Instruction handbook

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be in motion be in motion

BAUMÜLLER

b maXX

BM4-O-CAN-03

Option module

CANopen slave for

BM4400, BM4400 ES
BM4600, BM4600 ES
BM4700, BM4700 ES

Read the Instruction Handbook before starting any work!

Preliminary information

Warning Insofar as this document is identified as being preliminary information, the following applies:
This version is regarded as providing advance technical information to users of the described devices and their functions at an early enough time in order to adapt to any possible changes or expanded functionality.
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This Instruction handbook is a part of the equipment/machine. This Instruction handbook must be available to the operator at all times and must be in legible condition. If the equipment/machine is sold or moved another location, this Instruction handbook must be passed on by the owner together with the equipment/machine.
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No liability can be accepted concerning the correctness of this Instruction handbook unless otherwise specified in the General Conditions of Sale and Delivery.

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INTRODUCTION

This manual is an important part of your b maXX 4400 appliance; therefore, please read this documentation completely, before starting operation, last but not least, because of your own security.

In this chapter we describe the first steps, which have to be done after you have received the module. We will define terms, which are continuous used throughout this documentation. We also will be giving you instructions, what should be taken into consideration when handling with this module.

Further information you will find in the documentations „Manual b maXX 4400“ and in the „Application manual“.

1.1 First steps

1 prove the delivery, see ▹Packing and Transportation◃ from page 17.

2 forward all data, which was delivered with the plug-in module to the responsible places in your company.

3 provide capable personnel for the installation and startup.

4 hand over this manual to the personnel and assure, that in particular the safety instructions, which are stated here are understood and can be followed.

1.2 Safety precautions in normal operation

- at the location of your appliance regard the safety regulations for the plant, into which the appliance has been built in.
- if safety regulations require additional monitoring or safety devices supply your appliance with them.

1.3 Used terms

For the Baumüller product „**CANopen slave**“ we will also use in this documentation the terms „Module“, „Plug-in module“ or „CANopen-Slave-Option module“.

A list of the abbreviations which are used are to be found in ▷Appendix A - Abbreviations◁ from page 57.

2

BASIC SAFETY INSTRUCTIONS

Every Baumüller plug-in module we have constructed and made according to strict safety specifications. Nevertheless the work with the plug-in module can be dangerous.

In this chapter we described hazards, that can arise when working with the Baumüller plug-in module. Hazards we point up with symbols (icons). All symbols which are used in this documentation we will list and explain.

How you can protect yourself against the single hazards in the concrete case, we will not explain in this chapter. In this chapter we will only give general safety precautions. The concrete safety precautions we will always give directly after the note to the hazard.

2.1 Hazard information and commandments

Hazard information will show you the dangers, that can lead to injuries or even to death.

Always follow the hazard information given in this documentation.

We always divide a hazard into three danger classes. Every danger class is signalized by one of the following signal words:

DANGER

- considerable damage to property
- severe injury
- death **will o**ccur

WARNING

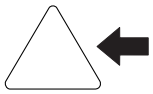
- considerable damage to property
- severe injury
- death - **can** occur

CAUTION

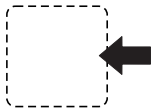
- damage to property
- light to medium personal injury - **can** occur

2.1.1 Structure of a hazard information

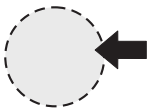
The following examples show the principle construction of a hazard information. A triangle is used, if there is a danger against humans. If the triangle is missing, the notes of danger only refer to damages to property.



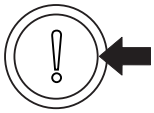
A triangle shows, that there is a danger for humans.
The color of the border shows, how great the hazard is - the darker the color the greater the danger is.



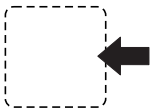
The icon in the square describes the hazard.
The color of the border shows, how great the hazard is - the darker the color the greater the danger is.



The icon in the circle demonstrates a command. This command must be followed by the operator.
(the circle is dashed, because not by every hazard information a command is existent as icon)



The circle demonstrates, that a danger for damage to property exists.



The icon in the square describes the hazard.
The color of the border shows, how great the hazard is - the darker the color the greater the danger is. (the square is dashed, because not by every hazard information the danger is demonstrated as an icon)

The text next to the icons is constituted as follows:

HERE IS THE SIGNAL WORD, WHICH SHOWS THE LEVEL OF THE DANGER

Here we write, if one or more of the consequences mentioned below appear, if this warning information is not followed.

- here we describe the possible consequences. The worst consequence is rightmost.

Here we describe the danger.

Here we describe, what you can do, to avoid the hazard.

2.1.2 Used hazard notes

If there is a hazard sign in front of a signal word: ⚠ or ⚠ or ⚠, then the safety information refers to personal injury.

If there is a round hazard sign in front of a signal word: Ⓘ then the safety instruction refers to damage to property.

2.1.2.1 Hazard information against personal injuries

In order to differentiate optically we use for every class of hazard information an own bordering for the triangular hazard information and for the square pictographs ⚠ .

The following hazard information of this hazard class are used in this documentation.

DANGER

The following **will arise**, if you ignore this warning note:

- severe injury
- death

*The hazard is: **Electricity.** If necessary, here the hazard is described more exact.*

Here we describe, what you can do, to avoid the hazard.

DANGER

The following **will occur**, if you disregard this hazard information:

- severe injury
- death

*The hazard is: **mechanical influence. If** necessary, here the hazard is described more exact.*

Here we describe, what you can do, to avoid the hazard.

For the hazard class (WARNING) we use the hazard sign ⚠.

The following hazard information of this hazard class is used in this documentation.

WARNING

The following **can occur**, if you disregard this hazard information:

- severe injury
- death

*The hazard is: **Electricity.** If necessary, here the hazard is described more exact.*

Here we describe, what you can do, to avoid the hazard.

For the hazard class CAUTION we use the hazard sign ⚠.

The following hazard information of this hazard class are used in this documentation.

CAUTION

The following **can occur**, if you disregard this hazard information:

- light to medium injury

*The hazard is: **sharp edges.** If necessary, here the hazard is described more exact.*

Here we describe, what you can do, to avoid the hazard.

(CAUTION)

The following **can occur**, if you disregard this warning instruction:

- Environmental pollution

*The hazard is: **improper disposal.** If necessary, here the hazard is described more exact.*

Here we describe, what you can do, to avoid the hazard.

2.1.2.2 Hazardous instructions against damage to property

If there is a round hazard sign in front of a signal word: Ⓘ then the safety instruction refers to damage to property.

(CAUTION)

The following can occur**,** if you disregard this hazard information:

- Damage to property

*The hazard is: **electrostatic discharge. If** necessary, here the hazard is described more exact.*

Here we describe, what you can do, to avoid the hazard.

2.1.2.3 Used mandatory signs

Wear safety gloves

Wear safety shoes

2.2 Info sign

NOTE

This note is a particularly important information.

2.3 Legal instructions

This documentation is addressed to technical qualified personnel, who is specifically skilled and who is thoroughly familiar with all warnings and maintenance procedures.

The devices are made according to the state-of-the-art technology and are fail-safe. They can be installed safe, can be put into operation and they function without problems, if it is assured, that the instructions of the documentation are followed.

The user is responsible for the execution of service and commissioning according to the safety instructions of the prevailing standards and other relevant national and local instructions concerning conductor dimensioning and protection, earthing, disconnectors, overcurrent protection and so on.

For damages, which result from the mounting or from the connection, the one is liable, who has carried out the mounting or the installation.

2.4 Usage according to regulations

You must always use this appliance in applications for which it was made. Listed below you will find some important information. The information given are intended to give you some impression on how operating this appliance in applications for which it was made. The information below is not a complete list; you must always observe the information given throughout this documentation.

- project this application in a way, that the appliance is run within its specifications.
- take care that only qualified personnel is working with or at this appliance.
- mount this appliance only at a reasonable steady wall.
- install this appliance according to the way shown in this documentation.
- take care that the power supply always meets the requested specifications.
- operate this appliance only if it is in a correct technical state.
- operate this appliance always in an environment according to the information given in the “Technical data“.
- operate this appliance always in the regular condition.
  For safety reasons you are not allowed to reconstruct this appliance.
- observe all respective information given if you want to store this appliance.

You are using this appliance in applications for which it was made, if you observe all notes and information given in this operating manual.

2.5 Faulty usage

Listed below you will find some examples of non-appropriate application. The information below is intended to give you some impression of what non-appropriate application is. However we cannot state all possible non-appropriate applications here. All applications, where the notes and information given in this documentation is disregarded, are non-appropriate and therefore forbidden.

- You have build in the plug-in module in other devices as the series b maXX 4400.
- You have disregarded instructions of this operating manual.
- You have not used the plug-in module according to the terms.
- The plug-in module has been
  - installed inappropriate
  - connected inappropriate
  - put inappropriate into operation,
  - operated inappropriate,
  - mounted, connected, put into operation, operated and/or maintained from not qualified or inadequately qualified personnel,
  - overloaded,
  - operated with
    - with defect safety devices,
    - not in proper form installed or without safety devices,
    - with not operative safety- and protection devices,
    - not within the required environmental conditions
- You have reconstructed the plug-in module.
- You have not referred to the instructions regarding maintenance in the components´ descriptions.
- You have improperly combined the plug-in module with products of other manufacturers.
- You have combined the device with faulty and/or faulty documented products of other manufacturers.

