

Manual | EN

MS7801-0000-1117

Switch, CP-Link 4, 24 V DC, push-pull, M12

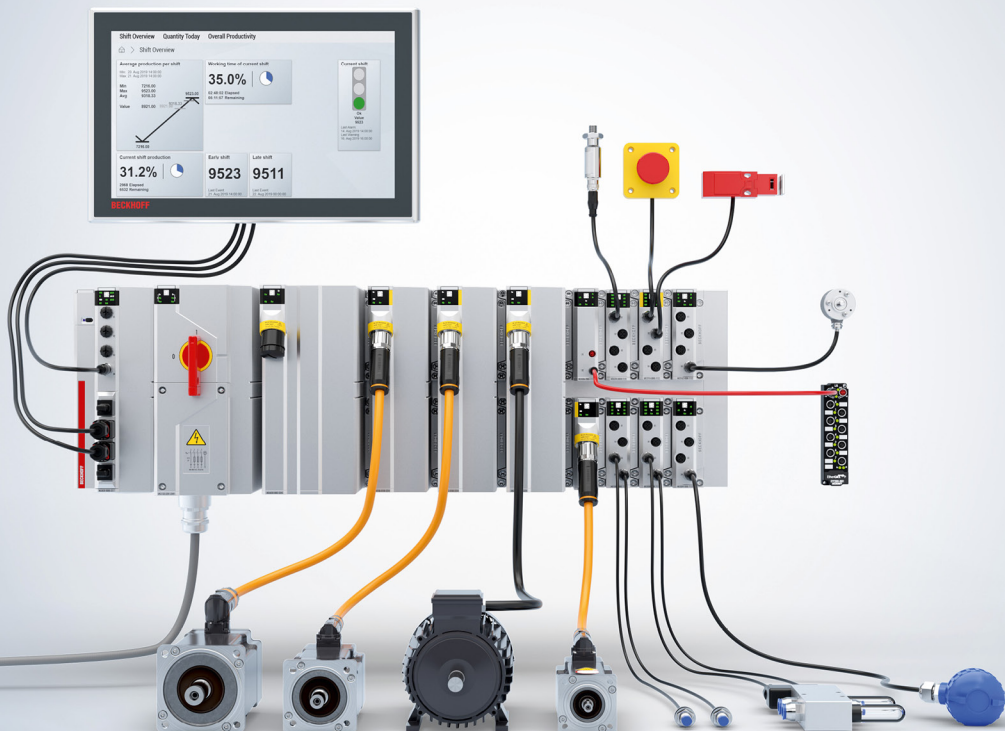


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1 Foreword

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.

