# Instruction handbook

Language **English**

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be in motion be in motion

BAUMÜLLER

# Control Panel

**for**

**b maXX 3000**
**b maXX 5000**

| E | 5.12068.01 |
|---|---|

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

Preliminary information

**Warning** Insofar as this document is identified as being preliminary information, the following applies:
this version is regarded as providing advance technical information to users of the described devices and their functions at an early enough time in order to adapt to any possible changes or expanded functionality.
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The conditions stipulated in the following section under "Obligatory" are invalid in case of preliminary information.

Obligatory

This Instruction handbook are a part of the equipment/machine. This Instruction handbook must be available to the operator at all times and must be in legible condition. If the equipment/machine is sold or moved another location, this Instruction handbook must be passed on by the owner together with the equipment/machine.
After any sale of the equipment/machine, this original and all copies must be handed over to the buyer. After disposal or any other end use, this original and all copies must be destroyed.

When the present Instruction handbook is handed over, corresponding sets of Instruction handbooks of a previous version are automatically invalidated.
Please note that the specifications/data/information **are current values according to the printing date**. These statements are **not legally binding** with regard to measurements, computation or calculations.
Baumüller Nürnberg GmbH reserves the right, in developing its products further, to change the technical specifications and handling of it products concerned without prior notice.

No liability can be accepted concerning the correctness of this Instruction handbook unless otherwise specified in the General Conditions of Sale and Delivery.

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# 1

# GENERAL

## 1.1 Information on this Instruction handbook

This Instruction handbook provides important information on handling the device. A prerequisite for safe work is compliance with all specified safety notes and procedural instructions.

Additionally, the valid accident prevention regulations and general safety regulations applicable to the scope of application the device must be complied with.

Read this Instruction handbook, particularly the safety notes chapter, completely before beginning any work on the device. This Instruction handbook is part of the product and must be kept accessible to personnel at all times in the immediate vicinity of the device.

## 1.2 Associated documents

| | Doc. No. | Part No. German | Part No. English |
|---|---|---|---|
| Instruction handbook BM3000 | 5.11018 | 441838 | 441839 |
| Parameter manual BM3000 | 5.12001 | 442289 | 442290 |
| Instruction handbook BM5000 | 5.09021 | 439682 | 439683 |
| Parameter manual BM5000 | 5.09022 | 428331 | 431082 |

## 1.3 Key to symbols

**Warning notes**

Warning notes are identified by symbols in this Instruction handbook. The notes are introduced by signal words that express the extent of the danger.

It is imperative that these notes be complied with and are conscientiously regarded in order to prevent accidents, personal injury and material damage.

**DANGER!**

....points out a directly dangerous situation, that will lead to severe injuries or death, if not avoided.

**WARNING!**

....points out a potentially dangerous situation, that could lead to severe injuries or death, if not avoided.

**CAUTION!**

....points out a potentially dangerous situation, that can lead to minor or slight injuries, if not avoided.

**NOTICE!**

....points out a potentially dangerous situation, that can lead to material damage, if not avoided.

**Recommendations**

**NOTE!**

....highlights useful hints and recommendations, as well as information for the efficient and trouble-free use.

## 1.4 Limitation of liability

All specifications and notes in this Instruction handbook were compiled taking into account the applicable standards and regulations, the state of the art and our knowledge and experience of many years.

The manufacturer assumes no liability for damages due to:

- noncompliance with the Instruction handbook
- usage for other than the intended purpose
- usage by untrained personnel

The actual scope of delivery can vary in case of optional equipment, laying claim to additional order options, or on account of the latest technical changes to the explanations and representations described herein.

The user bears the responsibility for performing service and commissioning in accordance with the safety regulations of the applicable standards and all other relevant governmental or local regulations referring to the dimensioning and protection of conductors, grounding, disconnectors, overcurrent protection, etc.

The person who carried out the mounting or installation is liable for any damage, which incurred when assembling or connecting the device.

## 1.5 Copyright protection

The Instruction handbook must be treated confidentially. It is to be used exclusively by personnel who work with the device. The consignment of the Instruction handbook to third persons without the written permission of the manufacturer is prohibited.

**NOTE!**

The specific contents, text, drawings, images and other representations are copyrighted and subject to industrial property rights. Any prohibited usage is punishable by law.

## 1.6 Applicable documents

Components of other manufacturers are integrated into the device. For these purchased parts, hazard assessments have been performed by the respective manufacturers. The compliance of the design construction with the applicable European and national regulations has been declared for the components by the respective manufacturers.

## 1.7 Spare parts

**WARNING!**

**False or flawed spare parts can lead to damage, malfunction or complete failure, thus endangering safety.**

Therefore:

- Only use original spare parts of the manufacturer.

Procure spare parts through an authorized dealer or directly from the manufacturer.

## 1.8 Disposal

Insofar as no take-back or disposal agreement has been made, please disassemble units correctly and properly recycle the constituent parts.

## 1.9 Guarantee provisions

The guarantee provisions are stated in a separate document of the sales documents.

The devices described herein may only be operated in accordance with the stipulated methods, procedures and conditions. Anything else not presented here, including the operation of devices in mounted positions, is not permitted and must be cleared with the plant on a case-by-case basis. If the devices are operated in any other manner than as described within this Instruction handbook, then all guarantee and warranty rights are rendered null and void.

## 1.10 Customer service

Our customer service is available to provide you with technical information.

Info on the responsible contact persons is available at all times via telephone, fax, mail or the Internet.

# 2

# SAFETY

This section provides an overview of all of the important safety aspects for optimum protection of personnel as well as for the safe and problem-free operation.

## 2.1 Contents of the instruction handbook

Each person who is tasked with performing work on or with the device must have read and understood the instruction handbook before working with the device. This also applies if the person involved with this kind of device or a similar one, or has been trained by the manufacturer.

## 2.2 Changes and modifications to the device

In order to prevent hazards and to ensure optimum performance, no changes, additions or modifications may be undertaken on the device that have not been explicitly approved by the manufacturer.

## 2.3 Appropriate use

The **Control Panel BM3000/BM5000** can be used for devices type b maXX 5000 or 3200/3300 only.

A device is considered as being used compliant with its intended purpose if all notes and information of this Instruction handbook are adhered to.

**WARNING!**

**Danger arising from usage for an unintended purpose!**

Any usage that goes beyond the intended purpose and/or any non-compliant use of the device can lead to dangerous situations.

Therefore:

- Only use the device compliant with its intended purpose.
- Observe all specifications of this Instruction handbook.
- Ensure that only qualified personnel work with/on this device.
- The device may only be operated in a technically flawless condition.
- Only operate the device in combination with devices type b maXX BM5000 or BM3200/3300.

## 2.4 Responsibility of the operating company

The device will be used in commercial areas. Thus, the proprietor of the device is subject to the legal work safety regulations.

Along with the notes on work safety in this Instruction handbook, the safety, accident prevention and environmental protection regulations valid for the area of application of this device must be complied with. Whereby:

- The operating company must inform himself about the applicable work health and safety regulations and ascertain, in a hazard assessment, any additional hazards that could arise from the special working conditions in the use area of the device. These must then be implemented in the form of operating instruction for operation of the device.
- This Instruction handbook must be kept accessible to personnel working with the device at all times in the immediate vicinity of the device.
- The specifications of the Instruction handbook must be adhered to completely and without exception.
- The device may only be operated in a technically faultless and operationally safe condition.

## 2.5 Protection

| Protection classification | |
|---|---|
| BM5-O-HMI | IP 20 |

## 2.6 Training of the personnel

**WARNING!**

**Risk of injury due to insufficient qualifications!**

Improper handling can lead to significant personal injury and material damage.

Therefore:

- Certain activities can only be performed by the persons stated in the respective chapters of this Instruction handbook.

In this Instruction handbook, the following qualifications are stipulated for various areas of activity:

- **Operating personnel**
  - The drive system may only be operated by persons who have been specially trained, familiarized and authorized.
  - Troubleshooting, maintenance, cleaning, maintenance and replacement may only be performed by trained or familiarized personnel. These persons must be familiar with the Instruction handbook and act accordingly.
  - Initial operation and familiarization may only be performed by qualified personnel.

- **Qualified personnel**
  - Electrical engineers authorized by Baumüller Nürnberg GmbH, and qualified electricians of the customer or a third party who have learned to install and maintain Baumüller drive systems and are authorized to ground and identify electrical power circuits and devices in accordance with the safety engineering standards of the company.
  - Qualified personnel have had occupational training or instruction in accordance with the respective locally applicable safety engineering standards for the upkeep and use of appropriate safety equipment.

## 2.7 Special hazards

In the following section, the remaining marginal risks will be stated that have been identified as a result of the hazard analysis.

Observe the safety notes listed here and the warning notes in the further chapters of this manual to reduce health risks and dangerous situations.

**Electrical current**

**DANGER!**

**Risk of fatal injury from electrical current!**

There is an immediate risk of fatal injury if live electrical parts are contacted. Damage to the insulation or individual components can be life-threatening.

Therefore:

- Switch off the electrical power immediately in case of damage to the power supply insulation.
- Only allow work on the electrical system to be performed by qualified personnel.
- Switch off the current when any kind of work is being performed on the electrical system and ensure safety before switching on again.

**Danger from residual energy**

**DANGER!**

**Risk of fatal injury from electrical current!**

Stored electric charge.

Discharge time of the system = discharge time of the device with the longest DC link discharge time connected to the DC link.

Therefore:

- Do not touch electrically live parts before taking into account the discharge time of the capacitors.
- Pay attention to the corresponding notes on the device.
- If several devices are connected e.g. with a mains rectifier unit, the DC link discharge can take a much longer time. In this case, the necessary waiting period must itself be determined or a measurement made to ensure the device is de-energized.

**Moving components**

**WARNING!**

**Risk of injury from moving components!**

Rotating components and/or components moving linearly can result in severe injury.

Therefore:

- Do not touch moving components during operation.
- Do not open any covering during operation.
- The amount of residual mechanical energy depends on the application. Powered components still turn/move for a certain length of time even after the power supply has been switched off. Ensure that adequate safety measures are taken.

## 2.8 Fire fighting

**DANGER!**

**Risk of fatal injury from electrical current!**

There is a risk of electric shock if an electrically-conductive, fire-extinguishing agent is used.

Therefore:

- Use the following fire-extinguishing agent:

ABC powder / $CO_2$

## 2.9 Safety equipment

**WARNING!**

**Risk of fatal injury due to non-functional safety equipment!**

Safety equipment provides for the highest level of safety in a facility. Even if safety equipment makes work processes more awkward, under no circumstances may they be circumvented. Safety can only be ensured by intact safety equipment.

Therefore:

- Before starting to work, check whether the safety equipment in good working order and properly installed.

## 2.10 Behavior in hazardous situations or at accidents

**Preventive measures**

- Always be prepared for accidents or fire!
- Keep first-aid equipment (e.g. first-aid kits, blankets, etc.) and fire extinguishers readily accessible.
- Familiarize personnel with accident signalling systems, first aid equipment and life saving equipment.

**And if something does happen: respond properly.**

- Stop operation of the device immediately with an EMERGENCY Stop.
- Initiate first aid measures.
- Evacuate persons from the danger zone.
- Notify the responsible persons of the site.
- Alarm medical personnel and/or the fire department.
- Keep access routes clear for rescue vehicles.

# 3

# TECHNICAL DATA

## 3.1 Dimensions

**NOTE!**

All dimensions in mm.

