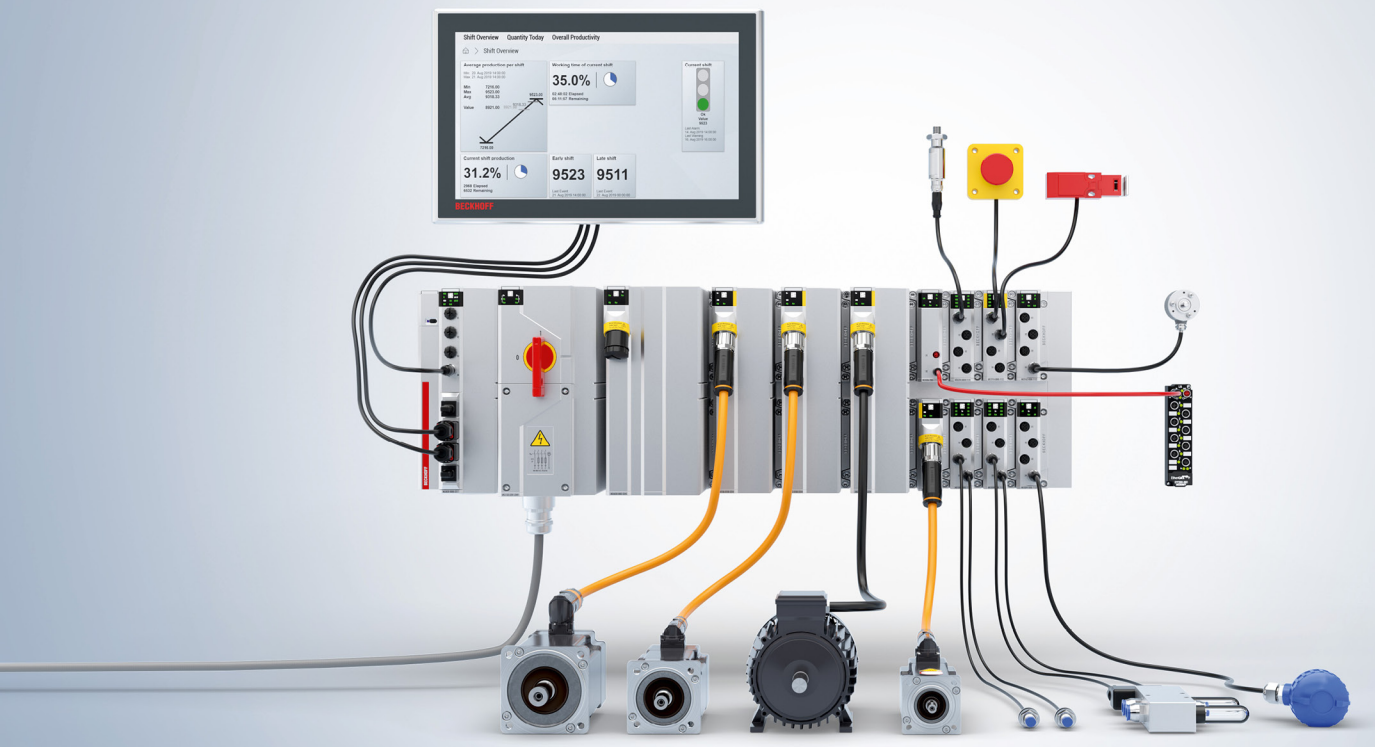
BECKHOFF New Automation Technology

Manual | EN

MR1310-0011-2242

3-channel relay, replaceable fuses, 230/277 V AC/10 A, M12



2026-11-12 | Version: 1.0

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1 Foreword

1.1 Notes on the documentation

This description is intended exclusively for trained specialists in control and automation technology who are familiar with the applicable national standards.
The documentation and the following notes and explanations must be complied with when installing and commissioning the components.
The trained specialists must always use the current valid documentation.

The trained specialists must ensure that the application and use of the products described is in line with all safety requirements, including all relevant laws, regulations, guidelines, and standards.

Disclaimer

The documentation has been compiled with care. The products described are, however, constantly under development.
We reserve the right to revise and change the documentation at any time and without notice.
Claims to modify products that have already been supplied may not be made on the basis of the data, diagrams, and descriptions in this documentation.

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1.2 For your safety

Safety regulations

Read the following explanations for your safety.
Always observe and follow product-specific safety instructions, which you may find at the appropriate places in this document.

Exclusion of liability

All the components are supplied in particular hardware and software configurations which are appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation, and drive technology who are familiar with the applicable national standards.

Signal words

The signal words used in the documentation are classified below. In order to prevent injury and damage to persons and property, read and follow the safety and warning notices.

Personal injury warnings

⚠ DANGER
Hazard with high risk of death or serious injury.

⚠ WARNING
Hazard with medium risk of death or serious injury.

⚠ CAUTION
There is a low-risk hazard that could result in medium or minor injury.

Warning of damage to property or environment

NOTICE
The environment, equipment, or data may be damaged.

Information on handling the product



This information includes, for example:
recommendations for action, assistance or further information on the product.

1.3 Intended use

This documentation describes a module designed to supply individually switchable phases of the three-phase AC voltage of the MX system. It may only be operated if it is mounted on a baseplate in accordance with the installation instructions in this manual and the fuse cover is closed.

With the exception of the fuse cover, the housing must not be opened by the user. There are no user-serviceable parts inside the housing. The housing screws on the bottom of the module may only be loosened by Beckhoff Service.

Intended use of an MX-System

Application in machines and systems in industrial environments and exclusively inside buildings.

The electrical wiring must be permanent wiring.

Improper use

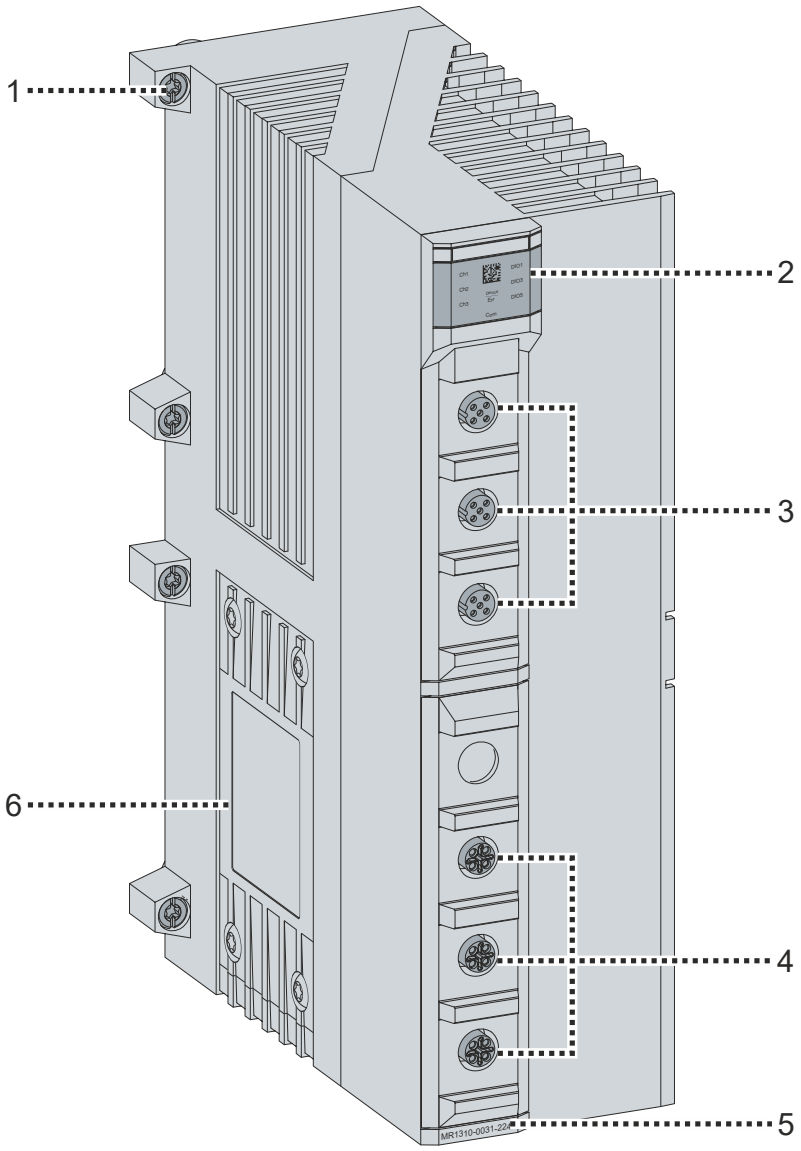
Improper use is not permitted and will result in the exclusion of liability on the part of Beckhoff Automation GmbH & Co. KG.

