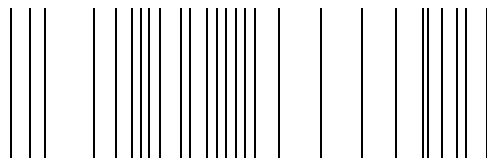
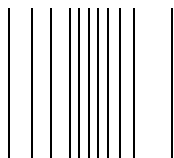
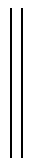


be in motion **be in motion**



BM4-F-AIO-XX



(Analog-I/O-Module b maXX)

Manual

E

5.01045.04



Title	Manual
Product	BM4-F-AIO-XX (Analog-I/O-Module b maXX)
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INTRODUCTION

This operation manual is an important constituent of your b maXX 4400 controller; accordingly, for your own safety, go through it fully.

The first steps that the user is supposed to take on receipt of this module are described in this chapter. Terms that have been used throughout this document are defined and directions regarding use and application are also given.

For further additional information, see manual for b maXX 4400 and application manual.

1.1 First steps

- 1 Check the consignment delivered, see Packing & Transportation from page 15 onwards.
- 2 Pass on all the documents which have been received with this plug-in module to the concerned personnel in your company.
- 3 Keep the suitable personnel for mounting & commissioning ready.
- 4 Hand over this operation manual to these personnel and make sure that especially the safety instructions as given herein are understood correctly and being followed.

1.2 Terms used

The term „Module“, „Plug in Module“, „Functional Module“ or „Analog-I/O-Module“ are also used in this Document for the Baumüller-Product „**BM4-F-AIO-XX**“.
See Annexure A -Abbreviations for the abbreviations used.

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 encoder 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 commands



Indications of danger point out to you the dangers which may lead to injuries and even to death.

Always observe the indications of danger specified in this document.

Any danger is always classified in one of the 3 danger classes. Each of this danger class is characterised by one of the following signal words:

DANGER

- Substantial damage to property
- Heavy body injury
- Death - **will** occur.

WARNING

- Substantial damage to property
- Heavy body injury
- Death - **may** occur

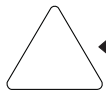
CAUTION

- Damage to property
- light to medium body injury - **may** occur.

2.1 Hazard information and commands

2.1.1 Structure of indication of hazard

The two examples given below show principally the form of an Indication of Danger. A triangle is used when warning against any danger to the living organisms is given. If the triangle is absent, then the danger indicated relates exclusively to damage to property.



A triangle indicates that there exists some danger here to the living organisms.

A coloured border indicates the magnitude of the danger: darker the colour shade, greater is the danger.



The icon in the quadrilateral represents the danger.

A coloured border indicates the magnitude of the danger: darker the colour shade, greater is the danger.



The icon in a circle represents a command: The user **MUST** follow this command.

(The circle is shown shaded, because a command is not necessarily present as an icon relating to every danger that is pointed out.)



The circle shows that there exists danger of damage to property.



The icon in the quadrilateral represents the danger.

A coloured border indicates the magnitude of the danger: darker the colour shade, greater is the danger. (The quadrilateral is shown shaded, because the danger is not necessarily indicated as an icon for every incidence of danger that is pointed out.)

The constitution of the text by the side of the icons is as follows:

THE SIGNAL WORD INDICATING THE DEGREE OF DANGER APPEARS HERE

We write here, whether one or several of the consequences given below occur, if attention is not paid to this warning.

- Here, we describe the likely consequences. The worst consequence is indicated at the extreme right.

Here, we describe the danger/hazard.

Here, we describe what you can do to avoid the occurrence of the danger.

2.1.2 Symbols used for indication of the danger

If the signal word is followed by a danger symbol:  or  or  , then the safety instructions relate to personal injuries.

If the signal word is followed by a circle  then the safety instructions relate to damage to property.

2.1.2.1 Indications of danger to personnel

For distinguishing optically, we use a separate border for the danger symbols in the form of a triangle and rectangular pictogram for each class of indication of danger.

For the danger class **DANGER**, we use the danger symbol  . The modes of indicating the dangers pertaining to this danger class are used in this document.



DANGER

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

- serious personal injury
- death

*The danger is: **electricity**. Here the danger is described precisely, too.*

Here, we describe what you can do to avoid the occurrence of the danger.



DANGER

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

- serious personal injury
- death

*The danger is: **mechanical effect**. Here the danger is described precisely, too.*

Here, we describe what you can do to avoid the occurrence of the danger.

For the danger class **WARNING**, we use the danger symbol  . The modes of indicating the dangers pertaining to this danger class are used in this document.



WARNING

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

- serious personal injury
- death

*The danger is: **Electricity**. Here the danger is described precisely, too.*

Here, we describe what you can do to avoid the occurrence of the danger.

For the danger class **CAUTION**, we use the danger symbol  . The modes of indicating the dangers pertaining to this danger class are used in this document.

2.1 Hazard information and commands



CAUTION

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

- minor to medium personal injury.

*The danger is: **sharp edges**. Here the danger is described precisely, too.*

Here, we describe what you can do to avoid the occurrence of the danger.



CAUTION

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

- environmental pollution.

*The danger is: **improper way of disposal**. Here the danger is described precisely, too.*

Here, we describe what you can do to avoid the occurrence of the danger.

2.1.2.2 Indication of danger of damage to property

If the indication of danger is followed by a round danger symbol: ⓘ then this relates to the safety instructions pertaining to damage to property.



CAUTION

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

- property damage.

*The danger is: **electrostatic discharge**. Here the danger is described precisely, too.*

Here, we describe what you can do to avoid the occurrence of the danger.

2.1.2.3 Used mandatory signs



Wear protective handgloves



Wear protective shoes

2.2 Info symbols



INSTRUCTIONS

This is an especially important piece of 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, disconnecter, 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 informations 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

In the following we are listing a few examples of faulty usage. The notes mentioned below shall give you a feeling, what a faulty usage of the plug-in module is. However, we cannot list all faulty usages, that could be thought of. All usages, in which the instructions of this documentation are disregarded are faulty and therewith forbidden, especially in the following cases:

- 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“ version 1.1 from February 15, 2002 and accordingly the newest version of the company Baumüller Nürnberg Electronic GmbH & Co. KG are always valid. These are at your disposal, at the latest, since conclusion of the contract.

2.6 Safety devices

During the transport the plug-in module is protected by its 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 part 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 personal injury
- death

Devices of the company Baumüller Nürnberg Electronic GmbH & Co. KG may only be assembled, installed, operated and maintained by qualified personnel.

Qualified personnel

Qualified personnel (professionals) is defined below:

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 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.

2.9 Obligatory and liability

In order to be able to operate and handle this Analog-I/O-Module with due regards to the safety requirements, use must be familiar with the indications of danger and Safety Instructions contained in this document.

2.9.1 Observe and comply with the indications of danger and Safety Instructions

Optically uniform safety pointers are used in this Operation Manual, which should be preserved from damage to property and injury to personnel.



WARNING

The following **may occur**, if attention is not paid to this indication of danger.

- Serious body injury with death

All the persons working on or handling the devices pertaining to the series b maXX must have in their possession this Operation Manual and observe and comply with the instructions and directions - especially the Safety Instructions - as contained herein.

In addition to that all the persons working on this unit must be familiar with and comply with any additional rules, regulations, etc. in force at the place of their use.

2.9.2 Dangers in use and handling this module

This state of the art analog-I/O-module has been developed and manufactured in compliance with the governing guidelines and regulations. In spite of that, there could still be some likelihood of some danger. These likely dangers are described at a glance in [►Basic Safety Instructions◄](#) and in [►Fig. 3◄](#).

We warn you against the acute hazard at the respective places in this documentation.

2.9.3 Warranty and liability

All technical 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 Electronic GmbH & Co. KG are excluded, if particularly one or more of the by us [►Usage according to regulations◄](#) specified causes have affected the damage.

PACKING AND TRANSPORTATION

Every Baumüller-plug-in module has been packed before shipment, such that likelihood of any damage to the contents during transportation is very low.

3.1 Transportation

The plug-in modules are packed in the manufacturer's works in compliance with the P.O.

- ▶ avoid heavy vibrations during transportation and powerful impacts, max. drop height of the packed module: 1.2 m.
- ▶ avoid discharges due to static electricity on the electronic components of the plug-in modules.
- ▶ take out the plug-in module from its protective packing just before assembly.

3.2 Unpacking

After receipt of the still packed plug-in module:

- ▶ check whether any damage to the packing during transportation is noticeable.

if yes:

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

CAUTION



The following **may occur** if attention is not paid to this indication of danger:

- Damage to property



*The danger is: **electrostatic discharge**. If the plug-in module, especially its electronic parts/ components are exposed to electrostatic discharge due to hand contact, it may suffer damage or get destroyed completely.*

Observe and comply with the regulations and directions relating to components sensitive to static electricity.

3.3 Disposal of the packing

There is no evidence of damage during transportation.

- open the packing of the module
- check the scope of supply with reference to the packing list.

The scope of supply is:

- **BM4-F-AIO-XX (Analog-I/O-Module b maXX)**
- this Operation Manual incl. declaration of conformity/manufacture.
- place the module for transportation back into the packing.
- 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 Disposal of the packing

The packing consists of cardboard and plastic.

- Observe and comply with the local disposal regulations, if the packing is to be disposed off.

3.4 Observe the following during transportation

For the first transportation of the module it is packed in the manufacturer's factory. If the module is to be transported again at a later date, observe the following :

- use the original packing.

or

- use a packing suitable for components/subassemblies sensitive to electrostatic discharge.

