

# **EUCHNER**

## **Operating Instructions**

**Extension Module  
MCM-MLI...**

**EN**

**from V1.0.0**

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## 1. About this document

### 1.1. Scope

This document is valid for all extension modules MCM-MLI...

These operating instructions, the document "Safety information and maintenance," the operating instructions for the modules connected and any enclosed data sheets form the complete user information for your system.

Series	Module connection type	Product versions
MCM...	...MLI...	from V1.0.0





#### 1.1.1. Notes on older product versions

Products with lower product versions or without a version number are not described by these operating instructions. Please contact our support team in this case.

### 1.2. Target group





Design engineers and installation planners for safety systems on machines, as well as setup and servicing staff possessing special expertise in handling safety components as well as expertise in the installation, setup, programming and diagnostics of programmable logic controllers (PLCs) and bus systems.

### 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	
Operating instructions (2500236)	(this document)	
Safety information and maintenance (2500232)	Information sheet with important safety information	
Operating instructions for the modules connected and their submodules	Device-specific information for the related module and the submodules installed	
Possibly enclosed data sheets	Item-specific information about deviations or additions	



#### Important!

Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from [www.euchner.com](http://www.euchner.com). For this purpose enter the doc. no. in the search box.

## 2. Correct use

The extension module MCM offers space for additional submodules MSM and is used to expand MGB2 systems with MLI interface.

Before the device is used in combination with a safety function, 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 60204-1
- › Possibly additional standards (depending on the submodules MSM used)

The extension module MCM-MLI may be combined only with suitable modules that have an MLI interface. You will find more detailed information on compatibility in the operating instructions for the related MLI device.

On the unauthorized 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.



### 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 13849-2.
- › Correct use requires observing the permissible operating parameters (see chapter 13. *Technical data on page 15*).
- › If a data sheet is included with the product, the information on the data sheet applies.

## 3. Description of the safety function

The extension module MCM has the safety function of *Evaluating submodules with safety function and forwarding the data to the bus module MBM*. If you use submodules MSM with safety function in the extension module, please observe the description of the safety functions in the operating instructions for your bus module MBM and in any data sheet for your submodule MSM.

## 4. Exclusion of liability and warranty

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

## 5. General safety precautions

Additionally observe the safety precautions in the operating instructions for your bus module MBM.



### WARNING

Danger to life due to improper installation or due to bypassing (tampering). Any contained safety components fulfill a personnel protection function.

- › Contained 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.
- › 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).

## 6. Function

Extension modules MCM have space for up to four submodules. In this way even more extensive control tasks can be realized.