1.4 Safety instructions

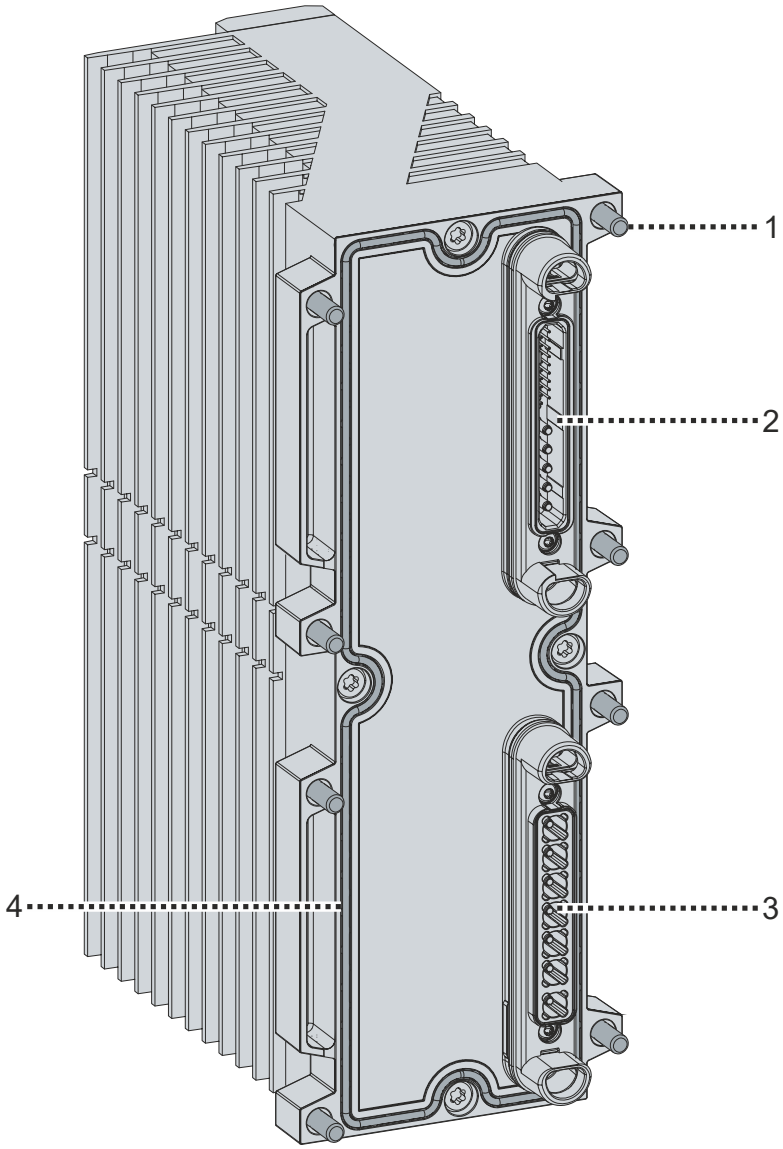
This module works with a life-threatening voltage. Work on the module may only be carried out in a de-energized state.

2 Product overview

The MR1310-0011-2242 relay module is used to connect resistive or inductive 1-phase AC loads. Each of the three relay outputs carries one phase together with the neutral conductor to the outside and can switch up to 10 A. Connection is via M12 connectors. The fuses for line protection are accessible and replaceable via a fuse flap on the side. The MR1310-0011-2242 also features three separate M12 connectors, each with two digital inputs.



Position	Name
1	Fastening screw, captive, 8 x
2	Status display
3	Digital inputs
4	Relay outputs
5	Module name
6	Safety flap



Position	Name
1	Fastening screw, captive, 8 x
2	Data connector
3	Power connector
4	Seal

2.1 Product functions

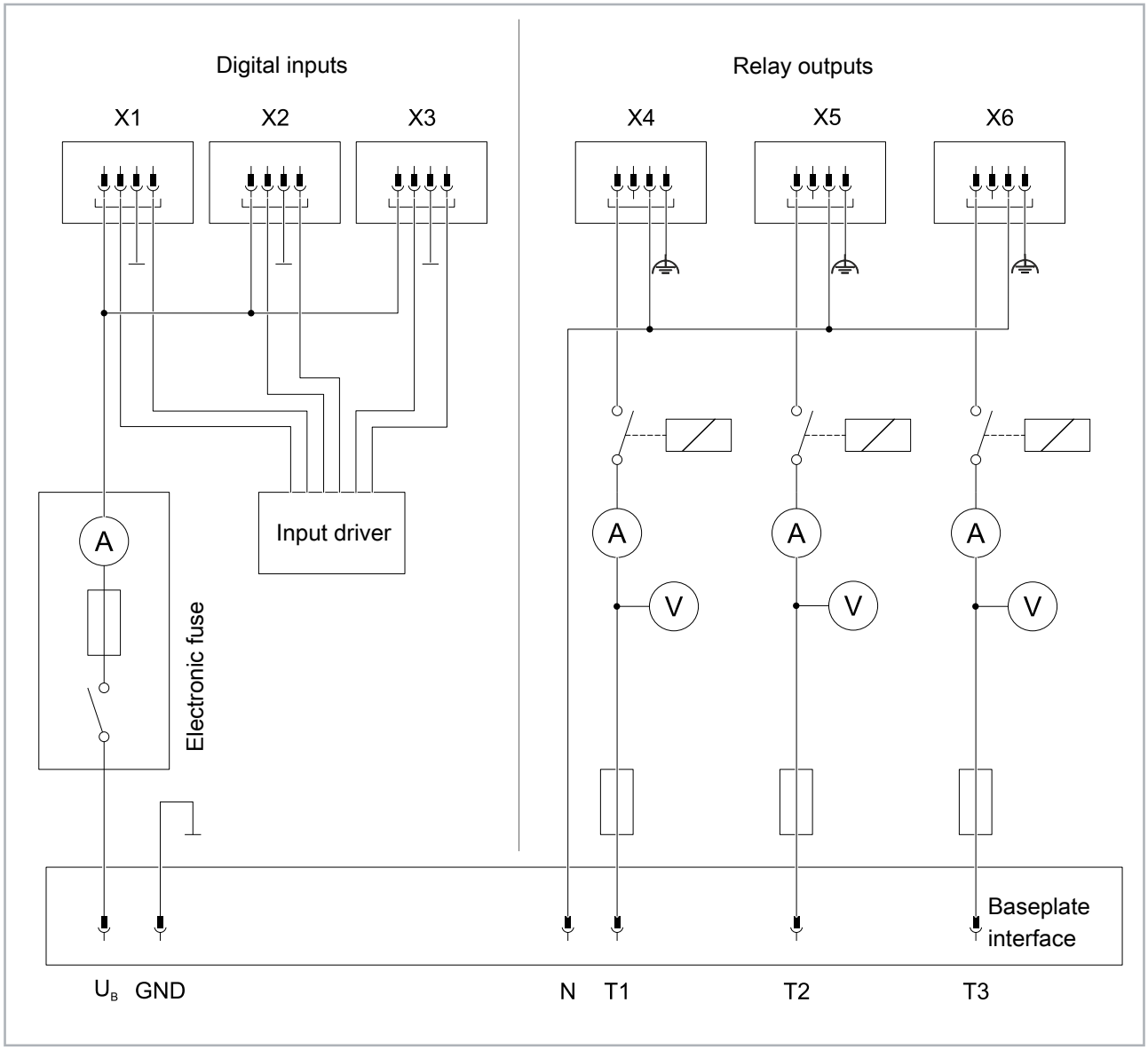
2.1.1 Relay outputs

The module is used to connect resistive or inductive 1-phase AC loads. At each of the three relay outputs, one phase of the internal three-phase AC voltage and the neutral conductor are available; the phase can be switched via a relay. Each output thus carries one phase together with the neutral conductor to the outside and can switch up to 10 A. Connection is made via M12 connectors. The fuses for line protection are accessible via a fuse flap on the side and are replaceable.

