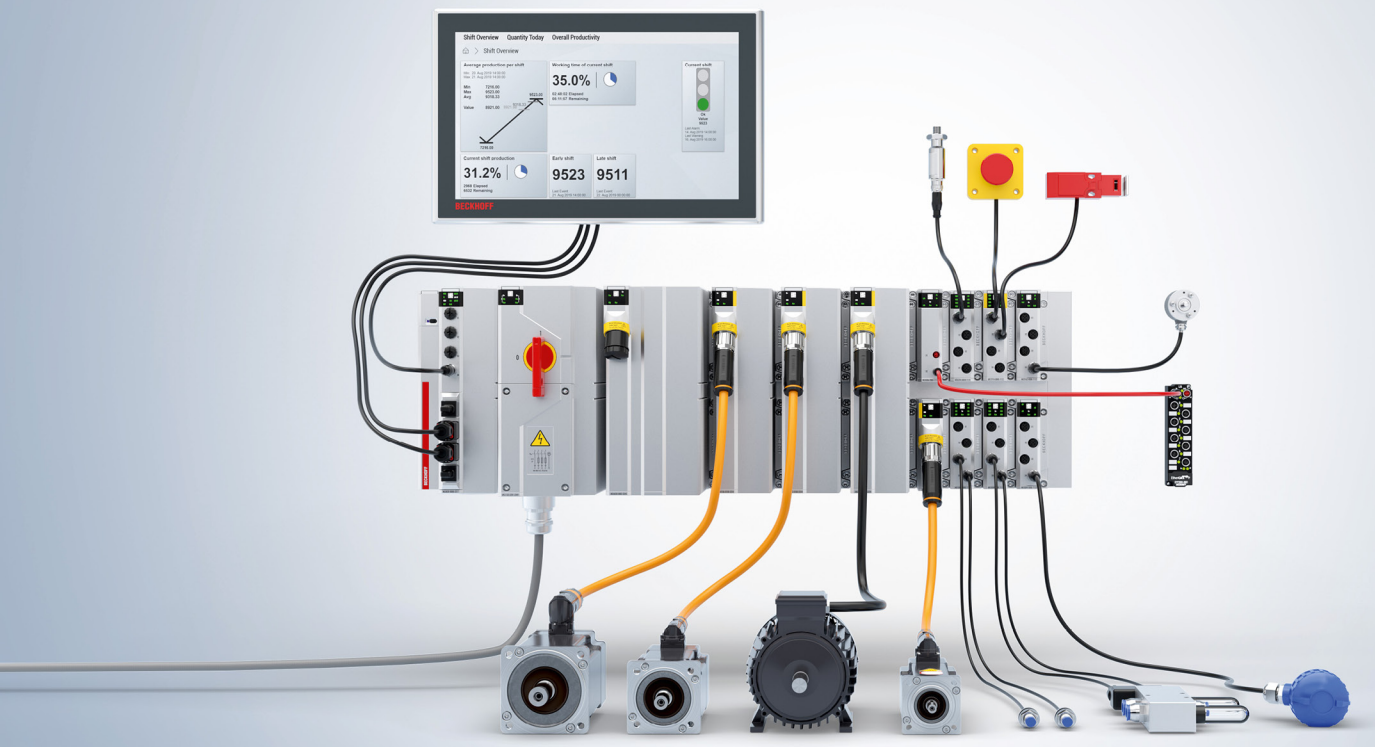
BECKHOFF New Automation Technology

Manual | EN

MS4208-3013-1122

3-channel EtherCAT power output, EtherCAT, 24 V DC/4 A, 48 V DC/8 A, switchable, M12



2026-10-28 | 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

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 Warning Signs and Symbols

Safety symbols, warning labels, and informational symbols are displayed on the product, the packaging, and in the technical documentation. The symbols used may vary depending on the device model and features.

The symbols are used:

- to protect people,
- to prevent damage to property and equipment,
- as well as for technical, safety-relevant, and environmental information.

Safety and information labels must not be removed, covered, or obscured. They must remain readable at all times.

The following section explains the symbols used on the device and in the documentation. These include both safety-relevant warning signs and general information and marking symbols, such as those for electrical labeling, disposal, or intended use.

When a symbol appears, follow the instructions provided in the technical documentation.



General warning sign

The relevant safety and warning instructions in the technical documentation must be followed. Improper operation or failure to follow the instructions may result in injury, property damage, or damage to the equipment.



Electronic Components/Disposal

Products marked with a crossed-out waste bin must not be disposed of with general waste. Electrical and electronic devices must be disposed of in accordance with applicable national regulations governing waste electrical and electronic equipment.



