

Manual | EN

MS1010-1002-1334

Power infeed + forwarding, 100...240 V AC/10 A, 24 V DC/7 A power supply, B17

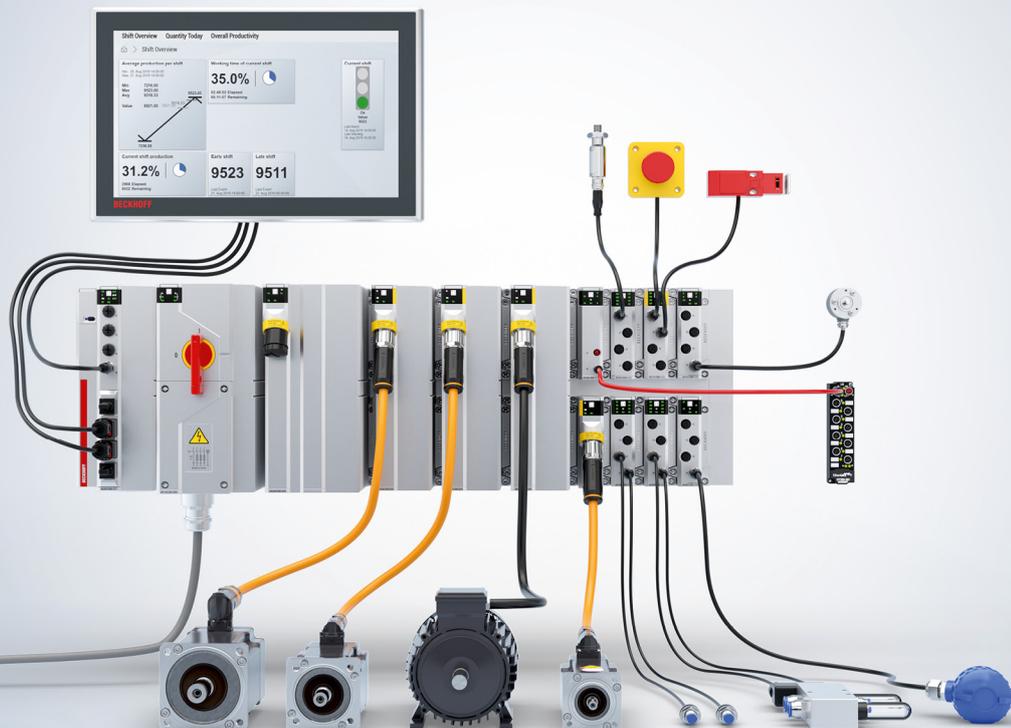


Table of contents

1 Foreword	5
1.1 Notes on the documentation	5
1.2 For your safety	6
1.3 Intended use	7
1.4 Safety instructions	7
2 Product overview	8
2.1 Product functions	10
2.2 Delivery state	11
2.3 Block diagram	12
2.4 Type key.....	13
2.5 Status display.....	14
2.6 Dimensions	15
3 Technical data	16
4 Software functions	19
4.1 Power supply.....	19
5 Mechanical installation	20
5.1 Preparation.....	20
5.2 Placement of the module on the baseplate.....	21
5.3 Mounting the module.....	22
6 Connection	23
7 Commissioning and operation	26
7.1 Requirements	26
7.2 Commissioning.....	26
7.3 During operation.....	26
8 Decommissioning	28
8.1 Disassembly	28
8.2 Disposal	28
9 Appendix	29
9.1 Manual version history	29
9.2 Support and Service.....	30
9.3 Accessories	31

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

The MS1010-1002-1334 is intended to supply other devices of an MX-System with $U_B = 24 \text{ V DC}$. It may only be operated if it is mounted on a baseplate in accordance with the mounting instructions in this manual.

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.