Make sure that the following conditions are complied with during the entire transportation :

- 2 K 3 (climatic category)
- - 30 °C to + 70 °C (temperature range)
- max. drop height (packed): 1,2 m

DESCRIPTION OF THE ANALOG-I/O-MODULE

The Analog-I/O-Module is described and the type keys mounted on the Plug-in Module are explained in this Chapter.

4.1 Construction

The analog-I/O-module is a plug-in module for a device from the b maXX 4400 series. The plug-in module has a connector (A) on the rear, which is used for the connection of the plug-in module with the controller unit. On the front, there is a 9-pole Sub-D connector (male) which is inserted in the connecting cable.

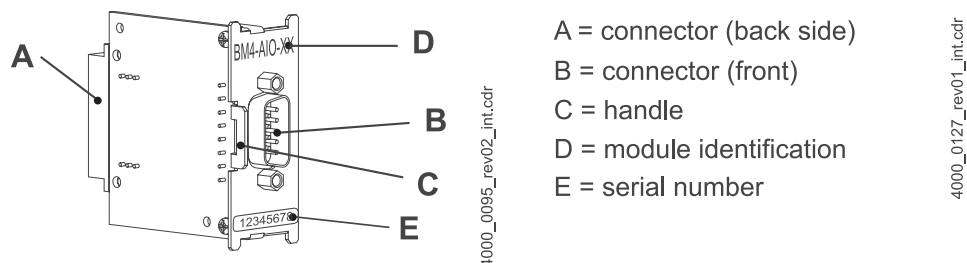


Figure 1: analog-I/O-module

The analog-I/O-module converts analog input signals in digital signals for control (e.g. default stipulated value) and/or makes available unconverted analog values (indication of RPM) at the analog output points, from internally processed digital signals.

Technical data of the plug-in module such as the description of assignment of the pins can be found in the Chapter [► Technical Data ◀](#).

4.1.1 Slots

A maximum of one Analog-I/O-Module can be assigned. The Analog-I/O-Module can operate only in the plugging location E.

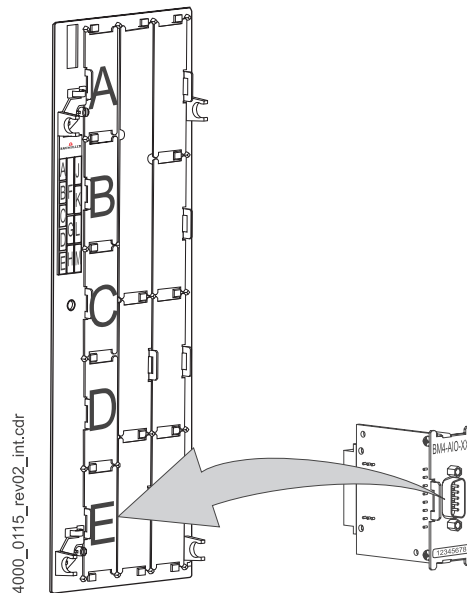


Figure 2: Controller unit, slot E



NOTE

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

4.2 Danger Areas

The greatest dangers originate from the basic device b maXX 4400 in which this module is plugged into. Observe and comply with all the safety instructions relating to the basic device b maXX 4400. The Figure below shows at a glance the ranges of danger as prevalent on the Plug-in Module.

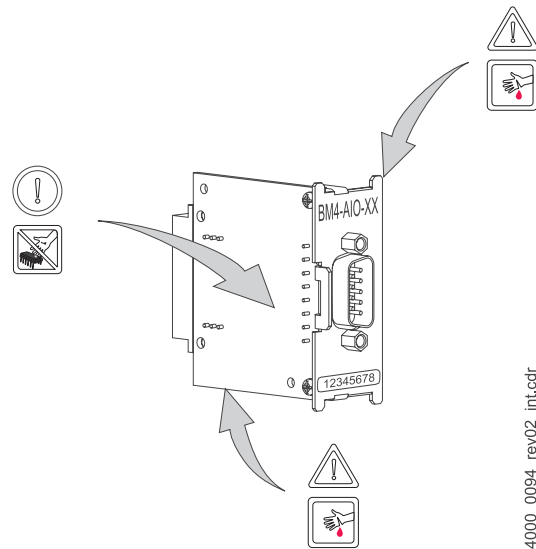


Figure 3: Hazard areas

4.3 Identification markings on the analog-I/O-plug-in module- type key

The type key can be found on the plate on the front side („D“ in ►Fig 1◄) along with the serial number.

NOTE



This type key is applicable exclusively for the Analog-I/O-Module pertaining to the Series b maXX 4400. Other plug-in modules have their own type keys.

BM4 - F - AIO - XX	Device generation, in which the plug-in module can be build in.
BM4 - <u>E</u> - AIO - XX	Plug-in module (Function Module)
BM4 - F - <u>AIO</u> - XX	Plug-in module identification (Analog-I/O)
BM4 - F - AIO - <u>XX</u>	Plug-in module version (number of input points/output points)
	01: 2 x 10 Bit Input, 2 x 8 Bit Output
	02: 2 x 16 Bit Input, 2 x 16 Bit Output
	03: 2 x 12 Bit Input, 2 x 12 Bit Output

The type identification can be found on the front plate of the front panel, whereas the type key can be found on the sticker on the plug. The type key contains the basic data of the Plug-in Module. Further additional data can be found in the chapter :”Technical Data” with the help of this key. The Technical Data is compiled in ►Annexure D - Technical Data◄.

ASSEMBLY AND INSTALLATION

The mechanical assembly and electrical installation of the analog-I/O-module **BM4-F-AIO-XX** is described in this chapter.

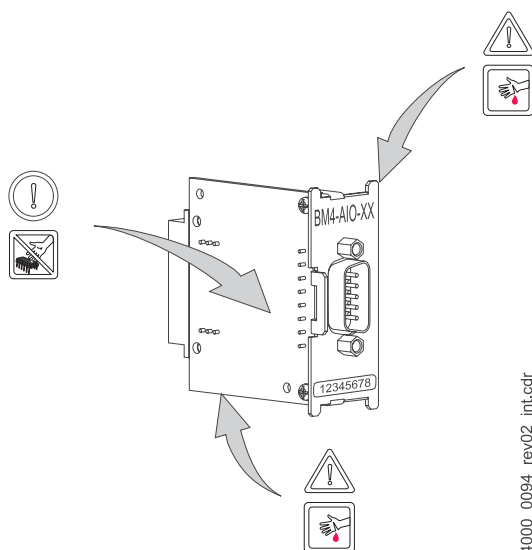
The assembly and installation involve the following steps :

- 1 mount the plug-in module.
- 2 connect the plug-in module with 24V- and signal cables.

5.1 General safety regulations

- observe the information contained in the chapters [►Regulations◄](#).
- observe all the areas in the b maXX-device which could harm for you during assembly.

The figure below shows at a glance the ranges of danger as relevant on the plug-in modules.



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Figure 4: Hazard areas

5.2 Requirements of the operating personnel



DANGER

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

- serious personal injury
- death

*The danger is: **Electricity**. The device and environment in the control cabinet may be carrying perilous voltages.*

Make sure before start of work that the device and the environment are free of any voltage.

Observe and comply with the appropriate safety regulations while handling with the devices carrying high values of voltages.

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

Qualified personnel are persons, who, by virtue of their training, experience and instruction and also knowledge of the relevant standards and regulations, regulations relating to prevention of accidents and the operating conditions are authorised by the person responsible for the safety of the system to carry out the required activities and are aware of the likely dangers associated therewith and able to avoid the same. The qualifications required for working with this unit are for instance :

- Training and instructions in accordance with the safety regulations for care and use of the safety device involved.

5.3 Preparation

- with the help of the type key (see „D“ in ►Fig 5◄), ascertain that the correct plug-in module has been kept ready.

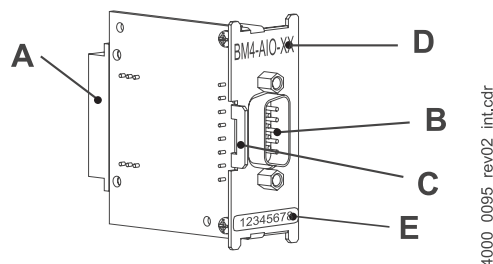
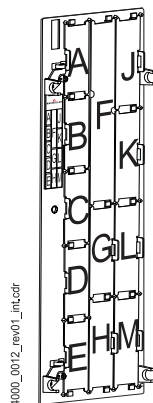


Figure 5: analog-I/O-module

- determine the correct slot (see ►Fig 6◄)



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Steckkarten_Rev09_e

	Function modules								Option modules										
A	X	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
B	-	X	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	0	0	X	X	-	-	-	-	-	-	-	-	-	-	-
D	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-
E	-	-	X	X	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
F	controller, permanently installed																		
G	-	-	-	-	-	-	-	-	0	0	0	0	-	-	X	X	X	X	X
H	-	-	-	-	-	-	-	-	X	X	X	X	X	X	-	-	-	-	-
J	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0
K	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	0	0	0	0
L	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	0	0	0	0
M	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	0	0	0	0

- X:** preferred slot
 Baumüller Nürnberg Electronic GmbH & Co. KG recommends, in order to use the whole functionality, to plug the modules into this slot
 Plugging point/location possible
- 0:** possible slot
 only when the preferred slot is used already, we recommend in order to use the whole functionality, to plug the module into this slot
- :** not possible - the module will not work in this slot
- *** prerequisite for these modules is a plugged in PLC module.

Fig.6 : Combinations of plugging points/locations

5.4 Assembly

- 1 switch off the b maXX 4400 and secure it against getting switched on inadvertently again during assembly.

DANGER



The following **will occur**, if attention is not paid to this indication of warning :

- serious body injury with death.



