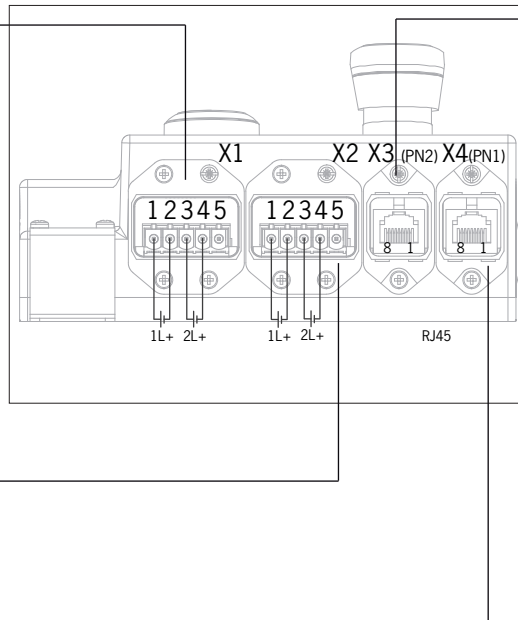
The bus module includes a PROFINET RT switch for Ethernet connection.

### 12.2.1. Terminal assignment for version with push-pull plugs

Pin	Description
X1.1	L1 operating voltage DC 24 V
X1.2	N1 operating voltage 0 V
X1.3	L2 auxiliary voltage* DC 24 V
X1.4	N2 auxiliary voltage* 0 V
X1.5	Functional earth

\* The auxiliary voltage is not required for the MGB system

Pin	Description
X2.1	L1 operating voltage DC 24 V
X2.2	N1 operating voltage 0 V
X2.3	L2 auxiliary voltage* DC 24 V
X2.4	N2 auxiliary voltage* 0 V
X2.5	Functional earth





Pin	Description
X3.1	Receive Data RD+
X3.2	Receive Data RD-
X3.3	Transmit Data TD+
X3.4	n.c.
X3.5	n.c.
X3.6	Transmit Data TD-
X3.7	n.c.
X3.8	n.c.

Pin	Description
X4.1	Receive Data RD+
X4.2	Receive Data RD-
X4.3	Transmit Data TD+
X4.4	n.c.
X4.5	n.c.
X4.6	Transmit Data TD-
X4.7	n.c.
X4.8	n.c.

## 13. Setup

### 13.1. Integrating into PROFINET and PROFIsafe

	<p><b>NOTICE</b></p> <p>The parameters <i>Update time</i> and <i>F-WD-Time</i> have a decisive effect on the reaction time of the safety function. The safety function could be lost if the reaction times are too long.</p>
	<p><b>Important!</b></p> <p>You will require the corresponding GSD file in GSDML format in order to integrate the MGB system:          ▶ GSDML-Vx.x-Euchner-MGB-PN_D_110026-YYYYMMDD.xml          You will find the GSD file in the Download area at <a href="http://www.euchner.com">www.euchner.com</a>.          Prior to setup, the GSD file must be imported into the configuration software for the control system (see control system manual).</p>

You must perform the following steps to integrate the MGB system into PROFINET:

1. Configure the MGB system with the configuration software of the control system and assign parameters.

The following PROFINET parameters must be set:

- ▶ Device name (factory setting from GSD file): [euchnermgb].
- ▶ IP address: optionally fixed or dynamic
- ▶ Update time:  
 Recommendation [32 ms]  
 Maximum value [128 ms]  
 (with number of repeat cycles = 3)

The following PROFIsafe parameters must be set:

- ▶ F\_dest\_adr (PROFIsafe address): this is generally assigned automatically by the control system.
- ▶ F\_WD\_Time (time during which the control system expects a response from the PROFIsafe device): [xxx ms]. Factory setting from GSD file: [600 ms].

2. Set the PROFIsafe address (F\_dest\_adr) on the MGB system using the DIP switches (see Fig. 16 on page 18). Important: Identical addresses must be set in the control system and on the device.
3. Save the configuration and transfer it to the MGB system.

### 13.2. Replacement of an MGB system without programming device

If servicing is required, the MGB system is easy to replace with a new one. For this purpose, the following prerequisites must be met:

- ▶ The DIP switch settings (PROFIsafe address) on the new device must match those on the old device.
- ▶ Your Profinet master must support the automatic replacement of Profinet devices.
- ▶ Your Profinet topology must be correctly configured.
- ▶ The replacement device must be connected to the same port as its predecessor.
- ▶ There must be no device name in the MGB system.  
 This field is empty in the delivery state. Systems that already contain a name must first be reset to the factory settings.

Once these conditions are met, simply replace the old system with the new system.

The Profinet bus does not need to be switched off for this purpose.

### 13.3. Resetting system to factory settings

You will find detailed instructions in the manual for the configuration software for your control system.

### 13.4. Mechanical function test

It must be possible to insert the bolt tongue easily into the locking module. To check, close guard several times and actuate door handle.

If available, check function of the escape release. With active guard locking it must be possible to operate the escape release from the inside without excessive effort (approx. 40 N).

### 13.5. Electrical function test

1. Switch on operating voltage.
2. Close all guards and insert the bolt tongue into the locking module.  
In case of guard locking by solenoid force ➔ activate guard locking.
  - The machine must not start automatically.
  - It must not be possible to open the guard.
  - The yellow STATE LED illuminates continuously.
3. Enable operation in the control system.
  - It must not be possible to deactivate guard locking as long as operation is enabled.
4. Disable operation in the control system and deactivate guard locking.
  - The guard must remain locked until there is no longer any risk of injury.
  - It must not be possible to start the machine as long as guard locking is deactivated.
  - It must be possible to open the guard.