The „General sales terms and delivery conditions“ are always valid. These are at your disposal, at the latest, since conclusion of the contract.

2.6 Safety devices

During the transportation the plug-in modules are protected by their packing. Don't take the plug-in module out of the transportation packing until shortly before you want to mount it.

The dust cover of the controller of the b maXX devices protects in the class of protection IP20 the plug-in modules from dirt and damages caused by static discharges due to touches. So, please, after mounting the plug-in module, attach the dust cover again.

2.7 Training of the personnel

WARNING

The following **may occur**, if you do not observe this warning information:

- serious personnel injury
- death

devices of the company Baumüller Nürnberg GmbH may only be assembled, installed, operated and maintained by qualified personnel.

Qualified personnel (professionals) is defined below:

Qualified personnel

Authorized electronic engineers and skilled persons of the customer or third persons, who have learned the installation and commissioning of Baumüller drive systems and who are authorized, to put circuits and devices into operation according to the standards of the safety technology, to ground and to label.

Qualified personnel has a training or an instruction due to the local valid standards of the safety technique in maintenance and usage of an adequate safety equipment.

Requirements to the operating personnel

The operating of the drive system must only be executed by persons, who have had a training, who have been instructed and who have been authorized for this.

Fault clearance, servicing, cleaning, maintenance and exchange must only be carried out by skilled or instructed personnel. These persons must know the operating manual and must act according to this.

The commissioning as well as the instruction must only be carried out by Qualified personnel.

2.8 Obligatory and liability

To be able to work as safe as possible with this CANopen slave module, you must know and follow the hazard notes as well as the safety instructions of this documentation.

2.8.1 Follow the hazard notes and the safety instructions

In this operating instruction we use optical uniform safety instructions, which should save you from personal injury and damage to property.

All persons, who work on and with devices of the series b maXX, must have this manual at their workings availably and must follow the instructions and notes contained in this - especially the safety instructions.

Furthermore all persons, who work with this device must additionally know and regard all regulations and instructions, that are valid at the location.

2.8.2 Hazards when handling this module

The CANopen slave option module was developed and manufactured according to the state-of-the-art technology and in compliance with the valid regulations and standards. Nevertheless hazards can arise when using it. An overview of possible hazards are to be found in chapter ▹Basic Safety Instructions◃ from page 9 and in ▹Figure 3◃ on page 23. We warn you against the acute hazard at the respective places in this documentation.

2.8.3 Warranty and liability

All information given in this documentation is a not binding information for the customer. It is subject to a steady further development and it is constantly updated.

Warranty- and liability claims against the company Baumüller Nürnberg GmbH are excluded, if particularly one or more of the from us described ▹Faulty usage◃ on page 14 or as stated below causes have/had affected the damage:

- Entry of a catastrophe caused by foreign particles or by act of nature beyond control

3

PACKING AND TRANSPORTATION

Before shipment we have packed every Baumüller plug-in module in such a way, that a damage during transportation is nearly impossible.

3.1 Transportation

The plug-in modules are packed according to the order in the manufacturing company.

- avoid strong transportation vibrations and severe hits (max. 1 *g*).
- avoid statical discharges on the electronic parts of the plug-in modules.
- don´t take the plug-in module out of the protecting packing until shortly before you want to mount it.

3.2 Unpacking

After receipt of the plug-in module, which is still packed:

- check, if transportation damages are visible on the packing!

if yes:

- immediately complain at the deliverer. Let the claim be confirmed in writing and immediately contact the substitution of Baumüller Nürnberg GmbH, which is in charge for your company.

CAUTION

The following **may occur**, if you do not observe this caution information:

- property damage.

The hazard is: ***electrostatic discharge.*** *If you expose the plug-in module, especially the electronic parts, to electrical discharges by touching with your hand, it can sustain damage or can completely be destroyed.*

refer to the instructions and notes referring to the working with electrostatically sensitive parts, when working with the plug-in module.

if there is no transportation damage noticeable:

- open the packing of the module.
- check the scope of supply on basis of the delivery note.

The scope of supply is:

- **BM4-O-CAN-03 (Option module CANopen slave for b maXX)**
- this operating instruction inclusively the copy of the declaration of conformity/declaration of manufacturer

- pack in the module back into the packing for transportation.
- claim at the Baumüller substitution, which is in charge, in case there is a recognizable transportation damage or if the delivery is not complete.

3.3 Dispose packing

The packing consists of cardboard and plastics.

- regard the local disposal instructions, in case you dispose the packing.

3.4 To be considered by transportation

For the first transportation of the module, the module was packed in the manufacturer´s company. In case you would have to transport the module later on, please consider the following:

- use the original packing.

or

- use a packing which is suitable for ESD-sensitive modules.

Assure, that the following conditions are fulfilled during the entire transport:

- 2 K 3 (climatic category)
- - 30 °C to + 70 °C (temperature range)
- max. 1 *g* Max. height of drop (packaged) 0.25 m

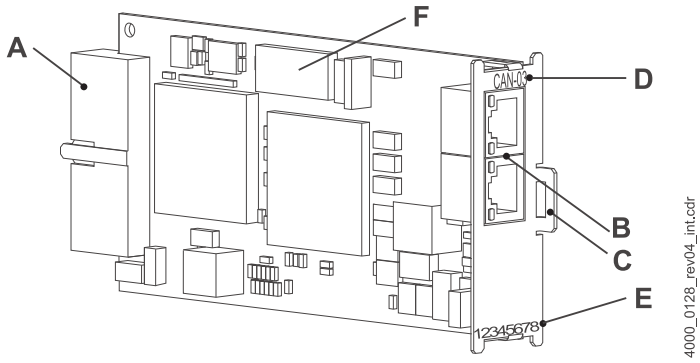
4

DESCRIPTION OF OPTION MODULE CANOPEN SLAVE

In this chapter we describe the **CANopen slave BM4-O-CAN-03** and explain the type key on the safety relay.
The option module **CANopen slave** is made for a connection from b maXX 4400 to the CANopen field bus. Transfer rate configuration, address configuration and so on is made over the DIP switch (further information is under ▹Operation◃ from page 37 and in the „Programming manual“).

4.1 Construction

The option module **CANopen slave** is a module to plug in a device from the b maXX series. The plug-in module has a connector (A) on the back side, which is used for the connection of the plug-in module with the controller unit.



A = connector (back side)
B = connector (front)
C = handle
D = module identification
E = serial number
F = DIP switch

Figure 1: option module CANopen slave

The option module **CANopen slave** has two RJ45 connections for CAN bus cables on the front. In case the option module **CANopen slave** is the last user in the line, the module has to be terminated with a terminating resistor connector. Over the module data can be transmitted to all the others and can be received by other CAN users (e. g. from the CANopen master).
The data of the plug-in modules and of the accessories (RJ45 connecting lines and of the terminating resistor connectors) as for example the description of the connector pins (pin assignment) you will find in chapter ▹Technical data◃ from page 61.

4.1.1 DIP switches

The option module **CANopen slave** for b maXX PLC is pre-configured via DIP switches.

Following can be set:

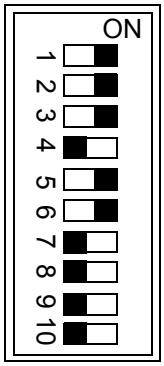
- Setting of baud rate via b maXX PLC (DIP switches 1 to 3)
  - The DIP switches 1 to 3 are set to ON, that means the option module **CANopen slave** reads the baud rate from the b maXX PLC while initialization.
- CANopen Node-ID (DIP switches 4 to 10)
  - The DIP switch setting is read and the value is increased by 1 internally. That means e.g. that the Node-ID in delivery state (DIP switch 4 to 10 is OFF) corresponds with the Node-ID 1. The DIP switch setting 127 is set to Node-ID 1 additionally.
  - The Node-ID can be changed with the application program on the b maXX PLC (by software setting).

DIP switch 3	2	1	Value	
1	1	1	7	Option module **CANopen slave** for b maXX PLC
				Option module **CANopen slave** for b maXX controller

3	2	1	Value	Baud rate
0	0	0	0	20 kBit/s
0	0	1	1	125 kBit/s
0	1	0	2	250 kBit/s
0	1	0	3	500 kBit/s
1	0	0	4	1 MBit/s
1	0	1	5	reserved
1	1	0	6	reserved

DIP switch 10	9	8	7	6	5	4	Value	Node-ID
0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	1	1	2
0	0	0	0	0	1	0	2	3
...								
1	1	1	1	1	1	0	126	127
1	1	1	1	1	1	1	127	1

Example 1: DIP switch setting for b maXX PLC



DIP switch 3	2	1	Value	
1	1	1	7	Option module **CANopen slave** for b maXX PLC

DIP switch 10	9	8	7	6	5	4	Value	Node-ID
0	0	0	0	1	1	0	6	7

NOTE

The Node-ID set by DIP switches can be changed via the application program on the b maXX PLC.

Example 2: DIP switch setting for b maXX controller

DIP switch 3	2	1	Value	
0	1	1	3	Option module **CANopen slave** for b maXX controller Baud rate 500 kBit/s

DIP switch 10	9	8	7	6	5	4	Value	Node-ID
0	0	0	0	1	0	0	4	5

4.1.2 Slots

You can only insert 1 option module **CANopen slave** into the slot at the b maXX 4400 (slot **H,** as far as this is not already assigned by other plug-in modules). In case there is another module in slot H, mount the module into another free and suitable slot (see ▹Figure 6◃ on page 27 or manual of the accordant module).

