

Manual | EN

MS4210-1003-1114

EtherCAT power output, EtherCAT, 2 x 24 V DC/10 A, switchable, B17

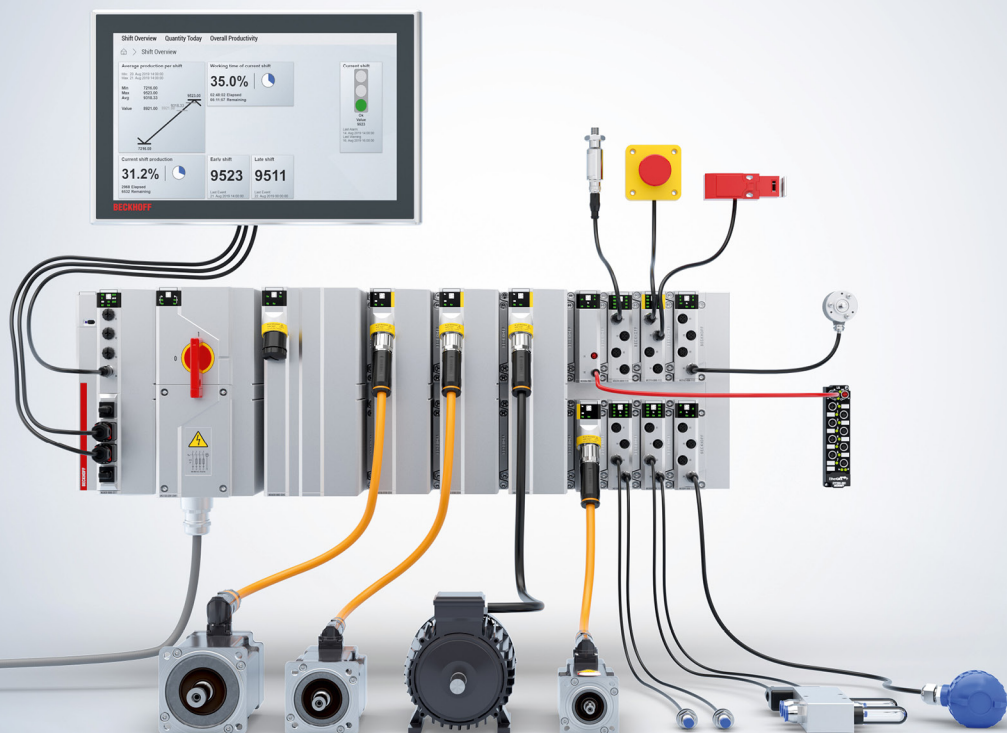


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1 Foreword

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

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.