*The danger is: **Electricity**. The device and the atmosphere/surrounding in the control cabinet may be carrying high fatal voltages.*

Make sure before start of work that the device and the environment is free of any voltage. Observe and comply with the appropriate safety regulations while handling with the devices carrying high values of voltages. .

- 2 pull off the cover of the control unit; the plugging points will become visible now.
- 3 look for the provided slot (E) at the controller plug-in.

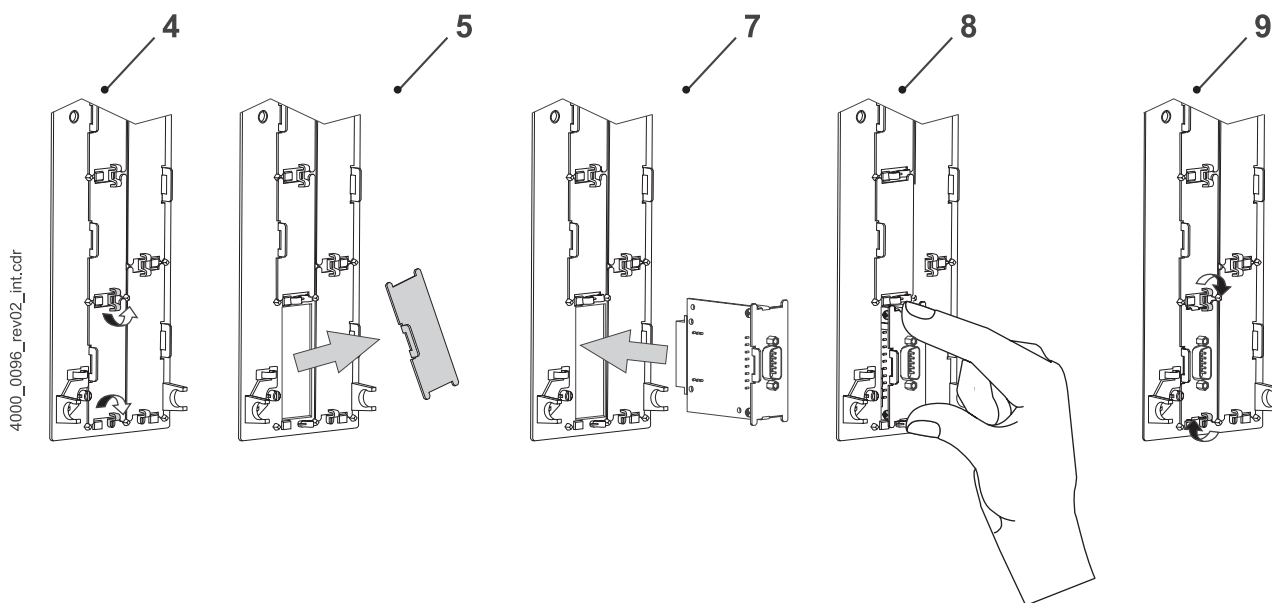


Figure 6: Mounting

- 4 turn the (rotating) bolts and below, the plugging point with a 90° rotation. The (rotating) bolts are horizontal now.
- 5 take the front plate cover towards the front off. Store this cover.



CAUTION

The following **may occur**, if attention is not paid to this indication of danger :

- Damage to property
- *The danger is: **electrostatic discharge**. The analog-I/O-Module contains components which are sensitive to electrostatic discharge.*

Observe the measures relating to electrostatic discharge while handling with the plug-in module.

Hold the plug-in module only by its grip (see „C“ in ►Fig 5◄)

- 6 take out the analog-I/O-module from its transportation packing. Avoid thereby contact with the electronic components of the plug-in module.
- 7 plug the analog-I/O-module into the guide supports of the slot. The handle must point to the same side as the other handles in this slot strip (here: left side).
- 8 press by two fingers on the front plate till you get a feeling that the analog-I/O-module is meshing inside the device.
- 9 Turn the (rotating) bolts above and below that through 90° in vertical position (closing position).
- 10 Connect the analog-I/O-module with the Sub-D-plug of the analog signal terminals.
- 11 Replace the covering bonnet on the device.



NOTE

If the analog-I/O-module is replaced by a one of the identical type merely for repairs, then further steps, installation, commissioning etc. can be shortened. In that case, merely the plug needs to be placed back on the plug-in module, the covering bonnet also needs to be placed back in position and the device can be switched on again.

With that, the assembly of the analog-I/O-module is completed.

5.5 Installation

Connect the analog-I/O-module for installation.

5.5.1 Connection diagram

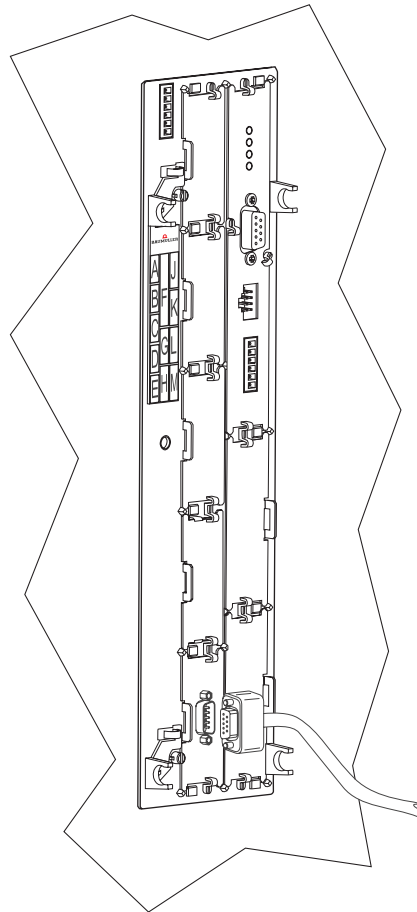


Figure 7: Connection diagram analog-I/O-module

4000_0097_rev02_int.cdr

5.5.2 Requirements of the electrical connections



CAUTION

The following **may occur**, if attention is not paid to this indication of danger :

- Damage to property

The danger is: **electrical voltage**. *If the requirements of electrical connections are not satisfied, then the plug-in module may get damaged or destroyed.*

Ensure that the electrical power connection parameters as specified in the Technical Data are adhered to and that the connections are made in accordance with the stipulated data.

Avoid short circuit between input pins and output pins. In the event of a short circuit between input points and output points the plug-in module may get destroyed.

In order to comply with the standard EN 60 204-1(electrical fitments on machines), the cable specified therein must be used. The connecting bushes must not drop - otherwise there is a danger of short circuits, foreign voltages, etc.

- Ensure that the cable is laid in accordance with the EMV-regulations.

5.5.3 Requirements of the connecting cable

The following cables have been cleared for use by Baumüller.

- Copper cables with a cross section : min. 0.25 mm², for further information see [►D.2 Connecting cable◄](#).

5.5.4 Installation Procedure



DANGER

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

- serious personal injury
- death

*The danger is: **Electricity**. The device and the environment in the control cabinet may be carrying high fatal voltages.*

Make sure before start of work that the device and the surrounding are free from any voltage. Observe and comply with the appropriate safety regulations while handling with the devices carrying high values of voltages. .

- 1 make sure that the b maXX device is connected free from any voltage.
- 2 take off the covering bonnet from the control unit.
 - the analog-I/O module is in the slot E (preferred plugging location), see [►Fig 2◄](#). The connecting cable for the analog-I/O-module has to be connected by the user.
- 3 connect the cables of the input/output points with the 9- pole Sub-D bush. Occupation of terminals, see [►D.1 Analog-I/O-Module BM4-F-AIO-XX◄](#).
- 4 fit the finished connecting cable on the analog-I/O module (cable to go downwards).
- 5 mount the covering bonnet on the device again.
- 6 do the wiring as per details in the control cabinet.

COMMISSIONING

In this chapter, it is described, how the analog-I/O-module which is already mounted and installed (see [►Mounting and Installation◄](#)) is commissioned. The commissioning ensures that the analog-I/O-module is identified and functions correctly. For further additional information on parametrisation of the plug-in module - parameters, see the application manual .

Before commissioning, ensure that the following pre-requisitions are met:

- 1 the plug-in module is mounted and assembled properly.
- 2 the plug-in module is properly installed.
 - wiring of the analog input points and output points is done properly
 - supply values are suiting the plug-in module.
- 3 the control cabinet is closed properly as per the regulations and all the safety devices have also been started.

The b maXX device has been commissioned and is ready for use

6.1 General safety regulations

- Observe and comply with the [►basic safety instructions◄](#)



DANGER

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

- serious personal injury
- death



*The danger is: **mechanical effects**. The drive unit may rotate during commissioning.*

Keep sufficient distance from the rotating parts. Note that the machine parts can be set in motion by the starting drives. In any case, activate the safety devices of the concerned machine parts and drives.

6.2 Requirements of personnel carrying out the commissioning

The commissioning jobs should be carried out only by specially trained personnel who can in particular, understand and comply with the safety instructions.

6.3 Description and checking of operating & display elements

The analog-I/O-module by itself does not have any operating and display elements. The LED H4 of the basic unit b maXX 4400 and replica of the LED in WinBASS II indicates all the errors in the plug-in module, e.g. occurrence of an error relating to the analog module.

6.4 Commissioning procedure

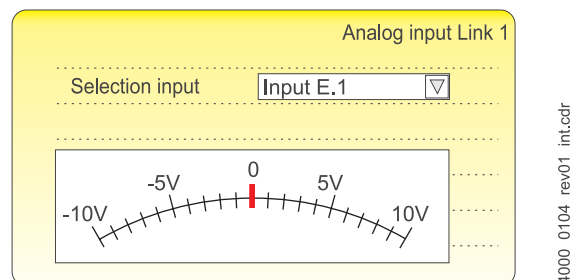
The commissioning is divided into the following sections:

- 1 recognition of the analog-I/O-module.
- 2 testing of the function.