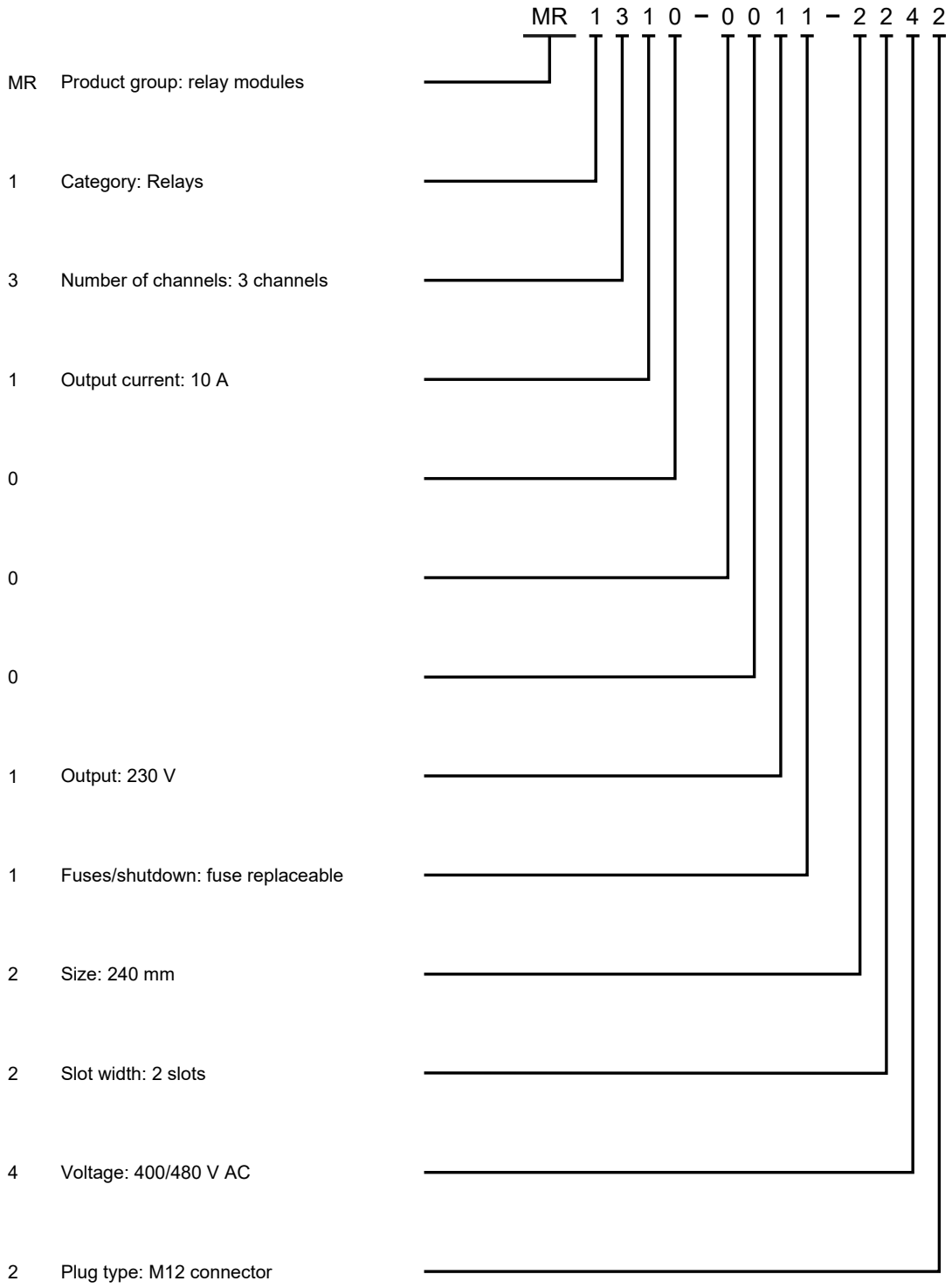
2.1.2 Digital inputs

The module also features six digital inputs connected to three separate M12 connectors. For the digital inputs, there is also one power supply output per connector; these three power supply outputs are protected by a common electronic fuse.

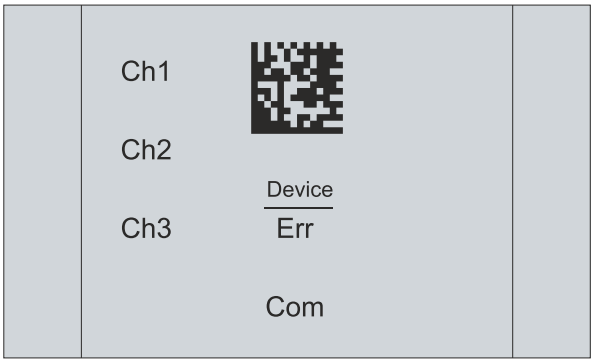
2.2 Block diagram



2.3 Type key


MR 1 3 1 0 – 0 0 1 1 – 2 2 4 2
MR Product group: relay modules
1 Category: Relays
3 Number of channels: 3 channels
1 Output current: 10 A
0
0
0
1 Output: 230 V
1 Fuses/shutdown: fuse replaceable
2 Size: 240 mm
2 Slot width: 2 slots
4 Voltage: 400/480 V AC
2 Plug type: M12 connector