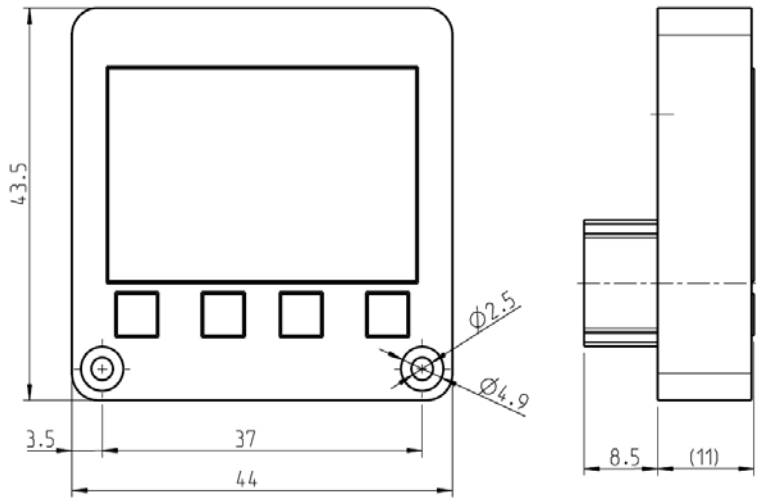



Figure 1: Dimensions **Control Panel BM3000/BM5000**

## 3.2 Weight

| | |
|---|---|
| Weight | 25 g |

## 3.3 Operating conditions

### 3.3.1 Required environmental conditions

| | |
|---|---|
| Transportation temperature range | - 25 °C to + 70 °C |
| Transportation climate classification<br>EN 60721-3-2 | 2 K 3 |
| Storage temperature range | - 25 °C to + 70 °C |
| Storage climate classification<br>EN 60721-3-1 | 1 K 4 |
| Operation temperature range | min. 5 °C to max. 55 °C |
| Operation climate classification<br>EN 60721-3-3 | 3 K 3 |
| Altitude of site [2)] | up to 2000 m altitude |
| Humidity (operation)<br>EN 60721-3-3 | relative humidity: 5 % to 85 % non-condensing<br>and<br>absolute humidity: 1 g/m$^3$ to 25 g/m$^3$ |
| Ionizing and non-ionizing radiation | < measurable range |
| Vibration, shock and repetitive shock<br>EN 61800-5-1, section 5.2.6.4 vibration test | max. 0,5 g operating (1 g tested) |
| Pollution degree<br>EN 61800-5-1, table 6, tab. 2 | 2 |

**NOTICE!**

Normally, only non-conductive pollution occurs. Any conductive pollution, if for a short-term or permanently, is forbidden and can cause the destruction of the device. The customer is responsible for destructions, which are caused by conductive materials.

### 3.3.2 Electrical Data

| | |
|---|---|
| Current consumption | max. 116 mA |
| Power loss | max 580 mW, typical 200 mW |

# 4

# DESIGN AND FUNCTION

In this chapter the basic design of the device **Control Panel BM3000/BM5000** is described and the type code on the devices is explained.

## 4.1 Construction


Figure 2: Control Panel

The **Control Panel** is used to parameter display, parameter setting and control of Baumüller drives BM3000/BM5000.

The **Control Panel** can display, change and save controller parameters. A backup of a controller parameter set can be transmitted to the nonvolatile memory directly.

**Following types are supported:**

- b maXX 3200/3300 series
- b maXX 5000 series

from firmware version 01.05.

**Available language**

- English
- German and other languages in preparation

**Configuration**

- Scaling
- Predefined parameter list
- Parameter list for drive status
- Start screen
- Management of up to 3 parameter sets
- Selection of type of decimal point

**Memory**

- 3 complete parameter sets can be stored (each max. 64 kByte)

**Display elements**

- OLED-LC Display, 4 lines, 128 x 96 pixel, 1,3“

**Operation elements**

- 4 soft keys, type rubber keyboard

**Interfaces**

- serial interface with GDP protocol

**Power supply**

- internal via controller

## 4.2 Identification of the device

**Type plate** The type code can be found on the type plate.

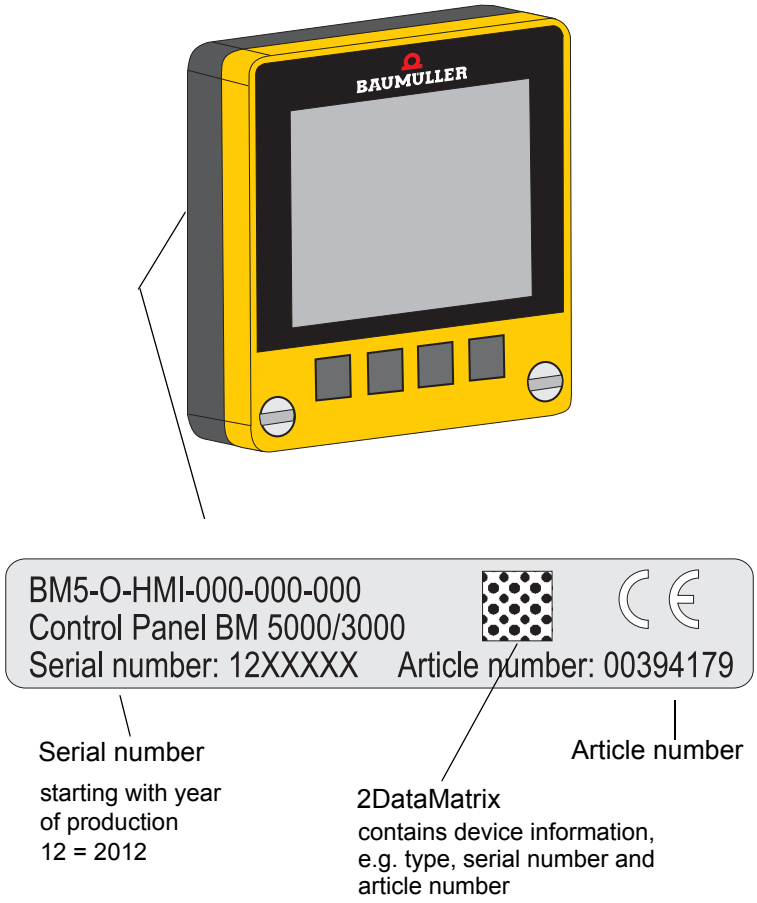



Figure 3: Type plate

### 4.2.1 Type code

The type code has following format:
BM5-O-HMI-000-000-000.

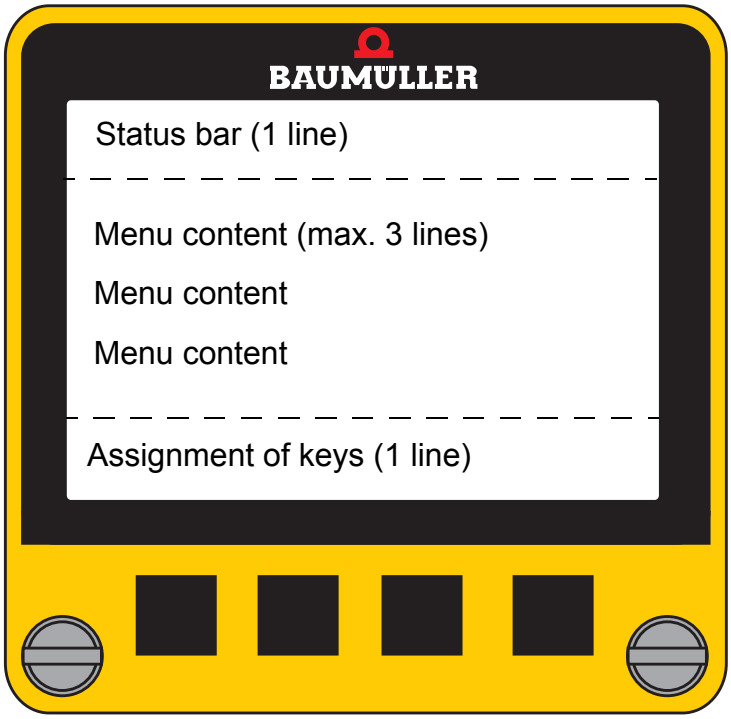
The type code is explained in the following table.

| | |
|---|---|
| BM5-O-HMI-XXX-XXX-XXX | Device generation |
| BM5-O-HMI-XXX-XXX-XXX | Module type option module |
| BM5-O-HMI-XXX-XXX-XXX | Module name<br>HMI: Control Panel |
| BM5-O-HMI-XXX-XXX-XXX | Module version |
| BM5-O-HMI-XXX-XXX-XXX | Hardware type |
| BM5-O-HMI-XXX--XXX-XXX | Software type |

## 4.3 Display and operation elements

### 4.3.1 LCD

The LCD is divided into 3 sections:



**Status bar** The first line is the status bar.

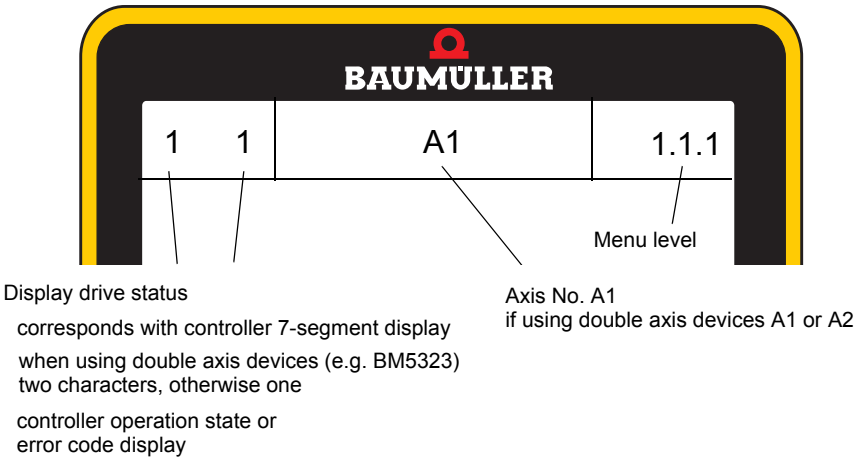



Figure 4: Status bar

| Drive status | State drive manager | Meaning |
|---|---|---|
| 0 | NOT READY FOR SWITCH-ON | Drive message „ Not ready for power enable“ |
| 1 | VOLTAGE INHIBITED | Voltage inhibited, e.g. quick stop active |
| 2 | READY FOR SWITCH-ON | Drive stopped<br>Control word: xxxx x110<br>Pulse enable = 0<br>Quick stop = 1 (low active) |
| 3 | SWITCHED ON | Control word: xxxx x111<br>Pulse enable = 1<br>Quick stop = 1 |
| 4 | OPERATION ENABLED | Control word: xxxx 1111<br>Pulse enable = 1<br>Quick stop = 1 |
| 5 | INHIBIT OPERATION ACTIVE | |
| 6 | SHUTDOWN DRIVE ACTIVE | Pulse enable = 0 |
| 7 | QUICK STOP ACTIVE | Quick stop = 0 (low active) |
| E | ERROR REACTION ACTIVE | |
| F | FAULT | Error code display,<br>Error code see corresponding handbook of the controller<br>Reset via control word 0xxx xxxx<br>or reset error memory 0 → 1 |
| P | Parking axis | |

**Display key assignment**

The bottom line shows the assignment of the 4 soft function keys T1 to T4, refer to ▹Function keys◃ on page 24.

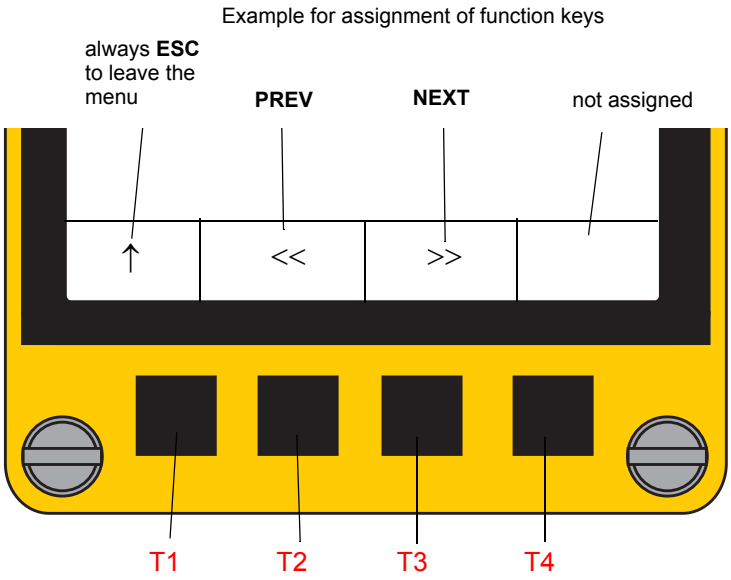



Figure 5: Display key assignment

**Main screen**

In the center of the display is the main screen.