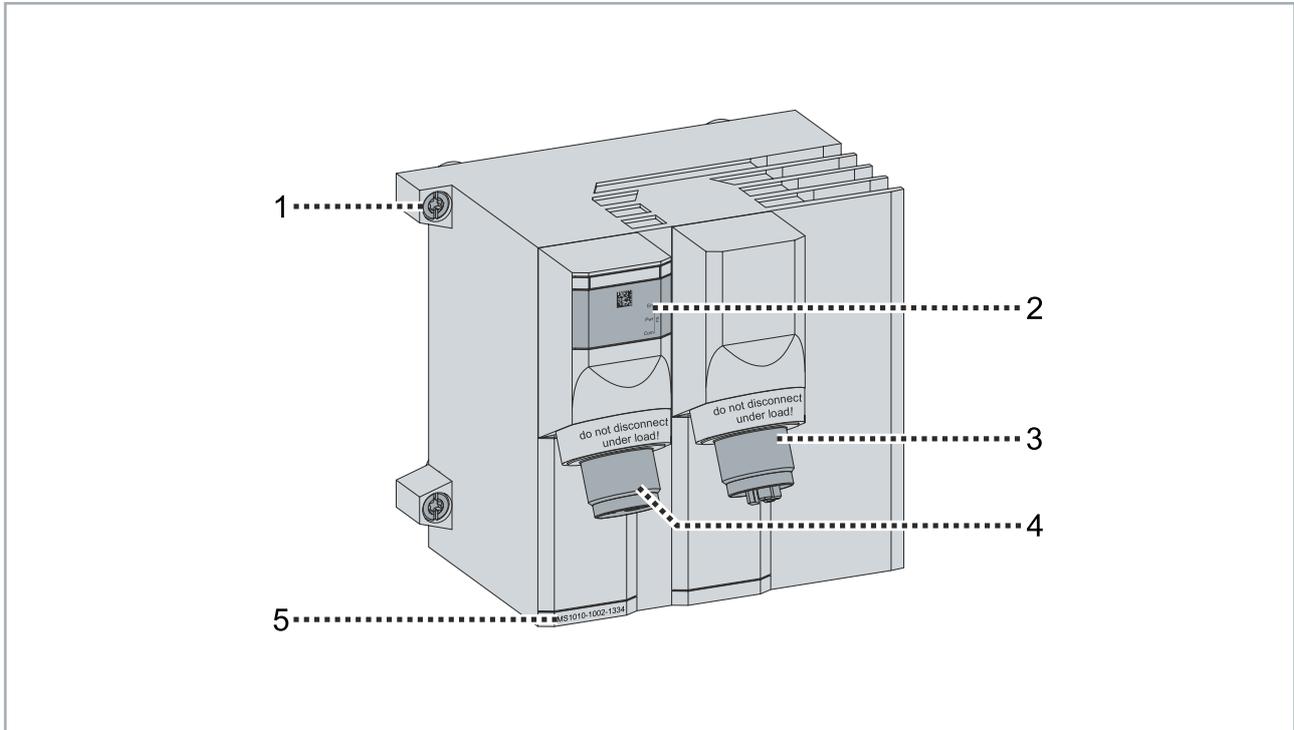
1.4 Safety instructions

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

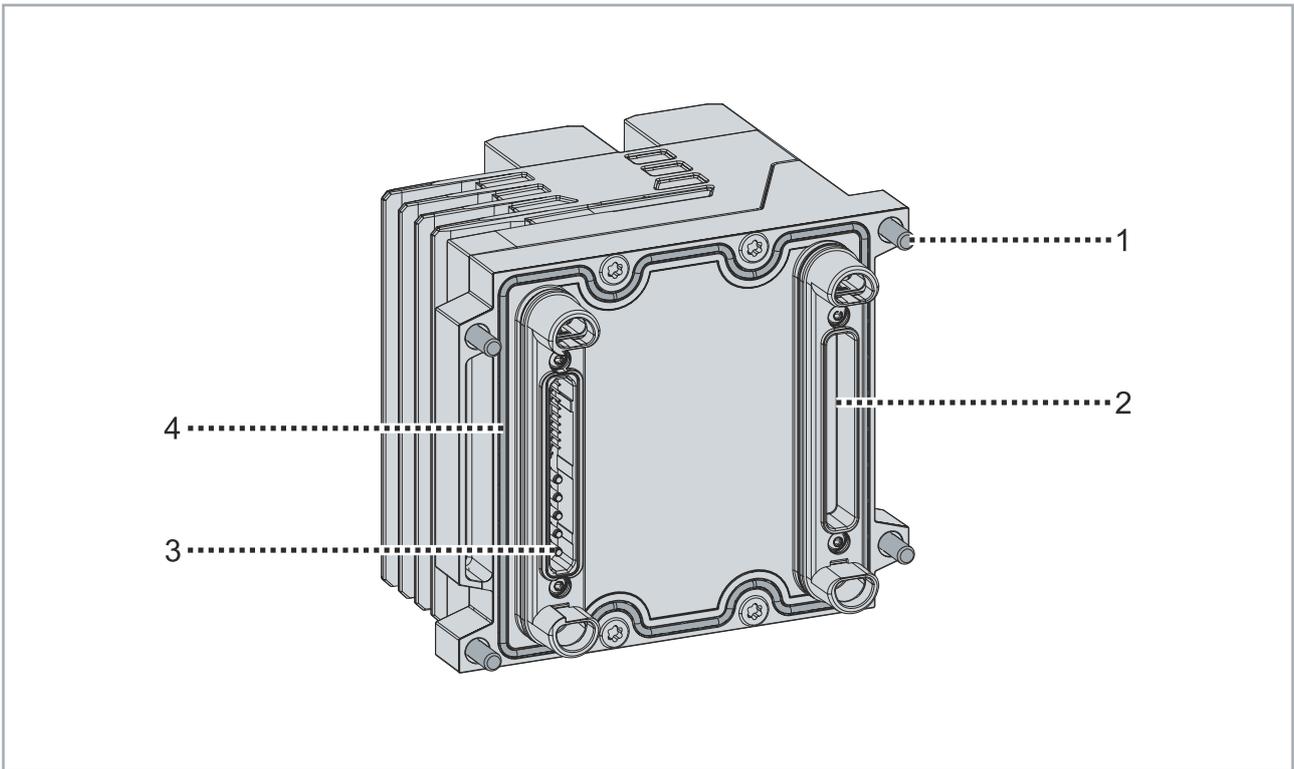
2 Product overview

The MS1010-1002-1334 power infeed module provides 24 V DC and up to 7 A for the system.

The integrated power supply is supplied with 1-phase 100...230 V AC. The second connection is used to pass on the single-phase voltage to supply an additional device, such as another MS1010-1002-1334.



Position	Name
1	Fastening screw, captive, 4 x
2	Status display
3	Power output X2
4	Power input X1
5	Module name



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

2.1 Product functions

2.1.1 Power supply 24 V DC

The power supply is electrically isolated.

You can control and monitor the power supply using the “Power Supply” software function. Further information can be found in chapter [Power supply](#) [► 19].

2.1.2 Parallel use to increase the output current

To increase the rated output current, you can operate up to two MS1010-1002-1334 units in parallel on the same baseplate.

Power transmission can be used for this purpose.

2.1.3 Power transmission

The voltage applied to power input X1 is available at power output X2 for forwarding to other modules.

The maximum input current of 10 A at power input X1 must not be exceeded.

If multiple MS1010-1002-1334 are connected in series, the following additional restrictions apply:

Input voltage	Maximum permissible number of MS1010-1002-1334 in series [units]
100...120 V AC	7
220...240 V AC	12

