# Parameter manual

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be in motion be in motion

BAUMÜLLER

## b maXX® BM4100

### Active mains inverter

**Parameter manual**

**Software Version 03.09**

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**Read the Operating Manual before starting any work!**

Preliminary information

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# 1

# INTRODUCTION

In this manual information is to be found referring to the parameters for the devices b maXX® 4100, for

**WinBASS II from version 1.09**
**ProDrive**
**Controller- firmware from version 03.03 to 03.09**

With the parameters you will affect the behavior of the controller.

The controller affects the behavior of the power unit and of the motor which is connected to it.

A survey of the control structures is to be found in ▹Control Structures◃ from page 9.

After an adaptation of the parameter values has been done to your application, you must store these. References to this are to be found in ▹Data Set Management◃ from page 13.

A procedure for the commissioning is to be found in ▹Commissioning◃ from page 29.

Operating principle of the single software modules and its parameters are described in chapter ▹Description of the software modules◃ from page 43.

A comprehensive description of the parameters sorted by parameter numbers you will find in chapter ▹Parameters◃ from page 85.

A brief survey of all the parameters is shown in ▹List of Parameters◃ from page 197.

## 1.1 Copyright and trade mark

## 1.1 Copyright and trade mark

# 2

# FUNDAMENTAL SAFETY INSTRUCTIONS

In this chapter we describe the possible dangers which may occur when you parameterize a Baumüller **b maXX® BM4100** controller part and we explain the meaning of the information sign.

## 2.1 Safety notes and instructions

**WARNING!**

**Risk of injury from mechanical and electrical cause**!

The modification of parameters affects the action of the Baumüller unit and consequently the action of the installation and its components. If you change the adjustments of the parameters, you may cause dangerous actions to the construction and/or of its components.

Therefore:

- After each modification of the parameter settings, execute a commissioning with consideration to all safety instructions and safety regulations.

## 2.2 Information signs

**NOTE!**

....highlights useful tips and recommendations, as well as information for efficient and problem-free use.

## 2.2 Information signs

# 3

# CONTROL STRUCTURES

In this chapter we describe the structure of the **b maXX® BM4100** controller. The model of the control system we describe by using graphics.

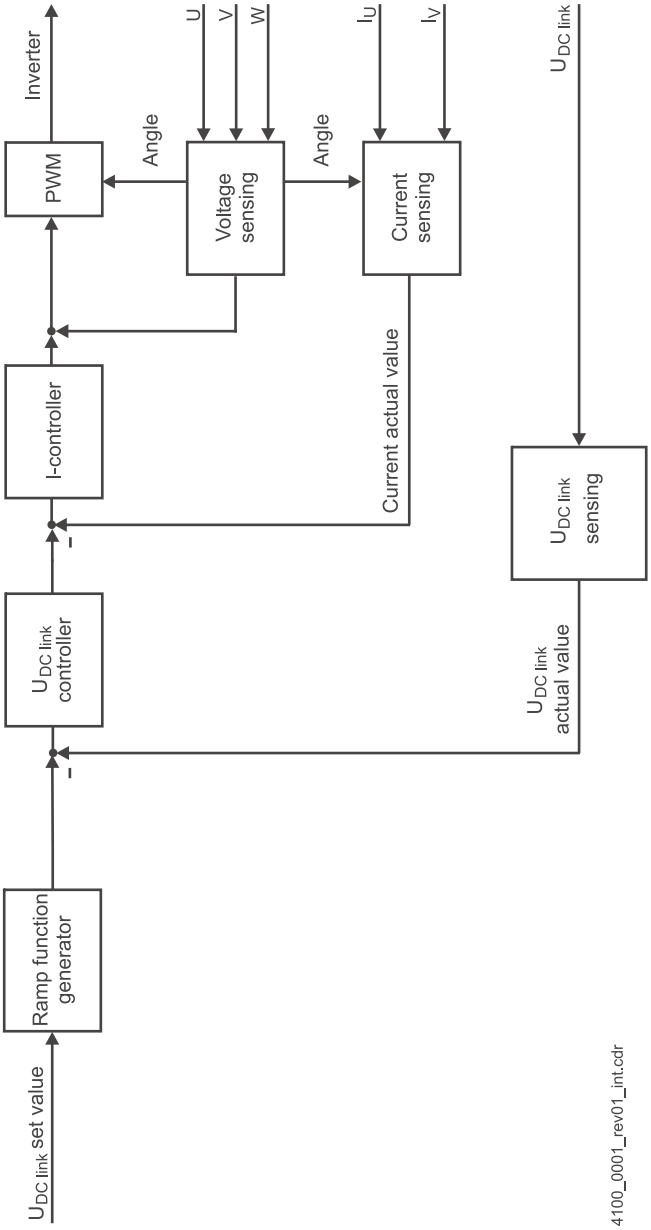



Figure 1: Overview

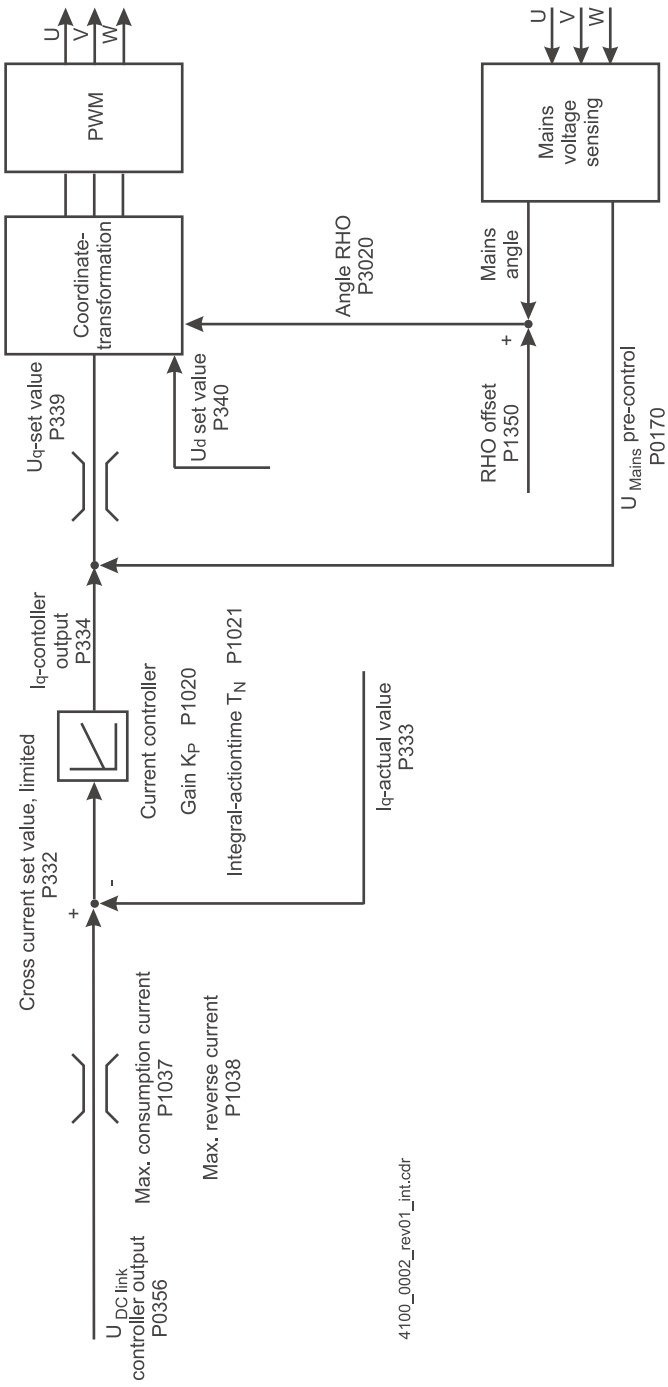



Figure 2: Current controller

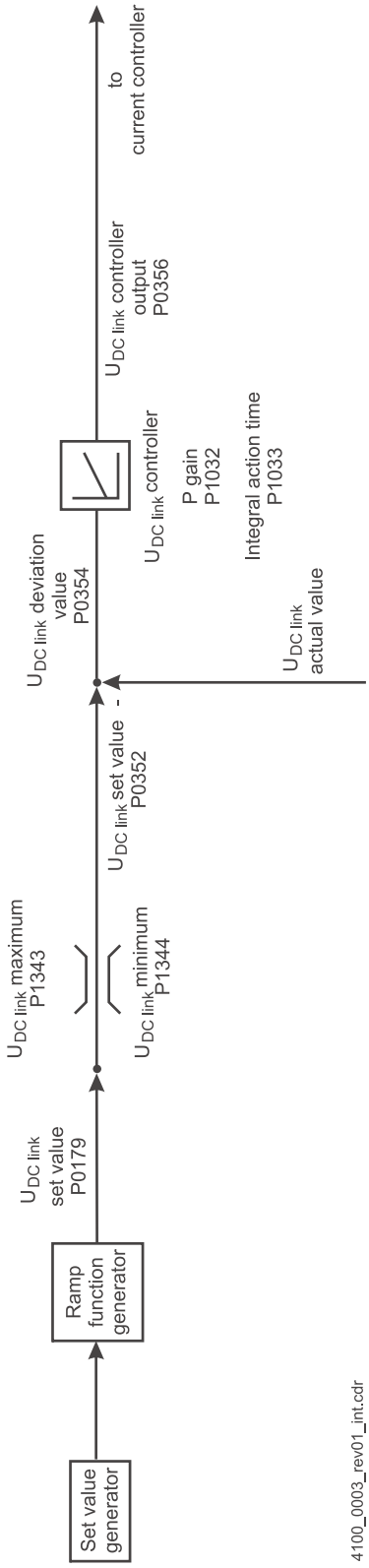



Figure 3: $U_{DC\ link}$ controller

# 4

# DATA SET MANAGEMENT

In this chapter we describe the controller's data set management. You will be informed about how to create and change data sets without using WinBASS II. Furthermore the operating principle of the **PSI** (**p**arameter **s**torage **i**nterface) is described.

All parameters related to the software module data set management, you will find under ▹Data set management◃ on page 78.

## 4.1 General information

Parameters, which can be stored in the EEPROM of the controller, are stored either in 'central data' or in max. 4 switchable data sets.

Central data (CD) are those parameters, which are valid for the entire system and must not be switched over application-specific in the online mode (e. g. encoder-, motor-, system settings), while data set parameters can be switched over in the online mode (operation enabled) (e. g. recipe change a. s. o.).

On the front side of the controller is a connector (X2) for an external data storage, the **PSI** (**P**arameter **S**torage **I**nterface).

**NOTE!**

The PSI must only be plugged or unplugged if the controller is in a no-voltage condition!

Due to the activation of the function 'PSI load automatically' ▹P0326◃, after switching on the data sets are loaded from the PSI instead of the internal EEPROM of the controller. By a further setting 'store PSI automatically' ▹P0326◃ the data which was loaded from the PSI are automatically stored into the EEPROM of the controller. The settings in parameter ▹P0326◃ must be stored on the PSI, as they are read out from the PSI after switch-on. With the help of the PSI several machines are able to be parameterized without WinBASS II/ProDrive via this mechanism.

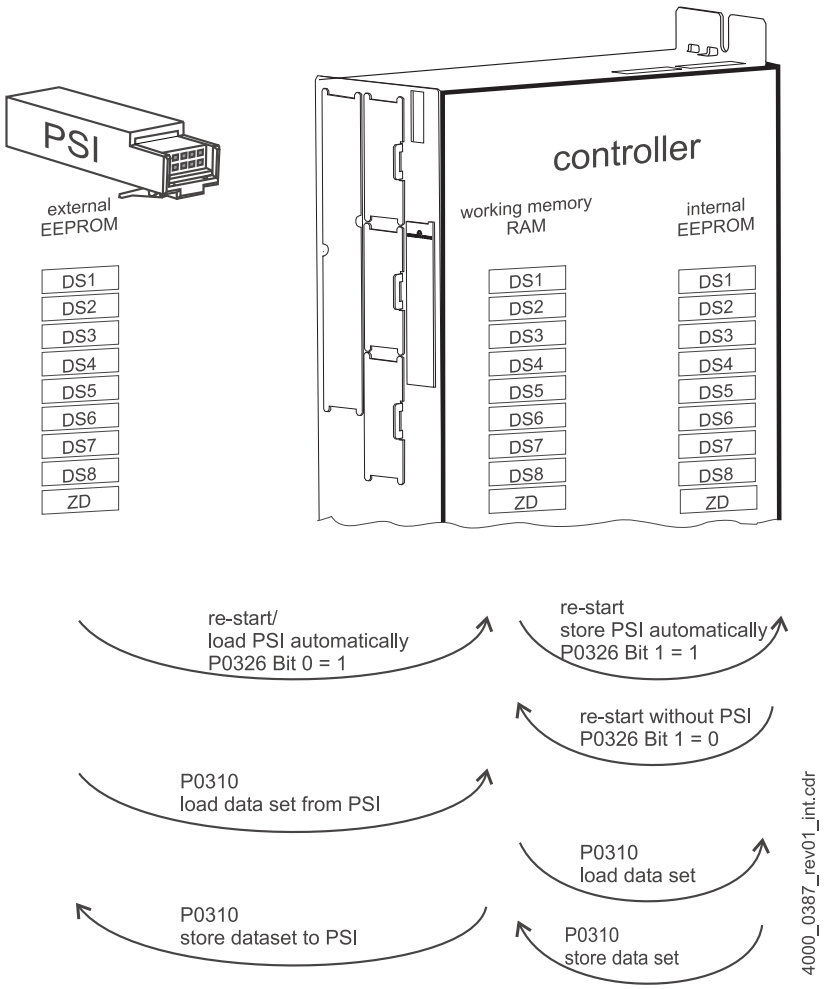



Figure 4: Data set management controller - PSI

## 4.2 Command interface

The data set management can be accessed via WinBASS II/ProDrive or via the field bus.

The following actions are permitted:

- Creating and deleting of data sets
- Initialization of data sets
- Switching between (valid) data sets
- Selection of the boot data record
- Copying of data sets
- Saving data sets to controller-internal EEPROM or PSI
- Loading data sets from controller-internal EEPROM or PSI

A command is activated either by WinBASS II/ProDrive or by writing a command code into parameter ▷P0310◁ data set management command. Additional auxiliary parameters complete the command interface.

When operating the system by use of WinBASS II/ProDrive, no data set command codes or data set auxiliary parameters must be observed, as the user interface does this automatically.

The parameter ▷P0311◁ Data set management status shows the immediate operational state of the command interface and also under certain circumstances an error message of the last command.

The write counter ▷P0317◁ EEPROM Write Count shows the number of EEPROM write cycles. Each command, which comprises an EEPROM memory access, forces the controller to increment this counter.

The write counter ▷P0318◁ PSI Write Count shows the number of EEPROM write cycles on the PSI. Each command, which comprises an EEPROM memory access, forces the controller to increment this counter.

## 4.3 Parameter organization within the data sets

Within the controller there are eight separate memory partitions for parameters marked by the ’data set’ attribute (DS1 to DS8).

The numbers of these parameters start from P1000. The parameter with the number P1000 also exists in data set 1, in data set 2, in data set 3... and in data set 8.

Additionally there is a ’window’, which represents the currently active data set (DS 0). One of these eight data sets are always switched active. By writing to the parameter ▹P0312◃ Active data set number, data set 1, 2, 3, 4, 5, 6, 7 or 8 can be connected active; that means that you are able to switch between the data sets. Doing so, the window is shifted from DS 0 to the memory area of the activated data set.

Example:
Data set 3 is activated.
The “window“ of the active data set addresses data set 3.

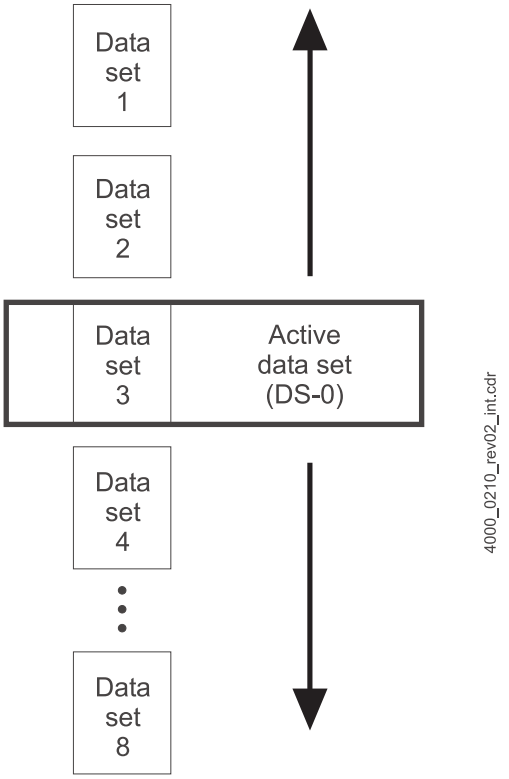



Figure 5: Active data set

Basically, by use of external option modules or field buses you can only access the data of the **active data set** (DS 0).

## 4.4 State of delivery

In the appliance's state of delivery only data set No. 1 is valid. The other data sets DS2 to DS8 are deleted. Boot data set and active data set (DS 0) are data set 1. All parameters have their standard values. Switching over to another data set is not possible.

After parameterization of the controller and homing or notch position search the parameters should be stored in the controller-internal EEPROM. If an error occurs, when storing into the EEPROM (e. g. by switching off the controller during a programming procedure), the controller writes the standard values (factory setting) into the parameters after restarting.

## 4.5 Start-up action

- Without PSI
  after b maXX® restart all parameters of the central data as well as all parameters of the created data sets are loaded from the controller-internal EEPROM into the user memory. The controller activates the data set, which is stored in parameter ▹P0327◃ Boot data set within the EEPROM. Invalid data sets are ignored.

- PSI are plugged and programmed
  If in the PSI the function 'load PSI automatically' ▹P0326◃ bit 0 = 1 is set, the data sets are loaded from the PSI instead from the controller-internal EEPROM into the RAM after switching on.
  Due to further setting 'store PSI automatically' ▹P0326◃ bit 1 = 1, the data which was loaded from the PSI are automatically stored into the controller-internal EEPROM and the previous parameterization is reset.
  For the control of the switch-on behavior the mode bits of parameter ▹P0326◃ as they are stored in the PSI and not the bits of this parameter, which were set in the controller, because the parameter▹P0326◃ is read out of the PSI immediately after switching on.

**NOTE!**

The settings for the load behavior after switch-on of „load PSI automatically“ and „store PSI automatically“ (mode bits of parameter ▹P0326◃) are stored in the PSI module. If these settings are changed, thereupon the PSI must be reprogrammed, in order to store these settings in the PSI module.

## 4.6 How to change, load, copy and store parameters

Changes of parameter values (e.g. by WinBASS II or via a field bus) only affect the user memory of the controller. If changes shall be kept also after the next restarting of the controller, the parameter must be explicitly stored in the EEPROM or the PSI. It is not possible to store a single parameter, but only a complete data set. If a single data set or all data sets are stored, the central data is also stored automatically.

By use of data set commands also parameter values of valid data sets can be loaded as single data sets or complete data sets from the EEPROM or PSI into the operating memory. If you load the complete set, an automatic data set switch-over can be performed, if the parameter value of ▹P0312◃ Active data set in the EEPROM or PSI differs from the current value in the RAM.

The copy function of data sets allows you to copy parameter values of a valid record set source into another record set target . If the record set target is not already created, the controller creates it automatically. If the record set target is valid, the source parameter values are overwritten.

By using the WinBASS II function 'Up-/Download' of the 'Data set management' menu you can store parameters also on PC data cartridges. You can also re-write data back to the controller.

## 4.7 How to mark data sets

b maXX® has two parameters for marking data sets:

| parameters | Data type | Meaning |
|---|---|---|
| ▹P1010◃<br>Data set ID | UINT | Here you can mark each data set (DS 1 to DS 8) with an unique number from 0 to 65535 |
| ▹P1010◃<br>Data set name | STRING | Free choice of name for data set |

## 4.8 Functions of the data set manager

**Data set management Commands**

The data set management has the following functions (adjustable in ▹P0310◃ Data set manager command):

- Reset data set command
- Write all data into EEPROM
- Read EEPROM completely
- Reset EEPROM completely
- Make settings of standard values (from ROM) for active data set
- Make settings of standard values (from ROM) for entire data sets which have been created
- Generate data set <n>
- Reset data set <n>
- Copy data set <x> to data set <y> (from RAM into RAM)
- Load data set <x> from EEPROM into RAM data set <x>
- Store data set <x> from EEPROM into RAM data set <x>
  You can only store data sets which have been defined before using the 'create data set <n>' command.
- Write all parameters of the valid data sets into the PSI
- Read PSI completely
- Reset PSI completely

**Boot data set**

The boot data set is defined over ▹P0327◃.

**Status of data set management**

In order to display the result, the status parameter ▹P0311◃ Data record management status:

- Writing error (false value, parameter write-protected, invalid parameter number)
- Reading error
- Command processing active
- Error code

Some commands used for data set management require additional parameters, which we have listed below:

**NOTE!**

In the parameter ▹P1101◃ communication source the BACI command interface must always be enabled. This way service data can be parameterized by use of option modules (such as CANopen, sercos, a. s. o.).

- ▹P0314◃ **Source data set**
  According to ▹P0310◃ data set command refers to source data set to the EEPROM or PSI (e. g. at reading of data set) or to the RAM (e. g. at data set write into EEPROM/ PSI).
- ▹P0315◃ – **Data Set Target**
  According to ▹P0310◃ the data set command the data set target refers to a data set in the EEPROM/PSI or in the RAM.
- ▹P0312◃ – **Active Data set**
  The number of the active data set is displayed here. Writing on this parameters in on-line-mode (operation enabled) causes an immediate data set switching.
- ▹P0316◃ – **Error Parameter**
  Displays number of the parameter, which has caused an error during memory access (read/write). If an error occurs during command processing, the command will not interrupt transferring, but will continue transferring with the next parameter.
  When multiple errors occur, only the last error will be displayed.
- ▹P0317◃ – **EEPROM Write Count**
  Number of EEPROM write cycles. Each command, which comprises EEPROM memory access, forces the controller to increment this counter.
- ▹P0318◃ – **PSI Write Count**
  Number of EEPROM write cycles to the PSI. Each command, which comprises PSI memory access, forces this counter to be incremented.
- ▹P1010◃ – **Record data set ID**
  Unique ID-number of data set stored in EEPROM.
- ▹P1011◃ – **Record name**
  Name of active data set (string) can be freely chosen by the user.

### 4.8.1 Data set commands and possible error messages

- **Reset data set command**

This command leads to a complete reset of all error bits or to the error status word of the data set manager.

- Possible error messages:
  None

- **Create data set**

In the state of delivery each controller comes with only one active data set (data set 1). The user therefore cannot switch to other data sets. Only after the user has created another data set (2 to 8) using this command, the controller enables to switch to that data set. This message contributes to ensure, that the user cannot switch by mistake to a still unchanged data set. The user that way is forced to willingly enable a data set for switching.

This data set command creates a data set, which is selected by ▷P0315◁ record set target. The parameter values of this data set are set to default values and are stored in the EEPROM.

This command causes incrementation of the write count ▷P0317◁ EEPROM Write Count.

Possible error messages:

- Data set already exists
- Wrong data set number (other than 1 to 8)

- **Reset data set <n>**

This data set command deactivates a data set. The data set stated in ▷P0315◁ record set target may not be the current active data set. When a data set becomes deactivated, the controller can no longer switch to that data set. Absolutely no values - neither in the EEPROM, nor in the RAM of the controller are modified. Only the flag, which data sets are created, will be actualized in the EEPROM.

This command causes incrementation of the write count ▷P0317◁ EEPROM Write Count.

Possible error messages:

- Data set not yet activated
- Wrong data set number (other than 1 to 8)

- **Copy data set <x> to data set <y> (from RAM into RAM)**

This data set command copies parameters from data set x (▹P0314◃ record set source) to parameters of data set y (▹P0318◃ record set target). The copy procedure takes a few milliseconds - therefore this command is valid in offline-mode (drive stopped) only.

Only state record set sources which are already created. If you prompt a record set target, it will be created automatically. That command will cause the copied data (record set target ) to be copied into the EEPROM.

This command causes incrementation of the write count ▹P0317◃ EEPROM Write Count.

Central data is also stored to EEPROM.

Possible error messages:

- Data set not yet activated
- False data set source number
- Wrong data set target number
- Drive not stopped

- **Load data set <x> from EEPROM**

This data set command loads all parameters of data set x (▹P0314◃ record set source) from the EEPROM into the controller's operating memory. The target data corresponds to the source data set. The data set must be valid. In online-mode (operation enabled) the data set must not be the actual active data set. During copying procedures switching of data sets is invalid.

Possible error messages:

- Data set not yet activated
- False data set source number
- Drive not stopped
- Value less than the minimum value
- Value greater than the maximum value
- Read-only parameter
- Parameter cannot be modified because of operating status
- Incorrect parameter value
- Checksum error during test

- **Store data set <x> into EEPROM**

This data set command stores all parameters of data set x (▷P0314◁ record set source) from RAM into EEPROM. The data set must be valid. In online-mode (operation enabled) the data set can also be the actual active data set. During copying procedures into EEPROM data set switching is valid.

This command causes incrementation of the write count ▷P0317◁ EEPROM Write Count.

Central data is also stored to EEPROM.

If the EEPROM is reset, the controller stores the data sets, which were created into the EEPROM.

Possible error messages:

- Data set not yet activated
- False data set source number
- No or invalid EEPROM header
- Invalid section in EEPROM
- Invalid data in EEPROM
- EEPROM write error
- EEPROM too small
- unidentified error

- **Read EEPROM completely**

This data set command reads all parameters from EEPROM into controller RAM. Only valid controller data sets are read. The numerically assignment of the data sets in EEPROM and RAM are kept.

During copying procedures switching of data sets is invalid.

Possible error messages:

- Drive not stopped
- Value less than the minimum value
- Value greater than the maximum value
- Read-only parameter
- Parameter cannot be modified because of operating status
- Incorrect parameter value
- Checksum error during test

- **Write all parameters of the valid data sets into EEPROM**

This data set command stores all parameters of the valid data sets from RAM into EEPROM. In online-mode (operation enabled) one of the data sets can also be the actual active data set. During copying procedure into EEPROM data set switching is valid.

This command causes incrementation of the write count ▹P0317◃ EEPROM Write Count.

Possible error messages:

- No or invalid EEPROM header
- Invalid section in EEPROM
- Invalid data in EEPROM
- EEPROM write error
- EEPROM too small
- Unidentified error

- **Reset EEPROM completely**

This data set command resets the header entry in EEPROM only. Thus all data within EEPROM expire their validity.

This command causes incrementation of the write count ▹P0317◃ EEPROM Write Count.

Possible error messages:

- EEPROM write error
- Unidentified error

- **Set standard values for active data/generated record data**

This data set command writes the default values (factory-set) from the ROM into the parameters of the active data set/generated record data. Possible in offline-mode (with drive stopped) only.

Possible error messages:

- Drive not stopped

- **Write all parameters of the valid data sets into the PSI**

This data set command stores all parameters of the valid data sets from RAM into PSI. In online-mode (operation enabled) one of the data sets can also be the actual active data set. During copying procedure into PSI a data set switching is valid.

This command causes incrementation of the write count ▹P0318◃ PSI Write Count.

Possible error messages:

- PSI not plugged
- Unidentified error

- **Read PSI completely**

This data set command reads all parameters from PSSI into the controller RAM. The numerically assignment of the data sets in PSI and RAM remain.

During copying procedures switching of data sets is invalid.

After reading the PSI the controller takes over the data set configuring from the PSI into the working storage (RAM). Due to this, the controller resets the data sets, which were created in the controller, but were not stored in the PSI. Accordantly the controller creates new data sets in the RAM, which were read from the PSI and which were not created in the controller yet. In order to receive this new configuration after the next switch-off, the data set command „Write all parameters of the valid data sets into EEPROM“ must be executed.

Possible error messages:

- PSI not plugged
- PSI reset
- Drive not stopped
- Value less than the minimum value
- Value greater than the maximum value
- Read-only parameter
- Parameter cannot be modified because of operating status
- Incorrect parameter value
- Checksum error during test

- **Reset PSI completely**

This record set command resets PSI. Thus all data within EEPROM expire their validity.

This command causes incrementation of the write count ▹P0318◃ PSI Write Count.

Possible error messages:

- PSI not plugged
- Writing error on PSI

### 4.8.2 Switching to data set 1 to 8

Data sets can be switched in online-mode (operation enabled), that means during active controlling.

Because of the mechanical inertia of the system to be controlled and the high controller sample rate you can assume a mechanical bumpless transfer.

**NOTE!**

When switching data sets you cannot regard inconsistent setpoints and monitoring values. At switch-over it is not to be excluded, that, e. g. a monitoring value of the new data set is smaller than the associated current actual value of the data set being active before that. In this case a monitoring function may respond, which, for example initiates an pulse inhibit.

The activation doesn't take place via data set command but only by writing of the according value in ▹P0312◃ Active data set number. In this parameter the user can read the number of the actual selected data set.

During input the following conditions are checked before data switching in online-mode (operation enabled):

**1** Is the value $\leq 8$ and $\geq 1$?

**2** Is the value valid, that means does the specified data set already exist?

Only if the above mentioned conditions have been fulfilled, the data set switching in the online mode (operation enabled) can be performed.

Possible error messages:

- Data set not yet activated
- False data set number
- At the moment a data transfer from EEPROM or PSI to RAM or vice versa is active. Data set switching invalid.
- Drive is not stopped (this error is only displayed in certain cases e. g. at encoder switching).

### 4.8.3 Overview of data set management commands

| ▹P0310◃ Data set management Command | Value | ▹P0314◃ Source data set | ▹P0315◃ Target data set | ▹P0317◃ EEPROM write count | ▹P0318◃ Number of write counts on PSI | Central data |
|---|---|---|---|---|---|---|
| Reset data set command | 0 | | | | | |
| Write all parameters of the valid data sets into EEPROM | 1 | | | Counter is incremented | | Yes |
| Read EEPROM completely | 2 | | | | | |
| Reset EEPROM completely | 3 | | | Counter is incremented | | Yes |
| Set standard values for active data set | 4 | | | | | |
| Set standard values for all generated data sets | 5 | | | | | Yes |
| Generate data set <n> | 6 | | Data set to be created | Counter is incremented | | |
| Reset data set <n> | 7 | | Data set to be reset | Counter is incremented | | |
| Copy data set <x> to data set <y> | 8 | Source data set | Target data set | Counter is incremented | | Yes |
| Load data set <x> from EEPROM | 9 | Data set in EEPROM | | | | |
| Store data set <x> into EEPROM | 10 | Data set in RAM = EEPROM | | Counter is incremented | | Yes |
| Write all parameters of the valid data sets into the PSI | 12 | | | | Counter is incremented | Yes |
| Read PSI completely | 13 | | | | | |
| Reset PSI completely | 14 | | | | Counter is incremented | Yes |

# 5

# COMMISSIONING

In this chapter we describe an exemplary commissioning of a b maXX mains inverter. Carry out the commissioning, to make sure that the delivered devices are in an accordingly condition. This commissioning is **not** for the complete installation of the device for your application.

## 5.1 Safety instructions

Please refer to the relevant information in chapter ▹Fundamental Safety Instructions◃ from page 7.

**DANGER!**

**Risk of injury from electricity**!

The control cabinet is equipped with power cables which carry dangerous voltages.

Therefore:

- Put all relevant cables off-circuit and protect them against accidental reactivation.
- Refer to the relevant safety rules when commissioning power electronics.

## 5.2 Requirements to the executing personnel

The personnel, who is assigned for commissioning, must have enough knowledge about:

- Safety technology
- PC-operation (windows), especially in the program WinBASS II / ProDrive
- Connection and operating method of the device b maXX® 4100.

## 5.3 Preconditions

The commissioning is an exemplary checking of the functionality of the device. When commissioning, make sure that the device is ready for operation.

## 5.4 Preparations

Precondition for the commissioning is that mounting and installation are correctly executed.

**1** Assure, that mounting is correctly executed and especially that all safety instruction were referred to (see mounting in manual of b maXX® 4100).

**NOTE!**

Figures referring to the next working steps are to be found in the manual of the basic unit b maXX 4100.

**2** Assure, that the installation is correctly executed, and that especially all safety instructions were referred to (see installation in the manual of the basic unit b maXX 4100).

**3** WinBASS II/ProDrive must be installed onto the PC/laptop.

**NOTE!**

The controller firmware versions which are supported by WinBASS II/ProDrive are to be found in the WinBASS II/ProDrive online help in the menu „user indications/supported b maXX® devices“, or on the WinBASS II/ProDrive CD in the readme file under „user indications/b maXX® devices“.

**4** Assure, that you have all necessary data.

**5** Make sure, that switching elements for pulse enable and reset error memory are connected to b maXX 4100 (e. g. in a switchboard) and function correctly. Assure, that the switches are in inoperative position (inactive).

**6** Assure, that all safety devices are connected line-side and are ready-to-operate.

**7** Assure, that a function module BM4F-UME-01 is plugged into slot A and connect it (see installation in the manual of the basic unit b maXX 4100).

**8** Assure, that a function module BM4F-SRM-01 or SRM-02 is plugged into slot B and is connected (see installation in the manual of the basic unit b maXX 4100).

**9** Assure, that a function module BM4-F-SEA-01 or SEA-02 is plugged into slot C and is connected (see installation in the manual of the basic unit b maXX 4100).

**10** Assure, that a function module BM4F-DIO-01 or BM4F-DIO-01 is plugged into slot D and is connected (see installation in the manual of the basic unit b maXX® 4100).

**11** Assure, that PC/laptop is connected with a serial cable (RS232/9-pin sub-d connector) to the plug connection X1 of the controller - start WinBass II.

**12** After starting the WinBASS II/ProDrive program window appears.

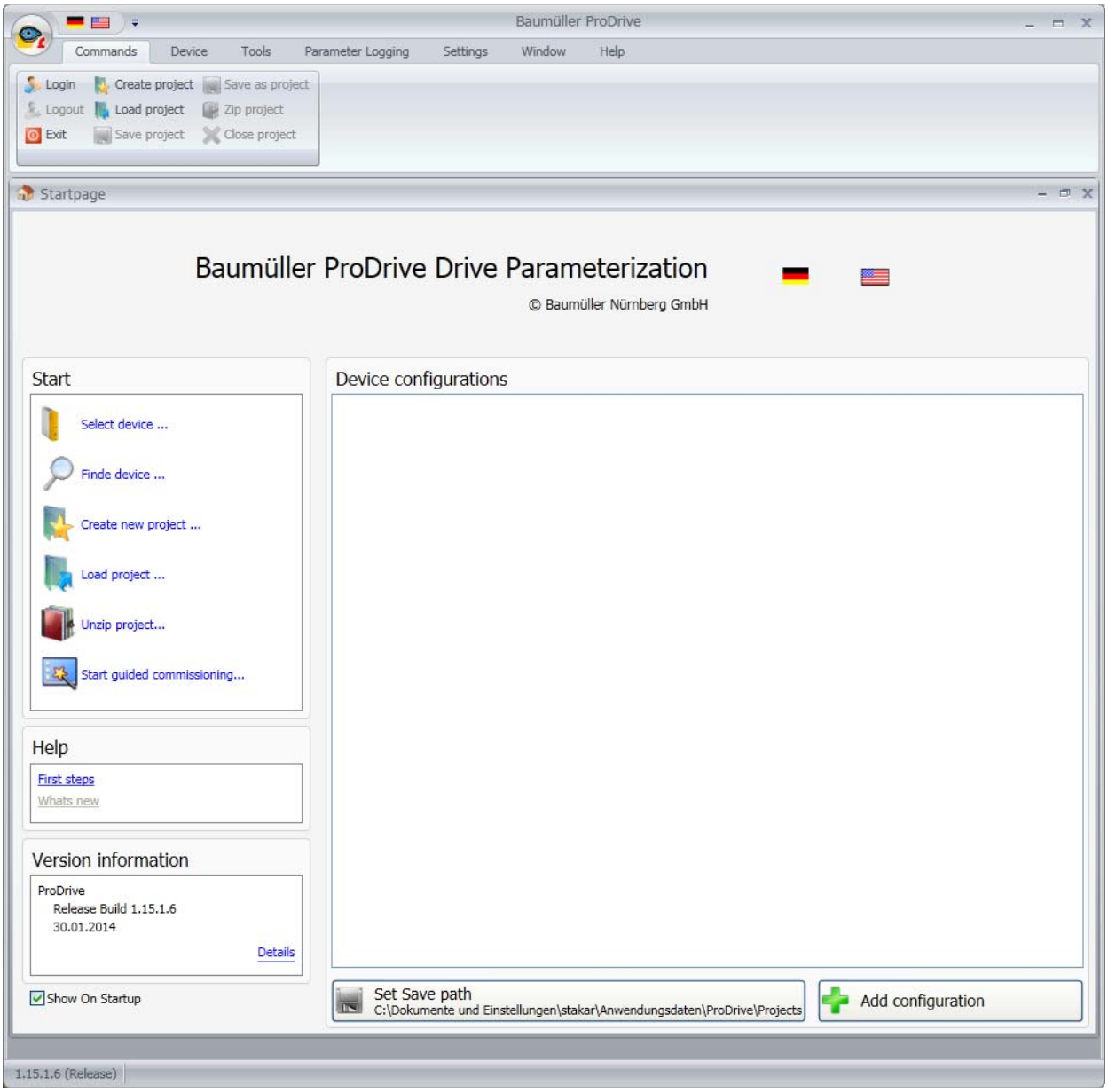



Figure 6: Start screen PorDrive

Select „Select device...“ on the start page. The window „Select device“ is opened (see ▹Figure 7◃ on page 32). Usually you can proceed as follows.

**13** Select the serial interface where the PC is connected with the b maXX® 4100 device.

**14** Then select the type of device.
Select „b maXX® 4100 FW03“ for controller firmware version 03.xx. Thereby it doesn't matter, if there is a PLC in the device or not (the firmware version is to be recognized at the device from the type key on the type plate after the third hyphen
e. g. BM4XXX-XXX-XXXXX-**XX**).

**15** Then press „test connection“. If an online connection with the b maXX® device is generated, then an according session is suggested, which only has to be confirmed.

**16** With a click on „continue“ the graphically user interface is started.

**NOTE!**

In case there is a PLC in the b maXX® device a communication with WinBASS II/ProDrive to the controller only can be established, if a project is existing in the PLC!


Figure 7: ProDrive - start

Further notes and explanations are to be found in the online help of the program. This online help is initiated with the following starting window with „help“.

**17** Wait until the following display mask appears and find the „Navigation“ on the right site.

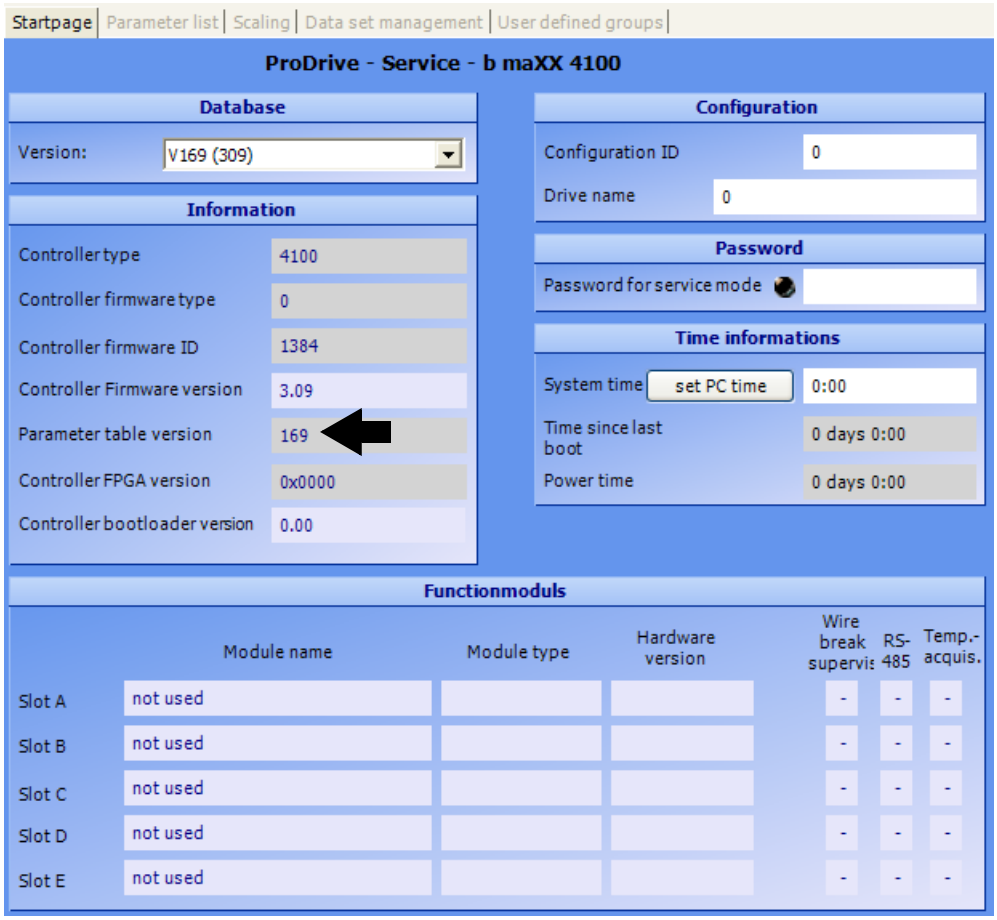



Figure 8: ProDrive - startpage b maXX 4100

**18** Click in the project tree/navigation on „power unit“.

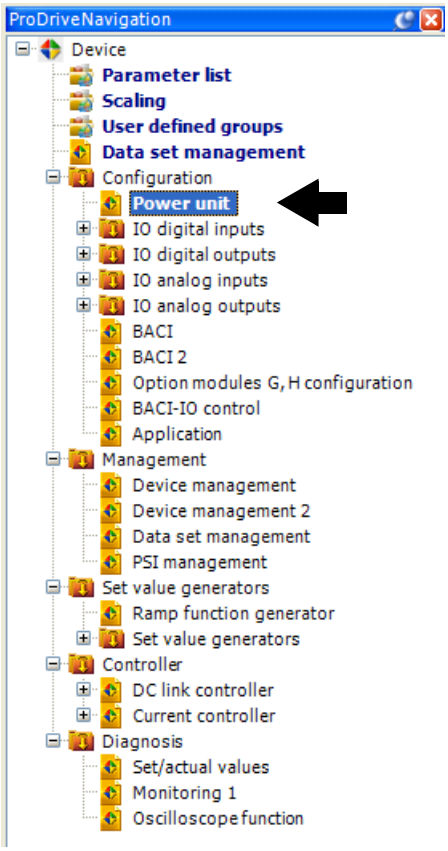



Figure 9: ProDrive: Navigation

**NOTE!**

If the window „power unit“, down right, shows „wrong version“ you have a software version, which is not compatible with the controller. You have to close WinBASS II/ ProDrive and start it anew. In the starting window you must then select „test connection“ or you must select the suitable WinBASS II/ProDrive session. In case there is no session for the present controller firmware version you need an update for the WinBASS II/ProDrive program.