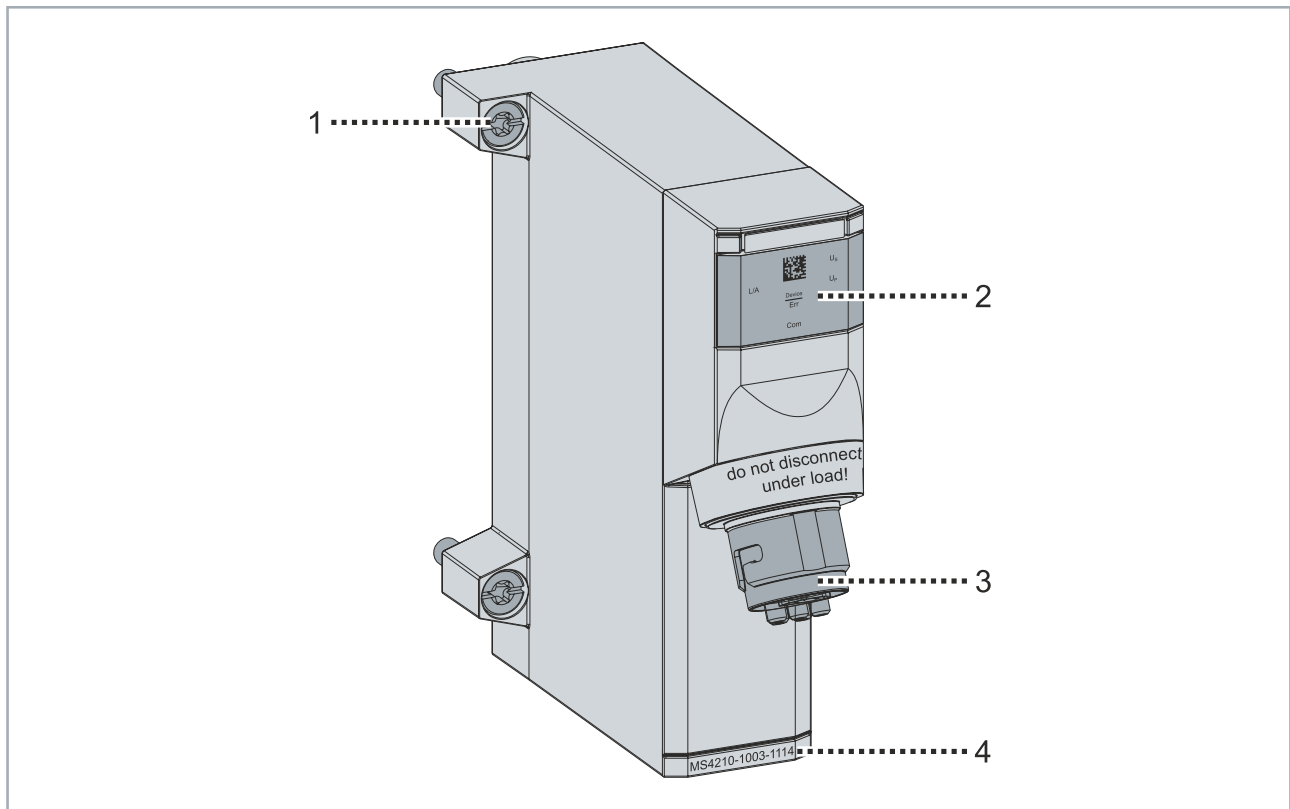
Improper use

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

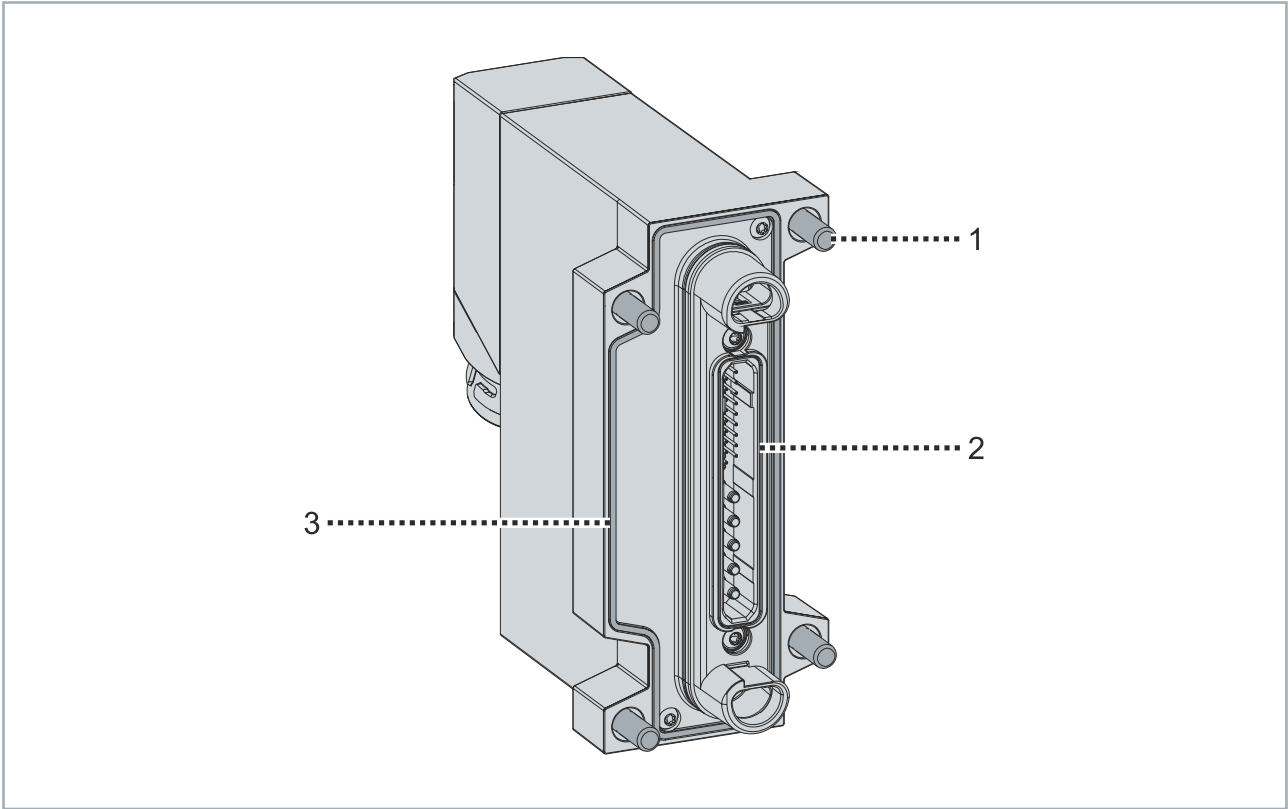
2 Product overview

The MS4210-1003-1114 EtherCAT power output module provides 24 V DC for the control voltage U_S or the load voltage U_P , each at up to 10 A, as well as EtherCAT. The power is supplied via a hybrid connector.

The fuses for line protection are integrated and cannot be replaced; an upstream electronic fuse is provided.