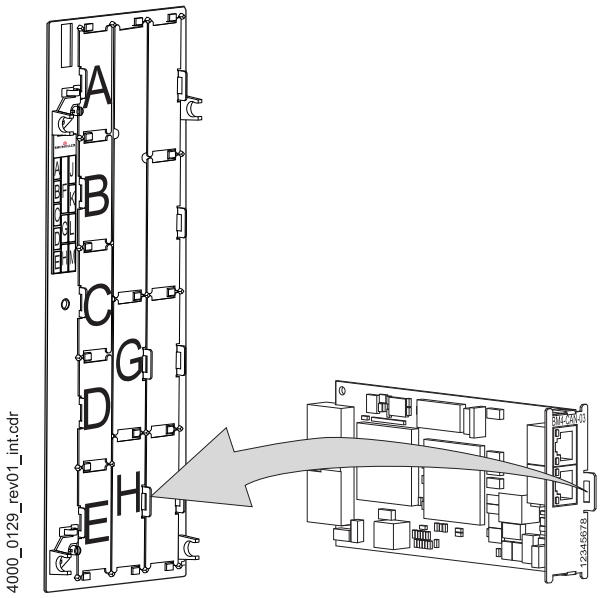


Figure 2: Controller unit, slot H

NOTE

In case you insert a Baumüller plug-in module into an unsuitable slot, it will not operate. We have assured, that the plug-in module is not damaged thereby.

4.2 Hazard areas

There are bigger hazards coming from the basic device b maXX 4400 than from the plug-in module. Please follow all the security advices of the basic device b maXX 4400. ▹Figure 3◃ on page 23 gives a view of the existing hazard areas at the plug-in module.

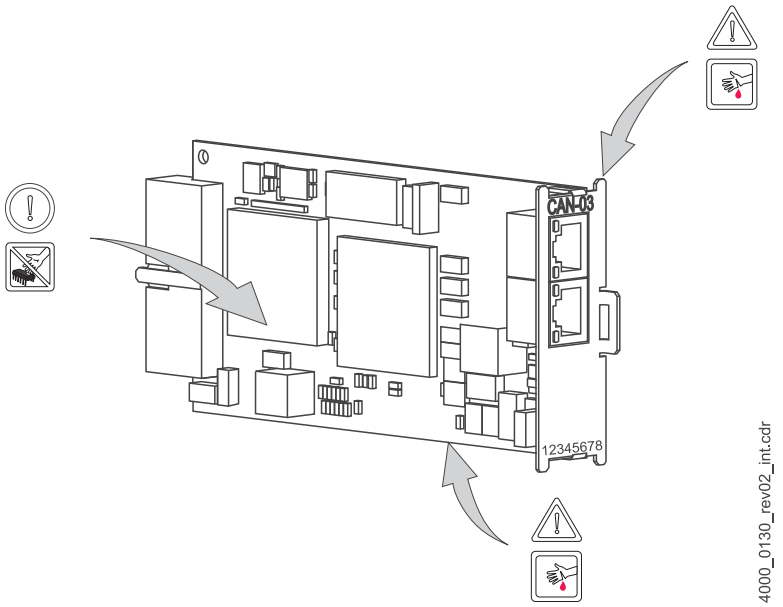


Figure 3: Hazard areas

4.3 Marking of the option module CANopen slave - type key

On the front sheet you will find a module identification („D“ in ▹Figure 1◃ on page 19) and the serial number („E“ in ▹Figure 1◃ on page 19) of the plug-in module.

NOTE

This type key only applies to the option module **CANopen slave** of the series b maXX 4400. Other plug-in modules have an own type key. Type key of the accessories see ▹Accessories◃ from page 59.

BM4 - O - CAN - xx - yy - zz	Device generation, in which the plug-in module can be build in
BM4 - O - CAN - xx - yy - zz	Module type (option module)
BM4 - O - CAN - xx - yy - zz	Plug-in module identification (CAN)
BM4 - O - CAN - xx - yy - zz	Plug-in module version 03: CANopen slave
BM4 - O - CAN - xx - yy - zz	Hardware version 00: Standard
BM4 - O - CAN - xx - yy - zz	Software version 00: Standard

This type key you will find on the front side of the front sheet. The type key includes the basic data of the plug-in module. With the type key you will find further data in the chapter „Technical Data“. A survey of all the technical data is to be found in ▹Appendix C - Technical data◃ from page 61.

5

MOUNTING AND INSTALLATION

In this chapter we describe the mechanical mounting and the electrical installation of a option module **CANopen slave**.

The mounting/installation exists of the following steps:

1 adjust at the plug-in module address and baud rate (transfer rate).

2 mount plug-in module.

3 connect plug-in module with CANopen bus cables (and possibly with terminated plug).

5.1 General safety instructions

- please regard to the information in chapter ▹Basic Safety Instructions◃ from page 9.
- pay attention to all areas at the b maXX-device, which could be dangerous for you while mounting.

The following figure gives a view of the existing hazard areas at the plug-in module.

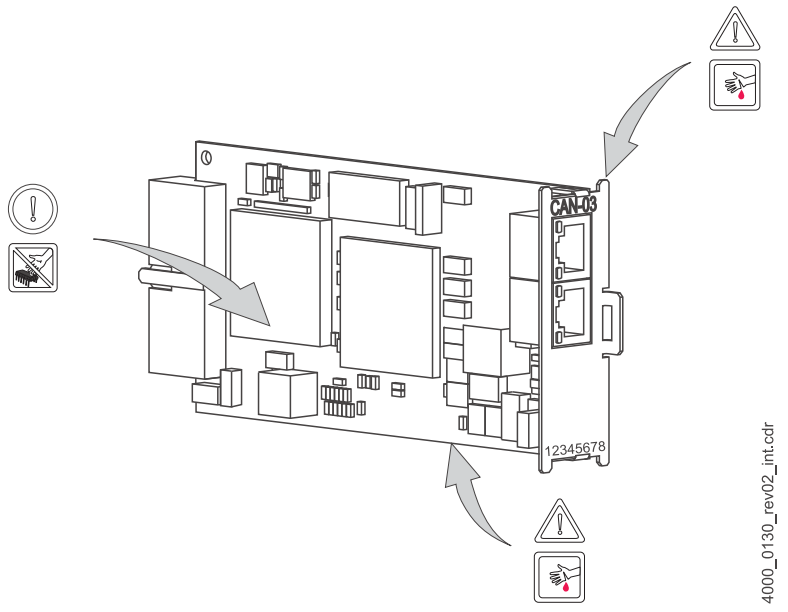


Figure 4: Hazard areas

5.2 Requirements to the executing personnel

DANGER

The following **will occur**, if you do not observe this danger information:

- serious personnel injury
- death

*The hazard is: **Electricity. D**evice and environment in the switching cabinet can carry perilous voltages.*

Before you start working, please assure that the device and the environment are off-circuit.

Pay attention to the relevant safety instructions when using mains voltage leading devices.

Assure, that only qualified personnel mount and install this plug-in module.

Qualified personnel are, from the company Baumüller Nürnberg GmbH authorized electronic engineers and skilled persons of the customer or of third persons, who have learned the installation and commissioning of Baumüller drive systems and who are authorized to put circuits and devices into operation according to the standards of the safety technology, to ground and to label.

Qualified personnel has a training or an instruction due to the local valid norms of the safety technique in maintenance and usage of an adequate safety equipment.

5.3 Preparation.

- assure yourself by means of the module identification (see „D“ in ▹Figure 5◃), that you keep the right plug-in module ready.

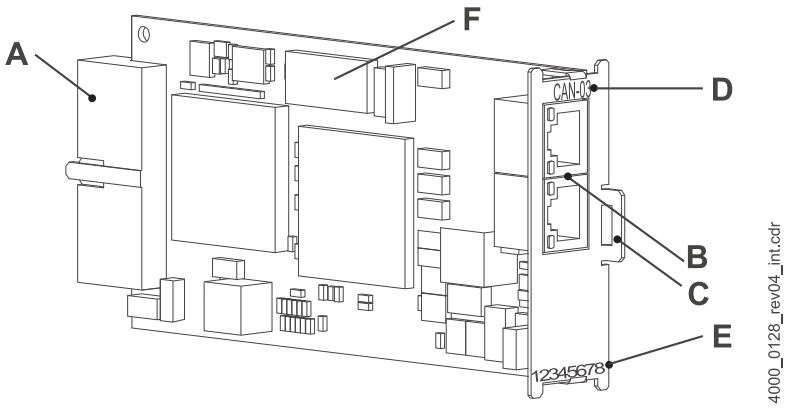
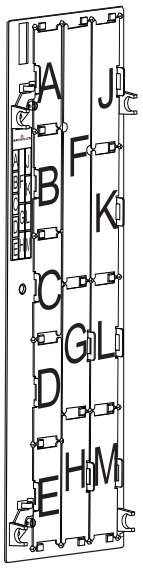


Figure 5: Option module CANopen slave

➲ determine the correct slot (see ▹Figure 6◃ on page 27).