2.2 Delivery state

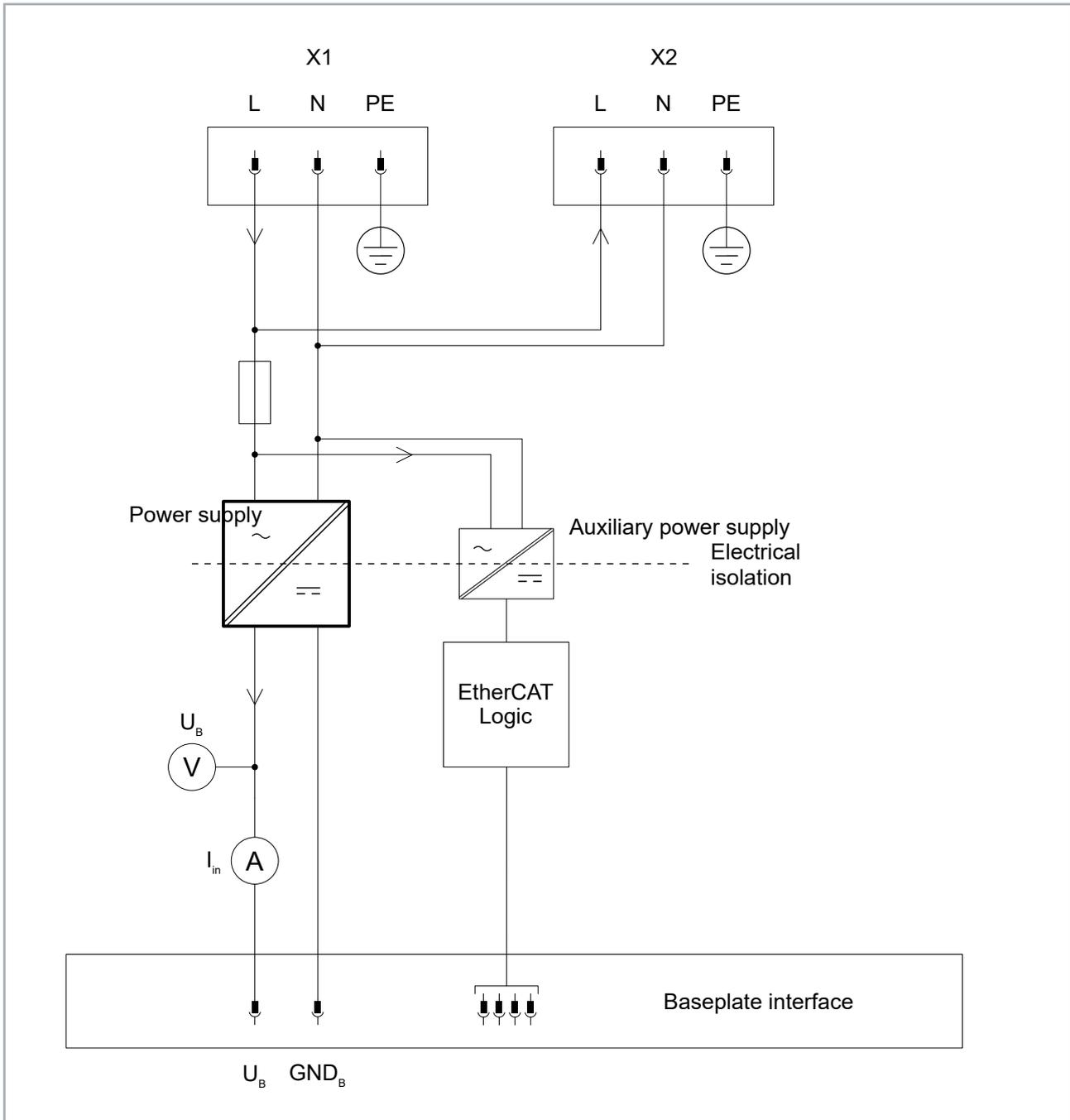
This chapter describes the default settings for basic product functions on delivery.

2.2.1 Power supply 24 V DC

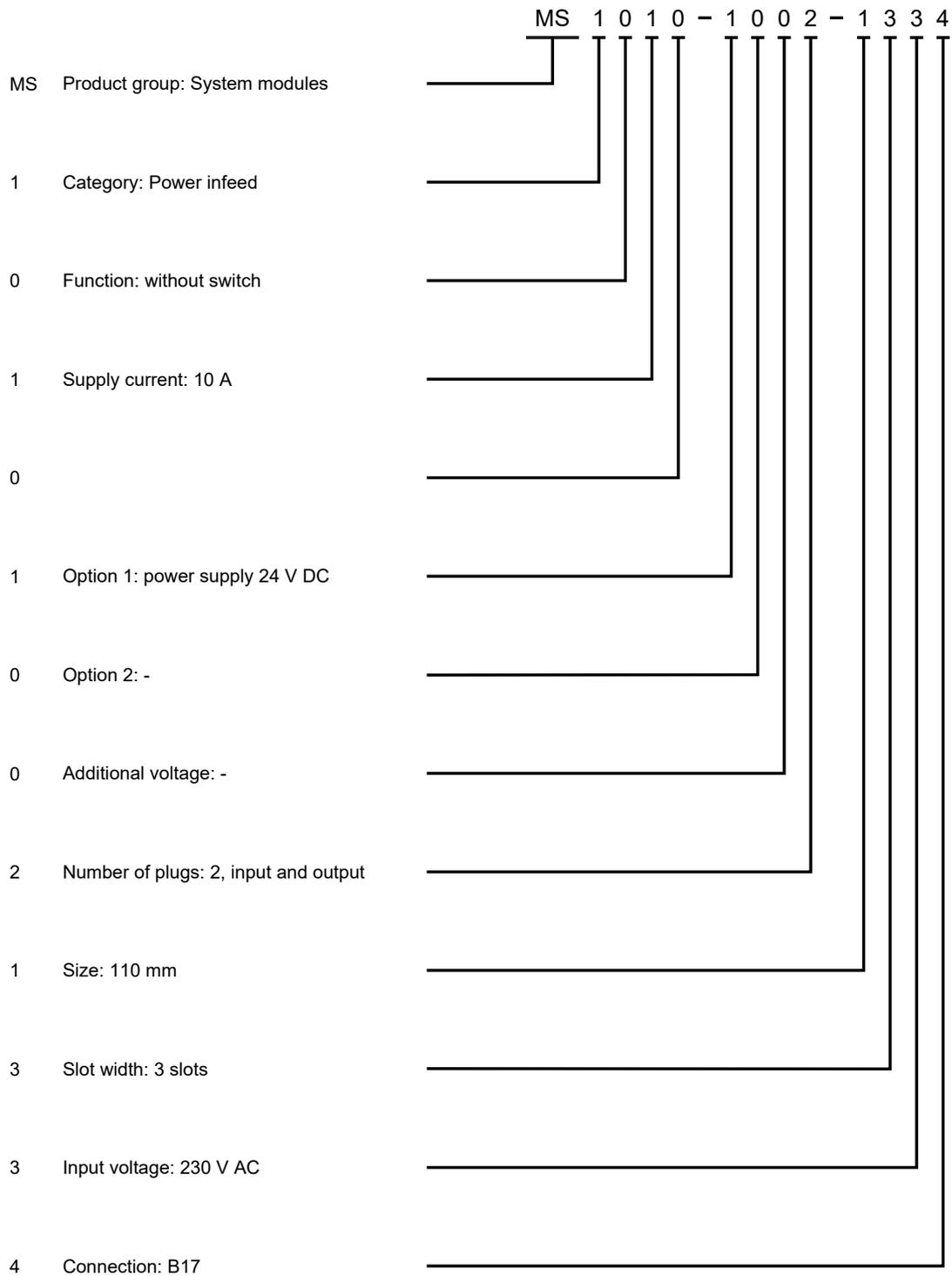
In the factory setting, the module is configured so that the power supply is automatically switched on and outputs the output voltage as soon as the input voltage is applied.

This behavior is independent of whether EtherCAT communication is present or not.