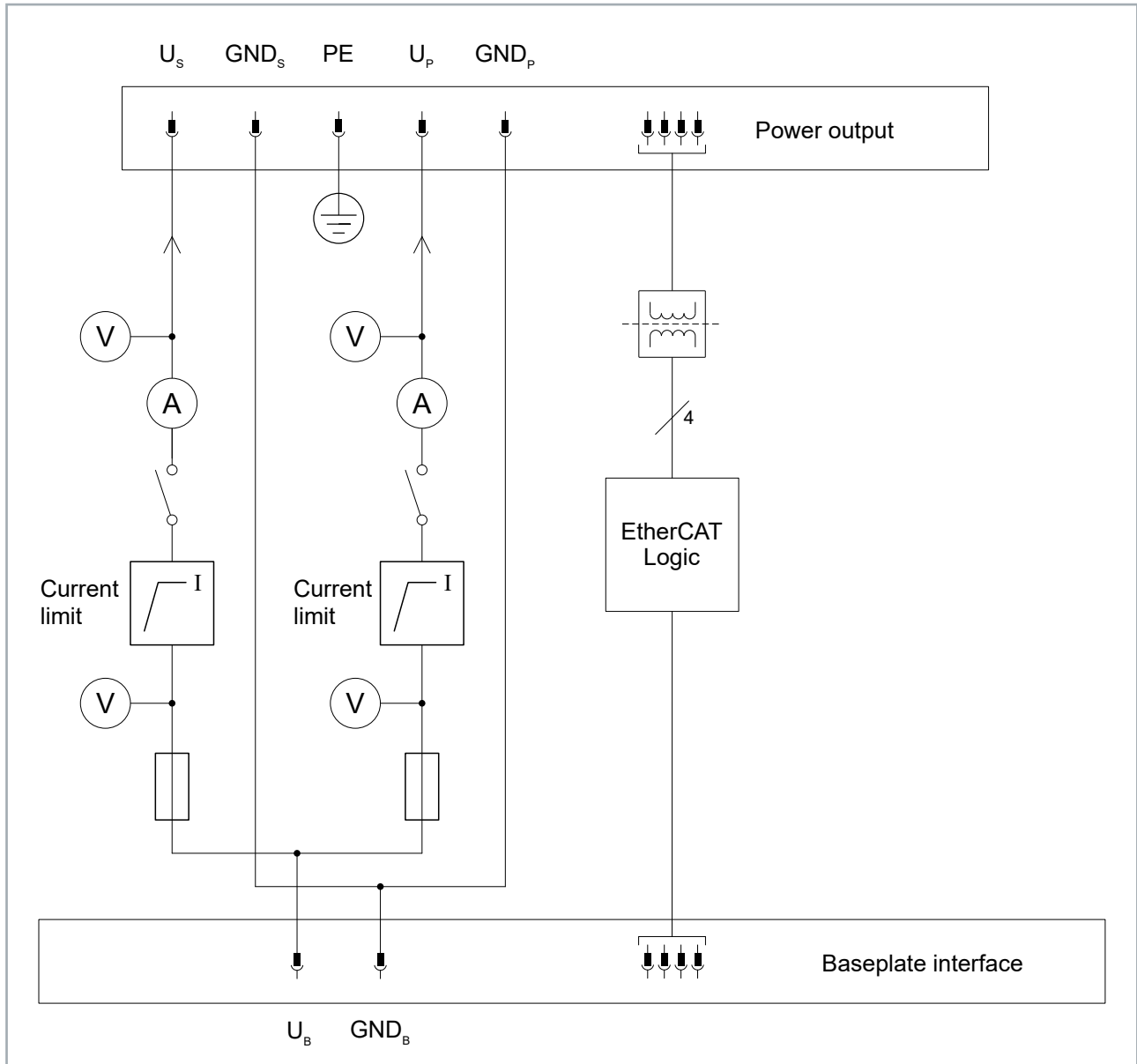


Position	Name
1	Fastening screw, captive, 4 x
2	Status display
3	EtherCAT power output
4	Module name