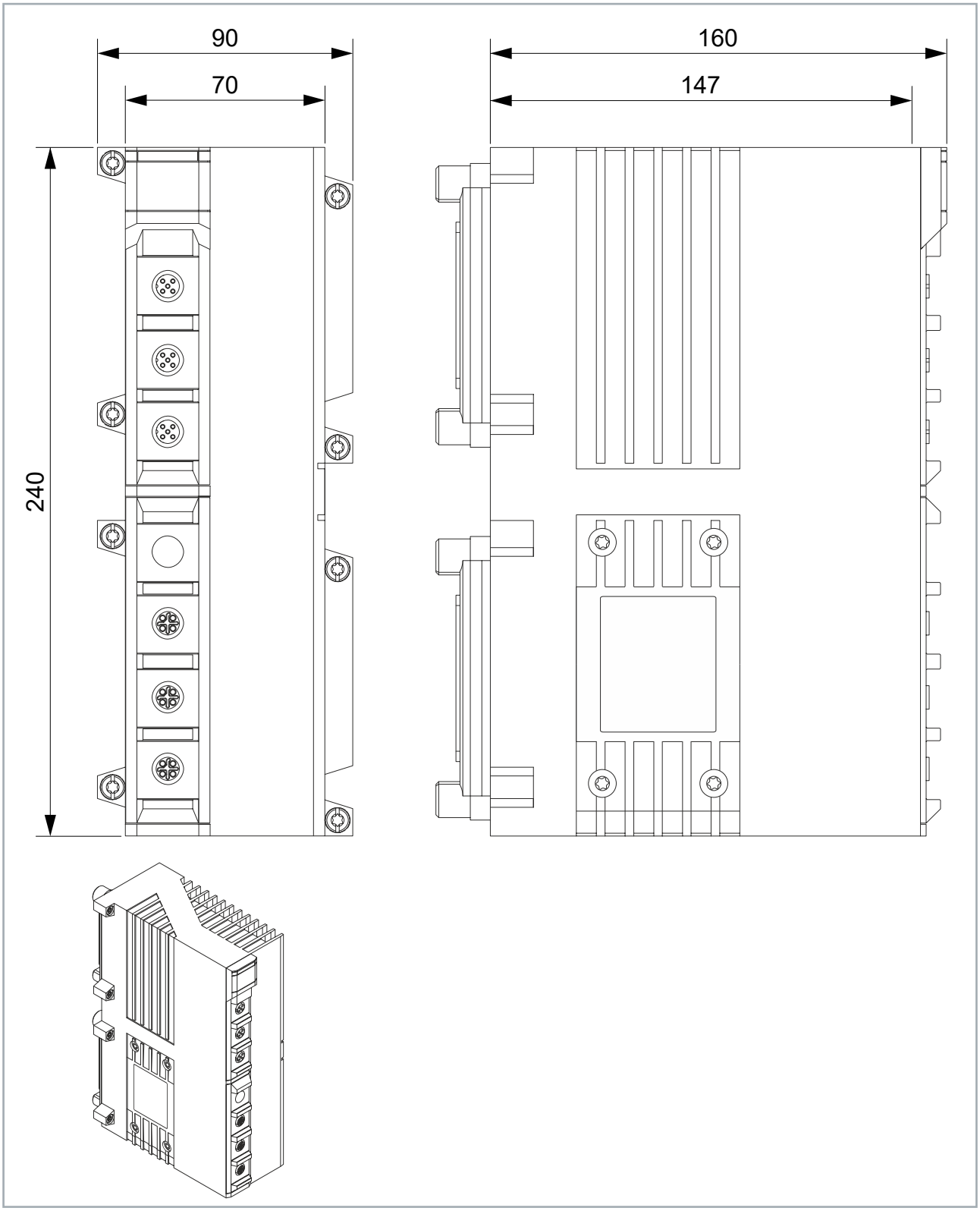
2.4 Status display



LED	State	Meaning
	-	Beckhoff Identification Code as Data Matrix code
Ch1/Ch2/Ch3	off	The corresponding relay output is turned off.
	flickers green	Undefined status at the corresponding relay output (the relay does not turn off).
	lights up green	The corresponding relay output (phase T1/T2/T3) is switched on.
Com	off	EtherCAT communication status: Initialization Initial state after switching on. The device is detected and initialized; no process data exchange is taking place yet.
	flashes green	EtherCAT communication status: Pre-Operational The device is configurable. Mailbox communication (e.g., CoE/ SDO accesses) is possible, but process data is not yet being transmitted.
	green single flash	EtherCAT communication status: Safe-Operational Configuration is now complete. The device receives and processes process data; however, the outputs remain in a safe state and are not yet activated.
	lights up green	EtherCAT communication status: Operational Normal operating state. Full cyclic process data exchange; inputs and outputs are active.
	flickers green	EtherCAT communication status: Bootstrap Special maintenance mode for firmware updates. Normal process data communication is not possible.
Device | Err	off	There are no active error messages.
	lights up red	There are active error messages. You can find more detailed information in TwinCAT.

2.5 Dimensions

All dimensions in mm



3 Technical data

All values are typical values over the entire temperature range, unless stated otherwise.

Baseplate interface	
Connector	1 data connector 1 power connector
Fieldbus	EtherCAT
Distributed clocks	No
Hot Swap	No

Input voltage AC	
Input voltage range	230…277 V AC (-15%…+20%)
Input current	7 A per phase 15 A in total
Frequency	50…60 Hz (±10%)

Relay outputs	
Connection	3 x M12 socket, 4-pin, S-coded
Load type	Resistive, inductive
Output voltage	230…277 V AC (-15%…+ 20%) from the baseplate
Output current	Max. 10 A per phase Max. 30 A in total
Switching frequency	Max. 6/min at 7 A output current Max. 300/min without load
Switching cycles	Electrical (under load): 100,000 Mechanical (without load): 20 million.
Current measuring range full scale value	24.42 A
Current measurement uncertainty	1.25% of measuring range full scale value
Fuse per phase	Replaceable, 16 A, 600 V AC, gRL 10.3 x 38 mm fuse, fine, 16 A, 600 V AC (SIBA 60 034 34.16)

Digital inputs	
Number of channels	6
Connection	3 x M12 socket, 5-pin, A-coded
Signals per connector	24 V DC (-15%…+20%) (electronic fuse) 2 x Digital In
Electronic fuse protection voltage output	4 A or 100 W

Housing data	
Width (slots)	2
Height (rows)	2
Dimensions W × H × D	90 mm × 240 mm × 160 mm 90 mm × 240 mm × 147 mm (housing only)
Material	Zinc die-cast and aluminum die-cast
Cooling	Convection
Installation position	Vertical. See system manual, chapter "Installation conditions".

Standards, approvals	
Device safety	Conforms to EN 61010-2-201
EMC immunity/emission	Conforms to EN IEC 61000-6-2/EN IEC 61000-6-4
Vibration/shock resistance	Conforms to EN 60068-2-6/EN 60068-2-27
Approvals	• CE • UL in preparation

Device safety	
Separation between main and control circuits	Double or reinforced electrical isolation
Protection class	I

Environmental conditions	
Operating temperature	0…50 °C
Storage temperature	-25…+60 °C
Air humidity	95 %, no condensation
Protection rating	IP20 as a separate module
	IP65/IP67 as part of a fully and correctly assembled MX-System
Pollution degree	2
Overvoltage category	III
Maximum installation altitude	2000 m

4 Software functions

Software functions are the functions of a module's firmware that a controller can access via EtherCAT.

Functionality

The following descriptions document the full range of software functions at the time of publication of this manual. The range of functions that can actually be used depends on the firmware version of a module.

Process data objects

Process data objects (PDOs) are used for the cyclic transmission of process data between the EtherCAT MainDevice and EtherCAT SubDevice. The data is exchanged at fixed intervals as part of the real-time cycle and serves as the basis for control and monitoring of field devices. PDOs typically contain input and output data required for the direct operation of a device. Cyclic transfer ensures a continuous and deterministic data exchange.

Inputs Profile DIP Input

Variable	Type	Description
Input Channel x	BIT	0 = There is no input value on the corresponding channel. 1 = An input value is present on the corresponding channel.

Inputs Profile RELAY Lx Inputs

Variable	Type	Description
Error	BIT	0 = There is no collective error message. 1 = A collective error message has been received.
Warning	BIT	0 = There is no collective warning. 1 = A collective warning has been issued.
Coil Enabled	BOOL	FALSE = There is no undervoltage in the relay coil. TRUE = Undervoltage of the relay coil.

Inputs Profile Device Inputs

Variable	Type	Description
Warning	BIT	0 = There are no general warnings. 1 = There are general warning messages.
Error	BIT	0 = There are no general error messages. 1 = There are general error messages.
Temperature Warning	BIT	0 = The device's temperature is within the permissible range. 1 = The internal device temperature has reached or exceeded the warning threshold.
Diag	BIT	0 = There are no new diagnostic messages. 1 = There are new diagnostic messages.
Input Cycle Counter	BIT2	A 2-bit counter that increments when the TxPDO data is updated.

Outputs Profile RELAY Lx Outputs

Variable	Type	Description
Enable Coil	BOOL	FALSE = The relay coil is not supplied with voltage. The relay is not engaged. TRUE = The relay coil is supplied with voltage. The relay is energized.
Reset	BOOL	FALSE = No acknowledgment process is triggered. TRUE = An acknowledgment is triggered by the rising edge, changing from FALSE to TRUE.

Outputs Profile (EFU) Device Outputs

Variable	Type	Description
Global Reset	BIT	0 = No global error acknowledgment is triggered. 1 = A global acknowledgment of all acknowledgable errors is triggered by the rising edge from FALSE to TRUE.

WcState

WcState indicates whether an EtherCAT SubDevice correctly participated in the cyclic process data exchange during the last bus cycle.