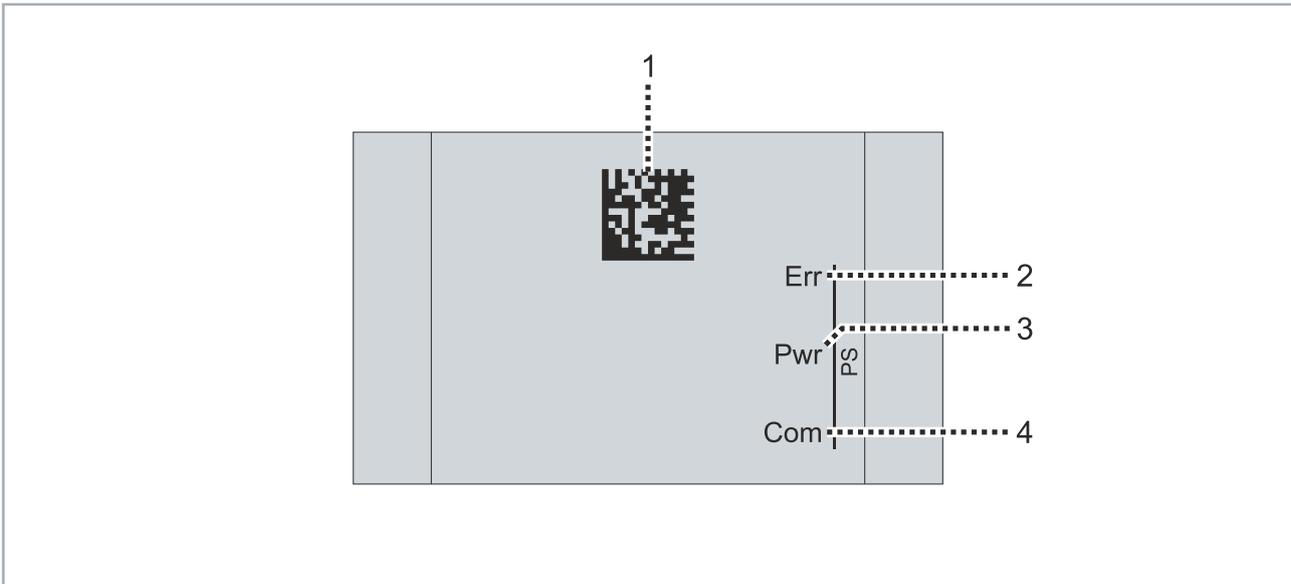
2.3 Block diagram



2.4 Type key



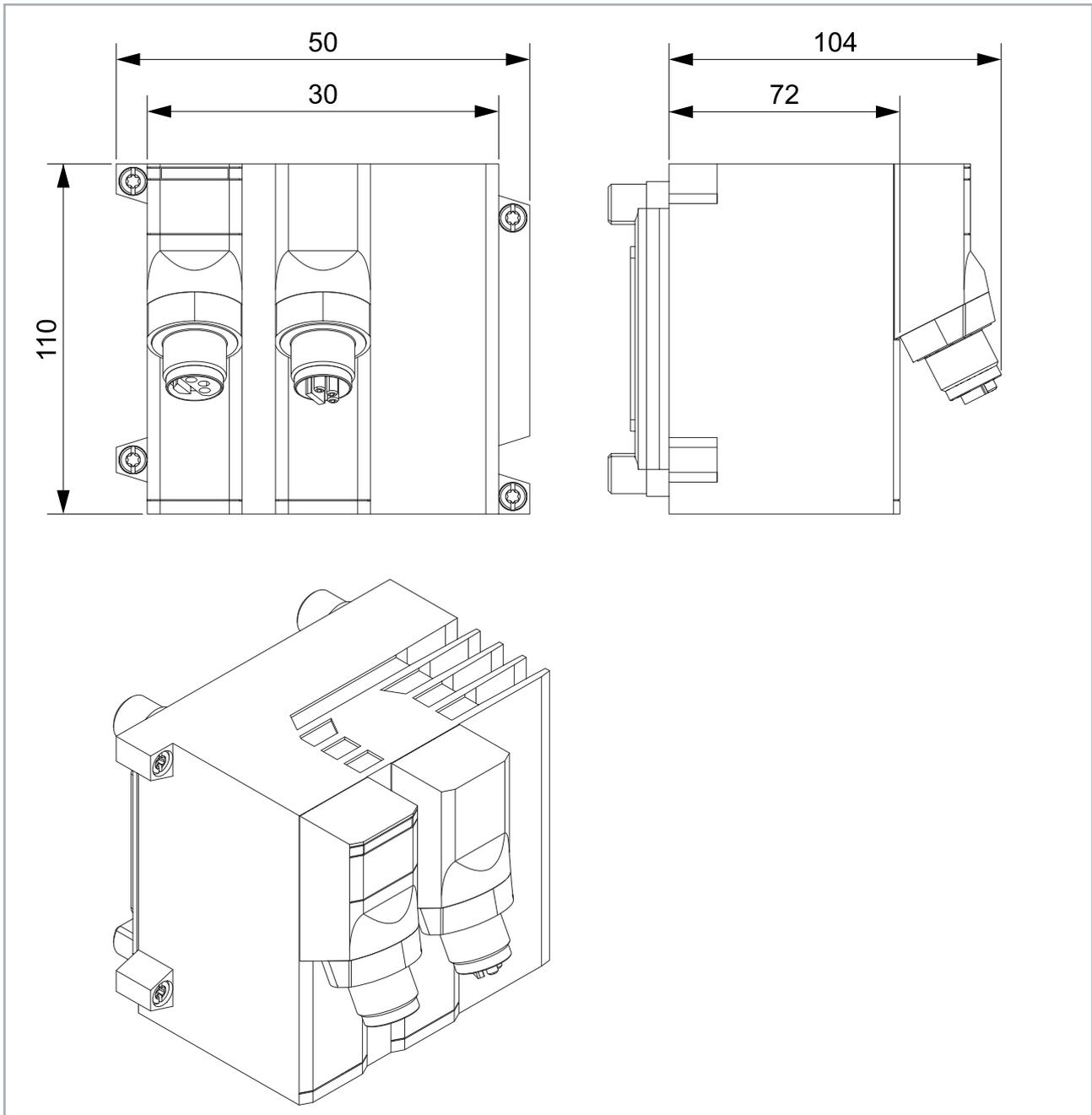
2.5 Status display



Position	Status display	Status	Explanation
1	-	-	Beckhoff Identification Code as DataMatrix code
2	Err	off	No error
		red illuminated	Power supply disabled due to error.
3	Pwr	Off	Power supply disabled or output voltage too low.
		green illuminated	Power supply active and DC output voltage in the valid range.
4	Com	Flashes or lights up green	"Communication" Displays the status of communication to the baseplate.