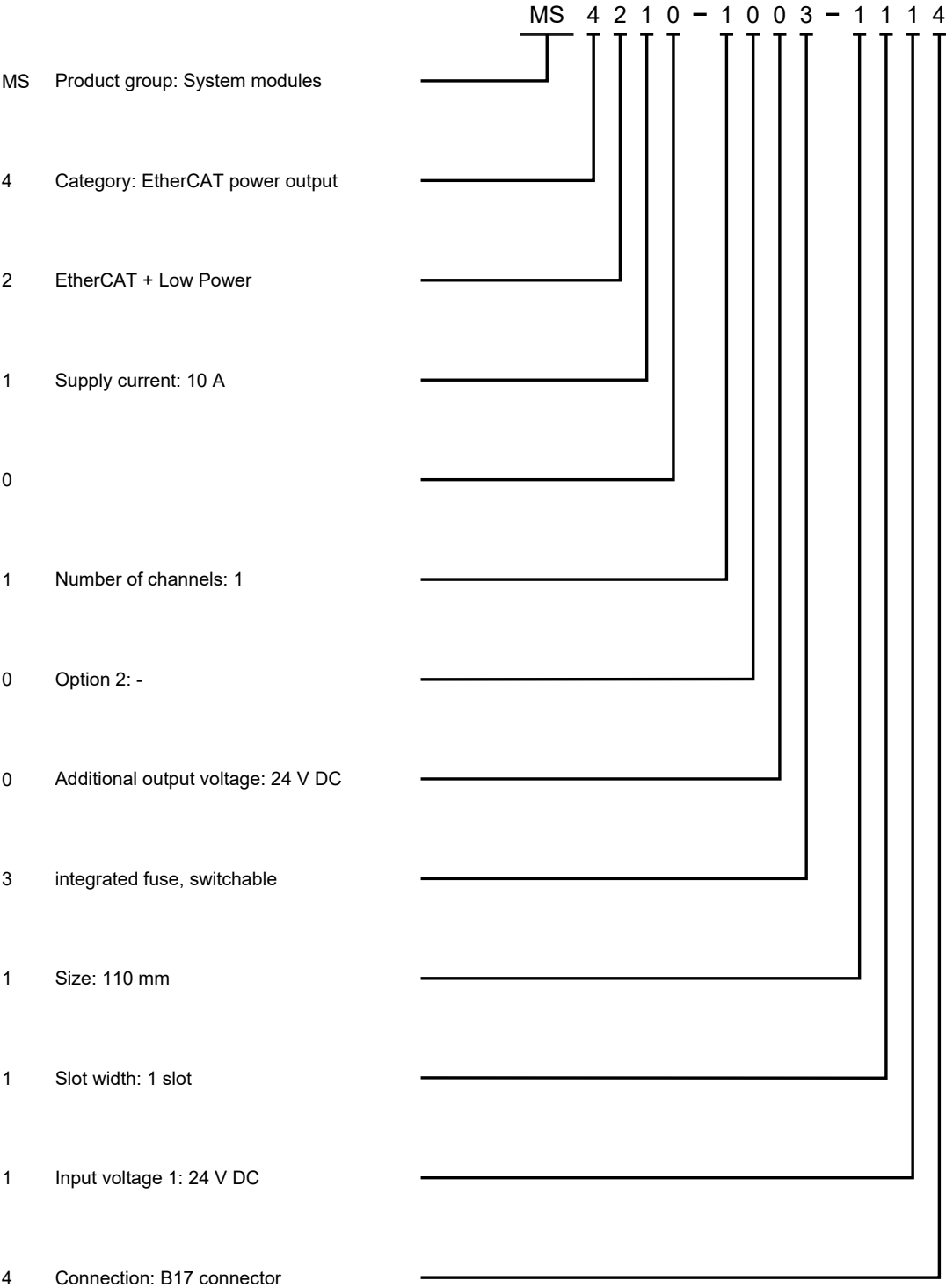


Position	Name
1	Fastening screw, captive, 4 x
2	Data connector
3	Seal

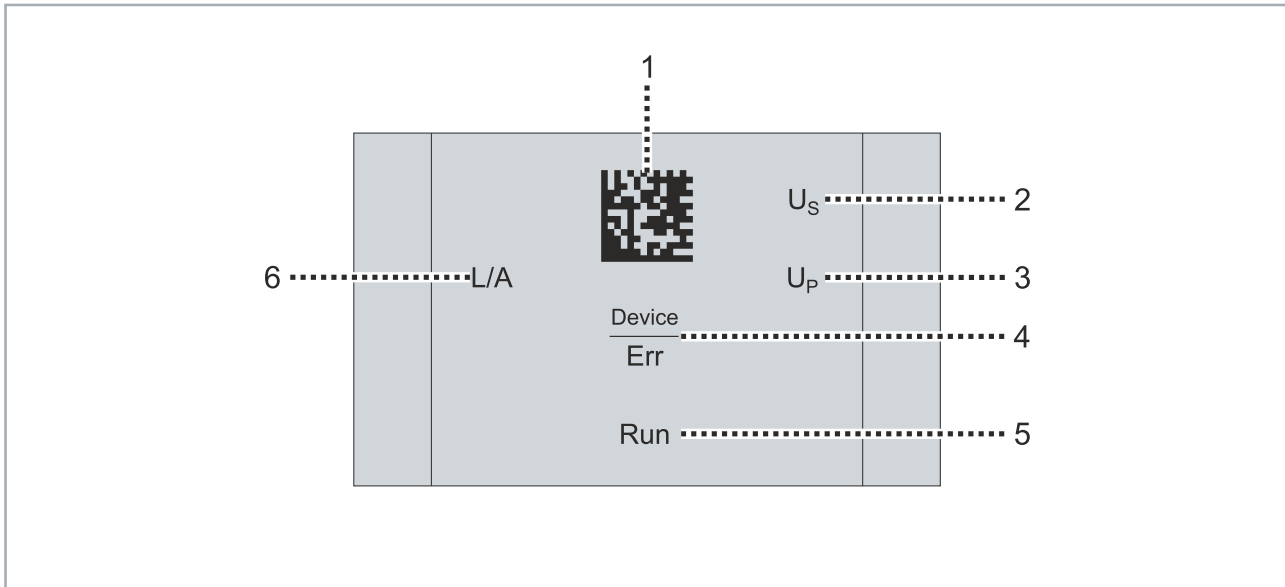
2.1 Block diagram



2.2 Type key



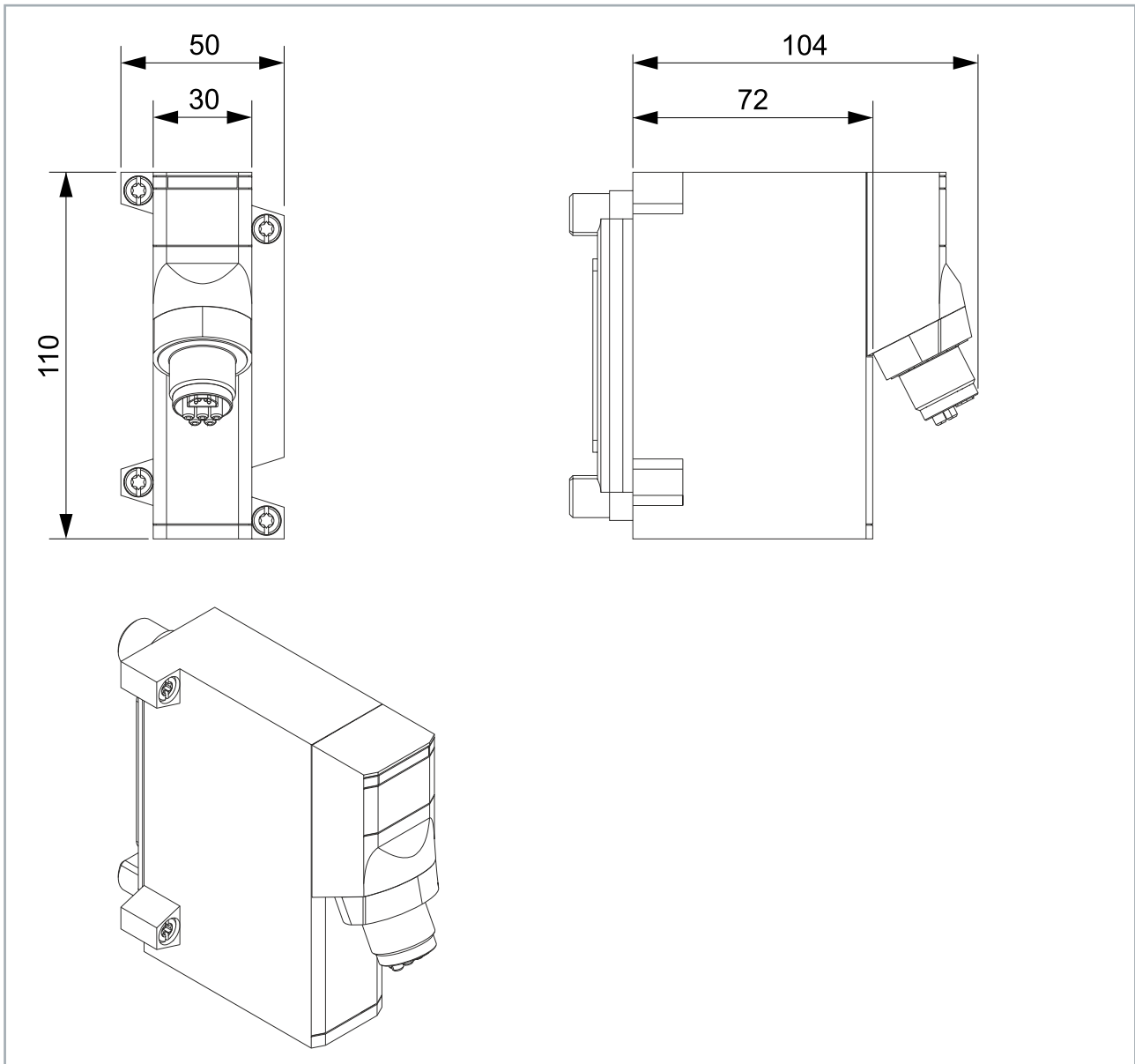
2.3 Status display



Position	Status display	Status	Explanation
1	-	-	Beckhoff Identification Code as DataMatrix code
2	U_S	off	No supply voltage present
		green illuminated	Supply voltage switched on
3	U_P	off	No supply voltage present
		green illuminated	Supply voltage switched on
4	Device Err	off	No error exists
		red illuminated	Error collection LED
5	Run	off	The EtherCAT State Machine of the module is in the initialization state
		flashing green	The EtherCAT State Machine of the module is in the <i>Pre-Operational</i> state
		single flash green	The EtherCAT State Machine of the module is in the <i>Safe-Operational</i> state
		green illuminated	The EtherCAT State Machine of the module is in the <i>Operational</i> state
		flickers green	Firmware is being loaded
6	L/A	off	No connection on the incoming EtherCAT segment
		green illuminated	Preceding EtherCAT device connected
		flashing green	Communication with preceding EtherCAT device

2.4 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
Hot Swap	No

EtherCAT	
Distributed Clocks	No
Current consumption from the E-bus 3.3 V	125 mA

EtherCAT ports	
Connection	1 x B17 hybrid connector, 5+4-pin, coding 1
Cable length	max. 100 m

Voltage output X1	
Connection	1 x B17 hybrid connector, 5+4-pin, coding 1
Nominal voltage	2 x 24 V DC (-15% ... + 20%)
Nominal current	max. 10 A each

Housing data	
Width (slots)	1
Height (rows)	1
Dimensions W × H × D	50 mm × 110 mm × 104 mm 50 mm × 110 mm × 72 mm (housing only)
Material	Zinc die-cast and aluminum die-cast
Cooling	Convection
Weight	-
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

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 300 V
Maximum installation altitude	2000 m