## 5.5 Survey

The following survey shows commissioning schematically. The individual steps of the commissioning you will find described in detail in ▹Executing commissioning◃ from page 36.

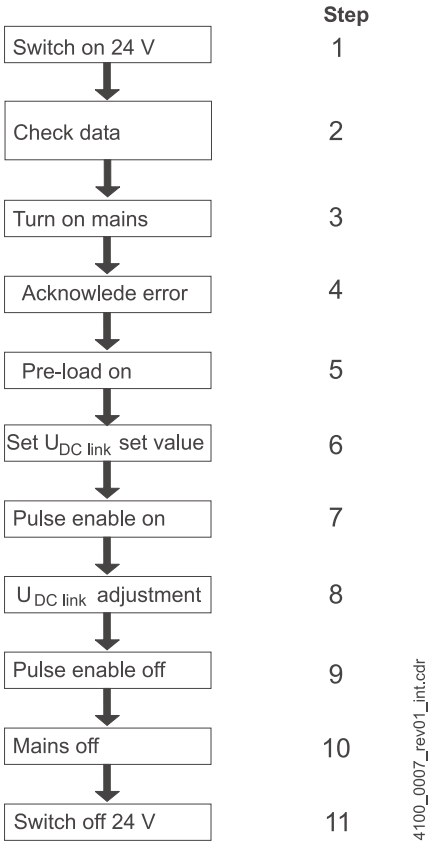



Figure 10: Starting sequence

## 5.6 Executing commissioning

Start with the commissioning, after you have completed the preparations.

**1** Effectuate the power supply to the bmaXX®
(supply voltage + control voltage).
Hereupon the device starts up and shows its operational readiness by flashing of the orange-colored LED H-2 (Power ON).

- LED H-2 must light up orange, this means Power ON, the device is ready-to-operate.
- LED H-2 may **not** light up green: The green lit LED H-2 means „operation enabled“! DC-link voltage is controlled! Immediately cancel this with the switch element pulse enable or quickstop enable!
- LED H-3; the red luminous LED means current limit reached. Reduce the load. Continue the parameterization.
- LED H-4; red lit LED means a state of error. Remove the error and with the help of the operating program WinBASS II or with the error reset switch connect the X3-4. Continue the parameterization.

**2** **Now** plug on the (RS232-)cable connector from the PC/laptop to the controller at the bmaXX®.
The communication runs through the connection cable between the processor and the bmaXX®.

**3** Start WinBASS II/ProDrive (as far as it isn't running yet).

**NOTE!**

In case you receive an error message referring to a plug-in module, then please first check if the plug-in module is accurately cabled and if necessary, is supplied with voltage.

**Warnings/reset errors**

**4** Then click on „device management“

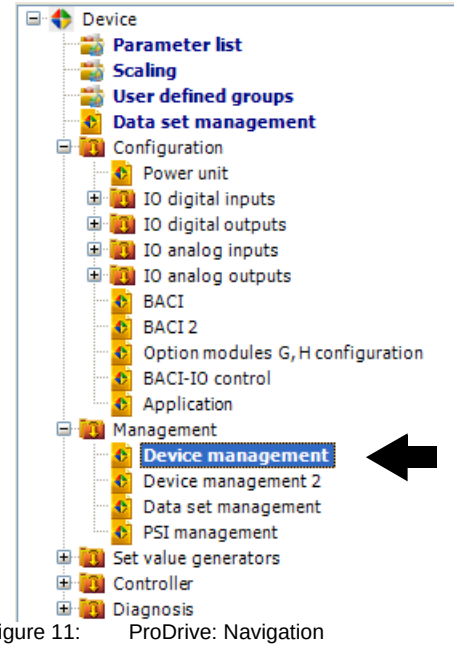



Figure 11: ProDrive: Navigation

5 If „by WinBASS II/ProDrive“ is selected „reset“ existing warnings/errors in the window „Drive manager“ (possibly the key „Quit errors“ has to be activated multiple times).

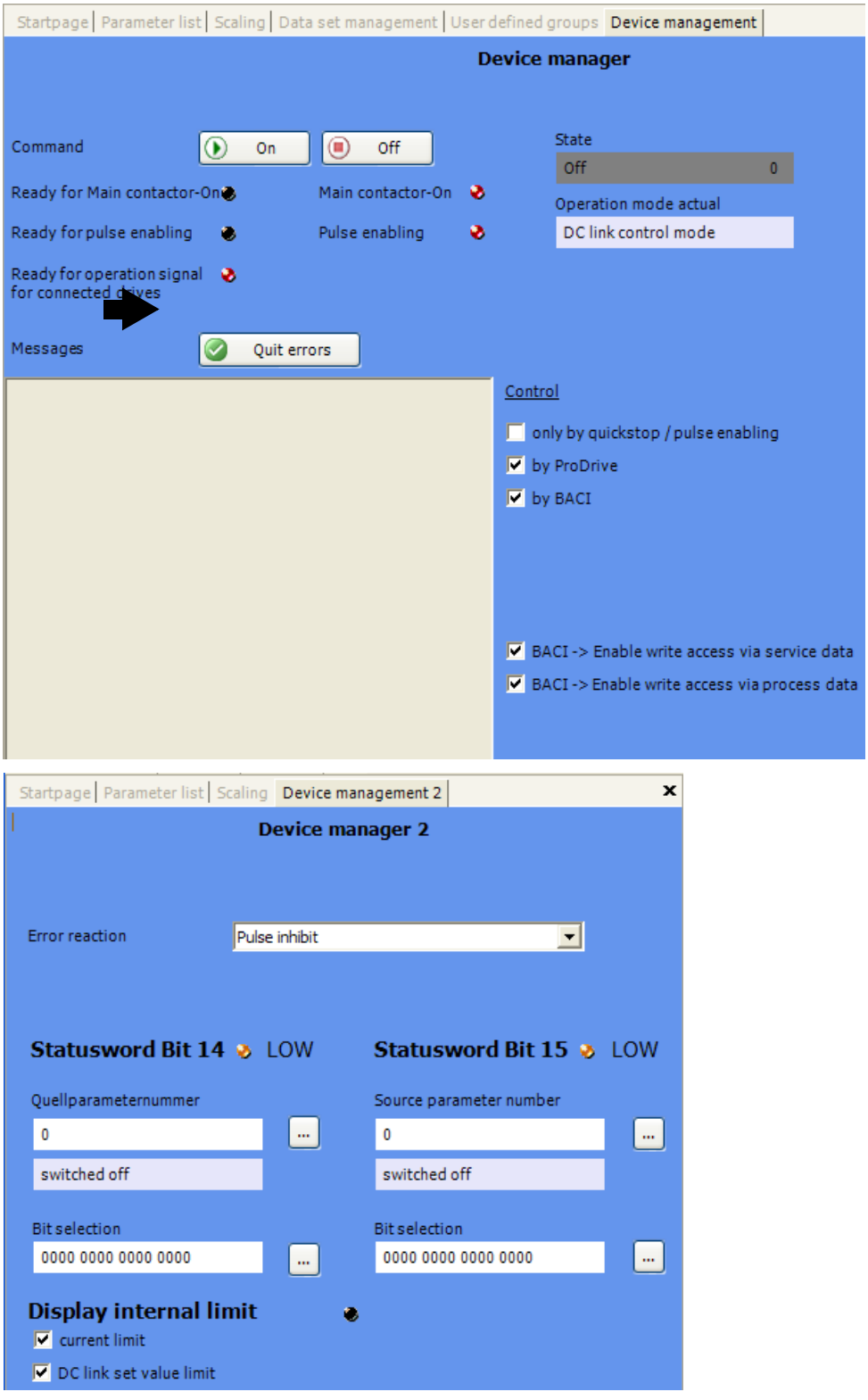



Figure 12: ProDrive: Device manager

**6** Click on „power unit“.

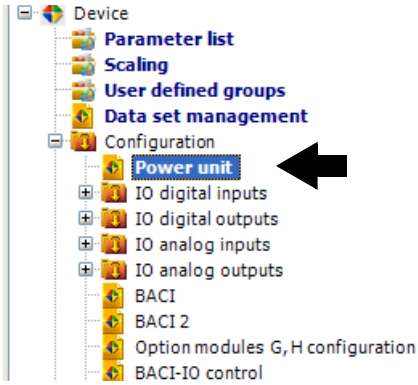



Figure 13: ProDrive: Navigation

**7** Enter into „maximum current of the drive“ the current, which is necessary for your application, at a maximum the limit current of the device (according to data sheet): 82.5 A, by which the power unit shall be operated.

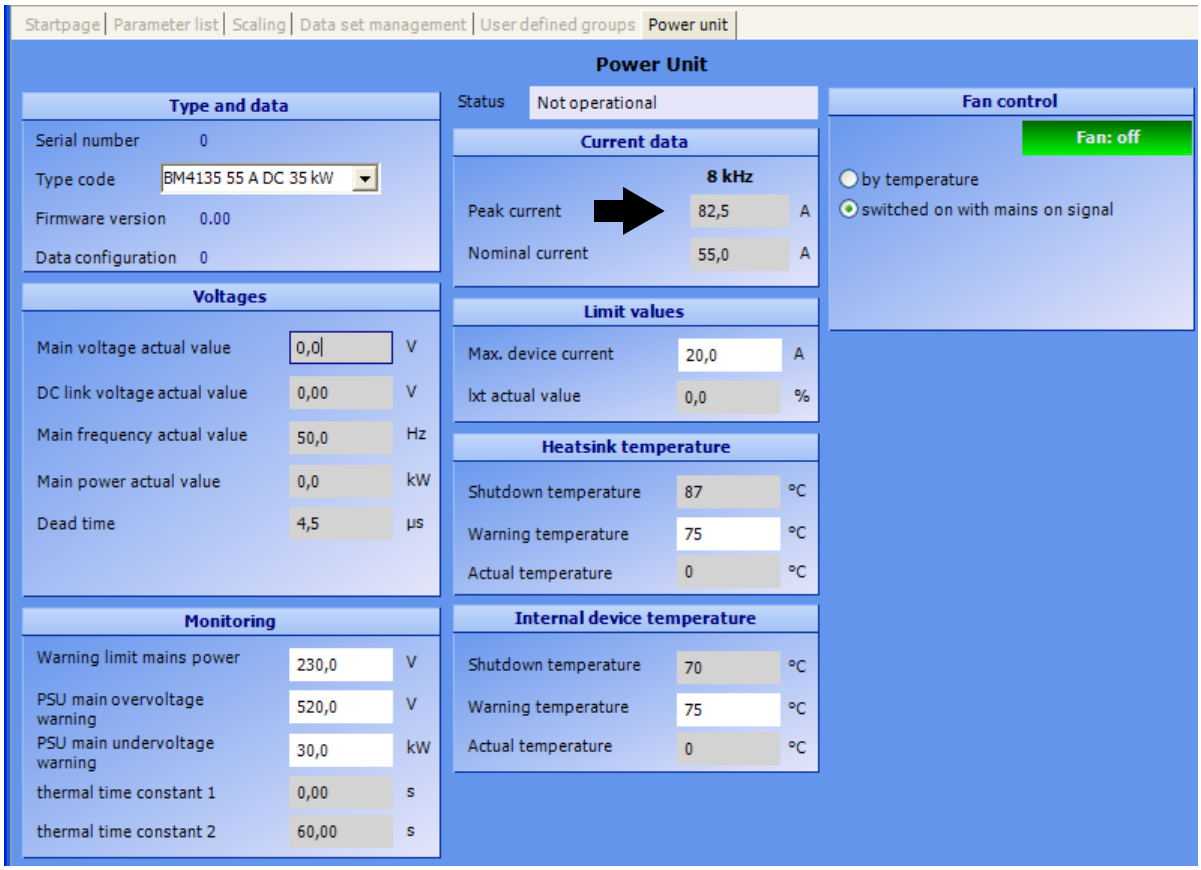



Figure 14: ProDrive: Power unit

**8** Go back to the project tree/navigation.

**9** Click on „Startpage“.

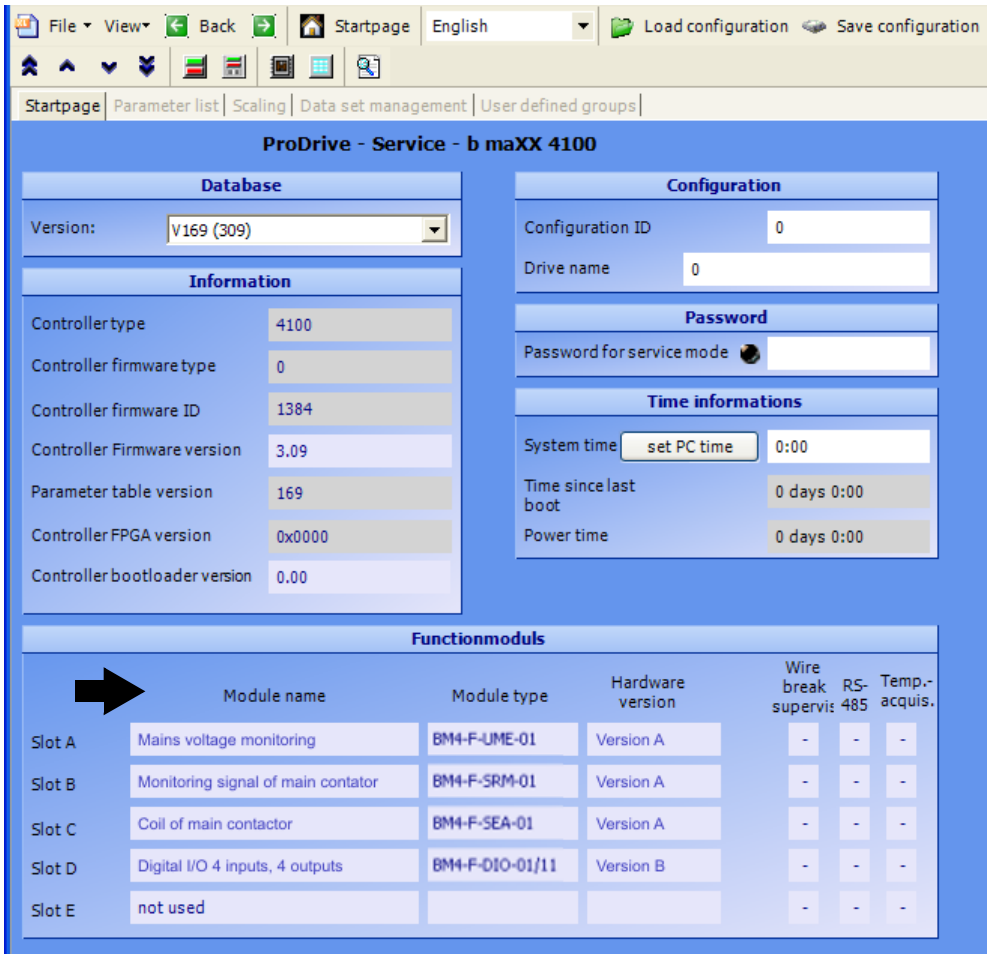



Figure 15: ProDrive: Start page with the used modules

In the start page it can be determined, at which slot the necessary modules for the mains inverter are plugged into.

**10** Check, if the modules, which were plugged in, have been recognized correctly.

**CAUTION!**

**Danger arising from errors in the hardware identification!**

The device in which the b maXX®4100 is installed, can be damaged or can work defective, if a module or more modules were not recognized or were recognized wrongly.

Therefore:

- Cancel commissioning, if at least one plug-in module was not or was recognized wrongly. Contact Baumüller Nürnberg GmbH.

**11** Go back to the project tree/navigation.

**12** Click in the data set management on the button „Save all“.

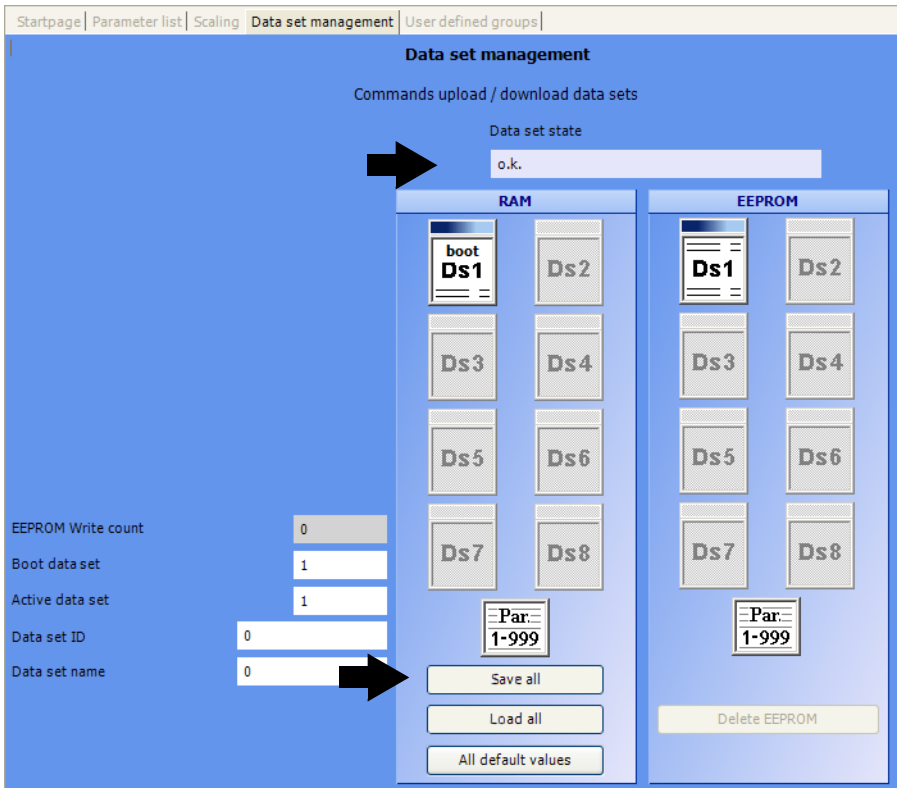



Figure 16: ProDrive 1.14: Data set management window

**13** Wait until next to „data set status“ is shown: „o.k.“
Thus the data record is saved in the EEPROM.

**14** Disconnect the device from the mains- and the control voltage.

**15** Effectuate the power supply to the b maXX®
(supply voltage + control voltage).

By switching on and off you can check, if your settings lead to warnings or errors.

**16** Go back to the project tree/navigation.

**17** Double-click on: „Set value generators“.

**18** Click on: „Set value generator 1“ .

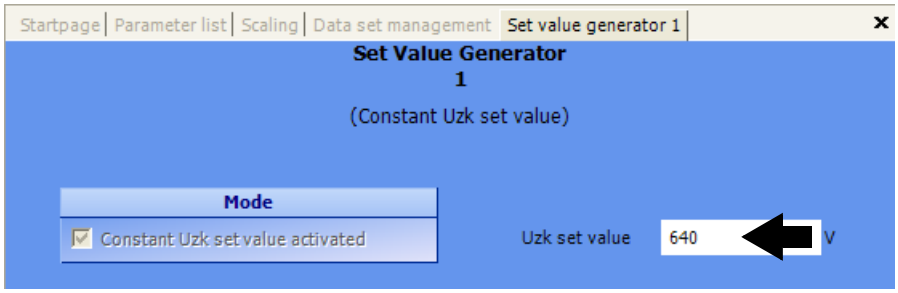



Figure 17: ProDrive: Ramp function generator

**19** Enter the values into the following entry fields:

- (Uzk set value) input

➲ Enter the value dependent on the mains voltage
(e.g. 640 V when $U_{mains}$ = 400 V). Confirm with *enter*.

**20** In case you have shut the window „drive manager dialogue“: click on the icon „Device management“.

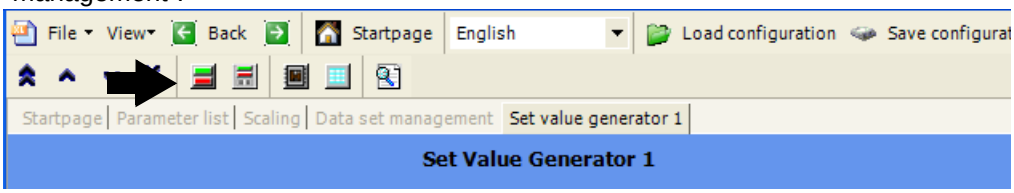



Figure 18: ProDrive: Ramp function generator - icon bar

Additionally the window „Drive manager dialogue“ appears.

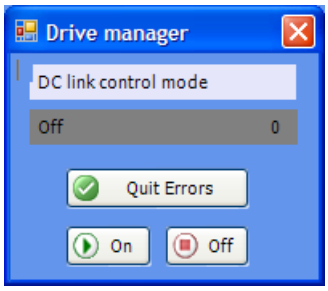



Figure 19: ProDrive: Drive manager

**21** Select in the drive manager dialogue in the scrolling list the operation mode „$U_{DC}$ control“.

**22** Turn on the charging contactor.

**23** Click on the drive manager dialogue on button „On“ to switch on the main contactor as soon as the pre-charge has been completed successfully.

**24** Switch on pulse enable active, as soon as the pre-charge has been completed successfully.

**25** Click on the drive manager dialogue menu on the button „Start“
Now $U_{DC}$ should be regulated to $U_{DC}$ set.

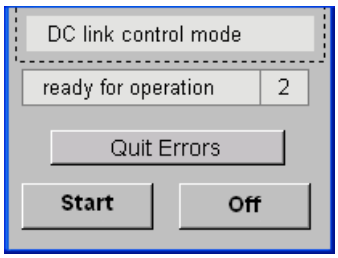



Figure 20: ProDrive: Drive manager

**26** Switch on pulse enable inactive.

**Data set storage**

This data record we now want to safe.

**27** Click in the icon bar on the icon „Data set management“.

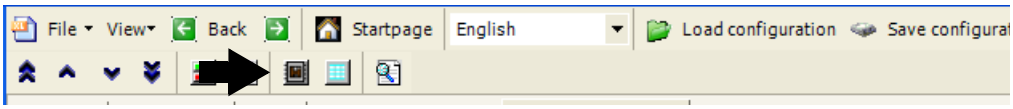



Figure 21: ProDriveI: Ramp function generator - icon bar

**28** Click in the data set management on the button „Save all“.

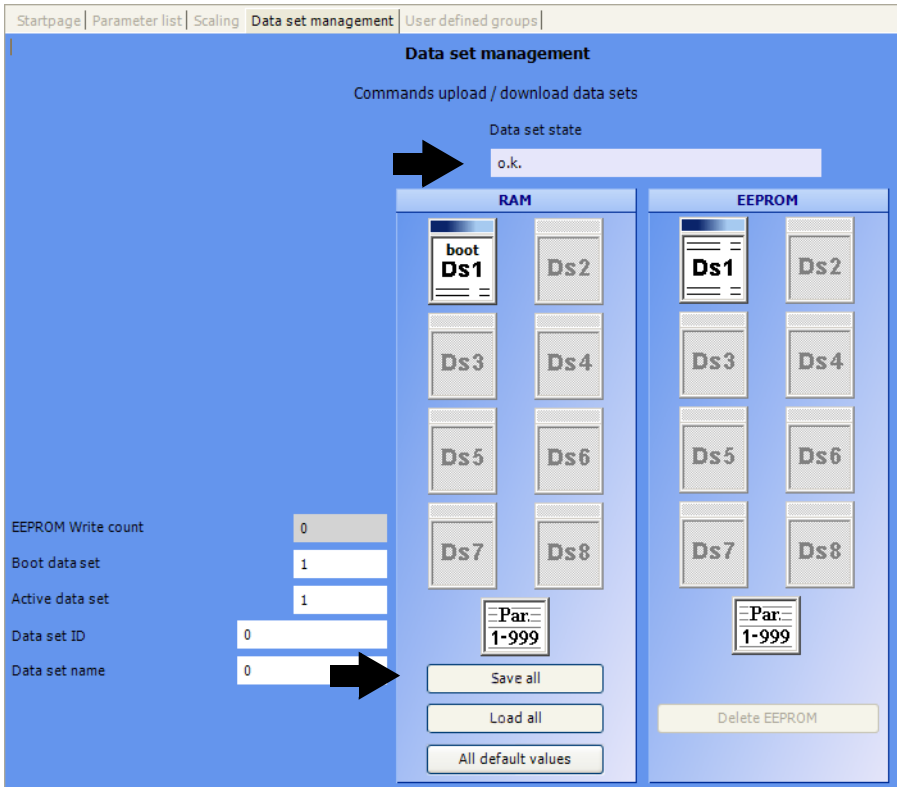



Figure 22: WinBASS II: Data set management

**29** Wait until next to „data set status“ is shown: „o.k.“

Thus the data record is saved in the EEPROM.

**30** Separate over the accordant switching elements the device from the mains- and control voltage.

Thus the commissioning is successfully completed.

# 6

# DESCRIPTION OF THE SOFTWARE MODULES

In the following we describe the working principles of software modules and its parameters. A comprehensive description of the parameters sorted by parameter numbers you will find in chapter ▷Parameters◁ from page 85.

A structure has been selected, which is similar to the WinBASS II Project tree/ProDrive Navigation.

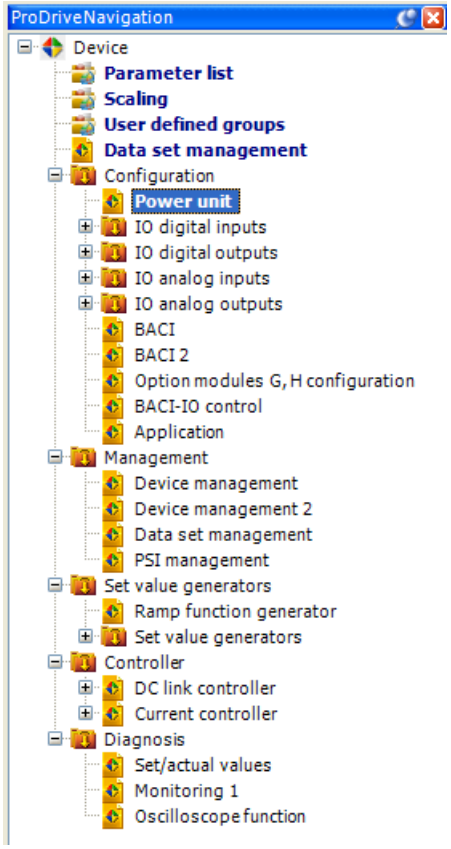



Figure 23: WinBASS II: Project tree

## 6.1 Allocation of the software modules in time slices

| Allocation of time slices | Software modules |
|---|---|
| every 125 µs | Current controller<br>$U_{DC}$ controller |
| every 250 µs | Mains inverter control |
| every 500 µs | Ramp function generator<br>Current controller control<br>Uploading of digital inputs |
| every 1 ms | Digital outputs<br>Mains inverter manager<br>Evaluation of digital inputs (dispatched, e. g. according to system working load possibly allocated to several time slices) |
| every 2 ms | Warning manager |
| every 4 ms | Drive manager<br>Status word 2<br>$U_{DC}$ controller control |
| every 8 ms | Overload management |
| every 16 ms | Operation mode switch-over<br>Setpoint generator<br>LED control |

## 6.2 Configuration

### 6.2.1 Power unit

Here you find parameters displayed regarding the power unit (power section). It is also possible to change the parameter values.

#### 6.2.1.1 Example for a power unit overload monitoring

This monitoring protects the power unit against thermal overload. By use of a I²t model the temperature is simulated and monitored.

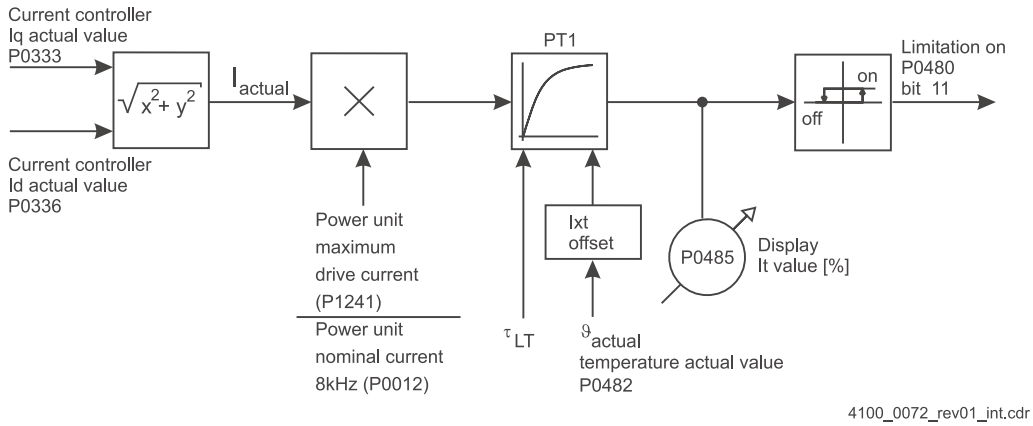



Figure 24: Example for a motor overload monitoring

| | | |
|---|---|---|
| Current controller Iq actual value | | ▹P0333◃ |
| Current controller Id actual value | | ▹P0336◃ |
| Apparent current actual value | ($I_{actual}$) [$A_{eff}$] | $\sqrt{P0333^2 + P0336^2}$ |
| Power unit nominal current 8 kHz | ($I_{nominal}$) [$A_{eff}$] | ▹P0012◃ |
| Power unit maximum current 8 kHz | ($I_{max}$) [$A_{eff}$] | ▹P0013◃ |
| Power unit maximum current of the drive | ($I_{limit}$) [$A_{eff}$] | ▹P1241◃ |
| Power unit overload time | ($t_u$) [s] | ▹P0015◃ |
| Power unit heatsink temperature actual value | ($\vartheta_{actual}$) [°C] | ▹P0482◃ |
| Power unit Ixt value | (Ixt) [%] | ▹P0485◃ |
| | | |
| Power unit overload factor max. | ($u_{max}$) [%] | |
| Power unit overload factor presently | (u) [%] | |
| Power unit thermal time constant | ($\tau_{LT}$) [s] | |
| Power unit release time | ($t_{off}$) [s] | Time up to limit on $I_{nom}$ |
| Power unit Ixt offset | (Ixt offset) [%] | |

$$u_{max} = \frac{I_{max}}{I_{nom}} \cdot 100 \quad [\%]$$

$$u = \frac{I_{act}}{I_{nom}} \cdot 100 \quad [\%]$$

$$\tau_{power\ unit} = -\frac{t_u}{\ln\left(\frac{u_{max} - 100}{u_{max}}\right)} \quad [s]$$

– for power unit temperature > 45 °C

$$IxtOffset = \frac{\vartheta_{act} - 45^oC}{85^oC - 45^oC} \cdot 100 \quad [\%]$$

– otherwise
Ixt offset = 0 %

– Release time

$$t_{off} = \tau_{power\ unit} \cdot \ln\left(\frac{u}{u - 100 + IxtOffset}\right)$$

**Example:**

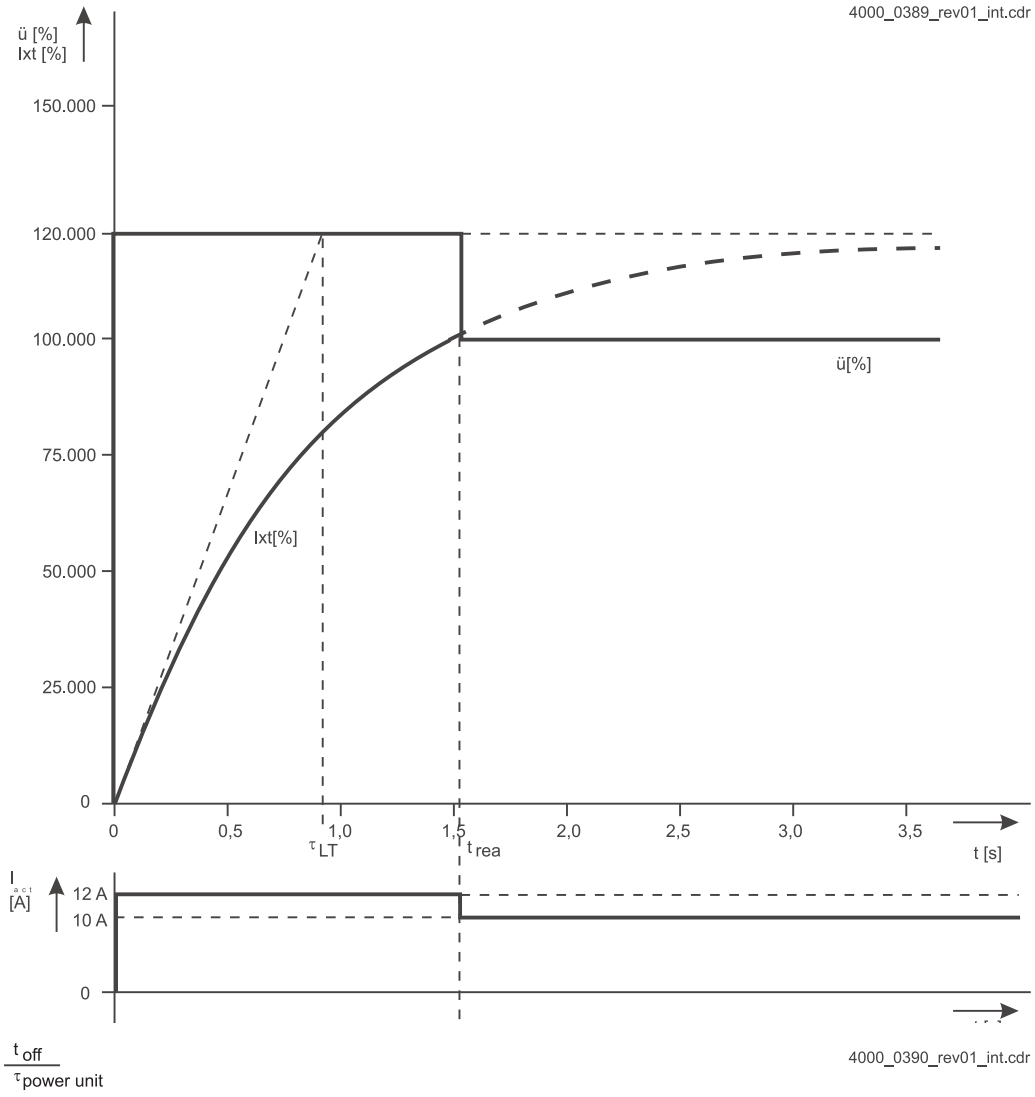
$I_{nominal}$ = 10 $A_{eff}$
$I_{max}$ = 15 $A_{eff}$
$t_U$ = 1 [S]
$I_{limit}$ = 12 $A_{eff}$
$\vartheta_{act}$ = 35 °C

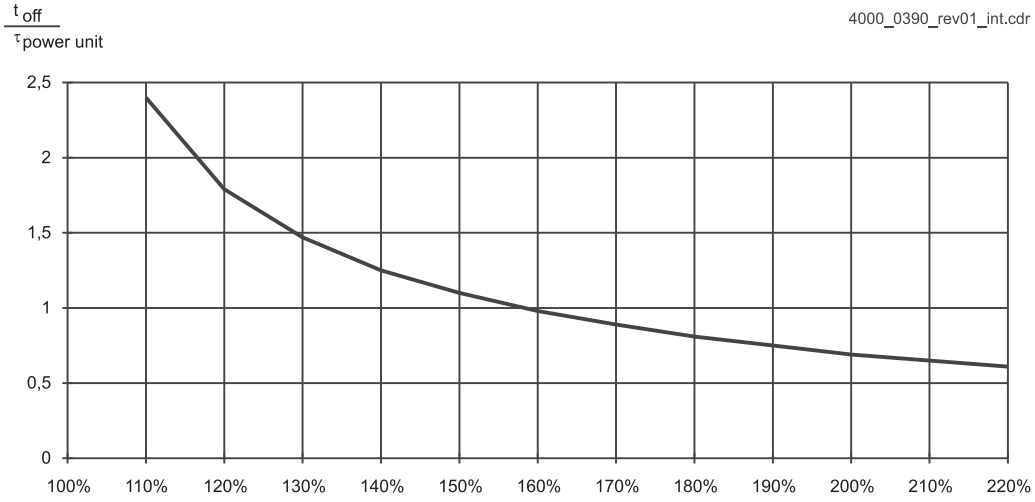
$$u_{max} = \frac{15}{10} \cdot 100 = 150 \quad [\%]$$

$$u = \frac{12}{10} \cdot 100 = 120 \quad [\%]$$

$$\tau_{power\ unit} = -\frac{1}{\ln\left(\frac{150 - 100}{150}\right)} = 0,91 \quad [s]$$

$$t_{off} = 0,91 \cdot \ln\left(\frac{120}{120 - 100}\right) = 1,63 \quad [s]$$




The characteristic curve is assumed from a cold power unit (Ixt offset = 0; $\vartheta_{actual}$ < 45 °C)

### 6.2.1.2 Setting the power rate cos φ

Parameter Power Supply Unit offset rho ▹P1350◃ sets the power factor within a range from -0.866 to +0.866.

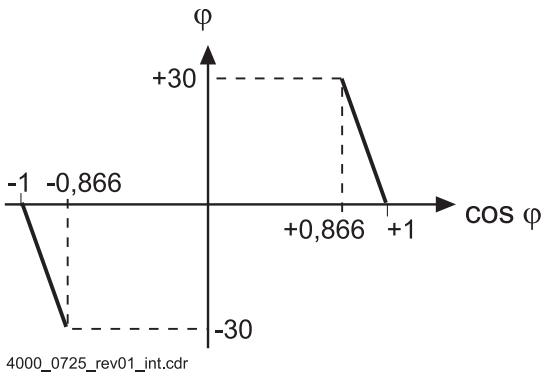



Figure 25: Characteristic curve power factor

Example:

cos φ should be +0,95.

▹P1350◃ = arccos (0,95) = 18,19 °

**NOTE!**

The angle change of φ (▹P1350◃) should be not higher than 5° per second.

The function of the device can be disturbed if the angle φ (▹P1350◃) is changed to fast.

### 6.2.2 Digital inputs

Digital inputs can be used for external control of single or even of several bits in parameters. That way, for example, single bits in the parameter „Drive manager control word“ can be influenced enabling you to control the drive manager.

**NOTE!**

One of the function modules BM4-F-DIO-01 or BM4-F-DIO-02 must be built-in the device if the b maXX® 4100 is controlled via hardware signals (drive manager menu „only via pulse enable“ is selected). The digital input 1 is predefined in this case. The other digital inputs 2 to 4 are freely programmable.

For the digital inputs 4 parameter blocks are provided. That way a maximum of four inputs can be evaluated simultaneously. These enable you to write to all writable 16-bit-parameters.

Each parameter block consists of five parameters:

- Select digital input x
  Channel selection
- Target number digital input x
  Input of target parameter number
- Bit selection digital input x
  Choice of the bits of the target parameter, which have got to be changed.
- Bit pattern at LOW digital input x
  Bit pattern, written to target parameter when digital input LOW.
- Bit pattern at HIGH digital input x
  Bit pattern, written to target parameter when digital input HIGH.

**At the inputs only edges are evaluated.**

Thus it is possible to influence a single parameter by use of several inputs.

Example: Two inputs influence the same parameter bit

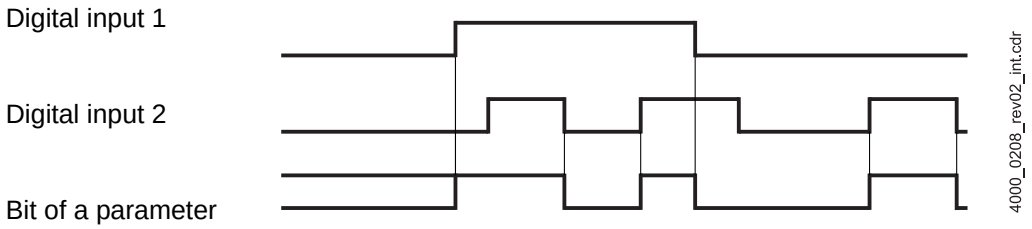



Figure 26: Edge evaluation of digital inputs

Any of the four inputs are scanned every millisecond at intervals of approx. 20 µs.

If 2 signals change their condition simultaneously, the signal with higher significance is accepted (digital input 1 has the lowest significance, digital input 4 has the highest).

Furthermore, for every of the 5 module slots there is a parameter, which reflects the status of the inputs of the module slots (▹P0410◃ to ▹P0414◃).

Thereby channel 1 corresponds to bit No. 0, channel 2 to bit No. 1 and so on. These 5 parameters are read-only.

**NOTE!**

A digital input is activated by writing to all parameters, which are associated to this input. The following sequence must be followed:

**1** Select digital input x
**2** Target number digital input x
**3** Bit selection digital input x
**4** Bit pattern at LOW digital input x
**5** Bit pattern at HIGH digital input x

Deactivation of a digital input is done by writing the value “0“ to parameter Target number digital input x.

Procedure when programming:

**1** Select module slot with the digital inputs and select respective **input**.

**2** Fill in **target number** of desired input.
⇒ still no effect on target parameter.

**3** Enter bit selection of requested output
Only the bits, which have been set in the parameter **Bit selection**, also can be modified in the target parameter according to pattern in the parameters **Bit pattern at High** or **bit pattern at Low**. Accordingly such bits are kept the same in the target parameter, which equal 0 in **bit selection**.