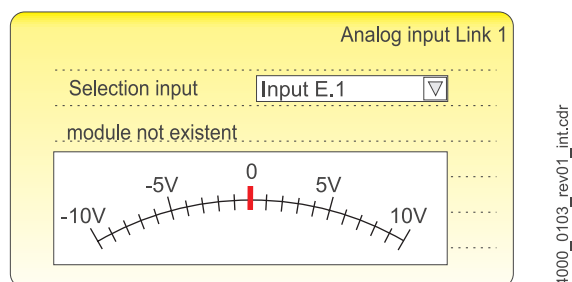
6.4.1 Recognition of the analog-I/O-module

While starting, the control unit reads the identification marker of the analog-I/O-module automatically. After that, check with the help of WinBASS II, whether the plug-in module has been correctly recognized. For this, proceed as follows:

- 1 switch on the b maXX 4400.
- 2 wait till the system attains its full capacity.
- 3 eliminate any errors / error messages eventually existing in the device b maXX 4400. These errors might have been caused by faulty assembly (e.g. defective cable) or some mistake(s) in installation (e.g. supply voltage absent). Only after having eliminated the errors can one continue with the commissioning.
- 4 open the window „Analog inputs, Link 1“ in WinBASS II. For this purpose, select in WinBASS II-Project tree „Device/configuration/IO_analog_inputs/IO_analog_input Link 1“.
- 5 if the plug-in-module is plugged in the slot E, select „input E.1“ in the following window..



- 6 Check whether the text: „module not existent“ is displayed directly above the scale. In this case, the module was not recognized..



- if the plug-in module is correctly recognized, i.e. **no text** appears directly above the scale, then it can be operated.
- if the plug-in module is not recognized, then switch off the device, check the assembly and the installation. After having removed the errors, let the device run up to full capacity for checking whether the plug-in module gets duly recognized now. If the plug-in module is not recognized even now, then it means that it is defective. In that case, contact Baumüller Nürnberg Electronic GmbH & Co. KG for replacement.

CAUTION

The following **may occur**, if attention is not paid to this indication of danger:

- Damage to property



*The danger is: **electrostatic discharge**. The analog-I/O-module may get damaged if it is plugged or pulled out under tension.*

The analog-I/O-module must not be pulled out or plugged/inserted, when the b maXX device is switched on. See to it that it is switched off first.

NOTE

If the plug-in module has still to be pulled out from the device due to some external factors, then also switch off the device. Try then to push in the analog-I/O-module again as described in the chapter [►Assembly and Installation◄](#).

6.4.2 Testing of the analog-I/O-module

Once the plug-in module has been duly recognized, then it can be checked whether the input and output points are working correctly using WinBASS II.

Requisites

The basic unit b maXX 4400 has been commissioned, **BM4-F-AIO-XX**-Module has been plugged in, analog connections are present and ready for functioning (voltage range +/-10 V DC, which can be set by a potentiometer in the circuit). Motor for speed set (clock-wise or counter-clockwise) has been connected; shaft ends are rotating freely.

- In WinBASS II in Project tree „diagnosis“, activate the submenu „service“.
- Check in the Menu „service“, whether the **Analog-I/O module** has been correctly recognized in the line for the slot E.

Testing of Inputs

- 1 Select in project tree „IO_analog_inputs“.
- 2 Click in WinBASS II on „Analog inputs Link 1“.

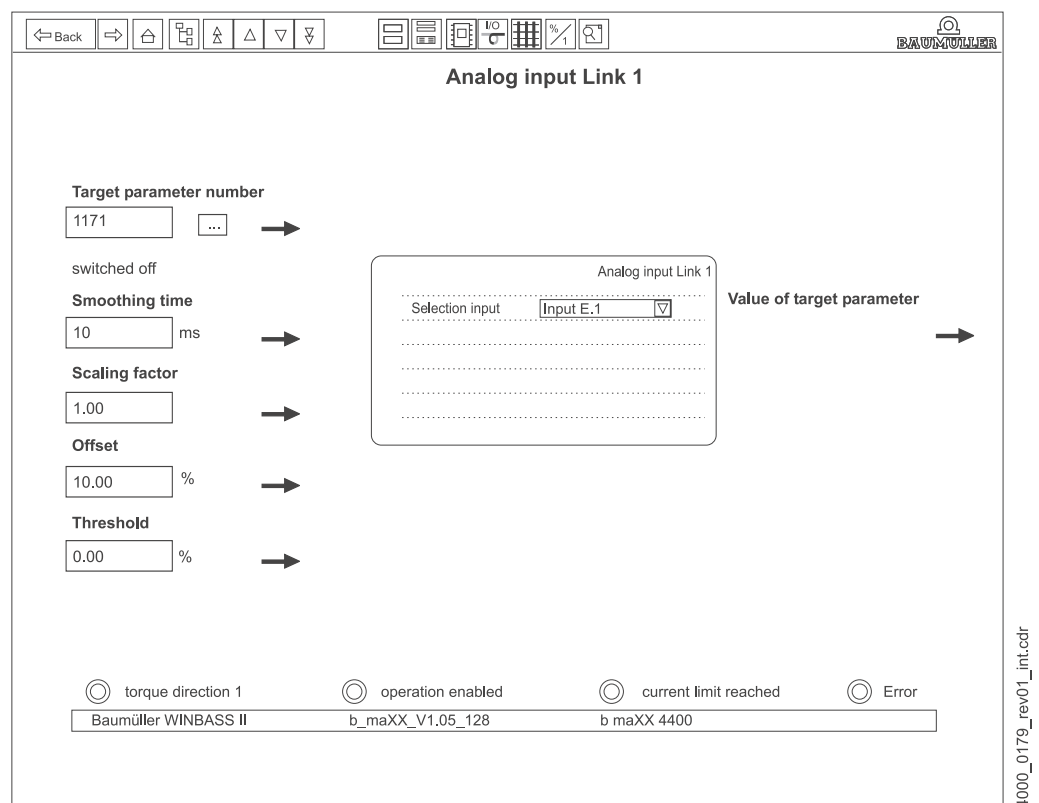
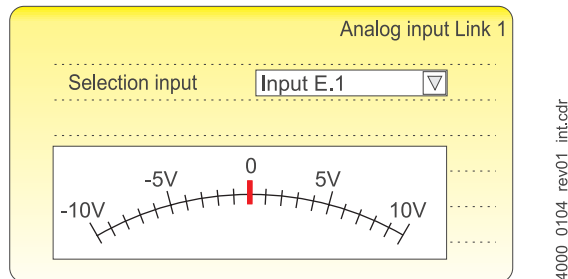


Figure 8: Menu analog input link 1

- 3 By clicking on the ▼-symbol, select the entry „Input E.1“ from the drop-down list in the central window by the side of „Selection input“ („E“, because the plug-in-module is plugged in the slot E, „1“ for input 1)..

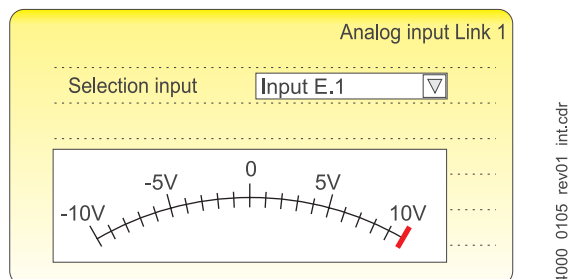


- 4 In the menu „Analog input Link 1“ enter:
- under *Target parameter number*: „1171“, (rampfunction-generator-input)
 - under *Smoothing time*: „10 ms“,
 - under *Scaling factor*: „1“,
 - under *Offset*: „0“,
 - under *Threshold*: „0“,

An analog scale with display of the voltage (set earlier by the potentiometer) laid, e.g. + 10 V.

- 5 Check the display scale in „Analog input Link 1“.

The RPM of the motor can be regulated now by potentiometer for instance within limits -10 V and +10 V (as well as clockwise or counter-clockwise running).



NOTE



If for example, the scale shows 0 V, even though there is an analog voltage present, then the input point is defective. On changing the analog input voltage, the relevant value of the voltage must be displayed on the scale.

- 6 Repeat the above steps for the input point 2.

After completing testing of the analog input points, you can now check the analog output points. The same requisites as those for the analog inputs, hold good for the analog outputs.

6.4 Commissioning procedure

- Testing of Outputs**
- 1 Click on „Analog outputs“ in WinBASS II
 - 2 Select the submenu „analog output Link 1“.