Repeat steps 2-4 for each guard.

### 13.6. PROFINET data bytes for “standard” and “expanded” data structures (data blocks for non-safe functions)



#### Important!

This device can be operated in the “standard” or “expanded” configuration. Additional functions are available in the “expanded” configuration (see chapter 13.7.3. *Additional button functions (only for configuration with expanded data structure) on page 25*).

Select one of the configurations by bringing together the corresponding modules via drag & drop in the configuration software of your control system.

The modules are easy to distinguish by means of the commentary block. Plug-in standard and expanded modules must not be mixed. The modules must be selected prior to the first Power On process. Another Power On is required if modules are to be exchanged.

The following modules can be present in various combinations in an MGB system:

- Bus module, MGB-B...PN (contains everything required for the PROFINET connection)
- Locking module, MGB-L. (forms the door locking mechanism together with the handle module)

Each MGB module occupies a certain number of PROFINET data bytes in the input and output areas of the control system.

The PROFINET data bytes for every MGB module or also individual functions are combined in data blocks (see tables below).

A distinction is made between the following data block types:

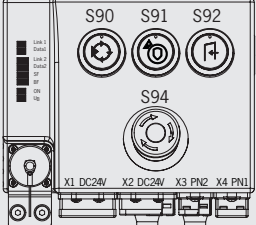
- Data blocks for MGB modules
- Data blocks for individual functions

These data blocks are automatically assigned to the designated slots in the configuration software of the control system when your MGB system is placed. This assignment changes according to MGB system. The exact assignment of the slots and the exact bit allocation for your device can be seen on the associated data sheet.

## 13.7. Data blocks for MGB modules

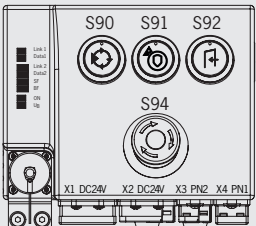
All standard functions of an MGB module are combined in these data blocks. Additional functions, e.g. an optional enabling switch or a stack light, have separate data areas (see chapter 13.8. *Data blocks of individual functions at a glance on page 26*)

**13.7.1. Data block for “standard” MGB bus module**

MGB module	Slot	Required memory in data area of the control system (IO controller) (refer to the data sheet of your device for the exact bit allocation)									
 <p>Bus module (Configuration example)</p>	See data sheet for slot assignment	Input area (2 bytes)	Control element	-	-	-	-	-	S92	S91	S90
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		I1.7		I1.6	I1.5	I1.4	I1.3	I1.2	I1.1	I1.0	
		Output area (1 byte)	Display	-	-	-	-	-	H92	H91	H90
Bit	O0.7		O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0		

Bit allocation for 1st byte					
Input area	Bit	Description	Output area	Bit	Description
	I0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)		O0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)
	I0.1			O0.1	
	I0.2			O0.2	
	I0.3			O0.3	
	I0.4			O0.4	
	I0.5			O0.5	
	I0.6			O0.6	
I0.7	O0.7				
Bit allocation for 2nd byte					
Input area	Bit	Description			
	I1.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)			
	I1.1				
	I1.2				
	I1.3				
	I1.4				
	I1.5				
	I1.6				
I1.7					

**13.7.2. Data block for “expanded” MGB bus module**

MGB module	Slot	Required memory in data area of the control system (IO controller) (refer to the data sheet of your device for the exact bit allocation)									
 <p>Bus module (Configuration example)</p>	See data sheet for slot assignment	Input area (1 byte)	Control element	-	-	-	-	-	S92	S91	S90
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		Output area (1 byte)	Display	-	-	-	-	-	H92	-	H90
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

Bit allocation for 1st byte					
Input area	Bit	Description	Output area	Bit	Description
	I0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)		O0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)
	I0.1			O0.1	
	I0.2			O0.2	
	I0.3			O0.3	
	I0.4			O0.4	
	I0.5			O0.5	
	I0.6			O0.6	
I0.7	O0.7				

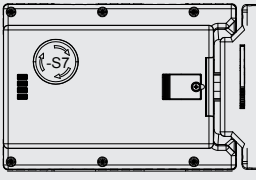


### 13.7.3. Additional button functions (only for configuration with expanded data structure)

#### Lamp control with MGB-PN in expanded mode

Lamp	Color	ON	OFF	Flashing
H90	white	Bit H90 = 1	Bit H90 = 0	-
H91	white	Door closed and acknowledged	Door open	Door closed and not acknowledged or escape release operated
	blue	Door closed and locked via bit from standard area and acknowledged	All other states	-
	yellow	Door closed and locked via bit from safe area and acknowledged	All other states	-
	green	Door closed and locked via bit from safe area and from standard area and acknowledged	All other states	-
H92	white		Bit H92 = 0	-
	blue	Bit H92 = 1		-
H94	red	Bit H94=1 and emergency stop not pressed and acknowledged	Bit H94 = 0 and emergency stop not pressed and acknowledged	Emergency stop pressed