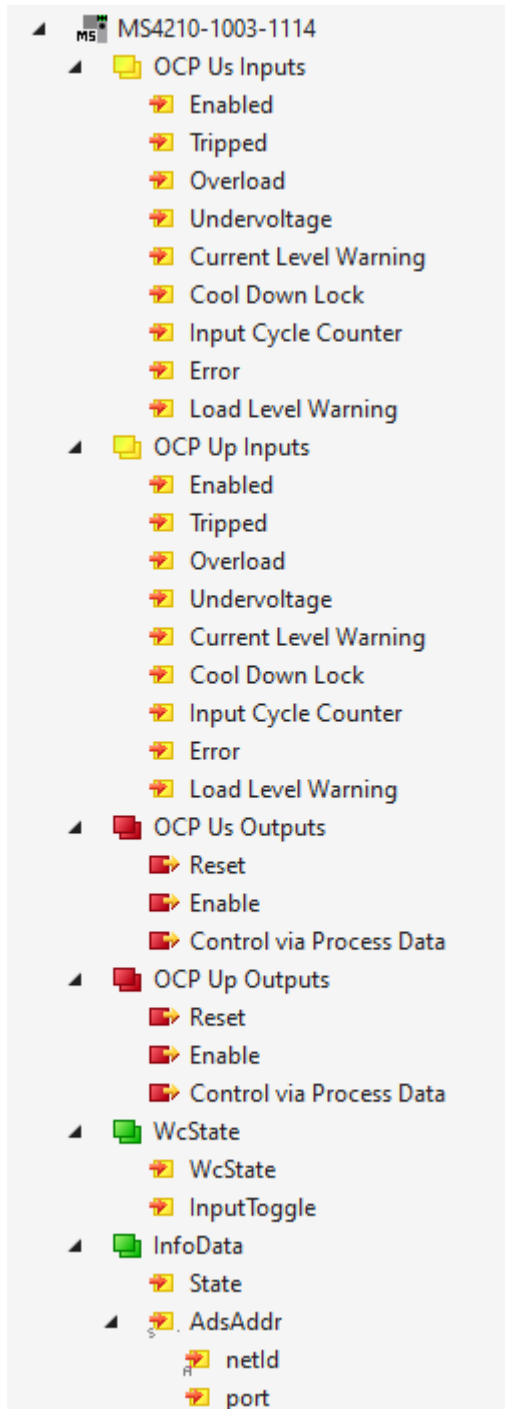
4 Software functions

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.

The following process data objects are provided by the module:



5 Mechanical installation



Required tools

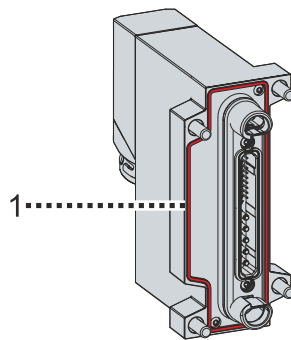
- Torx T25 screwdriver
- Torque wrench 5 Nm

5.1 Preparation

NOTICE

Check the module for damage

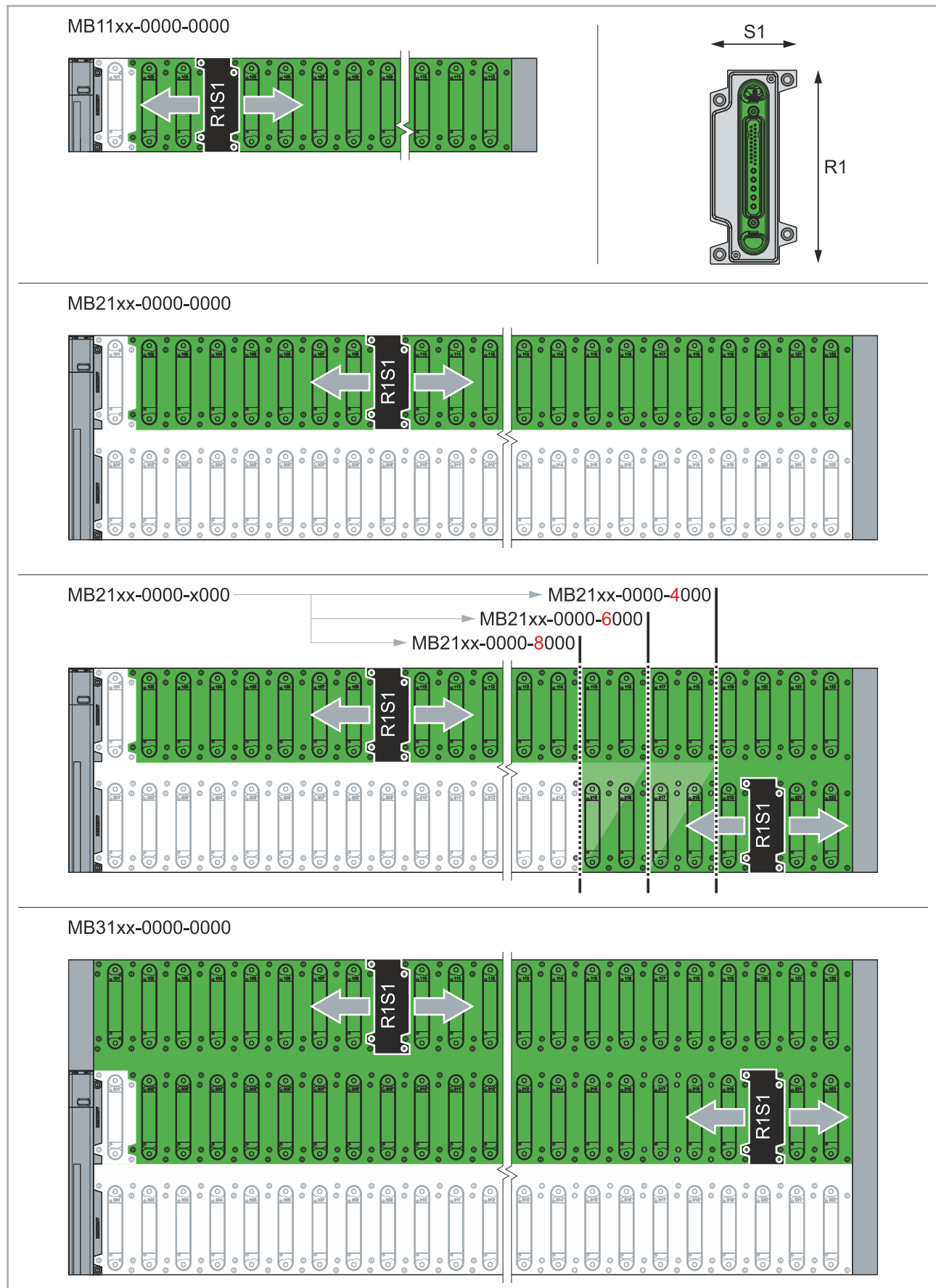
If the seal is worn or damaged, liquids and dirt can penetrate and damage the MX-System. The IP67 protection rating is not met if the seals are worn or damaged.