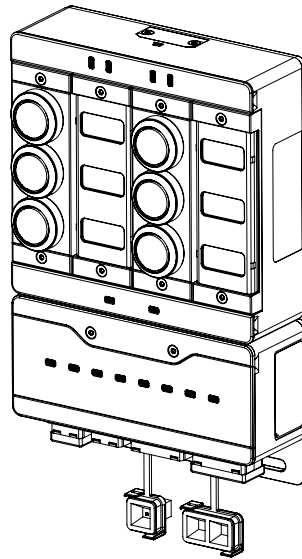
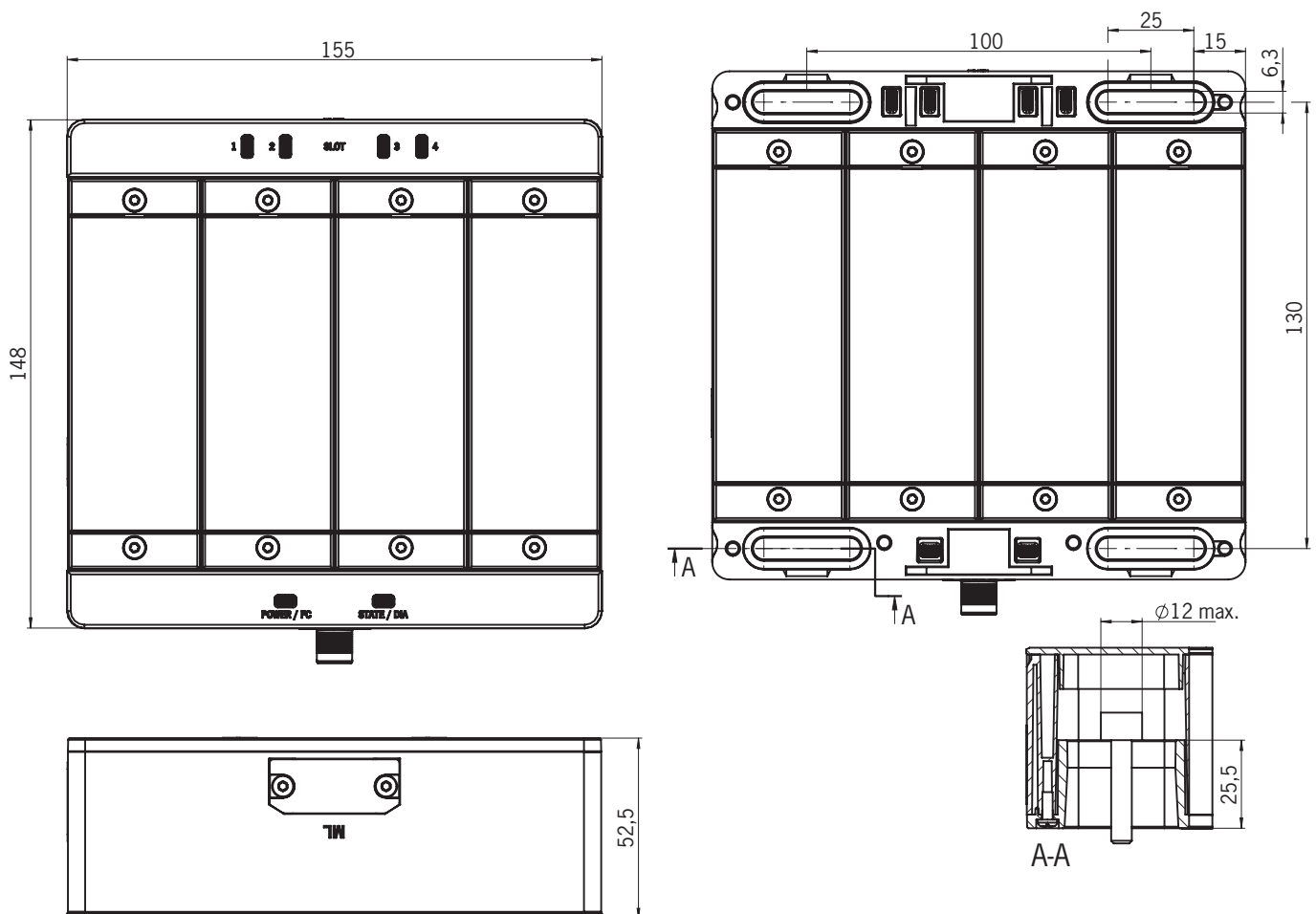


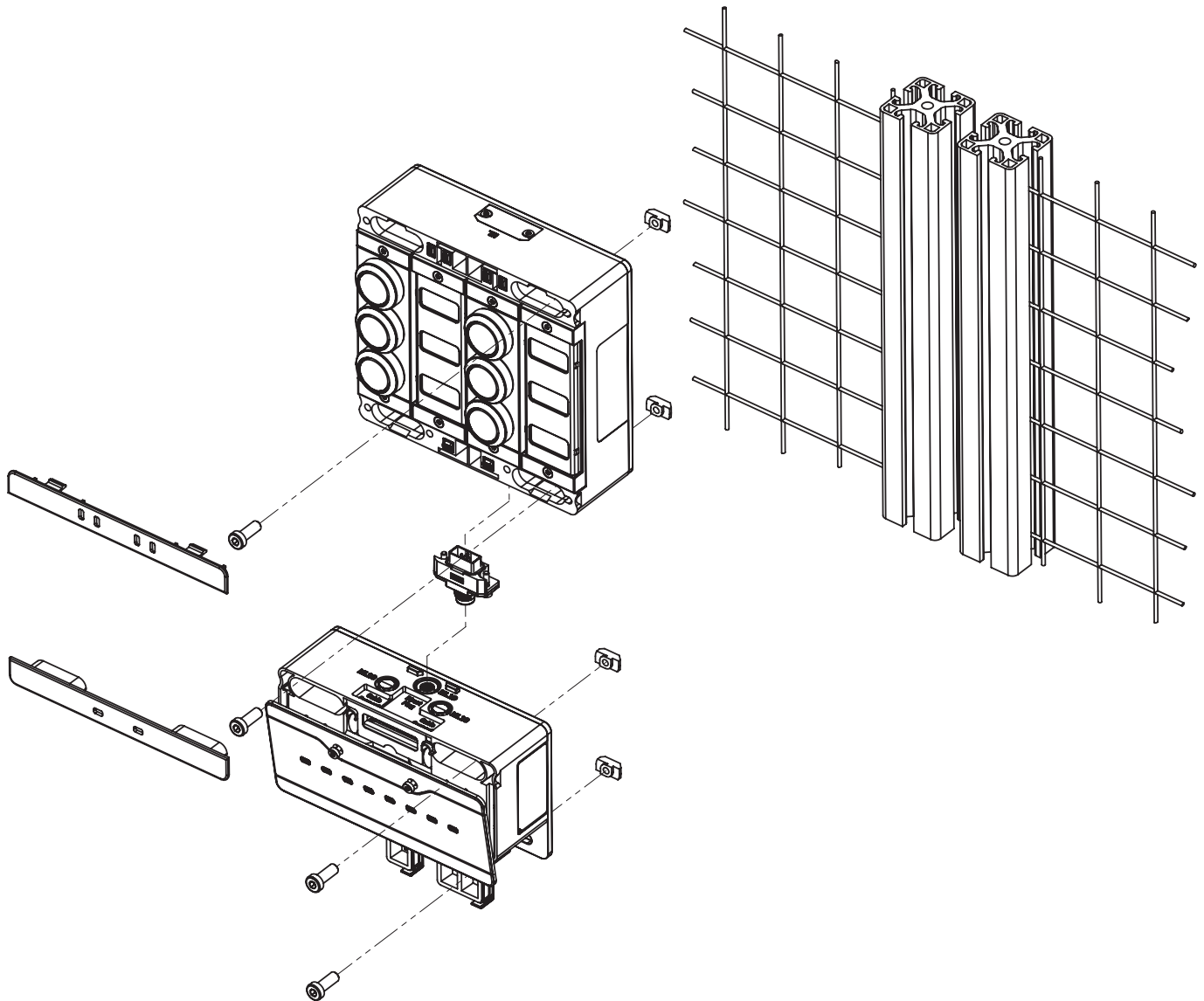
Figure 1: Extension module MCM with two operating modules and two labeling modules on one bus module MBM.