### 13.7.4. Data block for MGB locking module L2

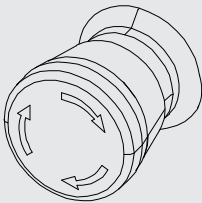
MGB module	Slot	Required memory in data area of the control system (IO controller) (refer to the data sheet of your device for the exact bit allocation)										
Locking module (Configuration example)  	See data sheet for slot assignment	Input area (1 byte)	Control element	ÜK	SK	-	-	-	Z	R	T	
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0	
		Output area (1 byte)	Display	-	-	-	-	-	-	-	-	Guard locking solenoid
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0	

Bit allocation					
Input area	Bit	Description	Output area	Bit	Description
	I0.0	T (door position)		O0.0	S, guard locking solenoid – control voltage on (Function identical to bit S00.0 => but control from PROFINET area)
	I0.1	R (bolt position)		O0.1	n.c.
	I0.2	Z (guard locking)		O0.2	n.c.
	I0.3	n.c.		O0.3	n.c.
	I0.4	n.c.		O0.4	n.c.
	I0.5	n.c.		O0.5	n.c.
	I0.6	SK (T AND R)		O0.6	n.c.
I0.7	ÜK (T AND R AND Z)	O0.7	n.c.		

### 13.8. Data blocks of individual functions at a glance

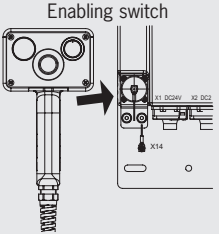
Function data blocks are required for all additional functions that are not included in the data blocks for MGB modules.

#### 13.8.1. Data block for “standard” emergency stop function

Function	Slot	Required memory in data area of the control system (IO controller) (refer to the data sheet of your device for the exact bit allocation)									
Emergency stop 	See data sheet for slot assignment	Input area (1 byte)	Control element	-	-	-	-	-	-	-	S94 (monitoring contact)
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		Output area (1 byte)	Display	-	-	-	-	-	-	-	H94 (LED)
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

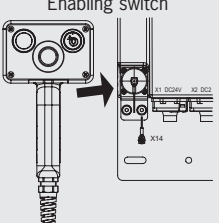
Bit allocation			
Input area		Output area	
Bit	Description	Bit	Description
I0.0	Emergency stop monitoring contact	O0.0	Emergency stop illumination. <b>For “standard” configuration:</b> control via this bit. 1 = ON, 0 = OFF <b>With “expanded” configuration:</b> controlled via the integrated lamp control system. (in slot “expanded PROFISafe 32 Bool IO”). See 13.7.3. <i>Additional button functions (only for configuration with expanded data structure) on page 25</i>
I0.1	n.c.	O0.1	n.c.
I0.2	n.c.	O0.2	n.c.
I0.3	n.c.	O0.3	n.c.
I0.4	n.c.	O0.4	n.c.
I0.5	n.c.	O0.5	n.c.
I0.6	n.c.	O0.6	n.c.
I0.7	n.c.	O0.7	n.c.

### 13.8.2. Data block for “standard” enabling switch function (optional)

Function	Slot	Required memory in data area of the control system (IO controller) (refer to the data sheet of your device for the exact bit allocation)								
		Function	-	ES -	ES +	-	-	-	-	ES (en-abling)
	See data sheet for slot assignment	Input area (1 byte)	Function	-	ES -	ES +	-	-	-	ES (en-abling)
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1
		Output area (1 byte)	Display	-	-	-	-	-	ES - (LED)	ES + (LED)
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1

Bit allocation					
Input area	Bit	Description	Output area	Bit	Description
	I0.0	Enabling switch in “enabling” position (monitoring contact)		O0.0	Enabling switch illumination for + button
I0.1	n.c.	O0.1	Enabling switch illumination for - button		
I0.2	n.c.	O0.2	n.c.		
I0.3	n.c.	O0.3	n.c.		
I0.4	n.c.	O0.4	n.c.		
I0.5	Enabling switch ES+ button	O0.5	n.c.		
I0.6	Enabling switch ES- button	O0.6	n.c.		
I0.7	n.c.	O0.7	n.c.		

### 13.8.3. Data block for “expanded” enabling switch function (optional)

Function	Slot	Required memory in data area of the control system (IO controller) (refer to the data sheet of your device for the exact bit allocation)								
		Function	-	-	ES (S1)	-	-	-	-	ES (en-abling)
	See data sheet for slot assignment	Input area (1 byte)	Function	-	-	ES (S1)	-	-	-	ES (en-abling)
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1
		Output area (1 byte)	Display	-	-	-	-	-	LED P1	LED S1
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1

Bit allocation					
Input area	Bit	Description	Output area	Bit	Description
	I0.0	Enabling switch in “enabling” position (monitoring contact)		O0.0	Enabling switch illumination <b>With “expanded” configuration:</b> controlled via the integrated lamp control system. See 13.8.4. <i>Additional button functions (only for configuration with expanded data structure) on page 27</i>
I0.1	n.c.	O0.1	see above		
I0.2	n.c.	O0.2	n.c.		
I0.3	n.c.	O0.3	n.c.		
I0.4	n.c.	O0.4	n.c.		
I0.5	Enabling switch S1 button	O0.5	n.c.		
I0.6	n.c.	O0.6	n.c.		
I0.7	n.c.	O0.7	n.c.		