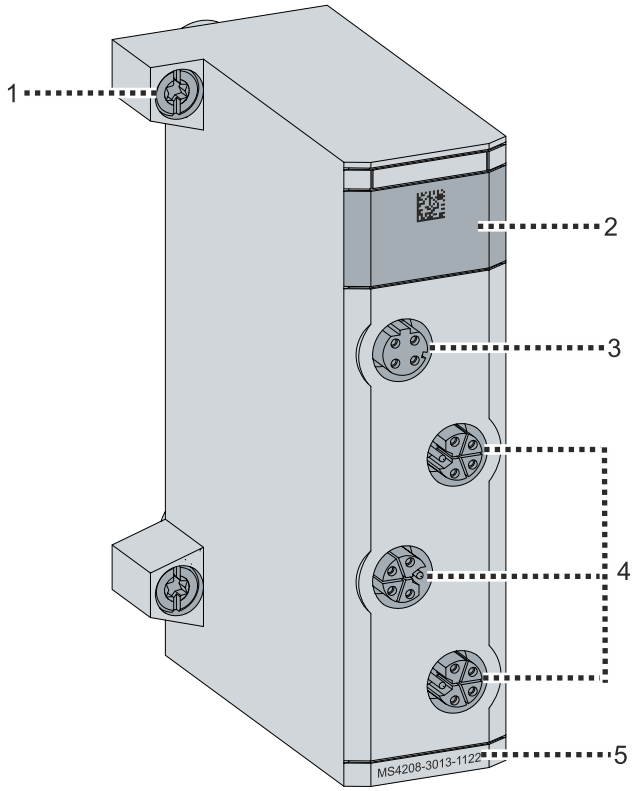
Read the original operating instructions

Be sure to read the entire operating instructions before commissioning the device. In particular, please observe the general safety instructions as well as the warnings in the individual chapters.

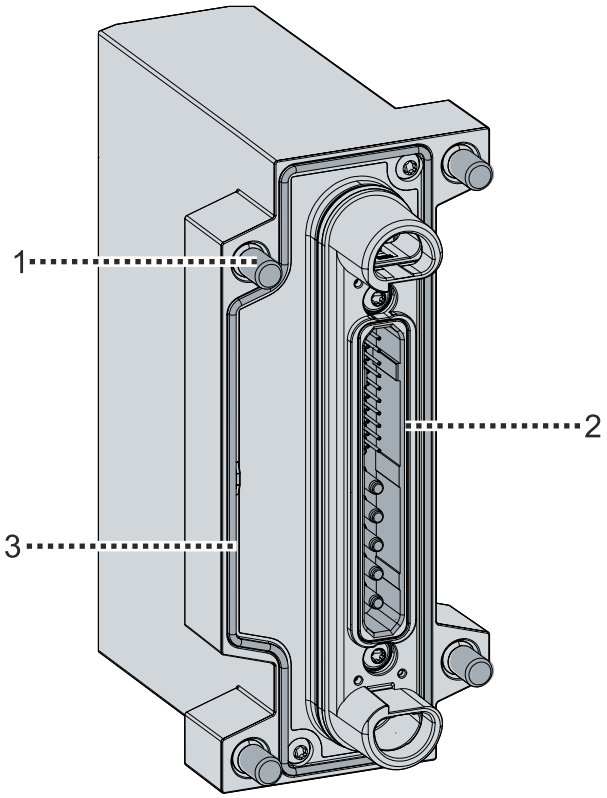
2 Product overview

The MS4208-3013-1122 EtherCAT power output module provides 24 V DC with up to 4 A and 48 V DC with up to 8 A for additional consumers. Three channels are supplied via separate connectors.

The integration of an EtherCAT power output module allows MX-System stations to be expanded to include EtherCAT Box modules as well as any other EtherCAT devices, such as EtherCAT valve terminals.



Position	Name
1	Fastening screw, captive, 4 x
2	Status display
3	EtherCAT power output X1
4	Supply voltage outputs X2, X3, and X4
5	Module name