2.6 Dimensions

All dimensions in mm



3 Technical data

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

Baseplate interface	
Connector	2 data connectors
Hot Swap	No
Current consumption 3.3 V	10 mA
Communication	EtherCAT without distributed clocks

Voltage input X1	
Connection	B17 plug, 3-pin, coding 2
Input voltage range V_{in}	100...240 V AC (-15...+10 %)
Frequency of the input voltage	50...60 Hz (± 10%)
Rated current connector	10 A

Power transmission X2	
Connection	B17 socket, 3-pin, coding 2
Rated current connector	10 A

Power supply	
Output voltage V_{OUT}	24 V DC in the factory setting. Adjustable up to 28 V DC.
Overvoltage limitation	33 V DC 36 V DC (max.)
Rated output current I_{Rated}	for $V_{Out} = 24$ V DC: $V_{in} = 100$ V AC: $I_{Rated} = 5$ A $V_{in} = 120$ V AC: $I_{Rated} = 5$ A $V_{in} = 230$ V AC: $I_{Rated} = 7$ A
	for $V_{Out} = 28$ V DC: $V_{in} = 100$ V AC: $I_{Rated} = 4.28$ A $V_{in} = 120$ V AC: $I_{Rated} = 4.28$ A $V_{in} = 230$ V AC: $I_{Rated} = 6$ A
Maximum output current I_{Max}	for $V_{Out} = 24$ V DC: $V_{in} = 100$ V AC: $I_{Max} = 6.25$ A $V_{in} = 120$ V AC: $I_{Max} = 6.25$ A $V_{in} = 230$ V AC: $I_{Max} = 8.75$ A
	for $V_{Out} = 28$ V DC: $V_{in} = 100$ V AC: $I_{Max} = 5.31$ A $V_{in} = 120$ V AC: $I_{Max} = 5.31$ A $V_{in} = 230$ V AC: $I_{Max} = 7.5$ A
Short-circuit current	11 A (max.)
Output type	PELV
Parallel use	permissible, max. 2 modules
Switch-on threshold	80 V AC
Switch-off threshold	66 V AC
Input current I_{In}	for $V_{Out} = 24$ V DC and $I_{Out} = I_{Rated}$ $V_{in} = 100$ V AC: $I_{In} = 1.4$ A $V_{in} = 120$ V AC: $I_{In} = 1.1$ A $V_{in} = 230$ V AC: $I_{In} = 0.8$ A
Power factor λ	for $V_{Out} = 24$ V DC and $I_{Out} = I_{Rated}$ $V_{in} = 100$ V AC: $\lambda = 0.99$ $V_{in} = 120$ V AC: $\lambda = 0.99$ $V_{in} = 230$ V AC: $\lambda = 0.98$
Inrush current I_{In} (without current flow in filter capacitors)	for $V_{Out} = 24$ V DC and $I_{Out} = I_{Rated}$ $V_{in} = 100$ V AC: $I_{In} = 3.4$ A $V_{in} = 120$ V AC: $I_{In} = 3.4$ A $V_{in} = 230$ V AC: $I_{In} = 4.8$ A
Efficiency η	for $V_{Out} = 24$ V DC and $I_{Out} = I_{Rated}$ $V_{in} = 100$ V AC: $\eta = 0.92$ $V_{in} = 120$ V AC: $\eta = 0.93$ $V_{in} = 230$ V AC: $\eta = 0.95$
Power loss P_{Loss}	for $V_{Out} = 24$ V DC and $I_{Out} = I_{Rated}$ $V_{in} = 100$ V AC: $P_{Loss} = 9.3$ W $V_{in} = 120$ V AC: $P_{Loss} = 8.3$ W $V_{in} = 230$ V AC: $P_{Loss} = 8.7$ W

Power supply	
Hold-up time	for $V_{Out} = 24 \text{ V DC}$ and $I_{Out} = I_{Rated}$ $V_{in} = 120 \text{ V AC}$: $t = 75 \text{ ms}$ $V_{in} = 230 \text{ V AC}$: $t = 53 \text{ ms}$
Output decoupling for redundancy	no
Feeding back into the output	permissible up to max. 35 V DC (overvoltage limitation can trigger beforehand)
Output capacitance	2670 μF

Housing data	
Width (slots)	3
Height (rows)	1
Dimensions W x H x D	130 mm x 110 mm x 104 mm 130 mm x 110 mm x 72 mm (housing only)
Weight	1.6 kg
Material	Zinc and aluminum die-cast
Cooling	Convection
Weight	1.6 kg
Installation position	Vertical. See system manual, chapter "Installation conditions".

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

Device safety	
Separation between input and output	Double or reinforced electrical isolation
Protection class	I

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

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.

4.1 Power supply

This software function enables configuration, control and diagnosis of the power supply integrated in the module.

It is implemented by the EtherCAT profile 5001.00911 "Power Supply", or "PSU" for short.

Full description of this software function in the Beckhoff Information System: [Link](#)

4.1.1 Process Data Objects (PDO)

The process data objects are disabled on delivery. You can enable them via the Predefined PDO Assignments.

PSU Inputs

Variable	Data type	Description
Warning	BOOL	Warning message
Error	BOOL	Error message. The output voltage has been switched off.
I2T Warning	BOOL	The I ² T warning threshold (0x8000:11) was exceeded.
DC OK	BOOL	The output voltage is within the permissible range.
Overrange	BOOL	One of the measured values is outside the measurable range.
Input Cycle Counter	BIT2	A 2-bit counter that is incremented each time the input data in the process image is updated.
Output Voltage	REAL32	The present output voltage in V.
Output Current	REAL32	The present output current in A.
I2T Utilization	UINT8	The current I ² T utilization.
Info Data 1	UINT16	Additional information. The content of these variables can be selected in parameter 8001:19.
Info Data 2	UINT16	Additional information. The content of these variables can be selected in parameter 8001:21.

PSU Outputs

Variable	Data type	Description
Disable Output	BOOL	Disables the output.
Reset	BOOL	Resets an error message and switches the output voltage back on.