### 13.8.4. Additional button functions (only for configuration with expanded data structure)

#### Lamp control in enabling switch for MGB-PN in expanded mode

Lamp	Color	ON	OFF	Flashing
ES+	red	Enabling switch inserted	Enabling switch not inserted	-
ES-	yellow	Enabling switch inserted and pressed and acknowledged	Enabling switch not pressed or enabling switch not inserted	Enabling switch inserted and pressed and not acknowledged

### 13.8.5. Data block for “standard” diagnostics function

Function	Slot	Required memory in data area of the control system (IO controller) (see below for exact bit allocation)									
		Diagnostics	See data sheet for slot assignment	Input area (1 byte)	Message	Mechanical life	-	-	272(6) 273(6)	272(2) 273(2)	272(1) 273(1)
Bit	I0.7				I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
Output area (1 byte)	Acknowledgment			-	-	-	-	-	-	Reset MGB	Ac-knowledgment
	Bit			O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

Bit allocation					
	Input area		Output area		
	Bit	Description	Bit	Description	
Input area	I0.0	Device diagnostics (PROFIsafe error 72): message present. Diagnostic code: see table of device-specific messages	O0.0	Device diagnostics: acknowledge message, acknowledgment of I0.2, I0.3 or I0.4. I0.0 is also acknowledged if only one message is present	
	I0.1	Device diagnostics, device-specific message 274(4) “Plausibility check detected an error (e.g. escape release actuated)”	O0.1	Trigger MGB locking module reset: acknowledge message, acknowledgment of I1. I0 is also acknowledged if only one message is present.	
	I0.2	Device diagnostics, device-specific message 272(1) or 273(1) “Error in emergency stop”	O0.2	n.c.	
	I0.3	Device diagnostics, device-specific message 272(2) or 273(2) “Error in enabling switch”	O0.3	n.c.	
	I0.4	Device diagnostics, device-specific message 272(3,4,5), 273(3,4,5) “Fault in locking module”	O0.4	n.c.	
	I0.5	n.c.	O0.5	n.c.	
	I0.6	n.c.	O0.6	n.c.	
	I0.7	Mechanical life > 1 million operating cycles	O0.7	n.c.	

## 13.8.6. Data block for “expanded” diagnostics function

Function	Slot	Required memory in data area of the control system (IO controller) (see below for exact bit allocation)									
		Message	Mechanical life	-	-	272(6) 273(6)	272(2) 273(2)	272(1) 273(1)	274(4)	72	
Diagnostics	See data sheet for slot assignment	Input area (2 bytes)	Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
				I1.7	I1.6	I1.5	I1.4	I1.3	I1.2	I1.1	I1.0
		Output area (2 bytes)	Acknowledgment	-	-	-	-	-	Reset MGB	Acknowledgment	
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0
					O1.7	O1.6	O1.5	O1.4	O1.3	O1.2	O1.1

Bit allocation				
	Input area		Output area	
	Bit	Description	Bit	Description
	I0.0	Device diagnostics (PROFIsafe error 72): message present. Diagnostic code: see table of device-specific messages	O0.0	Device diagnostics: acknowledge message, acknowledgment of I0.2, I0.3 or I0.4. I0.0 is also acknowledged if only one message is present
	I0.1	Device diagnostics, device-specific message 274(4) “Plausibility check detected an error (e.g. escape release actuated)”	O0.1	Trigger MGB locking module reset: acknowledge message, acknowledgment of I1. I0 is also acknowledged if only one message is present.
	I0.2	Device diagnostics, device-specific message 272(1) or 273(1) “Error in emergency stop”	O0.2	n.c.
	I0.3	Device diagnostics, device-specific message 272 (2,7) or 273 (2,7) “Fault in enabling switch”	O0.3	n.c.
	I0.4	Device diagnostics, device-specific message 272(3,4,5), 273(3,4,5) “Fault in locking module”	O0.4	n.c.
	I0.5	n.c.	O0.5	n.c.
	I0.6	n.c.	O0.6	n.c.
	I0.7	Mechanical life > 1 million operating cycles	O0.7	n.c.
	I1.0	Single diagnostics: door	O1.0	n.c.
	I1.1	Single diagnostics: bolt	O1.1	n.c.
	I1.2	Single diagnostics: guard locking	O1.2	n.c.
	I1.3	n.c.	O1.3	n.c.
	I1.4	n.c.	O1.4	n.c.
	I1.5	n.c.	O1.5	n.c.
	I1.6	n.c.	O1.6	n.c.
	I1.7	n.c.	O1.7	n.c.

### 13.9. PROFIsafe data bytes (data block for safe functions)

Safe PROFIsafe data are transmitted in addition to the non-safe PROFINET data. These data include all information about the door position and guard locking, emergency stop and enabling switch, for example.



**Important!**

This device can be operated in the “standard” or “expanded” configuration. Additional functions are available in the “expanded” configuration (see chapter 13.7.3. *Additional button functions (only for configuration with expanded data structure) on page 25*).

Select one of the configurations by bringing together the corresponding modules via drag & drop in the configuration software of your control system.

The modules are easy to distinguish by means of the commentary block. Plug-in standard and expanded modules must not be mixed. The modules must be selected prior to the first Power On process. Another Power On is required if modules are to be exchanged.

#### 13.9.1. “Standard” PROFIsafe data bytes

The “standard” PROFIsafe data block includes all safe functions. It is subdivided as follows:

- › 2 input bytes of data for the functions (e.g. emergency stop switch position).
- › 2 additional input bytes (empty)
- › 4 input bytes used within PROFIsafe
- › 1 output byte for the functions (e.g. safe control of guard locking)
- › 1 additional output byte (empty)
- › 4 output bytes used within PROFIsafe

All data bits are present in parallel in the non-safe PROFINET data area and can be used as a status bit there.



**Important!**

Never use the status bits for safety functions!