	Function modules									Option modules													
	BM4-F-ENC-XX (encoder 1 for motor control recommended)	BM4-F-ENC-XX (encoder 2)	BM4-F-AIO-01 (analog I/O)	BM4-F-AIO-02/03/04 (analog I/O)	BM4-F-DIO-XX (digital I/O)	BM4-F-FIO-XX (fast digital I/O)	BM4-F-IEE-XX (incremental encoder emulation)	BM4-F-SIE-XX (SSI encoder emulation)	BM4-F-UME-XX (mains voltage measurement)	BM4-O-SER-XX (Sercos slave)	BM4-O-PRO-01 (Profibus slave)	BM4-O-CAN-03 (CANopen slave)	BM4-O-ECT-01 (EtherCAT slave) for controller	BM4-O-PLK-01 (POWERLINK Controlled Node) for controller	BM4-O-EIP-01 (Ethernet-IP) for controller	BM4-O-PLC-XX (SPS)	BM4-O-CAN-04* (CANopen master)	BM4-O-IEI-XX* (incremental counter module)	BM4-O-ETH-01* (Ethernet)	BM4-O-ETH-02* (Ethernet + CANopen master)	BM4-O-ECT-01* (EtherCAT slave) for PLC	BM4-O-ECT-02* (Ethernet + EtherCAT master)	BM4-O-ECT-03* (Ethernet + EtherCAT cluster)
A	**X**	-	-	o	o	o	-	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	-	**X**	-	o	o	o	-	**X**	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	o	o	o	**V**	-	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	-	-	-	o	**X**	**X**	-	-	**X**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	-	-	**X**	**X**	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Controller unit																						
G	-	-	-	-	-	-	-	-	-	o	o	o	o	o	o	o	**X**	**X**	**X**	**X**	**X**	**X**	**X**
H	-	-	-	-	-	-	-	-	-	**X**	**X**	**X**	**X**	**X**	**X**	**X**	o	-	o	o	o	o	o
J	-	-	-	-	-	-	-	-	-	-	**P**	**P**	-	-	-	-	o	o	o	o	-	-	-
K	-	-	-	-	-	-	-	-	-	-	**P**	**P**	-	-	-	-	o	o	o	o	**o**	o	o
L	-	-	-	-	-	-	-	-	-	-	**P**	**P**	-	-	-	-	o	o	o	o	**o**	o	o
M	-	-	-	-	-	-	-	-	-	-	**P**	**P**	-	-	-	-	o	o	o	o	**o**	o	o

X: preferred slot
Baumüller Nürnberg GmbH recommends, in order to reach the highest functional range, to insert the plug-in modules into these slots.

o: possible slot
only if the preferred slot is occupied, we recommend in order to reach the highest functional range, to insert the plug-in modules into this slot.

P: only possible, if on slot G or H a PLC module (PLC) is plugged and the PLC (and not the controller) operates the communication to the field bus slave module.

V: dependent on controller hardware

- not possible - card doesn't work in this slot.

***** precondition for these cards is an inserted PLC module.

Steckkarten_Rev20_e

NOTE!

Only 2 analog outputs can be parametrized or linked even more than one AIO module is plugged.

Figure 6: Slot combinations

5.4 Mounting

1 Turn off the b maXX 4400 device and assure it against unintentional turning on during the mounting of the plug-in module.

DANGER

The following **will occur**, if you do not observe this danger information:

- serious personnel injury
- death

*The hazard is: **Electricity.** Device and environment in the switching cabinet can carry perilous voltages.*

Before you start working, please assure that the device and the environment are off-circuit. Pay attention to the relevant safety instructions when using mains voltage leading devices.

2 Pull the dust cover forwardly off of the controller unit; the slots now are visible.

3 Look at the controller unit for the provided slot (H).

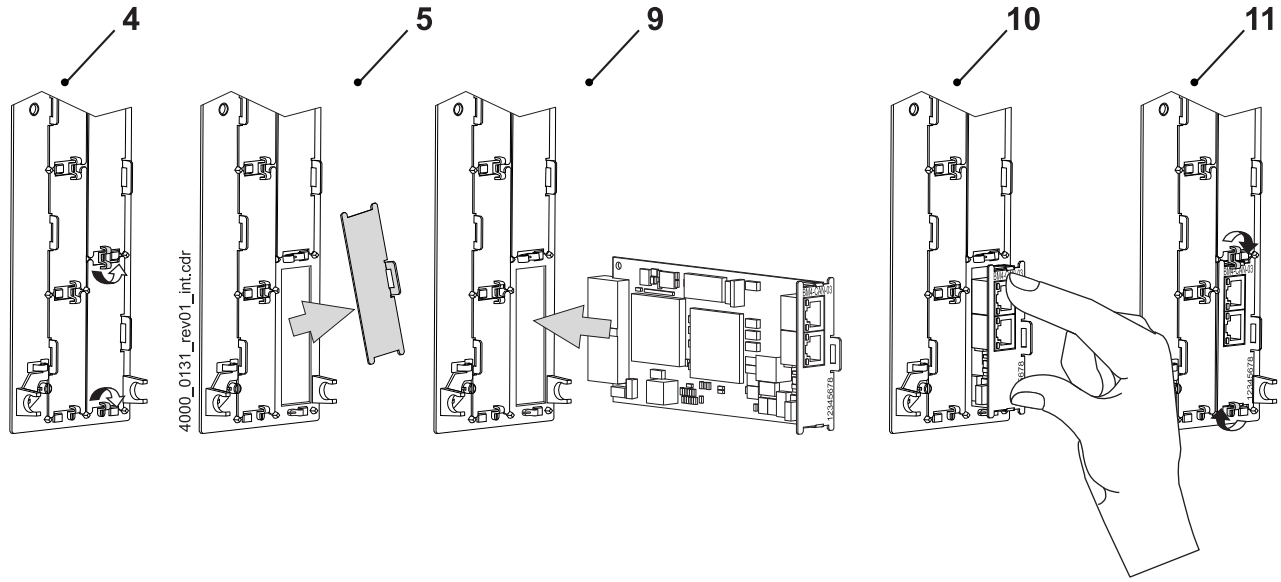


Figure 7: Mounting

4 Turn the twist lock over and under this slot by 90°. The twist locks now are standing horizontally.

5 Take the front panel cover forwardly off. Keep this cover.

CAUTION

The following **may occur**, if you do not observe this caution information:

- property damage.

*The hazard is: **electrostatic discharge.** The option module CANopen slave has ESD sensible parts.*

Regard the described ESD procedures when handling the plug-in module.

Touch the plug-in module only at its handle (see „C“ in ▹Figure 5◃ on page 26).

6 Take the option module **CANopen slave** out of its packing. Avoid the contact with electronic parts of the plug-in module.

7 For setting of baud rate and Node-ID see ▹DIP switches◃ on page 20.

8 Plug the option module **CANopen slave** into the guide supports of the slot. The handle must point to the same side as the other handles in this slot strip (here: right side).

9 Press with two fingers on the front panel until the option module **CANopen slave** within the device sensible latches tight into the end position.

10 Turn the twist lock beyond and beneath by 90° into the vertical position (locking position).

11 Put the dust cover again on the device.

NOTE

If you, within the scope of a repair of the option module **CANopen slave**, simply displace it by a similar plug-in module, you can shorten the further operation, installation, commissioning and so on. Then you simply must put on the connector to the plug-in module, put on the dust cover again and you can turn on the device again.

Therewith the mounting of the option module **CANopen slave** is completed.

5.5 Installation

During the installation you cable the option module **CANopen slave**.

5.5.1 Connection diagram

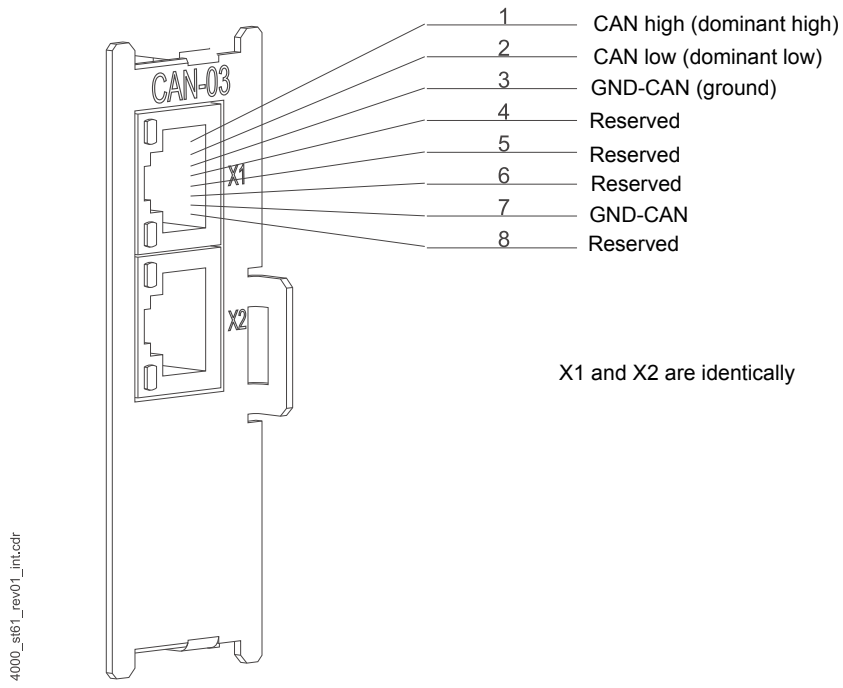


Figure 8: Connector pins option module CANopen slave

5.5.2 Requirements on the electrical connection

CAUTION

The following **may occur**, if you do not observe this caution information:

- property damage.