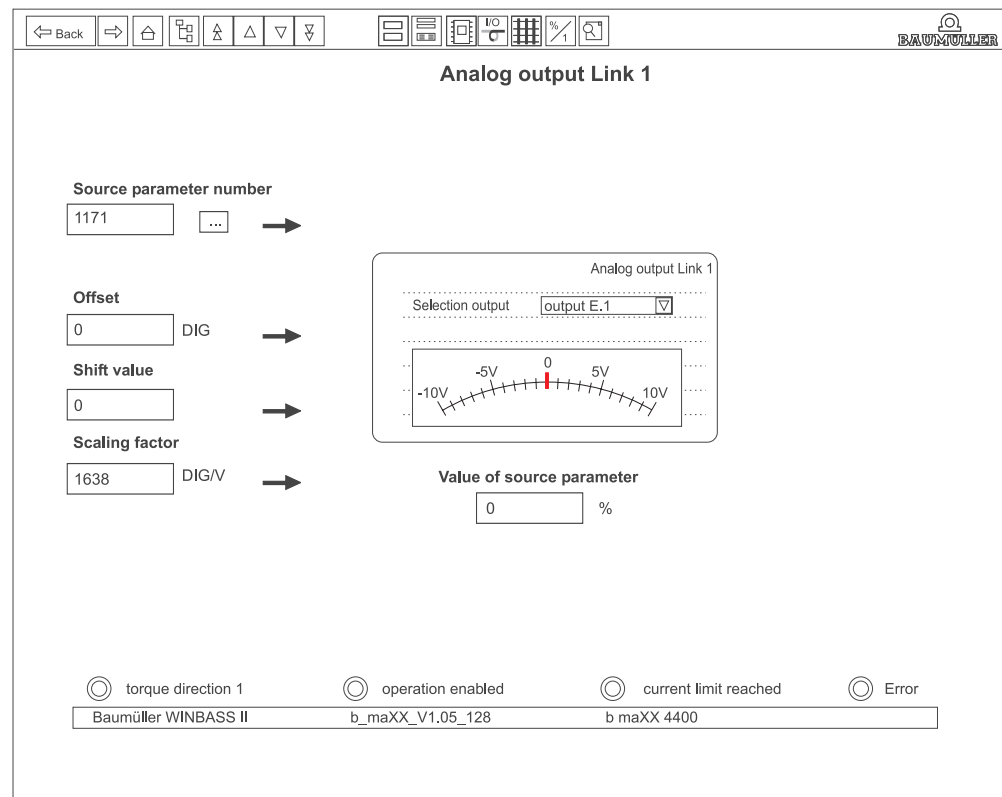
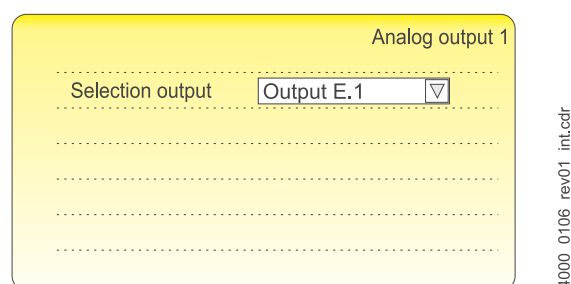


Figure 9: Menü Analoge output Link 1

- 3 By clicking on the ▼-symbol, select the entry „Output E.1“ from the drop-down list in the central window by the side of „Selection output“ („E“, because the plug-in-module is plugged in the slot E, „1“ for output 1)..



- 4 In the menu „Analog output Link 1“ enter:
 - under *Source parameter number*: „1171“,
 - under *Offset*: „0 dig“,
 - under *Shift value*: „0“,
 - under *Scaling factor*: „1638 Dig/V“.

The voltage at the output point E.1 can be measured now by using the suitable measuring instrument. If +10 V has been set at the input E.1, then there will also be an output voltage of +10 V at the output E.1.

**NOTE**

If you cannot measure any voltage at the output E.1, even though you change the voltage at the input point E.1, then it is an indication of the module or the controller/controller unit being defective.

5 Repeat the points 3 to 5 for the output 2.

With that, testing of the analog-I/O is complete.

OPERATION

The facilities for setting the parameters influencing the analog-I/O-module are described in this chapter.

7.1 Parameter

Setting of parameters determines the reaction of the plug-in module during operation. These parameters are set by the software WinBASS II.

The procedure for "Analog input Link 1" is described below via an example. The procedure for "Analog output Link 2" is similar with the corresponding changes.

- 1 Start WinBASS II.
- 2 Call the „project tree“.
- 3 Click on + before „IO_analog inputs“
(path: device/IO_analog inputs).
- 4 Click on „Analog_input Link 1“.
- 5 Now open the menu „Analog input 1“ with the data for one of the two analog inputs. You will find the button for the parameter list 1 in the icon bar.
- 6 Click on , for opening the *Parameter list*.
- 7 Click on the + -symbol before „Configuration_IO_analog“ in the window „Parameter-list“. You can now access the desired parameters of the analog-I/O module (see [►Fig 11◄](#)).

Name	Wert	Min	Max	Beschreibung
Device type				
Configuration Power Unit				
Configuration Encoder				
Configuration Motor				
Configuration Encoder emulation				
Configuration IO digital				
Configuration IO analog				
* BM AI1_Value	-77.83	-100	100	P0420 Analog input 1 actual value
* BM AI2_Value	-96.02	-100	100	P0421 Analog input 2 actual value
* BM DS0_AI1_Offset	0.00	-100	100	P1134 Offset analog input 1
BM DS0_AI1_Scaling	1.00	-2	2	P1132 Scaling factor analog input 1
* BM DS0_AI2_Offset	0.00	-100	100	P1140 Offset analog input 2
* BM DS0_AI2_Scaling	1.00	-2	2	P1138 Scaling factor analog input 2
* BM DS0_AOF1_Offset	0	-32768	32768	P1152 Offset fast analog output 1
* BM DS0_AOF1_Shiftvalue	2	0	15	P1153 Shift value fast analog output 1
* BM DS0_AOF2_Offset	0	-32768	32768	P1156 Offset fast analog output 2
* BM DS0_AOF2_Shiftvalue	12	0	15	P1157 Shift value fast analog output 2
* BM DS0_AOS1_Offset	0	-32768	32768	P1160 Offset slow analog output 1
* BM DS0_AOS1_Shiftvalue	1	-24	15	P1161 Shift value slow analog output 1
* BM DS0_AOS2_Offset	14000	-32768	32768	P1165 Offset slow analog output 2
* BM DS0_AOS2_Shiftvalue		-24	15	P1166 Shift value slow analog output 2
* BM DS0_AI1_Smoothing	10	0	30	P1131 Smoothing time analog input 1
* BM DS0_AI1_TargetPxxx	0	0	3376	P1133 Target number analog input 1
* BM DS0_AI1_Threshold	0.00	0	100	P1135 Threshold value analog input 1
* BM DS0_AI2_Smoothing	0	0	30	P1137 Smoothing time analog input 2
* BM DS0_AI2_TargetPxxx	0	0	3376	P1139 Target number analog input 2
* BM DS0_AI2_Threshold	0.00	0	100	P1141 Threshold value analog input 2
* BM DS0_AOF1_SourcePxxx	300	0	3376	P1151 Source number fast analog output 1
* BM DS0_AOF2_SourcePxxx	3338	0	3376	P1155 Source number fast analog output 2
* BM DS0_AOS1_Scaling	1638	1	65535	P1162 Scaling factor slow analog output 1
BM DS0_AOS1_SourcePxxx	1171	0	3376	P1159 Source number slow analog output 1
BM DS0_AOS2_Scaling	1638	1	65535	P1167 Scaling factor slow analog output 2
BM DS0_AOS2_SourcePxxx	0	0	3376	P1164 Source number slow analog output 2
BM DS0_AI1_InputChannel	0	0	1282	P1130 Selection analog input 1
BM DS0_AI2_InputChannel	0	0	1282	P1136 Selection analog input 2
BM DS0_AOF1_OutputChannel	0	0	65535	P1150 Selection fast analog output 1
BM DS0_AOF2_OutputChannel	1282	0	65535	P1154 Selection fast analog output 2
* BM DS0_AOS1_OutputChannel	1281	0	65535	P1158 Selection slow analog output 1
BM DS0_AOS2_OutputChannel	0	0	65535	P1163 Selection slow analog output 2
Configuration CANsync				
Configuration BACI				
Configuration Synchronization				
Configuration Application				
Configuration Power Supply Unit				
Drive manager				
Data set management				
Ramp Function Generator				
Set Value Generator				
Position controller				

* : not only showing the parameter value - it can be modified there too

Ok Filter... Import... Export... Options... Search... Print... Help...

Figure 10: Configuration analog-I/O, parameter list

NOTE



The fault-parameters of the analog-I/O-module can be found in the chapter on [►Troubleshooting](#) 4.

TROUBLESHOOTING AND FAULT REMOVAL

Error messages pertaining to the basic unit b maXX 4400 and the messages in WinBASS II are described in this chapter, whenever an error on the analog-I/O-module should occur. The meaning of each of these messages will be explained and in which way corrective action can be taken.

8.1 Safety regulations

- Observe and comply with the ► [Basic Safety Instructions](#) ◄.

8.2 Requirements of the personnel carrying out troubleshooting

The personnel working with the b maXX unit must have been trained in the safety regulations and operation of the unit and be familiar with the operation of the unit correctly and in a proper manner. In particular, reaction to error messages and the actual state requires special knowledge which such personnel must possess and exhibit. In this chapter, we shall be informing you regarding different errors and the corresponding messages resulting there from. These errors can be attributed either to mechanical or electrical causes.

8.3 Fault-parameters - fault messages (list of faults) - reactions to the faults

The units of the series b maXX 4400 give a signal of the status of the error in the analog-I/O-module by lighting up the bottom red LED (H-4) on the cover or the LED (H-4) on the controller. Defects in the analog-I/O-module generate in addition, error messages in the operation software. The reason and the contents of such error message must be determined by using a PC/Laptop, a hand held operating device and the error list as given in this document and/or by making use of the operation software.

A list of error-messages is given below. An error-message is displayed in WinBASS II in the window „Drive manager“. In the field of lists „Messages“ will be found the (short) error name, error number and - separated by a colon - meaning of that error, e.g. „ModuleError 53: error in Functional Module 1“.