**4** **Bit pattern at Low** and **bit pattern at High** is determined
With a positive edge of the digital input the target parameter is changed as follows:
Target parameter = (target parameter *AND NOT* (**bit_selection**))
OR (**bit pattern at High** *AND* **bit_selection**)

At a negative edge of the digital input the target parameter is changed as follows:
Target parameter = (target parameter *AND NOT*(**bit_selection**))
OR (**bit pattern at Low** *AND* **bit_selection**)

- Example 1:

In slot D (module slot 4) you have plugged in a module for digital inputs.

By operating module input 3, the parameter ▹P0440◃ Set value generator mode shall be set to 0 (when switch is LOW) and set to 1 (when switch is HIGH).
i. e. according to signal status bit 0 to 15 are „ANDed“ bitwise with the LOW or HIGH pattern.

Parameter block 1 shall be used.

The following parameters then must be written:

| | | |
|---|---|---|
| Selection digital input 1 | ▹P1090◃ | $P0403_{hex}$ |
| Target number digital input 1 | ▹P1091◃ | 440 |
| Bit selection digital input 1 | ▹P1092◃ | $FFFF_{hex}$ |
| Bit pattern at LOW digital input 1 | ▹P1093◃ | $0000_{hex}$ |
| Bit pattern at HIGH digital input 1 | ▹P1094◃ | $0001_{hex}$ |

- Example 2

In slot D (module slot 4) you have plugged in a module for digital inputs.

By programming an additional input (module slot 4) now value 2 and 3 in parameter ▹P0440◃ set value generator mode shall be adjusted.

Parameter block 1 and 2 shall be used.

So the following programming is necessary:

| | | |
|---|---|---|
| Selection digital input 1 | ▹P1090◃ | $0403_{hex}$ |
| Target number digital input 1 | ▹P1091◃ | 440 |
| Bit selection digital input 1 | ▹P1092◃ | $FFFD_{hex}$ |
| Bit pattern at LOW digital input 1 | ▹P1093◃ | $0000_{hex}$ |
| Bit pattern at HIGH digital input 1 | ▹P1094◃ | $0001_{hex}$ |
| | | |
| Selection digital input 2 | ▹P1095◃ | $0404_{hex}$ |
| Target number digital input 2 | ▹P1096◃ | 440 |
| Bit selection digital input 2 | ▹P1097◃ | $FFFE_{hex}$ |
| Bit pattern at LOW digital input 2 | ▹P1098◃ | $0000_{hex}$ |
| Bit pattern at HIGH digital input 2 | ▹P1099◃ | $0002_{hex}$ |

→ The digital input 1 influences now bit 0 and bits 2 to 15 ;
the digital input 2 influences the bits 1 to 15.

| Bit No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Example for initial value ▹P0440◃ | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| Input 1 → HIGH | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 0 | **1** |
| Input 2 → HIGH | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | 1 |
| Input 1 → LOW | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 1 | **0** |
| Input 2 → LOW | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | 0 |

- Example 3

In slot D (module slot 4) you have plugged in a module for digital inputs.

One input (module input 5) shall influence bit 4 and bit 11 of the parameter ▹P0300◃ control word.

Thereby parameter block 3 should be used.

So the following programming is necessary:

| | | |
|---|---|---|
| Selection digital input 3 | ▹P1100◃ | $0405_{hex}$ |
| Target number digital input 3 | ▹P1101◃ | 300 |
| Bit selection digital input 3 | ▹P1102◃ | $0810_{hex}$ |
| Bit pattern at LOW digital input 3 | ▹P1103◃ | $0800_{hex}$ |
| Bit pattern at HIGH digital input 3 | ▹P1104◃ | $0010_{hex}$ |

| Bit | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Initial value ▹P0300◃ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Input 2 → HIGH | 0 | 0 | 0 | 0 | **0** | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 | 1 | 1 | 1 |
| Input 2 → LOW | 0 | 0 | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | **0** | 1 | 1 | 1 | 1 |

### 6.2.3 Digital outputs

Digital outputs can be used to forward certain states to the higher-level control or for display purposes. That way, e. g. certain bits or also bit combinations of the parameter „status word of the drive manager“ can be signaled towards the outside.

For the digital outputs 4 parameter blocks are provided.
That way a maximum of 4 outputs can be evaluated simultaneously. Not assigned outputs are set „LOW“.

**NOTE!**

One of the function modules BM4-F-DIO-01 or BM4-F-DIO-02 must be built-in in module slot D, if the device is controlled only via hardware signals (device management „only via pulse enable“ is selected). In this case all 4 digital outputs are predefined.

All digital outputs of the function modules BM4-F-DIO-01 or BM4-F-DIO-02 are freely programmable, if the device is controlled via operation program / BACI (device management „via WinBASS II/ProDrive“ and/or „via BACI“.

Each parameter block consists of four parameters:

- Select digital output x
  Channel selection
- Source number digital output x
  Number of parameter, which is to be displayed (only 2 byte parameter permitted).
- Bit selection digital output x
  Selection of the bits of the source parameters, which have to be identical.
- Bit pattern digital output x
  If this pattern and the selected bit pattern of the source parameter are identical, the selected output will be switched to HIGH.

The 4 outputs are scanned every millisecond.

Furthermore, for every of the module slots there is a parameter, which reflects the status of the outputs of the module slots (▹P0418◃ to ▹P0419◃). Thereby channel 1 corresponds to bit 0, channel 2 to bit 1 and so on. These parameters are read-only.

**NOTE!**

You can activate a digital output by writing to all parameters, which are associated with this output. The following sequence must be followed:

**1** Select digital output x

**2** Source number digital output x

**3** Bit selection digital output x

**4** Bit pattern digital output x

Deactivation of a digital output is done by writing the value “0“ to parameter source number digital output x or by writing the value “0“ to parameter bit selection digital output x.

Procedure when programming:

**1** Select module slot with the digital outputs and select respective **output**.

**2** Fill in **source number** of desired output.
⇒ still no effect on source parameter.

**3** Enter **bit selection** of requested output:
⇒ All selected bits of the source parameter are set to 1.

**4** Enter **bit pattern** of the same output.
The selected bits of the source parameter are compared with the **bit pattern**. If they are identical, the output is set to HIGH.
⇒ Affects target parameter.

- Example:

In slot D (module slot 4) you have plugged in a module for digital outputs.

The digital output 2 of the module shall turn HIGH, if in parameter ▹P0200◃ error system 1 bit 0 = 0 and bit 2 = 1.

In order to do so, parameter block 3 shall be used:

The following parameters then must be written:

| | | |
|---|---|---|
| Selection digital output 3 | ▹P1118◃ | $P0402_{hex}$ |
| Source number digital output 3 | ▹P1119◃ | 200 |
| Bit selection digital output 3<br>bit 0, bit 2 | ▹P1120◃ | $0005_{hex}$ |
| Bit pattern digital output 3<br>bit 0 = 0 and bit 2 = 1 | ▹P1121◃ | $0004_{hex}$ |

### 6.2.4 Analog inputs

If you intend to use analog inputs, you need at least one of the function modules BM4-F-AIO-01, BM4-F-AIO-02 or BM4-F-AIO-03.

Analog inputs can be used read-in external voltages. That way, e. g. via the parameter „Ramp function generator input value“, the set speed can be specified with the help of an analog input voltage.

For the analog inputs 2 parameter blocks are provided. That way a maximum of four inputs can be evaluated simultaneously.

They enable writing to all 16-bit- and 32-bit-parameters that are not read-only. With the 32-bit-parameters only the high-word of parameter is written to. The low-word remains unchanged. Furthermore for 32-bit-parameters the high-word of the maximum value is valid.

Each parameter block consists of seven parameters:

- **Select analog input x:**
  Channel selection
- **Smoothing time analog input x:**
  Input of time constants of smoothing capacitor in ms.
- **Scaling factor analog input x:**
  Input of the scaling factor.
- **Target number analog input x:**
  Number of the parameter which has got to be changed.
- **Offset analog input x:**
  Offset input.
- **Threshold value analog input x:**
  Sensitivity of the input.
- **Value analog input x:**
  Current input value

The sampling of the specified analog input operates every 125 µs.

The input value is selected by use of **select analog input**. This value is smoothed by use of **smoothing time** and is converted with the **scaling factor**. Then the **offset** is added. Is this result less than the **threshold value**, it is set to 0.

The result is multiplied with the maximum value of the target parameter and written to the target parameter.

**NOTE!**

A connection follows, as soon as the **target number** has been set.

In order to deactivate an input, the **target number** must be set to 0. The latest output value is kept within the target parameter.

Procedure when programming:

1. Select module slot with the analog inputs and select respective **input**.
2. Set the required smoothing time.
3. Select **scaling factor**.
4. Set **offset** according to existing offset.
5. Eventually set **threshold** according to existing threshold.
6. Set **target number**.

With reprogramming to another target number the target number first must be set to zero and then has to be programmed as recommended above in order to avoid unwanted effects.

**Calculation basis:**

| | |
|---|---|
| Bigger absolute value of the level limits of the target parameter: | Maximum value |
| Analog input voltage: | $U_{in}$ { -10 ... +10 V }; $U_{inmax}$ = +10 V; |

**Calculation formula:**

- for unipolar parameter:

$$\text{VALUE ANALOG INPUT [\%]} = \frac{U_{in}[V] + 10\ V}{2 \cdot U_{inmax}[V]} * \text{scaling} * 100\ \% + \text{offset}$$

Is VALUE ANALOG INPUT > 100 %,
then VALUE ANALOG INPUT = 100 % is set.

If |VALUE ANALOG INPUT [%]| is < threshold value [%],
then VALUE ANALOG INPUT = 0 % is set.

- for bipolar parameter:

$$\text{VALUE ANALOG INPUT [\%]} = \frac{U_{in}[V]}{U_{inmax}[V]} * \text{scaling} * 100\ \% + \text{offset}$$

If VALUE ANALOG INPUT > 100 %,
then VALUE ANALOG INPUT = 100 % is set.

If VALUE ANALOG INPUT is < -100 %,
then VALUE ANALOG INPUT = -100 % is set.

If |VALUE ANALOG INPUT [%]| is < threshold value [%],
then VALUE ANALOG INPUT = 0 % is set.

To the target parameter the following value is written:

$$\text{Target parameter} = \frac{\text{VALUE ANALOG INPUT [\%]}}{100\ \%} \cdot \text{maximum value}$$

If you have 32-bit-parameters, the maximum value of the high-word equals the true maximum value. To the target parameter only the high-word is written. The low-word remains unchanged.

- Examples:

Input voltage ↔
VALUE ANALOG INPUT [%] * maximum value of target parameter

→ target parameter value

**Scaling = 1; offset = 0%; threshold value = 0%;**

| Unipolar target parameter: | | Bipolar target parameter: | |
|---|---|---|---|
| 10 V ↔ | 100 % * maximum value | 10 V ↔ | 100 % * maximum value |
| 5 V ↔ | 75 % * maximum value | 5 V ↔ | 50 % * maximum value |
| 0 V ↔ | 100 % * maximum value | 0 V ↔ | 100 % * maximum value |
| -5 V ↔ | 25 % * maximum value | - 5 V ↔ | -50 % * maximum value |
| - 10 V ↔ | 0 % * maximum value | - 10 V ↔ | -100 % * maximum value |

**Scaling = 1; offset = 0%; threshold value = 10.1%;**

| Unipolar target parameter: | | Bipolar target parameter: | |
|---|---|---|---|
| 10 V ↔ | 100 % * maximum value | 10 V ↔ | 100 % * maximum value |
| 5 V ↔ | 75 % * maximum value | 5 V ↔ | 50 % * maximum value |
| 0 V ↔ | 50 % * maximum value | 1 V ↔ | 0 % * maximum value (threshold!) |
| - 5 ↔ | 0 % * maximum value | - 1 V ↔ | 0 % * maximum value (threshold!) |
| - 9 V ↔ | 0 % * maximum value (threshold!) | - 5 V ↔ | -50 % * maximum value |
| - 10 V ↔ | 0 % * maximum value | - 10 V ↔ | -100 % * maximum value |

**Scaling = 2; offset = -100%; threshold value = 0%**

Unipolar target parameter:

| | | |
|---|---|---|
| 10 V | ↔ | 100 % * maximum value |
| 5 V | ↔ | 50 % * maximum value |
| 0 V | ↔ | 0 % * maximum value |
| - 5 V | ↔ | 0 % * maximum value (limit!) |
| - 10 V | ↔ | 0 % * maximum value (limit!) |

Bipolar target parameter:

| | | |
|---|---|---|
| 10 V | ↔ | 100 % * maximum value |
| 5 V | ↔ | 0 % * maximum value |
| 0 V | ↔ | -100 % * maximum value |
| - 5 V | ↔ | -100 % * maximum value (limit!) |
| - 10 V | ↔ | -100 % * maximum value (limit!) |

**Example characteristic curves:**

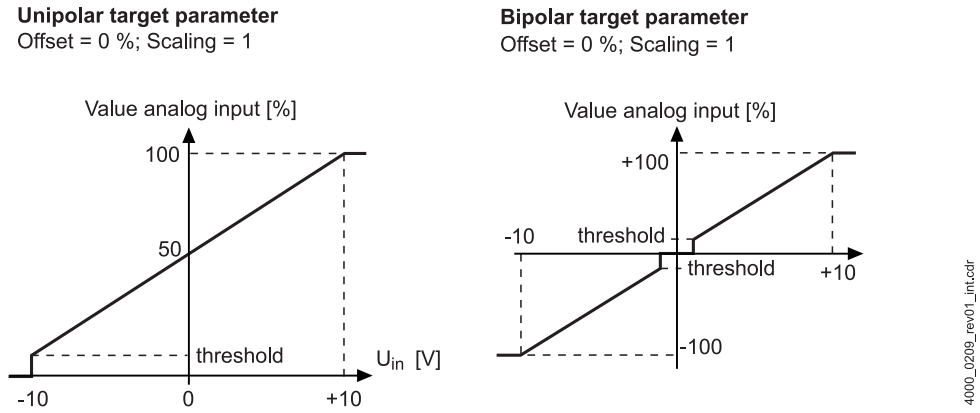



Figure 27: Example characteristics analog input

### 6.2.5 Analog outputs

If you intend to use analog inputs, you must have one of the AIO-01, AIO-02 or AIO-03 function modules.

With the analog outputs any device parameters, as e. g. current actual value or following error, but also the status parameters are issued. 16-bit as well as 32-bit parameters can be issued.

For the analog outputs two parameter blocks are provided. That way a maximum of 2 outputs can be evaluated simultaneously. The outputs are scanned every 125 µs.

Four parameters belong to every parameter block:

- Select fast analog output ▹P1150◃ and ▹P1154◃
  Select of the output channel and of the function module slots.
- Source parameter number analog output ▹P1151◃ and ▹P1155◃
  Parameter number for the source parameter, which shall be generated at the output. The calculation of the output value acts automatically in accordance with the kind of the parameter: 16 or 32 bit, signed or unsigned.
- Scaling factor analog output ▹P1153◃ and ▹P1157◃
  Scaling factor for the calculation of the output value.
- Offset analog output ▹P1152◃ and ▹P1156◃
  With the offset the output value is able to be shifted by a possible offset error of the analog output.

### 6.2.5.1 Calculation basis

For the calculation of the analog outputs it is assumed that there is a standard scaling in the drive. The most actual value parameters as e. g. speed, speed torque and current, are internally scaled to a value 4000 $_{hex}$ (at 16 bit parameters) or 40000000$_{hex}$ (at 32 bit parameters). That means that a parameter value of 4000$_{hex}$ (40000000$_{hex}$ is according to 100 %).

If the parameter, which is to be output, is shown in the standard scaling, the simplified conversion formulae can be used.

Signed parameters:

$U_{off}$ = parameter value [%] * scaling [WinBASS] * 10 V + offset [V]

Unsigned parameters:

$U_{off}$ = parameter value [%] * scaling [WinBASS] * 20 V - 10 V + offset [V]

For the scaling of parameters, which do not correspond to the standard scaling, the general calculation formulae are value. Thereby the internal representation must be used in order to calculate the parameter value. The internal representation is to be taken from the according parameter description.

16 bit signed parameter

$$U_{off} = \frac{\text{parameter value [internal]}}{4000_{hex}} \cdot \text{scaling [WinBASS]} \cdot 10\ V + \text{offset [V]}$$

32 bit signed parameter

$$U_{off} = \frac{\text{parameter value [internal]}}{40000000_{hex}} \cdot \text{scaling [WinBASS]} \cdot 10\ V + \text{offset [V]}$$

16 bit unsigned parameter

$$U_{off} = \frac{\text{parameter value [internal]}}{4000_{hex}} \cdot \text{scaling [WinBASS]} \cdot 20\ V - 10\ V + \text{offset [V]}$$

32 bit unsigned parameter

$$U_{off} = \frac{\text{parameter value [internal]}}{40000000_{hex}} \cdot \text{scaling [WinBASS]} \cdot 20\ V - 10\ V + \text{offset [V]}$$

#### 6.2.5.2 Sample 1 - Parameters with standard scaling

In slot E (module slot 5) you have plugged in a module for analog outputs.

The value of the parameter P0170 mains voltage shall be issued on output 1. Therefore parameter block 1 must be used.

Following settings are necessary:

| | |
|---|---|
| Select fast analog output 1 ▹P1150◃ | $0501_{hex}$ |
| Source number fast analog output 1 ▹P1151◃ | 170 |
| Offset fast analog output 1 ▹P1152◃ | -100 (no offset) |
| Scaling factor fast analog output 1 ▹P1153◃ (at output: $U_{mains}$ = 0 V, output = -10 V; $U_{mains}$ = 400 V, output = 0 V; $U_{mains}$ = 800 V, output = +10 V) | 1 |

### 6.2.6 Direct access to digital in-/outputs via the PLC

#### 6.2.6.1 Overview

The b maXX® controller from firmware version 3.01 onwards offers in connection with an existent drive PLC the option to read out or to control the digital in-/outputs of one or several function modules of the type DIO-01 and FIO-01 on the slots D to E.

Herewith the controller of the PLC supplies special addresses for I/O mappings on which the user program of the PLC can read or write. The contents of the mappings are exchanged in every control cycle that means **every 125 µs** between PLC and function module.

The bit assignment in the I/O mapping is defined by the hardware version status of a function module.

The status of hardware version is coded in the bits 8 ... 10 of the module identification (parameter module type slot D ... module type slot E ▹P0553◃ ... ▹P0554◃):

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| |
| \| | \| | \| | \| | \| | \| | \| | Reserved | | | | | | | |
| \| | \| | \| | \| | \| | \| | \| | | | | | | | | |
| \| | \| | \| | \| | \| | 0 | 0 | 0 | Reserved | | | | | | | |
| \| | \| | \| | \| | \| | 0 | 0 | 1 | Version status A | | | | | | | |
| \| | \| | \| | \| | \| | 0 | 1 | 0 | Version status B | | | | | | | |
| \| | \| | \| | \| | \| | 0 | 1 | 1 | Version status C | | | | | | | |
| \| | \| | \| | \| | \| | 1 | 0 | 0 | Version status D | | | | | | | |
| \| | \| | \| | \| | \| | 1 | 0 | 1 | Reserved | | | | | | | |
| \| | \| | \| | \| | \| | 1 | 1 | 0 | Reserved | | | | | | | |
| \| | \| | \| | \| | \| | 1 | 1 | 1 | Reserved | | | | | | | |
| \| | \| | \| | \| | \| | | | | | | | | | | | |
| X | X | X | X | X | Module function ID (0 0 1 0 $1_{binary}$ for DIO-01 and FIO-01) | | | | | | | | | | | |

Example:

At a DIO-01 with hardware version status the ID = $2B00_{hex}$.

At usage of different version statuses a decoding of the hardware version status which is dependent on the function module type is necessary in the PLC user program in order to guarantee a correct bit assignment.

### 6.2.6.2 Configuration

An I/O mapping address of the data type WORD (16 bit) is individually assigned to a function module. Each module possesses an own address in order to read the digital inputs from the function module and another address to write on these digital outputs.

A sharing of inputs of a function module is possible by the PLC and controller, during the usage of outputs which are configured bitwise as either only the controller or only the PLC uses the outputs of a module.

The configuration of the assignment of the outputs at the controller or at the PLC operates by the controller parameter ▹P0579◃ function module selection for PLC I/o accesses. Each of the lower five bits is a function module slot D ... E. If the according bit is not set, only the controller has the access to the outputs of the module. Then output information from the PLC mapping does not reach the module. If the according bit is set, the PLC can write to the outputs of the assigned module. In this case, output mappings of the controller do not effect the module, but only the controller output mapping (status of the digital outputs in module slot D ... E. Status of the digital outputs in module slot E ▹P0418◃ ... ▹P0419◃). The controller output mapping is shown in WinBASS.

A reconfiguring of the output assignment controller or PLC also is possible in the operating status. It has to be considered that after reconfiguring the according activated output mapping immediately is set.

### 6.2.6.3 Addresses of I/O mapping

```
w_InputSlotD    AT %MW3,1262094   :   WORD; (* input mapping slot D *)
w_InputSlotE    AT %MW3,1262098   :   WORD; (* input mapping slot E *)

w_OutputSlotD   AT %MW3,1262092   :   WORD; (* output mapping slot D *)
w_OutputSlotE   AT %MW3,1262096   :   WORD; (* output mapping slot E *)
```

### 6.2.6.4 Usable I/O modules

The following b maXX® functional modules are provided for the PLC direct accesses:

- BM-F-DIO-01
- BM-F-FIO-01

### 6.2.6.5 Structure of I/O mappings for DIO-01 and FIO-01 (4-bit digital in, 4-bit digital out)

The functional modules DIO-01/FIO-01 are provided with:

| | |
|---|---|
| 4 x inputs | I1...I4 |
| 4 x outputs | Q1...Q4 |

The assignment of the bits in the I/O mapping is dependent on HW version status (bits 8 ... 10 in the module ID).

- **Hardware revision (module identification: 29xx$_{hex}$)**

I/O input mapping

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No short-circuit and 24 V supply of the E/As is existent |
| | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Short-circuit or 24 V supply of I/Os is missing |
| | | | | X | X | X | X | Reserved | | | | | | | | |
| -I4 | -I3 | -I2 | -I1 | | | | | | | | | | | | | |

I/O output mapping

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | -Q1 | -Q2 | -Q3 | -Q4 |
| X | X | X | X | X | X | X | X | X | X | X | X | Reserved | | | |

- **Hardware revision B (module identification: 2Axx$_{hex}$)**

I/O input mapping

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No short-circuit and 24 V supply of the E/As is existent |
| | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Short-circuit or 24 V supply of I/Os is missing |
| | | | | | X | X | X | Reserved | | | | | | | | |
| | -I4 | -I3 | -I2 | -I1 | | | | | | | | | | | | |
| X | Reserved | | | | | | | | | | | | | | | |

I/O output mapping

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | X | Reserved |
| | | | | | | | | | | | -Q1 | -Q2 | -Q3 | -Q4 | | |
| X | X | X | X | X | X | X | X | X | X | X | Reserved | | | | | |

Q values in order to control Q1...Q4: 1D$_{hex}$, 1B$_{hex}$, 17$_{hex}$, 0F$_{hex}$

- **Hardware revision 1C1 and 1D (module identification: 2Bxx$_{hex}$ and 2Cxx$_{hex}$)**

I/O input mapping

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No short-circuit and 24 V supply of the E/As is existent |
| | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Short-circuit or 24 V supply of I/Os is missing |
| | | | | X | X | X | X | Reserved | | | | | | | | |
| -I4 | -I3 | -I2 | -I1 | | | | | | | | | | | | | |

I/O output mapping

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| |
| \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | -Q1 | -Q2 | -Q3 | -Q4 |
| \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | | | | |
| X | X | X | X | X | X | X | X | X | X | X | X | Reserved | | | |

Q values in order to control Q1...Q4: $0E_{hex}$, $0D_{hex}$, $0B_{hex}$, $07_{hex}$

## 6.2.7 BACI

### 6.2.7.1 Introduction

**BACI** (**BA**umüller-**C**omponent-**I**nterface) define the hardware- and the software interface of Baumüller between controller and option cards in the b maXX® system.

Via this interface both the controller and the control system is able to communicate with other option cards, like field bus slave, field bus master card, IEI option module and so on. Likewise controller and PLC can, among each other exchange data.

### 6.2.7.2 System overview

A communication connection by BACI always exists between a BACI master and up to five option cards as BACI slaves. The controller module always takes in the role of the master. The PLC takes in, towards the controller, the role of a slave ON, towards all the other option modules it takes in the role of the BACI master. The control of the communication connection is automatically executed by the b maXX® system. A data access over BACI is always active executed by a BACI master. A data transfer from slave to slave is not possible.

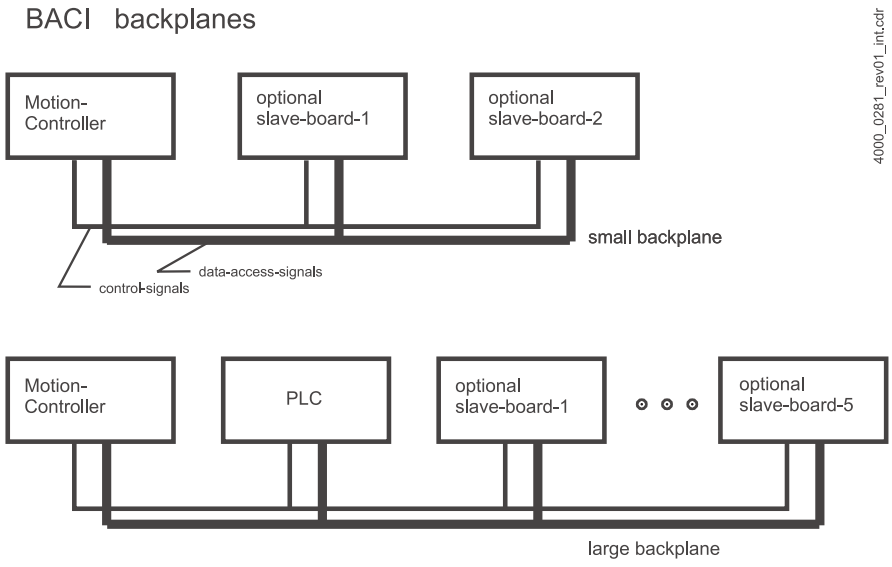



Figure 28: b maXX® option card bus

### 6.2.7.3 BACI services

The BACI differs between the following communication services:

1. **System configuration** (after power on) and reconfiguration (during the running operation)
2. **Cyclic data** - quick synchronous exchange (e. g. set- and actual values) - no character strings
3. **Service data** for the time-uncritical data transfer of adjusted- or configured parameters.
4. **Command interface** - b maXX® internal in order to configure and diagnose automatically.
5. **Synchronization, interrupt.** The controller processing cycle can be synchronized via the control lines with a synchronous signal, which is, e. g. generated via a field bus option module.

Furthermore, you can generate cyclic interrupts on field bus modules by the controller. For further information please refer to the description of the according field bus module.

**NOTE!**

The controller only operates option modules on the slots G and H.

The controller can at the time with max. one option module exchange cyclic data (a control module belongs to this, too). Service data and commands can be operated simultaneously with two option modules at maximum.

The PLC can, with several option modules, communicate cyclic on all slots.

The controller provides parameters for the BACI system configuration and for the adjusting of cyclic communication between controller and the option module with whom cyclic data shall be exchanged.

### 6.2.7.4 Configuration of the BACI via controller parameter

**Slot selection**
▹P0827◃

The controller checks the assignment of both slots G and H consecutively in the specified sequence. It automatically configures the first option module, which it finds for the cyclic communication and herewith uses the parameters ▹P0800◃ to ▹P0819◃. If the controller recognizes a second option module it configures the second module with the parameters ▹P0860◃ to ▹P0879◃.

The assignment between the modules and the BACI configuration parameter can be exchanged with the setting in the parameter option module selection (▹P0827◃). Further information see description of this parameter.

The controller only evaluates this parameter after the switching off/switching on of the system.

**Hardware-/software configuration of the option module**

The parameters option module G configuration 1 ▹P0830◃ ... option module G configuration 8 ▹P0837◃ as well as option module H configuration 1 ▹P0840◃ ... option module H configuration 8 ▹P0847◃ provide the option modules on slot G and H module with module-specific configuration parameters. During initialization the option modules can read these parameters and make according initialization or settings. The meaning of the entries into these parameters is module-specific and can be read in the according option module manual.

**Configuration of the set- and actual value parameters**

We designate those parameters setpoints, which are cyclic written from the option card to the controller; actual values we designate the parameters, which are cyclic written from the controller. If there is a cyclic communication, a specified scope of set- and actual values is exchanged one to another in a defined period at a determined point of time. After switching on this configuration is read from the particular controller parameters and is notified to the option card. The option card on its part can assign a deviant configuration to the controller. This happens automatically on system initialization. After completion of this initialization, the configuration parameters in the controller show the configuration which is currently valid.

Moreover, after running up the system, that means in the running operation, an option card with the controller can declare and effectuate a change of configuration. In this case the controller configuration parameters reflect the changed configuration.

For the cyclic set- and actual value transmissions the kind and scope of the parameters are limited:

- The number of the possible set- and actual value transmissions between controller and option card are, at the moment, limited by the b maXX® controller of controller type 2 to eight setpoints and 8 actual values.
- Only those parameters may be cyclic written, which possess the attribute „cyclic writable“ (in this manual marked with CW).
- Only those parameters may be cyclic read, which have a 16- or 32-bit data type. Character strings of cyclic transfer are excluded. These can be read or can be written as service data.

**Setpoints:**

The parameters option module 1 master 1 para-number setpoint ▹P0801◃ to ▹P0808◃ specify the parameter numbers of max. 8 theoretical possible cyclic setpoints.

**Actual values:**

The parameters option modules 1 master 1 para-number actual value ▹P0809◃ to ▹P0816◃ specify the parameter numbers of the max. 8 theoretical possible cyclic actual values.

**Cyclic transfer rate:**

Parameter option module 1 master cycle time ▹P0800◃ and option module 2 master cycle time ▹P0860◃ specify at which intervals the controller (per 125 µs) places the cyclic transfer for the assigned slave (see parameter option module select ▹P0827◃:

The value refers to a multiple of 125 µs.

| Value | Meaning |
|---|---|
| 0 | no cyclic data exchange |
| 1 | not permissible |
| 2 | 250 µs |
| 3 | 375 µs |
| and so on | |

### 6.2.7.5 Definition of time of cyclic transfer

Option module 1 master 1 cycle offset setpoints ▹P0818◃ or
option module 2 master 1 cycle offset setpoints ▹P0878◃
as well as
option module 1 master 1 cycle offset actual values ▹P0819◃ or
option module 2 master 1 cycle offset actual values ▹P0879◃.
Specify the cycle offset for the data exchange of the set- or actual values for the according slaves. This offset defines in which controller cycle within a transfer period the data exchange for the set- or actual values shall occur.

When using two BACI slaves it is to be considered at cycle time parameterization, cycle offset setpoints and cycle offset actual values, that not both slaves exchange data in a controller cycle, because otherwise a time-slice time-error could occur during the running operation (error No. 19).

**Example:**

At the same cycle time (▹P0800◃) and (▹P0860◃) the offset values however should be

Option module 1 master 1 cycle offset setpoint ▹P0818◃ and
option module 1 master 1 cycle offset actual values ▹P0819◃ are not identical.

The accordant is valid for
Option module 2 master 1 cycle offset setpoints ▹P0878◃ and
option module 2 master 1 cycle offset actual values ▹P0879◃.

**NOTE!**

At an unfavorable choice of the cycle offsets, during the cyclic communication access conflicts between controller and option card can arise.

Therefore, if you change an offset without exact knowledge of the time coherences, the recommendations specified in the option module manuals should be followed!

### 6.2.7.6 Definition of time cyclic trigger signal generation

In the chosen data exchange interval the controller can read out a cyclic trigger signal to the option module. The offset (unit µs) option module 1 master 1 trigger offset ▹P0817◃ determines the temporal reference between the beginning of the communication interval and the output of the trigger signal.

### 6.2.7.7 Sequence cyclic communication:

The following diagram outlines the temporal process of a cyclic BACI communication between controller and ***an*** option card. In order to configure the option card the parameters ▹P0800◃ to ▹P0819◃ are used (option module select ▹P0827◃ have the value 0).

The following settings are effective:

The value refers to a multiple of 125 µs.

| Parameters | Value | Description |
|---|---|---|
| Option module 1 master 1 cycle time ▹P0800◃ | 4 | Data exchange every 500 µs. This accords to the sync-interval, on which the controller synchronizes. |
| Option module 1 master 1 cycle offset setpoints ▹P0818◃ | 0 | Setpoints are transmissioned in the controller cycle, which follows the sync pulse, that therefore means in the interval zero. |
| Option module 1 master 1 cycle offset actual values▹P0819◃ | 3 | Actual values are transferred in the third controller interval, that means in the last interval before the next sync pulse. |

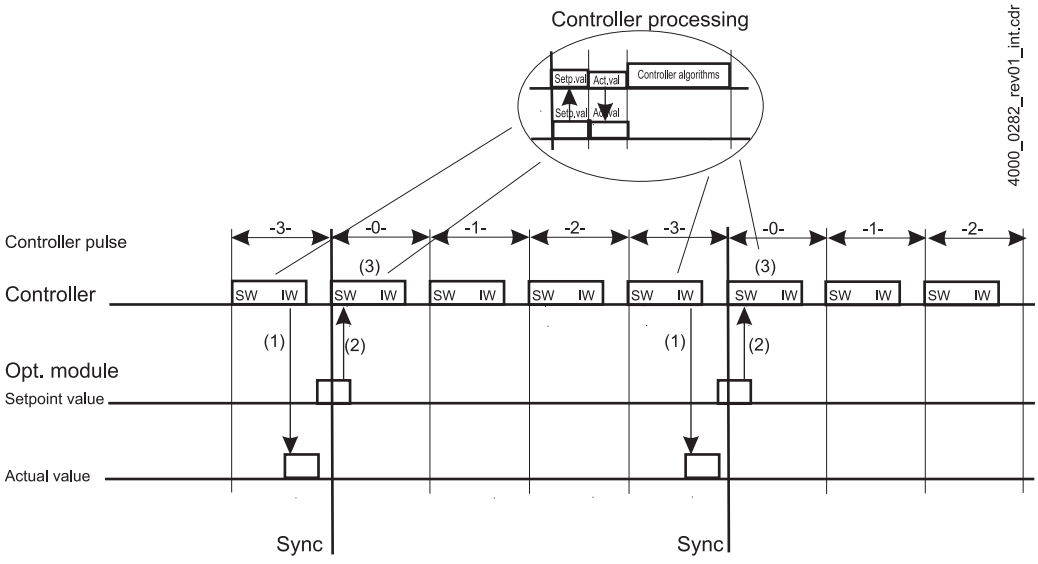



Figure 29: BACI timing cyclic communication

The individual processes during the communication are characterized in the diagram by parenthesized numerals, e. g. (3).

(1) Transmission of the actual values from the controller to the option card in the third controller interval. If necessary, the actual values are scaled within the option card and are made available to the field bus.

(2) Preparation of the setpoints by the option card and transmission of the setpoints to the controller

(3) Within the controller processing the setpoints are written into the target parameters and afterwards the control algorithms are calculated. At the end of the controller task new actual values are available.

The detail drawing of the controller processing shows, how the controller first reads in the setpoints over the BACI interface of the option card, then writes the actual values to the option card and then calculates the control algorithms.

### 6.2.7.8 Error monitoring

By the usage of BACI different error sources are possible.

- Configuration errors
- Delay errors

All errors are detected by the system and are signaled via the error mechanisms of the controller and are, for example, shown in WinBASS.

Parameter error in function- or option modules ▹P0204◃ shows, that there is an error in coherence with an option module. The error code in the parameters error option module G ... error option module H ▹P0245◃ ... ▹P0246◃ shows the exact cause of error. If there are two errors at one module simultaneously, the controller shows the most recent error code.

**Configuration errors**

The most configuration errors are:

| Errors | Meaning |
|---|---|
| Invalid parameter number for setpoint 1..8 | The parameter number doesn't exist or isn't cyclic writable |
| Invalid parameter number for actual value 1..8 | The parameter number doesn't exist or isn't cyclic readable (false data type) |
| False value für cycle time | The data of the communication interval is 0 or 1 |
| False value für cycle offset | The value for cycle offset, that means the information, in which the controller interval set- or actual values are exchanged is invalid. Cycle offset never may never be greater than or equal to the value of the cycle time, because the counting method of cycle offset begins at 0. |
| PCI-error or general reading error/writing error | Reading error/writing error on the configuration register of the option module - cause: module invalid. |
| Timeout within the configuration phase after system start | The option module doesn't initialize its BACI driver or it initializes it too late. Error reaction is.<br><br>Possible causes:<br>· At the PLC: Program is not started.<br>· At field bus cards: system initialization is not completed. |

**Delay errors**

Delay errors of the BACI can appear at all communication services during the cyclic communication and at the service data communication.

| Errors | Meaning |
|---|---|
| Invalid value at setpoint parameter 1... 8 | The cyclic to be written value violates the min-/max limit of the named parameter |
| BACI-timeout with cyclic data | The controller monitors the cyclic communication over a timeout mechanism. A timeout-counter starts at the first successful cyclic setpoint transmission. Every further successful cyclic setpoint transmission retriggers this time counter. |
| Access conflicts with slave at cyclic communication | At an unfavorable choice of the cycle offsets, during the cyclic communication access conflicts between controller and option card can arise.<br>Hence these offsets shouldn't be changed from the in the option module manuals given recommendations, without having exact knowledge of the temporal connections!<br>Corrective measures by access conflicts: Modification of the offset values. |
| Error cyclic communication: Alive-counter conflict | The so-called alive-counter-mechanism of BACI cyclically monitors the reciprocative existence and correct operating of the communication partner.<br>The controller signals an alive-counter conflict, if the option card doesn't react to the cyclic communication demands anymore.<br>Remedy: Restarting of the system, checking of the user program in the PLC, if the associated option module is a control. |

**Diagnosis**

For a diagnosis of the BACI-communication services the controller offers the following development parameters:

| Parameters | Meaning |
|---|---|
| ▹P3344◃ | Internal BM_u_BaciStatus. |
| ▹P3345◃<br>▹P3385◃ | Counter for access conflicts with option module. |
| ▹P3346◃<br>▹P3386◃ | Counter for Alive-Counter-Errors (see above) |
| ▹P3347◃<br>▹P3387◃ | Counter for reconfiguration operations during the current operation |
| ▹P3348◃<br>▹P3388◃ | Counter for the cyclic data exchange of setpoints. |
| ▹P3349◃<br>▹P3389◃ | Counter for den cyclic data exchange of actual values. |
| ▹P3350◃<br>▹P3390◃ | Counter for BACI commands |
| ▹P3351◃<br>▹P3391◃ | Counter for service data communication |

### 6.2.8 Application

Application parameter is placed at ones disposal, e. g.:

- Linking of in- and outputs
- Access via field busses or PLC

All application parameters are stored at the storing of data sets (retained).

## 6.3 Management

### 6.3.1 Drive management

The drive manager controls the essential system resources of the device. These are for example: the complete device control in the different operation modes, the change-over operation mode, troubleshooting, the managing of all communication interfaces and so on.

The device control occurs via a status machine, which is operated via the control word ▹P0300◃ and via hardware control inputs. Thereby, a control is possible via the hardware inputs, i. e. without operating the control word ▹P1001◃. The bits for the $U_{DC}$-control must be reset in parameter communication source.

The device control status machine is shown in ▹Figure 31◃ on page 74. The control word ▹P0300◃ and the accordant commands are precisely described in the parameter description.

The following control inputs are existent:

- Input reset errors: FX 3-4
  - A rising edge at this input enables an error reset.
- Pulse enable (IF):
  - Terminal: FX 3-5
    Enables the pulses of the PWM. This input directly effectuates the power unit driver. If there is a zero level here, no pulses can be enabled by the power unit.