5 Mechanical installation



Required tools

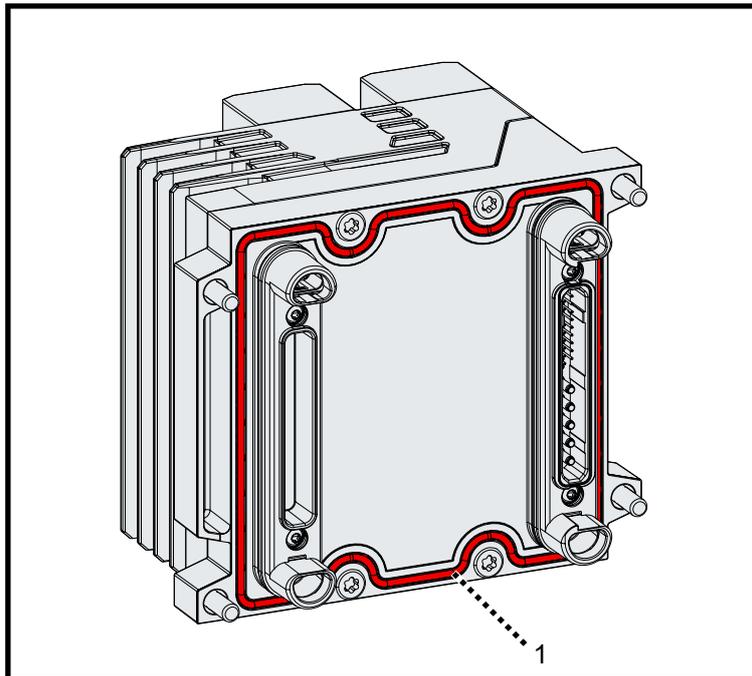
- Torx T25 screwdriver
- Torque wrench 5 Nm

5.1 Preparation

NOTICE

Check the module for damage

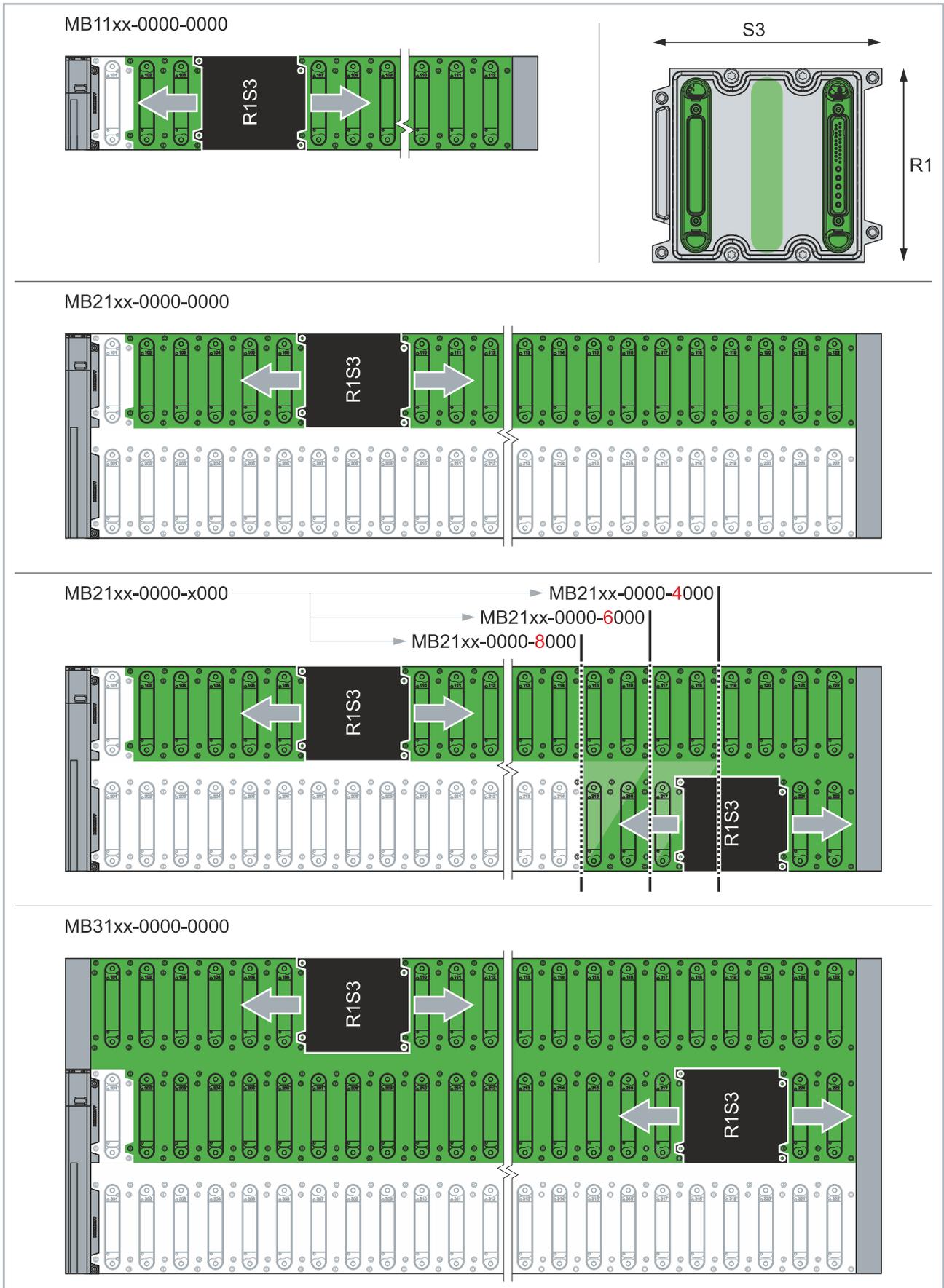
If the seal is worn or damaged, liquids and dirt can penetrate and damage the MX-System. The IP67 protection rating is not met if the seals are worn or damaged.



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

WARNING

Danger to life

Failure to observe the following instructions may result in danger to life, fire hazard and risk of property damage.

- Avoid contaminating the connectors before connecting them.
- Only connect or disconnect cables when they are de-energized.
- Tighten the cap nuts on the hybrid connectors until they click into place.
- Cover connectors to which no cable is connected with a protective cap.
- The cables must be suitable for the expected heating and insulation voltage. The installation must comply with the installation requirements of EN 60204.

Overview

The MS1010-1002-1334 has two connections:

- The power input X1 is used to feed in the mains voltage.
- The mains voltage fed into X1 is available at power output X2 for forwarding to other loads.