### 6.1. Dimension drawing for extension module MCM



## 7. Mounting

### 7.1. Mounting modules



### 7.2. Replacing modules



#### CAUTION

Risk of damage to equipment or malfunction as a result of uncontrolled machine stop. The communication within the system is interrupted by the replacement of a module, and the safe bits are reset. If a process is running, this situation can result in an uncontrolled stop and damage to the installation or the product.

› Before replacement make sure the installation is in a suitable operating mode.

Modules (e.g. locking modules or extension modules) can be replaced only in combination with a restart of the overall system. On the disconnection of the module connection, the system enters into a fault state. The affected module and all downstream modules remain inactive (fault state) until the overall system is restarted.

### 7.3. Mounting submodules



#### CAUTION

Risk of damage to equipment or malfunction as a result of incorrect connection or a configuration change.

- › Only submodules of connection types P, R, E and N can be used. Check the compatibility before installation. For information on the related connection type of a submodule, please refer to the sticker on the rear of the submodule or the data sheet for the related submodule. This is included with each submodule.
- › Pay attention to the alignment of the submodule. See marking (a) in *Figure 2: Mounting submodule*. Submodules can also be installed rotated by 180°. The marking (a) always indicates the first position to be equipped. This means the position of pushbutton S1 in the example below.
- › Make sure the pins on the submodule slide straight into the guide. Tighten the cover screws to 0.5 Nm.
- › On using a submodule with labeling fields, pay attention to the correct alignment of the modules in relation to the labeling fields. Incorrect assignments can cause serious malfunctions in your installation.
- › Make sure no foreign bodies, e.g. chips or wires, enter the open slots on the submodule. These can cause short circuits or contact problems.
- › Avoid touching the contacts on the underside of the submodule. Risk of ESD damage and contact problems due to soiling.
- › Unused submodule slots must be fitted with a cover (e.g. order number 126372).