- **Device control statuses**

  - NOT READY-TO-START
    - The electronics are voltage-supplied
    - Initialization is running
    - The device function is inhibited
    - “Ready-to-operate“ relay is OFF (device is not ready-to-operate)
    - Main contactor is not switched on

  - INHIBIT START
    - Software/hardware initialization is completed
    - Application can be reparameterized
    - Device function is inhibited
    - Switch-on is inhibited
    - “Ready-to-operate“ relay is OFF (device is not ready-to-operate)
    - Main contactor is not switched on

  - Main contactor - READY-TO-START
    - Application can be reparameterized
    - Device function is inhibited
    - Switch-on is inhibited
    - Main contactor is switched on
    - “Ready-to-operate“ relay is OFF (device is not ready-to-operate)

  - READY-TO-START
    - Application can be reparameterized
    - Device function is inhibited
    - Main contactor is switched on
    - Operation is enabled
    - “Ready-to-operate“ relay is ON (device is read-to-operate)

  - SWITCHED ON
    - Application can be reparameterized
    - Device function is inhibited
    - Power unit is ready for use, there is supply voltage
    - Main contactor is ON
    - “Ready-to-operate“ relay is ON (device is ready-to-operate)

- OPERATION ENABLED
  - Application can be reparameterized
  - Device function is enabled
  - “Ready-to-operate“ relay is ON (device is ready-to-operate)
  - Main contactor is ON
  - Ready-to-operate for drive (operation mode) is ON

- ERROR
  - Application can be reparameterized
  - Device function is inhibited
  - “Ready-to-operate“ relay is OFF (device is not ready-to-operate)
  - Main contactor is OFF
  - Ready-to-operate for drive (operation mode) is OFF

- UNREGULATED DC LINK VOLTAGE
  - Application can be reparameterized
  - Device function is LIMITED (power reduction is necessary)
  - “Ready-to-operate“ relay is ON (device is ready-to-operate)
  - Main contactor is ON
  - Ready-to-operate for drive (operation mode) is ON

Introduction of the device control display

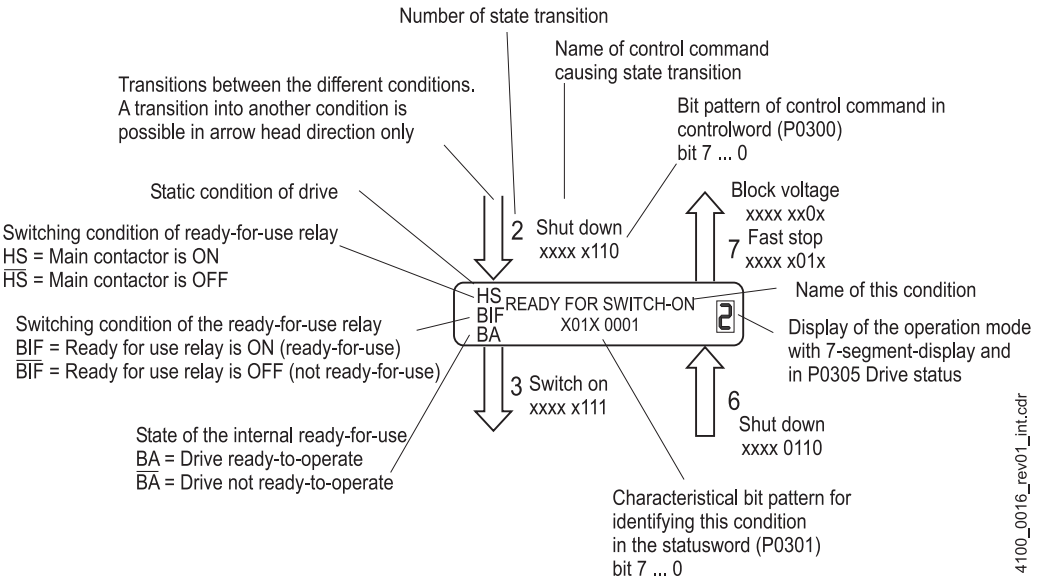


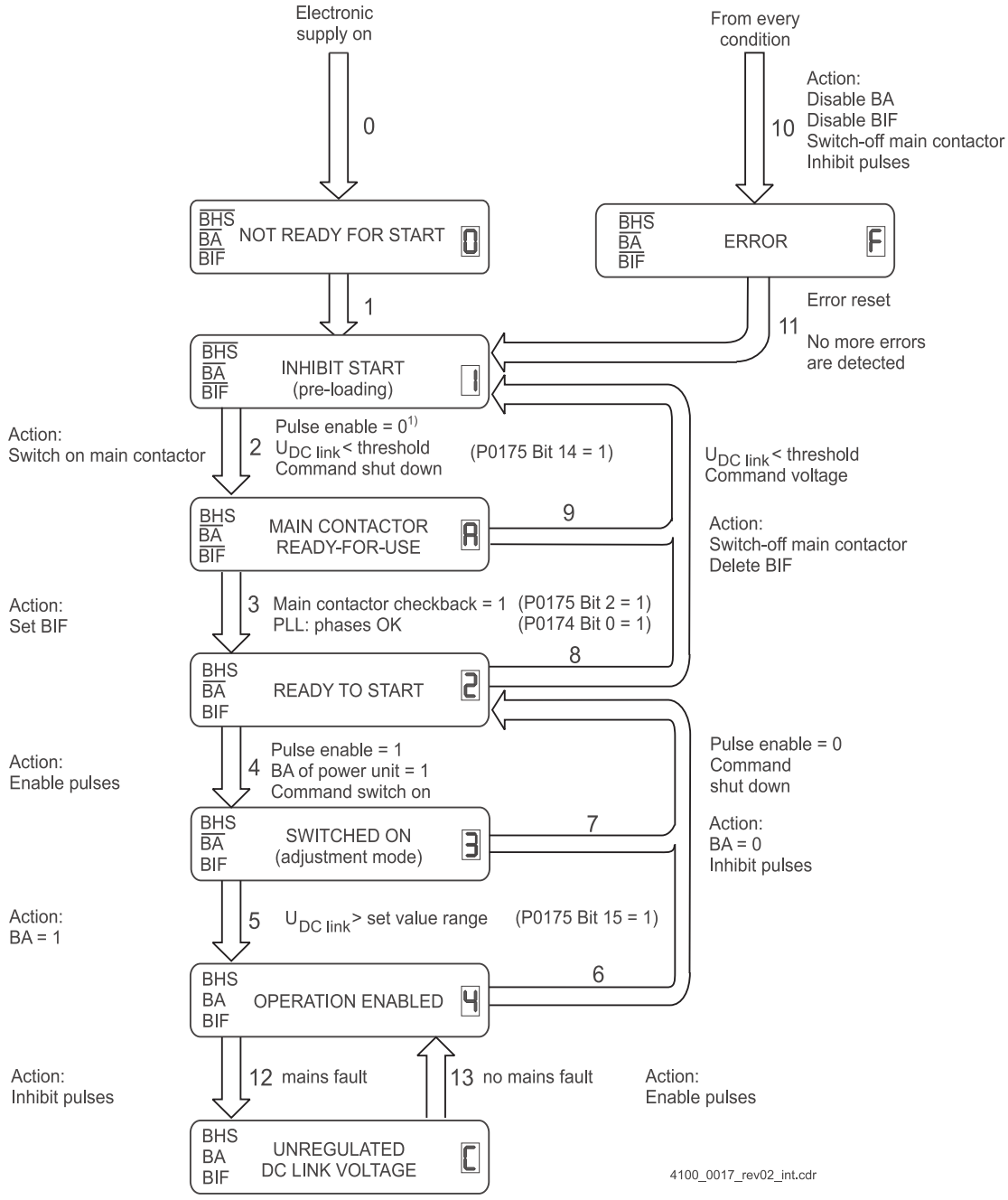

Figure 30: Introduction of the device control

Within the statuses (see above) the bits 7 ...0 of the status word ▹P0301◃ are shown in binary type as XXXX XXXX.

At the state transitions (arrows, see above) the bits 7 ....0 of the control word ▹P0300◃ are shown in binary form as xxxx xxxx.

All digits, which are marked with X (that means the bits of the status word) or x (that means the bits of the control word) are without a meaning for the control of the status machine and the representation of the current status.

- **Device control status machine**




BHS : Ready for main contactor ON
BA: Ready-to-operate drive
BIF: Ready for pulse enable

IF = 1: Pulse enable on 1-level (1 = high)
$\overline{IF}$ = 0: Pulse enable on 0-level (0 = low)

BA = 1: Ready-to-operate on 1-level (1 = high)
$\overline{BA}$ = 0: Ready-to-operate on 0-level (0 = low)

BIF = 1: Ready for pulse enable on 1-level (1 = high)
$\overline{BIF}$ = 0: Ready for pulse enable on 0-level (0 = low)

BHS = 1: Ready for main contactor ON on 1-level (1 = high)
$\overline{BHS}$ = 0: Ready for main contactor ON on 0-level (0 = low)

Figure 31: Device control status machine

- **State transitions of device control**

**0 Input of the status machine → NOT READY-TO-START**
- Event:
  - Switch on electronic power supply
  - Hardware reset or
  - Software reset
- Action:
  - “Ready-to-operate“ relay is switched off
  - Initialization and self-test are started

**1 NOT READY TO START → Inhibit start**
- Event:
  - Initialization and self-test are completed error-free
- Action:
  - Monitoring precharge is activated

**2 Inhibit start → MAIN CONTACTOR READY-TO-START**
- Event:
  - Precharge successful
  - Ready for main contactor ON
- Action:
  - Main contactor ON = 1

**3 MAIN CONTACTOR READY-TO-START → READY-TO-START**
- Condition:
  - Main contactor monitoring ok
- Action:
  - Signal ready for pulse enable = 1

**4 READY-TO-START → SWITCHED ON**
- Event:
  - Command “switch on“
- Condition:
  - Pulse enable FX3-5 = 1
  - Power unit signal ready-to-operate
- Action:
  - Monitoring DC-link voltage is activated
  - Monitoring ready-to-operate of the power unit is activated
  - Pulses are enabled, $U_{DC}$ is controlled

**5 SWITCHED ON → ENABLED**
- Event:
  - $U_{DC} > U_{DC}$ - setpoint
- Action:
  - Ready-to-operate relay is switched on
  - BA of DIO = 1 and FX3-1 = 1

**6 ENABLED → READY-TO-START**

- Event:
  - Pulse enable FX3-5 = 0
    or
  - command “shut down“
- Action:
  - Device function is inhibited, pulse is inhibited
  - “Ready-to-operate“ relay is switched off
  - BA of DIO = 0 and FX3-1 = 1
  - Monitoring ready-to-operate of the power unit is switched off

**7 SWITCHED ON → READY-TO-START**

- Event:
  - Pulse enable FX3-5 = 0
    or
  - command “shut down“
- Action:
  - Device function is inhibited, pulse is inhibited
  - Monitoring ready-to-operate of the power unit is switched off

**8 READY-TO-START → INHIBIT START**

- Event:
  - $U_{DC}$ < threshold
  - Command “inhibit voltage”
- Action:
  - Main contactor is switched off
  - Device is inhibited
  - BIF = 0

**9 MAIN CONTACTOR READY-TO-START → INHIBIT START**

- Event:
  - $U_{DC}$ < threshold
  - Command “inhibit voltage”
- Action:
  - Main contactor is switched off
  - Device is inhibited

**10 all statuses → ERROR**

- Event:
  - Device error is recognized
- Action:
  - Main contactor is switched off
  - Device function is inhibited, pulse is inhibited
  - “Ready-to-operate“ relay is switched off
  - BA of DIO = 0
  - Monitoring ready-to-operate of the power unit is switched off
  - BIF = 0

**11 ERROR → INHIBIT START**

- Event:
  - Command “reset error“ or
  - RESET ERROR MEMORY input = 0✹ 1 (rising edge)
- Condition:
  - Error doesn't exist anymore
- Action:
  - Reset error is carried out
  - Monitoring precharge is activated

**12 ENABLED → UNREGULATED DC LINK VOLTAGE**

- Event:
  - Mains fault, but no power failure
- Condition:
  - ▹P1007◃ error reaction = 1
- Action:
  - Pulses are inhibited
  - Power limit reached from DIO = 1

**13 UNREGULATED DC LINK VOLTAGE → ENABLED**

- Event:
  - Mains fault no longer detected
- Action:
  - Pulses are enabled, $U_{DC\ link}$ is controlled
  - Power limit reached from DIO = 0

The status change only operates, if the actions have completely been carried out. The sequence of the actions is the same as their execution during condition change. After complete controller processing of the actions the next status is reached and new commands are accepted.

- Control of the ready-to-operate relay

The switching condition of the ready-to-operate relay is only changed at the following transition conditions.

| Transition | Switching action at the ready-to-operate relay | Comment |
|---|---|---|
| 0 | Switch off | Beginning of initialization of the device |
| 5 | Switch on | $U_{DC}$ is controlled |
| 13 | Switch off | An error has occurred in the device. |
| 6 | Switch off | Pulse enable = 0 or error |

The outcome for each status of the drive manager is a definite operating status for the ready-to-operate relay.

| Status | Operating status of the ready-to-operate relay |
|---|---|
| NOT READY-TO-START | OFF |
| INHIBIT START | OFF |
| MAIN CONTACTOR-READY-TO-START | OFF |
| READY-TO-START | OFF |
| SWITCHED ON | OFF |
| OPERATION ENABLED | ON |
| ERROR REACTION ACTIVE | OFF |
| ERROR | OFF |
| UNREGULATED DC LINK VOLTAGE | ON |

### 6.3.2 Data set management

A description of the data set management function principle you will find in chapter ▹Data Set Management◃ from page 13.

### 6.3.3 PSI-management

The description of the mode of functioning of the **PSI** (**P**arameter **S**torage **I**nterface) is to be found in chapter ▹Data Set Management◃ from page 13.

## 6.4 Setpoint generators

### 6.4.1 Ramp function generator

The ramp function generator is for the generation of acceleration- or deceleration ramps of the setpoint of the DC-link voltage in the DC-link voltage control.

The ramp function generator has an input with a separately ramp-up- and ramp-down time.

The input value of the acceleration encoder is an absolute variable in V.

The ramp grade for the rising and the decrease of the DC-link voltage is determined by the acceleration- or deceleration time. The times thereby refer to 0 V setpoint change.

For the further acceleration- or deceleration a smoothing element (smoothening) with an adjustable time constant is connected to the ramp function generator.

The ramp function generator offers the following control possibilities directly via the control word also see ▷P0300◁ on page 114:

- Stop ramp function generator (freeze output value)

Furthermore the negative setpoint at the ramp function generator is inhibited.

### 6.4.2 Setpoint generator

#### 6.4.2.1 Fix setpoint

The setpoint generator 1 generates a constant setpoint of the DC link voltage.

The setpoint generator is able to effectuate the following target parameter (adjustable via ▷P0440◁ setpoint generator mode):

- Fix setpoint

Normally $U_{DC\ link}$ should calculated as follows:

$$U_{DClink} = 1,35 \cdot U_{mains}(\underbrace{phase - phase}_{\text{line to line}}) + 100\ V$$

### 6.4.2.2 Time controlled setpoint

The setpoint generator 2 generates for each of the four time zones a constant setpoint. Thereby the setpoint and the time is adjustable for every zone.

The setpoint generator 2 is able to effectuate the following target parameters (adjustable via ▷P0440◁ setpoint generator mode):

- Time control

In this mode the output time for the according setpoint is set with the time.

Furthermore it can be set, if after expiration of the last time zone the setpoint generator starts with the first time zone again (endless operation), or if only one cycle is passed through and the last setpoint remains.

Therewith, e. g. the following $U_{DC}$-setpoint variation can be generated:

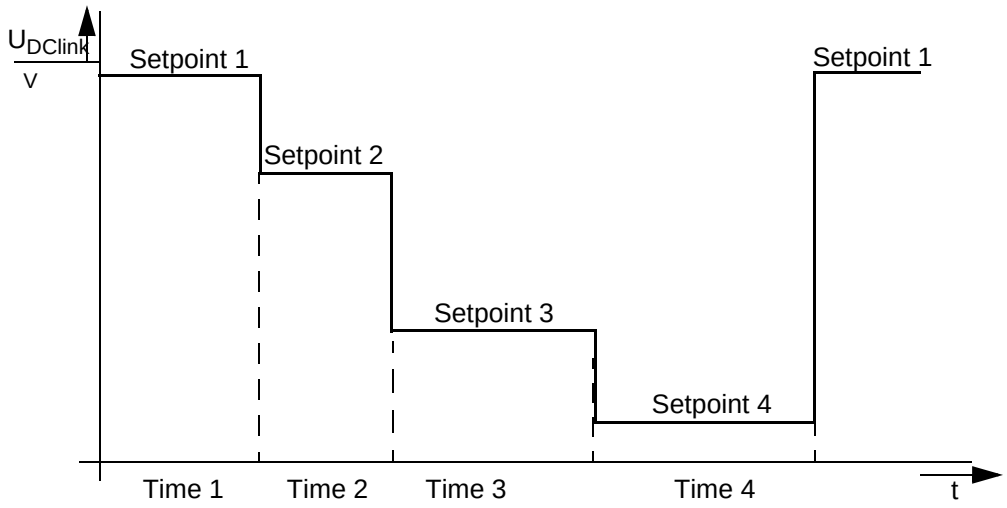



Figure 32: Setpoint generator $U_{DC}$-setpoint variation

The setpoint generator 2 has a cycle time of 16 ms and is only active if the device is enabled. After enable of the device it is always started with the first setpoint from the profile, which was set.

### 6.4.2.3 Setpoint depending on mains voltage

from firmware-version FW 03.07

The setpoint generator 3 generates the setpoint of DC link voltage, which depends on the mains voltage.

The setpoint generator 3 is able to effectuate the following target parameters (adjustable via ▹P0440◃ setpoint generator mode):

- depends on mains voltage

A hysteresis has been set:

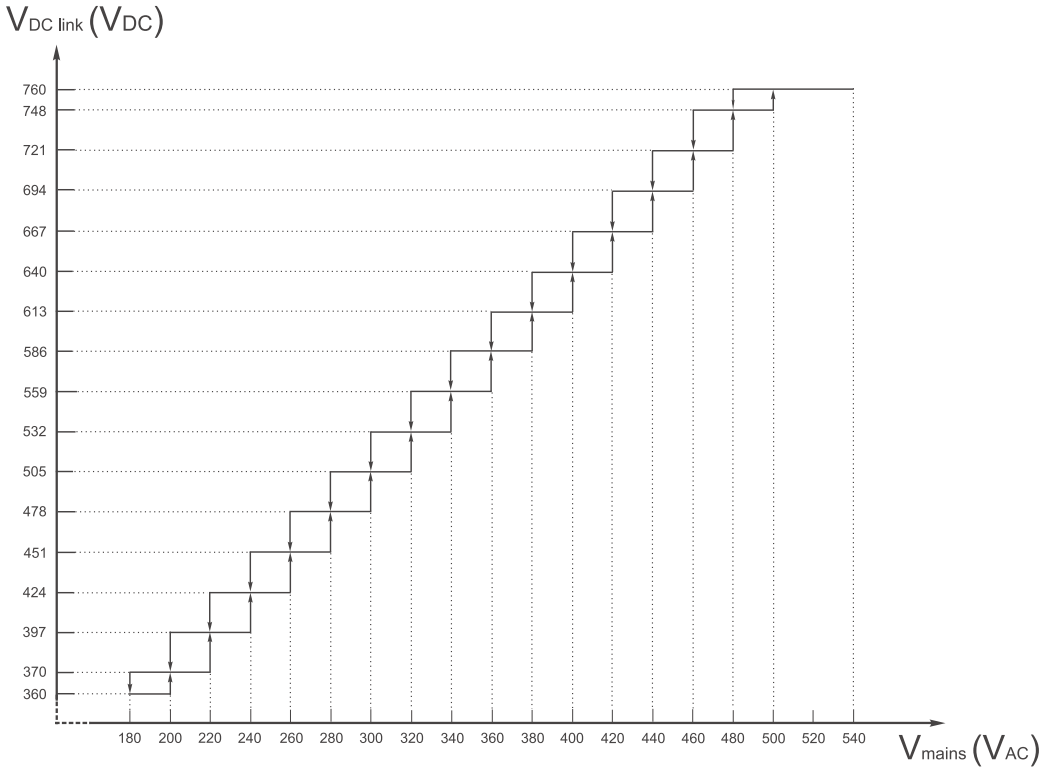



Figure 33: DC link voltage depending on the mains voltage

## 6.5 Diagnosis

### 6.5.1 Oscilloscope function

For the quick and user-friendly commissioning the b maXX® controller offers an integrated oscilloscope function.

Function range of oscilloscope function:

| | |
|---|---|
| Number of channels: | 8 |
| Sampling time: | $2^n$ * 125 µs (n = 0....65535) |
| Recording: | triggered or not triggered |
| Triggering: | • by internal status change,<br>• change of value or<br>• external digital or analog inputs |
| Number of triggers | 2 |
| Trigger linking: | Logic operation of both trigger events: AND, OR, XOR |
| Trigger time referring to memory depth: | programmable 0 ... 100 %<br>(i. e. recording with or without history referring to the trigger event) |
| Trigger sources: | • digital signals (selection of relevant bits via bit masks possible) e. g.:<br>  ○ status change<br>  ○ error- or warning events<br>  ○ external digital inputs<br>• analog signals<br>  ○ set- or actual values<br>  ○ analog inputs |

1 Command, in order to initiate recording in bmaXX® controller.
2 Command to interrupt a running recording. Then no values are shown.
3 Command to start a recording with the trigger condition (trigger settings (see ▷Oscilloscope configuration◁ from page 83)).
4 Export recorded measuring data to an external CSV file (table).
5 Invoking dialog „oscilloscope configuration“
(also see ▷Oscilloscope configuration◁ from page 83).
6 Buttons to position the scales.
7 Buttons to switch on or switch off the measuring curves.
8 Invoking dialog „oscilloscope limits“
(also see ▷Oscilloscope scaling◁ from page 83).
9 The larger the storage of oscilloscope is set, the longer the measuring values are recorded, but also the longer the transmission of data will take.

### Oscilloscope configuration

In this window trigger conditions can be configured and the source parameters for the maximum of eight channels can be selected. The deactivating of record channels enlarges automatically the available record buffer for the remaining channels.

### Oscilloscope scaling

There is the possibility to set limits for each scale of the measuring curves. In mode „user limits“ the limits, which where set on this dialog are immediately accepted. At „auto. limits“ automatically calculated limits are set from the recorded minimum and maximum values.

7

# PARAMETERS

For the controller b maXX® 4100 there are more than 300 parameters, which are described in this chapter.

## 7.1 Structure of controller parameter range

Every parameter has

- a name,
- an association to a function group,
- an unique number,
- a data type,
- and fixed attributes or characteristics.

### 7.1.1 Range of numbers

Not all parameter numbers have been assigned yet - according to function association and meaning. The following table shows the parameter range of numbers:

| Range | Parameter numbers from | up to |
|---|---|---|
| Reserved for invalid number | 0 | 0 |
| Controller identification | 1 | 5 |
| Power unit identification | 6 | 49 |
| Data for the mains inverter | 170 | 189 |
| Actual values and operational data | 190 | 599 |
| Reserved | 600 | 859 |
| BACI configuration | 860 | 879 |
| Reserved | 880 | 899 |
| Array parameters | 900 | 999 |
| Active data set | 1000 | 1999 |

| Range | Parameter numbers from | up to |
|---|---|---|
| Oscilloscope function | 2000 | 2029 |
| System | 2030 | 2049 |
| Reserved | 2050 | 2999 |
| Development parameters | 3000 | 3499 |
| Reserved | 3500 | 65535 |

### 7.1.2 Field bus addressability

Access on parameters by use of field busses is done using the parameter numbers only. Some field busses do not support 16-bit-numbers or limit the valid range of numbers. Thereby the arrangement of the parameters in number ranges for b maXX was selected in such a way, that all parameters relevant for the operation of the controller are addressable by standardized field busses.

**NOTE!**

When handling data set parameters, you can access by use of the parameter number only the parameters of the active data set.

Overview of field busses and accessability of appliance parameters.

| Field bus | Directly accessible parameter range in LC/MC appliance | Manufacturer parameter number in protocol | Expansion by two-step access possible |
|---|---|---|---|
| OPC | All | Parameter name | Not necessary |
| USS | 0 - 2047 | Para No. | yes |
| PROFIBUS | 0 - 1999 (without 900 - 999) | Para No. | yes |
| CANopen | 0 - 16384 | Para No. + $4000_{hex}$ | yes |
| CANsync | 0 - 4095 | Para No. | yes |
| Sercos | 0 - 4095 | Para No. + $8000_{hex}$ | yes |

### 7.1.3 Data type

Every parameter has a data type. The data type reflects the number of bytes occupied by the parameter and the interpretation of each single bit. The b maXX recognizes the following data types:

| Data type | Bit number | Value range |
|---|---|---|
| INT | 16 | -32768 to 32767 |
| UINT | 16 | 0 to 65,535 |
| DINT | 32 | -2,147,483,648 to 2,147,483,647 |
| UDINT | 32 | 0 to 4,294,967,295 |
| WORD | 16 | 0 to $FFFF_{hex}$ |
| DWORD | 32 | 0 to $FFFFFFFF_{hex}$ |
| STRING | 80 * 8 | 80 ASCII characters |

Some parameters become standardized from the ranges of integer values stated in the table above into smaller or bigger ranges of values. WinBASS II/ProDrive carries out this scaling automatically, but at accesses via external field buses it eventually must be taken into account.

Example:

Parameters **P0171 PSU DC link actual mains voltage (filtered)**

Data type = UINT (normal range of values, 0 to 65535)

Scaled range of values: 0 to 2160 V.

One increment equals 0.03296 volts

### 7.1.4 Attributes

Every parameter can have one or more attributes - see detailed parameter description

| Attributes | Meaning |
|---|---|
| A | Parameter only serves as display (identification, operational status, actual value, etc.) |
| EE | The parameter is part of the “Central data“ and can be stored in EEPROM. This parameter will be automatically loaded from the controller’s internal EEPROM when the controller is started. |
| DS | Data set parameter<br>This parameter can be stored to one of the four existing data sets. When the controller is switched on it will be loaded automatically out of the controller-internal EEPROM. |
| - | The parameter will not be stored (effective for e.g. actual values) |
| CW | The parameter may (e. g. via a field bus) be written cyclical. Normally this affects synchronously to be written setpoints or the control word of the controller. Parameters, who don’t have this attribute, can be written to only by using the service data communication (or WinBASS II/ProDrive) - thereby consider parameter ’Communication source’ ▷P1001◁. |

### 7.1.5 Reserved bits

In the description of the parameters, especially of the mode parameters and status parameters several bits are marked as reserved. The bits can obtain an importance with future extensions. For these bits the following is valid:

- In setting parameters the bits are to be set to 0.
- In status parameters these bits are not to be evaluated.

## 7.2 Structure of the parameter description

All parameter descriptions are based on the following scheme:

| | | | |
|---|---|---|---|
| **P1172** | Hochlaufgeber Hochlaufzeit | 0.00 to 650.00 s | |
| DS | **Ramp function generator ramp-up time** | 0.00 s | |
| | BM_u_Ds0_RFG1RampUpTime | 100:1 | CW |

The different branches of the scheme are described below:

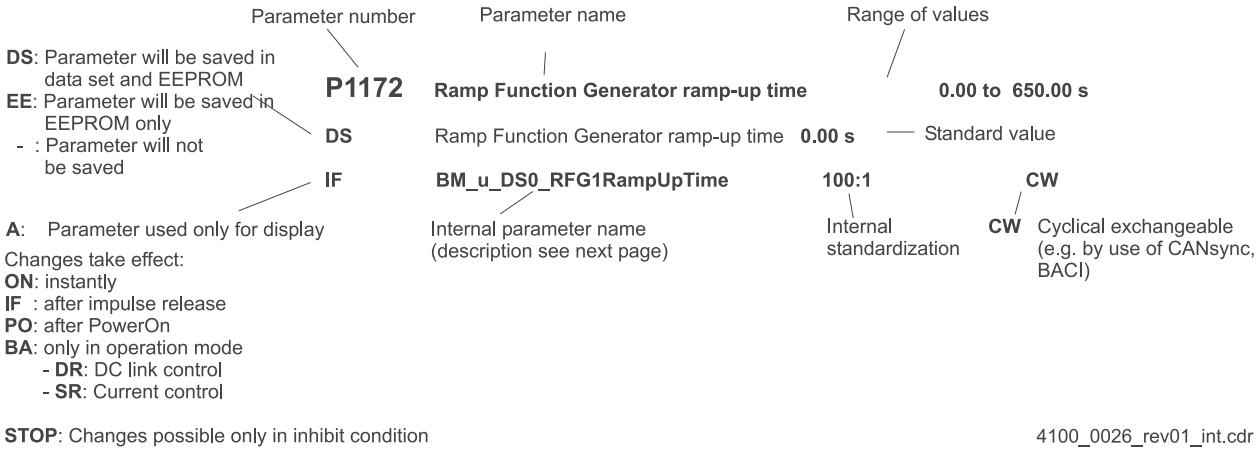



Figure 34: Parameter description scheme

The construction of the internal parameter name is shown below:

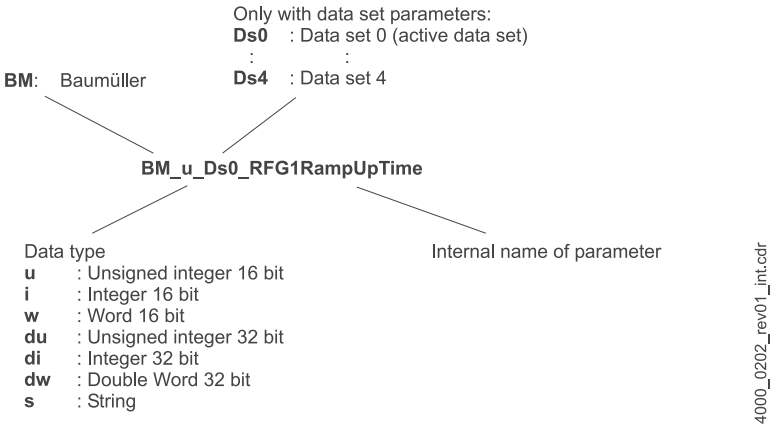



Figure 35: Construction of internal parameter name

In the tables in which we have listed the meaning of the single error bits, you will also find - by certain parameters - the column „reaction“ and „following parameter“. Thereby was meant:

**Reaction**

IS = Pulse inhibit, the drive reacts to this error with pulse inhibit. This reaction can, on behalf of the security, not be changed.

**Settable** = You can adjust the reaction of the drive to this error. Use for the selection of the code the following table:

| Selection code | Function | Name |
|---|---|---|
| 0 | Pulse inhibit | DRIVE_REACTION_PULSEINHIBIT |
| 1 | Deceleration on the ramp function generator | DRIVE_REACTION_RFG_STOP |
| -1 | No reaction | DRIVE_REACTION_NONE |

**Following parameters**

With following parameters we denote the parameter(s), in which further details according an error event are shown.

Example:
In the parameter ▷P0206◁ an error is shown by bit 0 (error No. 80), which was set. In the „following parameter“ ▷P0233◁ then the exact error cause of the communication error by means of the displayed error number can be read off there.

## 7.3 Parameter description

| | | | |
|---|---|---|---|
| **P0001** | Regler Typ | 1 to 3 | |
| - | **Controller type** | 1 | |
| A | BM_u_ControllerType | 1:1 | - |

Identification of controller type.

| Value | Meaning |
|---|---|
| 1 | LC controller |
| 2 | LC controller with 28xx-processor(LC2) |
| 3 | LC controller with 28xx-processor (LC3) |

| | | | |
|---|---|---|---|
| **P0002** | Regler Firmware-Typ | 0 to 65535 | |
| - | **Controller firmware type** | 0 | |
| A | BM_u_SoftwareType | 1:1 | - |

Differentiation between standard firmware and customized firmware.

| Value | Meaning |
|---|---|
| 0 | Standard software |
| 1 to 65535 | Customized software |

| | | | |
|---|---|---|---|
| **P0003** | Regler Firmware-Nummer | 0 to 65535 | |
| - | **Controller firmware ID** | 0 | |
| A | BM_u_SoftwareID | 1:1 | - |

Baumüller internal software number.

| | | | |
|---|---|---|---|
| **P0004** | Regler Firmware-Version | 0.00 to 655.35 | |
| - | **Controller firmware version** | 0.00 | |
| A | BM_u_SoftwareVersion | 100:1 | - |

Version of the software, which is used.

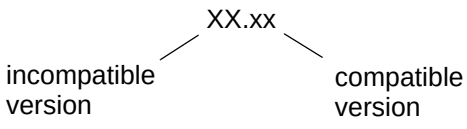



Figure 36: Controller software version

| | | | |
|---|---|---|---|
| **P0005** | Parametertabellen-Version | 0 to 65535 | |
| - | **Parameter table version** | 0 | |
| A | BM_u_ParamTableVersion | 1:1 | - |

Version of parameter table used.

| | | | |
|---|---|---|---|
| **P0006** | Leistungsteil-Typenschlüssel | 20 ASCII characters | |
| - | **Power unit type code** | "" | |
| A | BM_s_AmpType | 1:1 | - |

Display of power unit type key. 0 means unknown power unit.

| | | | |
|---|---|---|---|
| **P0007** | Leistungsteil Seriennummer | 0 to 65535 | |
| - | **Power unit serial number** | 0 | |
| A | BM_ud_AmpSerialNr | 1:1 | - |

Display of power unit serial number. 0 means unknown serial number.

| | | | |
|---|---|---|---|
| **P0008** | Leistungsteil Datenkonfiguration | 0 to 65535 | |
| - | **Power unit data configuration** | 0 | |
| A | BM_u_AmpDataConfig | 1:1 | - |

Baumüller internal power unit data code.

| | | | |
|---|---|---|---|
| **P0009** | Leistungsteil Firmware-Version | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Power unit firmware version** | $0_{hex}$ | |
| A | BM_u_AmpSW_Version | 1:1 | - |

Version of power unit software.

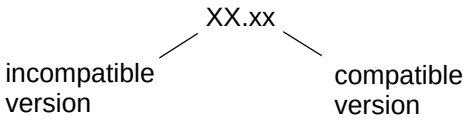



Figure 37: Software version of power unit

Example: $0201_{hex}$ is according to software version 2.01.

| | | | |
|---|---|---|---|
| **P0012** | Leistungsteil Nennstrom 8 kHz | 0.0 to 6553.5 A | |
| EE | **Power unit nominal current 8kHz** | 2.5 A | |
| A | BM_u_AmpNomCurrent8kHz | 10:1 A | - |

Display of power unit nominal current at 8 kHz switching frequency.

| | | | |
|---|---|---|---|
| **P0013** | Leistungsteil Maximalstrom 8 kHz | 0.0 to 6553.5 A | |
| EE | **Power unit peak current 8kHz** | 2.5 A | |
| A | BM_u_AmpPeakCurrent8kHz | 10:1 A | - |

Display of power unit peak current at 8 kHz switching frequency. The peak current is greater or equal to the power unit nominal current at 8 kHz.

| | | | |
|---|---|---|---|
| **P0014** | Leistungsteil Überlastzeit 1 | 0.00 to 655.35 s | |
| EE | **Power unit overload time 1** | 1.00 s | |
| A | BM_u_AmpTimeConst1kHz | 100:1 s | - |

Display of defined time constant in the power unit “overload time 1". During the overload time 1 the power unit can be operated with peak current. After that, the current will be limited to the nominal current.

| | | | |
|---|---|---|---|
| **P0015** | Leistungsteil Überlastzeit 2 | 0.00 to 655.35 s | |
| EE | **Power unit overload time 2** | 1.00 s | |
| A | BM_u_AmpTimeConst2 | 100:1 s | - |

Display of defined time constant in the power unit “overload time 2". During the overload time 2 the power unit can be operated with peak current. After that, the current will be limited to the nominal current.

| | | | |
|---|---|---|---|
| **P0016** | Leistungsteil Innenraum-Warntemperatur | 0 to 125 °C | |
| EE | **Power unit internal device warning temperature** | 75 °C | |
| ON | BM_u_AmpAmbientWarnTemp | 1:1 | - |

Warning threshold for interior air temperature within power unit. If the inside air temperature exceeds this threshold, warning 16 is generated. The warning threshold of every power unit has a predefined individual value. Warning threshold can be changed.

## P0017

| | | | |
|---|---|---|---|
| | Leistungsteil Inneraum-Abschalttemperatur | 0 to 125 °C | |
| EE | **Power unit internal device shutdown temperature** | | |
| A | BM_u_AmpAmbientMaxTemp | 1:1 °C | - |

Display of shutdown threshold for interior air temperature. If the interior air temperature exceeds this threshold, the power unit will be shut down and error 85 will be generated.

## P0018

| | | | |
|---|---|---|---|
| | Leistungsteil Kühlkörper-Warntemperatur | 0 to 125 °C | |
| EE | **Power unit heatsink warning temperature** | 75 °C | |
| ON | BM_u_AmpHeatsinkWarnTemp | 1:1 °C | - |

Warning threshold for heatsink temperature within power unit. If the heatsink temperature exceeds this threshold, warning 17 is generated. The warning threshold of every power unit has a predefined individual value. Warning threshold can be changed.

## P0019

| | | | |
|---|---|---|---|
| | Leistungsteil Kühlkörper-Abschalttemperatur | 0 to 125 °C | |
| EE | **Power unit heatsink shutdown temperature** | | |
| A | BM_u_AmpHeatsinkMaxTemp | 1:1 °C | - |

Display of shutdown threshold for heatsink temperature. If the heatsink temperature exceeds this threshold, the power unit is shut down and error 81 is generated.

## P0020

| | | | |
|---|---|---|---|
| | Leistungsteil Uzk-Nennwert | 280 to 1000 V | |
| EE | **Power unit nominal voltage** | 540 V | |
| | BM_u_AmpNomDcLinkVolt | 1:1 V | - |

Nominal value of DC link voltage for internal voltage scaling within control. This value should be always 540 V independent on $U_{DC}$ link setpoint (▹P1353◃).

## P0021

| | | | |
|---|---|---|---|
| | Leistungsteil Totzeit | 0.0 to 6553.5 µs | |
| EE | **Power unit dead time** | 0.0 µs | |
| A | BM_u_AmpDeadTime | 10:1 µs | - |

Dead time required for power transistors. Internal value, not relevant for user.

## P0022

| | | | |
|---|---|---|---|
| | Leistungsteil Bürdenfaktor Iac | -1.65 to 1.65 V | |
| EE | **Power unit burden factor Iac** | 0 V | |
| A | BM_i_AmpBurdenFactor_Iac | 100:1 V | - |

Conversion factor for current measuring. Internal value, not relevant for user.

## P0023

| | | | |
|---|---|---|---|
| | Leistungsteil Bürdenfaktor Vdc | 0.00 to 10.00 V | |
| EE | **Power unit burden factor Vdc** | 0 V | |
| A | BM_u_AmpBurdenFactor_Vdc | 100:1 V | - |

Conversion factor for DC link voltage measurement. Internal value, not relevant for user.

Displayed value accords to 1000 V $U_{DC\ link}$.

## P0024

| | | | |
|---|---|---|---|
| | Leistungsteil Modus | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Power unit mode** | $0_{hex}$ | |
| | BM_w_AmpMode | 1:1 | - |

Setting for behavior of power unit.

| Bit No. | Meaning |
|---|---|
| 0 | 0: Fan is controlled via the heatsink temperature of the power unit<br>1: Fan is switched on with mains-on signal |
| 15 ... 1 | reserved |

## P0030

| | | | |
|---|---|---|---|
| | Leistungsteil Bürdenfaktor Netzspannung | 0 to 65535 | |
| A | **Power unit burden factor Vmain** | 0 | |
| | BM_u_AmpBurdenFactor_Main | 1:1 | - |

Power unit-specific burden factor for the measurement of the mains voltage.

## P0170

| | | | |
|---|---|---|---|
| | Einspeiseeinheit Netzspannung gefiltert | 0 to 763.6 V | |
| - | **PSU actual mains voltage (filtered)** | 0 V | |
| A | BM_u_ActMainVoltFiltered | $4000_{hex}$:100 % | - |

Display of filtered mains voltage (smoothing time = 8 ms).

Scaling: 100 % ↔ Power unit $U_{DC\ link}$ nominal value (▹P0020◃)/$\sqrt{2}$

## P0171

| | | | |
|---|---|---|---|
| | Einspeiseeinheit UZK-Istwert gefiltert | 0 to 1080 V | |
| - | **PSU DC link actual mains voltage (filtered)** | 0 V | |
| A | BM_u_ActDCLinkVoltFiltered | $4000_{hex}$:100 % | - |

Display of the filtered DC-link voltage. The smoothing time is set in ▹P1342◃.

Scaling: 100 % ↔ Power unit $U_{DC\ link}$ nominal value (▹P0020◃)

## P0172

| | | | |
|---|---|---|---|
| | Einspeiseeinheit Netzleistung-Istwert | -3276.8 to 3276.7 kW | |
| - | **PSU actual mains power** | 0 kW | |
| A | BM_i_ActMainPower | 10:1 kW | - |

Display of measured mains power.

## P0173

| | | | |
|---|---|---|---|
| | Einspeiseeinheit Netzfrequenz-Istwert gefiltert | 0 to 312.5 Hz | |
| - | **PSU actual mains frequency** | 0 Hz | |
| A | BM_i_ActMainFreqFiltered | 65535/312.5 Hz | - |

Display of measured mains frequency (smoothing time = 20 ms).

## P0174

| | | | |
|---|---|---|---|
| | Einspeiseeinheit Status 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **PSU status1** | 0 | |
| A | BM_w_PSU_Status1 | 1:1 | - |

Status 1 of supply unit

| Bit No. | Meaning |
|---|---|
| 0 | 1: Mains ok |
| 3 ...1 | Reserved |
| 4 | 1: Phase failure |
| 5 | 1: Power failure |
| 6 | 1: Undervoltage |
| 7 | 1: Overvoltage |
| 8 | 1: Error phase sequence identification |
| 9 | 1: Frequency change > 5 Hz/s |
| 10 | 1: Frequency range exceeded |
| 11 | 1: Errors mains connection |
| 12 | 1: Errors $U_{DC}$ min |
| 13 | 1: Error synchronization |
| 15 ... 14 | Reserved |

| | | | |
|---|---|---|---|
| **P0175** | Einspeiseeinheit Status2 | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **PSU status2** | 0 | |
| A | BM_w_PSU_Status2 | 1:1 | - |

Status 2 of supply unit

| Bit No. | Meaning |
|---|---|
| 0 | Main contactor control<br>0: Main contactor off<br>1: Main contactor on |
| 1 | Monitoring main contactor<br>0: None<br>1: O.K. |
| 2 | Monitoring after debouncing operation<br>0: None<br>1: O.K. |
| 3 | Phase sequence<br>0: Clockwise<br>1: Counter-clockwise |
| 4 | Phase sequence identification<br>0: Not completed<br>1: Completed |
| 5 | Offset compensation<br>0: Not completed<br>1: Completed |
| 6 | Mains frequency<br>0: 50 Hz<br>1: 60 Hz |
| 7 | Mains frequency measurement<br>0: Not executed<br>1: Executed |
| 8 | Monitoring mains connection<br>0: Not executed<br>1: Executed |
| 9 | Precharging<br>0: Off<br>1: On |
| 10 | Current limit reached<br>0: No<br>1: Yes |
| 11 | Energy direction<br>0: Supply<br>1: Feedback |
| 13 ... 12 | Reserved |
| 14 | Precharging<br>0: Not completed<br>1: Completed |
| 15 | Ready-to-operate<br>0: Not ready<br>1: ready |

| | | | |
|---|---|---|---|
| **P0176** | Einspeiseeinheit Status3 | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **PSU status 3** | 0 | |
| A | BM_w_PSU_Status3 | 1:1 | - |

Status 3 of supply unit

| Bit No. | Meaning |
|---|---|
| 0 | 0: ID Set-ID Actual < Diff_Id_Max<br>1: ID Set-ID Actual >= Diff_Id_Max |
| 1 | 0: Iq Set-Iq Actual < Diff_Iq_Max<br>1: Iq Set-Iq actual >= Diff_Iq_Max |
| 2 | 0: Vdc Set-Vdc actual < Diff_Vdc_Max<br>1: Vdc Set-Vdc actual >= Diff_Vdc_Max |
| 14 ... 3 | Reserved |
| 15 | 0:Not ready for precharge<br>1: Ready for precharge |

| | | | |
|---|---|---|---|
| **P0177** | Einspeiseeinheit UZK-Regler Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **PSU DC link controller status** | 0 | |
| A | BM_w_PSU_VdcCtrlStatus | 1:1 | - |

Status 1 of supply unit.

| | | | |
|---|---|---|---|
| **P0178** | Einspeiseeinheit Ausgangswert des Hochlaufgebers | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| - | **PSU ramp function generator output** | 0 | |
| A | BM_ud_PSU_RFPOutput | 1:1 | - |

Status 1 of supply unit.

| | | | |
|---|---|---|---|
| **P0179** | Einspeiseeinheit UZK-Sollwert | 280 V to 800 V | |
| - | **PSU DC link voltage set voltage** | 640 V | |
| A | BM_u_PSU_DClinkVoltSetBUC | 1:1 | CW |

This parameter is only for the display.

| | | | |
|---|---|---|---|
| **P0180** | Einspeiseeinheit SWG Sollwert1 | 280 V to 800 V | |
| EE | **PSU SVG setpoint 1** | 640 V | |
| | BM_u_PSU_SVGSetvalue1 | 1:1 V | CW |

This parameter can be used with values of -280 V to +800 V. The setpoints are switched onto the setpoint generator output depending on the assigned time.