Variable	Type	Description
WcState	BIT	0 = data is valid 1 = data is invalid
InputToggle	BIT	A 1-bit counter that increments after each cycle

InfoData

InfoData indicates which diagnostic and status information an EtherCAT SubDevice provides.

Variable		Type	Description
State		UINT	0x___1 = EtherCAT SubDevice in INIT state 0x___2 = EtherCAT SubDevice in PREOP state 0x___3 = EtherCAT SubDevice in BOOT state 0x___4 = EtherCAT SubDevice in SAFEOP state 0x___8 = EtherCAT SubDevice in OP state 0x001_ = EtherCAT SubDevice reports an error 0x002_ = Invalid vendor ID, product code x read 0x004_ = Initialization error occurred 0x008_ = EtherCAT SubDevice disabled 0x010_ = EtherCAT SubDevice not present 0x020_ = EtherCAT SubDevice reports a connection error 0x040_ = EtherCAT SubDevice reports no connection 0x080_ = EtherCAT SubDevice reports an unexpected connection 0x100_ = Communication Port A 0x200_ = Communication Port B 0x400_ = Communication Port C 0x800_ = Communication Port D
AdsAddr		AMSADDR	Full ADS address for accessing the EtherCAT SubDevice (mailbox)
	netId	AMSNETID	unique network address
	port	WORD	Internal ADS port number of the EtherCAT device

5 Mechanical installation

Required tools

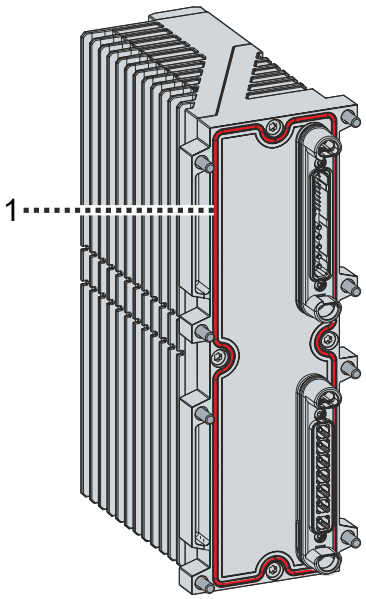
- Torx T25 screwdriver
- Torque wrench 5 Nm

5.1 Preparation

NOTICE

Check the module for damage

If the seal is worn or damaged, liquids and dirt can penetrate and damage the MX-System. The IP65/IP67 protection rating is not met if the seals are worn or damaged.

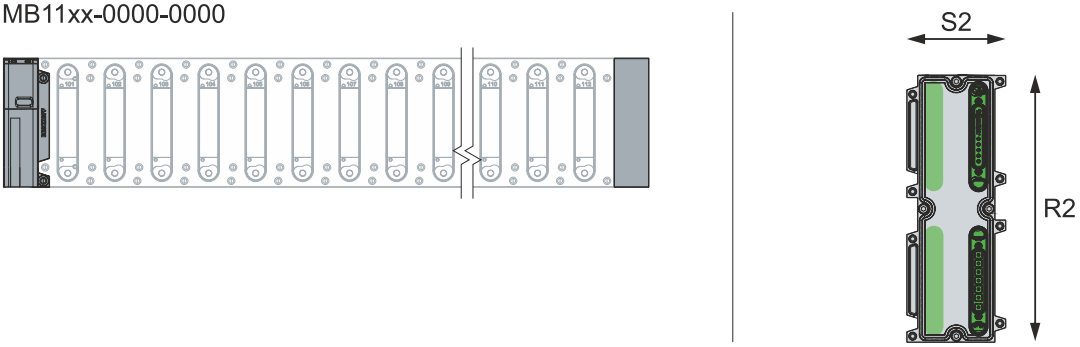


1. Check the seal [1] of the module for wear and damage
2. Replace worn and damaged seals

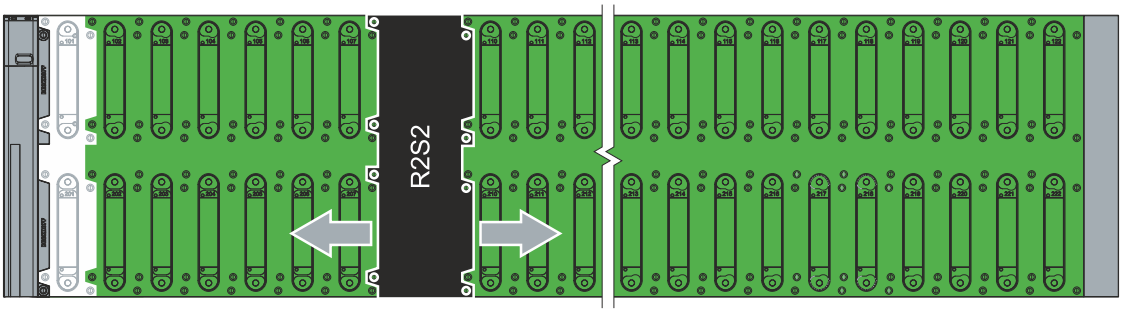
5.2 Placement of the module on the baseplate

The module can be plugged into the following areas marked in green:

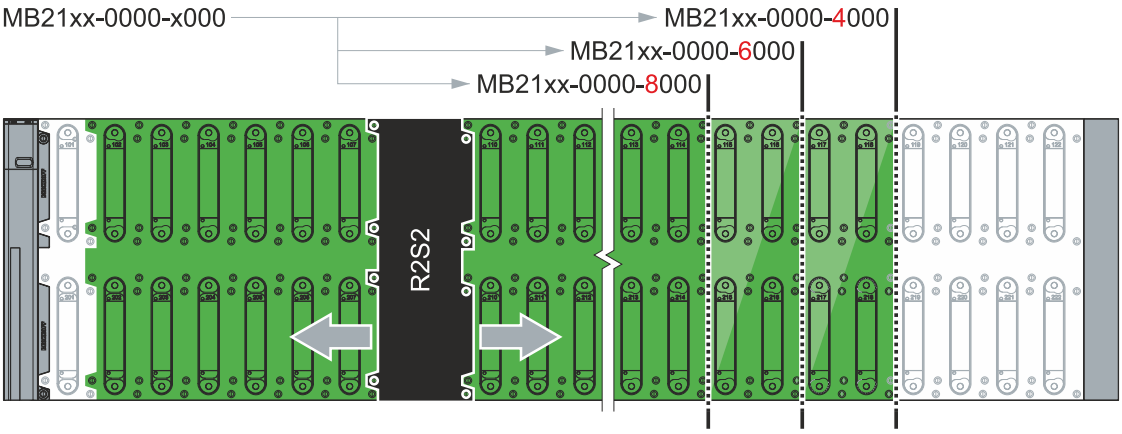
MB11xx-0000-0000



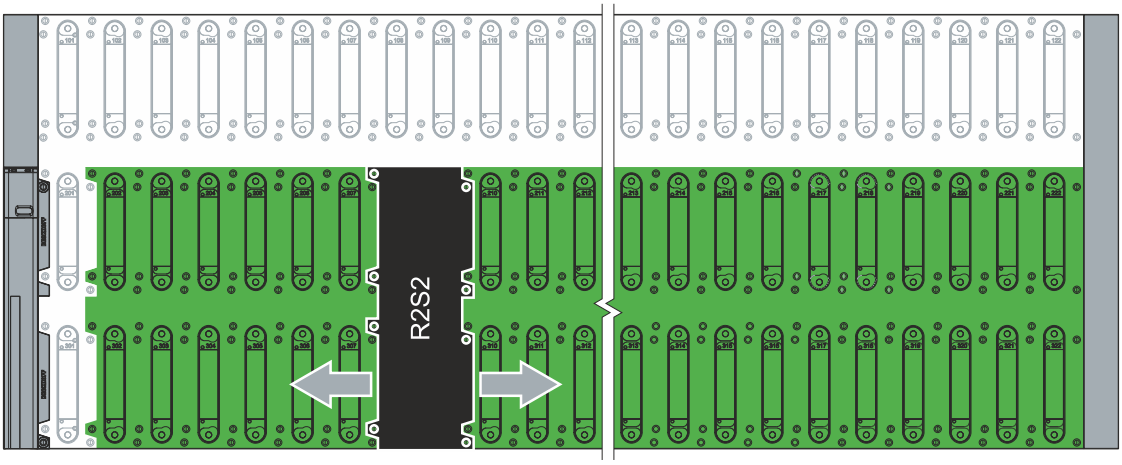
MB21xx-0000-0000



MB21xx-0000-x000



MB31xx-0000-0000



5.3 Mounting the module

⚠ CAUTION

Danger due to the high weight of an equipped baseplate

First mount the baseplate and then the modules to the baseplate. If you mount the modules on the baseplate first, the total weight of the MX-System will increase. Another person is required to transport and installation an equipped baseplate.