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

2.1 Product functions

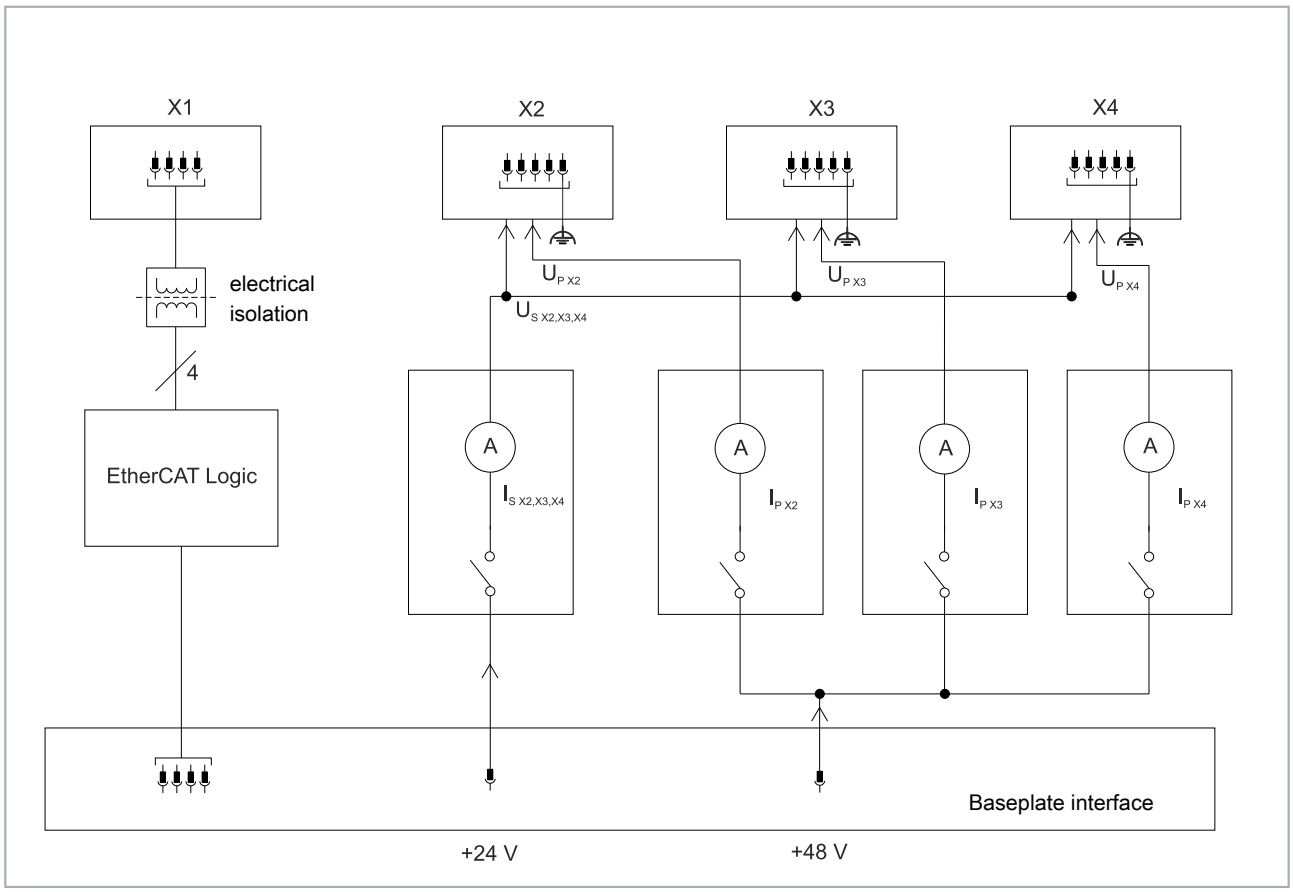
EtherCAT connection

An EtherCAT SubDevice can be connected to the EtherCAT port. The module integrates the connected devices into the EtherCAT network.