The hazard is: **electrical voltage. I***n case you do not ensure the requirements to the electrical connection, the plug-in module can be damaged/destroyed.*

Assure, that the in the technical data specified connection values are complied with and that the connections are made according to the requirements of the CANopen field buses.

To achieve the standard EN 60 204-1 (electrical equipment of machines), you must use the cables, which are recommended there. The connectors may not decrease - otherwise the following dangers can arise - short circuits, interference voltages a. s. o.

➲ regard to EMC-compatible laying of the CANopen connection cables.

5.5.3 Requirements to the connection cables

The following cables are released for usage from Baumüller:

- CANopen connection cable; further information is to be found in ▹D.5 Cable connector◃ from page 64.

5.5.4 Operating sequence of installation

1. assure that the b maXX-device is off-circuit.
2. take off the dust cover from the controller unit.
   - The option module **CANopen slave** is in slot H (preferred slot), see ▹Figure 2◃ on page 22.
3. connect the CANopen connection cables and accordingly the connection lines and terminating resistor connectors (RJ45 connector), see ▹B.1 List of all accessories◃ on page 59 with the plug-in module (outgoing cable downwards).
4. attach the dust cover to the device again.
5. install the lines according to the instructions into the switching cabinet.

6

COMMISSIONING

In this chapter we describe how you take the mounted and installed (see ▹Mounting and Installation◃ from page 25) option module **CANopen slave** into operation. The commissioning assures, that the option module **CANopen slave** operates correctly. Further information on parameterization of the plug-in module you will find in the „Application manual“.

Assure before installing, that the following preconditions are fulfilled:

1 Plug-in module is correctly mounted.

2 Plug-in module is correctly installed.

- CANopen connection lines are correctly cabled.

3 The switching cabinet is properly closed and all safety devices are put into operation.

4 The b maXX device is ready-for-use .

6.1 General safety instructions

refer to ▹Basic Safety Instructions◃ from page 9.

DANGER

The following **will arise**, if you ignore this warning note:

- severe injury
- death

The hazard is: ***mechanical influence. During commissioning the drive can rotate.***

Keep enough distance from rotating parts. Please note that from starting drives machine parts can be set in motion. In any case activate the safety devices of the machine parts and drives which are concerned.

6.2 Requirements to the executing personnel

The workings on commissioning may only be carried out by skilled personnel, who especially understands the safety instructions and -notes and can obey to these.

6.3 Description and checking of the operating- and displaying elements

The option module **CANopen slave** shows operating- and displaying elements. The operating elements consist of 10 DIP switches in a common cabinet. The display elements exist of 4 LEDs, which are integrated into the connectors on the front side.

DIP switch For setting of the DIP switches refer to ▹DIP switches◃ from page 20.

LEDs After turning on the b maXX 4400 the module is initialized, the LEDs are blinking in sequences.

NOTE

Should the plug-in module due to external conditions be pulled out of the device, turn off the device. Then try to insert the plug-in module again, as we describe in chapter ▹Mounting and Installation◃ from page 25.

6.4 Description/check of safety and monitoring elements

Before starting the commissioning of the option module **CANopen slave** it is necessary to clear possible errors/error messages on the b maXX 4400 basic unit. This errors can be caused by incorrect mounting (e.g. defect cables) or incorrect installation. The commissioning of the option module **CANopen slave** can be started after this errors are acknowledged.

6.5 Description/check of operation and display elements

6.5.1 Configuration example

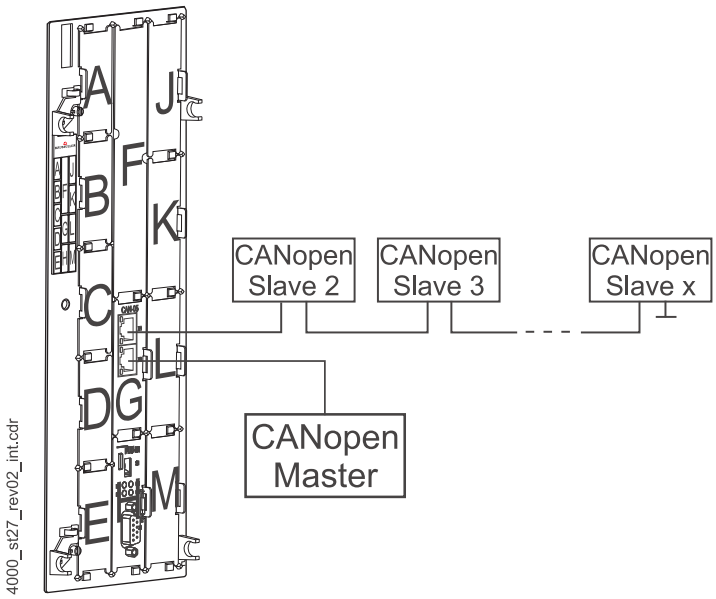


Figure 9: b maXX with CANopen slave for b maXX PLC on slot G and b maXX PLC on slot H

6.5.2 LEDs

The RJ45 connectors X1 and X2 are equipped with 2 LEDs (green and red) each. The LEDs are named H1 to H4. The LEDs display the operation state of the option module **CANopen slave**.

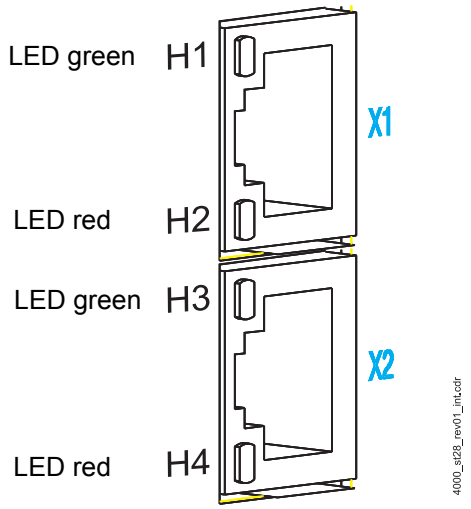


Figure 10: LEDs on option module **CANopen slave**

6.5.2.1 LEDs CANopen slave for b maXX PLC

Switch on and initialization

After switching on the LEDs are lightning for a short time in sequence H4 (red), H3 (green), H2 (red), H1 (green).

Then the option module **CANopen slave** is initialized.
Following pattern is displayed:

Start of initialization:	H1 on,	H2 to H4 off
End of initialization:	H3 on,	H1, H3, H4 off
Initializing finished:		H1 to H4 off

The basis initialization of the option module **CANopen slave** is finished.

If the initialization was not done without error then the LEDs H2 and H4 are blinking synchronously.
In this case refer to ▹Error detection and trouble shooting◃ from page 39 for further information.

Commissioning

After initialization of the option module **CANopen slave** an application program on the b maXX PLC can configure it.

The option module **CANopen slave** displays with LED H1 to H4 off, that it is waiting for PLC configuration.

In the manual to the b maXX PLC this configuration is called „Initialization CANopen slave on the option module CANopen slave for b maXX PLC“, also.

Further information see „Application handbook b maXX PLC“ and „Application handbook CANopen slave for b maXX PLC“.

After configuration of the option module via the application program on the b maXX PLC the LEDs H1 and H2 correspond with the CiA specification DR303-3. LEDs H3 and H4 are reserved.

H1 single flash	**CANopen slave** is in state STOPPED
H1 blinking	**CANopen slave** is in state PRE-OPERATIONAL
H1 on	**CANopen slave** is in state OPERATIONAL

single flash:	ca. 200 ms on, then ca. 1000 ms off
blinking:	ca. 200 ms on, then ca. 200 ms off

H2 (red) is normally off, otherwise an error occurred,
see ▹Error detection and trouble shooting◃ from page 39 for trouble shooting.

6.5.2.2 LEDs CANopen slave for b maXX controller

Switch on and initialization

After switching on the LEDs are lightning for a short time in sequence H4 (red), H3 (green), H2 (red), H1 (green).

Then the option module **CANopen slave** is initialized.
Following pattern is displayed:

Start of initialization:	H1 on,	H2 to H4 off
End of initialization:	H3 on,	H1, H3, H4 off
Initializing finished:		H1 to H4 off

The basis initialization of the option module **CANopen slave** is finished.

If the initialization was not done without error then the LED H2 is blinking.
In this case refer to ▹Error detection and trouble shooting◃ from page 39 for further information.

Commissioning

After initialization of the option module **CANopen slave** the parameters are set via the operation software.

See also „Programming handbook CANopen slave“.

After configuration of the option module the LEDs H1 and H2 correspond with the CiA specification DR303-3. LEDs H3 and H4 are reserved.

H1 single flash	**CANopen slave** is in state STOPPED
H1 blinking	**CANopen slave** is in state PRE-OPERATIONAL
H1 on	**CANopen slave** is in state OPERATIONAL

single flash:	ca. 200 ms on, then ca. 1000 ms off
blinking:	ca. 200 ms on, then ca. 200 ms off

H2 (red) is normally off, otherwise an error occurred,
see ▹Error detection and trouble shooting◃ from page 39 for trouble shooting.

6.6 Procedure of commissioning

6.6.1 Commissioning CANopen slave for b maXX PLC

The commissioning of the option module **CANopen slave** is divided into the following sections:

1 Recognizing the option module **CANopen slave**

2 Testing of the CANopen-Slave-module

Recognizing the CANopen slave

- Read and observe the ▹General safety instructions◃ on page 25.
- The chapter „Mounting and Installation“ must be observed.
- Switch on the b maXX 4000.