8.3 Fault-parameters - fault messages (list of faults) - reactions to the faults

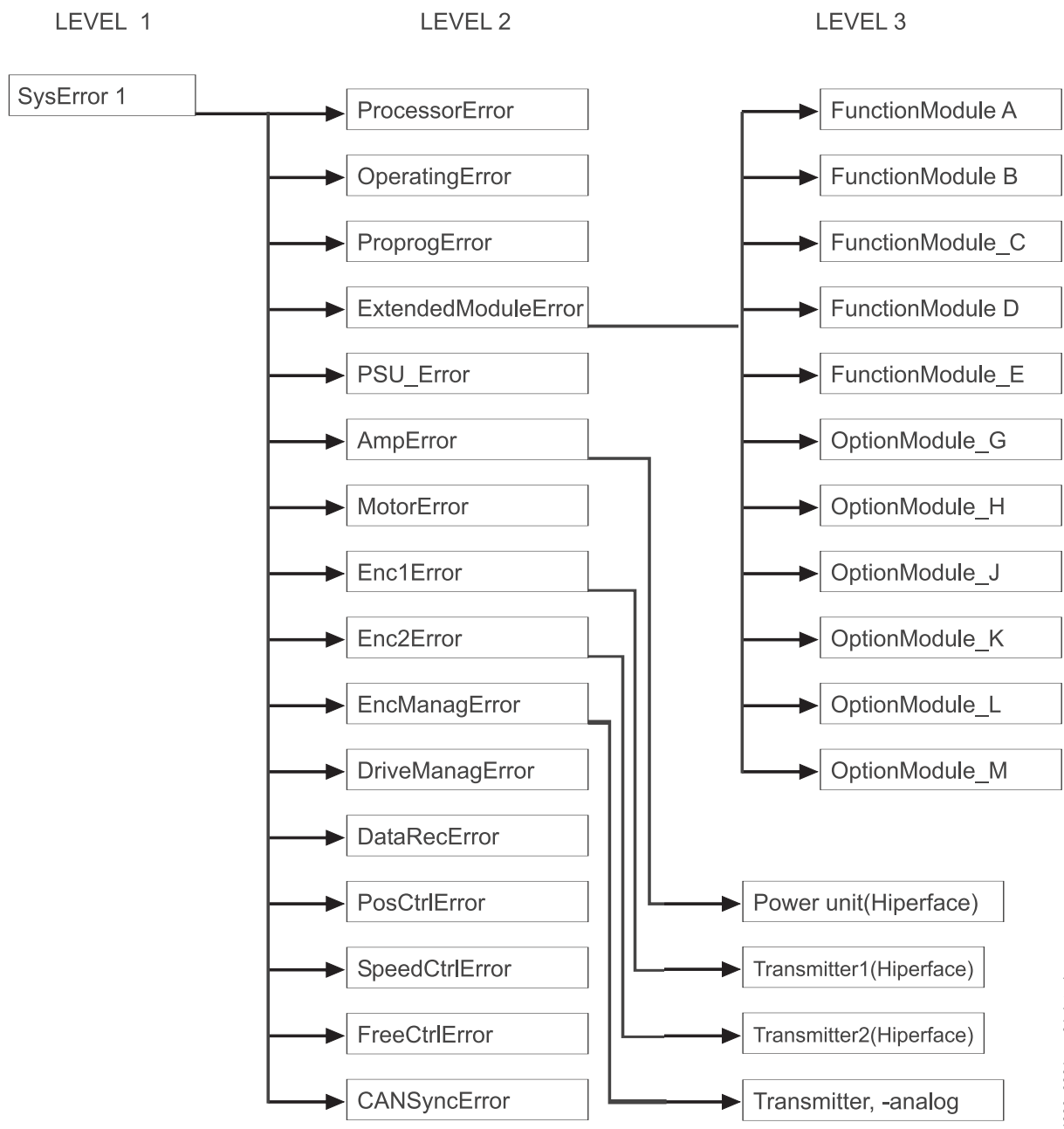


Figure 11: Structure of the List of Errors - overview

Level 1 **SysError1**, of interest only for accessing the error using the parameters but without use of WinBASS II, e.g. in case of field bus communication. This error is not displayed in WinBASS II.

Level 2 Next level below SysError1. Here you will find the errors, which you can remove directly with the help of the information displayed, or by pointing to the next level, where the error may be present.

The error messages have been tabulated in [►Fig 12◄](#).

In the column „Reaction“ you will find the reaction of the systems to the errors.

- „IS“ = Pulse blocking;

- depending on the setting means that you are able to select as to how the system will react, e.g. braking on the brake ramp, immediate stop, etc. For further additional information, see „Manual for b maXX 4400“ or in the „Parameter Manual/Application Manual„

In the coloumn „remedy“ you will find tips for removal of the errors. For further additional information, see „Parameter Manual“.

8.3 Fault-parameters - fault messages (list of faults) - reactions to the faults

The following error messages are generated by the analog-I/O-module in case of any error:

Module Error (Error in Module Extension) P0204

Error name	Error No.	Meaning	Reaction	Removal of the Error
ModuleError	48	Error in Functional Module A	depending on setting	see ►Functional Modules A to E P0240 to P0244◄
ModuleError	49	Error in Functional Module B	depending on setting	see ►Functional Modules A to E P0240 to P0244◄
ModuleError	50	Error in Functional Module C	depending on setting	see ►Functional Modules A to E P0240 to P0244◄
ModuleError	51	Error in Functional Module D	depending on setting	see ►Functional Modules A to E P0240 to P0244◄
ModuleError	52	Error in Functional Module E	depending on setting	see ►Functional Modules A to E P0240 to P0244◄

Functional Module A to E P0240 to P0244

(Error in Functional Modules A to E)

Error name	Level 3 Error No.	Meaning	Reaction	Removal of the Error
Functional Modules A to E	0	r e s e r v e d		
Functional Modules A to E	1	submodule not recognized	no reaction	check whether the correct module has been plugged in at the right place
Functional Modules A to E	2	recognized module at a place that is not permitted	no reaction	check whether the correct module has been plugged in at the right place
Functional Modules A to E	3	digital output short circuited	no reaction	check the wiring of the digital output points
Functional Modules A to E	4	wrong destination parameter value by the digital input	no reaction	check the parametrisation of the input channel
Functional Modules A to E	5	direct PLC-I/O-access for this Module not permitted	no reaction	do not select the module.
reserved Error	6 to 15			

NOTE



For further additional information, refer to the manual b maXX 4400 and the parameter manual.

MAINTENANCE

If the specified ambient conditions as given in [►Technical Data◄](#) are adhered to, then the analog-I/O-module does not require any maintenance. If however any defect in the analog-I/O-module is detected or you feel that there exists some defect in it, then contact Baumüller Nürnberg Electronic GmbH & Co. KG.



REPAIR

A defect analog-I/O-module can not be repaired; for replacement contact the company Baumüller Nürnberg Electronic GmbH & Co. KG.



DEMOUNTING, STORAGE

In this chapter, it is described, how to take the analog-I/O-module out of operation and how to store it.

11.1 Safety regulations

- Observe and comply with the [►Basic Safety Instructions◄](#).



WARNING

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

- serious personal injury
- death

*The danger is: **Electricity**. The device carries hazardous high values of voltages and currents as well as residual charges in the intermediate circuit.*

Ensure that the electrical terminals are not carrying any current and have been secured such way that there is no possibility of them being re-powered again.

Wait for the intermediate circuit to get discharged, before undertaking any dismantling operations. The condensators used in the device get discharged automatically **10 min** after switching off the power supply to such an extent that the connections can be disconnected safely without any danger.

If any additional condensators have been connected in the intermediate circuit, then discharging of the intermediate circuit may take a substantially long time. In this case, you have to determine the necessary waiting period by yourself.

Before doing any jobs on the electrical connections using suitable measuring equipment, check that these connections are not carrying any voltage.

Dismantle the connections only after having yourself assured about absence from any voltage thereon.

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

- Keep the below mentioned working material ready before starting with demounting:
 - Suitable packing for the analog-I/O-module, as far as possible, the original packing.
 - Cover plate for covering the slot becoming vacant.

Sequence of demounting:

- 1 Connect the basic unit b maXX 4400 such that it is free from any voltage and secure it against any eventuality of getting switched on inadvertently.
- 2 Wait for 10 min. (the capacitors get discharged). If some additional capacitors have been connected in the intermediate circuit, then discharging of the intermediate circuit may take a substantially long time. In this case, you have to determine the necessary waiting period yourself.
- 3 Open the control cabinet.
- 4 Take off the (covering) hood of the basic unit b maXX 4400.
- 5 Pull off the plug from the Analog-I/O-Module (normally it is in the slot D).
- 6 Turn the rotating bolt above and below the front plate of the Analog-I/O-module through 90° (horizontal = unbolted position)



CAUTION

The following **may occur**, if attention is not paid to this indication of danger:

- Damage to property

*The danger is: **electrostatic discharge**. The electronic parts on the PCB may get damaged or destroyed due to hand contact.*

Hold the analog-I/O-module only by the gripping handle on the front panel.



CAUTION

The following **may occur**, if attention is not paid to this indication of danger:

- light to medium body injury.

*The danger is: **sharp edges**. The front plate of the analog module may have sharp edges.*

Wear suitable protective handgloves.

- 7 Holding the analog-I/O-module by its gripping handle, pull it out towards the front side from the control unit.
- 8 Place the analog-I/O-module in the packing kept ready - hold the plug-in module only by its gripping handle thereby.
- 9 Insert a cover plate (or a new analog-I/O-module) in the inserting location now lying open (the handle must be pointing to the left side of the unit).
- 10 Turn the rotating bolt through 90° (vertical = closing position)
- 11 Mount the cover back on the unit.
- 12 Close the control cabinet.
- 13 Document the demounting carried out (or the replacements made) of the Analog-I/O-module.