## P0181

| | | | |
|---|---|---|---|
| | Einspeiseeinheit SWG Sollwert2 | 280 V to 800 V | |
| EE | **PSU SVG setpoint 2** | 640 V | |
| | BM_u_PSU_SVGSetvalue2 | 1:1 V | CW |

This parameter can be used with values of -280 V to +800 V. The setpoints are switched onto the setpoint generator output depending on the assigned time.

## P0182

| | | | |
|---|---|---|---|
| | Einspeiseeinheit SWG Sollwert3 | 280 V to 800 V | |
| EE | **PSU SVG setpoint 3** | 640 V | |
| | BM_u_PSU_SVGSetvalue3 | 1:1 V | CW |

This parameter can be used with values of 280 V to +800 V. The setpoints are switched onto the setpoint generator output depending on the assigned time.

## P0183

| | | | |
|---|---|---|---|
| | Einspeiseeinheit SWG Sollwert4 | 280 V to 800 V | |
| EE | **PSU SVG setpoint 4** | 640 V | |
| | BM_u_PSU_SVGSetvalue4 | 1:1 V | CW |

This parameter can be used with values of -280 V to +800 V. The setpoints are switched onto the setpoint generator output depending on the assigned time.

## P0184

| | | | |
|---|---|---|---|
| | Einspeiseeinheit DIO Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **PSU DIO status** | $0_{hex}$ | |
| A | BM_u_PSU_DIOStatus | 1:1 | - |

This parameter displays the DIO status of the power supply unit.

| Bit No. | Meaning |
|---|---|
| 0 | Ready for pulse enable |
| 1 | Current limit reached |
| 2 | Ready-to-operate for drive |
| 3 | Ready for main contactor ON |
| 15 ... 4 | reserved |

## P0200

| | | | |
|---|---|---|---|
| | Fehler System 1 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| - | **Error System 1** | $0_{hex}$ | |
| A | BM_dw_SysError1 | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

| Bit No. | Meaning | Reaction | Following parameter |
|---|---|---|---|
| 0 | Error in module µ-processor | IS | P0201 |
| 1 | Error in module operating system | IS | P0202 |
| 2 | Error in module Proprog communication | adjustable | P0203 |
| 3 | Error in functional or optional modules | adjustable | P0204 |
| 4 | Error in module feed unit | adjustable | P0205 |
| 5 | Error in module power unit | adjustable | P0206 |
| 9 ... 6 | not assigned = 0 | | |
| 10 | Error in module drive manager | adjustable | P0211 |
| 11 | Error in module data set manager | adjustable | P0212 |
| 13 ... 12 | not assigned = 0 | | |
| 14 | Error in module free programmability | adjustable | P0215 |
| 15 | Reserved | adjustable | P0216 |
| 32 ... 16 | Reserved | | |

## P0201

| | | | |
|---|---|---|---|
| | Fehler Prozessor | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error Processor** | $0_{hex}$ | |
| A | BM_w_ProcessorSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Errors in module processor.

| Bit No. | Meaning | Error No. | Reaction |
|---|---|---|---|
| 0 | Reserved | 0 | |
| 1 | **Watchdog** error | 1 | IS |
| 2 | False or unexpected **interrupt** has occurred | 2 | IS |
| 3 | NMI-**Interrupt** has occurred /bus error | 3 | IS |
| 15 ... 4 | not assigned = 0 | 4 to 15 | |

## P0202

| | | | |
|---|---|---|---|
| | Fehler Betriebssystem | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error Operating System** | $0_{hex}$ | |
| A | BM_w_OperatingSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in module operating system.

| Bit No. | Meaning | Error No. | Reaction |
|---|---|---|---|
| 0 | Errors while booting | 16 | IS |
| 1 | Software error: | 17 | IS |
| 2 | Time slot configuration | 18 | IS |
| 3 | Time slicing - time violation | 19 | IS |
| 4 | 1= not assigned memory | 20 | IS |
| 5 | Invalid error code | 21 | IS |
| 6 | Invalid warning code | 22 | IS |
| 7 | False FPGA version | 23 | IS |
| 15 ... 8 | not assigned = 0 | 24 to 31 | |

## P0203

| | | | |
|---|---|---|---|
| | Fehler PROPROG Kommunikation | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error in module Proprog communication** | $0_{hex}$ | |
| A | BM_w_ProprogSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in module Proprog communication driver.

| Bit No. | Meaning | Error No. | Reaction |
|---|---|---|---|
| 0 | Timeout protocol | 32 | No reaction |
| 1 | Protocol structure | 33 | No reaction |
| 2 | Incorrect module type | 34 | No reaction |
| 3 | Too many data in the telegram | 35 | No reaction |
| 4 | Not enough data in telegram | 36 | No reaction |
| 5 | Invalid operand | 37 | No reaction |
| 6 | Invalid memory type | 38 | No reaction |
| 7 | Invalid operand address | 39 | No reaction |
| 8 | Value less than the minimum value | 40 | No reaction |
| 9 | Value greater than the maximum value | 41 | No reaction |
| 10 | Parameter is **write-protected** | 42 | No reaction |
| 11 | Parameters in this operation status not writeable | 43 | No reaction |
| 12 | Incorrect parameter value | 44 | No reaction |
| 13 | Communication error WinBASS/ProDrive ↔ controller | 45 | can be set with ▹P1007◃ |
| 15 ... 14 | not assigned = 0 | 46 to 47 | |

| | | | |
|---|---|---|---|
| **P0204** | Fehler in Funktions- oder Optionsmodulen | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error in function- or option modules** | $0_{hex}$ | |
| A | BM_w_ExtendedModuleError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in additional modules.

| Bit No. | Meaning | Error No. | Reaction | Sequence parameter |
|---|---|---|---|---|
| 0 | Error in function module A | 48 | Level 3 error | P0240 |
| 1 | Error in function module B | 49 | Level 3 error | P0241 |
| 2 | Error in function module C | 50 | Level 3 error | P0242 |
| 3 | Error in function module D | 51 | Level 3 error | P0243 |
| 4 | Error in function module E | 52 | Level 3 error | P0244 |
| 5 | Error in option module G | 53 | Level 3 error | P0245 |
| 6 | Error in option module H | 54 | Level 3 error | P0246 |
| 10 ... 7 | not assigned = 0 | 55 to 58 | Level 3 error | |
| 11 | Timeout when waiting for the RST signal of the slaves | 59 | IS | |
| 12 | CRC error in SPI transmission module ▸ controller | 60 | No reaction | |
| 13 | CRC error in SPI transmission controller ▸ module | 61 | No reaction | |
| 15 ... 14 | not assigned = 0 | 62 to 63 | | |

| | | | |
|---|---|---|---|
| **P0205** | Fehler Netzeinspeisung | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error PSU** | $0_{hex}$ | |
| A | BM_w_PSU_SysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in module feed unit.

| Bit No. | Meaning | Error No. | Reaction |
|---|---|---|---|
| 0 | Power failure | 64 | adjustable |
| 1 | Phase failure | 65 | IS |
| 2 | Mains undervoltage | 66 | IS |
| 3 | Mains overvoltage | 67 | IS |
| 4 | Undervoltage 24 V | 68 | IS |
| 5 | Phase sequence identification error | 69 | IS |
| 6 | Frequency change | 70 | IS |
| 7 | Frequency range error | 71 | IS |
| 8 | Error of main contactor | 72 | IS |
| 9 | No monitoring signal from the main contactor | 73 | IS |
| 10 | Error at precharge | 74 | IS |
| 11 | Mains input undervoltage $U_{DC}$ | 75 | IS |
| 12 | Mains connection error | 76 | IS |
| 13 | Current limit reached | 77 | IS |
| 14 | Synchronization errors | 78 | IS |
| 15 | not assigned = 0 | 79 | |

| | | | |
|---|---|---|---|
| **P0206** | Fehler Leistungsteil | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error Power Unit** | $0_{hex}$ | |
| A | BM_w_AmpSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in module power unit.

| Bit No. | Meaning | Error No. | Reaction | Following parameter |
|---|---|---|---|---|
| 0 | Communication error after HIPERFACE ® specification | 80 | IS | ▹P0233◃ |
| 1 | Heatsink temperature | 81 | IS | |
| 2 | Overvoltage DC link | 82 | IS | |
| 3 | Overcurrent | 83 | IS | |
| 4 | Earth current | 84 | IS | |
| 5 | Device internal overtemperature | 85 | IS | |
| 6 | Cable break temperature sensor | 86 | IS | |
| 7 | Safety relay off (and accordingly defect)*) | 87 | IS | |
| 8 | Bridge short-circuit | 88 | IS | |
| 9 | Power unit not ready-to-operate | 89 | IS | |
| 15 ... 10 | not assigned = 0 | 90 to 95 | | |

*): The controller signals an error „Error safety relay“ (Amp Error 87), if pulse enable has been set and one of the cases occurs:

1 The safety relay is not controlled or

2 the safety relay is faulty

If there is no pulse enable and if the cases 1) or 2) occur, the controller only signals a warning (No. 20).

## P0211

| | | | |
|---|---|---|---|
| | Fehler Antriebs-Manager | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error drive manager** | $0_{hex}$ | |
| A | BM_w_DriveManagSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in module drive manager.

| Bit No. | Meaning | Error No. | Reaction |
|---|---|---|---|
| 0 | Timeout communication | 160 | No reaction |
| 1 | Timeout BACI | 161 | No reaction |
| 2 | Timeout cyclic communication | 162 | No reaction |
| 3 | Timeout required data | 163 | No reaction |
| 4 | Field bus error | 164 | No reaction |
| 5 | Controller not synchronous to external signal | 165 | adjustable ▹P0300◃ |
| 15 ... 6 | not assigned = 0 | 166 to 175 | |

## P0212

| | | | |
|---|---|---|---|
| | Fehler Datensatzverwaltung-Manager | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error data set manager** | $0_{hex}$ | |
| A | BM_w_DataRecSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in module data set management.

| Bit No. | Meaning | Error No. | Reaction |
|---|---|---|---|
| 0 | EEPROM copy error | 176 | No reaction |
| 1 | Write timeout EEPROM | 177 | No reaction |
| 2 | checksum error | 178 | IS |
| 3 | No boot data set | 179 | IS |
| 4 | Incompatible software | 180 | IS |
| 5 | Data record is nonexistent | 181 | No reaction |
| 6 | Checksum error im PSI module | 182 | No reaction |
| 7 | PSI is reset | 183 | No reaction |
| 8 | PSI data invalid | 184 | No reaction |
| 9 | Autotuning tables invalid.<br>(carry out autotuning anew) | 185 | No reaction |
| 10 | A/D correction table invalid (exchange controller cartridge) | 186 | No reaction |
| 15 ... 11 | not assigned = 0 | 187 to 191 | |

| | | | |
|---|---|---|---|
| **P0215** | Fehler Freie Programmierbarkeit | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error in module free control section.** | $0_{hex}$ | |
| A | BM_w_FreeCtrlSecSysError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in module free control section.

| Bit No. | Meaning | Error No. |
|---|---|---|
| 15 ... 0 | not assigned = 0 | 224 to 239 |

| | | | |
|---|---|---|---|
| **P0216** | Fehler CANsync | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error CANsync** | $0_{hex}$ | |
| A | BM_w_CANSyncError | 1:1 | - |

Reserved

| | | | |
|---|---|---|---|
| **P0233** | Fehler Leistungsteil-Serielle Schnittstelle | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error Power Unit serial interface** | $0_{hex}$ | |
| A | BM_w_AmpHiperfaceError | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in module power unit serial interface.

| Number | Meaning |
|---|---|
| 6 | Data overflow |
| 7 | Bit framing error |
| 8 | Invalid command state |
| 9 | Partition error |
| 10 | Checksum error |
| 11 | Invalid command code |
| 12 | Data number error |
| 13 | Invalid argument |
| 14 | Data field not writable |
| 15 | Incorrect access code |
| 16 | Data field is not changeable in its size |
| 17 | Word address outside of data field |
| 18 | Data field is nonexistent |
| 36 | Wrong data checksum |
| 37 | No answer |
| 38 to 65 | Reserved |
| 66 | Invalid answer |

## P0240

| | | | |
|---|---|---|---|
| Fehler Funktionsmodul A | | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error function module A** | $0_{hex}$ | |
| A | BM_w_SmallModuleErrorA | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in function module A.

| Sub-error No. | Meaning | Reaction |
|---|---|---|
| 0 | Reserved | |
| 1 | Module not recognized | No reaction |
| 2 | Module not permitted at this position | No reaction |
| 3 | 24 V missing or output short-circuited | No reaction |
| 4 | Invalid target parameter value due to digital input | No reaction |
| 5 | Direct PLC-I/O access for this module not permitted. | No reaction |
| 6 | The necessary module is missing | IS |
| 7 | Module in controller not permitted | IS |
| 8 to 15 | not assigned = 0 | |

## P0241

| | | | |
|---|---|---|---|
| Fehler Funktionsmodul B | | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error function module B** | $0_{hex}$ | |
| A | BM_w_SmallModuleErrorB | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in function module B.

Sub-error description see ▹P0240◃ on page 108.

## P0242

| | | | |
|---|---|---|---|
| Fehler Funktionsmodul C | | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error function module C** | $0_{hex}$ | |
| A | BM_w_SmallModuleErrorC | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in function module C.

Sub-error description see ▹P0240◃ on page 108.

## P0243

| | | | |
|---|---|---|---|
| | Fehler Funktionsmodul D | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error function module D** | $0_{hex}$ | |
| A | BM_w_SmallModuleErrorD | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in function module D.

Sub-error description see ▷P0240◁ on page 108.

## P0244

| | | | |
|---|---|---|---|
| | Fehler Funktionsmodul E | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error function module E** | $0_{hex}$ | |
| A | BM_w_SmallModuleErrorE | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in function module E.

Sub-error description see ▷P0240◁ on page 108.

## P0245

| | | | |
|---|---|---|---|
| | Fehler Optionsmodul G | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error option module G** | $0_{hex}$ | |
| A | BM_w_BigModuleErrorG | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

Error in option module G.

| Sub-Error No. | Meaning | Reaction |
|---|---|---|
| 4096 | Wrong parameter No. at setpoint parameter 1 | No reaction |
| 4097 | Wrong parameter No. at setpoint parameter 2 | No reaction |
| 4098 | Wrong parameter No. at setpoint parameter 3 | No reaction |
| 4099 | Wrong parameter No. at setpoint parameter 4 | No reaction |
| 4100 | Wrong parameter No. at setpoint parameter 5 | No reaction |
| 4101 | Wrong parameter No. at setpoint parameter 6 | No reaction |
| 4102 | Wrong parameter No. at setpoint parameter 7 | No reaction |
| 4103 | Wrong parameter No. at setpoint parameter 8 | No reaction |
| 4104 | Wrong parameter No. at setpoint parameter 9 | No reaction |
| 4105 | Wrong parameter No. at setpoint parameter 10 | No reaction |
| 4106 | Wrong parameter No. at setpoint parameter 11 | No reaction |
| 4107 | Wrong parameter No. at setpoint parameter 12 | No reaction |
| 4108 | Wrong parameter No. at setpoint parameter 13 | No reaction |
| 4109 | Wrong parameter No. at setpoint parameter 14 | No reaction |
| 4110 | Wrong parameter No. at setpoint parameter 15 | No reaction |

| Sub-Error No. | Meaning | Reaction |
|---|---|---|
| 4111 | Wrong parameter No. at setpoint parameter 16 | No reaction |
| 4112 | Wrong parameter No. at actual value parameter 1 | No reaction |
| 4113 | Wrong parameter No. at actual value parameter 2 | No reaction |
| 4114 | Wrong parameter No. at actual value parameter 3 | No reaction |
| 4115 | Wrong parameter No. at actual value parameter 4 | No reaction |
| 4116 | Wrong parameter No. at actual value parameter 5 | No reaction |
| 4117 | Wrong parameter No. at actual value parameter 6 | No reaction |
| 4118 | Wrong parameter No. at actual value parameter 7 | No reaction |
| 4119 | Wrong parameter No. at actual value parameter 8 | No reaction |
| 4120 | Wrong parameter No. at actual value parameter 9 | No reaction |
| 4121 | Wrong parameter No. at actual value parameter 10 | No reaction |
| 4122 | Wrong parameter No. at actual value parameter 11 | No reaction |
| 4123 | Wrong parameter No. at actual value parameter 12 | No reaction |
| 4124 | Wrong parameter No. at actual value parameter 13 | No reaction |
| 4125 | Wrong parameter No. at actual value parameter 14 | No reaction |
| 4126 | Wrong parameter No. at actual value parameter 15 | No reaction |
| 4127 | Wrong parameter No. at actual value parameter 16 | No reaction |
| 4128 | Invalid value at setpoint parameter No. 1 | No reaction |
| 4129 | Invalid value at setpoint parameter No. 2 | No reaction |
| 4130 | Invalid value at setpoint parameter No. 3 | No reaction |
| 4131 | Invalid value at setpoint parameter No. 4 | No reaction |
| 4132 | Invalid value at setpoint parameter No. 5 | No reaction |
| 4133 | Invalid value at setpoint parameter No. 6 | No reaction |
| 4134 | Invalid value at setpoint parameter No. 7 | No reaction |
| 4135 | Invalid value at setpoint parameter No. 8 | No reaction |
| 4136 | Invalid value at setpoint parameter No. 9 | No reaction |
| 4137 | Invalid value at setpoint parameter No. 10 | No reaction |
| 4138 | Invalid value at setpoint parameter No. 11 | No reaction |
| 4139 | Invalid value at setpoint parameter No. 12 | No reaction |
| 4140 | Invalid value at setpoint parameter No. 13 | No reaction |
| 4141 | Invalid value at setpoint parameter No. 14 | No reaction |
| 4142 | Invalid value at setpoint parameter No. 15 | No reaction |
| 4143 | Invalid value at setpoint parameter No. 16 | No reaction |
| 4144 | Invalid value for setpoint period | No reaction |
| 4145 | Invalid value for actual value period | No reaction |
| 4146 | Wrong value for cycle offset setpoints | No reaction |
| 4147 | Wrong value for cycle offset actual values | No reaction |
| 4148 | BACI timeout at cyclic data | with P0298 |
| 4149 | BACI timeout at service data | No reaction |
| 4150 | Checksum error during test | IS |
| 4151 | Ramp-up timeout when waiting for the Slave-Type or when waiting for the reset of Config-Pending-Flag | No reaction |
| 4152 | Invalid data transfer structure type | No reaction |
| 4153 | Internal error: Wrong BACI status | No reaction |
| 4154 | Access conflicts with slave at cyclic communication | No reaction |

| Sub-Error No. | Meaning | Reaction |
|---|---|---|
| 4155 | Error cyclic communication: Parameter value wrong | No reaction |
| 4156 | Error cyclic communication: Alive-counter conflict | No reaction |
| 4157 | Cmd interface: Channel number wrong (0 or > 6) | No reaction |
| 4158 | Cmd interface: The channel which was indicated does not exist | No reaction |
| 4159 | Cmd interface: Internal error - wrong pointer | No reaction |
| 4160 | Cmd interface: Internal error - wrong status | No reaction |
| 4161 | Cmd interface: Wrong package number | No reaction |
| 4162 | Cmd interface: Wrong command number | No reaction |
| 4163 | Cmd interface: Wrong status when handling the package | No reaction |
| 4164 | Cmd interface: Timeout at command processing | No reaction |
| 4165 | Cmd interface: Wrong package length | No reaction |
| 4166 | Cmd interface: Desciptor not available | No reaction |
| 4167 | Cmd interface: Wrong package type | No reaction |
| 4168 | Cmd interface: Checksum error | No reaction |
| 4169 | Module identification: PCI-error when reading | No reaction |
| 4170 | Module identification: PCI-error when writing | No reaction |
| 4171 | Module identification: general Reading error | No reaction |
| 4172 | Module identification: general Error at writing | No reaction |
| 4173 | Internal error | No reaction |
| 4174 | Configuration cyclic services: Parameters are not cyclic writeable | No reaction |
| 4175 | Configuration cyclic services: Invalid parameter number | No reaction |
| 4176 | Wrong option module error code | No reaction |
| 4177 to 8191 | Reserved | |
| 8192 | Error CANopen timeout on CAN bus | set with ▹P1007◃ |

## P0246

| | | | |
|---|---|---|---|
| | Fehler Optionsmodul H | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Error in option module H** | $0_{hex}$ | |
| A | BM_w_BigModuleErrorH | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX® 4100.

Error in option module H.

Sub-error description see ▹P0245◃ on page 109.

## P0251

| | | | |
|---|---|---|---|
| | Fehler-Parameter ID Proprog-Zugriff | 0 to 65535 | |
| - | **Error communication parameter No.** | 0 | |
| A | BM_u_ProprogCmdErrId | 1:1 | - |

Number of parameter, where an error occurred during the last protocol access (WinBASS/ProDrive).

## P0260

| | | | |
|---|---|---|---|
| | Warnungen System 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Warning System 1** | $0_{hex}$ | |
| A | BM_w_SysWarning1 | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

| Bit No. | Meaning | Following parameters |
|---|---|---|
| 0 | Warning in module feed unit | ▹P0261◃ |
| 1 | Warning in module power unit | ▹P0262◃ |
| 15 ... 2 | not assigned = 0 | |

## P0261

| | | | |
|---|---|---|---|
| | Warnungen Netzeinspeisung | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Warning PSU** | $0_{hex}$ | |
| A | BM_w_PSU_Warning | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

| Bit No. | Meaning | Warning No. |
|---|---|---|
| 0 | Reserved warning | 0 |
| 1 | Undervoltage 24V | 1 |
| 2 | Mains undervoltage | 2 |
| 3 | Mains overvoltage | 3 |
| 4 | Power failure | 4 |
| 5 | Phase failure | 5 |
| 6 | Phase sequence identification | 6 |
| 7 | Frequency change | 7 |
| 8 | Frequency range | 8 |
| 9 | Mains connections | 9 |
| 10 | Precharge is running | 10 |
| 11 | Undervoltage $U_{DC}$ | 11 |
| 12 | Synchronization | 12 |
| 13 | Exceeding the set power limit | 13 |
| 15 ... 14 | not assigned = 0 | 14 to 15 |

## P0262

| | | | |
|---|---|---|---|
| | Warnungen Leistungsteil | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Warning Power Unit** | $0_{hex}$ | |
| A | BM_w_AmpWarning | 1:1 | - |

Procedures for troubleshooting and for additional information see chapter „Troubleshooting“ in the manual b maXX®4100.

| Bit No. | Meaning | Warning No. |
|---|---|---|
| 0 | Inside temperature of device | 16 |
| 1 | Heatsink temperature | 17 |
| 6 ... 2 | not assigned = 0 | 18 to 22 |
| 7 | Undervoltage DC-link | 23 |
| 8 | Ixt-threshold 1 is exceeded | 24 |
| 15 ... 9 | not assigned = 0 | 25 to 31 |

## P0290

| | | | |
|---|---|---|---|
| | Client-Überwachungs-Timeout | 0 to 65535 ms | |
| EE | **Client alive timeout** | 2000 ms | |
| ON | BM_u_ClientAliveTimeout | 1:1 ms | - |

This parameter is for the setting of the connection monitoring between WinBASS II/ProDrive and the controller. This allows the controller to guide the drive at interrupted communication into a safe status.

If the value is zero no connection monitoring operates.

The controller checks the maximum time between two telegrams. If there is a telegram failure the controller signals an error. The error reaction is to be set via error reaction ▹P1007◃.

This mechanism is implemented not before controller firmware version 3.01 and WinBASS Version 1.08 or ProDrive.

## P0291

| | | | |
|---|---|---|---|
| | Empfangstimeout Proprog Protokoll | 300 to 65535 ms | |
| EE | **Receive timeout proprog protocol** | 500 ms | |
| ON | BM_u_ProprogCharTimeout | 1:1 ms | - |

This parameter determines the maximum value of the time which may elapse between two sequently signs of a telegram before the controller signals a communication error and sychronizes anew.

Deviations from the standard value are only then technical efficient if the according settings of the value timeout have been made in the connection settings of WinBASS II/ProDrive or PROPROG wt, in order to, for example, allow protocol processing for modem operation.

## P0298

| | | | |
|---|---|---|---|
| | Fehlerreaktion für BACI-Kommunikation | -1 to 3 | |
| EE | **Error reaction BACI communication** | -1 | |
| ON | BM_i_ErrReactionBaci | 1:1 | - |

Reaction of the controller at abort of the cyclic setpoint transmission over the BACI. Reaction code see table:

| Reaction code | Meaning |
|---|---|
| -1 | No reaction |
| 0 | Pulse disable |
| 1 | Stop. ramp down at the ramp function generator ramp (BM_u_Ds0_RFG1RampDownTime - ▹P1173◃) |
| 2 | Quickstop ramp down at the quickstop ramp (BM_u_Ds0_RFG1StopTime - ▹P1175◃) |
| 3 | Stop. Ramp down at the current limit |

The monitoring of the cyclic BACI-setpoint transmission starts after the first error-free transmission. If due to the parameter timeout for cyclic BACI communication ▹P0839◃ determined monitoring time the controller does not receive any new setpoints, from this starting point on, then the controller signals the error „BACI timeout at cycl. data“ - error code 4148 in parameter ▹P0245◃ on page 109.

## P0300

| | | | |
|---|---|---|---|
| | Steuerwort | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Control word** | $0_{hex}$ | |
| ON | BM_w_Control word | 1:1 | CW |

See also ▹Drive management◃ from page 70.

This parameter is the input word used in the status machine of the device control.

| Bit No. | Meaning |
|---|---|
| 0 | 1: Command “switch on“<br>0: Command “shut down |
| 1 [1)] | 1: Command „inhibit **no** voltage“ (operating status)<br>0: Command “inhibit voltage“ |
| 2 | Reserved |
| 3 | 1: Command “operation enabled“<br>0: Command „inhibit operation“ |
| 4 | Depending on operation mode:<br>Ramp function generator inhibit, start homing, new setpoint |
| 5 | Depending on operation mode:<br>RFG-stop, set homing position, immediately change set |
| 6 | Depending on operation mode:<br>RFG zero, absolute/relative target input |
| 7 | 0 -> 1 reset error |
| 15 ... 8 | Reserved |

[1)] These bits are **low active**.

**Description of bits**

- Bit 0 to 3
  Control of drive status machine.
  The device control commands are defined with the following bit combinations:

| Command | Bit 7 Reset ERROR | Bit 3 Operation enabled | Bit 2 Quickstop[1)] | Bit 1 Inhibit voltage [1)] | Bit 0 Switch on | Transitions |
|---|---|---|---|---|---|---|
| Close down | X | X | 1 | 1 | 0 | 2,6,7 |
| Switch on | X | X | 1 | 1 | 1 | 4 |
| Inhibit voltage | X | X | X | 0 | X | 8, 9 |
| Reset error | 0 → 1 | X | X | X | X | 11 |

The bits which are marked with X are of no significance for the accordant command.

1) These bits are **low active**.

- Bit 4 - inhibit RFG
  - $U_{DC}$ control (operating mode -3)
    1: Inhibit ramp function generator (output on 0)
    0: Enable ramp function generator (enable output)

- Bit 5 - RFG stop
  - $U_{DC}$ control (operating mode -3)
    1: Ramp function generator inhibit ramp-up, freeze output
    0: Ramp function generator enable ramp-up

- Bit 6 - RFG zero
  - $U_{DC}$ control (operating mode -3)
    1: Set ramp function generator input to zero (braking with ramp)
    0: Ramp function generator enable input

- Bit 7: device control command „reset errors“.
  For the command is a change from 0 to 1 in this bit necessary.

### Control word total overview of all operating modes

| Bit No. | Speed control<br>-3[2)] |
|---|---|
| 0 | Switch on (status machine device control) |
| 1 | Inhibit voltage (status machine device control) [1)] |
| 3 | Operation enabled (status machine device control) |
| 4 | Inhibit RFG |
| 5 | RFG stop |
| 6 | X |
| 7 | Reset error (status machine device control) |
| 8 | X |
| 9 | X |
| 10 | X |
| 11 | X |
| 12 | X |
| 13 | X |
| 14 | X |
| 15 | X |

The bits which are marked with X are reserved and are to be set from the control to 0.

1) These bits are **low active**.

2) In the operating modes -3 and 4 the bits 4, 5 and 6 are prioritized as follows:
Bit 4 before bit 5 before bit 6

| | | | |
|---|---|---|---|
| **P0301** | Statuswort | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Status word** | $0_{hex}$ | |
| A | BM_w_Status word | 1:1 | - |

See also ▹Drive management◃ from page 70.

This parameter is the output word used in the status machine of the device control. Every 4 ms it is updated.

| Bit No. | Meaning |
|---|---|
| 0 [2] | 1: Ready-to-start<br>0: Not ready-to-start |
| 1 [2] | 1: Switched on<br>0: Not ready-to-operate |
| 2 [2] | 1: Operation enabled<br>0: Operation inhibited |
| 3 [2] | 1: Error<br>0: No error |
| 4 [1] [2] | 1: Main contactor is switched on<br>0: Main contactor is switched off |
| 5 [1] | 1: Regulated DC link voltage<br>0: Unregulated DC link voltage |
| 6 [2] | 1: INHIBIT START<br>0: No inhibit start |
| 7 | 1: Warning<br>0: No warning |
| 8 | RFG stop |
| 9 | Remote |
| 10 | 1: Setpoint reached<br>0: Setpoint not reached |
| 11 | 1: Internal limit active<br>0: no internal limit active |
| 12 | Depending on operation mode |
| 13 | Depending on operation mode |
| 15 ... 14 | Parameterizable real time bits - see parameters ▹P1290◃ to ▹P1293◃ |

[1] These bits are **low active**.

[2] Display operational status of drive manager

### Description of bits

- Bit 0 to bit 6
  These bits show the status of the drive status machine.

| Bit in status word | | | | | |
|---|---|---|---|---|---|
| Status of unit control | Bit 6 INHIBIT START | Bit 3 ERROR | Bit 2 OPERATION ENABLED | Bit 1 SWITCHED ON | Bit 0 Ready-to-start |
| NOT READY-TO-START | 0 | 0 | 0 | 0 | 0 |
| INHIBIT START | 1 | 0 | 0 | 0 | 0 |
| READY-TO-START | 0 | 0 | 0 | 0 | 1 |
| SWITCHED ON | 0 | 0 | 0 | 1 | 1 |
| OPERATION ENABLED | 0 | 0 | 1 | 1 | 1 |
| ERROR | 0 | 1 | 0 | 0 | 0 |

- Bit 3 - error
  The controller will set this bit, as soon as an error (▹P0200◃ error system 1) is present, which will cause an error reaction of the drive. The bit remains set during the error reaction and under the status error. The bit is deleted only after the error has been successfully reset.
  As soon as this bit is set, the error LED lights up.

- Bit 4: main contactor switched on

- Bit 5: unregulated DC link voltage
  The bit is low-active and is deleted, if a mains error (but not mains failure) is detected and all IBGT are disabled. The bit is set again, if the mains error is detected no longer and the mains inverter is enabled again.

- Bit = 7 warning
  The bit displays, if there is a warning or an error in the controller, which causes that there is no error reaction. This status is external recognizable due to the flashing of the error LED.

- Bit 8 - status ramp function generator stop
  The bit displays that the high ramp generator has been stopped, that means that the output was frozen.

- Bit 9 - remote
  The bit is set, if at the communication source ▹P1001◃ the control e. g. the access on the control word is controlled via BACI.

- Bit 10 - setpoint reached
  The bit is set, if the $U_{DC}$controller deviation is less than the limit, which was set.

- Bit 11: internal limit active
  The bit is set, if an internal limit is active, for example current limit. This bit is updated, independent on the device status.
  Via parameter ▹P1008◃ mask for internal limits it is able to be determined which internal limits shall be displayed.

## P0302

| | | | |
|---|---|---|---|
| | Steuerwort 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Control word 2** | $0_{hex}$ | |
| ON | BM_w_Control word 2 | 1:1 | CW |

See also ▹Drive management◃ from page 70.

Second control word of drive manager.

| Bit No. | Meaning |
|---|---|
| 15 ... 0 | Reserved |

## P0303

| | | | |
|---|---|---|---|
| | Statuswort 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Status word 2** | $0_{hex}$ | |
| A | BM_w_Status word 2 | 1:1 | - |

See also ▹Drive management◃ from page 70.

The status word 2 of the drive manager is assigned as follows:

| Bit No. | Meaning | Corresponds to bit in parameter |
|---|---|---|
| 7 ... 0 | Reserved | - |
| 8 | Status of free digital input 1 in slot D<br>0: Input is set<br>1: Input is not set | ▹P0413◃ status of digital inputs in module slot D<br>bit 0 |
| 15 ... 9 | Reserved | - |

## P0304

| | | | |
|---|---|---|---|
| | Ist-Betriebsart | -7 to 6 | |
| - | **Operation mode actual** | -3 | |
| A | BM_i_OperationModeAct | 1:1 | - |

This parameter displays the momentary active drive operation mode.

| Value | Meaning |
|---|---|
| -3 | $U_{DC}$-control |

## P0305

| | | | |
|---|---|---|---|
| | Antriebs-Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Drive status** | $0_{hex}$ | |
| A | BM_w_DriveStatus | 1:1 | - |

This parameter shows the current status of the drive.

See also ▹Drive management◃ from page 70.

| Value (hex) | Meaning |
|---|---|
| 0 | Not ready-to-start |
| 1 | Inhibit start |
| 2 | Ready-to-start |
| 3 | Switched on |
| 4 | Operation enabled |
| A | Main contactor ready-to-start |
| C | Unregulated DC link voltage |
| F | Error |

## P0306

| | | | |
|---|---|---|---|
| | Status dig. inputs drive manager | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Status digital inputs drive manager** | $0_{hex}$ | |
| A | BM_w_DI_StatusDrvControl | 1:1 | - |

Display of the status of the digital inputs for drive control (quickstop FX 3-4 and pulse enable FX 3-5).

See also ▹Drive management◃ from page 70.

| Bit No. | Meaning |
|---|---|
| 0 | 1: Pulse enable input is closed<br>0: Pulse enable is open |
| 1 | 1: Error reset input is closed<br>0: Error reset input is open |
| 15 ... 2 | Reserved |

## P0308

| | | | |
|---|---|---|---|
| | Statuswort 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Status word 3** | $0_{hex}$ | |
| ON | BM_w_Statusword 3 | 1:1 | - |

The status word 3 of the drive manager is assigned as follows:

| Bit No. | Meaning |
|---|---|
| 0 | Two-level-controller 1 output<br>0: output inactive<br>1: output active |
| 1 | Two-level-controller 2 output<br>0: output inactive<br>1: output active |
| 2 ... 15 | Reserved |

## P0310

| | | | |
|---|---|---|---|
| | Datensatzverwaltung Kommando | 0 to 32 | |
| EE | **Data set command** | 0 | |
| ON | BM_i_RecordCommand | 1:1 | - |

See ▹Data Set Management◃ from page 13.

By use of this parameter the commands for the data set management are defined.

| Value | Meaning | ▹P0314◃ Source data set | ▹P0315◃ Target data set |
|---|---|---|---|
| 0 | Reset data set command | | |
| 1 | Write all parameters from the valid data sets into EEPROM | | |
| 2 | Read EEPROM completely | | |
| 3 | Reset EEPROM completely | | |
| 4 | Set standard values for active data set | | |
| 5 | Set standard values for all generated data sets | | |
| 6 | Generate data set <n> | | Data set to be generated |
| 7 | Reset data set <n> | | DS to be deleted |
| 8 | Copy data set <x> to data set <y> | Source data set | Target data set |
| 9 | Load data set <x> from EEPROM | DS in EEPROM | |
| 10 | Store data set <x> into EEPROM | DS in RAM = EEPROM | |
| 11 | Reserved | | |
| 12 | Write all parameters of the valid data sets into the PSI | | |
| 13 | Read PSI completely | | |
| 14 | Reset PSI completely | | |
| 15 ... 32 | Reserved | | |

| | | | |
|---|---|---|---|
| **P0311** | Datensatzverwaltung Status | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Data set status** | 0 | |
| A | BM_w_RecordStatus | 1:1 | - |

See ▹Data Set Management◃ from page 13.

This parameter displays the status of the last data set management command.

| Return code | Meaning |
|---|---|
| $00_{hex}$ | No error |
| $01_{hex}$ | Write/read cycle in process |
| $02_{hex}$ | Invalid parameter number |
| $03_{hex}$ | Invalid data type |
| $04_{hex}$ | Value less than the minimum value |
| $05_{hex}$ | Value greater than the maximum value |
| $06_{hex}$ | Parameter is read-only |
| $07_{hex}$ | Parameter cannot be modified because of operating status |
| $08_{hex}$ | Incorrect parameter value |
| $09_{hex}$ | EEPROM header not existent or invalid |
| $0A_{hex}$ | Invalid section in EEPROM |
| $0B_{hex}$ | Invalid data in EEPROM |
| $0C_{hex}$ | Checksum error during test |
| $0D_{hex}$ | Writing error to EEPROM |
| $0E_{hex}$ | EEPROM too small |
| $0F_{hex}$ | Unidentified error |
| $10_{hex}$ | Incompatible parameter (-numbers) |
| $11_{hex}$ | Data set operation in the active operation status not permissible (RUN) |
| $12_{hex}$ | Selected data set has not been generated yet |
| $13_{hex}$ | Selected data set already exists - cannot be generated anymore |
| $14_{hex}$ | Wrong data set number (not equal 1 to 8) |
| $15_{hex}$ | Wrong data set source number |
| $16_{hex}$ | Wrong data set target number |
| $17_{hex}$ | No enable possible during data set switch-over |
| $18_{hex}$ | EEPROM is reset |
| $19_{hex}$ | Self-optimization parameters invalid → copying not permitted |
| $1A_{hex}$ | PSI not plugged |
| $1B_{hex}$ | PSI reset |
| $1C_{hex}$ | PSI -data are not compatible (e. g. PSI data generated from BM3XXX). |

| Value | Meaning |
|---|---|
| $0000_{hex}$ | Command „reset data set management“ successfully completed |
| $1001_{hex}$ | „Write all parameters of valid data sets into EEPROM“ successfully completed |
| $1002_{hex}$ | „Completely read EEPROM“ successfully completed |
| $1003_{hex}$ | „Reset EEPROM completely“ successfully completed |
| $1004_{hex}$ | „Set standard values for active data set“ successfully completed |
| $1005_{hex}$ | „Make settings of standard values for entire data sets“ successfully completed |
| $1006_{hex}$ | „Create data set <n>“ successfully completed |
| $1007_{hex}$ | „Reset data set <n>“ successfully completed |
| $1008_{hex}$ | „Copy data set <x> to data set <y>“ successfully completed |
| $1009_{hex}$ | „Load data set <x> from EEPROM“ successfully completed |
| $100A_{hex}$ | „Store data set <x> into EEPROM“ successfully completed |
| $100B_{hex}$ | Reserved |
| $100C_{hex}$ | „Write all parameters of the valid data sets into the PSI“ successfully completed |
| $100D_{hex}$ | „Read PSI completely“ successfully completed |
| $100E_{hex}$ | „Reset PSI completely“ successfully completed |
| $1010_{hex}$ to $1016_{hex}$ | Reserved |

## P0312

| | | | |
|---|---|---|---|
| | Aktive Datensatznummer | 1 to 8 | |
| - | **Active data set number** | 1 | |
| ON | BM_u_ActiveDataSet | 1:1 | - |

See ▹Data Set Management◃ from page 13.

Here, the number of the active data set is displayed. Writing to this parameter, in online mode causes an instant data set switch-over (certain status must be met anyway, see also ▹Switching to data set 1 to 8◃ from page 26).

## P0313

| | | | |
|---|---|---|---|
| Angelegte Datensätze | | $00_{hex}$ to $FF_{hex}$ | |
| - | **Valid data sets** | $01_{hex}$ | |
| A | BM_w_ValidDataSets | 1:1 | - |

See ▹Data Set Management◃ from page 13.

Bit mask in order to show which of the eight data sets are existent in the controller, e.g. which data sets can be stored or read. A set bit signals an existent data set. A set bit signals a created data set.

| Bit No. | Meaning |
|---|---|
| 0 | 0: data set 1 is deleted<br>1: data set 1 existent |
| 1 | 0: data set 2 is deleted<br>1: data set 2 existent |
| 2 | 0: data set 3 is deleted<br>1: data set 3 existent |
| 3 | 0: data set 4 is deleted<br>1: data set 4 existent |
| 4 | 0: data set 5 is deleted<br>1: data set 5 existent |
| 5 | 0: data set 6 is deleted<br>1: data set 6 existent |
| 6 | 0: data set 7 is deleted<br>1: data set 7 existent |
| 7 | 0: data set 8 is deleted<br>1: data set 8 existent |
| 8 to 15 | Reserved |

## P0314

| | | | |
|---|---|---|---|
| Quell-Datensatz | | 0 to 8 | |
| - | **Data set source** | 0 | |
| ON | BM_u_RecCmdSource | 1:1 | - |

See ▹Data Set Management◃ from page 13.

Source data set number for data set operations. According to ▹P0310◃ data set command the data set source refers to the EEPROM (e. g. at read data set) or to the RAM (e. g. at write data set in EEPROM).

## P0315

| | | | |
|---|---|---|---|
| Ziel-Datensatz | | 0 to 8 | |
| - | **Data set target** | 1 | |
| ON | BM_u_RecCmdTarget | 1:1 | - |

See ▹Data Set Management◃ from page 13.