## 13.9.2. Data block for “standard” PROFIsafe



### Important!

Refer to the associated data sheet for the exact bit allocation. Use only bits that are specified according to the data sheet.

Function	Slot	Required memory in data area of the control system (IO controller) (see below for exact bit allocation)										
Diagnostics	See data sheet for slot assignment	Function		-				Guard locking (Z)	Bolt position (R)	Door position (T)	ES (enabling switch)	S94 (emergency stop)
		1st byte	SI0.7	SI0.6	SI0.5	SI0.4	SI0.3	SI0.2	SI0.1	SI0.0		
		Function		-				-	-	-	ÜK	SK
		2nd byte	SI1.7	SI1.6	SI1.5	SI1.4	SI1.3	SI1.2	SI1.1	SI1.0		
		Function										
		3rd - 8th bytes		Unused or used within PROFIsafe (control byte, CRC, etc.)								
		Function		-				-	-	-	-	Guard locking
		1st byte	SO0.7	SO0.6	SO0.5	SO0.4	SO0.3	SO0.2	SO0.1	SO0.0		
		Function		-				-	-	-	-	-
		2nd byte	SO1.7	SO1.6	SO1.5	SO1.4	SO1.3	SO1.2	SO1.1	SO1.0		
		Function										
		3rd - 6th bytes		Used within PROFIsafe (control byte, CRC, etc.)								

### Bit allocation for 1st byte

Input area		Bit	Description	Output area	
	SI0.0	Emergency stop		SO0.0	Guard locking solenoid – control voltage on (Function identical to bit O0.0 in data block for MGB evaluation module L0, L1 or L2 => but with safe control via PROFIsafe)
	SI.01	Enabling switch Enabling contacts closed (three-stage enabling switch in center position), no evaluation of the edges		SO0.1	n.c.
	SI0.2	Door position (T)		SO0.2	n.c.
	SI0.3	Bolt position (R)		SO0.3	n.c.
	SI0.4	Guard locking (Z)		SO0.4	n.c.
	SI0.5	Operating mode selector, 1st bit (here: not used)		SO0.5	n.c.
	SI0.6	Operating mode selector, 2nd bit (here: not used)		SO0.6	n.c.
	SI0.7	Operating mode selector, 3rd bit (here: not used)		SO0.7	n.c.

### Bit allocation for 2nd byte

Input area		Bit	Description	Output area	
	SI1.0	SK (T AND R)		SO1.0	n.c.
	SI1.1	ÜK (T AND R AND Z)		SO1.1	n.c.
	SI1.2	n.c.		SO1.2	n.c.
	SI1.3	n.c.		SO1.3	n.c.
	SI1.4	n.c.		SO1.4	n.c.
	SI1.5	n.c.		SO1.5	n.c.
	SI1.6	n.c.		SO1.6	n.c.
	SI1.7	Reserved for customer-specific function		SO1.7	n.c.

### 13.9.3. "Expanded" PROFIsafe data bytes

The "expanded" PROFIsafe data block includes all safe functions. It is subdivided as follows:

- › 2 input bytes of data for the functions (e.g. emergency stop switch position).
- › 2 additional input bytes (empty)
- › 4 input bytes used within PROFIsafe
- › 1 output byte for the functions (e.g. safe control of guard locking)
- › 1 additional output byte (empty)
- › 4 output bytes used within PROFIsafe

All data bits are present in parallel in the non-safe PROFINET data area and can be used as a status bit there.



**Important!**

Never use the status bits for safety functions!

### 13.9.4. Data block for "expanded" PROFIsafe



**Important!**

› Refer to the associated data sheet for the exact bit allocation. Use only bits that are specified according to the data sheet.

Function	Slot	Required memory in data area of the control system (IO controller) (see below for exact bit allocation)											
Diagnostics	See data sheet for slot assignment	Function		-				Guard locking (Z)	Bolt position (R)	Door position (T)	ES (enabling switch)	S94 emergency stop	
		1st byte	SI0.7	SI0.6	SI0.5	SI0.4	SI0.3	SI0.2	SI0.1	SI0.0			
		Function		-				-	-	-	ÜK	SK	
		2nd byte	SI1.7	SI1.6	SI1.5	SI1.4	SI1.3	SI1.2	SI1.1	SI1.0			
		Function		PSÜK	-	-	ZSIN	ZSQ	ÜKQ	SKQ	NHQ		
		3rd byte	SI2.7	SI2.6	SI2.5	SI2.4	SI2.3	SI2.2	SI2.1	SI2.0			
		Function		-				-	-	-	-	-	-
		4th byte	SI3.7	SI3.6	SI3.5	SI3.4	SI3.3	SI3.2	SI3.1	SI3.0			
		Function											
		5th - 8th bytes		Used within PROFIsafe (control byte, CRC, etc.)									
		Function		ETR	ENR	ANH	-	-	-	Emergency release	Guard locking		
		1st byte	SO0.7	SO0.6	SO0.5	SO0.4	SO0.3	SO0.2	SO0.1	SO0.0			
		Function		-				-	-	-	-	-	-
		2nd byte	SO1.7	SO1.6	SO1.5	SO1.4	SO1.3	SO1.2	SO1.1	SO1.0			
Function													
3rd - 6th bytes		Used within PROFIsafe (control byte, CRC, etc.)											