**DANGER**

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

- serious personal injury
- death



*The danger is: **mechanical effects**. An undefined operational characteristic of the bmaXX 4400 may be developed due to dismantling of the Analog-I/O-Module*

See to it that the values set in the operating system/WinBASS via the analog-I/O-module continue to be retained in the parameters till they are changed. While switching it on again from the drive side, activate all the safety devices for your own safety, for avoiding undesired reaction of the drive.

The device can be switched on again now.

Change then the parameters affected by the analog-I/O-Module in WinBASS in the menu „IO_analog_inputs“.

If the analog-I/O-module is to be disposed off, then further additional information for this can be found in the chapter [►Disposal◄](#).

11.4 Storage conditions

Store the analog-I/O-module in a suitable packing and under the storage conditions specified in the [►Technical Data◄](#).

11.5 Restarting

If the analog-I/O-module has to be recommissioned, observe the details given under „Storage conditions“. Then again run a commissioning (see [►Commissioning◄](#)).

DISPOSAL

The correct and safe way of the disposal of the analog-I/O-module (**BM4-F-AIO-XX**) is described in this chapter. During this disposal, mainly electronic scrap is generated.

12.1 Safety regulations

- Observe and comply with ► [Basic Safety Instructions](#)◄.

CAUTION



The following **may occur**, if attention is not paid to this indication of danger.

- light to medium body injuries.



*The danger is: **sharp edges**. The components of the analog-I/O-module, sheet metal parts, etc. may be having sharp edges! If the analog-I/O-module is not held by its handle, then you may cut your hand or fingers.*

Accordingly, hold the analog-I/O-module by its handle on its front panel.

CAUTION



The following **may occur**, if attention is not paid to this warning.

- pollution of environment



*The danger is: **improper way of disposal***

The disposal must be carried out in due compliance of the safety regulations. Where relevant and applicable, also observe and comply with any special local regulations. If you cannot carry out the disposal by yourself, entrust it to a suitable disposal agency.

In case of fire, hazardous substances may eventually get evolved or liberated.

Do not expose the electronic parts to high temperatures.

In case of different power semiconductors beryllium oxide is used for example as an internal insulating material. The beryllium dust evolved on opening is hazardous to health.

Do not open the electronic parts.

12.2 Requirements of the executing personnel

The personnel, whom you instruct to dispose/demount the device must have the knowledge and training to carry out these works properly. The personnel is to be chosen in such a way, that the safety instructions on the basic unit b maXX 4400 and its parts are understood and referred to.

12.3 Disposal instructions

Preconditions	• The analog-I/O-module has been dismantled in a proper manner.
Sheet steel	The front panel is made up of zinc galvanised steel plate. The steel plate must be taken to the site for recycling of ferrous materials.
Electronic scrap	The electronic scrap (PCB), which cannot be dismantled, must be disposed off as special garbage. Observe and comply with the relevant regulations in this regard.

12.4 Disposal plants/offices

Ensure that the disposal is carried out in conformity with the guidelines laid down by your company in this regard as also by the competent disposal agencies and offices. In case of doubt, contact the factory inspector competent for you to deal in these matters or the pollution control office.



APPENDIX A - ABBREVIATIONS

A	ampere	DAC	digital/analog converter
+ IAist 	amount of rotor current actual value (pos. signal)	DB	data byte (8 bits)
AA	function module Analog Outputs	DC	► direct current ► drive-control
Abs.	paragraph (in German text)	DE	function module Digital Inputs
AC	alternating current	DES	digital input adjust
ADR	address byte	DIN	Deutsches Institut für Normung e.V., German standards institute
AE	function module Analog Inputs	DIO	digital input/output
AIO	analog input/output	DOPPELW	double word (32 bits)
AK	command-/knowledge ID	DSV	function module Data Set Management
AM	► asynchronous motor ► function module Drive Manager	DW	data word (16 bits)
ASF	rotor contactor release	DWort	double word (32 bits)
BACI	Baumüller drives communication interface	EMK	electromagnetic constant
BAPS	Baumüller drives parallel interface	EMC	electromagnetic compatibility
BASS	Baumüller drives serial interface	EN	european standard
BB	ready-to-use	EOF	end of file
BBext	ready-to-use (external)	ES	function module Infeed
BBint	ready-to-use (internal)	ESD	electrostatic discharge
BCC	block check character	Ext	function module Current Monitoring
BE	► construction element ► handling unit	EXT, ext	external
BEDAS	operation data memory	FBS	BEDAS missing
BOF	begin of file	FI	erroneous current
BS	function module operating system	FLG	error position encoder signal
BSA	analog reference potential	FPH	missing phase
BSD	digital reference potential	FTO	error motor encoder signal
BSE	external reference for 24 V controller inputs	GL	technology module Synchronous Operation
CPU	central processing unit	GRE	rectifier end position
DA	digital/analog	HE	main contactor ON

HLG	function module Ramp Generator	MM	► Function module Motor Model ► torque encoder
HM	main menu	\$	prefix for hexadecimal number
HS	main contactor	Mot	function module Field Angle Calculation
HSE	main contactor ON	MR1	torque direction 1
HSF	main contactor release	MR2	torque direction 2
HW	high word	MT	function module Motor Temperature
I	function module Current Control	mtr.	medium fast blow
$\hat{I}$	peak current, undefined curve form	n = 0	speed = 0
I2t	function module Overload Monitoring	N	function module Speed Control
I_{AC}	effective value, alternating current	n_{ist}, n_{act}	speed actual value
I_{Aist}	rotor current actual value	n_{max}	max. speed
I_{DC}	effective value, direct current	n_{min}	min. speed
I_{eff}	effective current, alternating current	NMX	max. speed exceeded
I_F	field current	NN	height above sea level
I_{Fmax}	max. field current (rated current)	n_{SG}	slow motion speed
I_{Fmin}	min. field current	n_{soll}, n_{set}	speed setpoint value
I_{Fsoll}, I_{Fset}	field current setpoint value	OPM	optional power module
IEE	incremental encoder emulation	P	identification number
ID-Nr.	identification no.	PBE	parameter description
IKG	function module Incremental Encoder	PELV	protected low voltage with secure separation - earthed
Inc	counting unit of position	PKE	parameter identifier
IND	index	PKW	parameter identifier value
Inc	graduation of incremental encoder	PNU	parameter number
INC.	incremental	POS	technology module Positioning
IPM	intelligent power module	PWE	parameter value
I_{soll}, I_{set}	rotor current setpoint value	PWM	function module Puls Width Modulation
IW	actual value	PZD	process data
IWK	actual value channel	R	reserved
IxR_{operation}	IxR-compensation at "operation"	R_A	rotor resistance
IxR_{slow motion}	IxR-compensation at "slow motion"	RA	function module Relay Output
IZK	overcurrent in intermediate circuit	Res	function module Resolver Evaluation
KT	function module Coordinate Transformation	RF	controller release
L	function module Position Control	RS	controller blocking
LED	light emitting diode	SE	screen earth
LGE	length of telegram	SELV	protected low voltage with secure separation
LT	function module Power Section	SF	drag error, position deviation error
LW	low word	SGR	current limit reached
M	function module Drive Manager	SH	quick stop
M24	reference potential 24 V		

SL	protective conductor
SM	synchronous motor
STX	start of text
SV	function module Service Interface
SW	► setpoint value ► software
SWG	function module Setpoint Value Generator
SWK	setpoint value channel
TBA	overtemperature of ballast resistor
TKK	overtemperature of heatsink
TM	motor temperature probe
TMO	motor overtemperature
U	voltage
$\hat{U}$	peak voltage
U_A	rotor voltage
U_{AC}	effective value, alternating current
U_{DC}	effective value, direct current
U_{eff}	effective value, alternating current
UM	sub menu
USS	function module USS-protocol
UVS	supply voltage too low
USS®	Siemens trademark, universal serial interface
U_{ZK}	intermediate circuit voltage
V	volts
VBG	Verwaltungs-Berufsgenossen- schaft, German administration oc- cupation co-operative
VDE	Verband deutscher Elektrotechni- ker, German electrotechnical as- sociation
VE	linking element
WRE	inverter end position
X	contact bar, connector, connection
ZK	DC link, intermediate circuit





APPENDIX B - ACCESSORIES

All the accessories that are available for the analog-I/O-module of Baumüller Nürnberg Electronic GmbH & Co. KG are listed in this appendix.

The product management of Baumüller welcomes enquiries and responses, if any from your side.

B.1 List of all the accessories

No accessories are available for the analog-I/O-module manufactured by Baumüller Nürnberg Electronic GmbH & Co. KG .



APPENDIX C - DECLARATION OF CONFORMITY / DECLARATION BY MANUFACTURER

In this section we provide general information about EC directives, the CE symbol and the Declaration of Conformity/by Manufacturer.

C.1 What is an EC directive?

EC directives specify requirements. The directives are written by the relevant bodies within the EU (which used to be called the EC, and the EEC before that, hence the now illogical term EC directive), and are implemented by all the member countries of the EU in national law. In this way the EC directives guarantee free trade within the EU.

An EC directive only contains essential minimum requirements. You will find detailed requirements in standards, to which references are made in the directive.

C.2 What the CE symbol indicates

a) The CE marking symbolizes conformity to all the obligations incumbent on manufacturers for the product by virtue of the Community directives providing for its affixing.

...

b) The CE marking affixed to industrial products symbolizes the fact that the natural or legal person having affixed or been responsible for the affixing of the said marking has verified that the product conforms to all the Community total harmonization provisions which apply to it and has been the subject of the appropriate conformity evaluation procedures.

...

Council Decision 93/465/EEC, Annex I B. a) + c)

We affix the CE mark to the equipment and to the documentation as soon as we have established that we have satisfied the requirements of the relevant directives.

All converters and control systems supplied by the Baumüller Nürnberg Electronic GmbH & Co. KG satisfy the requirements of 73/23/EEC (Low Voltage Directive).