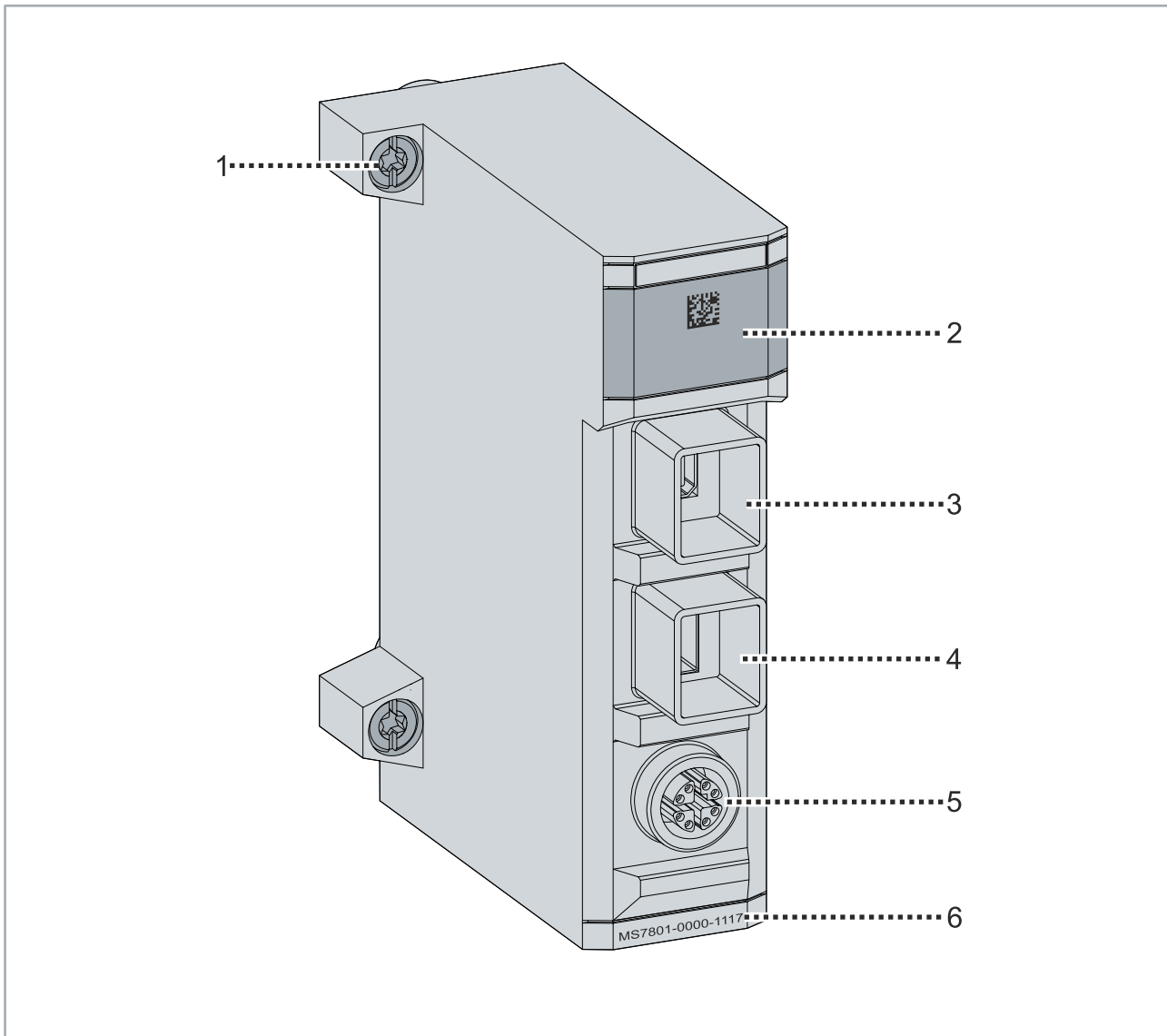


Read the original operating instructions

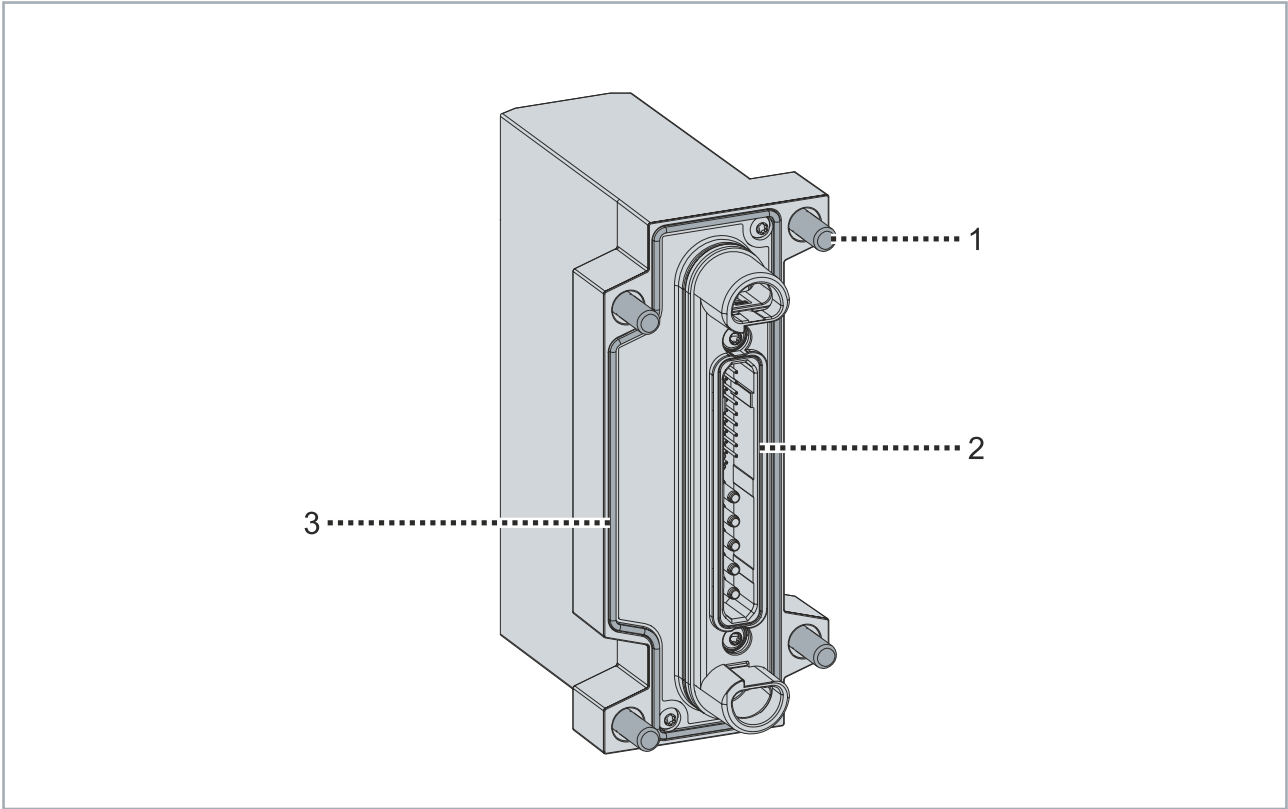
Be sure to read the entire operating instructions before commissioning the device. In particular, please observe the general safety instructions as well as the warnings in the individual chapters.