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:



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 assemble 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 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

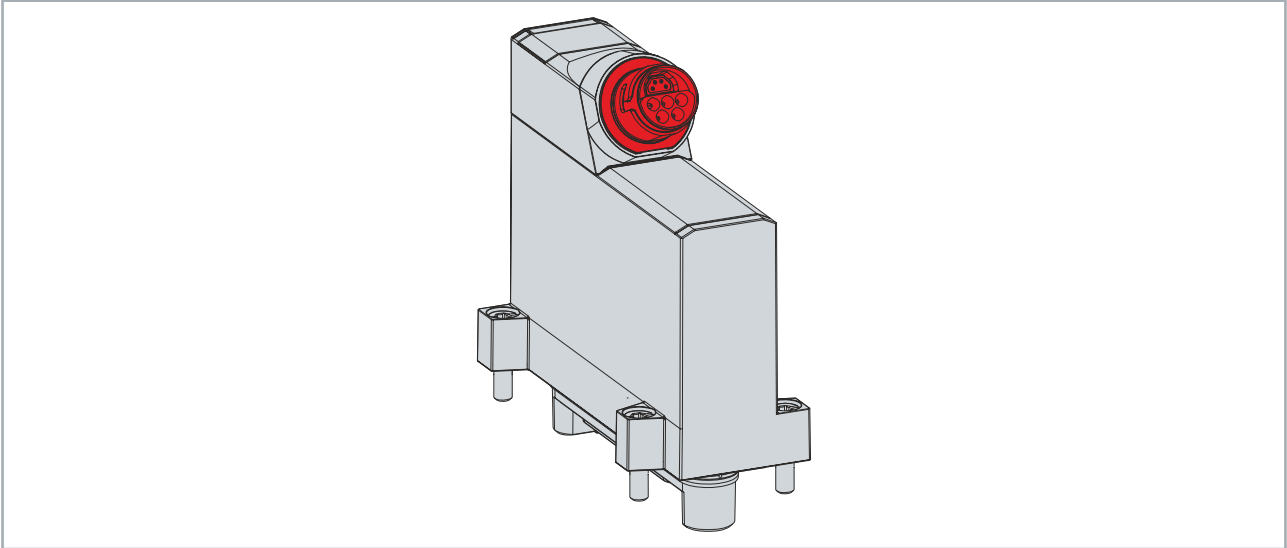
NOTICE

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.

Power output



The power output is a 5-pin B17 connector with coding 1 and a 4-pin data element.

Pin assignment

B17 connector	Pin	Signal	Function
	1	TX+	EtherCAT data line
	2	RX+	EtherCAT data line
	3	RX-	EtherCAT data line
	4	TX-	EtherCAT data line
	5	GND 24 V	-U _S
	6	PE	Protective earth
	7	+24V	+U _S
	8	GND 24 V	-U _P
	9	+24V	+U _P

7 Commissioning and operation

NOTICE

Danger if operated in an unsuitable environment

Material damage is possible.

- Before commissioning, ensure that the environmental conditions at the place of commissioning and operation are complied with at all times. See environmental conditions in the chapter [Technical data](#) [► 15].

7.1 Requirements

- Components show no signs of damage
- Screw connections of the components are correctly tightened
- Wiring and cables are installed correctly

7.2 Commissioning

NOTICE

The supply voltage activates the power supply

As soon as the external supply voltage is applied, the power supply is automatically active and outputs $U_B = 24 \text{ V DC}$ to the baseplate. This behavior cannot be set.