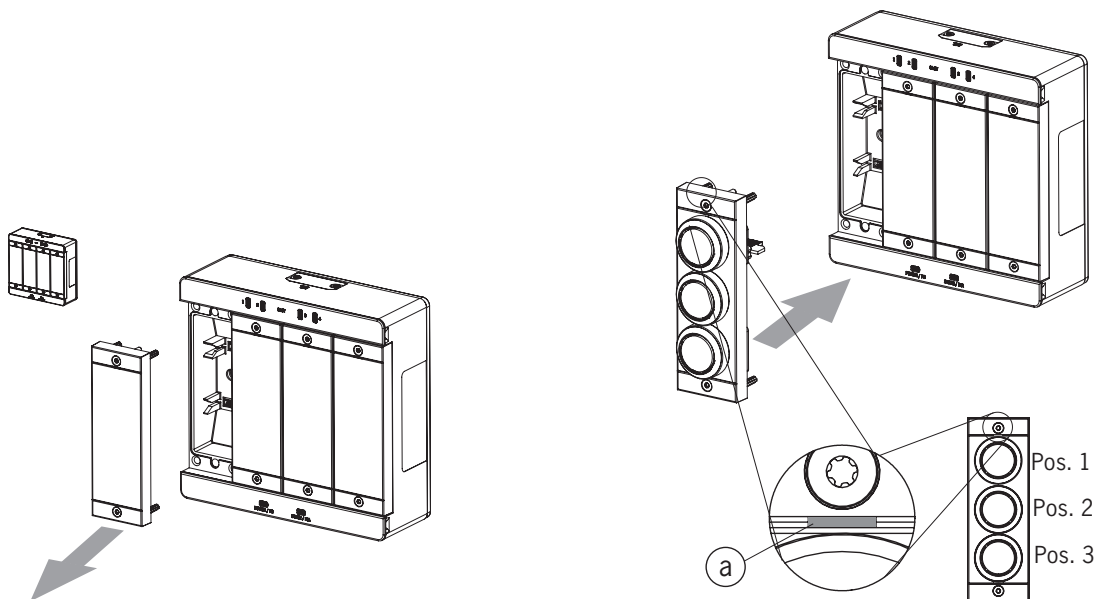


Figure 2: Mounting submodule



## 7.4. Replacing submodules



### CAUTION

Risk of damage to equipment or malfunction as a result of uncontrolled machine stop. The communication within the system is interrupted by the replacement of a submodule, and the safe bits are reset. If a process is running, this situation can result in an uncontrolled stop and damage to the installation or the product.

› Before replacement make sure the installation is in a suitable operating mode.



### NOTICE

Pay attention to the information on the replacement of a submodule in the operating instructions for the related module. On submodules with a safety function, the correct function must be tested after replacement before the system enters normal operation again.

Submodules MSM can be replaced during operation as well (pay attention to safety note above). As soon as the system detects a correct submodule, the submodule is ready for operation. The system reacts as follows on a replacement:

1. If the submodule MSM is removed, the SLOT LED illuminates red, interrupted by 1x green flash. In addition, the SF LED on the bus module MBM illuminates red
2. If the submodule MSM contains a safety function, the related bit on the bus is cleared as soon as the submodule has been removed
3. If an identical submodule is inserted with the same alignment, the fault display goes out and the bit is transmitted on the bus again to suit the actual situation.

### 7.4.1. Replacing faulty submodule

A submodule should be replaced during operation.



### Important!

If alignment detection is active, the system checks the alignment of the newly inserted submodule and compares it to the submodule inserted last. The alignment of the previous submodule must be retained in this situation because otherwise the configuration of the device will change. If a configuration change is required, pay attention to the sequence in 7.4.2. *Replacing submodule with a submodule with a different function (changing configuration)*. You will find information on switching on and off the alignment detection in the operating instructions for your bus module MBM.

### 7.4.2. Replacing submodule with a submodule with a different function (changing configuration)

The system saves the last configuration of your system.

The configuration changes if

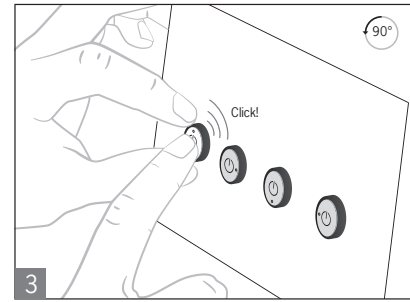
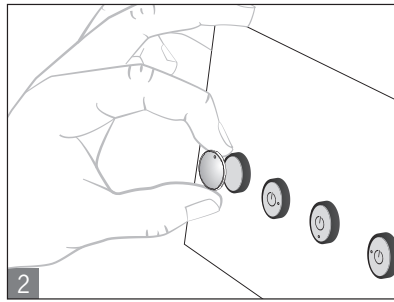
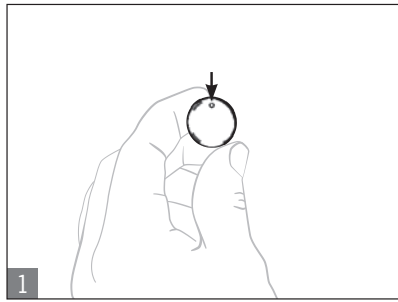
- › You replace a submodule with a submodule with a different function or
- › You fit the same submodule rotated by 180°.