Target data set number for data set operations. The target data set refers, according to the ▹P0310◃ data set command either to a data set in the EEPROM or in the RAM.

## P0316

| | | | |
|---|---|---|---|
| | Fehlerhafter Parameter | 1 to max. Para No. | |
| - | **Error data set parameter No.** | - | |
| A | BM_u_RecCmdError | 1:1 | - |

See ▹Data Set Management◃ from page 13.

Here, the number of the parameter is displayed, which has caused an error during memory access (read/write). If an error occurs during command processing, the command will not interrupt transferring, but will continue transferring with the next parameter.
When multiple errors occur, only the last error will be displayed.

## P0317

| | | | |
|---|---|---|---|
| | Anzahl Schreibvorgänge EEPROM | 1 to 65535 | |
| - | **EEPROM write count** | | |
| A | BM_u_EepromWriteCount | 1:1 | - |

See ▹Data Set Management◃ from page 13.

Number of write counts in EEPROM. This counter will be incremented at each write access.

## P0318

| | | | |
|---|---|---|---|
| | Anzahl Schreibvorgänge auf das PSI | 1 to 65535 | |
| - | **PSI write count** | | |
| A | BM_u_PsiWriteCount | 1:1 | - |

Number of write counts to the PSI data memory. This counter is incremented each time a command that initiates memory access on the PSI is processed.

## P0319

| | | | |
|---|---|---|---|
| | Parameternummer für PSI-Zugriff | 1 to 65535 | |
| - | **PSI parameter number** | | |
| A | BM_u_PsiParameterId | 1:1 | - |

Auxiliary parameter for direct read-out of PSI parameters. The PSI parameter number indicates, which parameter (addressed via the number) is to be read-out directly from PSI.

## P0320

| | | | |
|---|---|---|---|
| | PSI Array index | 0 to 65535 | |
| - | **PSI array index** | | |
| A | BM_u_PsiArrayIdx | 1:1 | - |

Auxiliary parameter for direct read-out of PSI parameters. Array index for addressing arrays directly from the PSI.

Arrays can be read only element by element. On index-0 the array size can be read out.

## P0321

| | | | |
|---|---|---|---|
| | Datenbreite PSI Parameter | 0 to 65535 | |
| - | **PSI parameter data width** | | |
| A | BM_u_PsiDataSize | 1:1 | - |

Feed back value for direct read-out of PSI parameters. Holds, in coded form, the data size of the read-back data from PSI.

| Value | Meaning |
|---|---|
| 0 | 16 bit |
| 1 | 32 bit |
| 2 | String |

## P0322

| | | | |
|---|---|---|---|
| | PSI Parameterwert bis zu 32 Bit | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| - | **PSI parameter value (32 Bit)** | | |
| A | BM_ud_PsiData32 | 1:1 | - |

Union for feed back values from data type: SINT, USINT, INT, UINT, DINT, UDINT, BYTE, WORD, DWORD. Leading bits are set to zero (cast).

## P0323

| | | | |
|---|---|---|---|
| | PSI String-parameter | 40 ASCII characters | |
| - | **PSI string parameter** | "" | |
| A | BM_s_PsiDataString | 1:1 | - |

Feed back parameters for strings under direct read access to PSI.

## P0324

| | | | |
|---|---|---|---|
| | PSI data set selection | 1 to 4 | |
| - | **PSI data set selection** | | |
| A | BM_u_PsiDatasetSelect | 1:1 | - |

Data set selector for direct access on parameters in PSI.

## P0325

| | | | |
|---|---|---|---|
| | Angelegte Datensätze im PSI | 0 to 65535 | |
| - | **PSI valid data sets** | | |
| A | BM_w_ValidDataSets | 1:1 | - |

Bit mask used to display the data held within the PSI

## P0326

| | | | |
|---|---|---|---|
| | Betriebsart Datensatzverwaltung | 0 to 65535 | |
| - | **Data set manager mode** | | |
| A | BM_w_DataSetMode | 1:1 | - |

With these parameters you can select the operation mode for the data set manager.

| Bit No. | Meaning |
|---|---|
| 0 | 1: Automatic reading from PSI<br>The data is automatically read at each new starting of the controller from the PSI. |
| 1 | 1: Automatic writing<br>The data of the PSI is automatically stored in the EEPROM of the controller. |
| 15 ... 2 | Reserved |

## P0327

| | | | |
|---|---|---|---|
| | Boot Datensatz | 1 to 8 | |
| EE | **Boot data set** | 1 | |
| PO | BM_u_BootDataset | 1:1 | - |

Data set, which is activated after switching on of the device as start data set.

## P0330

| | | | |
|---|---|---|---|
| | Stromregler Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Current controller status** | $0_{hex}$ | |
| A | BM_w_CurrentCtrlStatus | 1:1 | - |

Status of current controller (no functions implemented yet).

## P0332

| | | | |
|---|---|---|---|
| | Stromregler Iq-Sollwert | -200,00 to +200.00 % | |
| - | **Current Iq setpoint** | 0.00 % | |
| A | BM_i_IqSetLimited | $4000_{hex}$:100 % | - |

Limited cross current setpoint.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

## P0333

| | | | |
|---|---|---|---|
| | Stromregler Iq-Istwert | -200,00 to +200.00 % | |
| - | **Current Iq actual value** | 0.00 % | |
| A | BM_i_IqAct | $4000_{hex}$:100 % | - |

Display of cross current actual value.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P0334** | Stromregler Iq-Regler Ausgang | -200,00 to +200.00 % | |
| - | **Current Iq controller output** | 0.00 % | |
| A | BM_i_CtrlOut_Uq | $4000_{hex}$:100 % | - |

Display of cross voltage setpoint from cross current controller.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P0335** | Stromregler Id-Sollwert | -100.00 to +100.00 % | |
| - | **Current Id setpoint** | 0.00 % | |
| A | BM_i_IdSetLimited | $4000_{hex}$:100 % | - |

Limited direct-axis current setpoint.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P0336** | Stromregler Id-Istwert | -200,00 to +200.00 % | |
| - | **Current Id Actual value** | 0.00 % | |
| A | BM_i_IdAct | $4000_{hex}$:100 % | - |

Display of actual value of the magnetizing direct-axis current.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P0337** | Stromregler Id-Regler Ausgang | -200,00 to +200.00 % | |
| - | **Current Id controller output** | 0.00 % | |
| A | BM_u_IdOut | $4000_{hex}$:100 % | - |

Display of direct-axis voltage setpoint from direct-axis current controller.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P0338** | Spannung EMK-Sollwert | -200,00 to +200.00 % | |
| - | **Voltage EMF setpoint** | 0.00 % | |
| A | BM_i_VemfSet | $4000_{hex}$:100 % | - |

Display of torque generating voltage setpoint from EMF feed forward.

Scaling: 100 % ↔ Power unit DC link nominal voltage (▹P0020◃)/$\sqrt{2}$

**P0339** Spannung Uq-Sollwert -200,00 to +200.00 %

- **Voltage Vq setpoint** 0.00 %

A BM_i_VqSet $4000_{hex}$:100 % -

Effective cross voltage setpoint.

Scaling: 100 % ↔ Power unit DC link nominal voltage (▹P0020◃)/$\sqrt{2}$

**P0340** Spannung Ud-Sollwert -200,00 to +200.00 %

- **Voltage Vd setpoint** 0.00 %

A BM_i_VdSet $4000_{hex}$:100 % -

Effective direct axis voltage setpoint.

Scaling: 100 % ↔ Power unit DC link nominal voltage (▹P0020◃)/$\sqrt{2}$

**P0341** Strom Phase U-Istwert -200,00 to +200.00 %

- **Current phase U actual value** 0.00 %

A BM_i_IphaseU $4000_{hex}$:100 % -

Display of the current actual value of ‚Phase U‘.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

**P0342** Strom Phase V-Istwert -200,00 to +200.00 %

- **Current phase V actual value** 0.00 %

A BM_i_IphaseV $4000_{hex}$:100 % -

Display of ‘phase V‘ current actual value.

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

**P0343** Scheinstrom-Istwert -200,00 to +200.00 %

- **Apparent current actual value** 0.00 %

A BM_u_Iamplitude $4000_{hex}$:100 % -

Display of apparent current in % (not yet implemented).

Scaling: 100 % ↔ power unit maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P0410** | Status der digitalen Eingänge in Modulschacht A | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module A: status digital input** | $0_{hex}$ | |
| A | BM_w_DI_Status_SlotA | 1:1 | - |

Display of channel conditions in module slot A.

Display is only valid, if a digital input/output module is plugged into the related slot. In case no module is plugged, $FFFF_{hex}$ is displayed.

| Bit No. | Meaning |
|---|---|
| 0 | Status digital input 1<br>0: low<br>1: high |
| 1 | Status digital input 2<br>0: low<br>1: high |
| 2 | Status digital input 3<br>0: low<br>1: high |
| 3 | Status digital input 4<br>0: low<br>1: high |
| 4 | Status digital input 5<br>0: low<br>1: high |
| 5 | Status digital input 6<br>0: low<br>1: high |
| 6 | Status digital input 7<br>0: low<br>1: high |
| 7 | Status digital input 8<br>0: low<br>1: high |
| 15 ... 8 | Reserved |

| | | | |
|---|---|---|---|
| **P0411** | Status der digitalen Eingänge in Modulschacht B | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module B: status digital input** | $0_{hex}$ | |
| A | BM_w_DI_Status_SlotB | 1:1 | - |

Display of the status of the channels in module slot B.

Display is only valid, if a digital input/output module is plugged into the related slot. In case no module is plugged, $FFFF_{hex}$ is displayed.

Bit description see ▹P0410◃ on page 130.

| | | | |
|---|---|---|---|
| **P0412** | Status der digitalen Eingänge in Modulschacht C | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module C: status digital input** | $0_{hex}$ | |
| A | BM_w_DI_Status_SlotC | 1:1 | - |

Display of the status of the channels in module slot C.

Display is only valid, if a digital input/output module is plugged into the related slot. In case no module is plugged, $FFFF_{hex}$ is displayed.

Bit description see ▹P0410◃ on page 130.

| | | | |
|---|---|---|---|
| **P0413** | Status der digitalen Eingänge in Modulschacht D | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module D: status digital input** | $0_{hex}$ | |
| A | BM_w_DI_Status_SlotD | 1:1 | - |

Display of the status of the channels in module slot D.

Display is only valid, if a digital input/output module is plugged into the related slot. In case no module is plugged, $FFFF_{hex}$ is displayed.

Bit description see ▹P0410◃ on page 130.

| | | | |
|---|---|---|---|
| **P0414** | Status der digitalen Eingänge in Modulschacht E | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module E: status digital input** | $0_{hex}$ | |
| A | BM_w_DI_Status_SlotE | 1:1 | - |

Display of the status of the channels in module slot E.

Display is only valid, if a digital input/output module is plugged into the related slot. In case no module is plugged, $FFFF_{hex}$ is displayed.

Bit description see ▹P0410◃ on page 130.

## P0418

| | | | |
|---|---|---|---|
| | Status der digitalen Ausgänge in Modulschacht D | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module D: Status digital output** | $0_{hex}$ | |
| A | BM_w_DO_Status_SlotD | 1:1 | - |

Display of the status of the channels in module slot D.

The displayed information depends upon if a module with digital outputs is plugged in or not.

| Bit No. | Meaning |
|---|---|
| 0 | Status digital output 1<br>0: low<br>1: high |
| 1 | Status digital output 2<br>0: low<br>1: high |
| 2 | Status digital output 3<br>0: low<br>1: high |
| 3 | Status digital output 4<br>0: low<br>1: high |
| 4 | Status digital output 5<br>0: low<br>1: high |
| 5 | Status digital output 6<br>0: low<br>1: high |
| 6 | Status digital output 7<br>0: low<br>1: high |
| 7 | Status digital output 8<br>0: low<br>1: high |
| 15 ... 8 | Reserved |

## P0419

| | | | |
|---|---|---|---|
| | Status der digitalen Ausgänge in Modulschacht E | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Function module E: Status digital output** | $0_{hex}$ | |
| A | BM_w_DO_Status_SlotE | 1:1 | - |

Display of the status of the channels in module slot E.

The displayed information depends upon if a module with digital outputs is plugged in or not.

Bit description see ▹P0418◃ on page 132.

**P0420** Wert analoger Eingang 1 -100.00 to +100.00 %

- **Analog input 1 actual value** 0.00 %

A BM_i_AI1_Value $7FFF_{hex}$:100% -

This parameter displays the respective actual input value considering the scaling.

**P0421** Wert analoger Eingang 2 -100.00 to +100.00 %

- **Analog input 2 actual value** 0.00 %

A BM_i_AI2_Value $7FFF_{hex}$:100% -

This parameter displays the respective actual input value considering the scaling.

**P0430** Hochlaufgeber-Status $0_{hex}$ to $FFFF_{hex}$

- **Ramp Function Generator status** $0_{hex}$

A BM_w_RFGStatus 1:1 -

Status of ramp function generator (RFG).

| Bit No. | Meaning |
|---|---|
| 3 ... 0 | Reserved |
| 4 | 1: RFG output is internally set to O (RFG_INHIBIT) |
| 5 | 1: RFG is stopped on the ramp (HLG_STOP) |
| 6 | 1: RFG input is internally set to set 0 (RFG_ZERO) |
| 7 | 1: Quickstop ramp is active (RFG_SHALT) |
| 8 | 1: Ramp-up is active |
| 9 | 1: Ramp down is active |
| 11 ... 10 | Reserved |
| 12 | 1: RFG output = RFG input (set reached) |
| 15 ... 13 | Reserved |

Bit 12: Setpoint reached

The status bit „Setpoint reached“ is set, according to the meaning of the bits in the control word (▹P0300◃) as follows:

| Control word bits | | | Operation | Bit 12 RFG output = RFG input (setpoint reached) |
|---|---|---|---|---|
| 6 | 5 | 4 | | |
| 0 | 0 | 0 | Normal | Ramp function generator is active, bit 12 is set, if the following is valid: Ramp function generator output - ramp function generator input <= Ramp function generator setpoint-reached-bandwidth |
| 0 | 0 | 1 | Inhibit RFG | Ramp function generator is active, bit 12 is set immediately. RFG output is set to 0-value. |
| 0 | 1 | 0 | RFG stop | Ramp function generator is deactivated. RFG output is frozen. Bit 12 is always FALSE. |
| 1 | 0 | 0 | RFG zero | Ramp function generator is active, bit 12 is set, if RFG output has reached value 0, i. e. the drive stands still. |

## P0440

| | | | |
|---|---|---|---|
| | Sollwertgenerator Modus | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Setpoint generator mode** | $0_{hex}$ | |
| | BM_w_SvgMode | 1:1 | - |

See also ▹Setpoint generator◃ from page 79.

Operation mode of setpoint generator.

| Bit No. | Meaning |
|---|---|
| 1 ... 0 | 000: Switched off<br>001: Ramp function generator input 1 |
| 15 ... 2 | Reserved |

## P0441

| | | | |
|---|---|---|---|
| | SWG Zeit 1 | 0.001 to 65.535 s | |
| EE | **SVG time 1** | 1.000 | |
| | BM_u_SvgTime1 | 1000:1 s | - |

See also ▹Setpoint generator◃ from page 79.

These parameters can be parameterized with values from 1 ms to 65 s. The setpoint generator has a cycle time of 16 ms. Therefore, only settings with a multiple of 16 ms are reasonable.
For these time values, the respective setpoints are switched onto the output of the setpoint generator.

## P0443

| | | | |
|---|---|---|---|
| | SWG Zeit 2 | 0.001 to 65.535 s | |
| EE | **SVG time 2** | 1.000 | |
| | BM_u_SvgTime2 | 1000:1 s | - |

See also ▹Setpoint generator◃ from page 79.

These parameters can be parameterized with values from 1 ms to 65 s. The setpoint generator has a cycle time of 16 ms. Therefore, only settings with a multiple of 16 ms are reasonable. For these time values, the respective setpoints are switched onto the output of the setpoint generator.

## P0445

| | | | |
|---|---|---|---|
| | SWG Zeit 3 | 0.001 to 65.535 s | |
| EE | **SVG time 3** | 1.000 | |
| | BM_u_SvgTime3 | 1000:1 s | - |

See also ▹Setpoint generator◃ from page 79.

These parameters can be parameterized with values from 1 ms to 65 s. The setpoint generator has a cycle time of 16 ms. Therefore, only settings with a multiple of 16 ms are reasonable. For these time values, the respective setpoints are switched onto the output of the setpoint generator.

## P0447

| | | | |
|---|---|---|---|
| | SWG Zeit 4 | 0.001 to 65.535 s | |
| EE | **SVG time 4** | 1.000 | |
| | BM_u_SvgTime4 | 1000:1 s | - |

See also ▷Setpoint generator◁ from page 79.

These parameters can be parameterized with values from 1 ms to 65 s. The setpoint generator has a cycle time of 16 ms. Therefore, only settings with a multiple of 16 ms are reasonable. For these time values, the respective setpoints are switched onto the output of the setpoint generator.

## P0449

| | | | |
|---|---|---|---|
| | Sollwertgenerator Ausgang | 0 to 65535 | |
| - | **Setpoint generator output** | 600 | |
| A | BM_i_SvgOutput | 1:1 | - |

See also ▷Setpoint generator◁ from page 79.

Output of setpoint generator.

## P0480

| | | | |
|---|---|---|---|
| | Leistungsteil Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Power unit status** | $0_{hex}$ | |
| A | BM_w_AmpStatus | 1:1 | - |

Status messages from power unit.

| Bit No. | Meaning |
|---|---|
| 0 | 0: fan is controlled via the heatsink temperature of the power unit<br>1: fan is switched on with mains-on signal |
| 7 ... 1 | Reserved |
| 8 | 1: there is no error message from the power unit. |
| 9 | Reserved |
| 10 | 1: pulses are enabled, power unit is operating in the switching mode (monitoring signal from the power unit) |
| 11 | 0: normal operation, no current reduction of Ixt-monitoring<br>1: Ixt via the limit value, current reduction in intervention, current reduction to 100 % $I_{nominal}$ |
| 12 | 0: fan is switched off<br>1: fan is switched on |
| 13 | 0: 24 V is switched off<br>1: 24 V is o.k. |
| 15 ... 14 | Reserved |

| | | | |
|---|---|---|---|
| **P0481** | Leistungsteil Geräte-Innentemperatur-Istwert | 0 to 125 °C | |
| - | **Power unit internal device actual temperature** | 0 °C | |
| A | BM_u_AmpActAmbientTemp | 1:1 °C | - |

Display of the power unit inside temperature of the device.

| | | | |
|---|---|---|---|
| **P0482** | Leistungsteil Kühlkörpertemperatur-Istwert | 0 to 125 °C | |
| - | **Power unit heatsink actual temperature** | 0 °C | |
| A | BM_u_AmpActHeatsinkTemp | 1:1 °C | - |

Display of power unit heatsink temperature.

| | | | |
|---|---|---|---|
| **P0484** | Leistungsteil Uzk-Istwert | 0 to 10290 V | |
| - | **Power unit DC-link actual value** | 0 V | |
| A | BM_u_AmpActDCLinkVolt | $4000_{hex}$:540 V | - |

Measured actual value of DC link voltage.

| | | | |
|---|---|---|---|
| **P0485** | Leistungsteil Ixt-Wert | 0 to 400.0 % | |
| - | **Power unit Ixt actual value** | 0.0 % | |
| A | BM_u_AmpAct_Ixt | $2000_{hex}$:100 % | - |

This parameter shows the current Ixt value (computation result of an internal temperature model consisting of heatsink and IGBT) of the overload monitoring. At a value of 100 % the current limit occurs to the power unit nominal current. If the Ixt-value falls below 95 %, the current limit is set to power unit maximum current of the drive (▷P1241◁) again.

| | | | |
|---|---|---|---|
| **P0487** | PWM Modus Umschaltung | 0.00 to 100.00 % | |
| EE | **Switching PWM mode** | 100.00 % | |
| ON | BM_u_PWM_Mode | $4000_{hex}$:100 % | CW |

(from FW 03.06)

With this parameter you select, from which modulation of the PWM the MRZM (modified space vector modulation) is activated. This parameter is settable from 0.00 to 100.00 %. A value of 0.00 % accords to zero voltage of the converter output (0.00 % modulation) and 100 % accord to 100 % modulation of PWM. From 80 % modulation on the switching losses with MRZM are reduced by on third, without increasing the switching current ripples compared with RZM (space vector modulation).

## P0490

| | | | |
|---|---|---|---|
| | Einspeiseeinheit Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **PSU status 3** | $0_{hex}$ | |
| A | BM_w_PSU_Status | 1:1 | - |

Status messages from power supply (mains supply) unit.

| Bit | Meaning |
|---|---|
| 0 | 0: DC-link voltage is generated by the device from the mains.<br>1: DC-link voltage is provided by external supply. |
| 7 ... 1 | Reserved |
| 8 | 1: message mains power failure |
| 15 ... 9 | Reserved |

## P0540

| | | | |
|---|---|---|---|
| | CAN Modus | 0 to 1 | |
| EE | **CAN mode** | 0 | |
| | BM_w_CAN_Mode | 1:1 | - |

Reserved.

## P0541

| | | | |
|---|---|---|---|
| | CAN Status | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **CAN status** | $0_{hex}$ | |
| A | BM_w_CAN_Status | 1:1 | - |

Reserved.

## P0542

| | | | |
|---|---|---|---|
| | CAN Baudrate (Konfig) | 125 to 1000 kBit/s | |
| EE | **CAN baud rate (config)** | 125 kBit/s | |
| | BM_u_CAN_BaudrateSet | 1:1 kBit/s | - |

Reserved.

## P0543

| | | | |
|---|---|---|---|
| | CAN Baudrate (DIP-Schalter) | 125 to 1000 kBit/s | |
| EE | **CAN baud rate (DIP switch)** | 125 kBit/s | |
| A | BM_u_CAN_BaudrateDIP | 1:1 kBit/s | - |

Reserved.

| | | | |
|---|---|---|---|
| **P0544** | CAN Baudrate (aktiv) | 125 to 1000 kBit/s | |
| - | **CAN baud rate (active)** | 125 kBit/s | |
| A | BM_u_CAN_BaudrateAct | 1:1 kBit/s | - |
| | Reserved. | | |
| **P0545** | CAN Slave Nummer (Konfig) | 0 to 128 | |
| EE | **CAN slave number (config)** | 0 | |
| | BM_u_CAN_SlaveNrSet | 1:1 | - |
| | Reserved. | | |
| **P0546** | CAN Slave Nummer (DIP-Schalter) | 0 to 128 | |
| EE | **CAN slave number (DIP-switch)** | 0 | |
| A | BM_u_CAN_SlaveNrDIP | 1:1 | - |
| | Reserved. | | |
| **P0547** | CAN Slave Nummer (aktiv) | 0 to 128 | |
| - | **CAN slave number (active)** | 0 | |
| A | BM_u_CAN_SlaveNrAct | 1:1 | - |
| | Reserved. | | |

| | | | |
|---|---|---|---|
| **P0550** | Modultyp Steckplatz A | $0_{hex}$ to $FFFF_{hex}$ | |
| - | **Module type slot A** | $0_{hex}$ | |
| A | BM_w_ModSlotAIdent | 1:1 | - |

Code of module in slot A.

| Bit No. | Meaning |
|---|---|
| 4 ... 0 | Reserved |
| 7 ... 5 | Module version (see table ▹Page 140◃) |
| 10 ... 8 | **Hardware version** of modules<br>000: Development<br>001: Hardware-version A<br>002: Hardware-version B<br>003: Hardware-version C<br>004: Hardware-version D<br>005: Hardware-version E<br>006: Hardware-version F<br>007: Hardware-version G |
| 15 ... 11 | **Module function** (see bit bar ▹Page 139◃) |

- Module functions P0550

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Module | | | | | Hardware status | | | Module-specific | | | Reserved | | | | |

| 15 | 14 | 13 | 12 | 11 | | |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | no module | |
| 0 | 0 | 0 | 0 | 1 | Reserved | |
| 0 | 0 | 0 | 1 | 0 | Reserved | |
| 0 | 0 | 0 | 1 | 1 | AIO-03 | analog I/O, 12 bit D/A - 12 bit A/D |
| 0 | 0 | 1 | 0 | 0 | Reserved | |
| 0 | 0 | 1 | 0 | 1 | DIO-01 | digital I/O, 4 inputs, 4 outputs |
| 0 | 0 | 1 | 1 | 0 | Reserved | |
| 0 | 0 | 1 | 1 | 1 | Reserved | |
| 0 | 1 | 0 | 0 | 0 | Reserved | |
| 0 | 1 | 0 | 0 | 1 | Reserved | |
| 0 | 1 | 0 | 1 | 0 | Reserved | |
| 0 | 1 | 0 | 1 | 1 | Reserved | |
| 0 | 1 | 1 | 0 | 0 | Reserved | |
| 0 | 1 | 1 | 0 | 1 | Reserved | |
| 0 | 1 | 1 | 1 | 0 | Reserved | |
| 0 | 1 | 1 | 1 | 1 | Reserved | |
| 1 | 0 | 0 | 0 | 0 | Reserved | |
| 1 | 0 | 0 | 0 | 1 | AIO-01 | analog I/O, 8 bit D/A - 10 bit A/D |
| 1 | 0 | 0 | 1 | 0 | SRM-01 | monitoring signal for NWR* (standard slot B) |
| 1 | 0 | 0 | 1 | 1 | Reserved | |
| 1 | 0 | 1 | 0 | 0 | Reserved | |
| 1 | 0 | 1 | 0 | 1 | FIO-01 | digital I/o, 4 fast inputs 4 outputs |

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Module | | | | | Hardware status | | | Module-specific | | | Reserved | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 1 | 0 | UME-01 | voltage access NWR * (standard slot A) |
| 1 | 0 | 1 | 1 | 1 | Reserved | |
| 1 | 1 | 0 | 0 | 0 | Reserved | |
| 1 | 1 | 0 | 0 | 1 | AIO-02 | analog I/O, 16 bit D/A - 16 bit A/D |
| 1 | 1 | 0 | 1 | 0 | Reserved | |
| 1 | 1 | 0 | 1 | 1 | Reserved | |
| 1 | 1 | 1 | 0 | 0 | Reserved | |
| 1 | 1 | 1 | 0 | 1 | Reserved | |
| 1 | 1 | 1 | 1 | 0 | Reserved | |
| 1 | 1 | 1 | 1 | 1 | SEA-01 | main contactor control for NWR * (standard slot C) |

*) NWR: Mains inverter

- Module-specific meaning of bit 7 ... 5

Examples:

| Module | | Value P0550 |
|---|---|---|
| AIO-01 | Analog I/O, 8 bit D/A - 10 bit A/D | $8800_{hex}$ |
| AIO-02 | Analog I/O, 16 bit D/A - 16 bit A/D | $CBF0_{hex}$ |
| AIO-03 | Analog I/O, 12 bit D/A - 12 bit A/D | $1A00_{hex}$ |
| DIO-01 | Digital I/O, 4 inputs, 4 outputs | $2800_{hex}$ |
| FIO-01 | Digital I/O, 4 fast inputs 4 outputs | $5800_{hex}$ |
| UME-01 | Mains voltage sensing | $B000_{hex}$ |
| SEA-01 | Control of the main contactor | $F800_{hex}$ |
| SRM-01 | Monitoring signal of the main contactor | $9000_{hex}$ |

**P0551** Modultyp Steckplatz B $0_{hex}$ to $FFFF_{hex}$

\- **Module type slot B** $0_{hex}$

A BM_w_ModSlotBIdent 1:1 -

Code of module in slot B.

Description see ▹P0550◃ on page 139.

**P0552** Modultyp Steckplatz C $0_{hex}$ to $FFFF_{hex}$

\- **Module type slot C** $0_{hex}$

A BM_w_ModSlotCIdent 1:1 -

Code of module in slot C.

Description see ▹P0550◃ on page 139.

**P0553** Modultyp Steckplatz D — $0_{hex}$ to $FFFF_{hex}$

- **Module type slot D** — $0_{hex}$

A BM_w_ModSlotDIdent 1:1 -

Code of module in slot D.

Description see ▹P0550◃ on page 139.

**P0554** Modultyp Steckplatz E — $0_{hex}$ to $FFFF_{hex}$

- **Module type slot E** — $0_{hex}$

A BM_w_ModSlotEIdent 1:1 -

Code of module in slot E.

Description see ▹P0550◃ on page 139.

**P0555** FPGA-Version — $0_{hex}$ to $FFFF_{hex}$

- **FPGA version** — 0

A BM_w_FpgaVersion 1:1 -

Firmware version of programmable logic module situated in the controller.

**P0556** Bootloader-Firmware-Version — 0 to 65535

- **Bootloader firmware version** — 0

A BM_u_BootloaderVersion 1:1 -

Firmware version of bootstrap loader.

**P0557** Programmier-Anforderung — 0 to 1

- **Programming request** — 0

ON BM_w_ProgRequest 1:1 -

Special parameter to start a firmware update over WinBASS II/ProDrive.

**P0558** Konfigurations-Identifikationsnummer — 0 to 4294967295

EE **Configuration ID** — 0

ON BM_ud_ConfigId 1:1 -

This parameter acts as a storage of an item number or similar in the controller. The value is not processed by the controller, but is stored in the central data during storage of data sets.

| | | | |
|---|---|---|---|
| **P0559** | Gerätename | 80 ASCII characters | |
| EE | **Drive name** | "" | |
| ON | BM_s_DriveName | 1:1 | - |

This parameter serves for the storage of an device name for example for the system configuration. The string is not evaluated by the controller, but stored during storage of data sets.

| | | | |
|---|---|---|---|
| **P0575** | Digitaler Input-Kanal für Fehlerquittierung | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Digital input channel for error acknowledge** | $0_{hex}$ | |
| | BM_w_DI_AckErrInpChannel | 1:1 | - |

Slot and channel select of digital inputs, which will be used to reset drive error messages.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Selection of input module slot (possible values 1 to 5, corresponding to slot A to E) |

Value 0 means that no input channel is selected. Resetting of errors by use of a digital input is deactivated then.

Example:
▹P0575◃ = $0502_{hex}$; That means digital input for error reset is connected with pin 2 in the slot E (= 5) of the input module.

| | | | |
|---|---|---|---|
| **P0579** | Funktionsmodul-Auswahl für PLC-I/O-Zugriffe | $0_{hex}$ to $1F_{hex}$ | |
| EE | **Function module selection for PLC I/O-access** | $0_{hex}$ | |
| PO | BM_w_PlcModSelect | 1:1 | - |

Selection of, which digital- or analog-I/O function module can trigger the PLC direct-reading/or writing. In principle an access of the PLC on other function module types (e. g. touch probe, ...) is not possible.

| Bit No. | Meaning |
|---|---|
| 0 | Function module slot A<br>0: access by PLC not permitted<br>1: access by PLC permitted |
| 1 | Function module slot B<br>0: access by PLC not permitted<br>1: access by PLC permitted |
| 2 | Function module slot C<br>0: access by PLC not permitted<br>1: access by PLC permitted |
| 3 | Function module slot D<br>0: access by PLC not permitted<br>1: access by PLC permitted |
| 4 | Function module slot E<br>0: access by PLC not permitted<br>1: access by PLC permitted |
| 5 to 15 | Reserved |

The directly access on I/Os of the controller are only possible by controllers with special FPGA version.

## P0800

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master Zykluszeit | 0 to 32000 µs | |
| EE | **Option module 1 master cycle time** | 4000 µs | |
| PO | BM_u_Baci1M1Period | 1:125 µs | - |

This parameter is accepted after switching on, it also can be changed by the option module, but then it only acts as display.

This parameter specifies with which cycle time the new set-/actual values are transmitted. The value refers to a multiple of 125 µs.

| Value | Meaning |
|---|---|
| 0 | no cyclic data exchange |
| 1 | not permissible |
| 2 | 250 µs |
| 3 | 375 µs |
| and so on | |

## P0801

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Para-Nummer Sollwert 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. setpoint 1** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal1 | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Parameter of the first setpoint (1 ... 8) for the cyclic communication. Only the numbers of the parameters may be specified, which are cyclic writeable (attribute CW).

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

## P0802

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Para-Nummer Sollwert 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. setpoint 2** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal2 | 1:1 | - |

2nd setpoint. Description of the parameters see ▹P0801◃ on page 144.

## P0803

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Para-Nummer Sollwert 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. setpoint 3** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal3 | 1:1 | - |

3rd setpoint. Description of the parameters see ▹P0801◃ on page 144.

**P0804** Optionsmodul 1 Master 1 Para-Nummer Sollwert 4 $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| EE | **Option module 1 master 1 parameter no. setpoint 4** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal4 | 1:1 | - |

4th setpoint. Description of the parameters see ▹P0801◃ on page 144.

**P0805** Optionsmodul 1 Master 1 Para-Nummer Sollwert 5 $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| EE | **Option module 1 master 1 parameter no. setpoint 5** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal5 | 1:1 | - |

5th setpoint. Description of the parameters see ▹P0801◃ on page 144.

**P0806** Optionsmodul 1 Master 1 Para-Nummer Sollwert 6 $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| EE | **Option module 1 master 1 parameter no. setpoint 6** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal6 | 1:1 | - |

6th setpoint. Description of the parameters see ▹P0801◃ on page 144.

**P0807** Optionsmodul 1 Master 1 Para-Nummer Sollwert 7 $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| EE | **Option module 1 master 1 parameter no. setpoint 7** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal7 | 1:1 | - |

7th setpoint. Description of the parameters see ▹P0801◃ on page 144.

**P0808** Optionsmodul 1 Master 1 Para-Nummer Sollwert 8 $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| EE | **Option module 1 master 1 parameter no. setpoint 8** | $0_{hex}$ | |
| PO | BM_u_Baci1M1SetVal8 | 1:1 | - |

8th setpoint. Description of the parameters see ▹P0801◃ on page 144.

**P0809** Optionsmodul 1 Master 1 Para-Nummer Istwert 1 $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| EE | **Option module 1 master 1 parameter no. act value 1** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal1 | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Parameter of the actual values (1 ... 8) for the cyclic communication. The parameter specified by the number must be data type INT, UINT, DINT, UDINT, WORD or DWORD.

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

| | | | |
|---|---|---|---|
| **P0810** | Optionsmodul 1 Master 1 Para-Nummer Istwert 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 2** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal2 | 1:1 | - |

2nd actual value Description of the parameters see ▹P0809◃ on page 145.

| | | | |
|---|---|---|---|
| **P0811** | Optionsmodul 1 Master 1 Para-Nummer Istwert 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 3** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal3 | 1:1 | - |

3rd actual value Description of the parameters see ▹P0809◃ on page 145.

| | | | |
|---|---|---|---|
| **P0812** | Optionsmodul 1 Master 1 Para-Nummer Istwert 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 4** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal4 | 1:1 | - |

4th actual value Description of the parameters see ▹P0809◃ on page 145.

| | | | |
|---|---|---|---|
| **P0813** | Optionsmodul 1 Master 1 Para-Nummer Istwert 5 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 5** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal5 | 1:1 | - |

5th actual value Description of the parameters see ▹P0809◃ on page 145.

| | | | |
|---|---|---|---|
| **P0814** | Optionsmodul 1 Master 1 Para-Nummer Istwert 6 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 6** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal6 | 1:1 | - |

6th actual value Description of the parameters see ▹P0809◃ on page 145.

| | | | |
|---|---|---|---|
| **P0815** | Optionsmodul 1 Master 1 Para-Nummer Istwert 7 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 7** | $0_{hex}0$ | |
| PO | BM_u_Baci1M1ActVal7 | 1:1 | - |

7th actual value Description of the parameters see ▹P0809◃ on page 145.

## P0816

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Para-Nummer Istwert 8 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 parameter no. act value 8** | $0_{hex}$ | |
| PO | BM_u_Baci1M1ActVal8 | 1:1 | - |

8th actual value Description of the parameters see ▹P0809◃ on page 145.

## P0817

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Trigger-Offset | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 trigger offset** | $0_{hex}$ | |
| PO | BM_u_Baci1M1TriggOffset | 1:1 | - |

Not yet implemented.

## P0818

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Zyklus-Offset Sollwerte | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 cycle offset setpoints** | 2 | |
| PO | BM_u_Baci1M1CycleSetOffset | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Cycle offset for setpoint transmission. Exact description see software module BACI.

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

## P0819

| | | | |
|---|---|---|---|
| | Optionsmodul 1 Master 1 Zyklus-Offset Istwerte | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 1 master 1 cycle offset act. values** | $0_{hex}$ | |
| PO | BM_u_Baci1M1CycleActOffset | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Cycle offset for actual value transmission. Exact description see software module BACI.

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

## P0827

| | | | |
|---|---|---|---|
| | Optionsmodul Auswahl | 0 to 6 | |
| EE | **Option module select** | 0 | |
| PO | BM_u_BaciModuleSelect | 1:1 | - |

The controller only evaluates this parameter after the switching off/switching on of the system.

The controller has two separate configuration parameter blocks:

- BACI1-master1-parameters (▹P0800◃ to ▹P0819◃) and
- BACI2-master1-parameters (▹P0860◃ to ▹P0879◃)

This parameter acts as an allocation between option module slot and one or both BACI configuration parameter blocks according to the following table:

| Value | Slave G | Slave H | Allocation of the BACI configuration parameters |
|---|---|---|---|
| 0 | X | - | P0800 to P0819 are valid for the slave on slot G |
| | - | X | P0800 to P0819 are valid for the slave on slot H |
| | X | X | P0800 to P0819 are valid for the slave on slot G<br>P0860 to P0879 are valid for the slave on slot H |
| 1 | X | - | P0800 to P0819 are valid for the slave on slot G |
| | - | X | P0860 to P0879 are valid for the slave on slot H |
| | X | X | P0800 to P0819 are valid for the slave on slot G<br>P0860 to P0879 are valid for the slave on slot H |
| 2 | X | - | P0860 to P0879 are valid for the slave on slot G |
| | - | X | P0800 to P0819 are valid for the slave on slot H |
| | X | X | P0860 to P0879 are valid for the slave on slot G<br>P0800 to P0819 are valid for the slave on slot H |
| 3 to 65535 | | | Reserved |

## P0830

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 1** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig1 | 1:1 | - |

First word for the software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- Option module CANsync

CAN-Mapping for setpoint 1

| Bit No. | Meaning |
|---|---|
| 0 | Validity<br>0: setpoint is not used<br>1: setpoint is used |
| 2 ... 1 | Position in set- or actual value telegram<br>00: setpoint begins with WORD 0<br>01: setpoint begins with WORD 1<br>10: setpoint begins with WORD 3<br>11: setpoint begins with WORD 4 (for WORD-format only) |
| 5 ... 3 | Set- or actual value telegram No.<br>000: telegram 1<br>001: telegram 2<br>010: reserved<br>to<br>111: reserved |

| Bit No. | Meaning |
|---|---|
| 6 | Format<br>0: setpoint has WORD-format (16 bit)<br>1: setpoint has DWORD-format (32 bit) |
| 7 | Setpoint/actual value telegram<br>0: setpoint is in setpoint telegram<br>1: setpoint is in actual value telegram of slave No. (see bits 8 to 12) |
| 12 ... 8 | Slave No., if setpoint from actual value telegram<br>00000: slave 0<br>00001: slave 1<br>to<br>11111: slave 31 |
| 15 ... 13 | Reserved |

## P0831

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 2** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig2 | 1:1 | - |

Second word acts as software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for setpoint 2.

Bit-assignment see ▹P0830◃ on page 148.

## P0832

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 3** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig3 | 1:1 | - |

Third word acts as software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for setpoint 3.

Bit-assignment see ▹P0830◃ on page 148.

## P0833

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 4** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig4 | 1:1 | - |

Fourth word acts as software module configuration of the optional module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for setpoint 4.

Bit-assignment see ▹P0830◃ on page 148.

## P0834

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 5 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 5** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig5 | 1:1 | - |

Fifth word acts as software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for actual value 1

| Bit No. | Meaning |
|---|---|
| 0 | Validity<br>0: actual value is not used<br>1: actual value is used |
| 2 ... 1 | Position in actual value telegram<br>00: actual value begins with WORD 0<br>01: actual value begins with WORD 1<br>10: actual value begins with WORD 3<br>11: actual value begins with WORD 4 (for WORD-format only) |
| 4 ... 3 | Actual value telegram No.<br>00: telegram 1<br>01: telegram 2<br>10: reserved<br>11: reserved |
| 5 | Reserved |
| 6 | Format<br>0: actual value has WORD-format (16 bit)<br>1: actual value has DWORD-format (32 bit) |
| 7 ... 15 | Reserved |

## P0835

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 6 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 6** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig6 | 1:1 | - |

Sixth word acts as software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for actual value 2.

Bit-assignment see ▷P0834◁ on page 150.

## P0836

| | | | |
|---|---|---|---|
| | Optionsmodul G Konfiguration 7 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 7** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig7 | 1:1 | - |

Seventh word acts as software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for actual value 3.

Bit-assignment see ▷P0834◁ on page 150.

| | | | |
|---|---|---|---|
| **P0837** | Optionsmodul G Konfiguration 8 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module G configuration 8** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveGConfig8 | 1:1 | - |

Eighth word acts as software module configuration of the option module on slot G. The meaning of the parameter is module-dependent.

- CANsync: CAN-Mapping for actual value 4

Bit-assignment see ▹P0834◃ on page 150.

| | | | |
|---|---|---|---|
| **P0838** | Timeout Hochlaufphase der BACI-Initialisierung | 0 to 65535 s | |
| EE | **BACI Setup Timeout** | 60 s | |
| PO | BM_u_BaciSetupTimeout | 1:1 s | - |

Timeout value for the time-monitoring of the configuration phase after a system-starting.

| | | | |
|---|---|---|---|
| **P0839** | Timeout für zyklische BACI-Kommunikation | 0 to 65535 ms | |
| EE | **BACI cyclic communication timeout** | 50 ms | |
| PO | BM_u_BaciCyclicTimeout | 1:1 ms | - |

Timeout value for the time monitoring of the cyclic communication in the running operation.

The controller monitors the cyclic communication over a timeout mechanism. A timeout-counter starts at the first successful cyclic setpoint transmission. Every further successful cyclic setpoint transmission retriggers this time counter .