NOTE

The option module **CANopen slave** must **not** be plugged or unplugged if the b maXX device is switched on. Switch off the device before plugging or unplugging.

Function test

After switching on the LEDs light up sequentially (described in ▹LEDs CANopen slave for b maXX PLC◃ on page 34).

The option module **CANopen slave** displays then with H1 to H4 off that the module is waiting for configuration via b maXX PLC. The function test is finished.

If the option module is configured, the LED H1 shows the internal state of the **CANopen slave** according DR303-3. See b maXX PLC ▹Commissioning◃ on page 34.

6.6.2 Commissioning CANopen slave for b maXX controller

The commissioning of the option module **CANopen slave** is divided into the following sections:

1 Recognizing the option module **CANopen slave**

2 Testing of the CANopen-Slave-module

Recognizing the CANopen slave

- Read and observe the ▹General safety instructions◃ on page 25.
- The chapter „Mounting and Installation“ must be observed.
- Switch on the b maXX 4000.

NOTE

The option module **CANopen slave** must **not** be plugged or unplugged if the b maXX device is switched on. Switch off the device before plugging or unplugging.

Function test

After switching on the LEDs light up sequentially (described in ▹LEDs CANopen slave for b maXX controller◃ on page 35).

If the option module is configured, the LED H1 shows the internal state of the **CANopen slave** according DR303-3. See b maXX controller ▹Commissioning◃ on page 35. The function test is finished.

7

OPERATION

In this chapter we describe, whereupon you have to pay attention to, when operating the option module **CANopen slave**.

7.1 Commissioning CANopen slave for b maXX PLC

Information regarding the operation of the option module **CANopen slave** for b maXX PLC can be found in application handbook CANopen slave for PLC, application handbook b maXX PLC and programming handbook PROPRO wt II.

7.2 Commissioning CANopen slave for b maXX controller

Information regarding the operation of the option module **CANopen slave** for b maXX controller can be found in programming handbook **CANopen slave**.

8

ERROR DETECTION AND TROUBLE SHOOTING

In this chapter we describe the error displays on the basic device b maXX 4400. We explain the meaning of every error display and of every error message and how you can react to these.

8.1 Safety instructions

refer to ▹Basic Safety Instructions◃ from page 9.

8.2 Requirements to the executing personnel

The personnel, who works with the b maXX-device, must be introduced in the safety instructions and in the operation of the device and must be familiar with the accurate operating of the device. Especially the reaction to failure indications and -conditions requires special knowledge, which the operator must have. In the following we will inform you about the different faults and the consequential error messages.

8.3 Error messages - Error reactions

8.3.1 Error messages CANopen slave for b maXX PLC

The options module **CANopen slave** for b maXX PLC displays an error via LED H2 (red) according to CiA specification DR303-3 and via LED H4 (red)

H2 off	Option module **CANopen slave** operates without error.
H2 single flash [1)]	At least one error counter of the module exceed the warning level.
H2 double flash [2)]	„Guard“ (NMT master or NMT slave) or „Heartbeat“ occurred.
H2 triple flash [2)]	The SYNC messages misses withing the configured communication cycle.
H2 on	Option module **CANopen slave** does not communicate with the CANopen network.
H2 and H4 flash synchronously	See ▹Bootup for b maXX PLC◃ on page 41.

[1)] Following light pattern active: ON (200 ms) - OFF (1000 ms)

[2)] Following light pattern active: ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (1000 ms)

[3)] Following light pattern active: ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (200 ms)- ON (200 ms) - OFF (1000 ms)

After switching on the option module operates in the following phases:

1 Bootup

2 Establish communication

3 Continue communication

8.3.1.1 Bootup for b maXX PLC

The option module **CANopen slave** signalizes an error condition during the booting of the module over the lighting up of the LEDs H2 and H4 on the front side of the housing:

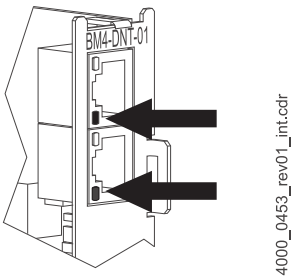


Figure 11: Errors while booting b maXX PLC

Flashing pattern of both LEDs	Error recovery
• blinking once then pause [1]	➲ Send module to company Baumüller Nürnberg GmbH
• blinking twice then pause [2]	
• blinking three times [3]	
• blinking four times then pause [4]	➲ Send device b maXX 4400 to company Baumüller Nürnberg GmbH.

[1] Hardware is faulty or no CANopen hardware on the option module

[2] no CANopen software on the option module

[3] a newer CANopen software version is necessary

[4] Hardware error of the device b maXX 4400

8.3.1.2 Establish a communication for b maXX PLC

After booting the option module **CANopen slave** tries to establish the communication with the CANopen network. If the module cannot establish the communication, the red LED H2 blinks:

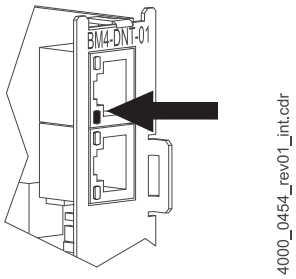


Figure 12: Error - no communication b maXX PLC

As soon as a few valid Data frames have been send/received, the red LED H2 turns off. This means, that although there is a valid communication the LED still can blink.

If the module has established the communication, but if the communication is faulty, you can only recognize the errors by using a bus monitor of the master. In the following you will find the most common errors.

Error	Trouble shooting
• CANopen slave doesn‘t report to the CAN network	➲ Remove connector and plug in again ➲ Remove module, check address at the DIP switch and plug in module again ➲ Check whether there is a boot project on the b maXX PLC, initializing the CANopen slave
• Slave sends error frames	➲ Remove terminating resistor connector on both ends and plug them in again ➲ Remove connector and plug in again ➲ Check baud rate (all devices at the same CAN-Bus must have an identical transfer rate)
• No cyclic communication	➲ Check whether there is a boot project on the b maXX PLC for initializing the CANopen slave ➲ Check PDO-Mapping

8.3.1.3 Continue communication for b maXX PLC

If the communication with the CANopen network is established, the option module **CANopen slave** tries to continue the communication with the CANopen network. If the communication cancels, the red LED H2 flashes up:

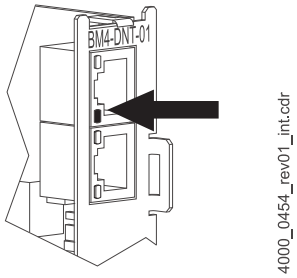


Figure 13: Error - no communication b maXX PLC

Further information is to be found in ▹D.4 LEDs◃ from page 64.

NOTE

Further details are to be found in the „Operation manual b maXX 4400“, and in the „Application handbook CANopen slave for b maXX PLC“.

8.3.2 Error messages CANopen slave for b maXX controller

The options module **CANopen slave** for b maXX PLC displays an error via LED H2 (red) according to CiA specification DR303-3 and via LED H4 (red)

H2 off	Option module **CANopen slave** operates without error.
H2 single flash [1)]	At least one error counter of the module exceed the warning level.
H2 double flash [2)]	„Guard“ (NMT master or NMT slave) or „Heartbeat“ occurred.
H2 triple flash [2)]	The SYNC messages misses withing the configured communication cycle.
H2 on	Option module **CANopen slave** does not communicate with the CANopen network.
H2 and H4 flash synchronously	See ▹Bootup for b maXX controller◃ on page 44.

1) Following light pattern active: ON (200 ms) - OFF (1000 ms)

2) Following light pattern active: ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (1000 ms)

3) Following light pattern active: ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (200 ms)- ON (200 ms) - OFF (1000 ms)

After switching on the option module operates in the following phases:

1 Bootup

2 Establish communication

3 Continue communication

8.3.2.1 Bootup for b maXX controller

The option module **CANopen slave** signalizes an error condition during the booting of the module over the lighting up of the LEDs H2 and H4 on the front side of the housing:

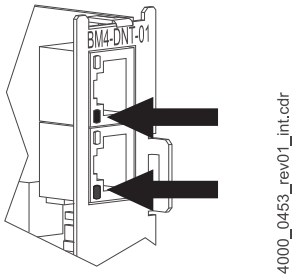


Figure 14: Errors while booting b maXX controller

Flashing pattern of both LEDs	Error recovery
• blinking once then pause [1]	➲ Send module to company Baumüller Nürnberg GmbH
• blinking twice then pause [2]	
• blinking three times [3]	
• blinking four times then pause [4]	➲ Send device b maXX 4400 to company Baumüller Nürnberg GmbH.

[1] Hardware is faulty or no CANopen hardware on the option module

[2] no CANopen software on the option module

[3] a newer CANopen software version is necessary

[4] Hardware error of the device b maXX 4400

8.3.2.2 Establish a communication for b maXX controller

After booting the option module **CANopen slave** tries to establish the communication with the CANopen network. If the module cannot establish the communication, the red LED H2 blinks:

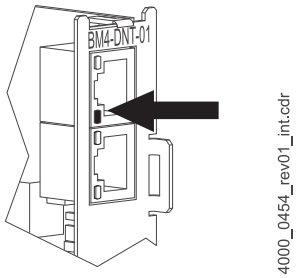


Figure 15: Error - no communication b maXX controller

As soon as a few valid Data frames have been send/received, the red LED H2 turns off. This means, that although there is a valid communication the LED still can blink.