Adapt the configuration in the configuration software for your control system.

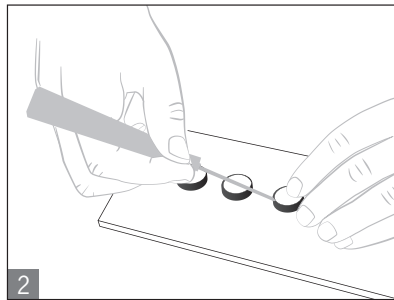
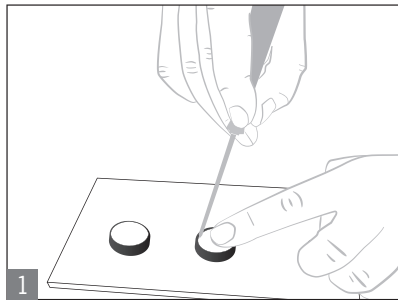
Then the new configuration must be taught-in by restarting the bus module MBM. You will find further information in the operating instructions for your bus module MBM.

## 7.5. Fitting and removing lenses and labels for controls and indicators

### Fitting



### Removing



## 8. Protection against environmental effects

A 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 housing.

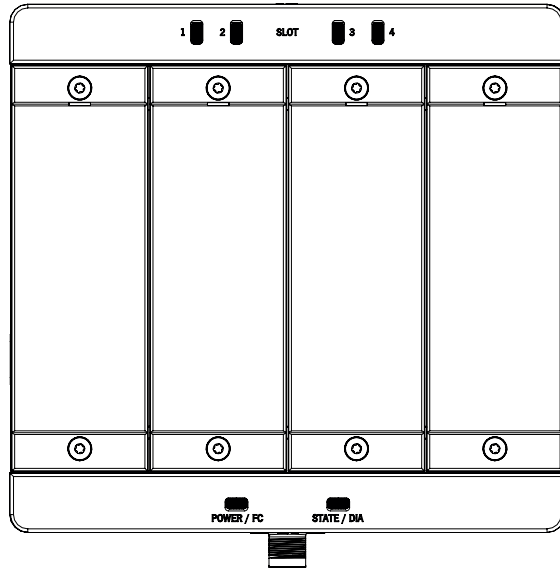
Pay attention to the following measures:

- › Seal unused connections using the covers provided.
- › Make sure the housing covers are correctly sealed and the cover screws are tightened to the necessary tightening torque.
- › Cover the device during painting work.

## 9. Controls and indicators

### 9.1. LED displays

The LEDs indicate the device status and the communication status. An exact description of the indicators and faults can be found in section 11. Setup.



LED	Description
<b>Extension module MCM</b>	
POWER/FC	Combined indication Power: illuminated with correct power supply FC (fault code): flashes 1 x to indicate MLI connection faults Color: green
STATE/DIA	Combined indication STATE: indicates the device state Color: green DIA: indicates faults Color: red
SLOT 1 ...4	Indicates the status of the submodule Color: red/green

## 10. Electrical connection



### Important!

Pay attention to the instructions on electrical connection in the operating instructions for your bus module MBM.

### 10.1. Connecting modules

Modules can either be connected together directly or using cables (see *Figure 3: Connecting modules*).

Each module has a top and a bottom connection. You can use either the bottom or the top connection or both if the module is between two other modules.

The bottom module connector is already integrated. To use the top connection, change its position. If you want to use both connections, you must order a corresponding module connector. Use only the module connectors intended to interconnect the modules (see *Table 1: Overview of module connectors*). The maximum cable length for a line must not exceed 20 m.