Parameter error reaction BACI communication (▹P0298◃ on page 114) acts as the setting of the according error reaction.

| | | | |
|---|---|---|---|
| **P0840** | Optionsmodul H Konfiguration 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 1** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig1 | 1:1 | - |

First word acts as software module configuration of the optional module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0830◃ on page 148.

| | | | |
|---|---|---|---|
| **P0841** | Optionsmodul H Konfiguration 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 2** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig2 | 1:1 | - |

Second word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0831◃ on page 149.

| | | | |
|---|---|---|---|
| **P0842** | Optionsmodul H Konfiguration 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 3** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig3 | 1:1 | - |

Third word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0832◃ on page 149.

| | | | |
|---|---|---|---|
| **P0843** | Optionsmodul H Konfiguration 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 4** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig4 | 1:1 | - |

Fourth word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0833◃ on page 149.

| | | | |
|---|---|---|---|
| **P0844** | Optionsmodul H Konfiguration 5 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 5** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig5 | 1:1 | - |

Fifth word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0834◃ on page 150.

| | | | |
|---|---|---|---|
| **P0845** | Optionsmodul H Konfiguration 6 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 6** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig6 | 1:1 | - |

Sixth word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0835◃ on page 150.

| | | | |
|---|---|---|---|
| **P0846** | Optionsmodul H Konfiguration 7 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 7** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig7 | 1:1 | - |

Seventh word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▹P0836◃ on page 150.

| | | | |
|---|---|---|---|
| **P0847** | Optionsmodul H Konfiguration 8 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module H configuration 8** | $0_{hex}$ | |
| PO | BM_w_BaciSlaveHConfig8 | 1:1 | - |

Eighth word acts as software module configuration of the option module on slot H. The meaning of the parameter is module-dependent see parameter ▷P0837◁ on page 151.

| | | | |
|---|---|---|---|
| **P0848** | Baci Fehlermeldungsverzögerung | 0 to 65535 s | |
| EE | **Baci error detection delay** | 30 s | |
| PO | BM_w_BaciSlaveHConfig8 | 1:1 s | - |

The setup of a coupled system over the BACI extends up to an application-dependent duration. During this setup, especially as long as the total system is not yet working synchronous, error messages, which come from BACI, can be unwanted. This parameter determines the time in seconds, how long the controller suppresses error messages after initialization of BACI.

## P0860

| | | | |
|---|---|---|---|
| | Optionsmodul 2 Master Zykluszeit | 0 to 32000 µs | |
| EE | **Option module 2 master cycle time** | 4000 µs | |
| PO | BM_u_Baci2M1Period | 1:125 µs | - |

This parameter is accepted after switching on, it also can be changed by the option module, but then it only acts as display.

This parameter specifies after which number of control cycles the new set-/actual values are transmitted. The value refers to a multiple of 125 µs.

| Value | Meaning |
|---|---|
| 0 | no cyclic data exchange |
| 1 | not permissible |
| 2 | 250 µs |
| 3 | 375 µs |
| and so on | |

## P0861

| | | | |
|---|---|---|---|
| | Optionsmodul 2 Master 1 Para-Nummer Sollwert 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. setpoint 1** | $0_{hex}$ | |
| PO | BM_u_Baci2M1SetVal1 | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Parameter of the first setpoint (1 ... 8) for the cyclic communication. Only the numbers of the parameters may be specified, which are cyclic (attribute CW).

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

## P0862

| | | | |
|---|---|---|---|
| | Optionsmodul 2 Master 1 Para-Nummer Sollwert 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. setpoint 2** | $0_{hex}$ | |
| PO | BM_u_Baci2M1SetVal2 | 1:1 | - |

2. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

## P0863

| | | | |
|---|---|---|---|
| | Optionsmodul 2 Master 1 Para-Nummer Sollwert 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. setpoint 3** | $0_{hex}$ | |
| PO | BM_u_Baci2M1SetVal3 | 1:1 | - |

3. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

**P0864** Optionsmodul 2 Master 1 Para-Nummer Sollwert 4 $0_{hex}$ to $FFFF_{hex}$

EE **Option module 2 master 1 parameter No. setpoint 4** $0_{hex}$

PO BM_u_Baci2M1SetVal4 1:1 -

4. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

**P0865** Optionsmodul 2 Master 1 Para-Nummer Sollwert 5 $0_{hex}$ to $FFFF_{hex}$

EE **Option module 2 master 1 parameter No. setpoint 5** $0_{hex}$

PO BM_u_Baci2M1SetVal5 1:1 -

5. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

**P0866** Optionsmodul 2 Master 1 Para-Nummer Sollwert 6 $0_{hex}$ to $FFFF_{hex}$

EE **Option module 2 master 1 parameter No. setpoint 6** $0_{hex}$

PO BM_u_Baci2M1SetVal6 1:1 -

6. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

**P0867** Optionsmodul 2 Master 1 Para-Nummer Sollwert 7 $0_{hex}$ to $FFFF_{hex}$

EE **Option module 2 master 1 parameter No. setpoint 7** $0_{hex}$

PO BM_u_Baci2M1SetVal7 1:1 -

7. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

**P0868** Optionsmodul 2 Master 1 Para-Nummer Sollwert 8 $0_{hex}$ to $FFFF_{hex}$

EE **Option module 2 master 1 parameter No. setpoint 8** $0_{hex}$

PO BM_u_Baci2M1SetVal8 1:1 -

8. Setpoint. Description of the parameters see ▹P0861◃ on page 154.

**P0869** Optionsmodul 2 Master 1 Para-Nummer Istwert 1 $0_{hex}$ to $FFFF_{hex}$

EE **Option module 2 master 1 parameter No. act value 1** $0_{hex}$

PO BM_u_Baci2M1ActVal1 1:1 -

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Parameter of the 1. actual values (1 ... 8) actual value for the cyclic communication. The parameter specified by the number must be data type INT, UINT, DINT, UDINT, WORD or DWORD.

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

| | | | |
|---|---|---|---|
| **P0870** | Optionsmodul 2 Master 1 Para-Nummer Istwert 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 2** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal2 | 1:1 | - |

2. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0871** | Optionsmodul 2 Master 1 Para-Nummer Istwert 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 3** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal3 | 1:1 | - |

3. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0872** | Optionsmodul 2 Master 1 Para-Nummer Istwert 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 4** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal4 | 1:1 | - |

4. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0873** | Optionsmodul 2 Master 1 Para-Nummer Istwert 5 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 5** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal5 | 1:1 | - |

5. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0874** | Optionsmodul 2 Master 1 Para-Nummer Istwert 6 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 6** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal6 | 1:1 | - |

6. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0875** | Optionsmodul 2 Master 1 Para-Nummer Istwert 7 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 7** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal7 | 1:1 | - |

7. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0876** | Optionsmodul 2 Master 1 Para-Nummer Istwert 8 | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 parameter No. act value 8** | $0_{hex}$ | |
| PO | BM_u_Baci2M1ActVal8 | 1:1 | - |

8. actual value. Description of the parameters see ▹P0869◃ on page 155.

| | | | |
|---|---|---|---|
| **P0877** | Optionsmodul 2 Master 1 Trigger-Offset | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 trigger offset** | $0_{hex}$ | |
| PO | BM_u_Baci2M1TriggOffset | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

In the chosen data exchange interval the controller can read out a cyclic trigger signal to the option module. The offset (unit µs) determines the temporal reference between the beginning of the communication interval and the reading out of the trigger signal output.

Parameter is accepted when switching on, it can also be changed by the option module, but then it only acts as display.

| | | | |
|---|---|---|---|
| **P0878** | Optionsmodul 2 Master 1 Zyklus-Offset Sollwerte | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 cycle offset setpoints** | 2 | |
| PO | BM_u_Baci2M1CycleSetOffset | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Cycle offset for setpoint transmission.
Exact description see ▹BACI◃ from page 63.

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

| | | | |
|---|---|---|---|
| **P0879** | Optionsmodul 2 Master 1 Zyklus-Offset Istwerte | $0_{hex}$ to $FFFF_{hex}$ | |
| EE | **Option module 2 master 1 cycle offset act. values** | $0_{hex}$ | |
| PO | BM_u_Baci2M1CycleActOffset | 1:1 | - |

Configuration for the selected option module by parameter option module selection (▹P0827◃).

Cycle offset for actual value transmission. Exact description see ▹BACI◃ from page 63.

This parameter is accepted after switching on, it also can be changed by the option module, but then it only serves as display.

## P1000

| | | | |
|---|---|---|---|
| | Soll-Betriebsart | -7 to 6 | |
| DS | **Operation mode desired** | -3 | |
| | BM_i_Ds0_OperationMode | 1:1 | CW |

With this parameter you determine the operation mode of the drive.

| Value | Meaning |
|---|---|
| -3 | $U_{DC}$-control |

## P1001

| | | | |
|---|---|---|---|
| | Kommunikationsquelle | $0_{hex}$ to $000F_{hex}$ | |
| DS | **Communication source** | $0001_{hex}$ | |
| | BM_w_DS0_CommSource | 1:1 | CW |

This parameter controls the access rights of the different communication sources to parameters. Communication sources we call modules, which exchange data with a superimposed control by use of a communication interface.

We distinguish between the following communication sources:

- WinBASS II/ProDrive
- Option modules connected by BACI-interface

Basically, read access on parameters is always possible. The read access has different access modes. Here, we have determined the following:

- Write access using request data
- Write access using cyclic data
- Write access for control (that means on the control word)

With respect to access rights, WinBASS II/ProDrive is an exception; it has full access (write and read) on all parameters at any time.

Write access for control should always be given to only one communication source, because otherwise writing conflicts occur. Then the source succeeds, which was the last one to write within the cycle, before the drive manager evaluates the control word.

| Bit No. | Meaning |
|---|---|
| 0 | 1: WinBASS II/ProDrive, control enabled [1)] |
| 1 | 1: CANsync, control enabled [1)] |
| 2 | 1: CANsync, write access via service channel data is enabled |
| 3 | 1: CANsync, write access using cyclic communication (setpoints) |
| 4 | 1: BACI, control enabled [1)] |
| 5 | 1: BACI, write access using service channel data enabled |
| 6 | 1: BACI, write access using cyclic communication (setpoints) |
| 7 to 15 | Reserved |

[1)] Note :
Only then, if in the parameter communication source the total bits for control (bit 0, 1 and 4) are reset, a controller enable is possible using only the hardware inputs pulse enable.

## P1002

| | | | |
|---|---|---|---|
| | Antriebsmanager-Optionen | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Drive manager options** | $0_{hex}$ | |
| | BM_w_Ds0_DrvManagerOptions | 1:1 | CW |

See also ▹Drive management◃ from page 70.

Settings for the drive manager

| Bit No. | Meaning |
|---|---|
| 0 | Reserved |
| 1 | 1: Errors are able to be accepted via hardware input „pulse enable“ (FX3-5). |
| 15 ... 2 | Reserved |

## P1007

| | | | |
|---|---|---|---|
| | Fehler-Reaktion | 0 to 3 | |
| DS | **Error reaction code** | 0 | |
| ON | BM_i_Ds0_ErrorReactionCode | 1:1 | - |

With this parameter the general error reaction is set. This is valid for errors, which do not require a pulse inhibit and which are not set to “No reaction”. At errors with separately adjustable error reaction the reaction, which was set there, is valid.

| Reaction code | Meaning |
|---|---|
| 0 | Pulse disable |
| 1 | Power reduction with unregulated DC link voltage: operation state activated<br>(from firmware-version FW 03.07)<br>When reaction code = 1 the customer is responsible for power reduction and no power feedback in this state, otherwise the device can be damaged. |
| 3 ... 2 | Reserved |

## P1008

| | | | |
|---|---|---|---|
| | Maske für interne Begrenzungen | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Mask for internal limits** | $FFFF_{hex}$ | |
| ON | BM_w_Ds0_InternalLimitMask | 1:1 | CW |

With this parameter it can be selected, which internal limits via bit 11 are signalized in parameter status word ▹P0301◃. Normally all limits are signalized.

Meaning of the individual bits:

| Bit No. | Meaning |
|---|---|
| 0 | Current limit |
| 1 | $U_{DC}$-setpoint limit |
| 7 ... 2 | Reserved |

If a bit is set to 0, the according limit is not shown in the status word anymore.

| | | | |
|---|---|---|---|
| **P1010** | Datensatz Identifikations-Nummer | 0 to 65535 | |
| DS | **Data set ID** | 0 | |
| ON | BM_u_Ds0_RecordId | 1:1 | CW |

See also ▹Data Set Management◃ from page 13.

Free selectable identification number of stored parameter set.

| | | | |
|---|---|---|---|
| **P1011** | Datensatz Name | 80 ASCII characters | |
| DS | **Data set name** | "" | |
| ON | BM_s_Ds0_RecordName | 1:1 | - |

See also ▹Data Set Management◃ from page 13.

Free selectable name of data set with maximal 80 characters.

| | | | |
|---|---|---|---|
| **P1020** | Stromregler P-Verstärkung | 0.01 to 655.35 | |
| DS | **Current controller P-gain** | 1.00 | |
| | BM_u_Ds0_CurrentCtrl_PGain | 100:1 | - |

Proportional gain (Kp) of the current controller.

| | | | |
|---|---|---|---|
| **P1021** | Stromregler Nachstellzeit | 0.0 to 1000.0 ms | |
| DS | **Current controller integral-action time** | 2.5 ms | |
| | BM_u_Ds0_CurrentCtrl_ITime | 10:1 ms | - |

Integral-action time (Ti) of current controller.

| | | | |
|---|---|---|---|
| **P1023** | Ausgangsbegrenzung der Stromregler | 0 to 199.99 % | |
| DS | **Current controller output limiter** | 199.99 % | |
| ON | BM_u_Ds0_VdqLimit | $4000_{hex}$:100 % | - |

Limit of output voltage of the d- and q-current controller.

## P1037

| | | | |
|---|---|---|---|
| | Momenten-Grenze motorisch/MR1 | 0.00 to 100.00% | |
| DS | **Torque limiter motor/TD1** | 100.00 % | |
| ON | BM_u_Ds0_TrqLimMot_TD1 | $4000_{hex}$:100 % | - |

See also ▷P1037◁ on page 161.

This torque limiter limits the torque setpoint at generating operation and accordingly in torque direction 2 (according to settings in ▷P1037◁, bit 2).

The torque limit can either be separately be adjusted for each torque direction or can be separately adjusted for feeding-in or feeding-back operation. The type of limit is set via parameter ▷P1037◁ bit 2 - that means if torque is limited by torque direction or by motoring/generating operation.

Scaling: 100 % ↔ power unit maximum current (▷P1241◁)

## P1038

| | | | |
|---|---|---|---|
| | Momenten-Grenze generatorisch/MR2 | 0.00 to 100.00% | |
| DS | **Torque limiter Generator/TD2** | 100.00 % | |
| ON | BM_u_Ds0_TrqLimGen_TD2 | $4000_{hex}$:100 % | - |

See also ▷P1037◁ on page 161.

This torque limiter limits the torque setpoint at generating operation and accordingly in torque direction 2 (according to settings in ▷P1037◁, bit 2).

The torque limit can either be separately be adjusted for each torque direction or can be separately adjusted for feeding-in or feeding-back operation. The type of limit is set via parameter ▷P1037◁ bit 2 - that means if torque is limited by torque direction or by motoring/generating operation.

Scaling: 100 % ↔ power unit maximum current (▷P1241◁)

## P1090

| | | | |
|---|---|---|---|
| | Auswahl digitaler Eingang 1 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital input 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI1_InputChannel | 1:1 | - |

Selection of slot and channel for digital input 1.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, corresponds to slot A to E) |

Value 0 means that no input channel is selected.

| | | | |
|---|---|---|---|
| **P1091** | Zielnummer digitaler Eingang 1 | 0 to max. Para No. | |
| DS | **Target number: digital input 1** | 0 | |
| ON | BM_u_Ds0_DI1_TargetPxxx | 1:1 | - |

Number of parameter to be changed by digital input 1.

| | | | |
|---|---|---|---|
| **P1092** | Bit-Auswahl digitaler Eingang 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit selection digital input 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI1_BitSelection | 1:1 | CW |

Selection of target parameter bits to be changed by digital input 1.

| | | | |
|---|---|---|---|
| **P1093** | Bit-Muster bei LOW des digitalen Eingang 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern for LOW state digital input 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI1_LowPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 1 is LOW.

| | | | |
|---|---|---|---|
| **P1094** | Bit-Muster bei HIGH des digitalen Eingang 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern for HIGH state digital input 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI1_HighPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 1 is HIGH.

| | | | |
|---|---|---|---|
| **P1095** | Auswahl digitaler Eingang 2 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital input 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI2_InputChannel | 1:1 | - |

Selection of slot and channel for digital input 2.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

| | | | |
|---|---|---|---|
| **P1096** | Zielnummer digitaler Eingang 2 | 0 to max. para No. | |
| DS | **Target number: digital input 2** | 0 | |
| ON | BM_u_Ds0_DI2_TargetPxxx | 1:1 | - |

Number of parameter to be changed by digital input 2.

| | | | |
|---|---|---|---|
| **P1097** | Bit-Auswahl digitaler Eingang 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit selection digital input 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI2_BitSelection | 1:1 | CW |

Selection of target parameter bits to be changed by digital input 2.

| | | | |
|---|---|---|---|
| **P1098** | Bit-Muster bei LOW des digitalen Eingang 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern LOW state digital input 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI2_LowPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 2 is LOW.

| | | | |
|---|---|---|---|
| **P1099** | Bit-Muster bei HIGH des digitalen Eingang 2 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern HIGH state digital input 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI2_HighPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 2 is HIGH.

| | | | |
|---|---|---|---|
| **P1100** | Auswahl digitaler Eingang 3 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital input 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI3_InputChannel | 1:1 | - |

Selection of slot and channel for digital input 3.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

| | | | |
|---|---|---|---|
| **P1101** | Zielnummer digitaler Eingang 3 | 0 to max. para No. | |
| DS | **Target number: digital input 3** | 0 | |
| ON | BM_u_Ds0_DI3_TargetPxxx | 1:1 | - |

Number of parameter to be changed by digital input 3.

| | | | |
|---|---|---|---|
| **P1102** | Bit-Auswahl digitaler Eingang 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit selection digital input 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI3_BitSelection | 1:1 | CW |

Selection of target parameter bits to be changed by digital input 3.

| | | | |
|---|---|---|---|
| **P1103** | Bit-Muster bei LOW des digitalen Eingang 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern for LOW state digital input 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI3_LowPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 3 is LOW.

| | | | |
|---|---|---|---|
| **P1104** | Bit-Muster bei HIGH des digitalen Eingang 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern for HIGH state digital input 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI3_HighPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 3 is HIGH.

| | | | |
|---|---|---|---|
| **P1105** | Auswahl digitaler Eingang 4 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital input 4** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI4_InputChannel | 1:1 | - |

Selection of slot and channel for digital input 4.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

| | | | |
|---|---|---|---|
| **P1106** | Zielnummer digitaler Eingang 4 | 0 to max. para No. | |
| DS | **Target number: digital input 4** | 0 | |
| ON | BM_u_Ds0_DI4_TargetPxxx | 1:1 | - |

Number of parameter to be changed by digital input 4.

| | | | |
|---|---|---|---|
| **P1107** | Bit-Auswahl digitaler Eingang 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit selection digital input 4** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI4_BitSelection | 1:1 | CW |

Selection of target parameter bits to be changed by digital input 4.

| | | | |
|---|---|---|---|
| **P1108** | Bit-Muster bei LOW des digitalen Eingang 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern for LOW state digital input 4** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI4_LowPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 4 is LOW.

| | | | |
|---|---|---|---|
| **P1109** | Bit-Muster bei HIGH des digitalen Eingang 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Set bit pattern for HIGH state digital input 4** | $0_{hex}$ | |
| ON | BM_w_Ds0_DI4_HighPattern | 1:1 | CW |

Bit pattern, written to target parameter if digital input 4 is HIGH.

| | | | |
|---|---|---|---|
| **P1110** | Auswahl digitaler Ausgang 1 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital output 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO1_OutputChannel | 1:1 | - |

Selection of slot and channel for digital output 1.

| Bit | Meaning |
|---|---|
| 7 ... 0 | Channel selection of output module (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of output module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

| | | | |
|---|---|---|---|
| **P1111** | Quellnummer digitaler Ausgang 1 | 0 to max. para No. | |
| DS | **Source number digital output 1** | 0 | |
| ON | BM_u_Ds0_DO1_SourcePxxx | 1:1 | - |

Number of parameter for output by digital output 1.

| | | | |
|---|---|---|---|
| **P1112** | Bit-Auswahl digitaler Ausgang 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit selection digital output 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO1_BitSelection | 1:1 | CW |

Selection of bits in source parameter to be compared for digital output 1.

| | | | |
|---|---|---|---|
| **P1113** | Bit-Muster digitaler Ausgang 1 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit pattern digital output 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO1_BitPattern | 1:1 | CW |

Bit pattern to be compared with the bit pattern of source parameter for digital output 1.

| | | | |
|---|---|---|---|
| **P1114** | Auswahl digitaler Ausgang 2 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital output 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO2_OutputChannel | 1:1 | - |

Selection of slot and channel for digital output 2.

| Bit | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

The value 0 means no output channel selected.

| | | | |
|---|---|---|---|
| **P1115** | Quellnummer digitaler Ausgang 2 | $0_{hex}$ to max. para-No. | |
| DS | **Source number digital output 2** | 0 | |
| ON | BM_u_Ds0_DO2_SourcePxxx | 1:1 | - |

Number of parameter for output by digital output 2.

**P1116** Bit-Auswahl digitaler Ausgang 2 — $0_{hex}$ to $0508_{hex}$

| | | | |
|---|---|---|---|
| DS | **Bit selection digital output 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO2_BitSelection | 1:1 | CW |

Selection of bits in source parameter to be compared for digital output 2.

**P1117** Bit-Muster digitaler Ausgang 2 — $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| DS | **Bit pattern digital output 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO2_BitPattern | 1:1 | CW |

Bit pattern to be compared with the bit pattern of source parameter for digital output 2.

**P1118** Auswahl digitaler Ausgang 3 — $0_{hex}$ to $0508_{hex}$

| | | | |
|---|---|---|---|
| DS | **Selection digital output 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO3_OutputChannel | 1:1 | - |

Selection of slot and channel for digital output 3.

| Bit | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

The value 0 means, that an output channel has not been selected.

**P1119** Quellnummer digitaler Ausgang 3 — 0 to max. para No.

| | | | |
|---|---|---|---|
| DS | **Source number digital output 3** | 0 | |
| ON | BM_u_Ds0_DO3_SourcePxxx | 1:1 | - |

Number of parameter for output by digital output 3.

**P1120** Bit-Auswahl digitaler Ausgang 3 — $0_{hex}$ to $FFFF_{hex}$

| | | | |
|---|---|---|---|
| DS | **Bit selection digital output 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO3_BitSelection | 1:1 | CW |

Selection of bits in source parameter to be compared for digital output 3.

| | | | |
|---|---|---|---|
| **P1121** | Bit-Muster digitaler Ausgang 3 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit pattern digital output 3** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO3_BitPattern | 1:1 | CW |

Bit pattern to be compared with the bit pattern of source parameter for digital output 3.

| | | | |
|---|---|---|---|
| **P1122** | Auswahl digitaler Ausgang 4 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection digital output 4** | $0_{hex}$ | |
| | BM_w_Ds0_DO4_OutputChannel | 1:1 | - |

Selection of slot and channel for digital output 4.

| Bit | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

The value 0 means, that an output channel has not been selected.

| | | | |
|---|---|---|---|
| **P1123** | Quellnummer digitaler Ausgang 4 | 0 to max. para No. | |
| DS | **Source number digital output 4** | 0 | |
| ON | BM_u_Ds0_DO4_SourcePxxx | 1:1 | - |

Number of parameter for output by digital output 4.

| | | | |
|---|---|---|---|
| **P1124** | Bit-Auswahl digitaler Ausgang 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit selection digital output 4** | $0008_{hex}$ | |
| ON | BM_w_Ds0_DO4_BitSelection | 1:1 | CW |

Selection of bits in source parameter to be compared for digital output 4.

| | | | |
|---|---|---|---|
| **P1125** | Bit-Muster digitaler Ausgang 4 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit pattern digital output 4** | $0_{hex}$ | |
| ON | BM_w_Ds0_DO4_BitPattern | 1:1 | CW |

Bit pattern to be compared with the bit pattern of source parameter for digital output 4.

## P1130

| | | | |
|---|---|---|---|
| | Auswahl analoger Eingang 1 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection analog input 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_AI1_InputChannel | 1:1 | - |

Selection of slot and channel for analog input 1.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

## P1131

| | | | |
|---|---|---|---|
| | Glättungszeit analoger Eingang 1 | 0.000 to 60.000 ms | |
| DS | **Smoothing time analog input 1** | 1.000 ms | |
| ON | BM_u_Ds0_AI1_Smoothing | 1000:1 ms | - |

Smoothing time analog input 1.
In order to smooth errors on the analog input signal a smoothing time constant in ms can be entered.

Smoothing is off, if the particular parameter value = 0 ms is set.

## P1132

| | | | |
|---|---|---|---|
| | Skalierungsfaktor analoger Eingang 1 | -2.0 to 2.0 | |
| DS | **Scaling factor analog input 1** | 1.0 | |
| ON | BM_i_Ds0_AI1_Scaling | $3FFF_{hex}$:1 | - |

Scaling factor analog input 1. These parameters enable a scaling of the analog input value.
The output values (see parameters ▹P0420◃ and ▹P0421◃) are with unipolar target parameters from 0 to +100% and with bipolar target parameters from -100% to +100%. Which analog input voltage is used to reach these maximum values, is dependent on the scaling factor.

## P1133

| | | | |
|---|---|---|---|
| | Zielnummer analoger Eingang 1 | 0 to max. para No. | |
| DS | **Target number: analog input 10** | 0 | |
| ON | BM_u_Ds0_AI1_TargetPxxx | 1:1 | - |

Number of parameter to be controlled by “analog input 1“.

## P1134

| | | | |
|---|---|---|---|
| | Offset analoger Eingang 1 | -100.00 % to +100.00 % | |
| DS | **Offset analog input 1** | 0.00 % | |
| ON | BM_i_Ds0_AI1_Offset | $7FFF_{hex}$:100 % | CW |

Offset correction of analog input 1.

## P1135

| | | | |
|---|---|---|---|
| | Schwellenwert analoger Eingang 1 | 0.00 % to +100.00 % | |
| DS | **Threshold value analog input 1** | 0.00 % | |
| ON | BM_u_Ds0_AI1_Threshold | $7FFF_{hex}$:100 % | CW |

Threshold value of analog input 1. By using the threshold value, you can control the input threshold of sensitivity.

## P1136

| | | | |
|---|---|---|---|
| | Auswahl analoger Eingang 2 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection analog input 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_AI2_InputChannel | 1:1 | - |

Selection of slot and channel for analog input 1.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

## P1137

| | | | |
|---|---|---|---|
| | Glättungszeit analoger Eingang 2 | 0.000 to 60.000 ms | |
| DS | **Smoothing time analog input 2** | 1.000 ms | |
| ON | BM_u_Ds0_AI2_Smoothing | 1000:1 ms | - |

Smoothing time analog input 2. In order to smooth errors on the analog input signal a smoothing time constant in ms can be entered. The smoothing is off, if the particular parameter value = 1 ms is set.

## P1138

| | | | |
|---|---|---|---|
| | Skalierungsfaktor analoger Eingang 2 | -2.0 to 2.0 | |
| DS | **Scaling factor analog input 2** | 1.0 | |
| ON | BM_i_Ds0_AI2_Scaling | $7FFF_{hex}$:1 | - |

Scaling factor analog input 2.
These parameters enable a scaling of the analog input value. The output values (see parameters ▹P0420◃ and ▹P0421◃) are with unipolar target parameters from 0 to +100% and with bipolar target parameters from -100% to +100%. Which analog input voltage is used to reach these maximum values, is dependent on the scaling factor.

**P1139** Zielnummer analoger Eingang 2 — 0 to max. para No.

| | | | |
|---|---|---|---|
| DS | **Target number analog input 2** | 0 | |
| ON | BM_u_Ds0_AI2_TargetPxxx | 1:1 | - |

Number of parameter, which is to be changed by “analog input 2“.

**P1140** Offset analoger Eingang 2 — -100.00 % to +100.00 %

| | | | |
|---|---|---|---|
| DS | **Offset analog input 2** | 0.00 % | |
| ON | BM_i_Ds0_AI2_Offset | $7FFF_{hex}$:100 % | CW |

Offset correction of analog input 2.

**P1141** Schwellenwert analoger Eingang 2 — 0.00 % to +100.00 %

| | | | |
|---|---|---|---|
| DS | **Threshold value analog input 2** | 0.00 % | |
| ON | BM_u_Ds0_AI2_Threshold | $7FFF_{hex}$:100 % | CW |

Threshold value of analog input 2. Responsiveness of input.

**P1150** Auswahl schneller analoger Ausgang 1 — $0_{hex}$ to $0508_{hex}$

| | | | |
|---|---|---|---|
| DS | **Selection fast analog output 1** | $0_{hex}$ | |
| ON | BM_w_Ds0_AOF1_OutputChannel | 1:1 | - |

Selection of slot and channel for fast analog output 1.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

Value 0 means that no input channel is selected.

**P1151** Quellnummer schneller analoger Ausgang 1 — 0 to max. para No.

| | | | |
|---|---|---|---|
| DS | **Source number fast analog output 1** | 0 | |
| ON | BM_u_Ds0_AOF1_SourcePxxx | 1:1 | - |

You can select a parameter for output by filling in its parameter number.

If this parameter is set to 0, the regarded channel is switched off.

| | | | |
|---|---|---|---|
| **P1152** | Offset schneller analoger Ausgang 1 | -10.00 to +10.00V | |
| DS | **Offset fast analog output 1** | 0 V | |
| ON | BM_i_Ds0_AOF1_Offset | $7FFF_{hex}$:10 V | CW |

Offset correction of fast analog output 1.

| | | | |
|---|---|---|---|
| **P1153** | Skalierungsfaktor schneller analoger Ausgang 1 | 67108863.00 to 67108863.00 | |
| DS | **Scaling fast analog output 1** | 1.00 | |
| ON | BM_di_Ds0_AOF1_Scaling | 32:1 | CW |

Scaling factor fast analog output 1.

| | | | |
|---|---|---|---|
| **P1154** | Auswahl schneller analoger Ausgang 2 | $0_{hex}$ to $0508_{hex}$ | |
| DS | **Selection fast analog output 2** | $0_{hex}$ | |
| ON | BM_w_Ds0_AOF2_OutputChannel | 1:1 | - |

Selection of slot and channel for fast analog output 2.

| Bit No. | Meaning |
|---|---|
| 7 ... 0 | Channel selection (possible value 1 to 8, depending on function module) |
| 15 ... 8 | Slot selection of input module (possible values 1 to 5, correspond to slot A to E) |

The value 0 means, that an output channel has not been selected.

| | | | |
|---|---|---|---|
| **P1155** | Quellnummer schneller analoger Ausgang 2 | 0 to max. para No. | |
| DS | **Source number fast analog output 2** | 0 | |
| ON | BM_u_Ds0_AOF2_SourcePxxx | 1:1 | - |

You can select a parameter for output by filling in its parameter number.
If this parameter is set to 0, the regarded channel is switched off.

| | | | |
|---|---|---|---|
| **P1156** | Offset schneller analoger Ausgang 2 | -10.00 to +10.00V | |
| DS | **Offset fast analog output 2** | 0.0 V | |
| ON | BM_i_Ds0_AOF2_Offset | $7FFF_{hex}$:10 V | CW |

Offset correction of fast analog output 2.

| | | | |
|---|---|---|---|
| **P1157** | Skalierungsfaktor schneller analoger Ausgang 2 | 67108863.00 to 67108863.00 | |
| **DS** | **Scaling fast analog output 2** | 1.00 | |
| ON | BM_i_Ds0_AOF2_Scaling | 32:1 | CW |

Scaling factor fast analog output 2.

## P1170

| | | | |
|---|---|---|---|
| | Hochlaufgeber Modus | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Ramp function generator mode** | $0_{hex}$ | |
| | BM_w_Ds0_RFGMode | $4000_{hex}$:100 % | CW |

Settings for the ramp function generator.

| Bit No. | Meaning |
|---|---|
| 2 ... 0 | Reserved |
| 3 | 1: negative setpoints are inhibited |
| 4 | 1: positive setpoints are inhibited |
| 5 | 1: polarity reversal of the current setpoint |
| 6 | 0: trapezoidal speed profile with ramp function generator smoothing ($PT_1$-element)<br>1: S-curve with square speed profile |
| 15 ... 7 | Reserved |

## P1172

| | | | |
|---|---|---|---|
| | Hochlaufgeber Hochlaufzeit | 0.00 to 650.00 s | |
| DS | **Ramp function generator ramp-up time** | 0.00 s | |
| | BM_u_Ds0_RFG1RampUpTime | 100:1 s | CW |

Acceleration ramp for speed-controlled operation modes.

The time selected here corresponds to 100 % setpoint change.

## P1173

| | | | |
|---|---|---|---|
| | Hochlaufgeber Rücklaufzeit | 0.00 to 650.00 s | |
| DS | **Ramp function generator ramp-down time** | 0.00 s | |
| | BM_u_Ds0_RFG1RampDownTime | 100:1 s | CW |

Deceleration ramp for speed-controlled operation modes.

The time selected here corresponds to 100 % setpoint change.

## P1175

| | | | |
|---|---|---|---|
| | Hochlaufgeber Verschliff | 0 to 32 ms | |
| DS | **Ramp function generator smoothing time** | 0 ms | |
| | BM_u_Ds0_RFG1Smoothing | 1:1 ms | |

In order to achieve a smoothing of the ramp edges a $PT_1$-element is implemented. By use of this parameter, you can set the time constant of the $PT_1$-element.
Smoothing is effective only if a trapezoidal profile is set as ramp form.

| | | | |
|---|---|---|---|
| **P1241** | Leistungsteil Maximalstrom des Antriebs | 0.1 to 6553.5 A | |
| DS | **Power unit maximum drive current** | 2.5 A | |
| | BM_u_Ds0_CurrentDriveMax | 10:1 A | - |

Maximum current output of power unit.

This parameter defines the current scaling, i.e. it is the reference value for all percental current parameters.

| | | | |
|---|---|---|---|
| **P1251** | Uzk-Regler P-Verstärkung | 1.0 to 255.9 | |
| DS | **DC-link controller P-gain** | 50.0 | |
| | BM_u_Ds0_DCLinkCtrl_PGain | 10:1 | - |

P-gain of the DC link controller.

| | | | |
|---|---|---|---|
| **P1252** | Uzk-Regler-Nachstellzeit | 0.2 to 1000.0 ms | |
| DS | **DC-link controller integral-action time** | 20.0 ms | |
| | BM_u_Ds0_DCLinkCtr_lTime | 10:1 ms | - |

Integral action time of DC link controller.

| | | | |
|---|---|---|---|
| **P1260** | Blockierzeit (Stromgrenzezeit) | 0.0 to 6500.0 s | |
| DS | **Blocking time** | 10.0 s | |
| | BM_u_Ds0_BlockingTime | 10:1 s | - |

Release time for current limit monitoring.

Current limit monitoring becomes active, if the drive controller is at the current limit.

After operating sequence of release time for the current limit monitoring the drive is switched off with an error message.

With blocking time = 0.0 s, the current limit monitoring is switched off.

| | | | |
|---|---|---|---|
| **P1290** | Parameterauswahl Statusbit 14 | 0 to max. para No. | |
| DS | **Parameter selection statusbit 14** | 0 | |
| | BM_u_Ds0_StatusB14_IdSelect | 1:1 | - |

Selection of the parameter for the freely defined status bit 14 in the drive manager status word (▹P0301◃).

If in the selected parameter (▹P1291◃) a bit from the mask is set, the bit 14 in the status word is set.

| | | | |
|---|---|---|---|
| **P1291** | Bitmaske für Statusbit 14 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit pattern status bit 14** | $0_{hex}$ | |
| | BM_w_Ds0_StatusB14_Mask | 1:1 | - |

Mask for the freely defined status bit 14 in the drive manager status word (▹P0301◃).

If in the selected parameter (▹P1290◃) a bit from the mask is set, the bit 14 in the status word is set.

| | | | |
|---|---|---|---|
| **P1292** | Parameterauswahl Statusbit 15 | 0 to max. para No. | |
| DS | **Parameter selection statusbit 15** | 0 | |
| | BM_u_Ds0_StatusB15_IdSelect | 1:1 | - |

Selection of the parameter for the freely defined status bit 14 in the drive manager status word (▹P0301◃).

If in the selected parameter (▹P1293◃) a bit from the mask is set, the bit 15 in the status word is set.

| | | | |
|---|---|---|---|
| **P1293** | Bitmaske für Statusbit 15 | $0_{hex}$ to $FFFF_{hex}$ | |
| DS | **Bit mask for status bit 15** | $0_{hex}$ | |
| | BM_w_Ds0_StatusB15_Mask | 1:1 | - |

Mask for the freely defined status bit 15 in the drive manager status word (▹P0301◃).

If in the selected parameter (▹P1292◃) a bit from the mask is set, the bit 15 in the status word is set.

| | | | |
|---|---|---|---|
| **P1340** | Einspeiseeinheit Leistungsfaktor-Sollwert | -1.0 to 1.0 | |
| DS | **PSU power factor setpoint** | 1.0 | |
| ON | BM_u_Ds0_PSU_PowerfactorSet | 65535:1 | CW |

Power factor correction

| | | | |
|---|---|---|---|
| **P1342** | Einspeiseeinheit Zwischenkreisspannung Glättungszeit | 0 to 60.0 ms | |
| DS | **PSU DC link voltage smoothing time** | 1.0 ms | |
| ON | BM_u_Ds0_PSU_DCLinkVoltsmoothtime | 10:1 ms | CW |

Smoothing time of the DC link.

| | | | |
|---|---|---|---|
| **P1343** | Einspeiseeinheit max. UZK-Sollwert | 300 to 800 V | |
| DS | **PSU max. DC link voltage setpoint** | 760 V | |
| ON | BM_u_Ds0_PSU_DCLinkVoltSetBUC_ULim | 1:1 V | CW |

This voltage limit limits the DC link voltage setpoint. The DC link voltage is limited to this value, if the DC link voltage setpoint is greater than the limit.

| | | | |
|---|---|---|---|
| **P1344** | Einspeiseeinheit min. UZK-Sollwert | 280 to 800 V | |
| DS | **PSU min. DC link voltage setpoint** | 360 V | |
| ON | BM_u_Ds0_PSU_DCLinkVoltSetBUC_LLim | 1:1 V | CW |

This voltage limit limits the DC link voltage setpoint. The DC link voltage is limited to this value, if the DC link voltage setpoint is smaller than this limit.

| | | | |
|---|---|---|---|
| **P1345** | Einspeiseeinheit Faktor U Netz-Vorsteuerung | 0% to 125 % | |
| DS | **PSU main voltage feed forward factor** | 100 % | |
| ON | BM_u_Ds0_PSU_MainVoltfeedForFactor | $4000_{hex}$:100 % | CW |

Evaluation factor of mains voltage feed forward.

Scaling: 100 % ↔ Power unit $U_{DC}$ nominal value (▹P0020◃)/$\sqrt{2}$

| | | | |
|---|---|---|---|
| **P1346** | Einspeiseeinheit Netzspannungsvorsteuerung Glättungszeit | 0 to 50 ms | |
| DS | **PSU mains voltage feed forward smoothing time** | 1.0 ms | |
| ON | BM_u_Ds0_PSU_MainVoltSmoothTime | 10:1 ms | CW |

Smoothing time of mains voltage for mains feed forward.

| | | | |
|---|---|---|---|
| **P1347** | Einspeiseeinheit Id-Sollwert | -100.0 % to +100.0 % | |
| DS | **PSU Id setpoint** | 0.0 % | |
| ON | BM_i_Ds0_PSU_IdSet | $4000_{hex}$:100 % | CW |

Direct-axis current setpoint

Scaling: 100 % ÷ power unit; maximum current (▹P1241◃).

| | | | |
|---|---|---|---|
| **P1348** | Einspeiseeinheit Modus1 | $0000_{hex}$ to $FFFF_{hex}$ | |
| DS | **PSU mode 1** | $FFFD_{hex}$ | |
| ON | BM_w_Ds0_PSU_Mode1 | 1:1 ms | CW |

Operation mode of the mains inverter.

| | | | |
|---|---|---|---|
| **P1349** | Einspeiseeinheit Id Regelabweichung Grenze | -100.0 % to +100.0 % | |
| DS | **PSU max. Id deviation** | 0.0 % | |
| ON | BM_i_Ds0_PSU_Id_Max_Dev | $4000_{hex}$:100 % | CW |

Limit Id control deviation.

Scaling: 100 % ÷ power unit; maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P1350** | Einspeiseeinheit Offset RHO | -30.0 ° to +30.0 ° | |
| DS | **PSU offset rho** | 0.0 ° | |
| ON | BM_u_Ds0_PSU_Offset_rho | $4000_{hex}$: 360 ° | CW |

This parameter sets the power factor cos φ, refer to ▹Setting the power rate cos φ◃ on page 48.

| | | | |
|---|---|---|---|
| **P1351** | Einspeiseeinheit Iq Regelabweichung Grenze | -100.0 % to +100.0 % | |
| DS | **PSU max. Iq deviation** | 0.0 % | |
| ON | BM_i_Ds0_PSU_Iq_Max_Dev | $4000_{hex}$: 100 % | CW |

Limit Iq deviation.

Scaling: 100 % ÷ power unit; maximum current (▹P1241◃)

| | | | |
|---|---|---|---|
| **P1352** | Einspeiseeinheit UZK Regelabweichung Grenze | -100.0 % to +100.0 % | |
| DS | **PSU max. DC link voltage deviation** | 0.0 % | |
| ON | BM_i_Ds0_PSU_Vdc_Max_Dev | $4000_{hex}$: 100 % | CW |

Limited $U_{DC}$ deviation.