- Wear personal protective equipment.
- The equipped baseplate must be transported and mounted by two people.

NOTICE

Ensure correct installation

If the module is not installed correctly, liquids and dirt may enter and damage the MX-System. The IP65/IP67 protection rating is not met if the installation is incorrect.

NOTICE

Limited number of mating cycles

The module may be plugged in a maximum of 25 times to attach it to the baseplate. If the module is plugged into the baseplate more than 25 times, a secure connection between the module and the baseplate cannot be guaranteed.

- Observe the permissible number of mating cycles.
- Replace the module if the number of mating cycles is exceeded.
- Replace the baseplate if the number of mating cycles is exceeded.

1. Plug the module on the baseplate
2. Tighten all screws
3. Observe tightening torques:

Components	Tightening torque [Nm]
Screws	5

Further information on installation can be found in the system manual in the “Mounting” chapter.

6 Connection

NOTICE

Defect caused by hot plug

If cables are connected or disconnected during operation, damage to property is possible.

- Only connect or disconnect cables when all supply voltages have been shutdown.

NOTICE

PELV voltage source

The module must be powered by a PELV voltage source.

NOTICE

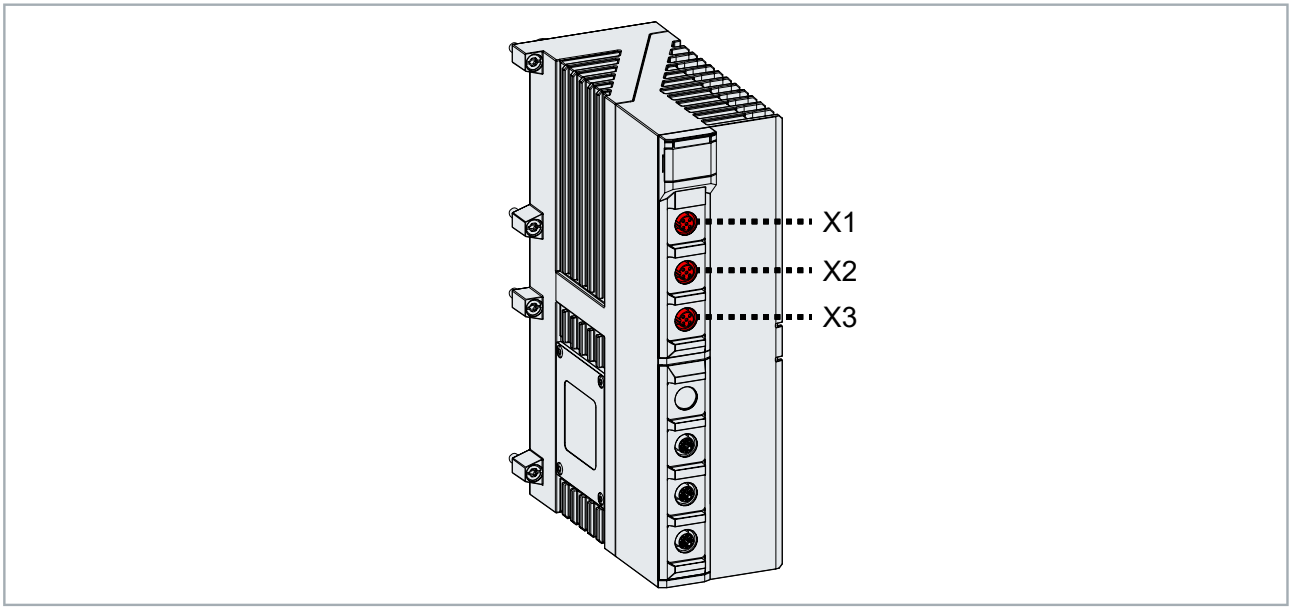
Cover unused sockets with protective caps

IP67 protection rating is only guaranteed if plugs are connected to all sockets and unused sockets are covered with protective caps.

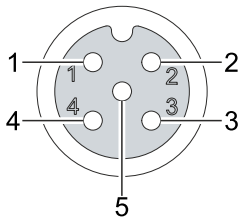
Tested with a UL-listed circuit breaker (without current limiting) rated at 20 A.

6.1 Digital inputs

The digital inputs are 5-pin M12 sockets, A-coded.

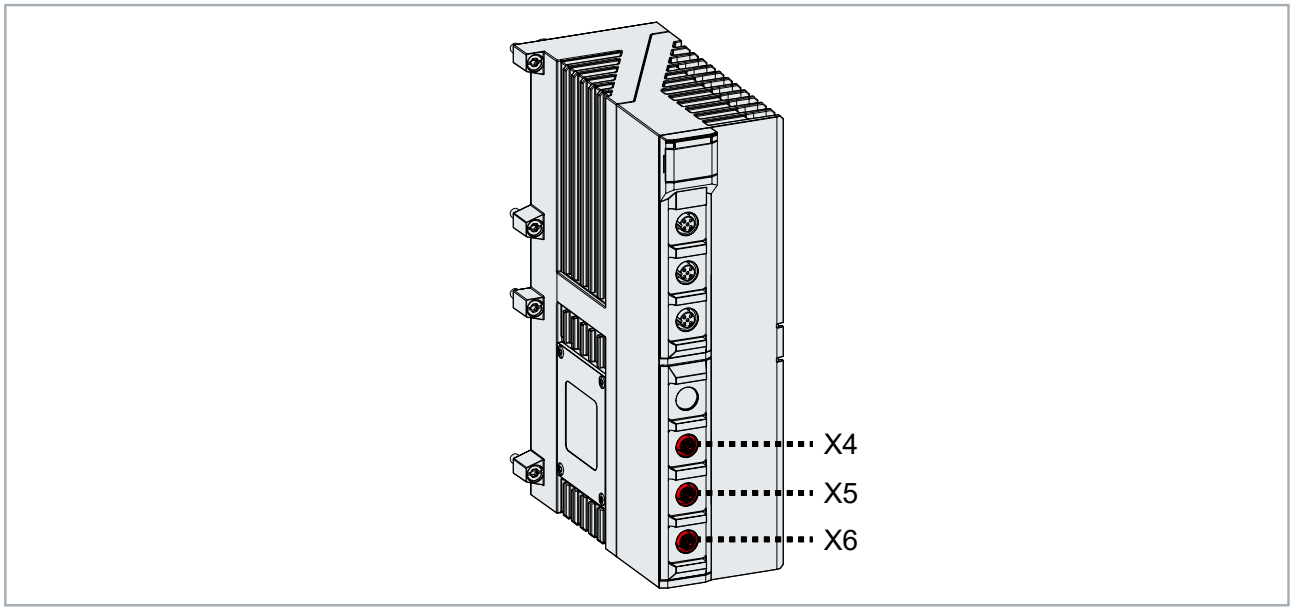


Tightening torque: 0.6 Nm

M12 socket, A-coded	Pin	Symbol	Function
	1	U_B	Supply voltage
	2	DI 2	Digital input 2
	3	GND	Ground
	4	DI 1	Digital input 1
	5	n. c.	not used

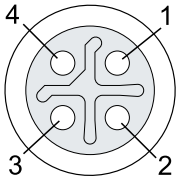
6.2 Relay outputs

The relay outputs are 4-pin M12 sockets, S-coded.