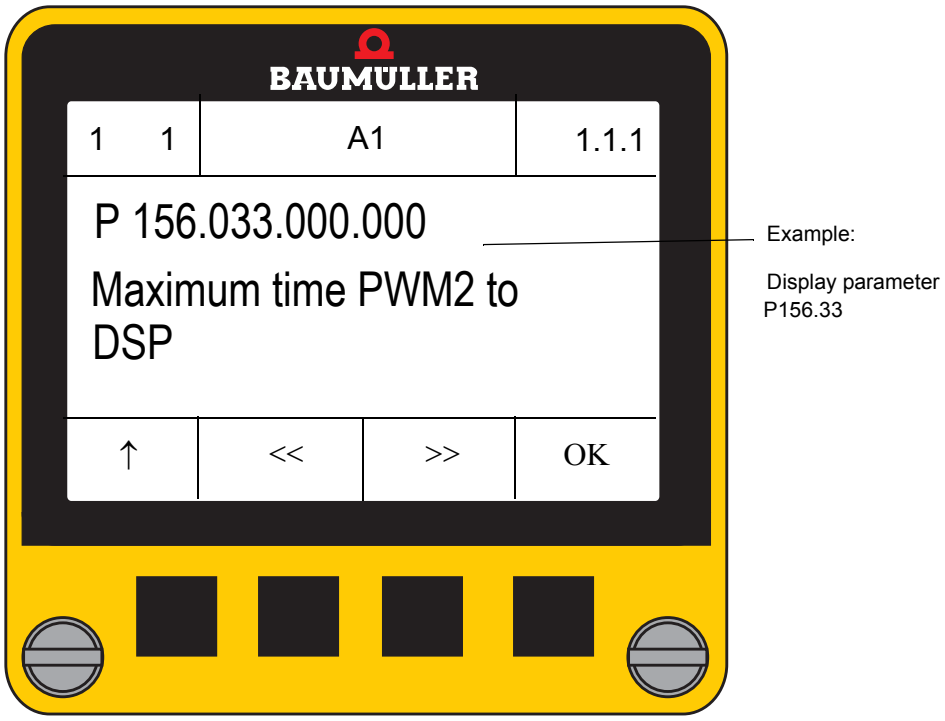



Figure 6: Main screen

### 4.3.2 Function keys

The **Control Panel** provides 4 function keys (T1 to T4), assigned depending on the active menu.

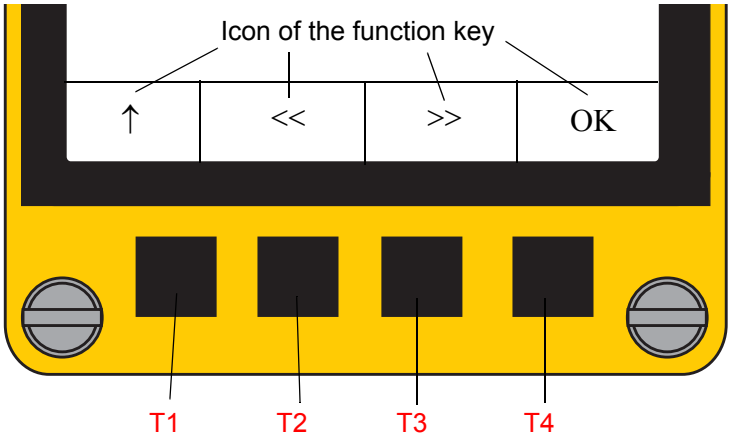



Figure 7: Function key assignment

| Icon of the function key | Abbreviation | Meaning |
|---|---|---|
| ↑ | **ESC** | Leave menu **without** change |
| **<<** | **PREV** | Open or display previous element |
| **>>** | **NEXT** | Open or display next element |
| **OK** | **OK** | Accept the selection<br>(character, part of parameter ID, index or selection of tree structure) |
| | **ENTER** | Activate with long keystroke > 1 s<br>Accept a value or parameter ID |
| No icon<br>T2 + T3 | **NEXT AXIS** | Only for double axis<br>Changes the active axis |

The keys ↑ **ESC**, **<< PREV** and **>> NEXT** have an autorepeat function, if the keystroke is longer than 0,8 s (similar to PC keyboard).

The function of the key **OK** depends on the menu and the keystroke length:
**OK**: accept address (short keystroke) or
**ENTER**: display or change value (keystroke longer than 1 s)

Special functions are enabled, if multiple keys are pressed simultaneously:

| Function keys pressed simultaneously | Function | Meaning |
|---|---|---|
| T2 + T3 | **NEXT AXIS** | Only double axis: axis change |

# 5

# TRANSPORT AND PACKAGING

## 5.1 What to observe when transporting

For initial transport of a device, it is packed at the manufacturer's plant. If the device must be transported, ensure that the following conditions are met throughout the entire transport:

- Climate class 2 K 3 as per EN 60721-3-2
- Temperature range - 30 °C up to + 70 °C
- Vibration, shock, continuous shock class 2 M 1 as per EN 60721-3-2

## 5.2 Transport inspection

Upon receiving the delivered goods, immediately examine them for completeness and transport damage.

If there is visible transport damage on the outside, proceed as follows:

- Do not accept the delivery or conditionally accept it with reservations.
- Note the extent of the damage on the transport documents or on the delivery note of the shipping agent.
- Immediately file a complaint with the freight carrier. Have the complaint confirmed in writing and immediately contact the responsible representative of Baumüller Nürnberg GmbH.

**NOTE!**

The device may not be operated if there is visible transport damage!

## 5.3 Unpacking

If no transport damage is visible:

- Open the packaging of the device.
- Verify the delivery scope based on the delivery note.

File a claim with the responsible Baumüller representative if the delivery is incomplete.

**NOTE!**

Claim each individual deficiency as soon as it has been detected. Damage claims can only be validly asserted within the claim registration period.

## 5.4 Disposal of the packaging

The packaging consists of cardboard.

- When disposing of the packaging, comply with the national regulations valid at the use area.

# 6

# MOUNTING AND INSTALLATION

The device is intended for mounting it on a b maXX 5000/3000.

**NOTICE!**

**Danger due to electrostatic discharge.**

ESD sensitive connecting plug

## 6.1 Mounting instruction

- Plugging of the **Control Panel**
- Tightening of the 2 disappearing screws (max. torque: Nm)

**NOTE!**

The display can be hot plugged, that means it can be plugged and unplugged while the device is energized.

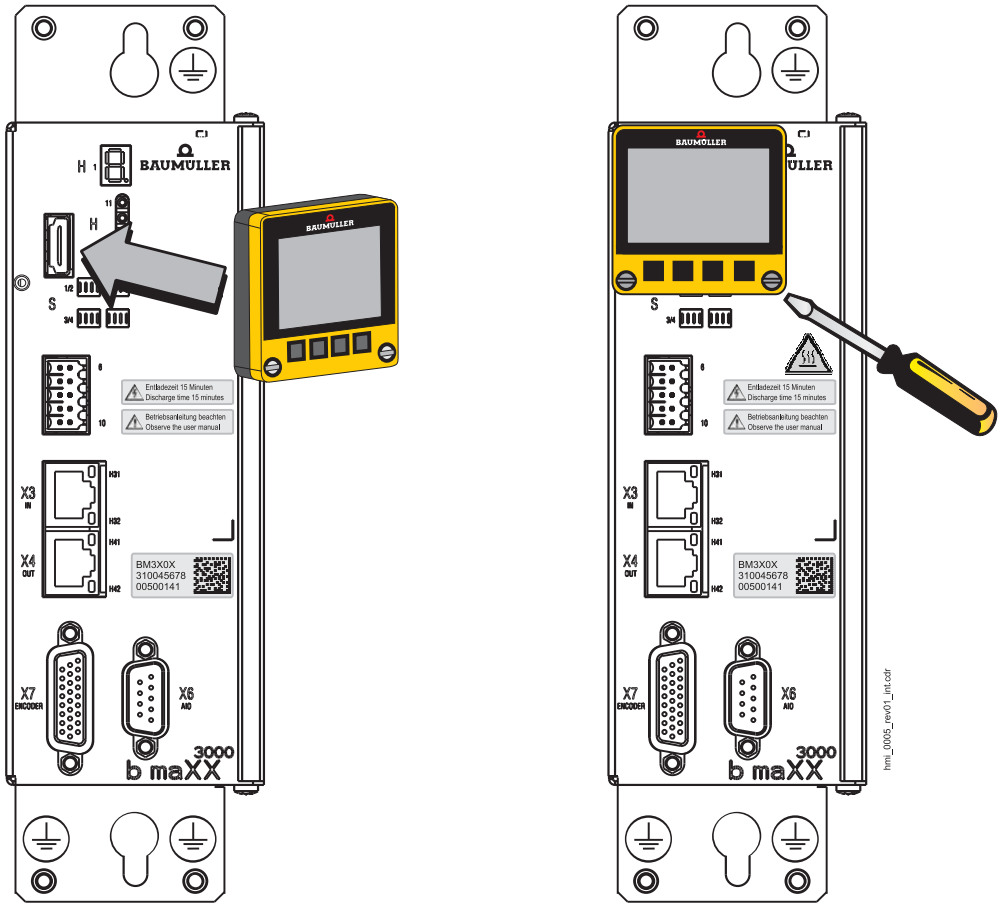



Figure 8: Mounting example b maXX BM3000

# 7

# OPERATION

## 7.1 Safety notes

**Basic information**

**WARNING!**

**Risk of injury due to improper operation!**

Improper operation can lead to severe personal injury or material damage.

Therefore:

- Perform all operational steps according to the details of this Instruction handbook.
- Before beginning work, ensure that all coverings and protective devices are installed and are functioning properly.
- The control cabinet in which the device is installed should be protected against contact with energized parts.
  Keep all doors of the control cabinet closed during operation.

**NOTICE!**

**Environmental conditions that do not fulfil the requirements.**

Environmental conditions that are non-compliant can lead to property damage.

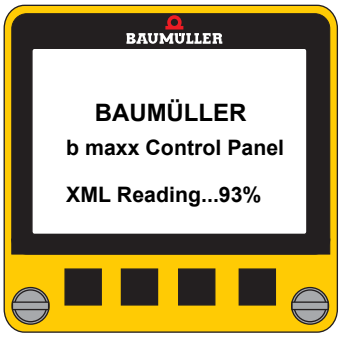
Therefore:

- Ensure that the environmental conditions are kept compliant during operation (see ▹Required environmental conditions◃ on page 16).

## 7.2 Start

Following screen appears immediately after controller switch-on or when plugging a Control Panel on a switched-on controller.


Shortly after the reading process of the XML file is displayed




The reading process is only finished without errors if the following message is displayed:


Then the start screen is displayed automatically (see ▹Start screen◃ on page 46).

## 7.3 Menu levels

The **Control Panel** provides different functions for display and modification of parameters, for storing/management of complete data sets and for error diagnosis.