Bit allocation for 1st byte					
	Bit	Description		Bit	Description
Input area	SI0.0	Emergency stop	Output area	SO0.0	Guard locking solenoid – control voltage on (Function identical to bit 00.0 in data block for MGB evaluation module LO, L1 or L2 => but with safe control via PROFIsafe)
	SI0.01	Enabling switch Enabling contacts closed (three-stage enabling switch in center position), no evaluation of the edges		SO0.1	Emergency release
	SI0.2	Door position (T)		SO0.2	n.c.
	SI0.3	Bolt position (R)		SO0.3	n.c.
	SI0.4	Guard locking (Z)		SO0.4	n.c.
	SI0.5	Operating mode selector, 1st bit		SO0.5	Control of emergency stop (ANH) If this bit is set, the red lamp is switched on during emergency stop. Attention: Internal light control is prioritized; see emergency stop lamp.
	SI0.6	Operating mode selector, 2nd bit		SO0.6	ENR If this bit is set, this allows the emergency stop to be acknowledged from the control panel. This is used in parallel with acknowledgment button S91 in the MGB (OR); only the falling edge is evaluated. This allows all emergency stops to be acknowledged simultaneously from the panel.
	SI0.7	Operating mode selector, 3rd bit		SO0.7	ETR If this bit is set, this allows the SK and the ÜK to be acknowledged from the control system. This is used in parallel with the acknowledgment button in the MGB (OR); only the falling edge is evaluated. This is used for one-time acknowledgment from the control system during system start-up.
Bit allocation for 2nd byte					
	Bit	Description		Bit	Description
Input area	SI1.0	SK (T AND R)	Output area	SO1.0	n.c.
	SI1.1	ÜK (T AND R AND Z)		SO1.1	n.c.
	SI1.2	n.c.		SO1.2	n.c.
	SI1.3	n.c.		SO1.3	n.c.
	SI1.4	n.c.		SO1.4	n.c.
	SI1.5	n.c.		SO1.5	n.c.
	SI1.6	n.c.		SO1.6	n.c.
	SI1.7	Reserved for customer-specific function		SO1.7	n.c.

Bit allocation for 3rd byte		
Bit	Description	
Input area	SI2.0	NHQ This is set if bit NH is set AND the falling edge is detected on bit S91 OR the falling edge is detected in bit ENR.  This is reset when the emergency stop button is pressed. Button S91 (acknowledgment) – operating module in bus module
	SI2.1	SKQ This is set if bit SK is set AND the falling edge is detected on bit S91 OR the falling edge is detected in bit ETR.  This is reset when SK switches off S91 (acknowledgment) – operating module in bus module
	SI2.2	ÜKQ This is set if bit ÜK is set AND the falling edge is detected on bit S91 OR the falling edge is detected in bit ETR.  This is reset when ÜK switches off.
	SI2.3	ZSQ
	SI2.4	ZSIN This is set as long as an enabling switch is inserted and no fault is present. This is reset when the enabling switch is removed.
	SI2.5	n.c.
	SI2.6	n.c.
	SI2.7	PSÜK This is set if bit ÜK is set and there is no ZH control in the Profisafe area (control only from Profinet area with bit ZH). This is reset when ÜK is switched off.
Bit allocation for 4th byte		
Bit	Description	
Input area	SI3.0	n.c.
	SI3.1	n.c.
	SI3.2	n.c.
	SI3.3	n.c.
	SI3.4	n.c.
	SI3.5	n.c.
	SI3.6	n.c.
	SI3.7	n.c.

## 14. MGB system diagnostic messages

All diagnostic messages are listed below. The scope of the possible messages can differ depending on MGB system version.

### PROFIsafe messages

Display via BF LED (see Fig. 16 on page 18)

No.	Description	Measures/rectifying errors
64	Error when comparing the PROFIsafe destination address (F_Dest_Add)	1. Check DIP switch position 2. Restart system
65	Invalid PROFIsafe destination address (F_Dest_Add)	1. Check addressing 2. Restart system
66	Invalid PROFIsafe source address (F_Source_Add)	1. Check addressing 2. Restart system
67	Value for the PROFIsafe time monitoring is 0 ms (F_WD_TIME)	1. Check system times 2. Restart system
68	Parameter F_SIL exceeds SIL of the device-specific application	1. Check settings 2. Restart system
69	Parameter F_CRC_Length does not match the generated values	1. Check settings 2. Restart system
70	Version for F_Parameter not correct	1. Check configuration 2. Restart system
71	Error CRC 1- (during booting)	1. Restart system
72	Device-specific diagnostic information (see following table)	1. Identify error via input bit I0.0 2. For troubleshooting, see the following table with device-specific messages

### Device-specific diagnostic information

Display via SF LED (see Fig. 16 on page 18)

#### Discrepancy error (two-channel monitoring detected an error)

Notice:

- ▶ The discrepancy time is the maximum time during which channel 1 and channel 2 may have different signal states.
- ▶ If acknowledgment was unsuccessful, send the device to the manufacturer.

No.	Description	Measures/rectifying errors
272	Discrepancy time exceeded	1. Search for cause 2. Acknowledge error (via output bit O0.0)
272(1)	Emergency stop discrepancy time exceeded	1. Press emergency stop 2. Acknowledge error (via output bit O0.0)
272(3)	Door position discrepancy time exceeded	1. Open the door 2. Acknowledge error (via output bit O0.0)
272(4)	Bolt position discrepancy time exceeded	1. Open the door 2. Acknowledge error (via output bit O0.0)
272(5)	Guard locking discrepancy time exceeded	1. Open the door 2. Acknowledge error (via output bit O0.0)
272(6)	Operating mode selector	1. Search for cause 2. Acknowledge error (via output bit O0.0)
272(7)	Enabling switch inserted detection (only with "expanded" configuration)	1. Search for cause 2. Acknowledge error (via output bit O0.0)

#### Test-pulse error (short-circuit monitoring detected an error)

Notice:

- ▶ Emergency stop must **not** be pressed during acknowledgment.
- ▶ If acknowledgment was unsuccessful, send the device to the manufacturer.