2 Product overview

The CP-Link 4 module MS7801-0000-1117 is used to connect a control panel with a CP-Link 4 interface to IPCs in the MCxxxx series equipped with a Mini DisplayPort connector and USB. The 24 V DC power supply for the control panel is provided via a separate connection directly to the MCxxxx (The Two Cable Display Link). This allows the IPC and control panel to be operated up to 100 m apart.



Position	Name
1	Fastening screw, captive, 4 x
2	Status display
3	Mini DisplayPort connection (push-pull)
4	USB 2.0 port (push-pull)
5	CP-Link 4 connection (M12)
6	Module name



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

2.1 Product functions

CP-Link 4

The CP-Link 4 interface is used to connect the module to a control panel equipped with a CP-Link 4 interface.

CP-Link 4 transmits video and USB signals over a Cat.6A cable. With the Two Cable Display Link, the control panel has a separate power supply on the MCxxxx.

USB 2.0

The module connects to the industrial PC's USB interface via its USB 2.0 interface. It provides the USB connection between the industrial PC and the connected control panel.

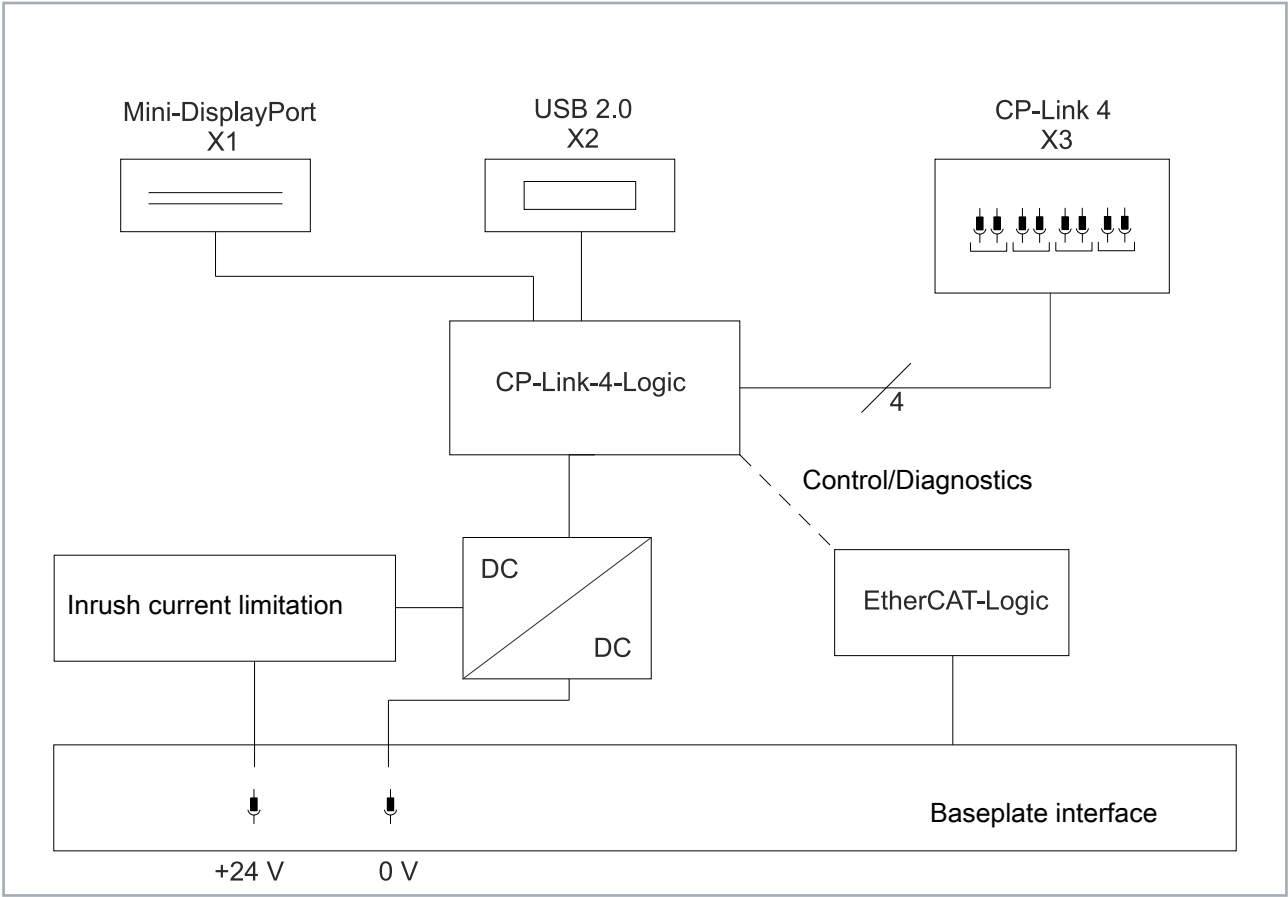
Mini DisplayPort

The module is connected to the industrial PC's video output via the Mini DisplayPort interface. The video signal is transmitted to the connected control panel via the CP-Link 4 interface.