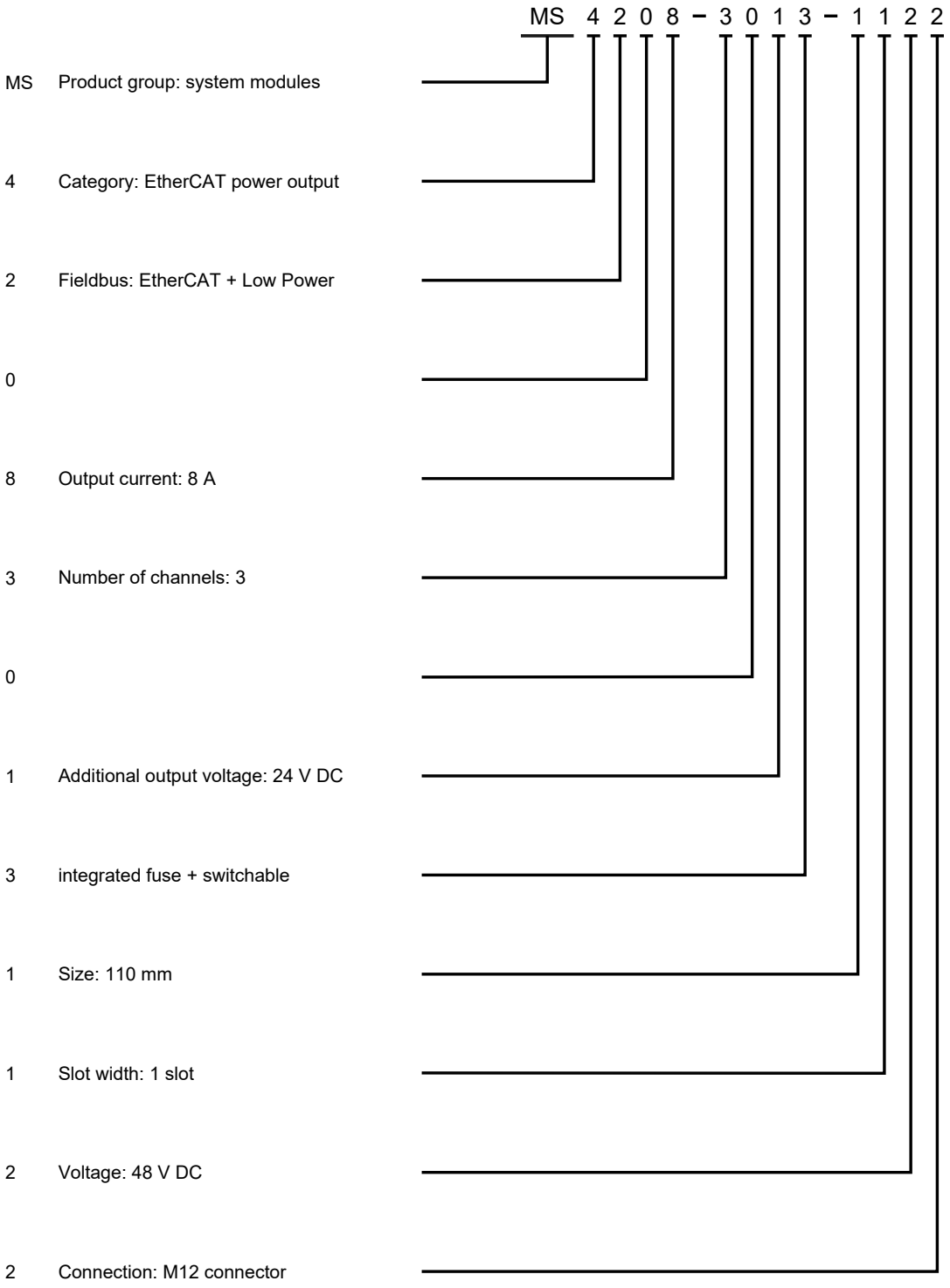
Supply voltage outputs

The MS4208-3013-1122 provides supply voltages to external loads via three separate supply voltage outputs. For each output, the module outputs a voltage of 24 V DC as the control voltage (U_S) and 48 V DC as the load voltage (U_P). The control voltage U_S is supplied to connections X2, X3, and X4 via a common electronic overcurrent circuit. The load voltage U_P is protected and can be switched separately for each connection (X2, X3, and X4) via its own electronic overcurrent circuit. The output currents are measured for the common U_S path as well as for each individual U_P path.

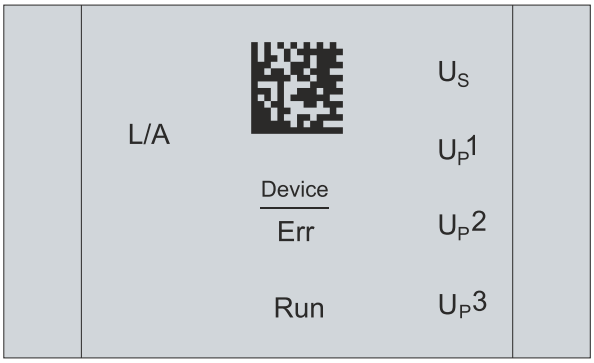
2.2 Block diagram



2.3 Type key


MS 4 2 0 8 – 3 0 1 3 – 1 1 2 2
MS Product group: system modules
4 Category: EtherCAT power output
2 Fieldbus: EtherCAT + Low Power
0
8 Output current: 8 A
3 Number of channels: 3
0
1 Additional output voltage: 24 V DC
3 integrated fuse + switchable
1 Size: 110 mm
1 Slot width: 1 slot
2 Voltage: 48 V DC
2 Connection: M12 connector