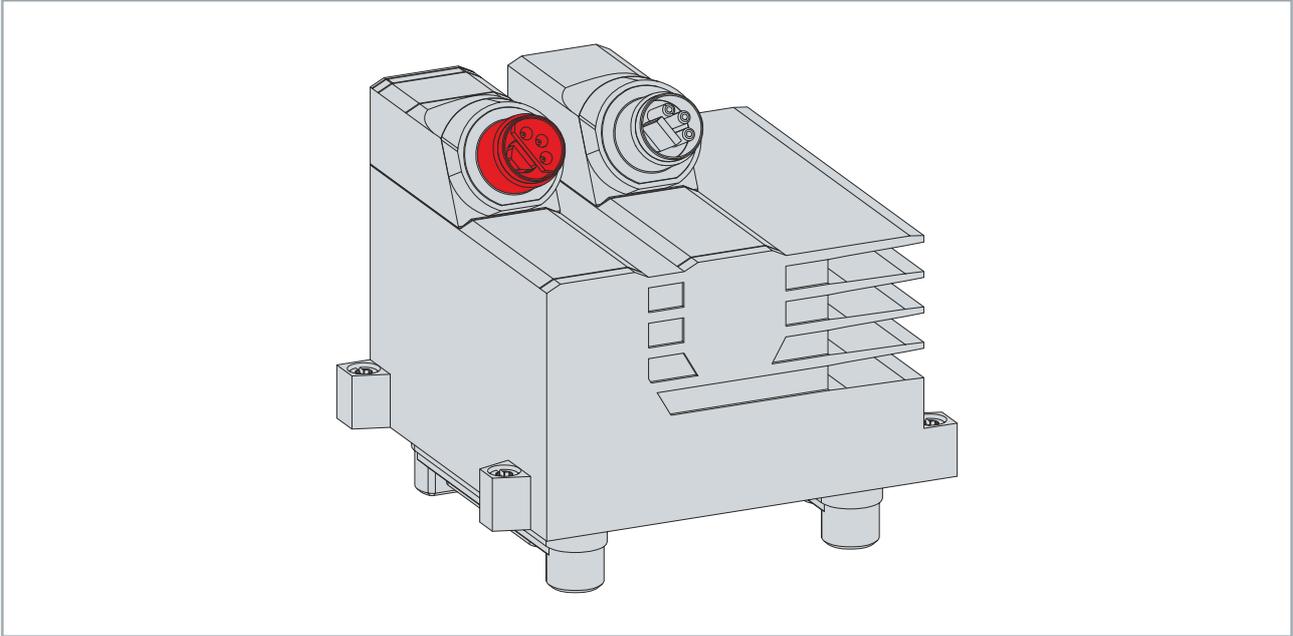
If no cable is connected to power output X2, it must be covered with a protective cap.

Power output X2 is not short-circuit proof. If necessary, install short-circuit protection behind the power output.

Fuse protection of the supply line at X1

Place of use	Fuse protection of the feed line
Europe	10 A
USA	A circuit breaker that is UL-listed and not current-limiting

6.1 Power input X1



The power input is a 3-pin B17 connector with coding 2 without data element.

Pin assignment

B17 connector	Pin	Symbol	Function
	5	PE	Protective earth
	6	N	N
	7	L	L

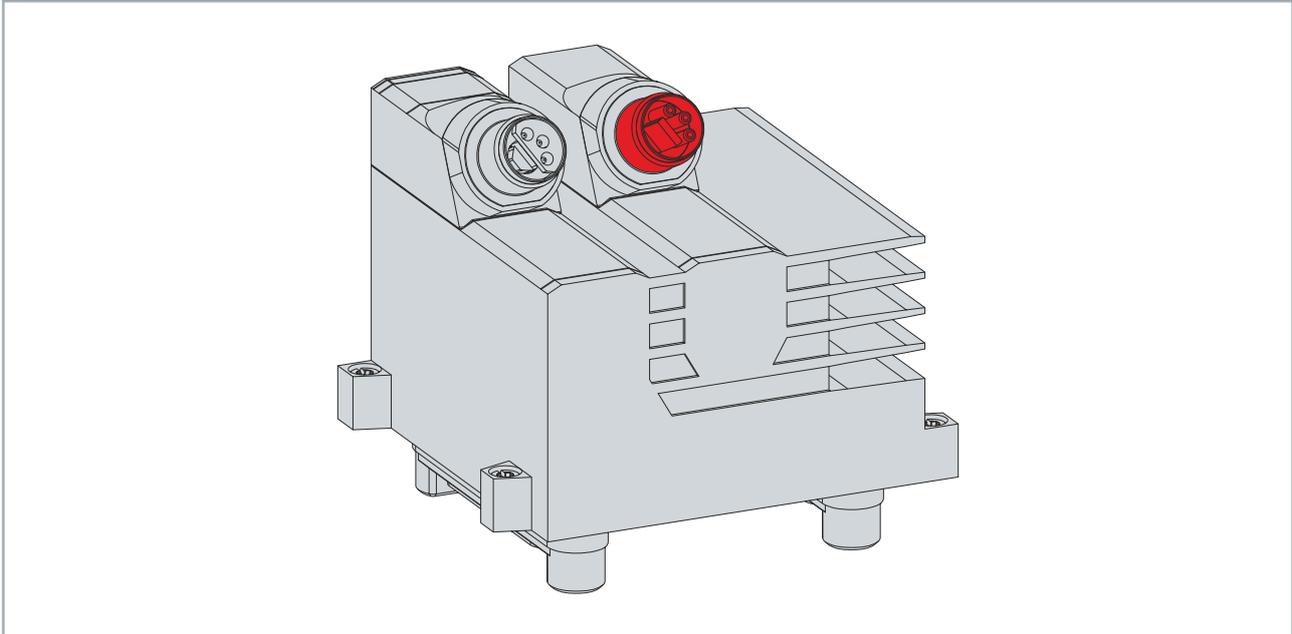
6.2 Power output X2

NOTICE

Risk of overload

Defect possible due to overload.

- Ensure that the maximum permissible current in the power input X1 is not exceeded by the power feed through. See chapter [Power transmission](#) [► 10].



The power output is a 3-pin B17 connector with coding 2 without data element. It forms a direct forwarding of the power input X1.

Pin assignment

B17 connector	Pin	Symbol	Function
<p>A top view diagram of a B17 connector. The connector is circular with nine pins. The pins are labeled with numbers 1 through 9. Pins 1, 2, and 3 are at the top. Pins 4, 5, and 6 are in the middle. Pins 7, 8, and 9 are at the bottom. Dotted lines connect the numbers to the corresponding pins.</p>	5	PE	Protective earth
	6	N	N
	7	L	L

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](#) [[▶ 16](#)].

Proceed as follows to put the module into operation.