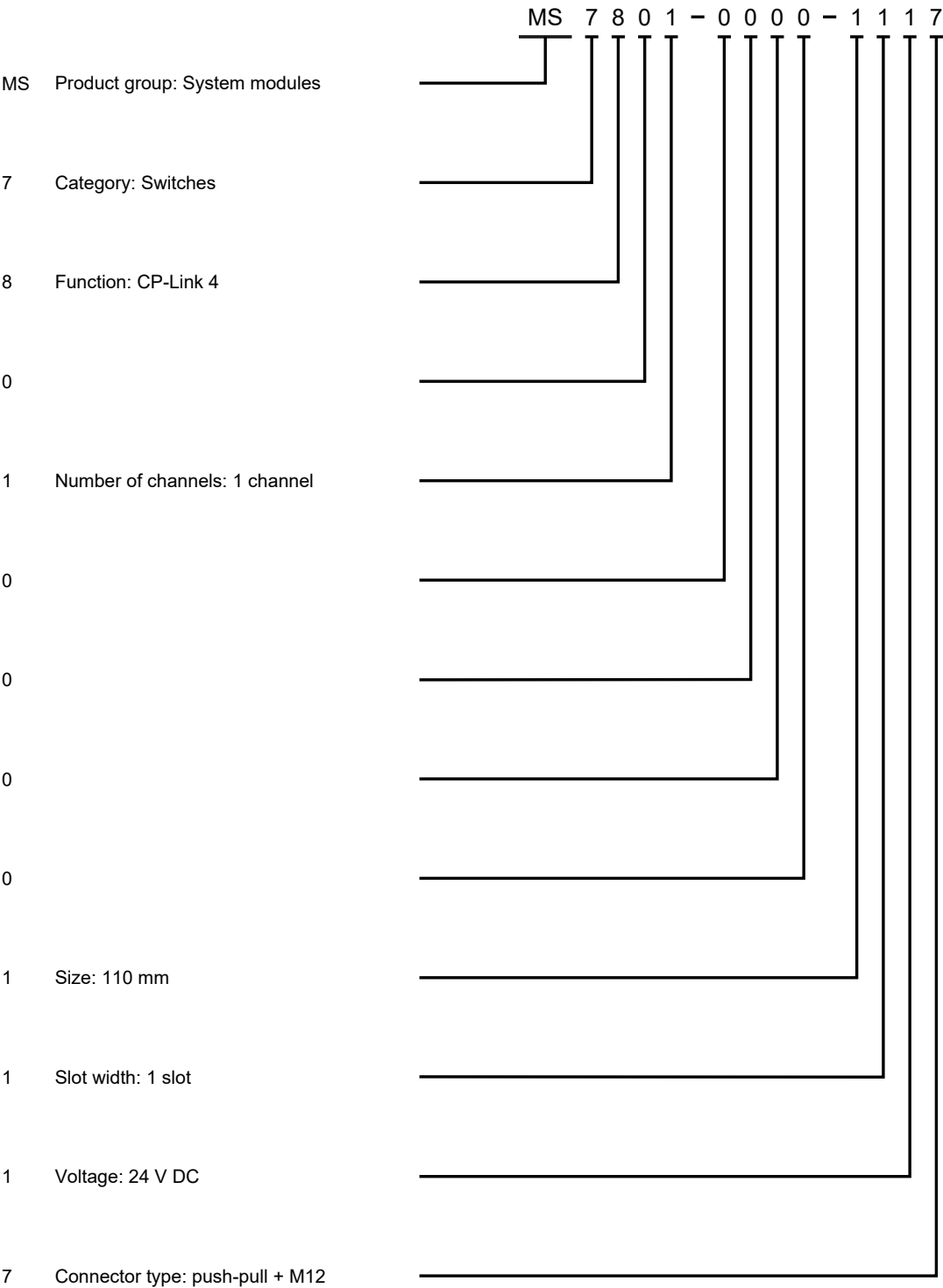
Automatic power source switching

If the 24 V power supply fails and the connected IPC switches to UPS mode, the MS7801-0000-1117 automatically switches its power supply to the USB port.

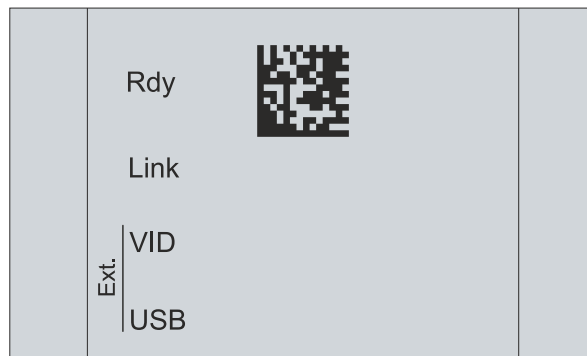
2.2 Block diagram



2.3 Type key



2.4 Status display