2.4 Status display



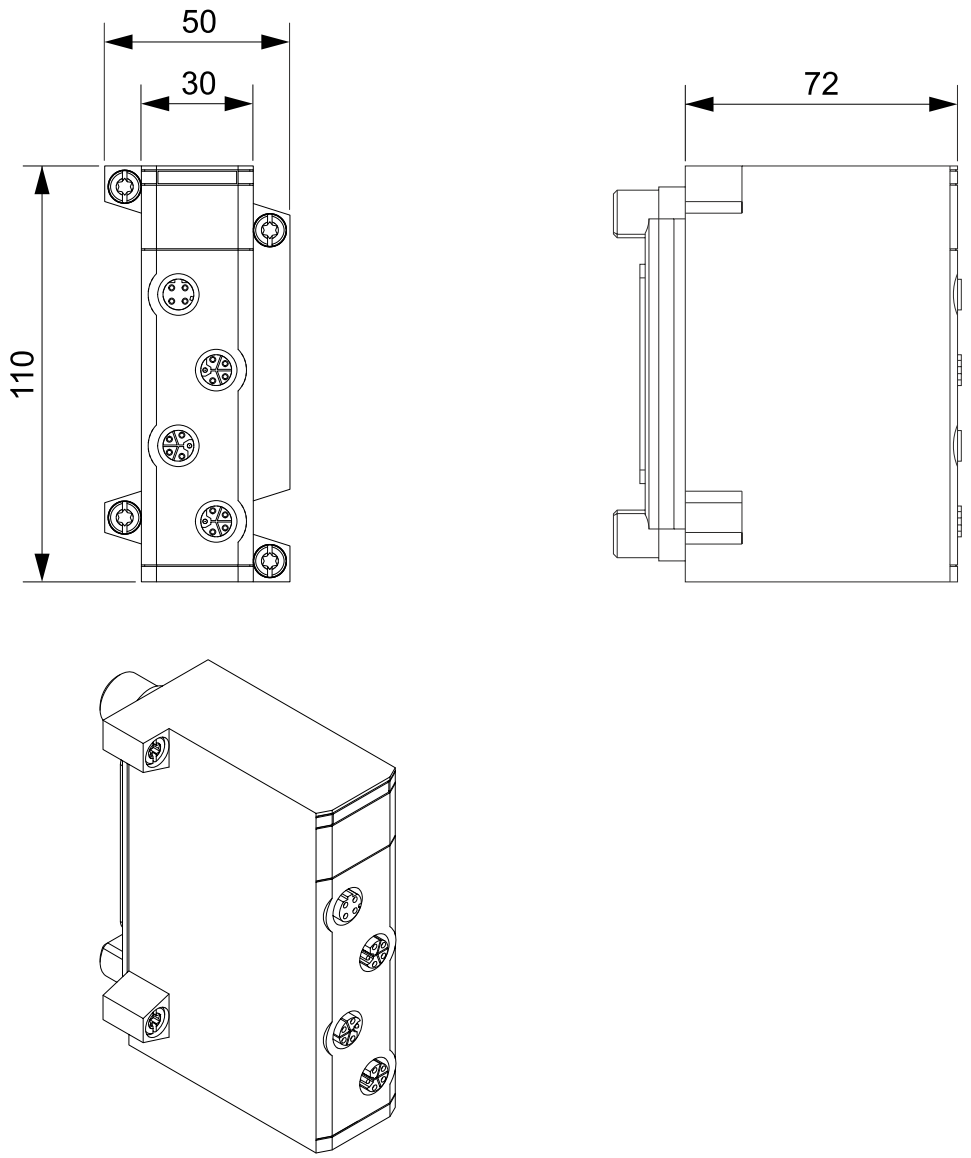
LED	State	Meaning
	-	Beckhoff Identification Code as Data Matrix code
Device | Err	off	There are no active error messages.
	lights up red	There are active error messages. You can find more detailed information in TwinCAT.
Run	off	EtherCAT communication status: Initialization Initial state after switching 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.
L/A	off	No connection on the incoming EtherCAT segment.
	flashes green	Communication is established with the previous EtherCAT device.
	lights up green	The preceding EtherCAT device is connected.
U_S	off	No control voltage present.
	lights up green	The 24 V DC control voltage is present.

Load voltage per voltage output

LED	State	Meaning
U_P	off	No load voltage present.
	lights up green	The 48 V DC load voltage is present.

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
Fieldbus	EtherCAT
Distributed clocks	No

EtherCAT output	
Connection	1 x M12 socket, D-coded
Cable length	max. 100 m

Supply voltage outputs	
Connection	3 x M12 socket, L-coded
Rated input voltage per connection	• 24 V DC (–15%…+20%) • 48 V DC (–15%…+20%)
Rated output current	• U_S: max. 4 A • U_P: max. 8 A per connection • Sum current for U_P: max. 20 A
Output current limitation	• U_S: 4.4 A • U_P: 27.5 A per connection
Output power limitation	• U_S: 100 W • U_P: 150 W per connection
Output current measuring range	• U_S: -15.5…+15.5 A • U_P: -41.25…+41.25 A

Housing data	
Width (slots)	1
Height (rows)	1
Dimensions W × H × D	50 mm × 110 mm × 73 mm 50 mm × 110 mm × 72 mm (housing only)
Material	Zinc die-cast and aluminum die-cast
Cooling	Convection
Installation position	Vertical. See system manual, chapter "Installation conditions".
Weight	Approx. 560 g

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
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.