No.	Description	Measures/rectifying errors
273	Test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O0.0 required.
273(1)	Emergency stop test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O0.0 required.
273(3)	Door position test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close door 2. Acknowledgment via output bit O0.0 required.
273(4)	Bolt position test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close door 2. Acknowledgment via output bit O0.0 required.
273(5)	Guard locking test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close and lock door 2. Acknowledgment via output bit O0.0 required.
273(6)	Operating mode selector	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O0.0 required.
273(7)	Enabling switch inserted detection (only with "expanded" configuration)	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O0.0 required.

**General messages of the overall system**

No.	Description	Measures/rectifying errors
274 (1)	Max. (mech.) life exceeded	Message via input bit 10.7 Message cannot be reset
274(2)	Internal device error	Contact our support organization.
274(3)	Signal sequence erroneous (e.g. broken bolt tongue detected)	1. Check mechanical functions 2. Acknowledge error (via output bit 00.1). The safety door must be open.
274(4)	Plausibility check detected an error (e.g. escape release actuated)	Important: The resetting procedure is contained in the section "Latching fault when actuating the escape release" ▶ Acknowledge error (via output bit 00.1)
274(5)	Locking module in error	Contact our support organization.

**PROFIsafe errors**

No.	Description	Measures/rectifying errors
276(1)	PROFIsafe starting error	Contact our support organization.
276(2)	RAM memory error	
276(3)	FLASH memory error	
276(4)	Communication error	
276(5)	Synchronization error	
276(6)	Voltage monitoring	

**General errors of the overall system**

No.	Description	Measures/rectifying errors
277(1)	MGB starting error	Contact our support organization.
277(2)	Communication error	
278	Internal device error	

**Cyclical Profisafe status message**

Bit	Description	Measures/rectifying errors
0	Reserved	-
1	Error in F-Device or F-Module	Device is being passivated (ON LED flashes). You will find information on de-passivating in the manual for your control system.
2	Communication error, CRC error	
3	Communication error, watchdog timeout	
4	Fail-safe values activated	-
5	Toggle bit	-
6	Consecutive number was reset	-
7	Reserved	-

## 15. System status table

### LEDs on interlocking/locking module

Operating mode	Door position	Position of the bolt tongue	Guard locking	Door position input bit SI0.2	Bolt position input bit SI0.3	Guard locking input bit SI0.4	ÜK input bit SI1.1	Device diagnostics input bit IO.0	Device diagnostics input bit IO.1	Device diagnostics input bit IO.7	POWER (gn)	STATE (gn)		LED indicator		DIA (rd)	State
												long ON short OFF	long OFF short ON	Lock (ye)	Lock (ye)		
<b>Normal operation</b>	open	not inserted	off	off	off	off	off	off	off	X		long ON short OFF	○	○	○	○	Normal operation, door open
	closed	not inserted	off	off	off	off	off	off	off	X		long ON short OFF	○	○	○	○	Normal operation, door closed
	closed	inserted	off	off	off	off	off	off	off	X		long ON short OFF	☀	☀	○	○	Normal operation, door closed, bolt tongue inserted
	closed	inserted	on	on	on	on	on	on	on	X			☀	☀	○	○	Normal operation, door closed and locked
<b>Teach-in standby</b> (only for MGB unit-code)	open	not inserted	off	off	off	off	off	off	off	X	☀		3 x	○	○	○	Door open; device is ready for teach-in of another handle module (only short time after power-UP)
	closed	inserted	on	on	on	on	on	on	on	X			1 Hz	○	○	○	Teach-in operation
<b>Setup</b> (only for MGB unit-code)	X	X	X	off	off	off	off	off	off	X				○	○	○	Positive acknowledgment after completion of teach-in operation
	X	X	X	off	off	off	off	on	off	X			3 x	☀	○	○	Handle module read error (e.g. error in code or code cannot be read)**
	X	X	X	off	off	off	off	on	off	X				○	○	○	Internal fault (e.g. component faulty, data error)*
<b>Fault display</b>	X	X	X	off	off	off	off	on	off	X				○	☀	○	Signal sequence incorrect e.g. broken bolt tongue recognized) ***
																	or after actuation of the escape release, for example*
<b>Key to symbols</b>	○																
	☀																
	☀ 10 Hz (8 s)																
	☀ 3 x																
X																	

\* Latching fault; use corresponding output bit to reset (see chapter 14. MGB system diagnostic messages on page 35)  
 \*\* Non-latching fault; open guard and close it again to reset  
 \*\*\* Latching fault; use corresponding output bit to reset; door must be open (see chapter 14. MGB system diagnostic messages on page 35)

**Important:** If you do not find the displayed device status in the system status table, this indicates an internal device fault. In this case, you should contact the manufacturer.

## 16. Technical data



### NOTICE

If a data sheet is included with the product, the information on the data sheet applies.