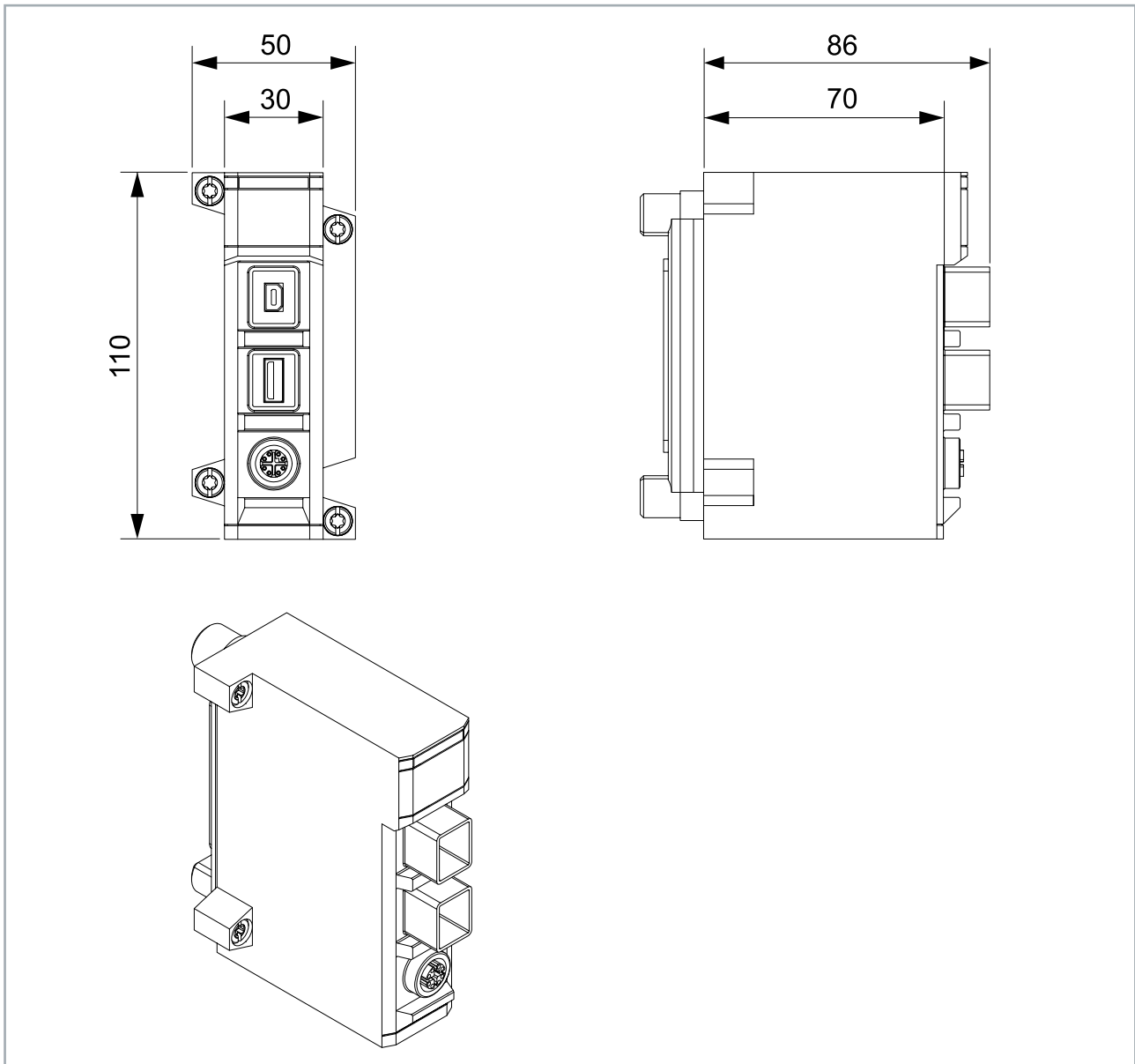
LED	State	Meaning
	-	Beckhoff Identification Code as Data Matrix code
Rdy	off	The module is not ready for operation.
	lights up green	The module is ready to operate.
Link	off	No CP-Link 4 device is connected, or there is no connection.
	lights up green	There is a connection to the connected CP-Link 4 device.