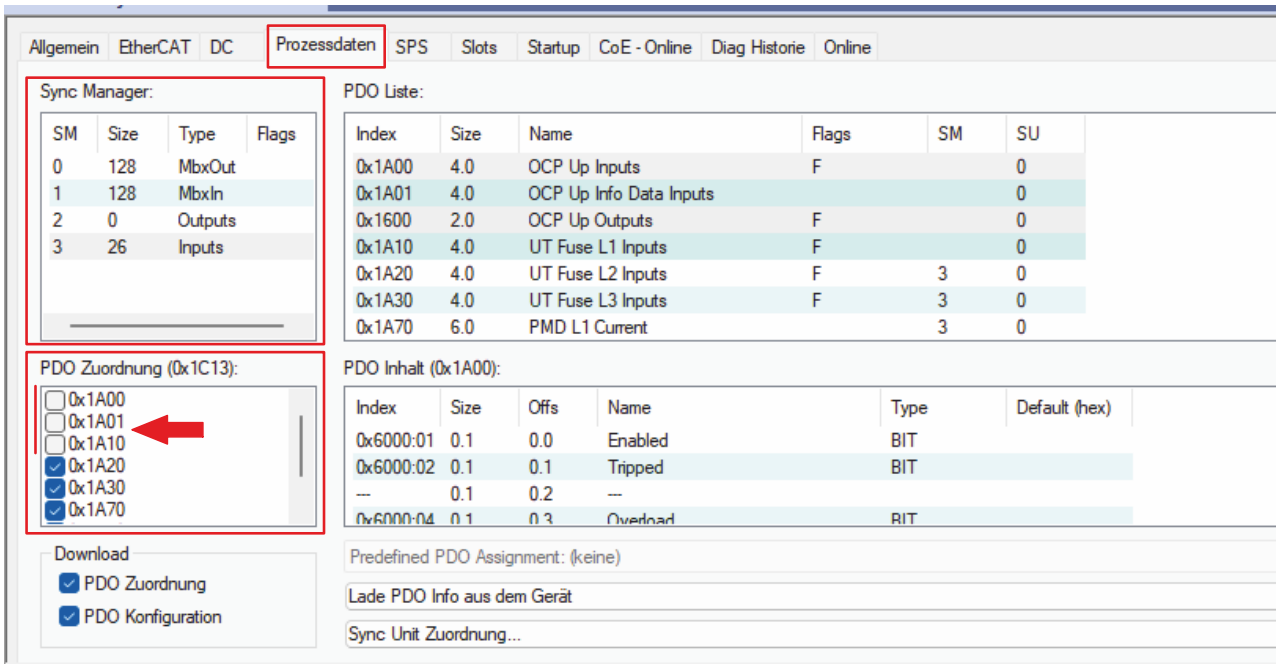
Process data objects

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.

Disabled PDOs

Some process data objects may be disabled in the delivery state. You can enable this using the **PDO assignment** .

1. To do this, select the appropriate device in the **Solution Explorer**.
2. In the view window, select the **process data** tab.
3. In Sync Manager, select the appropriate profile.
4. Under **PDO assignment, check the** desired empty box.



Inputs Profile OCP Ux (Channel x) Inputs

Variable	Type	Description
Enabled	BOOL	0 = The output is disabled. 1 = The output is enabled.
Tripped	BOOL	0 = The output was not triggered. 1 = The output was triggered.
Overload	BOOL	0 = No overvoltage detected. 1 = Overvoltage detected.
Undervoltage	BOOL	0 = No undervoltage detected. 1 = Undervoltage detected.
Current Level Warning	BOOL	0 = The current alert level has not been exceeded. 1 = The adjusted current alert level has been exceeded.
Cool Down Lock	BOOL	0 = Cooling-off period not active 1 = Cooling-off period active
Input Cycle Counter	BIT2	A 2-bit counter that increments when the TxPDO data is updated.
Error	BOOL	0 = No output error state. 1 = Output error state active.
Load Level Warning	BOOL	0 = The output is not overloaded. 1= The output is overloaded.

Inputs Profile OCP Up Total Inputs

Variable	Type	Description
Current Level Warning	BIT	0 = The adjusted current alert level has not been exceeded. 1 = The adjusted current alert level has been exceeded.
Input Cycle Counter	BIT2	A 2-bit counter that increments when the TxPDO data is updated.

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

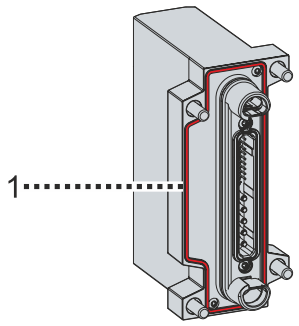
- Torx T25 screwdriver
- Torque wrench 5 Nm

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.

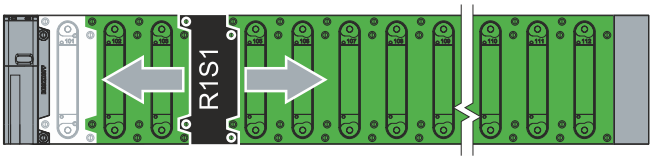


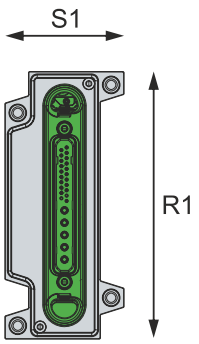
1. Check the seal [1] of the module for wear and damage
2. Replace worn and damaged seals

5.2 Placement of the module on the baseplate

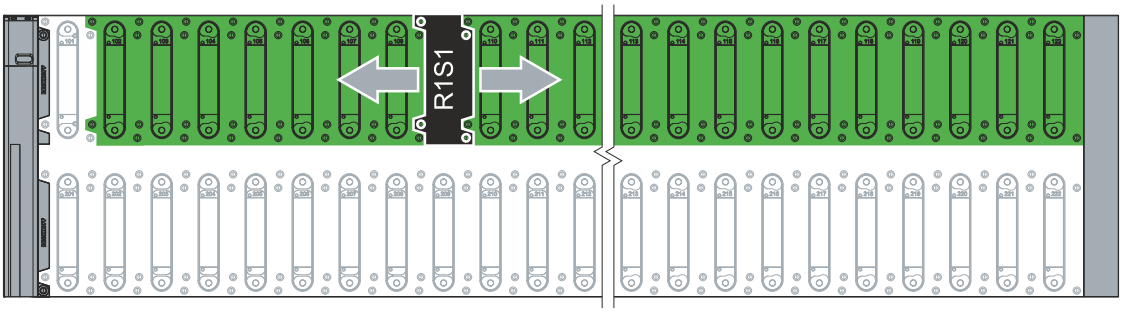
The module can be plugged into the following areas marked in green:

MB11xx-0000-0000

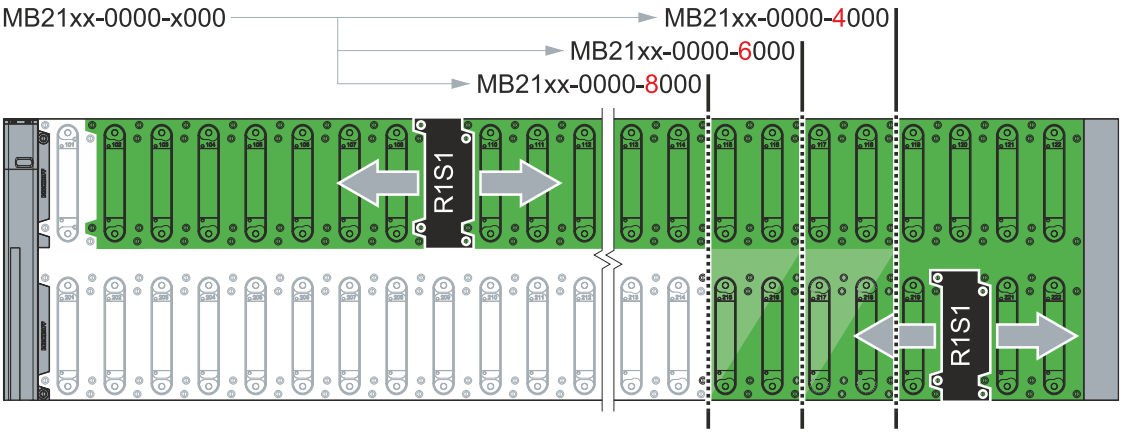




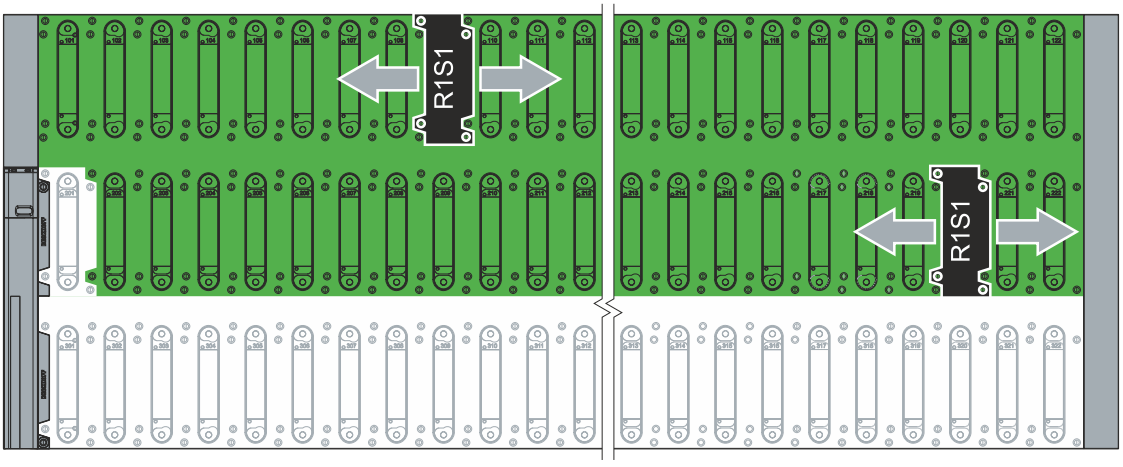
MB21xx-0000-0000



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

PELV voltage source

The module must be powered by a PELV voltage source.

NOTICE

Use EtherCAT/Ethernet cables indoors only

EtherCAT or Ethernet cables must not be run outside buildings.