### Menu overview

| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|
| 1 Parameter | 1.0 Axis Select<br>(nur bei Doppelachsen) | | | |
| | 1.1 Direct Parameter Selection | 1.1.1 Select Parameter | 1.1.1.1<br>Display Value | 1.1.1.1<br>Edit Value |
| 2 Parameter Set | 2.1 Load | 2.1.1 Select Number | | |
| | 2.2 Store | 2.2.1 Select Number | | |
| 3 Configuration | 3.1 Scaling | 3.1.1 Position | 3.1.1.1 ✓ Inc<br>3.1.1.2 ☐ Inc (hex)<br>3.1.1.3 ☐ User Units<br>3.1.1.4 ☐ mm | |
| | | 3.1.2 Angle | 3.1.2.1 ✓ Inc<br>3.1.2.2 ☐ Inc (hex)<br>3.1.2.3 ☐ Degrees<br>3.1.2.4 ☐ mm | |
| | | 3.1.3 Current | 3.1.3.1 ✓ %<br>3.1.3.2 ☐ A | |
| | | 3.1.4 Speed | 3.1.4.1 ✓ %<br>3.1.4.2 ☐ rpm<br>3.1.4.3 ☐ Inc/ms<br>3.1.4.4 ☐ Degree/s<br>3.1.4.5 ☐ m/ms | |
| | | 3.1.5 Revolutions | 3.1.5.1 ✓ Rev<br>3.1.5.2 ☐ Rev (hex) | |
| | | 3.1.6 Acceleration | 3.1.6.1 ✓ Inc/ms²<br>3.1.6.2 ☐ m/ms² | |
| | | 3.1.7 Jerk | 3.1.7.1 ✓ Inc/ms³<br>3.1.7.2 ☐ m/ms³ | |
| | 3.2 Decimal point | 3.2.1 ✓ „.“ Punkt<br>3.2.2 ☐ „,“ Komma | | |
| | 3.3 Protection | 3.3.1 ☐ Read Only<br>3.3.2 ✓ Read Write | | |
| | 3.4 Start Screen | 3.4.1 ☐ Predefined Parameter List<br>3.4.2 ☐ Load from Controller<br>3.4.3 ☐ Save to Controller<br>3.4.4 ☐ Firmware Versions<br>3.4.5 ☐ Drive Status<br>3.4.6 ✓ None | | |
| | 3.5 Drive Status<br>☐ Parameter ID 1 ... 19 | 3.5.0 ✓ Parameter ID 0<br>:<br>3.5.18 ☐ Parameter ID 19 | | |
| | 3.6 Predefined Parameter List<br>☐ Parameter ID 1 ... 20 | 3.6.1 ☐ Parameter ID 1<br>:<br>3.6.20 ☐ Parameter ID 20 | | |

| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---|---|---|---|---|
| 4 Info | 4.1 Firmware Versions<br>☐ Info Parameter Controller ID 1 ... 14 | 4.1.1 Parameter ID 1<br>:<br>4.1.14 Parameter ID 14 | | |
| | 4.2 Terminal Info<br>☐ Info Parameter Terminal ID 1 ... 3<br>☐ **CLR** Reset **Control Panel** | 4.2.1 Terminal Info 1<br>:<br>4.2.3 Terminal Info 3 | | |
| 5 Predefined Parameter List | 5.1 ☐ Parameter ID 1<br>:<br>5.20 ☐ Parameter ID 20 | | | |
| 6 Drive Status | 6.1 **Error Information**<br>6.2 ✓ Parameter ID 1<br>:<br>6.20 ✓ Parameter ID 19<br>☐ Fehlerliste auslesen **Error info**<br>☐ **R.Err** Reset Fehlermeldungen | | | |

## 7.4 Basic menus

The **Control Panel** changes to the basic menu after switch-on, if no start screen is configured (see ▹Start screen◃ on page 46).

The basic menu contains several sub-menus:

- Parameter
- Parameter Set
- Configuration
- Info
- Predefined Parameter List
- Drive Status

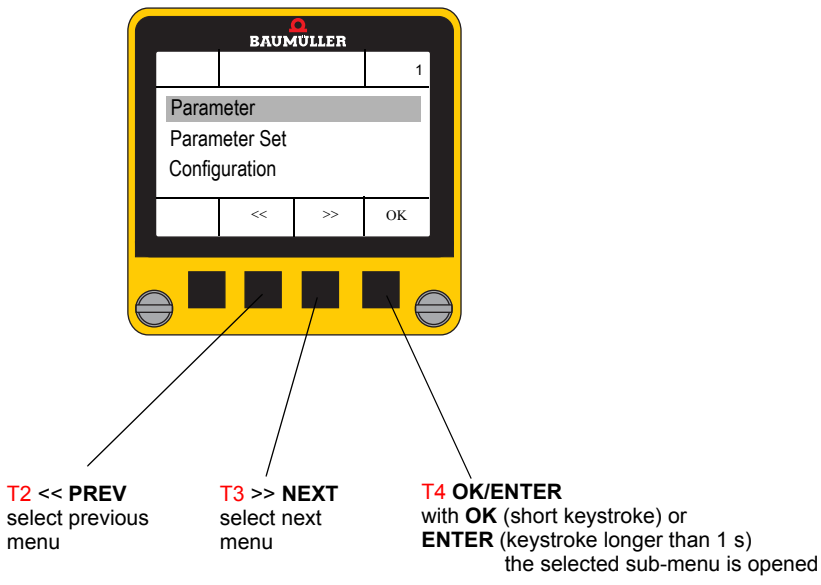
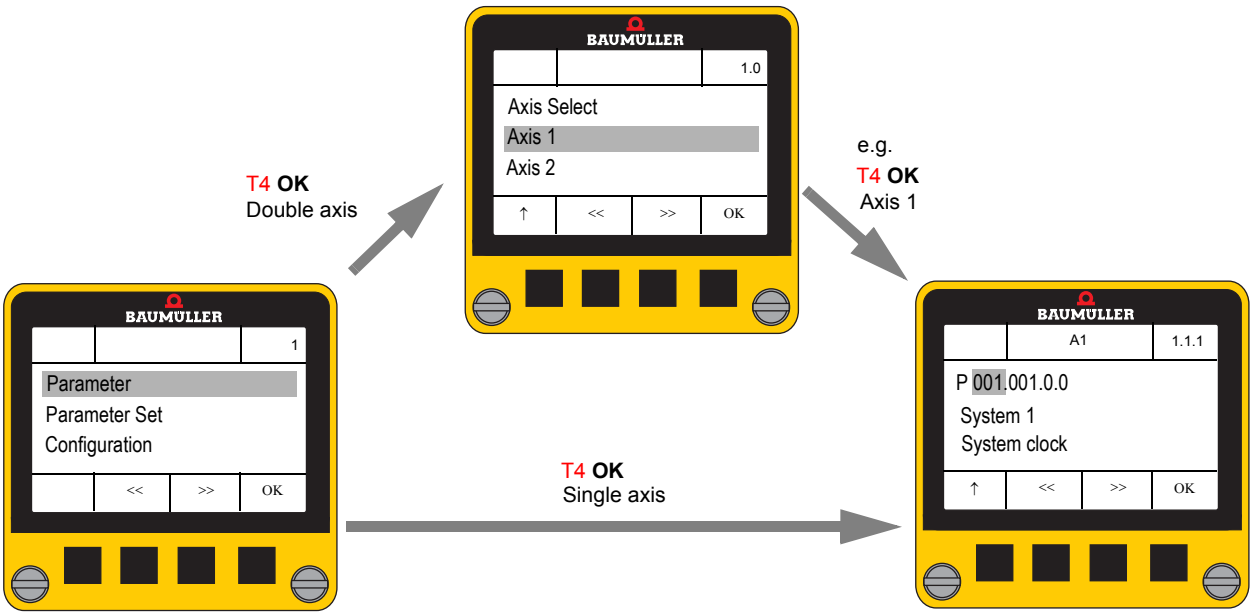



Figure 9: Basic menu

### 7.4.1 Parameter

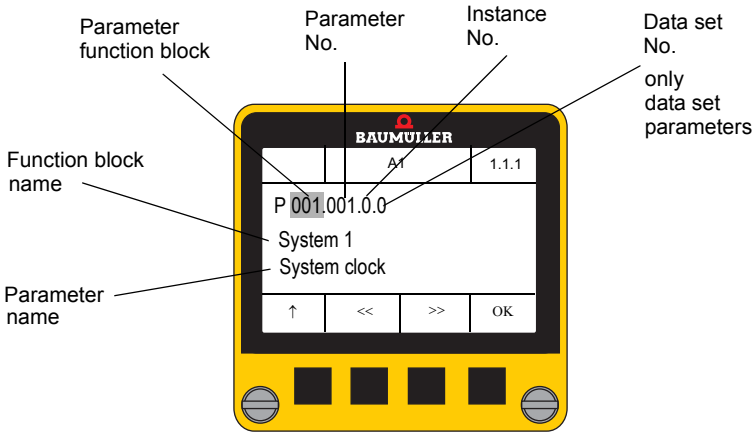



#### 7.4.1.1 Direct parameter selection

This menus enables the direct input of a parameter ID in order to display or change the value.

- The last parameter operated, is displayed after selecting this sub-menu - after initial start always P 001.001.0.0.

**Display of parameters**



### Overview of the important function blocks (depending on the controller type)

| FB-Nr. | Name |
|---|---|
| 1 | System control 1 |
| 2 | System control 2 |
| 6 | Diagnosis |
| 14 | Encoder monitoring |
| 18 | Controller |
| 19 | Motor management |
| 47 | Current controller |
| 52 | Measurement Ks factor |
| 100 | Error management |
| 102 | Firmware information |
| 105 | Data set management |
| 106 | Encoder |
| 107 | Motor type code |
| 108 | Drive manager |
| 109 | Operation mode |
| 110 | Ramp-up generator |
| 111 | Set value generator |
| 114 | $U_{DC\ link}$ controller |
| 116 | Digital inputs |
| 117 | Digital outputs |
| 118 | Positioning |
| 119 | Manual mode |
| 120 | Homing |
| 121 | Positioning general |
| 123 | Self optimization current controller |
| 124 | Touch probe |
| 125 | Analog outputs |

| FB-Nr. | Name |
|---|---|
| 126 | Application parameters |
| 127 | Notch position |
| 128 | Motor temperature |
| 129 | Power unit identification |
| 130 | Power unit |
| 131 | Field bus |
| 132 | Set value generator |
| 133 | Control without encoder |
| 134 | Brake manager |
| 136 | Position control with synchr. set value setting |
| 137 | Encoder monitoring |
| 138 | Current limiting |
| 139 | System control password |
| 140 | Signal bus |
| 141 | Active mains inverter |
| 142 | Field weakening |
| 143 | Position deviation monitoring |
| 144 | Analog inputs |
| 145 | Synchronous mode |
| 150 | PID controller |
| 151 | 2-point controller absolute |
| 152 | 2-point controller relative |
| 154 | Friction torque compensation |
| 155 | Controller adaption |
| 156 | Synchronization field bus |
| 157 | Optimization |
| | |

**Instances**

(only implemented at encoder parameters, yet)

Parameter with identical function block No./parameter No./parameter name is used multiple times.

- Example (single axis, 2 encoder):

| | | |
|---|---|---|
| P 106.001.**0**.0 | **Encoder type** | Encoder 1, assigned to axis 1 |
| P 106.001.**1**.0 | **Encoder type** | Encoder 2, assigned to axis 1 |

- Example (double axis, 2 encoder):

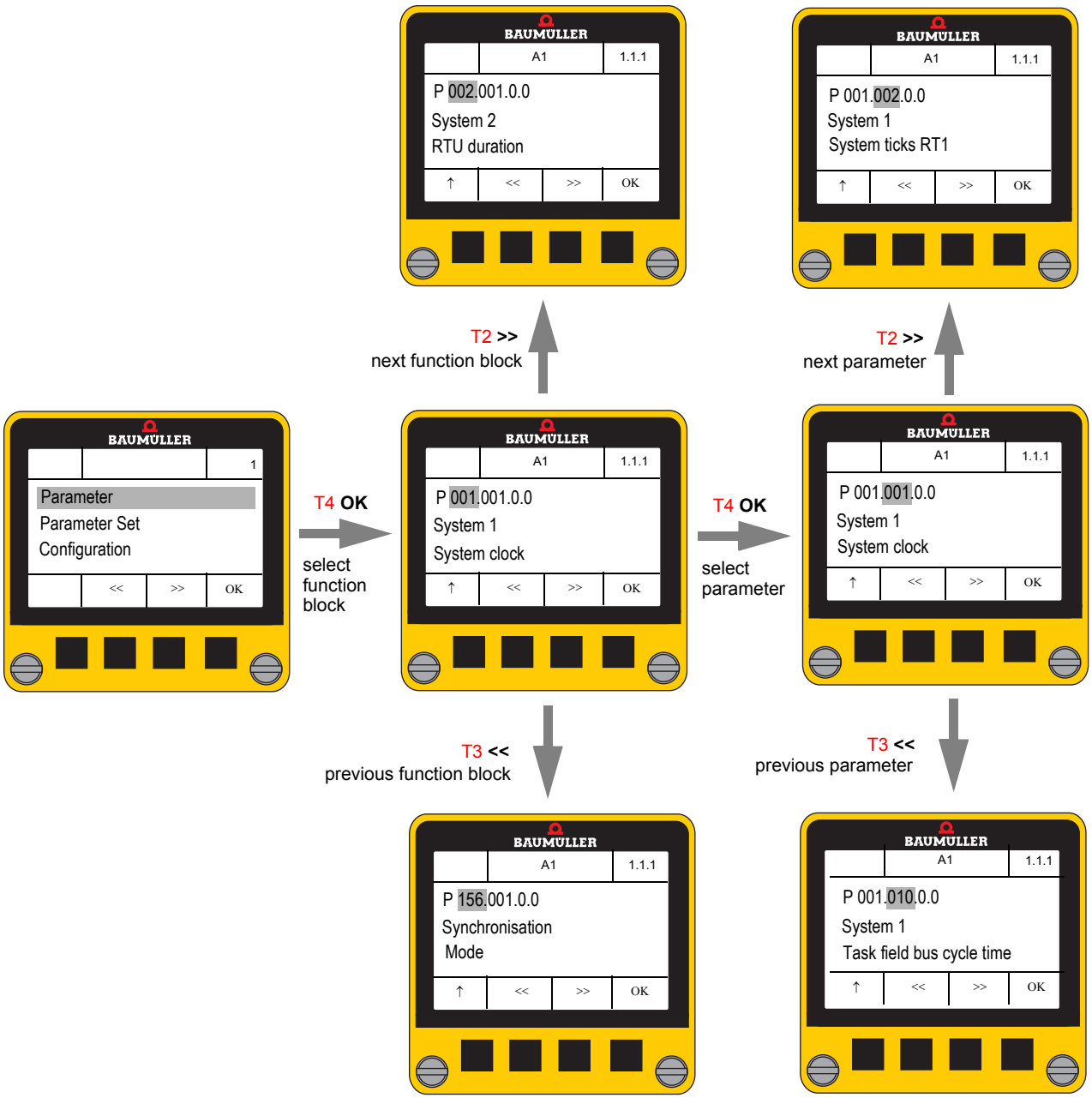
| | | | |
|---|---|---|---|
| A1 (axis 1) | P 106.001.**0**.0 | **Encoder type** | Encoder, assigned to axis 1 |
| A2 (axis 2) | P 106.001.**0**.0 | **Encoder type** | Encoder, assigned to axis 2 |