Ext. – Display area for external interfaces

LED	State	Meaning
VID	off	DisplayPort data transmission is not active.
	lights up green	DisplayPort data transmission is active.
USB	off	USB data transmission is not active.
	lights up green	USB data transmission is active.

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

Signal transmission	
Mini DisplayPort connection	1 x push-pull
USB 2.0 connection	1 x push-pull
CP-Link 4 connection	1 x M12 socket, X-coded
Mini DisplayPort cable length	max. 1 m
USB cable length	max. 1 m
CP-Link 4 cable length	max. 100 m (Cat.6A cable)
USB transmission rate via CP-Link 4	100 Mbit/s
Rated voltage	24 V DC (-15%...+20%)
Power consumption	typ. 3.2 W

Housing data	
Width (slots)	1
Height (rows)	1
Dimensions W x H x D	50 mm x 110 mm x 86 mm 50 mm x 110 mm x 70 mm (housing only)
Material	Zinc die-cast and aluminum die-cast
Cooling	Convection
Installation position	Vertical. See system manual, chapter "Installation conditions".
Weight	Approx. 570 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 EtherCAT master and EtherCAT slave. 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 Status

Variable	Type	Description
LED_RDY	BIT	Status information for LED Rdy 0 = The module is not ready for operation. 1 = The module is ready to operate. The firmware is running.
LED_LINK	BIT	Status information for LED Link 0 = No CP-Link 4 device is connected, or there is no connection. 1 = There is a connection to the connected CP-Link 4 device.
LED_VID	BIT	Status information for LED VID 0 = DisplayPort data transmission is not active. 1 = DisplayPort data transmission is active.
LED_USB	BIT	Status information for LED USB 0 = USB data transmission is not active. 1 = USB data transmission is active.

WcState

WcState Indicates whether an EtherCAT slave 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 slave provides.

Variable		Type	Description
State		UINT	0x___1 = EtherCAT slave in INIT state
			0x___2 = EtherCAT slave in PREOP state
			0x___3 = EtherCAT slave in BOOT state
			0x___4 = EtherCAT slave in SAFEOP state
			0x___8 = EtherCAT slave in OP state
			0x001_ = EtherCAT slave reports an error
			0x002_ = Invalid vendor ID, product code x read
			0x004_ = Initialization error occurred
			0x008_ = EtherCAT slave disabled
			0x010 = EtherCAT slave not present
			0x020_ = EtherCAT slave reports a connection error
			0x040_ = EtherCAT slave reports no connection
			0x080_ = EtherCAT slave reports an unexpected connection
			0x100_ = Communication Port A
			0x200_ = Communication Port B
			0x400_ = Communication Port C
			0x800_ = Communication Port D

5 Mechanical installation



Required tools

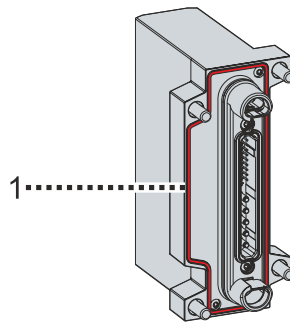
- Torx T25 screwdriver
- Torque wrench 5 Nm