Provide this Baumüller equipment is subjected to normal use in your machinery you can assume that the equipment satisfies the requirements of 73/23/EEC.

Compliance with 89/336/EEC (EMC Directive) depends on how the equipment is installed. Since you are performing installation yourself, it is you who are responsible for complying with 89/336/EEC.

We will provide you with support in the form of EMC information. You will find this information in the operating instructions of the b maXX 4400 basic unit. When you have complied with all the requirements we impose in this documentation, you can assume that the drive satisfies the requirements of the EMC Directive.

To enable you to market your machine within the EU, you must be in possession of the following:

- Conformity mark (CE mark)
- Declaration(s) of Conformity regarding the directive(s) relevant to the machine

C.3 Definition of the term Declaration of Conformity

A Declaration of Conformity as defined by this documentation is a declaration that the electrical equipment brought into circulation conforms to all the relevant fundamental safety and health requirements.

By issuing the Declaration of Conformity in this section the Baumüller Nürnberg Electronic GmbH & Co. KG declares that the equipment conforms to the relevant fundamental safety and health requirements resulting from the directives and standards which are listed in the Declaration of Conformity.

C.4 Definition of the term Declaration by Manufacturer

A Declaration by Manufacturer as defined by this documentation is a declaration that the machine/safety component brought into circulation conforms to all the relevant fundamental safety and health requirements.

By issuing the Declaration by Manufacturer in this section the Baumüller Nürnberg Electronic GmbH & Co. KG declares that the equipment conforms to the relevant fundamental safety and health requirements resulting from the directives and standards which are listed in the Declaration by Manufacturer.

The Baumüller equipment is integrated into a machine. For health and safety, of the users for example, it is important for the entire machine to conform to all the relevant fundamental safety and health requirements. For this reason the Baumüller Nürnberg Electronic GmbH & Co. KG draws attention in the Declaration by Manufacturer to the fact that it is prohibited to put the machine as a whole into operation before it has been declared that the machine conforms to the provisions of the Machinery Directive.

C.5 Declaration of Conformity

EU-Konformitätserklärung 2003**Declaration of Conformity 2003**

gemäß EU-Richtlinie 73/23/EG (Niederspannung) vom 19.02.1973

geändert durch: 93/68/EWG vom 22.07.1993

in accordance with EC directive 73/23/EG (low voltage) dated 19.02.1973

changed by: 93/68/EWG dated 22.07.1993

Analog-I/O Modul für b maXX 4400BM4 - F - AIO - 01

Analog-I/O Modul für b maXX 4400BM4 - F - AIO - 02

Analog-I/O Modul für b maXX 4400BM4 - F - AIO - 03

Das obige Gerät wurde entwickelt und konstruiert sowie anschließend gefertigt in Übereinstimmung mit o.g. EU-Richtlinie und u.g. Normen in alleiniger Verantwortung von:

the unit specified above was developed and constructed as well as manufactured in accordance with the above mentioned directive and the standards mentioned below under liability of:

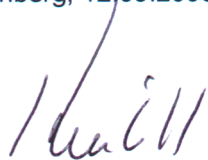
Baumüller Nürnberg Electronic GmbH & Co. KG, Ostendstr. 80 - 90, D-90482 Nürnberg

Berücksichtigte Normen - standards complied with:

Norm / standard

EN 50178	Ausrüstung von Starkstromanlagen mit elektrischen Betriebsmitteln Electronic equipment for use in power installations
EN 60204-1	Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen Safety of machinery - Electrical equipment of machines
EN 60529	Schutzarten durch Gehäuse (IP Code) Degrees of protection provided by enclosures (IP Code)
HD 625.1 51	Isolationskoordination für elektrische Betriebsmittel in Niederspannungsanlagen Insulation coordination for equipment within low-voltage systems

Nürnberg, 12.09.2003



Dr. Peter Kreisfeld
Geschäftsführer
Head Division



Dr. Heidrich
Entwicklungsleiter
Head of development

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C.6 Declaration by Manufacturer

EU-Herstellererklärung 2003**Declaration by Manufacturer 2003**

gemäß EU-Richtlinie 98/37/EG (Maschinen) vom 22.06.1998

geändert durch: 98/79/EG vom 27.10.1998

in accordance with EC directive 98/37/EG (machinery) dated 22.06.1998

changed by: 98/79/EC dated 27.10.1998

Analog-I/O Modul für b maXX 4400BM4 - F - AIO - 01

Analog-I/O Modul für b maXX 4400BM4 - F - AIO - 02

Analog-I/O Modul für b maXX 4400BM4 - F - AIO - 03

Die Inbetriebnahme der Maschine, in die dieses Gerät eingebaut wird, ist untersagt bis die Konformität der Maschine mit der genannten Richtlinie erklärt ist.

The machinery into which this unit is to be incorporated must not be put into service until the machinery has been declared in conformity with the provisions of the directive mentioned.

Bei der Entwicklung und Konstruktion des Gerätes wurden folgende Normen beachtet:

The development and construction of the unit is complied with following standards:

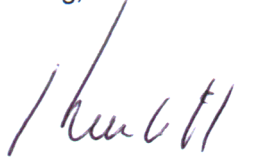
Norm / standard

EN 60204-1

Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen
Safety of machinery - Electrical equipment of machines

Baumüller Nürnberg Electronic GmbH & Co. KG, Ostendstr. 80 - 90, D- 90482 Nürnberg

Nürnberg, 12.09.2003



Dr. Peter Kreisfeld
Geschäftsführer
Head Division



Dr. Heidrich
Entwicklungsleiter
Head of development

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APPENDIX D - TECHNICAL DATA

The technical data of the analog-I/O-module **BM4-F-AIO-XX** of Baumüller Nürnberg Electronic GmbH & Co. KG is given in this appendix.

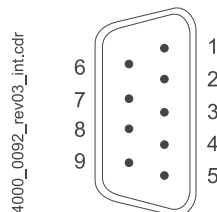
D.1 Analog-I/O-module BM4-F-AIO-XX

The Plug-in-Module has the following Specifications:

	BM4-F-AIO-01	BM4-F-AIO-02	BM4-F-AIO-03
Number of inputs	2	←	←
Number of I/O-input Links	2	←	←
Resolution	10 bit / 12 bit	16 bit	12 bit
Design	Difference input	←	←
Input resistance	about. 50 kΩ	←	←
Max. Input current	200 µA	←	←
Scanning rate, inputs one input used	125 µs	←	←
Scanning rate, inputs both inputs used	250 µs	←	←
Analog input voltage	- 10 V to + 10 V	←	←
Number of outputs	2 ¹⁾	←	←
Number of I/O-output Links	2	←	←
Max. output current	1 mA	←	←
Resolution	8 bit	16 bit	12 bit
Update-rate fast outputs	125 µs	←	←
Update-rate slow outputs	8 ms	←	←
Resistance to short circuiting, output	conditionally resistant to short circuit (max. 10s)	←	←
Analog output voltage	- 10 V to + 10 V	←	←
Ambient conditions	same as those for the basic unit b maXX 4400	←	←
Storage conditions	same as those for the basic unit b maXX 4400	←	←

¹⁾ The analog output points can be switched over from „fast output“ to „slow output“ and vice versa by means of the operation software.

Pin assignment X1



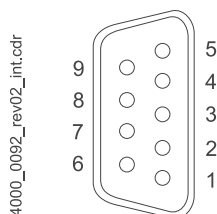
9-pole Sub-D plug

Pin No.	Occupation
1	IN 1 +
2	IN 2 +
3	OUT 1 - , OUT 2 -
4	OUT 1 +
5	OUT 2 +
6	IN 1 -
7	IN 2 -
8	OUT 1 - , OUT 2 -
9	OUT 1 - , OUT 2 -

See the parameter manual pertaining to the basic unit for any additional information, parameter tables and data required for setting and operation of the analog-I/O-module.

D.2 Connecting cable

Containing of the following components (plug connector + cable):



9-pole Sub-D bush ,
Metal design or
metallised

Pin No.	Occupation
1	shielded copper cable, min. 0.25 mm ² , shielding on both the sides
2	
3	
4	
5	
6	
7	
8	
9	

D.3 Internal circuit of the analog-I/O-module BM4-F-AIO-01/-02/-03

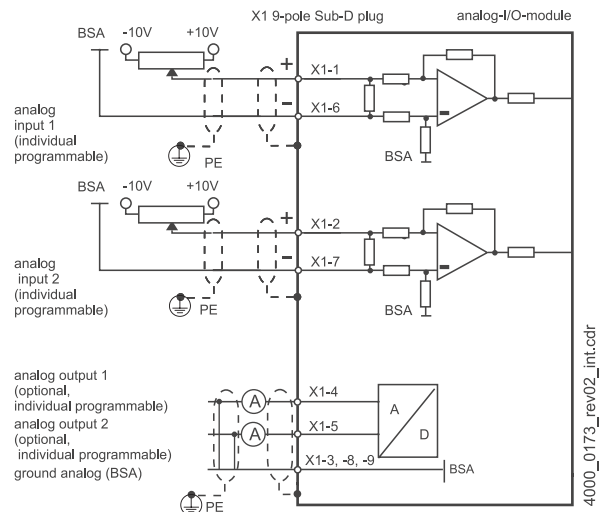


Figure 12: Internal circuit of the Analog-I/O-Module BM4-F-AIO-01/-02/-03



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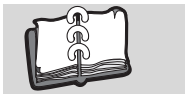


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Baumüller Nürnberg Electronic GmbH & Co. KG Ostendstraße 80-90 90482 Nürnberg T: +49(0)911-5432-0 F: +49(0)911-5432-130 www.baumueller.de

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