- Switch on the external supply voltage
- Parameterize the functions of the module if required

7.3 During operation

- Observe information for environment and operation
- Observe maintenance intervals
- Switch off the system if
 - unusual noise occurs
 - smoke develops
 - an atypical temperature development occurs

8 Decommissioning

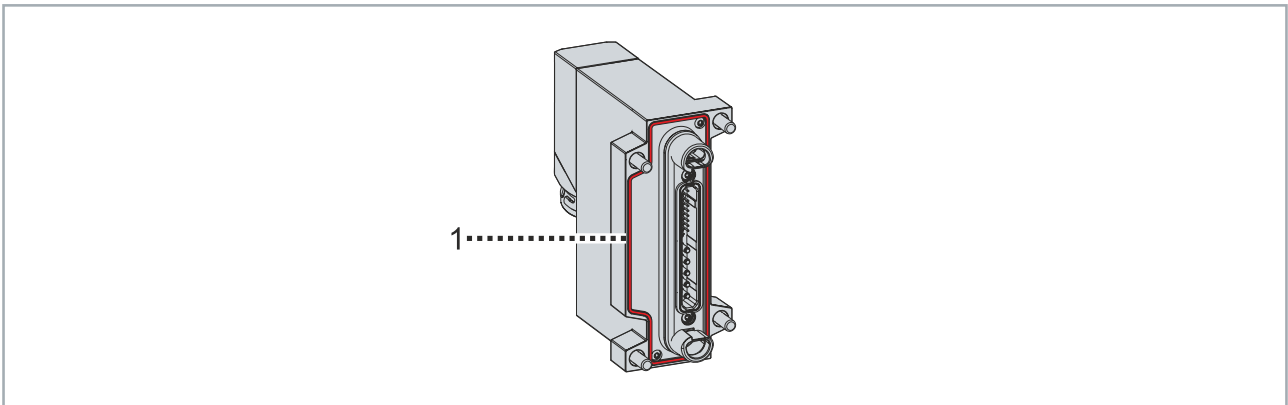
8.1 Disassembly

Disassembly may only be carried out by qualified and trained technical personnel.

Further information can be found in chapter [Notes on the documentation](#) [► 5].

1. Remove Cable
2. Loosen all mounting screws of the module
3. Take the module off the baseplate
4. Transport the module to the workplace or storage place

Further information can be found in the chapter [Technical data](#) [► 15] and in the system manual in the chapter "Disassembly".



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

Further information can be found in chapter [Accessories](#) [► 26].

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 Manual version history

The following table shows the version history of this manual.

Version	Comment
1.0.0	• First release

9.2 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

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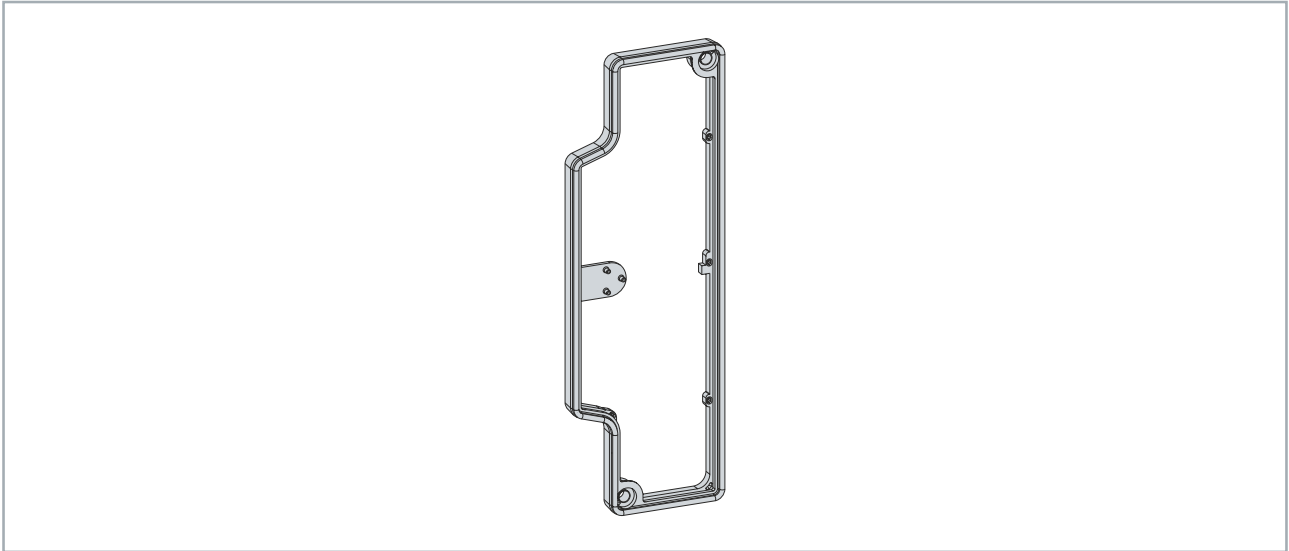
9.3 Accessories

Suitable accessories can be found on the product website:

www.beckhoff.com/ms4210-1023-1114

The following items are also available for replacing worn parts:

MX module base S1R1 with seal



The module base S1R1 with seal is available for replacing worn and damaged seals on a 1-row MX module with one slot.

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