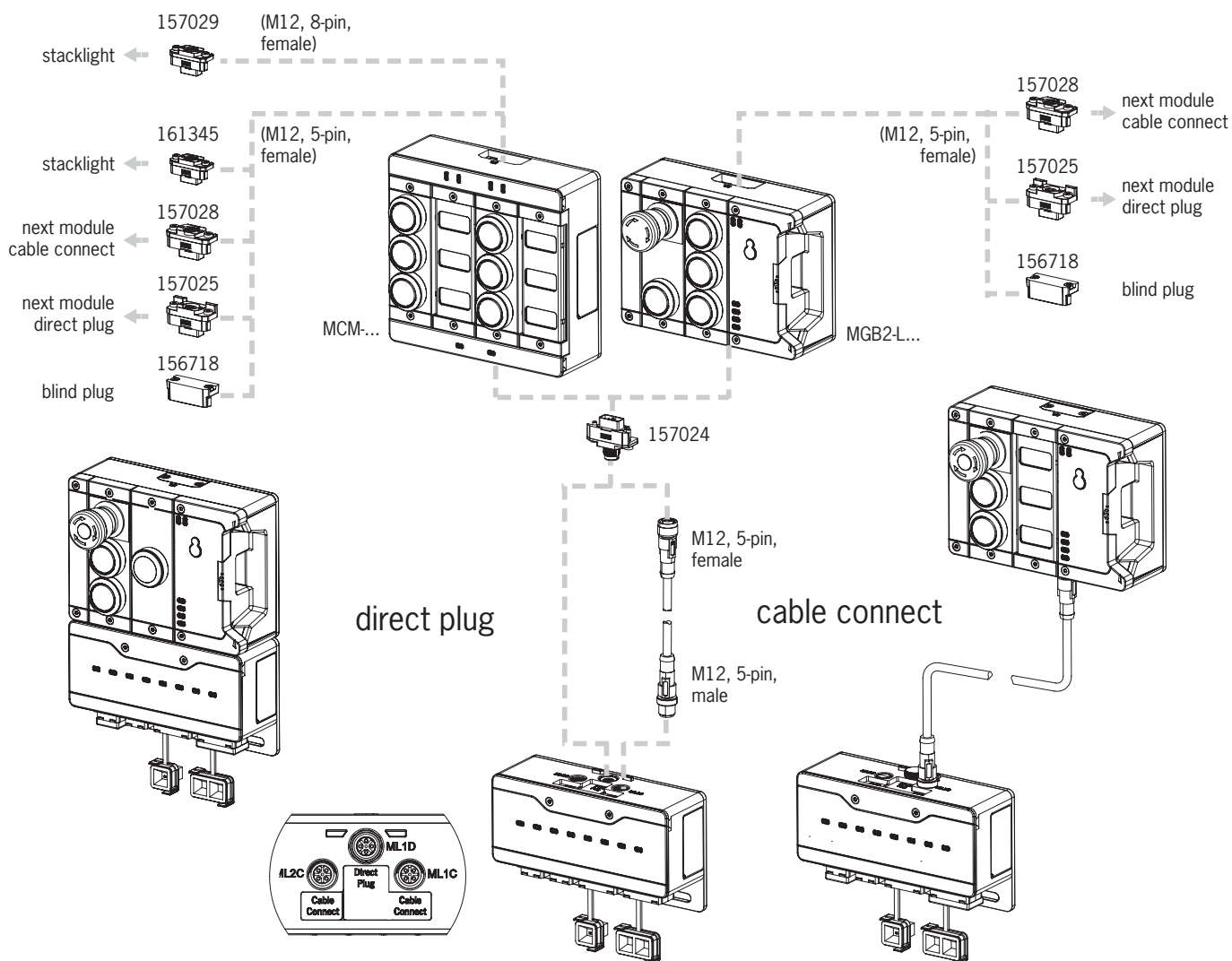


Figure 3: Connecting modules

Table 1: Overview of module connectors

Function	Order no.	Included?
Module connector M12, 5-pin, male	157024	1x
Blanking cover	156718	1x
Set with sealing caps for unused connections	156739	Yes
Module connector, 5-pin socket, for the direct connection of a further module	157025	No, must be ordered separately
Module connector M12, 5-pin socket, for the connection of a further module via a connecting cable	157028	
Module connector M12, 5-pin socket, for the connection of a stacklight	161345	
Module connector M12, 8-pin socket, for the connection of a stacklight	157029	
Connecting cable M12, 5-pin	See catalog or <a href="http://www.euchner.com">www.euchner.com</a>	
Connecting cable M12, 8-pin		

## 11. Setup

For instructions on setup, please refer to the operating instructions for your bus module MBM.

### 11.1. System status table (module LEDs)

If there are faults, the bit `EM.E_G` is set. After the fault has been rectified, it can be acknowledged using the bit `EM.ACK_G`. The bit `EM.E_G` is reset during the process.