**Data set**

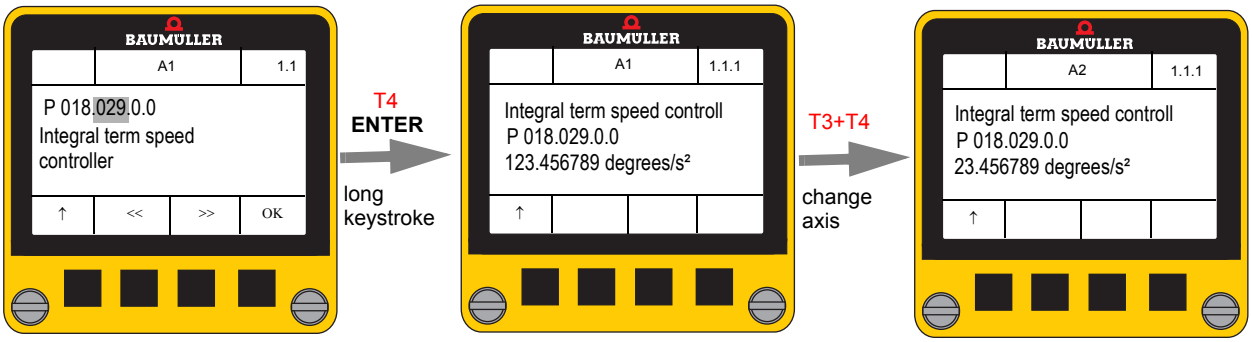
For further information see parameter handbook BM3000 or BM5000.

- Only available at data set parameters (data set 1 to 7 can be changed)
- Data set 0 is the active data set
  the value of the active data set (e. g. data set 4) is displayed
- Only created data sets are displayed
- Example:

| | |
|---|---|
| P 018.014.0.**0** | Parameter value active data set |
| P 018.014.0.**1** | Parameter value data set 1 |
| : | : |
| P 018.014.0.**7** | Parameter value data set 7 |



### 7.4.1.2 Display parameter value

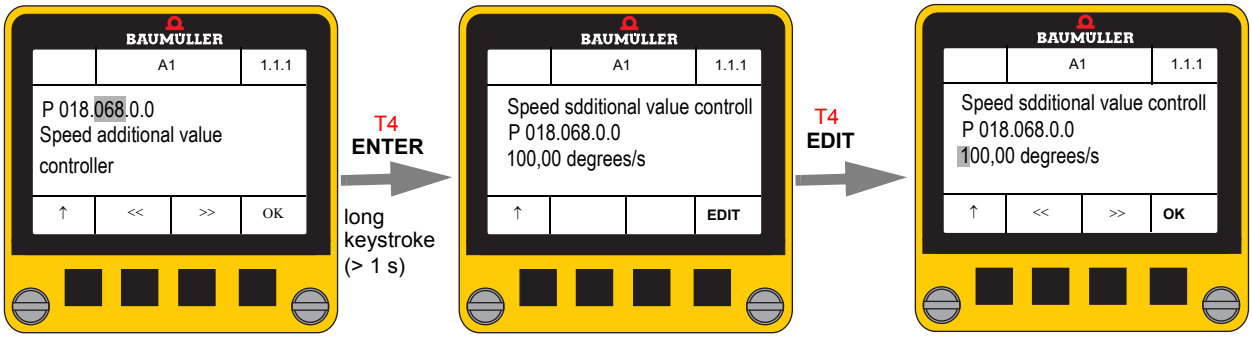



- The values are displayed according the set scaling in configuration menu.
- The key function **NEXT AXIS** (T2 + T3) changes to the other axis when using double axis devices.
- The soft key function **EDIT** is not available, if the parameter is read-only.

### 7.4.1.3 Edit parameter value

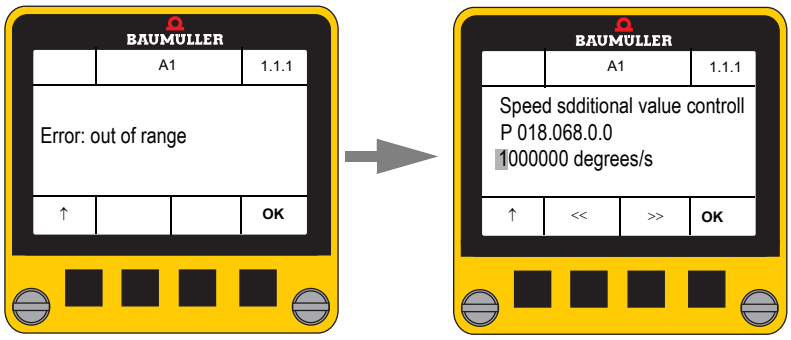
This menu is available, if

- the previous selected parameter is not read-only and
- the user has set writing access in configuration menu (see ▹Write-protection◃ on page 45).




- While editing the parameter the new value is not transmitted to the controller.
- The value is edited character by character.
  - The keys **<< PREV** (T2) and **>> NEXT** (T3) edit the selected character.
  - The list of selectable characters depends on the cursor position and the display format of the parameter.
- The value is checked and transmitted to the controller by a longer keystroke on **OK** (function **ENTER**, T4).

The display shows a corresponding error message and returns to edit parameter, if a not valid value was entered, e. g.:



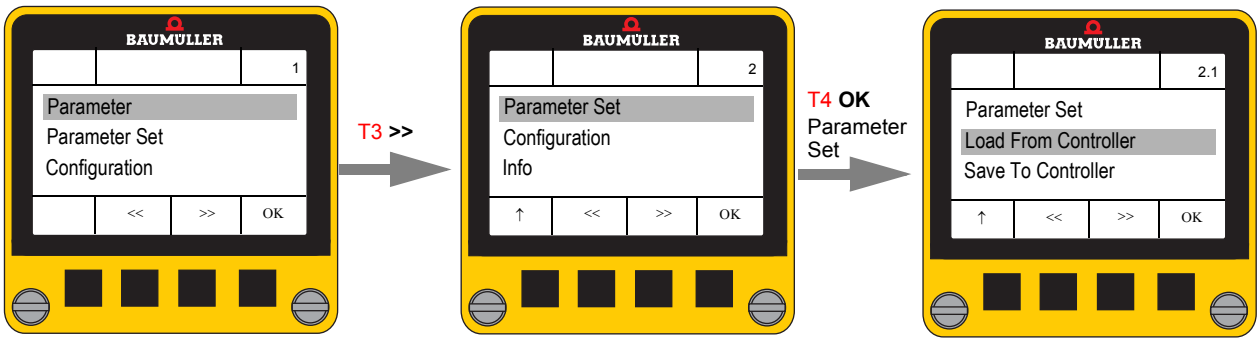

**Special rules for editing**

- Hexadecimal numbers (prefix 0x) have a fix length of 4 or 8 digits according to data type. The prefix 0x cannot be edited.
- The list of selectable characters contents a **space character**, if it is a display format without fixed length. This **space character** deletes all characters on the right side of the cursor.
- The display is scrolled, while editing character strings longer than 3 lines.
- It is not possible to change the given display format.

### 7.4.2 Parameter set management

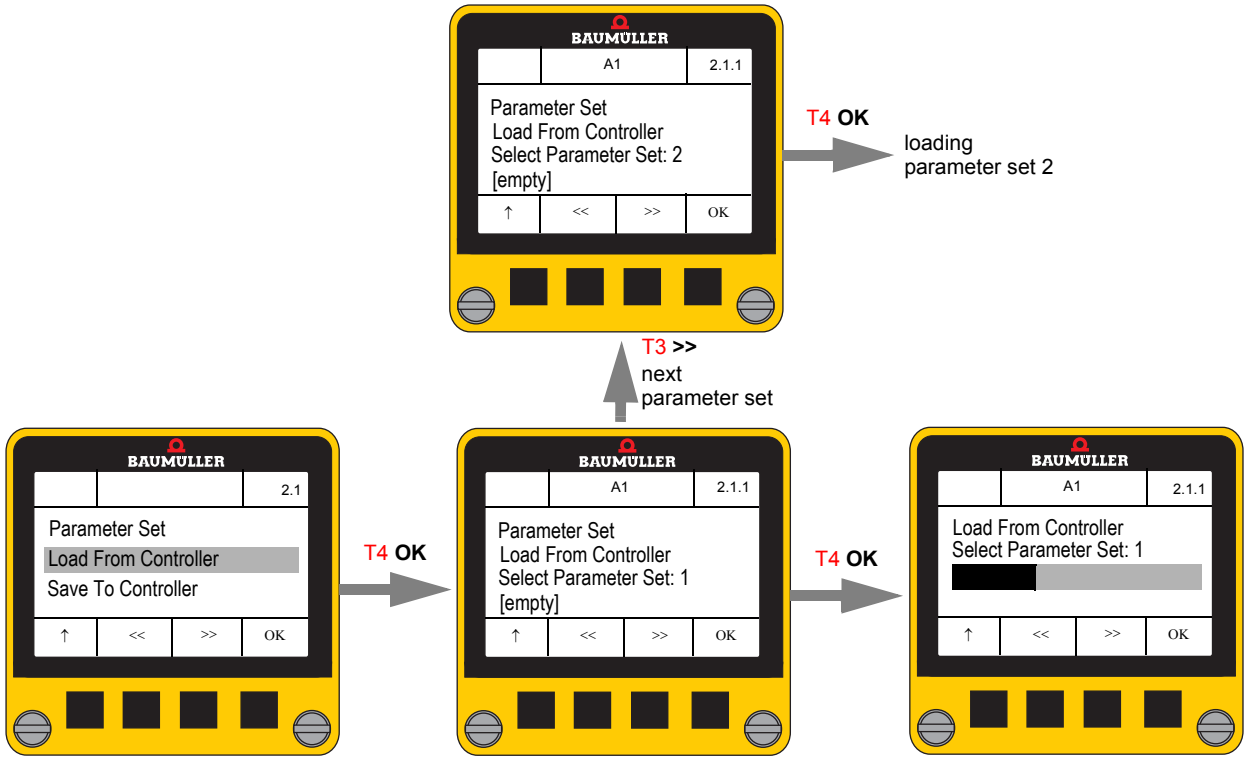
This menu enables the **Control Panel** to save to or load from the controller up to 3 parameter sets. Each parameter set can be consist of up to 7 (selectable) data sets (configurations of the drive).