If the module has established the communication, but if the communication is faulty, you can only recognize the errors by using a bus monitor of the master. In the following you will find the most common errors.

Error	Trouble shooting
• CANopen slave doesn‘t report to the CAN network	➲ Remove connector and plug in again ➲ Remove module, check address at the DIP switch and plug in module again ➲ Check the communication source by using the operation program
• Slave sends error frames	➲ Remove terminating resistor connector on both ends and plug them in again ➲ Remove connector and plug in again ➲ Check baud rate (all devices at the same CAN-Bus must have an identical transfer rate)
• No cyclic communication	➲ Release communication source (P1001) ➲ Check PDO-Mapping

8.3.2.3 Continue communication for b maXX controller

If the communication with the CANopen network is established, the option module **CANopen slave** tries to continue the communication with the CANopen network. If the communication cancels, the red LED H2 flashes up:

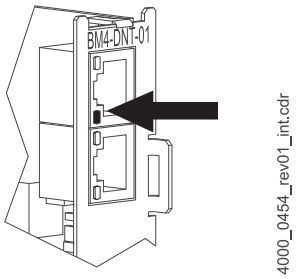


Figure 16: Error - no communication b maXX controller

Further information is to be found in ▹D.4 LEDs◃ from page 64.

NOTE

Further details are to be found in the „Operation manual b maXX 4400“, and in the „Programming handbook CANopen slave for b maXX controller“.

9

MAINTENANCE

If you comply with the prescribed environmental conditions, see ▷Technical data◁ from page 61, the option module **CANopen slave** maintenance-free. In case you find or assume a fault of the option module **CANopen slave**, contact the company Baumüller Nürnberg GmbH.

10

REPAIR

A faulty option module **CANopen slave** cannot be repaired; contact the company Baumüller Nürnberg GmbH for replacement.

11

DEMOUNTING, STORAGE

In this chapter we describe, how you shutdown and store the option module **CANopen slave**.

11.1 Safety instructions

refer to ▹Basic Safety Instructions◃ from page 9.

WARNING

The following **may occur**, if you do not observe this warning information:

- serious personnel injury
- death

*The hazard is: **Electricity.** The unit carries dangerous voltages and currents, as well as residual charges in the DC-link.*

Assure, that when working in the switching cabinet, that all electrical terminals in the switching cabinet are off-circuit and are safe against reclosing.

Await the discharge of the DC-link, before you carry out demounting works. The capacitors which are used in the device are **10 min.** after interruption of the supply voltage automatically discharge so far, that the terminals can be demounted without danger.

If you have additional capacitors connected to the DC-link, the DC-link decharging also can last much longer. In this case you must determine the necessary waiting time yourself.

Before working, check at the electrical connections with suitable measuring devices, that the connections are off-circuit.

Demount the connections not until you have verified yourself from the safe isolation of the supply.

11.2 Requirements to the executing personnel

The personnel which you instruct to demount the device must have the knowledge and training to carry out these works properly. Select the personnel in such a way, that the safety instructions, which are mounted to the device and its parts as well as to the terminals, are understood and applied to.

11.3 Demounting

Provide the following working materials, before you start demounting:

- Suitable packing for the option module **CANopen slave**, preferably the original packing.
- Cover for the covering of the enabled slot.

Carry out the demounting in the following order:

1. put the basic unit b maXX 4400 off-circuit and assure the device against unintentional re-closing.
2. wait 10 minutes. (capacitors are discharging). If you have additional capacitors connected to the DC-link, the DC-link decharging also can last much longer. In this case you must determine the necessary waiting time yourself.
3. open the switching cabinet.
4. take off the dust cover of the basic unit b maXX 4400.
5. take off the RJ45 connectors from the plug-in module.
6. turn the twist locks over and under the front sheet of the option module **CANopen slave** by 90° over (horizontal = unlocking position).

CAUTION

The following **may occur**, if you do not observe this caution information:

- minor to medium personnel injury

*The hazard is: **sharp edges.** The handle of the module maybe is sharp-edged.*

Do not pull too strong on the handle of the module. In case the module is very tight, your fingers can be injured. Use a pincer, if the module is very tight.

CAUTION

The following **may occur**, if you do not observe this caution information:

- property damage.

*The hazard is: **electrostatic discharge.** The electronic parts of the board can be damaged or destroyed by touchings with your hands.*

Touch the option module **CANopen slave** only at the handle of the front sheet.

7. pull the option module **CANopen slave** at the handle forwardly out of the controller unit.
8. lay the option module **CANopen slave** into the prepared packing - thereby touch plug-in module only at the handle.
9. put a cover (or a new option module **CANopen slave**) in the slot, which is now standing open (handle must show to the right side of the device).
10. turn the twist locks by 90° degrees (vertical = fastening position).
11. put the dust cover on the device again.
12. close the switching cabinet.
13. document the demounting (or the replacement) of the option module **CANopen slave**.

The device now can be switched on again. In case you want to dispose the option module **CANopen slave**, you will receive further information in ▹Disposal◃ from page 55.

11.4 Storage conditions

Store the option module **CANopen slave** in a suitable packing and at the in the ▹Technical data◃ from page 61 specified storage conditions.

11.5 Recommissioning

In case you would like to take the option module **CANopen slave** in operation again, refer to the specifications under „Storage conditions“. Then again run a commissioning, see ▹Commissioning◃ from page 31.

12

DISPOSAL

In this chapter we describe the correct and safe disposal of the option module **CANopen slave**. During the disposal you will mainly electronic scrap.

12.1 Safety instructions

refer to ▹Basic Safety Instructions◃ from page 9.

CAUTION

The following **may occur**, if you do not observe this caution information:

- minor to medium personal injury.

*The hazard is: **sharp edges.** The components of the option module CANopen slave, sheet metal components, and so on can have sharp edges! In case you don´t touch a option module CANopen slave on the handle, you can cut your fingers and palms.*

Only touch the option module **CANopen slave** on the handle of the front panel or wear suitable safety gloves.

CAUTION

The following **may occur**, if you do not observe this danger information:

- environmental pollution.

*The hazard is: **improper disposal.***

You may only dispose under consideration of the safety instructions. If necessary, also refer to the local regulations. In case you cannot carry out a secure disposal, contact a certified disposal business.

During a fire dangerous materials may be generated or set free.

Do not expose electronic components to high temperatures.

The inner insulation of e. g. various power semiconductors hold beryllium oxide. When opened, the beryllium dust is dangerous to your health.

Do not open the electronic components.

12.2 Requirements to the executing personnel

The personnel which you instruct to dispose/demount the device must have the knowledge and training to carry out these works properly. The personnel is to be chose in such a way, that the safety instructions on the device and its parts is understood and referred to by the personnel.

12.3 Disposal instructions

Preconditions

- The option module **CANopen slave** has already properly been demounted.
- All technical appliances are prepared and are in a faultlessly condition.

Sheet steel The front panel is made of galvanized sheet steel. Sheet steel must be given to the iron metal recycling.

Electronic scrap The electronic scrap from PCBs, which no further can be demounted, must be recycled as special waste. Thereby refer to the relevant instructions.

12.4 Recycling plants/offices

Assure, that the disposal is carried out according to your company´s regulations and the regulations of the disposal companies and official administrations. In case of doubt, contact the local business administration, which is responsible for your company or the environmental office.

APPENDIX A - ABBREVIATIONS

CAN	Controller Area Network
CE	Communité Europeenne
CEN	Comité Européen de Normalisation
CiA	CAN in Automation e.V.
DIN	Deutsches Institut für Normung e.V., German standards institute
DR	Draft Recommendation
DS	Draft Standard
DSP	Draft Standard Proposal
EMC	Electromagnetic compatibility
EN	European standard
ESD	Electrostatic discharge
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LED	Light Emitting Diode
OSI	Open System Interconnect
PLC	Process loop control
PROPROG wt II	Tool for programming of b maXX PLC
R	Reserved
RAM	Random access memory
RS485	Standard serial interface (IEC 61158)
SPS	PLC

B

APPENDIX B - ACCESSORIES

In this appendix you find all accessories, which are available for the option module **CANopen slave** of the company Baumüller Nürnberg GmbH.

In case you have questions and suggestions according the accessories, do not hesitate to contact our product management.

B.1 List of all accessories

Available CANopen connection cables:

- Cable type: BM4-CAN-K-33-xx (RJ connector, RJ connector)

Type	Form of construction	Length [m]	Article number
BM4-CAN-K-33-05	RJ45, RJ45	0.5	353315
BM4-CAN-K-33-01		1	346577
BM4-CAN-K-33-02		2	353317
BM4-CAN-K-33-03		3	353321
BM4-CAN-K-33-04		4	353327
BM4-CAN-K-33-05		5	351766
BM4-CAN-K-33-10		10	353329

- Cable type: BM4-CAN-K-31-xx (RJ connector, D-Sub male connector)

Type	Form of construction	Length [m]	Article number
BM4-CAN-K-31-05	RJ45, D-Sub male connector	0.5	353334
BM4-CAN-K-31-01		1	346568
BM4-CAN-K-31-02		2	353335
BM4-CAN-K-31-03		3	346571
BM4-CAN-K-31-04		4	353337
BM4-CAN-K-31-05		5	351764
BM4-CAN-K-31-10		10	353339

- Cable type: BM4-CAN-K-32-xx (RJ connector, D-Sub female connector)

Type	Form of construction	Length [m]	Article number
BM4-CAN-K-32-05	RJ45, D-Sub female connector	0.5	353330
BM4-CAN-K-32-01		1	346572
BM4-CAN-K-32-02		2	353331
BM4-CAN-K-32-03		3	346573
BM4-CAN-K-32-04		4	353332
BM4-CAN-K-32-05		5	351765
BM4-CAN-K-32-10		10	353333

- Terminating resistor connector CAN
  (RJ45 with pin assignment according to CIA-standard)

Type		Article number
BM4-CAN-T01	RJ45	346408
K-CAN-T1-O	9-pole D-Sub male	313910
K-CAN-T2-O	9-pole D-Sub female	313911

C

APPENDIX C - TECHNICAL DATA

In this appendix you will find the technical data for the option module **CANopen slave** of the company Baumüller Nürnberg GmbH.