Parameter	Value
Housing material	Fiber glass reinforced plastic Die-cast zinc, nickel-plated, stainless steel, powder-coated sheet steel
Dimensions	See dimension drawing
Weight of MGB-L.B (bus module, locking module and operating module with mounting plate)	3.1 kg
Weight of handle module with mounting plate	1.20 kg
Weight of escape release module with mounting plate	1.15 kg
Ambient temperature	-20 ... +55 °C
Degree of protection	IP54
Safety class	III
Degree of contamination	3
Installation position	Any
Locking force $F_{zh}$	2,000 N
$SAR_{SK}$	20 mm <sup>1)</sup>
Connection options, power supply	2 x push-pull power <sup>2)</sup> or 2 x plug connectors 7/8" acc. to ANSI/B93.55M-1981
Connection, bus	2 x RJ 45, push-pull, acc. to EN IEC 61076-3-117 variant 14, screened <sup>2)</sup> or 2 x M12 (d-coded) acc. to EN IEC 61076-2-101
Connecting cable, bus	Profinet I/O cable, at least cat. 5e
Operating voltage $U_B$	DC 24V +10% / -15% (PELV – see chapter 12. <i>Electrical connection on page 19</i> )
Current consumption, max.	600 mA
Max. feed-in current in the connection block (push-pull plug connector)	4,000 mA
Fuse protection for power supply, external	Min. 1 A slow-blow
Safety outputs	Profisafe acc. to EN IEC 61784-3-3
Rated insulation voltage $U_i$	75 V
Rated impulse withstand voltage $U_{imp}$	0.5 kV
Resilience to vibration and shock	Acc. to EN 60947-5-3
EMC protection requirements	Acc. to EN 61000-4 and DIN EN 61326-3-1
Switching frequency, max.,	1 Hz
Risk times, max. (turn-off times) <sup>3)</sup>	
- Emergency stop	250 ms
- Enabling switch	250 ms
- Operating mode selector	220 ms
- Door position	550 ms
- Bolt position	550 ms
- Guard locking	550 ms
<b>Characteristics acc. to EN ISO 13849-1/EN IEC 62061</b>	
Category	4
Safety Integrity Level	SIL 3
Performance Level	PL e
MTTF <sub>D</sub> <sup>4)</sup>	91 years
DC	99%
Mission time	20 years
PFH <sup>4)</sup>	
- Monitoring of guard locking	4.07 x 10 <sup>-8</sup>
- Evaluation of emergency stop, enabling switch, multi-position switch	4.10 x 10 <sup>-8</sup>
$B_{10D}$ <sup>5)</sup>	
- Emergency stop	0.13 x 10 <sup>6</sup>
- Enabling switch	Acc. to manufacturer's specifications

1) Applies only to use on sliding doors with activated guard lock monitoring

2) The document *PROFINET Cabling and Interconnection Technology* from the PNO aids in the correct selection of cables.

3) The risk time is the maximum time between the change in an input status and the clearing of the corresponding bit in the bus protocol.

4) Fixed failure rate without consideration of faults in wearing parts.

5) Information regarding wearing parts without consideration of fixed failure rates in electronic components.

## 17. Troubleshooting

### 17.1. Latching fault when actuating the escape release

In order to achieve monitoring of the locking element in category 4, PL e according to EN ISO 13849-1, an internal monitoring logic system is integrated into every locking module.

**Result:** The MGB system enters into a latching fault when the escape release is actuated (see 15. System status table on page 37).

Door position	Position of the bolt tongue	Guard locking	Door position input bit SIO.2	Bolt position input bit SIO.3	Guard locking input bit SIO.4	ÜK input bit SI1.1	Device diagnostics input bit IO.0	Device diagnostics input bit IO.1	Device diagnostics input bit IO.7	LED indicator				State
										Power (gn)	State (gn)	Lock (ye)	DIA (rd)	
X	X	X	off	off	off	off	on	on	X				1 x	Signal sequence incorrect (e.g. after actuation of the escape release)*
														LED not illuminated
														LED illuminated
													10 Hz (8 s)	LED flashes for 8 seconds at 10 Hz
													3 x	LED flashes three times
													X	Any state



#### NOTICE

The system might not enter into a latching fault if the escape release is actuated very slowly.

### 17.2. Resetting errors

Proceed as follows:

1. Acknowledge fault via output bit OO.1 (in data block for diagnostics function).
  2. Close guard if necessary and switch on guard locking.
- ➔ The system is in normal operation again.

## 18. Service

If servicing is required, please contact:

Euchner GmbH + Co. KG  
Kohlhammerstraße 16  
70771 Leinfelden-Echterdingen  
Germany

**Service telephone:**

+49 711 7597-500

**E-mail:**

support@euchner.de

**Internet:**

www.euchner.com

## 19. Inspection and service



**WARNING**

Loss of the safety function because of damage to the device.  
In case of damage, the affected module must be replaced completely. Only accessories or spare parts that can be ordered from Euchner may be replaced.

Regular inspection of the following is necessary to ensure trouble-free long-term operation:

- › Check the switching function (see chapter 13.5. *Electrical function test on page 22*)
- › Check the secure mounting of the devices and the connections
- › Check for contamination

No servicing is required. Repairs to the device are only allowed to be made by the manufacturer.



**NOTICE**

The year of manufacture can be seen in the lower right corner of the type label.

## 20. Declaration of conformity

The product complies with the requirements according to Machinery Directive 2006/42/EC.

The EU declaration of conformity can be found at [www.euchner.com](http://www.euchner.com). Enter the order number of your device in the search box. The document is available under *Downloads*.





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