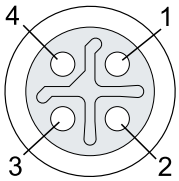


Tightening torque: 0.6 Nm

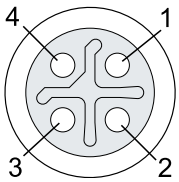
Output X4

M12 socket, S-coded	Pin	Symbol	Function
	1	T1	switched outer conductor T1
	2	n. c.	not used
	3	N	Neutral conductor
	4	PE	Protective earth

Output X5

M12 socket, S-coded	Pin	Symbol	Function
	1	T2	switched phase conductor T2
	2	n.c.	not used
	3	N	Neutral conductor
	4	PE	Protective earth

Output X6

M12 socket, S-coded	Pin	Symbol	Function
	1	T3	switched phase conductor T3
	2	n.c.	not used
	3	N	Neutral conductor
	4	PE	Protective earth

7 Commissioning and operation

⚠ WARNING

Danger to life due to electric shock

After switching on, a life-threatening voltage may be present at open connectors.

- Before switching on, make sure that all components supplied with power voltage are fully and properly installed and correctly wired.
- Before switching on, ensure that unused connectors and other connections are covered with the sealing caps, dummy caps or protective caps provided for this purpose.

NOTICE

Damage to property due to operation in an unsuitable environment

Before commissioning, ensure that the environmental conditions at the place of commissioning and operation are complied with at all times.

1. Plug the module into a baseplate.
2. Screw the module onto the baseplate.
3. Wire the module.
4. Switch on the external supply voltage.

7.1 During operation

7.1.1 Replacing the fuses

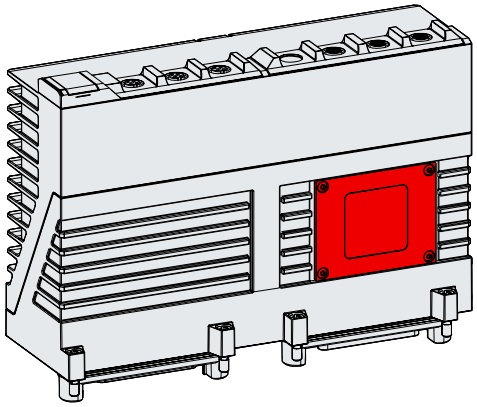
⚠ WARNING

Danger to Life from Electric Shock

Death or serious injury can occur.

- Apply the five safety rules of electrical engineering before changing a fuse.

The fuses are located behind the fuse cover on the side of the module.



Proceed as follows to replace a fuse:

Required tools

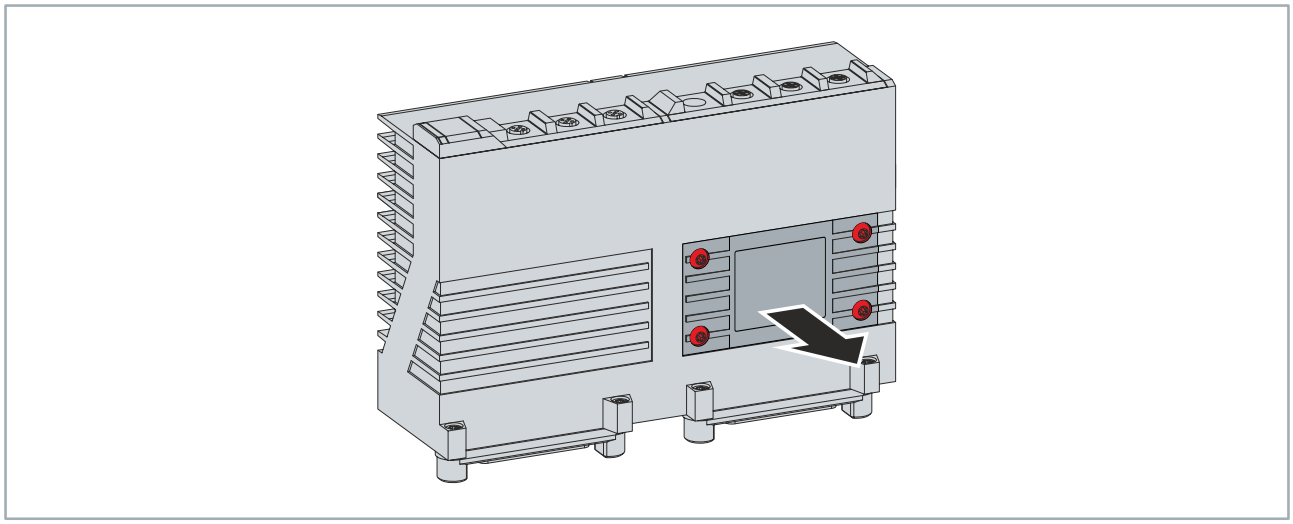
- Torx T25 screwdriver
- Torque wrench 5 Nm
- Pliers

Required replacement fuses with the following specifications

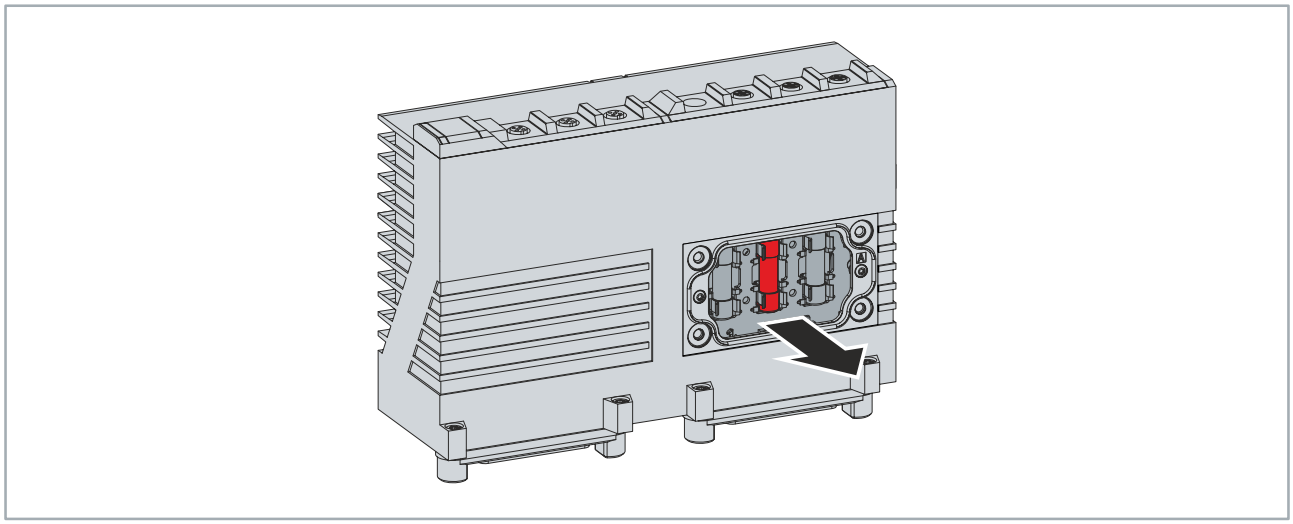
- Rated current: 16 A
- Rated voltage: 600 V AC
- Characteristics: gRL
- Dimensions: 10.3 x 38 mm
- Type examples: SIBA 60 034 34.16