For this 3 non-volatile storage areas, each kByte are provided.



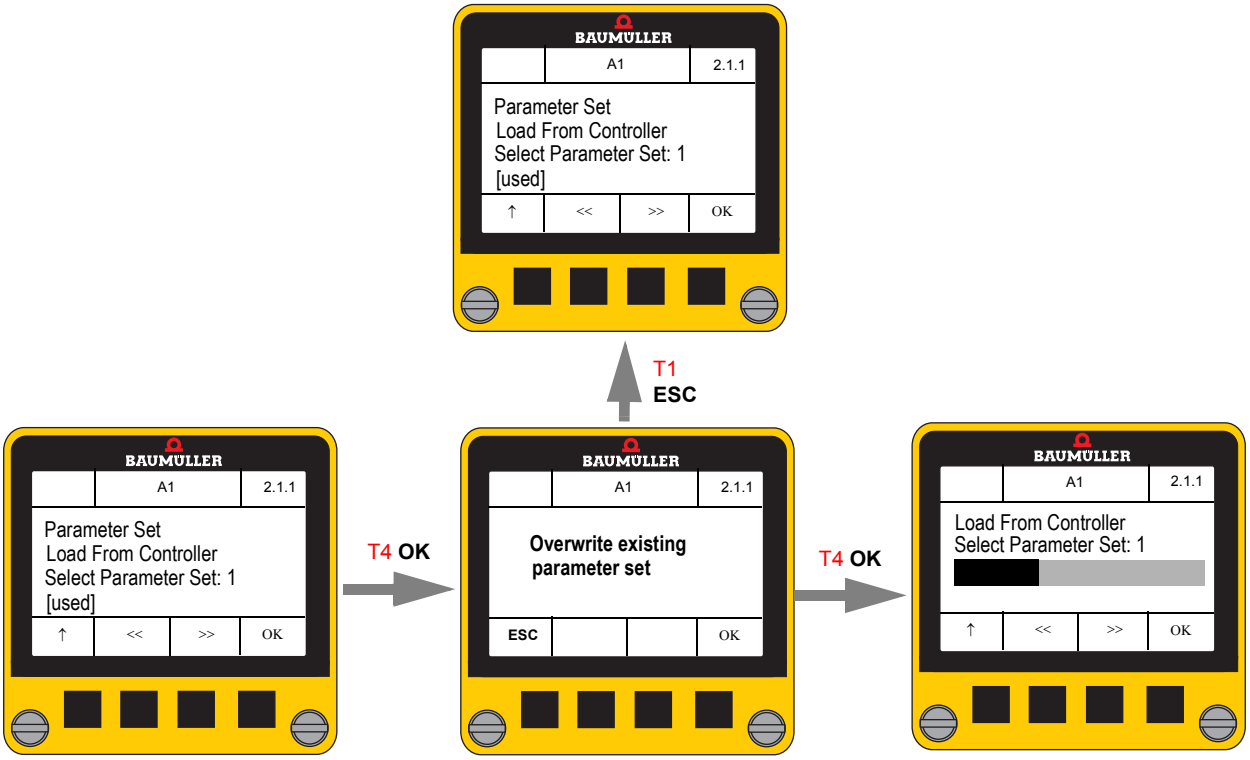

#### 7.4.2.1 Load parameter set from controller

The parameter set filed in the controller flash memory is load after selecting the data set storage No. 1 ... 3 with **PREV** (T2) and **NEXT** (T3) and pressing the **OK** key (T4).



The number of the first free data set storage No. is displayed after the dialog is opened. 1 is displayed, if all 3 storage areas are used.

The display shows either [**empty**], if there is no parameter set stored in the storage area, or [**used**]. An used storage area can simply be overwritten after a security query.



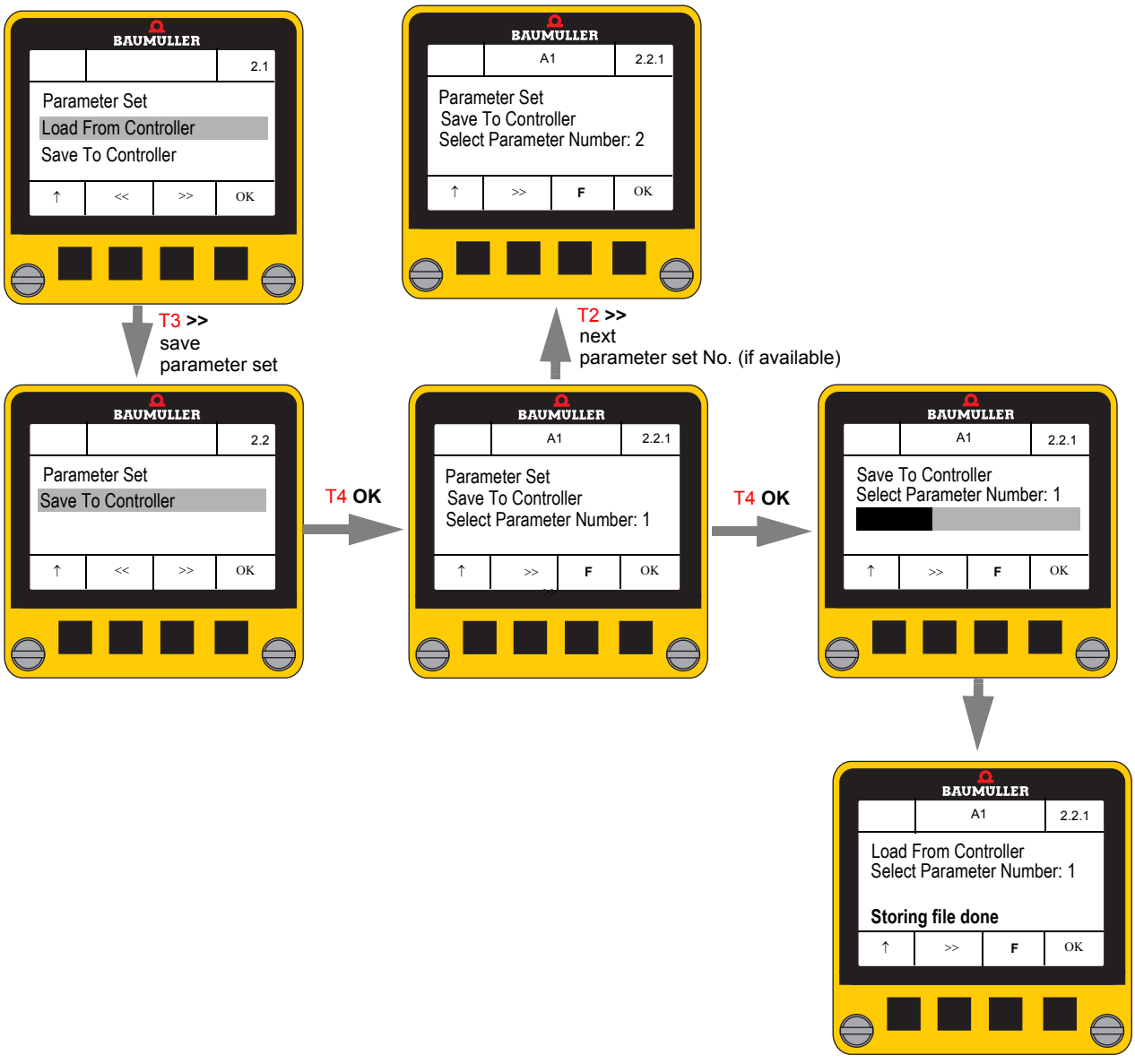
### 7.4.2.2 Transmit parameter set to the controller

This dialog enables the transmission of a **Control Panel** data set (previously loaded) to the controller.

Only parameter set numbers, containing a parameter set, can be selected.

The transmitted parameter set is stored in the flash memory of the controller, always.

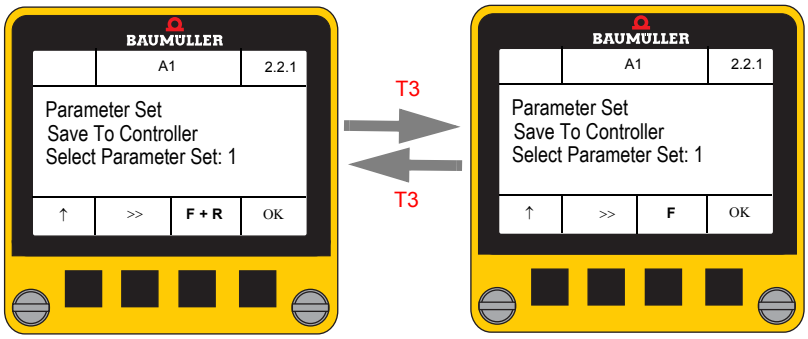
The **NEXT** key (T2) selects the next valid parameter set No.



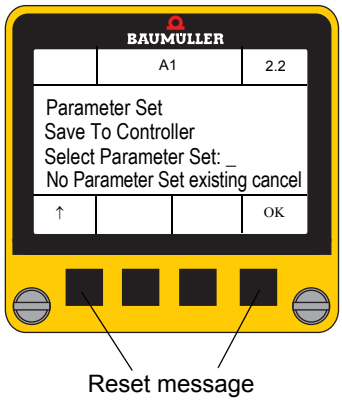
Following options can be selected with key T3 („**F**“ or „**F+R**“) :

**F** The parameter is only saved in the flash memory of the controller

**F+R** The parameter set is saved in the flash memory of the controller at first. Then the parameter set is loaded automatically in the RAM of the controller.




Following message is generated, if no parameter set is saved in the **Control Panel**:



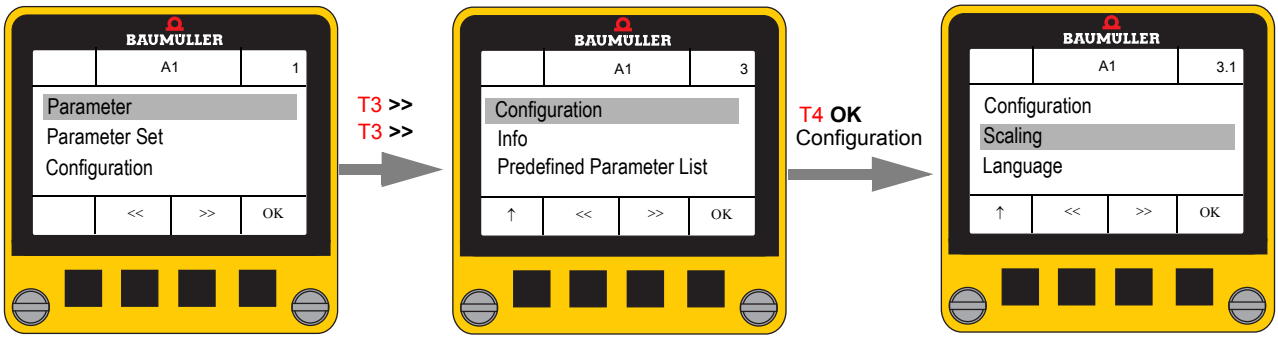
### 7.4.3 Configuration

The menu configuration consists of following sub-menus:

- Scaling
- Language
- Decimal point
- Protection
- Start screen
- Drive status
- Predefined parameter list

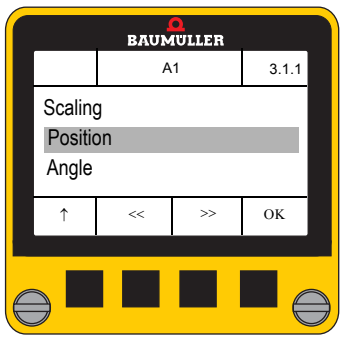
The active configuration is shown by a set checkmark (✓). Another option (selected with T2 or T3) is ticked by the **OK** key (T4).

Settings remain saved in the **Control Panel** even when power is disconnected.




### 7.4.3.1 Scaling

Different physical units can be set for the scaling of position, angle, current etc. in this sub-menu.