5.1 Preparation

NOTICE

Check the module for damage

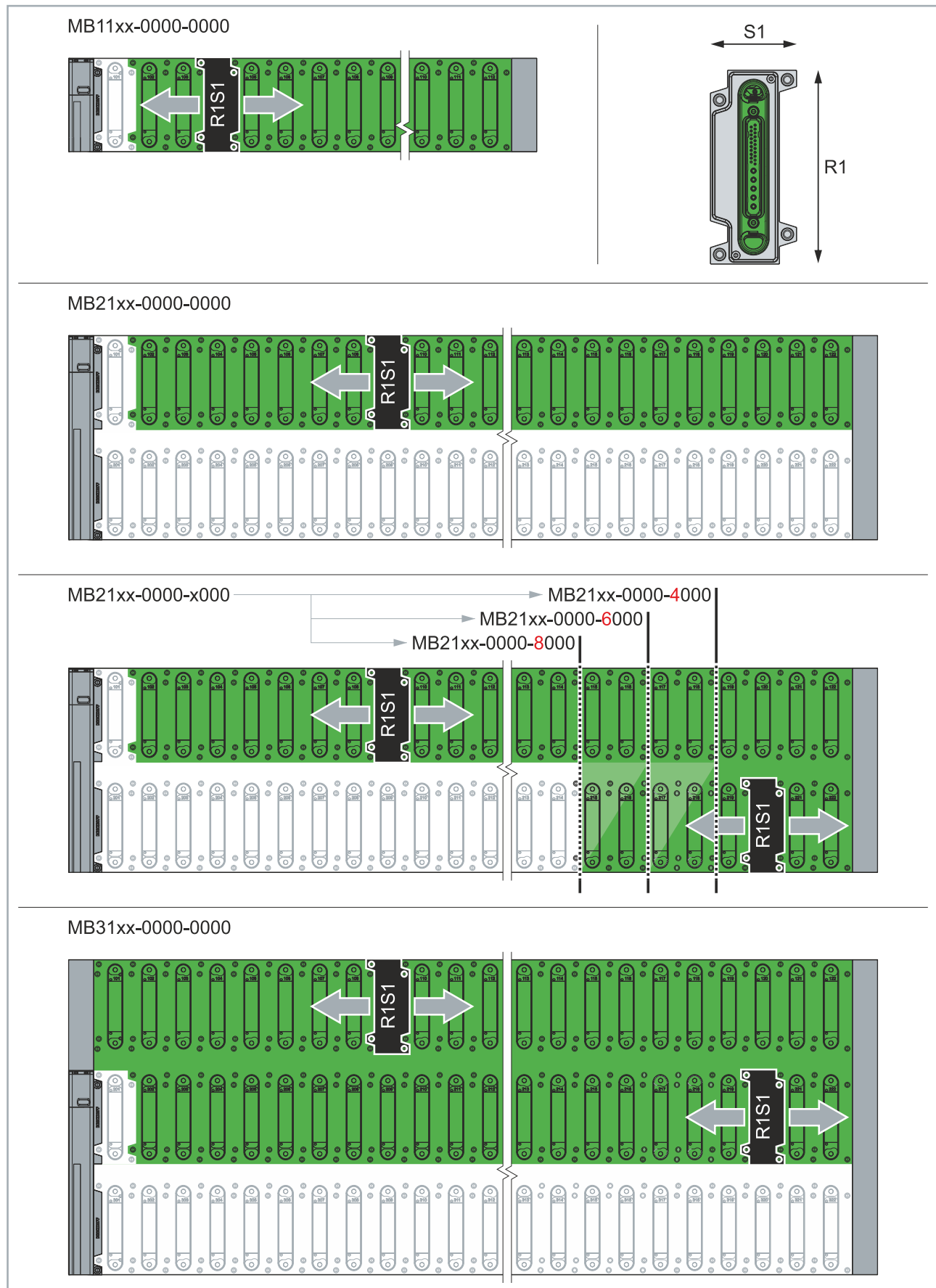
If the seal is worn or damaged, liquids and dirt can penetrate and damage the MX-System. The IP65/IP67 protection rating is not met if the seals are worn or damaged.