Scaling: 100 % ↔ Power unit $U_{DC}$ nominal value (▹P0020◃)/$\sqrt{2}$

| | | | |
|---|---|---|---|
| **P1353** | Einspeiseeinheit Eingangswert des HLG | 280 V to 800 V | |
| DS | **PSU ramp function generator input** | 640 V | |
| ON | BM_u_Ds0_PSU_RFGInput | 1:1 V | CW |

Input value of the ramp function generator.

| | | | |
|---|---|---|---|
| **P1354** | Einspeiseeinheit Warnungsschwelle der Netzunterspannung | 360 V to 500 V | |
| DS | **PSU mains undervoltage warning** | 180 V | |
| ON | BM_u_Ds0_PSU_MainsUnderVolt_L | 10:1 V | CW |

Warning threshold of mains undervoltage.

| | | | |
|---|---|---|---|
| **P1355** | Einspeiseeinheit Warnungsschwelle der Netzüberspannung | 400 V to 528 V | |
| DS | **PSU mains overvoltage warning** | 400 V | |
| ON | BM_u_Ds0_PSU_MainsOverVolt_L | 10:1 V | CW |

Warning threshold of mains overvoltage.

| | | | |
|---|---|---|---|
| **P1356** | Einspeiseeinheit Überwachungszeit der Rückmeldung | 0,000 to 10,000 s | |
| DS | **PSU contactor confirmation supervision time** | 1,000 s | |
| ON | BM_u_Ds0_PSU_Cconfirm_Rdelay | 1000:1 s | CW |

Monitoring time of main contactor feedback. After monitoring time an error message is generated. With monitoring time = 0.0 s the monitoring of the feedback is switched-off.

| | | | |
|---|---|---|---|
| **P1357** | Einspeiseeinheit Zyklen der Vorladung | 0,000 bis 120,000 s | |
| DS | **PSU Precharge cycle** | 0 s | |
| ON | BM_ud_Ds0_PSU_Prechargecycle | 1000:1 s | CW |

Cycle time of the pre-charge. The charge circuit cannot be activated, as long as this time is not expired.

| | | |
|---|---|---|
| **P1358** | Einspeiseeinheit Warnungsschwelle der Netzleistung | 0,000 bis 3276,7 kW |
| DS | **PSU Mains warning power** | 30,0 kW |
| ON | BM_ud_Ds0_PSU_Main_OverPower_L | 10:1 kW |

Warning threshold limit of the mains power is exceeded.

| | | |
|---|---|---|
| **P1359** | Einspeiseeinheit Max. Ladezeit | 1,00 bis 600,00 s |
| DS | **PSU Mains max. load time** | 30,00 s |
| ON | BM_ud_Ds0_PSU_PrechargeTimeMax | 1000:1 s |

Warning threshold limit of power supply unit load time.

## P2000

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 1 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 1** | $0_{hex}$ | |
| | BM_ud_Transient_Source1Pxxx | 1:1 | - |

Parameter numbers of the recording parameter (1 ... 8) for the oscilloscope function. For recording, all 16- and 32-bit parameters can be used. String- and array parameters cannot be used for oscilloscope recording.

At 0 the channel is switched off.

## P2001

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 2 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 2** | $0_{hex}$ | |
| | BM_ud_Transient_Source2Pxxx | 1:1 | - |

2. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2002

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 3 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 3** | $0_{hex}$ | |
| | BM_ud_Transient_Source3Pxxx | 1:1 | - |

3. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2003

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 4 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 4** | $0_{hex}$ | |
| | BM_ud_Transient_Source4Pxxx | 1:1 | - |

4. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2004

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 5 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 5** | $0_{hex}$ | |
| | BM_ud_Transient_Source5Pxxx | 1:1 | - |

5. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2005

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 6 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 6** | $0_{hex}$ | |
| | BM_ud_Transient_Source6Pxxx | 1:1 | - |

6. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2006

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 7 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 7** | $0_{hex}$ | |
| | BM_ud_Transient_Source7Pxxx | 1:1 | - |

7. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2007

| | | | |
|---|---|---|---|
| | Quellnummer Oszilloskop, Kanal 8 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope source channel 8** | $0_{hex}$ | |
| | BM_ud_Transient_Source8Pxxx | 1:1 | - |

8. recording parameters for the oscilloscope function.
Description see parameters ▹P2000◃ on page 181.

## P2008

| | | | |
|---|---|---|---|
| | Quellnummer Triggerquelle 1 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope trigger source 1** | $0_{hex}$ | |
| | BM_ud_Transient_TriggSrc1Pxxx | 1:1 | - |

Number of the parameters of the first trigger source for the oscilloscope function.

All 16- and 32-bit parameters can be used as trigger source parameters. String- and array parameters cannot be used as trigger.

If the value is 0, it can not be triggered.

## P2009

| | | | |
|---|---|---|---|
| | Quellnummer Triggerquelle 2 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Oscilloscope trigger source 2** | $0_{hex}$ | |
| | BM_ud_Transient_TriggSrc2Pxxx | 1:1 | - |

Number of the parameters of the second trigger source for the oscilloscope function.

All 16- and 32-bit parameters can be used as trigger source parameters. String- and array parameters cannot be used as trigger.

If the value is 0, it can not be triggered.

## P2010

| | | | |
|---|---|---|---|
| | Maske Triggerquelle 1 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Mask trigger source 1** | $FFFFFFFF_{hex}$ | |
| | BM_d_Transient_TriggerMask1 | 1:1 | - |

Mask for trigger source 1.

At evaluation of trigger condition the controller ANDs the value of the first trigger source parameter with this bit mask and compare the value which was masked out with the trigger comparison value 1.

## P2011

| | | | |
|---|---|---|---|
| | Maske Triggerquelle 2 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Mask trigger source 2** | $FFFFFFFF_{hex}$ | |
| | BM_d_Transient_TriggerMask2 | 1:1 | - |

Mask for trigger source 2.

At evaluation of trigger condition the controller ANDs the value of the second trigger source parameter with this bit mask and compares the value, which was masked out with the trigger comparison value 2.

## P2012

| | | | |
|---|---|---|---|
| | Trigger-Vergleichsoperator 1 | 0 to 3 | |
| EE | **Trigger compare operator 1** | 0 | |
| | BM_u_Transient_TriggerOp1 | 1:1 | - |

The transient operator compares the trigger source with the trigger comparison value according to the following formula:

Trigger result 1 =

(content of source number trigger source 1 ▹P2008◃)
AND
Mask trigger source 1 ▹P2010◃) OPERATOR 1 → Trigger comparison value 1 ▹P2014◃

| Value | Operation |
|---|---|
| 0 | greater than |
| 1 | less than |
| 2 | equal |
| 3 | not equal |

According to data type of the trigger source parameter the comparison operation is signed or unsigned 16- bitwise or 32-bitwise.

## P2013

| | | | |
|---|---|---|---|
| | Trigger-Vergleichsoperator 2 | 0 to 3 | |
| EE | **Trigger compare operator 2** | 0 | |
| | BM_u_Transient_TriggerOp2 | 1:1 | - |

The transient operator compares the trigger source with the trigger comparison value according to the following formula:

Trigger result 2 =

(content of source number trigger source 2 ▹P2009◃)
AND
Mask trigger source 2 ▹P2011◃) OPERATOR 2 → Trigger comparison value 2 ▹P2015◃

| Value | Operation |
|---|---|
| 0 | greater than |
| 1 | less than |
| 2 | equal |
| 3 | not equal |

According to data type of the trigger source parameter the comparison operation is signed or unsigned 16- bitwise or 32-bitwise.

## P2014

| | | | |
|---|---|---|---|
| | Trigger-Vergleichswert 1 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Trigger compare value 1** | $FFFFFFFF_{hex}$ | |
| | BM_ud_Transient_TriggerCmpVal1 | 1:1 | - |

Comparison value for trigger condition 1.

## P2015

| | | | |
|---|---|---|---|
| | Trigger-Vergleichswert 2 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Trigger compare value 2** | $FFFFFFFF_{hex}$ | |
| | BM_ud_Transient_TriggerCmpVal2 | 1:1 | - |

Comparison value for trigger condition 2.

## P2016

| | | | |
|---|---|---|---|
| | Triggerquellen-Verknüpfungs-Operator | 1 to 3 | |
| EE | **Trigger source combination operator** | 1 | |
| | BM_u_Transient_TriggerCompi | 1:1 | - |

The operator compares the results of two trigger conditions and sets the trigger, if the linking is logically combined.

Trigger = trigger result 1 OPERATOR trigger result 2

Trigger operators:

| Value | Operation |
|---|---|
| 1 | AND |
| 2 | or |
| 3 | Exclusively-OR |

## P2017

| | | | |
|---|---|---|---|
| | Triggerzeitpunkt in % der Speichertiefe | 0 to 100 % | |
| EE | **Trigger delay in %** | 0 % | |
| | BM_u_Transient_TriggerDelay | 1:1 % | - |

This parameter specifies, how many data is to be recorded before the trigger event. The percent specification refers to the entire recording memory.

Examples:

At 0 % the controller stores all values starting from the trigger event.

At 33 % the trigger time instant (identified by a vertical dashed line) lies at the end of the first third of the recording window.

## P2018

| | | | |
|---|---|---|---|
| | Status der Triggerung | $0_{hex}$ to $FFFF_{hex}$ | |
| A | **Trigger status** | $0_{hex}$ | |
| - | BM_u_Transient_TriggerStatus | 1:1 | - |

This parameter shows the current status of the oscilloscope function.

| Value | Status |
|---|---|
| 1 | Non-operated |
| 2 | Trigger monitoring ready, but no recording |
| 3 | Recording is running |
| 4 | Recording completed |
| 5 | Preparations in order to store are completed |
| 6 | Recording interrupted - drop memory contents |
| 7 | Waiting for the trigger event, but recording is already running, in order to record the history |

## P2019

| | | | |
|---|---|---|---|
| | Trigger-Kommando | 1 to 6 | |
| EE | **Trigger command** | 1 | |
| | BM_u_Transient_TriggerComand | 1:1 | - |

This parameter controls the oscilloscope function.

| Value | Status |
|---|---|
| 1 | IDLE command |
| 2 | Stop recording |
| 3 | Start trigger monitoring |
| 4 | Start recording independent on trigger event |
| 5 | Recording data assured, transition to IDLE |
| 6 | Resetting of status machine.<br>Standard value for source- and trigger parameter |

## P2020

| | | | |
|---|---|---|---|
| | Speichertiefe pro Kanal | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| A | **Transient samples** | $0_{hex}$ | |
| | BM_ud_Transient_Samples | 1:1 | - |

After a recording this parameter provides the number of the executed measuring points.

The possible number of the measured values is dependent on:

- the measuring memory which is available
  (see parameters size oscilloscope memory ▹P2023◃),
- the number and
- the word width of each parameter, which is to be recorded.

## P2021

| | | | |
|---|---|---|---|
| | Abtastrate | 0.125 ms to 8191 ms | |
| EE | **Sample rate** | 0.125 ms | |
| | BM_u_Transient_SampleTime | 1:0.125 ms | - |

Sampling rate in multiples of 125 µs.

## P2022

| | | | |
|---|---|---|---|
| | Aufzeichnungsdauer | 0 to 32 ms | |
| A | **Measurement time** | 0 ms | |
| | BM_ud_Transient_Duration | 1:1 ms | - |

After a recording this parameter shows the recording duration of the prior measurement.

This value is generated from:

(memory depth per channel ▹P2020◃) * (sampling rate ▹P2021◃)

## P2023

| | | | |
|---|---|---|---|
| | Größe Oszilloskopspeicher | 1024 to 16384 | |
| EE | **Oscilloscope memory length** | 1024 | |
| | BM_ud_Transient_Memory | 1:1 | - |

This parameter defines the usable memory depth for the oscilloscope function in words.

The larger the memory depth, the longer data transmission of controller to WinBASS/Pro-Drive lasts.

For testing purposes (e. g. For testing purposes (e.g. optimization of trigger parameters) it is recommendable, to set memory depth low and to maximize not before in fact a lot of data shall be recorded.

## P2024

| | | | |
|---|---|---|---|
| | Startadresse Oszilloskopspeicher | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| A | **Oscilloscope memory start address** | $0_{hex}$ | |
| | BM_ud_Transient_MemoryStartAdr | 1:1 | - |

Constant, which specifies the starting address of measured value memory.

## P2025

| | | | |
|---|---|---|---|
| | Oszilloskop Fehlercode | 0 to 65535 | |
| A | **Oscilloscope error code** | $0_{hex}$ | |
| | BM_u_Transient_ErrorCode | 1:1 | - |

Error code of oscilloscope function:

| Value | Status |
|---|---|
| 0 | No error |
| 1 | Parameter number for data source 1 is faulty |
| 2 | Parameter number for data source 2 is faulty |
| 3 | Parameter number for data source 3 is faulty |
| 4 | Parameter number for data source 4 is faulty |
| 5 | Parameter number for data source 5 is faulty |
| 6 | Parameter number for data source 6 is faulty |
| 7 | Parameter number for data source 7 is faulty |
| 8 | Parameter number for data source 8 is faulty |
| 9 | Parameter number for data source 8 or trigger source is incorrect |
| 10 | Parameter number for trigger source 1 is faulty |
| 11 | Parameter number for trigger source 2 is faulty |
| 12 | Wrong trigger operator |
| 13 | No source parameter specified |
| 14...65535 | Reserved |

| | | | |
|---|---|---|---|
| **P2030** | Passwort | 0 to 65535 | |
| | **Password** | 0 | |
| ON | BM_u_Password | 1:1 | - |

Parameter used for the input of a system password and for the display of the current password level.

Special functions only can be changed or activated after input of a password (also see ▹P2032◃ system commands). Thereby there are different password levels with different passwords.

After input of a valid password in this parameter the password level is shown. After switching-on and after input of an incorrect password the password level is set to 0.

The password for password level 1 is: 1234.

| | | | |
|---|---|---|---|
| **P2032** | Systemzeit | 0 to 4294967295 s | |
| | **System time** | 0 s | |
| ON | BM_u_SystemTime | 1:1 s | - |

This parameter contains the system time in seconds. Time starts at each booting operation with 0 and is incremented every second.

By writing of the parameter, the system time can be set to any time. The format „seconds since 01.01.1970 0:00:00 o'clock" should be used, which is common in the PC range.

| | | | |
|---|---|---|---|
| **P2034** | Zeit seit letzten Boot-Vorgang | 0 to 4294967295 s | |
| | **Time since last boot** | 0 s | |
| ON | BM_ud_UpTime | 1:1 s | - |

This parameter indicates the operating time in seconds, since the last switch-on. With every booting operation time starts with 0 again.

| | | | |
|---|---|---|---|
| **P2035** | Betriebs-Sekundenzähler | 0 to 4294967295 s | |
| | **Power on seconds** | 0 s | |
| A | BM_ud_UpTimeSum | 1:1 s | - |

Not yet implemented.

| | | | |
|---|---|---|---|
| **P3314** | Applikationsparameter 1 | -2147483648 to 2147483647 | |
| EE | **Application parameter 1** | 0 | |
| ON | BM_di_ApplicationParam1 | 1:1 s | CW |

Application parameter is placed at ones disposal, e. g.:

- Linking of in- and outputs
- Access via field busses or PLC

All application parameters are stored at the storing of data sets (retained).

| | | | |
|---|---|---|---|
| **P3315** | Applikationsparameter 2 | -2147483648 to 2147483647 | |
| EE | **Application parameter 2** | 0 | |
| ON | BM_di_ApplicationParam2 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3316** | Applikationsparameter 3 | -2147483648 to 2147483647 | |
| EE | **Application parameter 3** | 0 | |
| ON | BM_di_ApplicationParam3 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3317** | Applikationsparameter 4 | -2147483648 to 2147483647 | |
| EE | **Application parameter 4** | 0 | |
| ON | BM_di_ApplicationParam4 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3318** | Applikationsparameter 5 | -2147483648 to 2147483647 | |
| EE | **Application parameter 5** | 0 | |
| ON | BM_di_ApplicationParam5 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3319** | Applikationsparameter 6 | -2147483648 to 2147483647 | |
| EE | **Application parameter 6** | 0 | |
| ON | BM_di_ApplicationParam6 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3320** | Applikationsparameter 7 | -2147483648 to 2147483647 | |
| EE | **Application parameter 7** | 0 | |
| ON | BM_di_ApplicationParam7 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3321** | Applikationsparameter 8 | -2147483648 to 2147483647 | |
| EE | **Application parameter 8** | 0 | |
| ON | BM_di_ApplicationParam8 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3322** | Applikationsparameter 9 | -2147483648 to 2147483647 | |
| EE | **Application parameter 9** | 0 | |
| ON | BM_di_ApplicationParam9 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3323** | Applikationsparameter 10 | -2147483648 to 2147483647 | |
| EE | **Application parameter 10** | 0 | |
| ON | BM_di_ApplicationParam10 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3324** | Applikationsparameter 11 | -2147483648 to 2147483647 | |
| EE | **Application parameter 11** | 0 | |
| ON | BM_di_ApplicationParam11 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3325** | Applikationsparameter 12 | -2147483648 to 2147483647 | |
| EE | **Application parameter 12** | 0 | |
| ON | BM_di_ApplicationParam12 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3326** | Applikationsparameter 13 | -2147483648 to 2147483647 | |
| EE | **Application parameter 13** | 0 | |
| ON | BM_di_ApplicationParam13 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3327** | Applikationsparameter 14 | -2147483648 to 2147483647 | |
| EE | **Application parameter 14** | 0 | |
| ON | BM_di_ApplicationParam14 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3328** | Applikationsparameter 15 | -2147483648 to 2147483647 | |
| EE | **Application parameter 15** | 0 | |
| ON | BM_di_ApplicationParam15 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3329** | Applikationsparameter 16 | 0 to 4294967295 | |
| EE | **Application parameter 16** | 0 | |
| ON | BM_ud_ApplicationParam16 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3330** | Applikationsparameter 17 | 0 to 4294967295 | |
| EE | **Application parameter 17** | 0 | |
| ON | BM_ud_ApplicationParam17 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3331** | Applikationsparameter 18 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Application parameter 18** | 0 | |
| ON | BM_d_ApplicationParam18 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3332** | Applikationsparameter 19 | $0_{hex}$ to $FFFFFFFF_{hex}$ | |
| EE | **Application parameter 19** | 0 | |
| ON | BM_d_ApplicationParam19 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3333** | Applikationsparameter 20 | -32768 to 32767 | |
| EE | **Application parameter 20** | 0 | |
| ON | BM_i_ApplicationParam20 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3334** | Applikationsparameter 21 | -32768 to 32767 | |
| EE | **Application parameter 21** | 0 | |
| ON | BM_i_ApplicationParam21 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3335** | Applikationsparameter 22 | -32768 to 32767 | |
| EE | **Application parameter 22** | 0 | |
| ON | BM_i_ApplicationParam22 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3336** | Applikationsparameter 23 | 0 to 65535 | |
| EE | **Application parameter 23** | 0 | |
| ON | BM_u_ApplicationParam23 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3337** | Applikationsparameter 24 | 0 to 65535 | |
| EE | **Application parameter 24** | 0 | |
| ON | BM_u_ApplicationParam24 | 1:1 s | CW |
| | Description of the parameters see parameter ▹P3314◃ on page 189. | | |

| | | | |
|---|---|---|---|
| **P3338** | Applikationsparameter 25 | 0 to 65535 | |
| EE | **Application parameter 25** | 0 | |
| ON | BM_u_ApplicationParam25 | 1:1 s | CW |

Description of the parameters see parameter ▹P3314◃ on page 189.

| | | | |
|---|---|---|---|
| **P3344** | BACI Status | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI status** | $0_{hex}$ | |
| A | BM_u_BaciStatus | 1:1 | - |

Internal BM_u_BaciStatus.

| Value | Meaning |
|---|---|
| 0 | Initialization phase |
| 1 | Waiting for the hardware enable signal RST of the BACI slaves |
| 2 | Ramp-up-/configuration phase |
| 3 | Ramp-up completed |
| 4 | Normal operation |

| | | | |
|---|---|---|---|
| **P3345** | BACI Zugriffsfehler Steckplatz G | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI access error slot G** | $0_{hex}$ | |
| A | BM_w_BaciCntrAccessErrG | 1:1 | - |

Counter for access conflicts with option module.

High byte: Number of access errors at the transmission of actual values

Low byte: Number of access error at the transmission of setpoints.

| | | | |
|---|---|---|---|
| **P3346** | BACI Zugriffsfehler AliveCounter Steckplatz G | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI Alive Counter Error Slot G** | $0_{hex}$ | |
| A | BM_w_BaciCntrAliveG | 1:1 | - |

Counter for alive counter errors (also see ▹Delay errors◃ on page 69).

High byte: Number of alive counter error at transmission of actual values

Low byte: Number of alive counter errors at the transmission of setpoints

| | | | |
|---|---|---|---|
| **P3347** | Zähler für BACI-Rekonfigurierungsvorgänge Steckplatz G | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI reconfiguration counter slot G** | $0_{hex}$ | |
| A | BM_w_BaciCntrReconfigG | 1:1 | - |

Counter for reconfiguration operations during the current operation

High byte: Number of initiation of reconfiguration operations during transmission of actual values

Low byte: Number of initiations of reconfiguration operations during setpoint transmissions

The characteristic, if a reconfiguration operation was started via actual values or via setpoints, is specified by the firmware of the particular option modules.

| | | | |
|---|---|---|---|
| **P3348** | Zähler zyklischer Austausch von BACI-Sollwerten Steckplatz G | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI set data exchange counter slot G** | $0_{hex}$ | |
| A | BM_w_BaciCntrCyclSetValG | 1:1 | - |

Counter for the cyclic data exchange of setpoints. If, e. g., the cycle time is set to 4 (1 ms), then this counter should have counted to 1000 after error-free cyclic transfer for one second.

| | | | |
|---|---|---|---|
| **P3349** | Zähler zyklischer Austausch von BACI-Istwerten Steckplatz G | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI act data exchange counter slot G** | $0_{hex}$ | |
| A | BM_w_BaciCntrCyclActValG | 1:1 | - |

Counter for den cyclic data exchange of actual values.

| | | | |
|---|---|---|---|
| **P3350** | BACI Kommandozähler Steckplatz G | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI command counter slot G** | $0_{hex}$ | |
| A | BM_w_BaciCntrCmdG | 1:1 | - |

Counter for BACI commands

High byte: Number of errors, which have occurred at command processing

Low byte: Number of commands

**P3351** BACI Kommandozähler Steckplatz G — $0_{hex}$ to $FFFF_{hex}$

**BACI command counter slot G** — $0_{hex}$

A BM_w_BaciCntrSrvDataG — 1:1 -

Counter for service data communication.

High byte: Number of the reading service data transfer

Low byte: Number of the writing service data transfer

**P3385** BACI Zugriffsfehler Steckplatz H — $0_{hex}$ to $FFFF_{hex}$

**BACI access error slot H** — $0_{hex}$

A BM_w_BaciCntrAccessErrH — 1:1 -

Parameter description see ▹P3345◃ on page 193.

**P3386** BACI Zugriffsfehler AliveCounter Steckplatz H — $0_{hex}$ to $FFFF_{hex}$

**BACI alive counter error slot H** — $0_{hex}$

A BM_w_BaciCntrAliveH — 1:1 -

Parameter description see ▹P3346◃ on page 193.

**P3387** Zähler für BACI-Rekonfigurierungsvorgänge Steckplatz H — $0_{hex}$ to $FFFF_{hex}$

**BACI reconfiguration counter slot H** — $0_{hex}$

A BM_w_BaciCntrReconfigH — 1:1 -

Parameter description see ▹P3347◃ on page 194.

**P3388** Zähler zyklischer Austausch von BACI-Sollwerten Steckplatz H — $0_{hex}$ to $FFFF_{hex}$

**BACI set data exchange counter slot H** — $0_{hex}$

A BM_w_BaciCntrCyclSetValH — 1:1 -

Parameter description see ▹P3348◃ on page 194.

**P3389** Zähler zyklischer Austausch von BACI-Istwerten Steckplatz H — $0_{hex}$ to $FFFF_{hex}$

**BACI act data exchange counter slot H** — $0_{hex}$

A BM_w_BaciCntrCyclActValH — 1:1 -

Parameter description see ▹P3349◃ on page 194.

| | | | |
|---|---|---|---|
| **P3390** | BACI Kommandozähler Steckplatz H | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI Command Counter Slot H** | $0_{hex}$ | |
| A | BM_w_BaciCntrCmdH | 1:1 | - |
| | Parameter description see ▹P3350◃ on page 194. | | |

| | | | |
|---|---|---|---|
| **P3391** | BACI Kommandozähler Steckplatz H | $0_{hex}$ to $FFFF_{hex}$ | |
| | **BACI Command Counter Slot H** | $0_{hex}$ | |
| A | BM_w_BaciCntrSrvDataH | 1:1 | - |
| | Parameter description see ▹P3351◃ on page 195. | | |

# APPENDIX A - LIST OF PARAMETERS

| Parameter | | Range | Standard value | Internal standardization | Page |
|---|---|---|---|---|---|
| P0001 | Controller type | 1 to 2 | 1 | 1:1 | 91 |
| P0002 | Controller firmware type | 0 to 65535 | 0 | 1:1 | 91 |
| P0003 | Controller firmware ID | 0 to 65535 | 0 | 1:1 | 91 |
| P0004 | Controller firmware version | 0.00 to 655.35 | 0.00 | 100:1 | 91 |
| P0005 | Parameter table version | 0 to 65535 | 0 | 1:1 | 92 |
| P0006 | Power unit type code | 20 ASCII characters | "" | 1:1 | 92 |
| P0007 | Power unit serial number | 0 to 65535 | 0 | 1:1 | 92 |
| P0008 | Power unit data configuration | 0 to 65535 | 0 | 1:1 | 92 |
| P0009 | Power unit firmware version | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 92 |
| P0012 | Power unit nominal current 8kHz | 0.0 to 6553.5 A | 2.5 A | 10:1 A | 93 |
| P0013 | Power unit peak current 8kHz | 0.0 to 6553.5 A | 2.5 A | 10:1 A | 93 |
| P0014 | Power unit overload time 1 | 0.00 to 655.35 s | 1.00 s | 100:1 s | 93 |
| P0015 | Power unit overload time 2 | 0.00 to 655.35 s | 1.00 s | 100:1 s | 93 |
| P0016 | Power unit internal device warning temperature | 0 to 125 °C | 75 °C | 1:1 | 93 |
| P0017 | Power unit internal device shutdown temperature | 0 to 125 °C | 1:1 °C | | 94 |
| P0018 | Power unit heatsink warning temperature | 0 to 125 °C | 75 °C | 1:1 °C | 94 |
| P0019 | Power unit heatsink shutdown temperature | 0 to 125 °C | 1:1 °C | | 94 |
| P0020 | Power unit nominal voltage | 280 to 1000 V | 540 V | 1:1 V | 94 |
| P0021 | Power unit dead time | 0.0 to 6553.5 µs | 0.0 µs | 10:1 µs | 94 |
| P0022 | Power unit burden factor Iac | -1.65 to 1.65 V | 0 V | 100:1 V | 95 |
| P0023 | Power unit burden factor Vdc | 0.00 to 10.00 V | 0 V | 100:1 V | 95 |
| P0024 | Power unit mode | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 95 |
| P0030 | Power unit burden factor Vmain | 0 to 65535 | 0 | 1:1 | 95 |
| P0170 | PSU actual mains voltage (filtered) | 0 to 763.6 V | 0 V | $4000_{hex}$:100 % | 95 |
| P0171 | PSU DC link actual mains voltage (filtered) | 0 to 1080 V | 0 V | $4000_{hex}$:100 % | 96 |
| P0172 | PSU actual mains power | -3276.8 to 3276.7 kW | 0 kW | 10:1 kW | 96 |
| P0173 | PSU actual mains frequency | 0 to 312.5 Hz | 0 Hz | 65535/312.5 Hz | 96 |
| P0174 | PSU status1 | $0_{hex}$ to $FFFF_{hex}$ | 0 | 1:1 | 96 |
| P0175 | PSU status2 | $0_{hex}$ to $FFFF_{hex}$ | 0 | 1:1 | 97 |
| P0176 | PSU status 3 | $0_{hex}$ to $FFFF_{hex}$ | 0 | 1:1 | 98 |

| Parameter | | Range | Standard value | Internal standardization | Page |
|---|---|---|---|---|---|
| P0177 | PSU DC link controller status | $0_{hex}$ to $FFFF_{hex}$ | 0 | 1:1 | 98 |
| P0178 | PSU ramp function generator output | $0_{hex}$ to $FFFFFFFF_{hex}$ | 0 | 1:1 | 98 |
| P0179 | PSU DC link voltage set voltage | 280 V to 800 V | 640 V | 1:1 | 98 |
| P0180 | PSU SVG setpoint 1 | 280 V to 800 V | 640 V | 1:1 V | 98 |
| P0181 | PSU SVG setpoint 2 | 280 V to 800 V | 640 V | 1:1 V | 99 |
| P0182 | PSU SVG setpoint 3 | 280 V to 800 V | 640 V | 1:1 V | 99 |
| P0183 | PSU SVG setpoint 4 | 280 V to 800 V | 640 V | 1:1 V | 99 |
| P0184 | PSU DIO status | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 99 |
| P0200 | Error System 1 | $0_{hex}$ to $FFFFFFFF_{hex}$ | $0_{hex}$ | 1:1 | 100 |
| P0201 | Error Processor | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 100 |
| P0202 | Error Operating System | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 101 |
| P0203 | Error in module Proprog communication | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 101 |
| P0204 | Error in function- or option modules | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 102 |
| P0205 | Error PSU | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 103 |
| P0206 | Error Power Unit | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 104 |
| P0211 | Error drive manager | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 105 |
| P0212 | Error data set manager | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 105 |
| P0215 | Error in module free control section. | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 106 |
| P0216 | Error CANsync | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 106 |
| P0233 | Error Power Unit serial interface | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 107 |
| P0240 | Error function module A | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 108 |
| P0241 | Error function module B | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 108 |
| P0242 | Error function module C | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 108 |
| P0243 | Error function module D | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 109 |
| P0244 | Error function module E | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 109 |
| P0245 | Error option module G | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 109 |
| P0246 | Error in option module H | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 111 |
| P0251 | Error communication parameter No. | 0 to 65535 | 0 | 1:1 | 111 |
| P0260 | Warning System 1 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 112 |
| P0261 | Warning PSU | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 112 |
| P0262 | Warning Power Unit | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 113 |
| P0290 | Client alive timeout | 0 to 65535 ms | 2000 ms | 1:1 ms | 113 |
| P0291 | Receive timeout proprog protocol | 300 to 65535 ms | 500 ms | 1:1 ms | 113 |
| P0298 | Error reaction BACI communication | -1 to 3 | -1 | 1:1 | 114 |
| P0300 | Control word | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 114 |
| P0301 | Status word | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 117 |
| P0302 | Control word 2 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 119 |
| P0303 | Status word 2 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 119 |
| P0304 | Operation mode actual | -7 to 6 | -3 | 1:1 | 119 |
| P0305 | Drive status | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 120 |
| P0306 | Status digital inputs drive manager | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 120 |
| P0308 | Status word 3 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 121 |
| P0310 | Data set command | 0 to 16 | 0 | 1:1 | 121 |
| P0311 | Data set status | $0_{hex}$ to $FFFF_{hex}$ | 0 | 1:1 | 122 |
| P0312 | Active data set number | 1 to 8 | 1 | 1:1 | 123 |

| Parameter | | Range | Standard value | Internal standardization | Page |
|---|---|---|---|---|---|
| P0313 | Valid data sets | $00_{hex}$ to $FF_{hex}$ | $01_{hex}$ | 1:1 | 124 |
| P0314 | Data set source | 0 to 8 | 0 | 1:1 | 124 |
| P0315 | Data set target | 0 to 8 | 1 | 1:1 | 124 |
| P0316 | Error data set parameter No. | 1 to max. Para No. | - | 1:1 | 125 |
| P0317 | EEPROM write count | 1 to 65535 | 1:1 | | 125 |
| P0318 | PSI write count | 1 to 65535 | 1:1 | | 125 |
| P0319 | PSI parameter number | 1 to 65535 | 1:1 | | 125 |
| P0320 | PSI array index | 0 to 65535 | 1:1 | | 125 |
| P0321 | PSI parameter data width | 0 to 65535 | 1:1 | | 126 |
| P0322 | PSI parameter value (32 Bit) | $0_{hex}$ to $FFFFFFFF_{hex}$ | 1:1 | | 126 |
| P0323 | PSI string parameter | 40 ASCII characters | "" | 1:1 | 126 |
| P0324 | PSI data set selection | 1 to 4 | 1:1 | | 126 |
| P0325 | PSI valid data sets | 0 to 65535 | 1:1 | | 126 |
| P0326 | Data set manager mode | 0 to 65535 | 1:1 | | 127 |
| P0327 | Boot data set | 1 to 8 | 1 | 1:1 | 127 |
| P0330 | Current controller status | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 127 |
| P0332 | Current Iq setpoint | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 127 |
| P0333 | Current Iq actual value | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 127 |
| P0334 | Current Iq controller output | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 128 |
| P0335 | Current Id setpoint | -100.00 to +100.00 % | 0.00 % | $4000_{hex}$:100 % | 128 |
| P0336 | Current Id Actual value | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 128 |
| P0337 | Current Id controller output | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 128 |
| P0338 | Voltage EMF setpoint | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 128 |
| P0339 | Voltage Vq setpoint | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 129 |
| P0340 | Voltage Vd setpoint | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 129 |
| P0341 | Current phase U actual value | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 129 |
| P0342 | Current phase V actual value | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 129 |
| P0343 | Apparent current actual value | -200,00 to +200.00 % | 0.00 % | $4000_{hex}$:100 % | 129 |
| P0410 | Function module A: status digital input | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 130 |
| P0411 | Function module B: status digital input | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 130 |
| P0412 | Function module C: status digital input | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 131 |
| P0413 | Function module D: status digital input | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 131 |
| P0414 | Function module E: status digital input | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 131 |
| P0418 | Function module D: Status digital output | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 132 |
| P0419 | Function module E: Status digital output | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 132 |
| P0420 | Analog input 1 actual value | -100.00 to +100.00 % | 0.00 % | $7FFF_{hex}$:100% | 133 |
| P0421 | Analog input 2 actual value | -100.00 to +100.00 % | 0.00 % | $7FFF_{hex}$:100% | 133 |
| P0430 | Ramp Function Generator status | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 133 |
| P0440 | Setpoint generator mode | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 134 |
| P0441 | SVG time 1 | 0.001 to 65.535 s | 1.000 | 1000:1 s | 134 |
| P0443 | SVG time 2 | 0.001 to 65.535 s | 1.000 | 1000:1 s | 134 |
| P0445 | SVG time 3 | 0.001 to 65.535 s | 1.000 | 1000:1 s | 134 |
| P0447 | SVG time 4 | 0.001 to 65.535 s | 1.000 | 1000:1 s | 135 |
| P0449 | Setpoint generator output | 0 to 65535 | 600 | 1:1 | 135 |
| P0480 | Power unit status | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 135 |

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| P0482 | Power unit heatsink actual temperature | 0 to 125 °C | 0 °C | 1:1 °C | 136 |
| P0484 | Power unit DC-link actual value | 0 to 10290 V | 0 V | $4000_{hex}$:540 V | 136 |
| P0485 | Power unit Ixt actual value | 0 to 400.0 % | 0.0 % | $2000_{hex}$:100 % | 136 |
| P0487 | Switching PWM mode | 0.00 to 100.00 % | 100.00 % | $4000_{hex}$:100 % | 136 |
| P0490 | PSU status 3 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 137 |
| P0540 | CAN mode | 0 to 1 | 0 | 1:1 | 137 |
| P0541 | CAN status | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 137 |
| P0542 | CAN baud rate (config) | 125 to 1000 kBit/s | 125 kBit/s | 1:1 kBit/s | 137 |
| P0543 | CAN baud rate (DIP switch) | 125 to 1000 kBit/s | 125 kBit/s | 1:1 kBit/s | 137 |
| P0544 | CAN baud rate (active) | 125 to 1000 kBit/s | 125 kBit/s | 1:1 kBit/s | 138 |
| P0545 | CAN slave number (config) | 0 to 128 | 0 | 1:1 | 138 |
| P0546 | CAN slave number (DIP-switch) | 0 to 128 | 0 | 1:1 | 138 |
| P0547 | CAN slave number (active) | 0 to 128 | 0 | 1:1 | 138 |
| P0550 | Module type slot A | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 139 |
| P0551 | Module type slot B | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 140 |
| P0552 | Module type slot C | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 140 |
| P0553 | Module type slot D | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 141 |
| P0554 | Module type slot E | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 141 |
| P0555 | FPGA version | $0_{hex}$ to $FFFF_{hex}$ | 0 | 1:1 | 141 |
| P0556 | Bootloader firmware version | 0 to 65535 | 0 | 1:1 | 141 |
| P0557 | Programming request | 0 to 1 | 0 | 1:1 | 141 |
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| P0803 | Option module 1 master 1 parameter No. setpoint 3 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 144 |
| P0804 | Option module 1 master 1 parameter No. setpoint 4 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 145 |
| P0805 | Option module 1 master 1 parameter No. setpoint 5 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 145 |
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| P0807 | Option module 1 master 1 parameter No. setpoint 7 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 145 |
| P0808 | Option module 1 master 1 parameter No. setpoint 8 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 145 |
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| P1093 | Set bit pattern for LOW state digital input 1 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 162 |
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| P1097 | Bit selection digital input 2 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 163 |
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| P1100 | Selection digital input 3 | $0_{hex}$ to $0508_{hex}$ | $0_{hex}$ | 1:1 | 163 |
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| P1107 | Bit selection digital input 4 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 165 |
| P1108 | Set bit pattern for LOW state digital input 4 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 165 |
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| P1111 | Source number digital output 1 | 0 to max. para No. | 0 | 1:1 | 166 |
| P1112 | Bit selection digital output 1 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 166 |
| P1113 | Bit pattern digital output 1 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 166 |
| P1114 | Selection digital output 2 | $0_{hex}$ to $0508_{hex}$ | $0_{hex}$ | 1:1 | 166 |
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| P1116 | Bit selection digital output 2 | $0_{hex}$ to $0508_{hex}$ | $0_{hex}$ | 1:1 | 167 |
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| P1124 | Bit selection digital output 4 | $0_{hex}$ to $FFFF_{hex}$ | $0008_{hex}$ | 1:1 | 168 |
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| P1134 | Offset analog input 1 | -100.00 % to +100.00 % | 0.00 % | $7FFF_{hex}$:100 % | 170 |
| P1135 | Threshold value analog input 1 | 0.00 % to +100.00 % | 0.00 % | $7FFF_{hex}$:100 % | 170 |
| P1136 | Selection analog input 2 | $0_{hex}$ to $0508_{hex}$ | $0_{hex}$ | 1:1 | 170 |
| P1137 | Smoothing time analog input 2 | 0.000 to 60.000 ms | 1.000 ms | 1000:1 ms | 170 |
| P1138 | Scaling factor analog input 2 | -2.0 to 2.0 | 1.0 | $7FFF_{hex}$:1 | 170 |
| P1139 | Target number analog input 2 | 0 to max. para No. | 0 | 1:1 | 171 |
| P1140 | Offset analog input 2 | -100.00 % to +100.00 % | 0.00 % | $7FFF_{hex}$:100 % | 171 |
| P1141 | Threshold value analog input 2 | 0.00 % to +100.00 % | 0.00 % | $7FFF_{hex}$:100 % | 171 |
| P1150 | Selection fast analog output 1 | $0_{hex}$ to $0508_{hex}$ | $0_{hex}$ | 1:1 | 171 |
| P1151 | Source number fast analog output 1 | 0 to max. para No. | 0 | 1:1 | 171 |
| P1152 | Offset fast analog output 1 | -10.00 to +10.00V | 0 V | $7FFF_{hex}$:10 V | 172 |
| P1153 | Scaling fast analog output 1 | 67108863.00 to 67108863.00 | 1.00 | 32:1 | 172 |
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| P1260 | Blocking time | 0.0 to 6500.0 s | 10.0 s | 10:1 s | 175 |
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| P1291 | Bit pattern status bit 14 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 176 |
| P1292 | Parameter selection statusbit 15 | 0 to max. para No. | 0 | 1:1 | 176 |
| P1293 | Bit mask for status bit 15 | $0_{hex}$ to $FFFF_{hex}$ | $0_{hex}$ | 1:1 | 176 |
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| P1343 | PSU max. DC link voltage setpoint | 300 to 800 V | 760 V | 1:1 V | 177 |
| P1344 | PSU min. DC link voltage setpoint | 280 to 800 V | 360 V | 1:1 V | 177 |
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| P1346 | PSU mains voltage feed forward smoothing time | 0 to 50 ms | 1.0 ms | 10:1 ms | 177 |
| P1347 | PSU Id setpoint | -100.0 % to +100.0 % | 0.0 % | $4000_{hex}$:100 % | 178 |
| P1348 | PSU mode 1 | $0000_{hex}$ to $FFFF_{hex}$ | $FFFD_{hex}$ | 1:1 ms | 178 |
| P1349 | PSU max. Id deviation | -100.0 % to +100.0 % | 0.0 % | $4000_{hex}$:100 % | 178 |
| P1350 | PSU offset rho | -30.0 ° to +30.0 ° | 0.0 ° | $4000_{hex}$: 360 ° | 178 |
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| P1357 | PSU Precharge cycle | 0,000 bis 120,000 s | 0 s | 1000:1 s | 179 |
| P1358 | PSU Mains warning power | 0,000 bis 3276,7 kW | 30,0 kW | 10:1 kW | 180 |
| P1359 | PSU Mains max. load time | 1,00 bis 600,00 s | 30,00 s | 1000:1 s | 180 |
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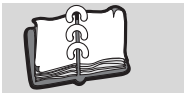

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# Revision survey

| Version | Date of issue | Changing |
|---|---|---|
| 5.04054.03 | 21.06.2006 | First issue |
| 5.04054.04 | 10.11.2006 | P0022, P0171 modified, P0487 inserted, default values P1090 to P1094 and P1110 to P1125 modified |
| 5.04054.05 | 13.03.2008 | Unregulated DC link voltage |
| 5.04054.06 | 09.11.2012 | Setting of the power factor, new parameters P1350/1359 |
| 5.04054.0 | 26.05.2014 | P0449 and P1344: errors eliminated<br>Chapter Commissioning updated |

**Notice:**

**be in motion**

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