Operating mode	LED indicator					Device diagnostics, related fault/ status bit	State
	POWER/FC (gn)	STATE/DIA (gn/rd)	SLOT 1 ...4				
Normal operation							Normal operation
Fault display					1 Hz	EM.E_G and EM.E_SM	Fault in the safety equipment of the submodule. See 11.2. System status table (slot LEDs)
		1 x				EM.E_G	MLI communication fault (also refer to the operating instructions for your bus module MBM)
			5 x			EM.E_G	Environmental fault (e.g. temperature or power supply outside the permissible range)
						EM.E_G	Internal fault (e.g. component faulty, data error)*
Key to symbols							LED not illuminated
							LED illuminated (here: green)
				10 Hz, 8 s			LED flashes for 8 seconds at 10 Hz
				3 x			LED flashes three times
							LED flashes, short ON, long OFF
				X			Any state

\* Latching fault; use corresponding output bit `EM.ACK_G` to reset.

**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.

## 11.2. System status table (slot LEDs)

If a fault occurs on the submodule, the bit EM.E\_SM.. is set. As soon as the fault has been corrected, it is reset automatically (non-latching fault).

Fault display LED SLOT1 ... 4	Meaning	Measures
OFF	A submodule is not used or Submodule functioning without faults	-
Red ON Green flashes 1 x	Submodule missing although a submodule was included in the last configuration	Insert suitable submodule or Change configuration
Red ON Green flashes 2 x	Submodule is installed rotated by 180°	Case 1: Submodule type is correct, but submodule must be installed rotated by 180°. Case 2: If it is intended to change the configuration, the system must be restarted so that the required configuration is taught-in. Case 3: Alignment is irrelevant for this submodule, but the parameter for alignment detection is active. Change parameter for alignment detection and restart system.
Red ON Green flashes 3 x	Submodule does not correspond to the submodule type configured last	Insert submodule of appropriate type or Change configuration
Red ON	Internal fault in the submodule	Replace submodule. ▶ If the problem persists: replace the base unit
Red flashing (1 Hz)  The DIA LED also illuminates	Fault in the safety equipment, can be reset automatically ▶ Enabling switch discrepancy fault ▶ Other input faults on the submodule	For enabling switch: Release enabling switch and press again. ▶ If the problem persists: check the cable and connection ▶ If the problem persists: replace the submodule ▶ If the problem persists: replace the base unit  For all other submodules: Replace submodule. ▶ If the problem persists: replace the base unit

## 12. Diagnostics, troubleshooting and aids

For instructions on diagnostics and troubleshooting, please refer to the operating instructions for your bus module MBM.

## 13. 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
Dimensions	See dimension drawing
Weight	Approx. 1 kg
Ambient temperature	-25 ... +55 °C
Degree of protection	IP65
Safety class	III
Degree of contamination	3
Installation orientation	Any
Connection options, power supply	Supply via MLI connection on the bus module or a module connected in-between
Current consumption, max. (without submodules)	75 mA
Current consumption, max., per submodule	50 mA
Current consumption, max., for stacklight module	100 mA per output at 24 V DC
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
Risk times, max. (turn-off times) <sup>1)</sup> - Extension module MCM - Submodules MSM	The extension module MCM does not contribute to increasing the risk time See information in the operating instructions for your bus module
<b>Reliability values acc. to EN ISO 13849-1:2015</b>	
Category	4
Performance Level	PL e
MTTF <sub>d</sub>	750 years
DC	99%
Mission time	20 years
PFH <sub>d</sub>	2.82 x 10 <sup>9</sup>

1) The risk time is the max. time between the change in the input status and the clearing of the corresponding bit in the bus protocol.

## 14. Service

If servicing is required, please contact:

EUCHNER GmbH + Co. KG  
Kohlhammerstraße 16  
70771 Leinfelden-Echterdingen

**Service telephone:**

+49 711 7597-500

**E-mail:**

support@euchner.de

**Internet:**

www.euchner.com

## 15. 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 secure mounting of the devices and the connections

Further inspection measures may be necessary for the modules connected and submodules installed. Please refer to the related operating instructions.

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 rating plate.



## 16. Declaration of conformity



# EUCHNER

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**EU-Konformitätserklärung**  
**EU declaration of conformity**  
**Déclaration UE de conformité**  
**Dichiarazione di conformità UE**  
**Declaración UE de conformidad**

Original DE  
Translation EN  
Traduction FR  
Traduzione IT  
Traducción ES

2518509-03-06/19

Die nachfolgend aufgeführten Produkte sind konform mit den Anforderungen der folgenden Richtlinien (falls zutreffend):  
The beneath listed products are in conformity with the requirements of the following directives (if applicable):  
Les produits mentionnés ci-dessous sont conformes aux exigences imposées par les directives suivantes (si valable)  
I prodotti sotto elencati sono conformi alle direttive sotto riportate (dove applicabili):  
Los productos listados a continuación son conforme a los requisitos de las siguientes directivas (si fueran aplicables):