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:



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

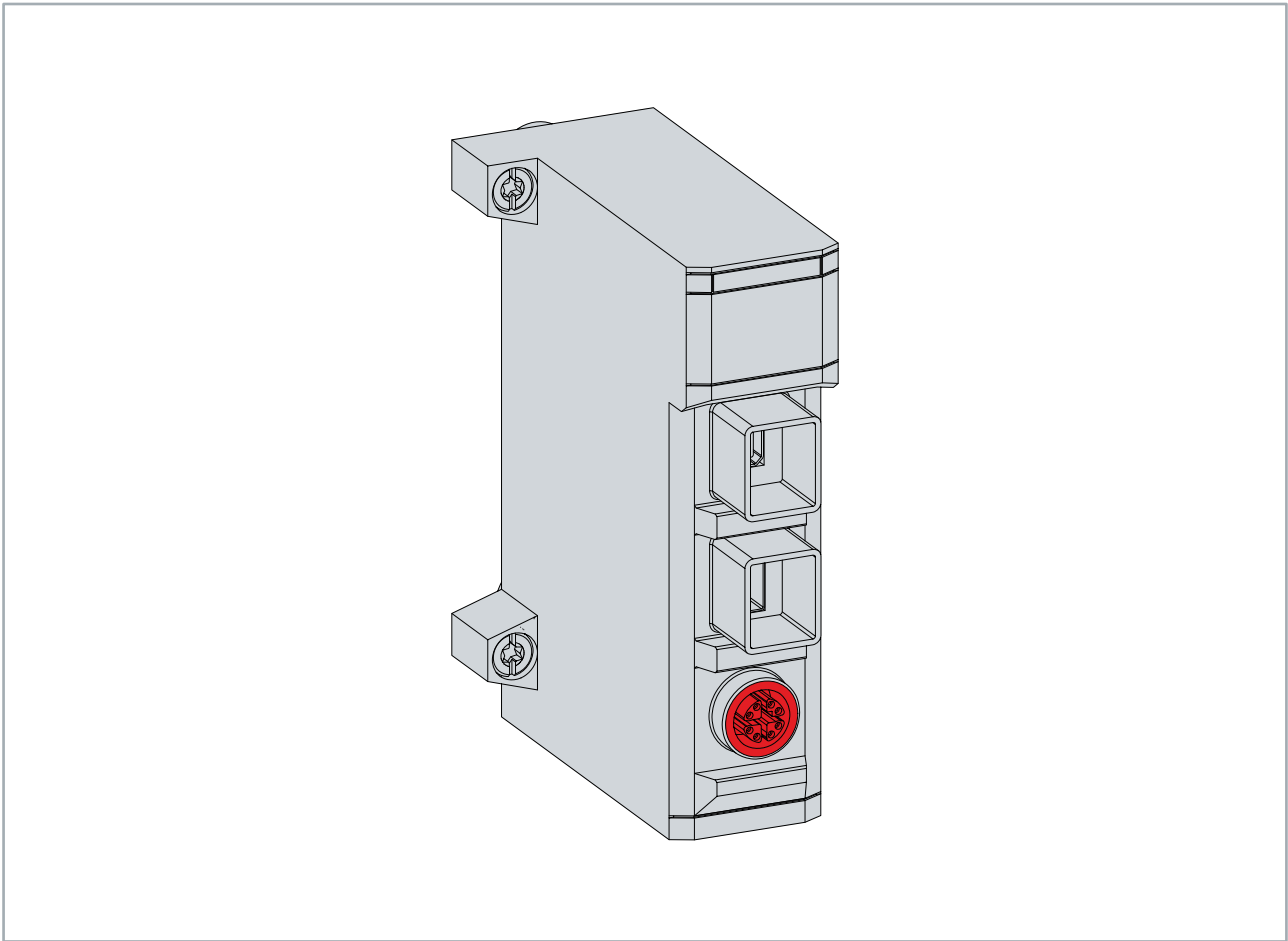
Use EtherCAT/Ethernet cables indoors only

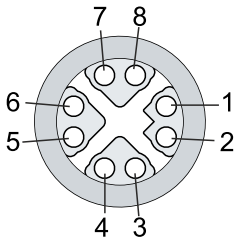
EtherCAT or Ethernet cables must not be run outside buildings.

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

6.1 CP-Link 4

The CP-Link 4 connection is an 8-pin M12 socket, X-coded.



M12 socket, X-coded	Pin	Symbol	Function
	1	DA+	CP-Link 4 Data Pair A
	2	DA-	CP-Link 4 Data Pair A
	3	DB+	CP-Link 4 Data Pair B
	4	DB-	CP-Link 4 Data Pair B
	5	DD+	CP-Link 4 Data Pair D
	6	DD-	CP-Link 4 Data Pair D
	7	DC-	CP-Link 4 Data Pair C
	8	DC+	CP-Link 4 Data Pair C

The cable shield is connected via the thread.

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.

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

✓ 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/MS7801-0000-1117

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.

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Web page: www.beckhoff.com/support

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Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl, Germany

☎ Phone: +49 5246 963-0
✉ Email: info@beckhoff.com
Web page: www.beckhoff.com

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Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com