1. Mount the module on a baseplate. Further information can be found in chapter [Installation](#).
2. Wire the module. Further information can be found in chapter [Connection](#) [[▶ 23](#)].
3. Switch on the external supply voltage.
 - ⇒ **Notice** As soon as the external supply voltage is applied, the power supply is automatically active and outputs $UB = 24\text{ V DC}$ to the baseplate. This behavior cannot be set.
4. Parameterize the functions of the module if required. Further information can be found in chapter [Software functions](#) [[▶ 19](#)].

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

- 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

NOTICE

This device is not hot-swappable

Disassembling this device under voltage can lead to material damage.

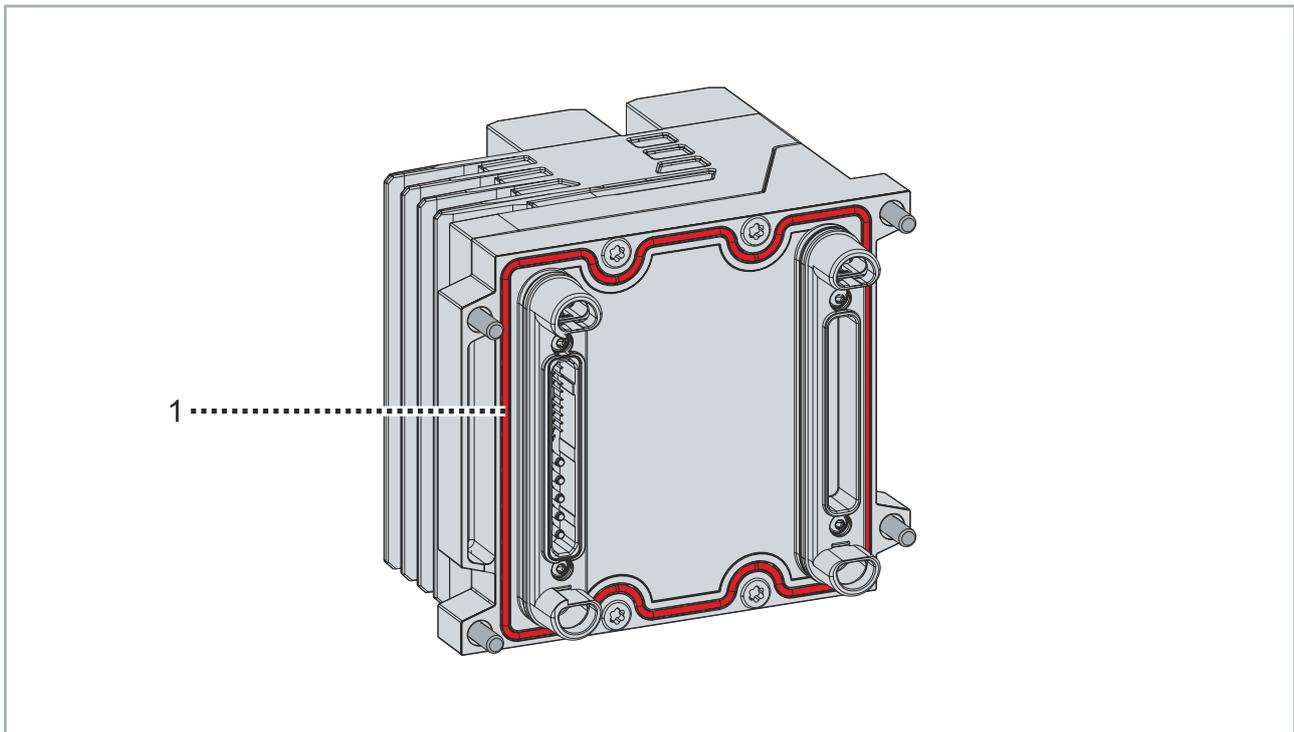
- Switch off the supply voltage before disassembling.

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 Power cables
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](#) [► 16] 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](#) [► 31].

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.

Download finder

Our [download finder](#) contains all the files that we offer you for downloading. You will find application reports, technical documentation, technical drawings, configuration files and much more.

The downloads are available in various formats.

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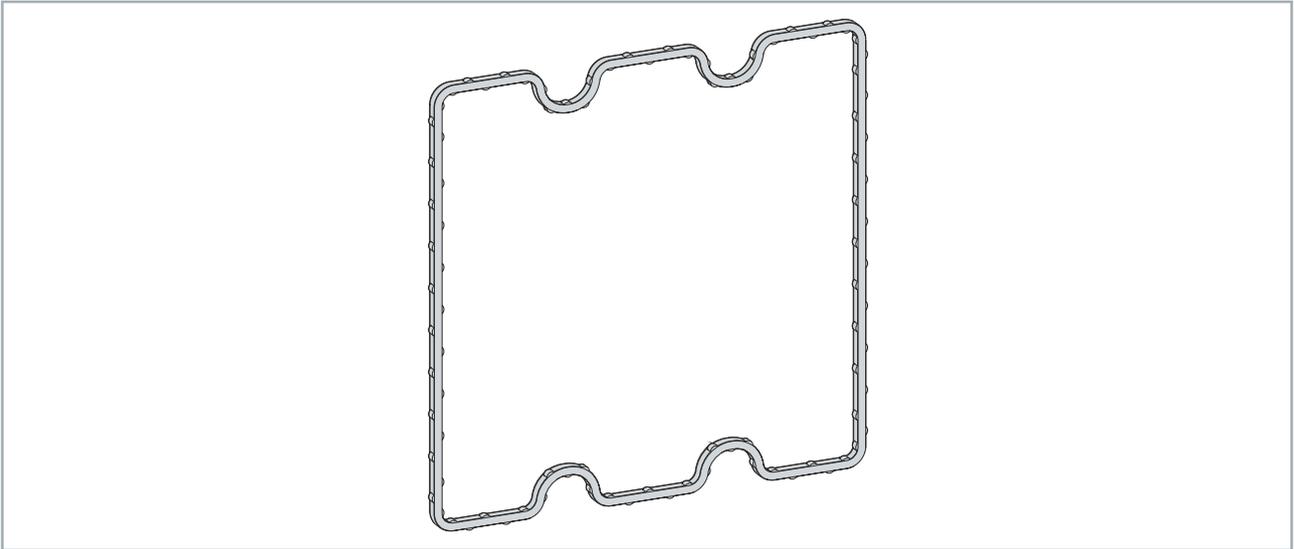
9.3 Accessories

Suitable accessories can be found on the product website:

<https://www.beckhoff.com/ms1010-1002-1334>

The following items are also available for replacing worn parts:

MX module base R1S3 with seal



The module base R1S3 with seal is available for replacing worn and damaged seals on a 1-row MX module with three slots.

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