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

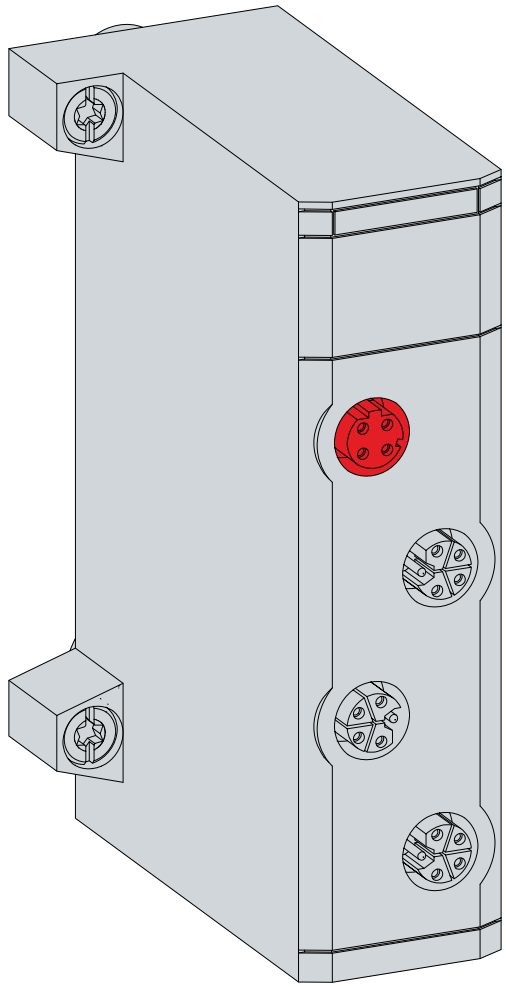
Cover unused sockets with protective caps

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

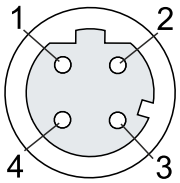
Tested with a UL-listed circuit breaker (without current limiting) rated at 20 A.

6.1 EtherCAT output: X1

The EtherCAT output is a 4-pin M12 socket, D-coded.



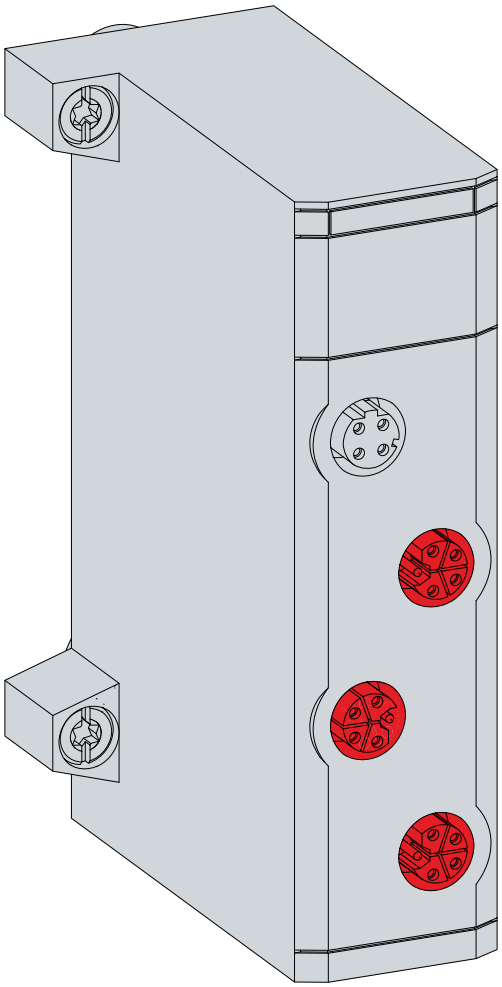
Tightening torque: 0.6 Nm

M12 socket, D-coded	Pin	Symbol	Function
	1	RX+	EtherCAT data line
	2	TX+	EtherCAT data line
	3	RX-	EtherCAT data line
	4	TX-	EtherCAT data line

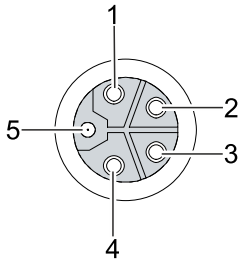
The cable shield is connected via the thread.

6.2 Supply voltage outputs: X2, X3, and X4

The supply voltage outputs are 5-pin M12 sockets, L-coded.



Tightening torque: 0.6 Nm

M12 socket, L-coded	Pin	Symbol	Function
	1	U_P+	Load voltage
	2	U_P-	GND to pin 1
	3	U_S+	Control voltage
	4	U_S-	GND to pin 3
	5	⏚	Functional earth

7 Commissioning and operation

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

8 Decommissioning

8.1 Disassembly

NOTICE

Damage to property due to electrical voltage

Disassembling this module under voltage can lead to material damage.

- Switch off the supply voltage before disassembling.

✓ 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 Manual version history

The following table shows the version history of this manual.

Version	Comment
1.0	• First release

9.2 Accessories

Suitable accessories can be found on the product website:

www.beckhoff.com/MS4208-3013-1122

Product	Description
ZMX1000-0010	M5x17.5 combi-TX25 replacement screws for module fastening (PU = 10 pcs.)
ZMX3001-0011	1-row, 1-slot replacement seal for module base
ZMX4001-0001	Replacement cover for potential equalization for 1-row baseplate with Beckhoff logo
ZMX4001-0002	Replacement cover for potential equalization for 2- and 3-row baseplate with Beckhoff logo
ZMX4001-0003	Replacement cover for MA6060 interface

9.3 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

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✉ Email:	support@beckhoff.com, Support form
Web page:	www.beckhoff.com/support

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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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33415 Verl, Germany

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