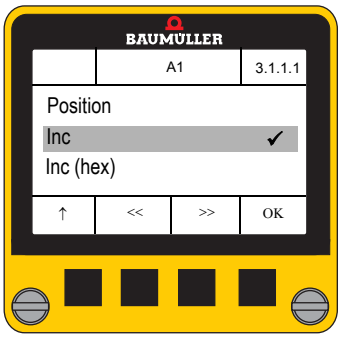



➲ Select the sub-menu with
**<<** (T2) and **>>** (T3), then **OK** (T4)

Following sub-menus are available

- Position
- Angle
- Current
- Speed
- Revolutions
- Acceleration
- Jerk

## Position

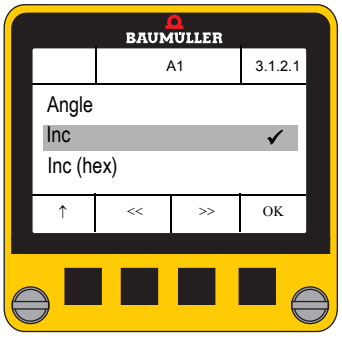



- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| ○ Increments | Inc |
| ○ Increments (hex) | Inc (hex) |
| ○ Milimeters | mm |
| ○ User units | User Units |

## Angle

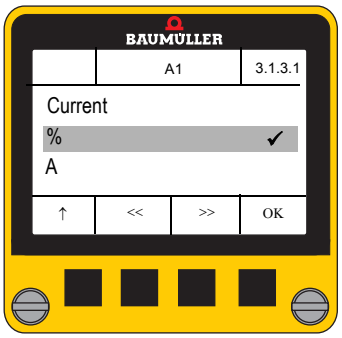



- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| ○ Increments | Inc |
| ○ Increments (hex) | Inc (hex) |
| ○ Milimeters | mm |
| ○ Angle in degree | Degree |

## Current

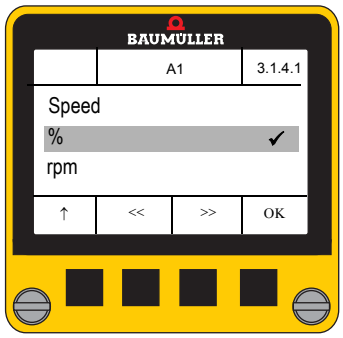



- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| ○ % of $I_{max}$ | % |
| ○ Ampere | A |

### Speed

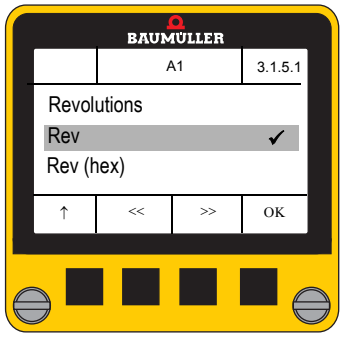



- Select with **<<** (T2) and **>>** (T3), ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| % of $n_{max}$ | % |
| Revolutions/min | rpm |
| Increments/ms | Inc/ms |
| Degree/s | Degree/s |
| m/s | m/s |

### Revolutions

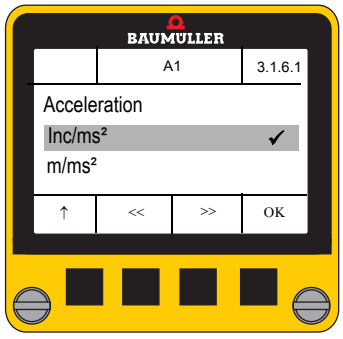



- Select with **<<** (T2) and **>>** (T3), ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| Revolutions | Rev |
| Revolutions hex | Rev (hex) |

### Acceleration

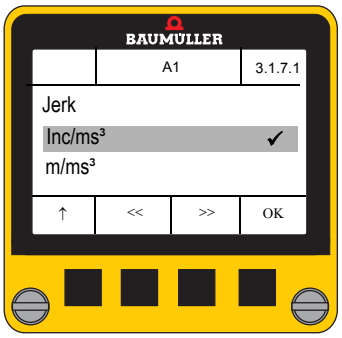



- Select with **<<** (T2) and **>>** (T3), ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| Inc/ms² | Inc/ms² |
| m/s² | m/s² |

**Jerk**



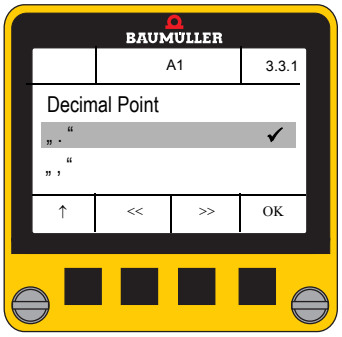

- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

Following choices are possible

| | |
|---|---|
| ○ Inc/ms³ | Inc/ms³ |
| ○ m/s³ | m/s³ |

### 7.4.3.2 Decimal point

Either „ . “ or „ , “ can be selected for decimal separator.




- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

### 7.4.3.3 Write-protection

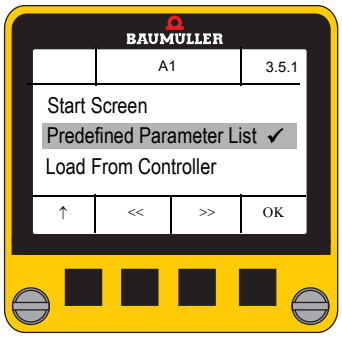
This sub-menu sets the access of the **Control Panel** for parameter setting.

- read only (Read Only) or
- read and write (Read Write)


- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

### 7.4.3.4 Start screen

This sub-menu sets the screen displayed after switching on the **Control Panel**.




- Select with **<<** (T2) and **>>** (T3),
  ✓ with **OK** (T4)

Following choices are possible
- Predefined Parameter List
- Load From Controller
- Save To Controller
- Firmware versions
- Drive Status
- none

### 7.4.3.5 Drive status

This sub-menu sets the parameter displayed in menu „Drive Status“.

Up to 19 parameters can be configured, the first parameter displayed is always parameter Error Information P100.003, if an error message exists.

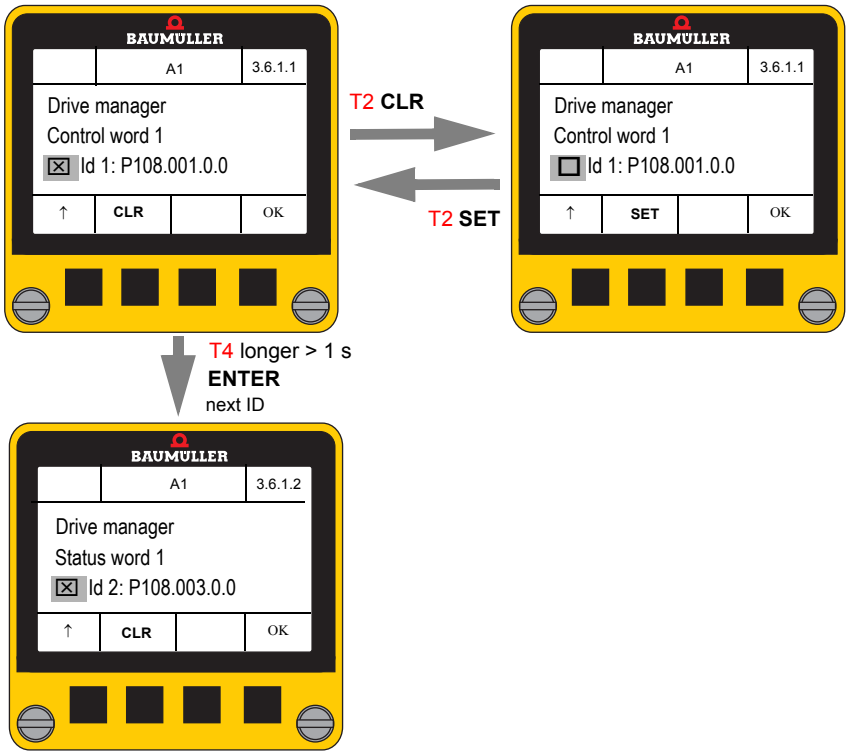
Following parameters are preset:

| Parameter ID | Parameter name |
|---|---|
| P 100.003.0.0 | Error info, if at least one error message is generated |
| P 108.001.0.0 | Control word 1 |
| P 108.003.0.0 | Status word 1 |
| P 108.007.0.0 | Communication source |
| P 108.008.0.0 | Status dig. inputs drive manager |
| P 109.002.0.0 | Actual operation mode |
| P 108.016.0.0 | Status internal limits |
| P 131.015.0.0 | Actual IP address |
| P 156.002.0.0 | Synchronization status |
| P 018.022.0.0 | Speed actual value |
| P 128.003.0.0 | Motor temperature |

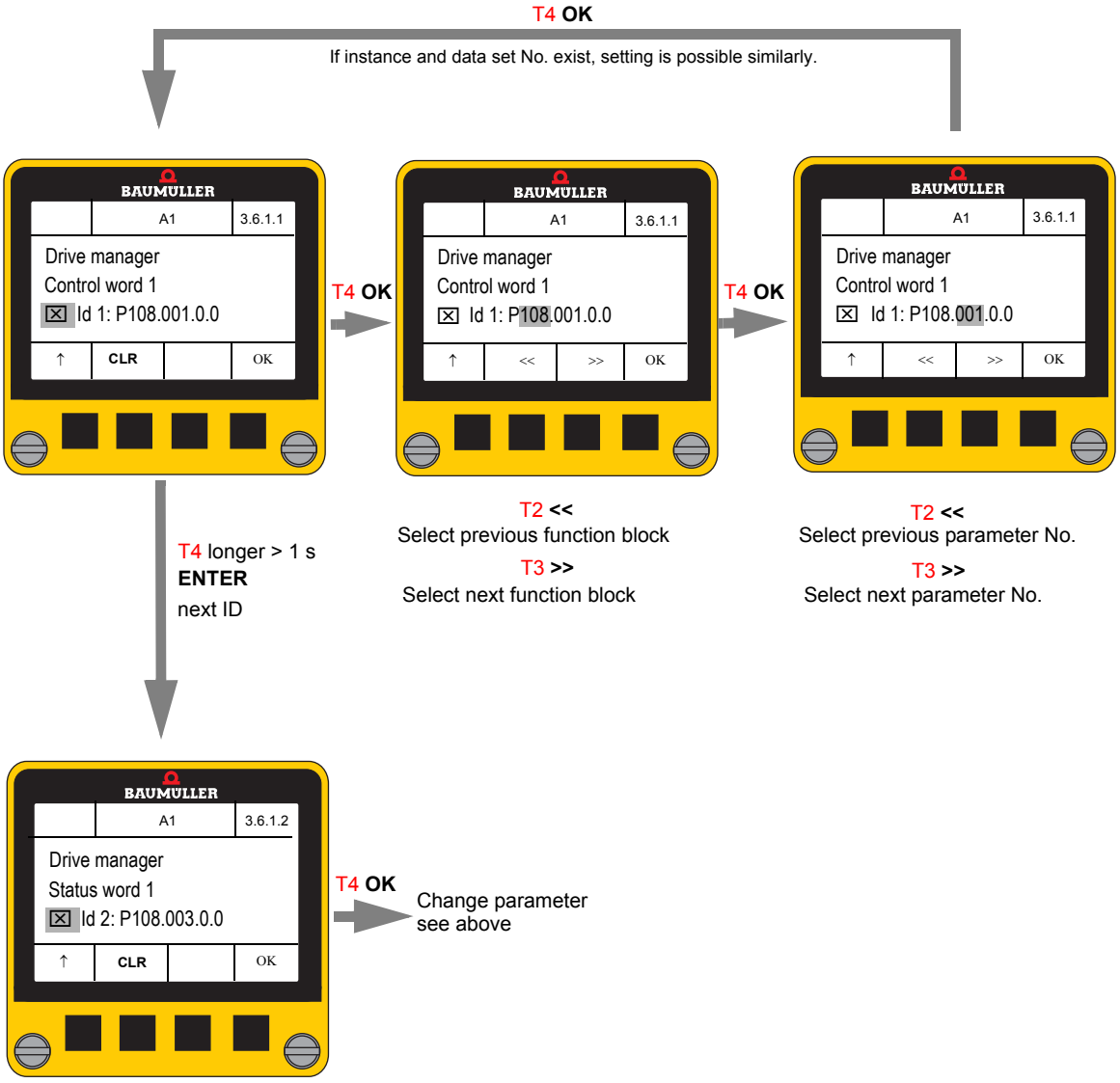
This parameter will be displayed again, if the **Control Panel** is reset to delivery status, see ▹Reset Control Panel◃ on page 52.