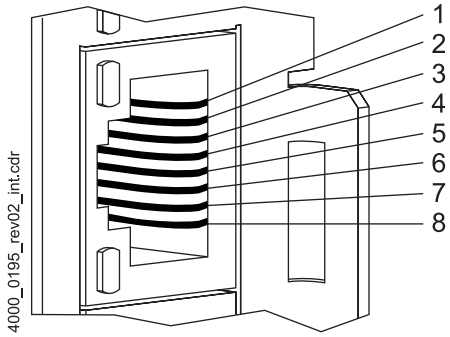
D.1 Option module CANopen slave BM4-O-CAN-03

The plug-in module has the following specifications:

Baud rates	20/125/250/500/1000 kBit/s
Physical Layer	ISO 11898
Electrical isolation	Optocoupler, DC/DC-converter
Connectors	2 x RJ45 female connector
Power supply	+5 V from controller supply
Current power	460 mA
Storage	4 kByte DP-RAM, 256 kByte RAM, 1 MByte Flash-Eprom
Environmental condition	According b maXX 4000
Storing condition	According b maXX 4000
Transport condition	According b maXX 4000

D.2 Pin assignment

RJ45 female 8-pole



Pin no.	Pin assignment
1	CAN high
2	CAN low
3	Ground (GND)
4	reserved
5	reserved
6	not connected
7	Ground (GND)
8	not connected

D.3 DIP switch

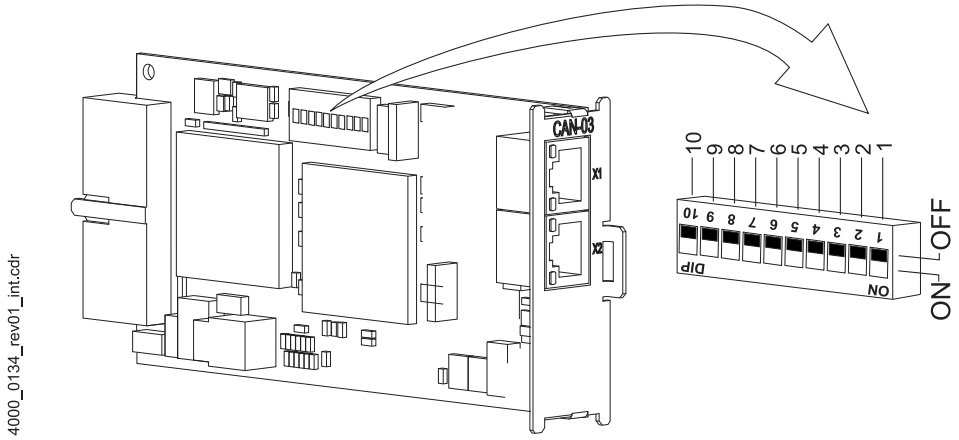


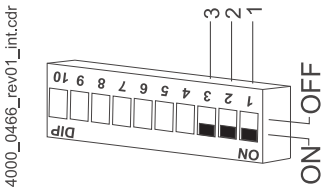
Figure 17: DIP switch S500

Pin no.	Pin assignment	
1	Baud rate-Settings Bit 0	above = 0, beneath (ON) = 1
2	Baud rate-Settings Bit 1	above = 0, beneath (ON) = 1
3	Baud rate-settings Bit 2	above = 0, beneath (ON) = 1
4	Bus-Address Bit 0	above = 0, beneath (ON) = 2^0
5	Bus-Address Bit 1	above = 0, beneath (ON) = 2^1
6	Bus-Address Bit 2	above = 0, beneath (ON) = 2^2
7	Bus-Address Bit 3	above = 0, beneath (ON) = 2^3
8	Bus-Address Bit 4	above = 0, beneath (ON) = 2^4
9	Bus-Address Bit 5	above = 0, beneath (ON) = 2^5
10	Bus-Address Bit 6	above = 0, beneath (ON) = 2^6

D.3.1 Adjusting of baud rate

D.3.1.1 Option module CANopen slave for b maXX PLC

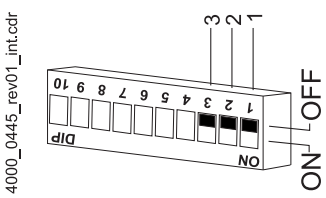
The baud rate is set via b maXX PLC while initialization. The DIP switches 1, 2 and 3 **must** be **ON**.



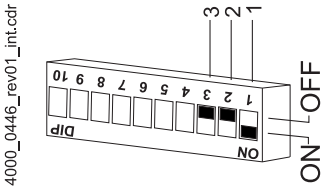
D.3.1.2 Option module CANopen slave for b maXX controller

The baud rate is adjusted by using the DIP switch 1 to 3 on the module.

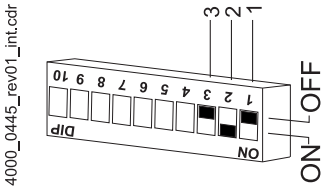
20 kBit/s:



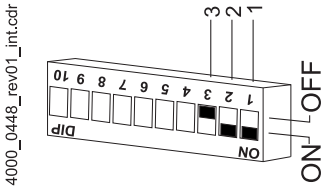
125 kBit/s:



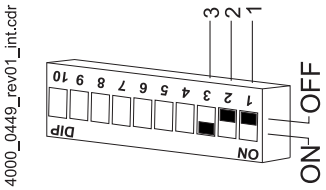
250 kBit/s:



500 kBit/s:



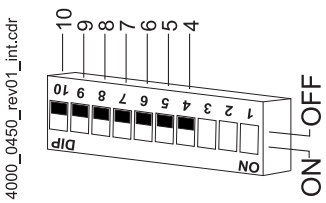
1 MBit/s:



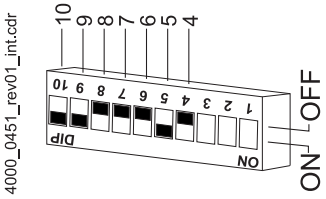
D.3.2 Adjusting of address

The address is adjusted by using the DIP switch 4 to 10 on the module.

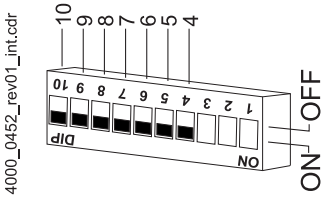
Module ID = 1 (DIP = 0)



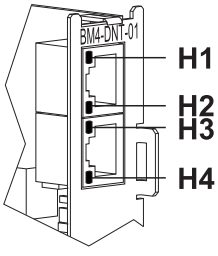
Module ID = 99 (DIP = 98)



Module ID = 1 (DIP = 127)



D.4 LEDs



H1 and H2 comply with the specification
DR-303-3 indicator specification

The green LED shows the operating condition of the device.

The red LED shows the type of the CAN-error.

These LEDs are intended for the internal usage of the company Baumüller Nürnberg GmbH.

H1 (green)

Short flashing up [1]	The CANopen network is in the condition STOPPED (also see „State machine of the communication“ in the documentation 5.02065).
Flashing up[2]	The CANopen network is in the condition PRE-OPERATIONAL (also see „State machine of the communication“ in the documentation 5.02065).
Continuous flashing	The CANopen network is in the condition OPERATIONAL (also see „State machine of the communication“ in the documentation 5.02065).

[1] This means that the following „Flashing cycle“ is active: ON (200 ms) - OFF (1000 ms)

[2] This means that the following „Flashing cycle“ is active: ON (200 ms) - OFF (200 ms)

H2 (red)

Doesn't flash up:	The CANopen module operates error-free.
Short flashing up [1]	At least one of the error counters of the module has exceeded the warning level.
Double short flashing up [2]	A „Guard“-event (NMT-master or NMT-slave) or a „heartbeat“-event has appeared.
Triple short flashing up [3]	The SYNC-message is not received within the configured communication cycle.
Continuous flashing	The CANopen module doesn't communicate with the CANopen network.

[1] This means that the following „Flashing cycle“ is active: ON (200 ms) - OFF (1000 ms)

[2] This means that the following „Flashing cycle“ is active: ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (1000 ms)

[3] This means that the following „Flashing cycle“ is active: ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (200 ms) - ON (200 ms) - OFF (1000 ms)

D.5 Cable connector

Usable Baumüller cable connectors are to be found in ▹List of all accessories◃ on page 59.

D.6 Terminating resistor connector

Characteristics: 120...124 Ohm, 0.25 W
Use the Baumüller terminating resistor connector (see ▹List of all accessories◃ on page 59).

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be in motion

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