I:	Maschinenrichtlinie	2006/42/EG
	<i>Machinery directive</i>	2006/42/EC
	<i>Directive Machines</i>	2006/42/CE
	<i>Direttiva Macchine</i>	2006/42/GE
	<i>Diretiva de máquinas</i>	2006/42/CE
II:	Funkanlagen-Richtlinie (RED)	2014/53/EU
	<i>Radio equipment directive</i>	2014/53/EU
	<i>Directive équipement radioélectrique</i>	2014/53/UE
	<i>Direttiva apparecchiatura radio</i>	2014/53/UE
	<i>Diretiva equipo radioeléctrico</i>	2014/53/UE
III:	RoHS Richtlinie	2011/65/EU
	<i>RoHS directive</i>	2011/65/EU
	<i>Directive de RoHS</i>	2011/65/UE
	<i>Direttiva RoHS</i>	2011/65/UE
	<i>Diretiva RoHS</i>	2011/65/UE

Die Schutzziele der Niederspannungsrichtlinie 2014/35/EU und EMV Richtlinie 2014/30/EU werden gemäß Artikel 3.1 der Funkanlagen-Richtlinie eingehalten.  
The safety objectives of the Low-voltage directive 2014/35/EU and EMC Directive 2014/30/EU comply with article 3.1 of the Radio equipment directive.  
Les objectifs de sécurité de la Directive basse tension 2014/35/UE et Directive de CEM 2014/30/UE sont conformes à l'article 3.1 de la Directive équipement radioélectrique.  
Gli obiettivi di sicurezza della Direttiva bassa tensione 2014/35/UE e Direttiva CEM 2014/30/UE sono conformi a quanto riportato nell'articolo 3.1 della Direttiva apparecchiatura radio.  
Los objetivos de seguridad de la Directiva de bajo voltaje 2014/35/UE y Directiva CEM 2014/30/UE cumplen con el artículo 3.1 de la Directiva equipo radioeléctrico.

Folgende Normen sind angewandt:  
Following standards are used:  
Les normes suivantes sont appliquées:  
Vengono applicate le seguenti norme:  
Se utilizan los siguientes estándares:

a:	EN 60947-5-3:2013
b:	EN ISO 14119:2013
c:	EN ISO 13849-1:2015
d:	EN 62061:2005/A2:2015
e:	EN 60947-5-5:1997/A11:2013
f:	EN 50364:2010
g:	EN 300 330 V2.1.1
h:	EN 50581:2012 (RoHS)

Bezeichnung der Bauteile Description of components Description des composants Descrizione dei componenti Descripción de componentes	Type Type Type Tipo Tipo	Richtlinie Directives Directive Direttiva Directivas	Normen Standards Normes Norme Estándares	Zertifikats-Nr. No. of certificate Número du certificat Número del certificado Número del certificado
Sicherheitsschalter Safety Switches Interrupteurs de sécurité Fincorsa di sicurezza Interruptores de seguridad	MGB2-I.-MLI... MGB2-L.-MLI... MGB2-H... MBM... MCM... MSM...	I, II, III	a, b, c, d, f, g, h	Z10 040393 0028
Sicherheitsschalter mit Not-Halt-Einrichtungen Safety Switches with Emergency-Stop facilities Interrupteurs de sécurité avec appareillage arrêt d'urgence Fincorsa di sicurezza con dispositivi di arresto di emergenza Interruptores de seguridad con dispositivos de parada de emergencia	MGB2-I.-MLI... MGB2-L.-MLI... MCM... MSM...			

Benannte Stelle  
Notified Body  
Organisme notifié  
Sede indicata  
Entidad citada

NB 0123  
TÜV SÜD Product Service GmbH  
Ridlerstrasse 65  
80339 München  
Germany

26.06.2019 - NG -VS - Blatt/Sheet/ Page/Pagina/ Página 1  
EUCHNER GmbH + Co. KG Kohlhammerstraße 16 70771 Leinfelden-Echterdingen Tel. +49/711/7597-0 Fax +49/711/753316 www.euchner.de info@euchner.de

Vorlage Rev 01



## EUCHNER

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Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller:  
*This declaration of conformity is issued under the sole responsibility of the manufacturer:*  
*La présente déclaration de conformité est établie sous la seule responsabilité du fabricant:*  
*La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante:*  
*La presente declaración de conformidad se expide bajo la exclusiva responsabilidad del fabricante:*

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

Leinfelden, Juni 2019

EUCHNER GmbH + Co. KG  
Kohlhammerstraße 16  
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