1. Loosen all mounting screws of the module
2. Take the module off the baseplate

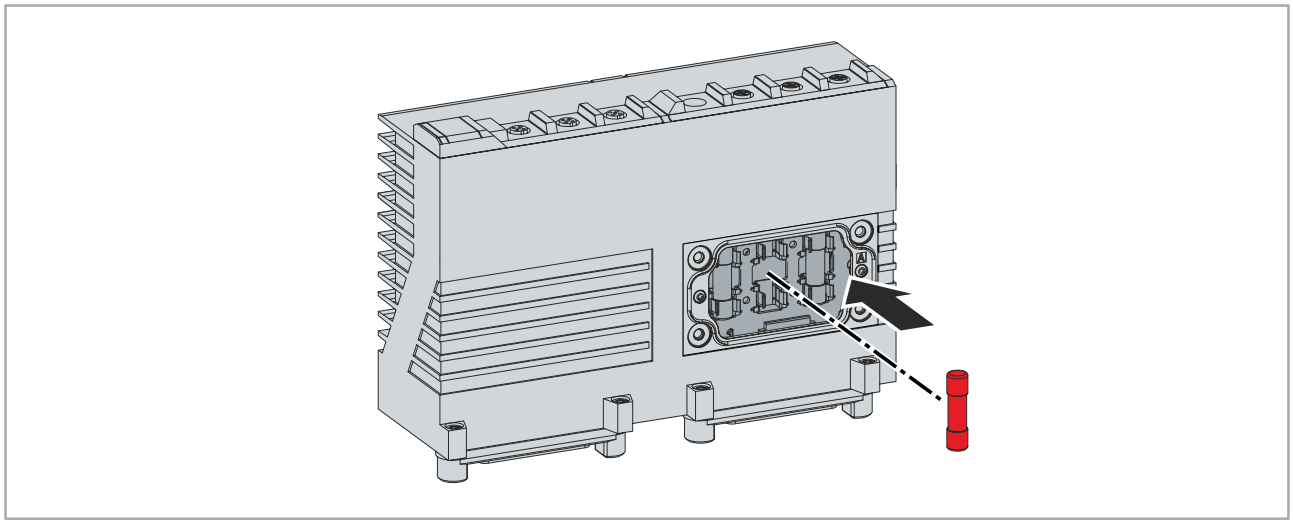
For more information, refer to the system manual in the chapter "Disassembly".



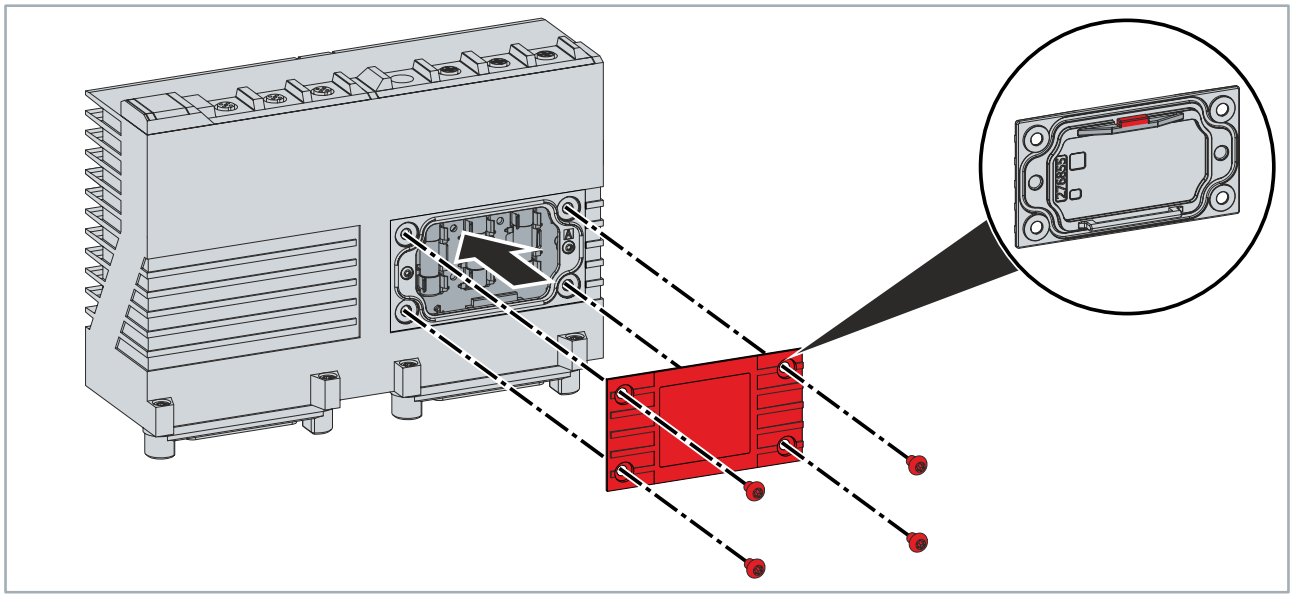
3. Remove the screws
4. Remove the safety flap



5. Remove old fuses with pliers



6. Insert new fuses by hand



7. Insert the safety flap with the latching lug facing upwards
8. Insert and tighten the screws
9. Observe tightening torques:

Components	Tightening torque [Nm]
Screws	5

8 Decommissioning

8.1 Disassembly

⚠ WARNING

Danger to life due to electric shock

After disconnecting from the supply voltage, a life-threatening voltage is still present at the contacts of the DC link voltage. Touching the contacts can lead to death or injury from electric shock.

- After disconnecting from the supply network, wait 10 minutes before starting disassembly.

✓ The supply voltage is shut down.

1. Remove cables.
2. Loosen all mounting screws of the module.
3. Take the module off the baseplate.

⇨ The module has been removed correctly.

8.2 Disposal



Products marked with a crossed-out wheeled bin shall not be discarded with the normal waste stream. The device is considered as waste electrical and electronic equipment. The national regulations for the disposal of waste electrical and electronic equipment must be observed.

9 Appendix

9.1 CoE parameters

CoE parameters (CANopen over EtherCAT) describe the configuration values and settings of an EtherCAT device. They are organized as entries in the device's object directory and are used for parameterization, commissioning, and diagnostics. CoE parameters are accessed acyclically, that is, independently of the real-time cycle, by reading and writing the corresponding objects. This allows devices to be flexibly configured and adapted to the specific application.

See parameter list in the Beckhoff Information System: Link

9.2 Manual version history

The following table shows the version history of this manual.

Version	Comment
1.0	• First release

9.3 Accessories

Suitable accessories can be found on the product website:

www.beckhoff.com/MR1310-0011-2242

Product	Description
ZMX1000-0010	M5x17.5 combi-TX25 replacement screws for module fastening (PU = 10 pcs.)
ZMX2000-0012	10.3 x 38 mm fuse, fine, 12 A, 600 V AC gRL (IEC/UL)
ZMX2000-0025	10.3 x 38 mm fuse, fine, 25 A, 600 V AC gRL (IEC/UL)
ZMX3001-0022	2-row, 2-slot replacement seal for module base
ZMX4001-0002	Replacement cover for potential equalization for 2- and 3-row baseplate with Beckhoff logo
ZMX4001-0003	Replacement cover for MA6060 interface
ZS5000-0020	Protective cap for M12 socket, plastic, black, IP65/67

9.4 Support and Service

Beckhoff Support and Service provides assistance with questions regarding Beckhoff products and system solutions, as well as with their planning, commissioning, and operation.

Beckhoff subsidiaries and representative offices

Please contact your Beckhoff subsidiary or your representative office for local support and service for Beckhoff products. You can find the addresses of Beckhoff subsidiaries and representative offices at: www.beckhoff.com/worldwide.

For Beckhoff products and technologies, we offer Training programs, tutorials, and webinars.

Beckhoff Support

Beckhoff Support provides assistance with technical questions regarding the use, planning, programming, and commissioning of Beckhoff products.

☎ Hotline:	+49 5246 963-157
✉ Email:	support@beckhoff.com, Support form
Web page:	www.beckhoff.com/support

Beckhoff Service

Our service specialists are here to assist you with any questions you may have regarding after-sales service processes, such as replacement parts, repairs, etc.

☎ Hotline:	+49 5246 963-460
✉ Email:	service@beckhoff.com, Service form
Web page:	www.beckhoff.com/service

Download finder

The Download finder serves as a central source for downloadable documents and files related to Beckhoff products, such as application reports, technical documentation, drawings, and configuration files.

Beckhoff Information System

The Beckhoff Information System is the central online documentation resource for Beckhoff products and contains documentation on products and automation topics, as well as sample code.

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