The sub-menu shows a list of 19 parameters with corresponding check box.

- The check box activates or deactivates a parameter.



- Another parameter can be selected by editing.




The key **OK** (T4 short keystroke) moves the cursor to the next valid element of the parameter ID or to the check box.

The **ENTER** function (T4 long keystroke) sets the cursor to the next parameter ID.

### 7.4.3.6 Predefined parameter list

20 parameters can be set in this sub-menu. This parameters can be displayed and/or edited in dialog „Predefined Parameter List“.

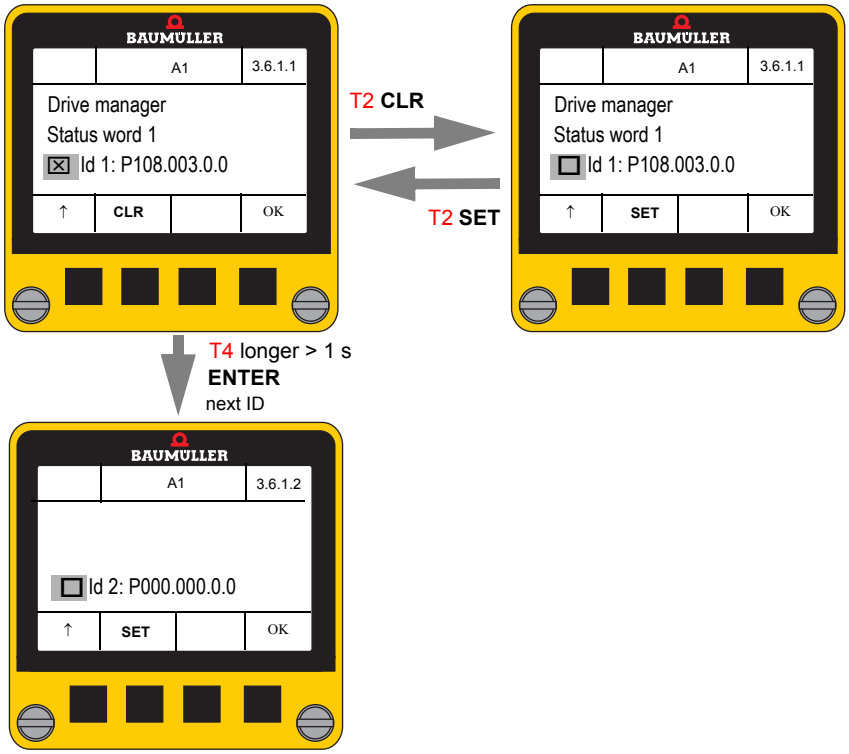
It is possible to set a list of parameters, displayed or changed frequently.

This parameter list is displayed immediately after switch-on the controller or plugging the **Control Panel** to a switched-on controller, if the **Predefined Parameter List** is selected for start screen (see ▹Start screen◃ on page 46).

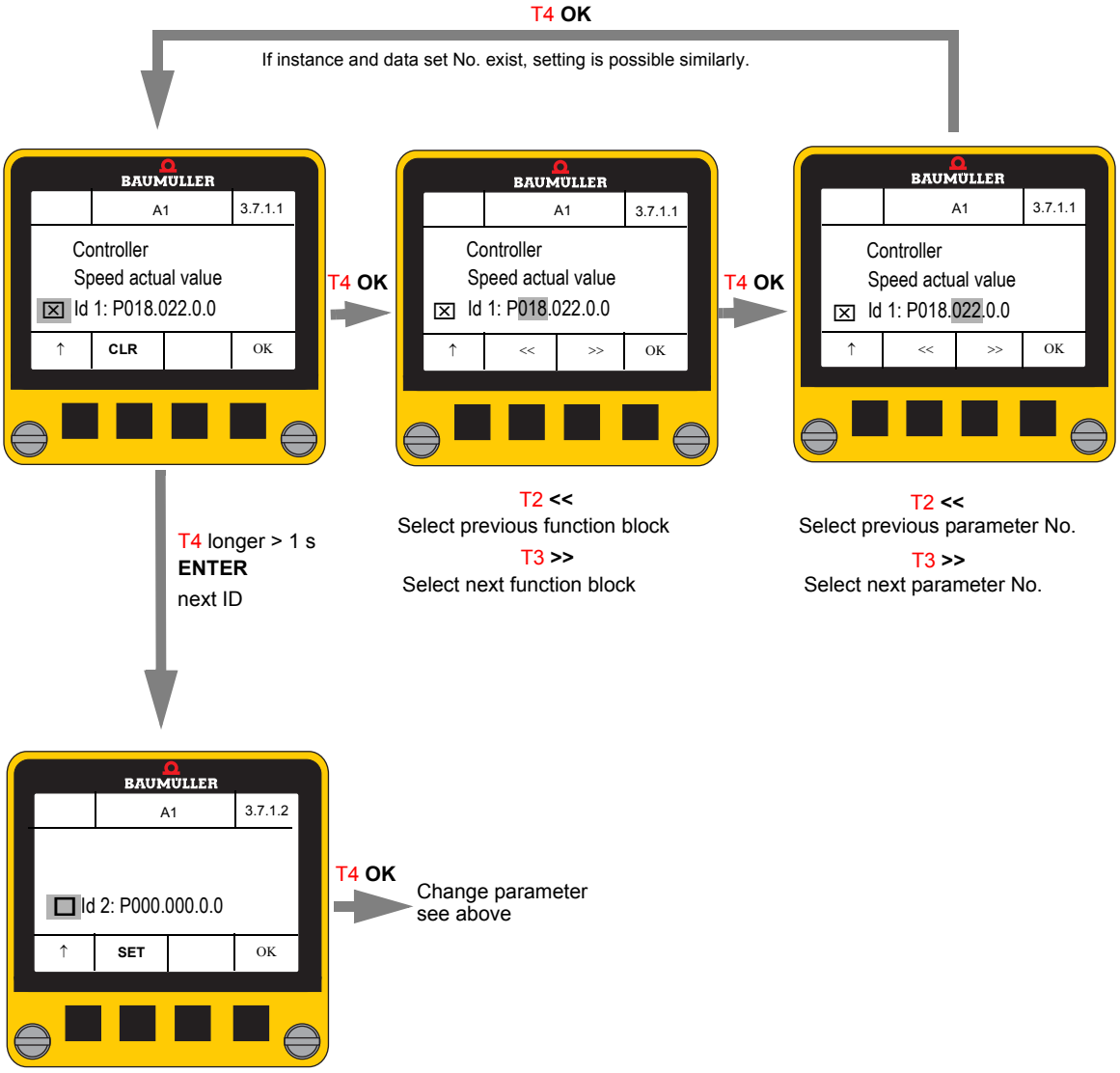
No parameters are set by delivery status.
All selected parameters are deleted, if the **Control Panel** is reset to delivery status, see ▹Reset Control Panel◃ on page 52.

All parameters, with a few exceptions can be selected for **Predefined Parameter List.**

➲ The check box activates or deactivates the parameter.



- Another parameter can be selected by editing.



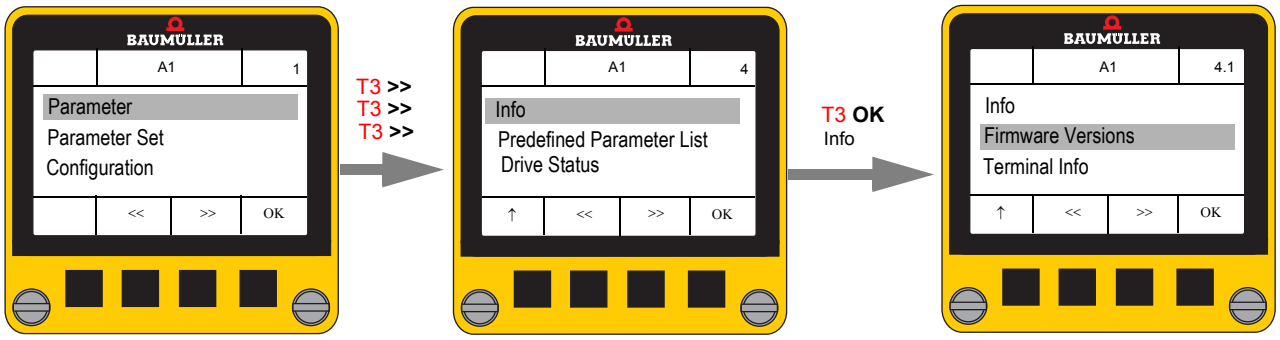

The key **OK** (T4 short keystroke) moves the cursor to the next valid element of the parameter ID or to the check box.

The **ENTER** function (T4 long keystroke) sets the cursor to the next parameter ID.

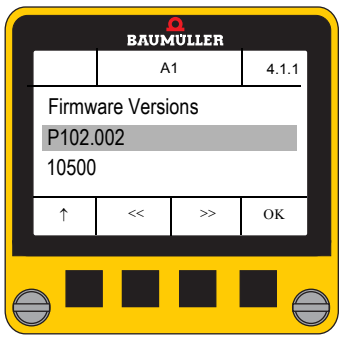
### 7.4.4 Info

This dialog displays information relating to software/hardware status of controller and **Control Panel**.

The **Control Panel** can be reset to delivery status, additionally.




#### 7.4.4.1 Firmware versions



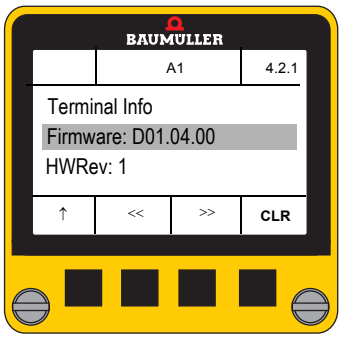

➲ Select with **<<** (T2) and **>>** (T3)

Following parameters are displayed

- **Firmware version** P102.002
- Firmware type P102.003
- Firmware number P102.004
- Firmware time P102.007
- Bootloader 0 version P102.008
- Bootloader 1 version P102.009
- FPGA version P102.010
- Hardware identification P102.025
- **Device type code** P102.035
- **Hardware name** P129.004
- FW field bus contr. P102.019
- FW field bus contr. time P102.020
- FW field bus contr. type P102.021
- FW field bus contr. number P102.022

For further information see parameter handbook BM3000 or BM5000.

### 7.4.4.2 Control panel info

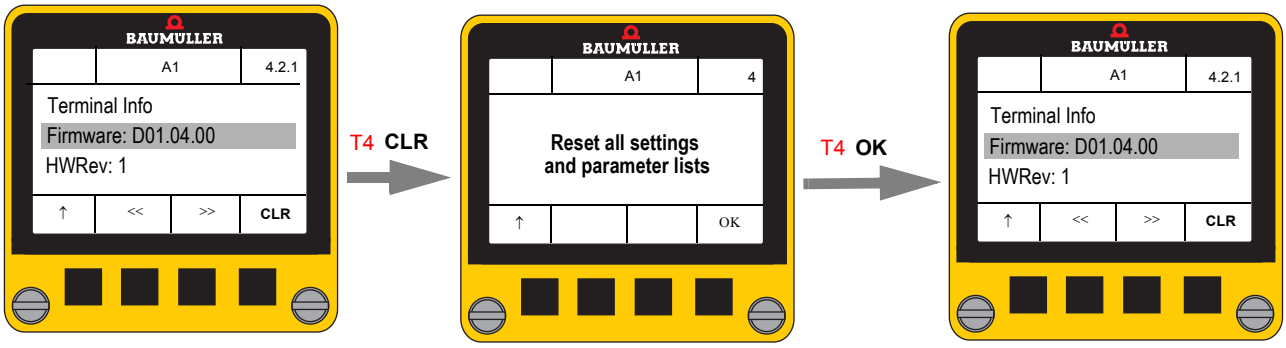



➲ Select with **<<** (T2) and **>>** (T3)

Following information is displayed
- Firmware revision
- Hardware revision HWRev
- Free Flash

### 7.4.4.3 Reset Control Panel

The **Control Panel** can be reset to delivery state in sub-menu „Terminal Info“.

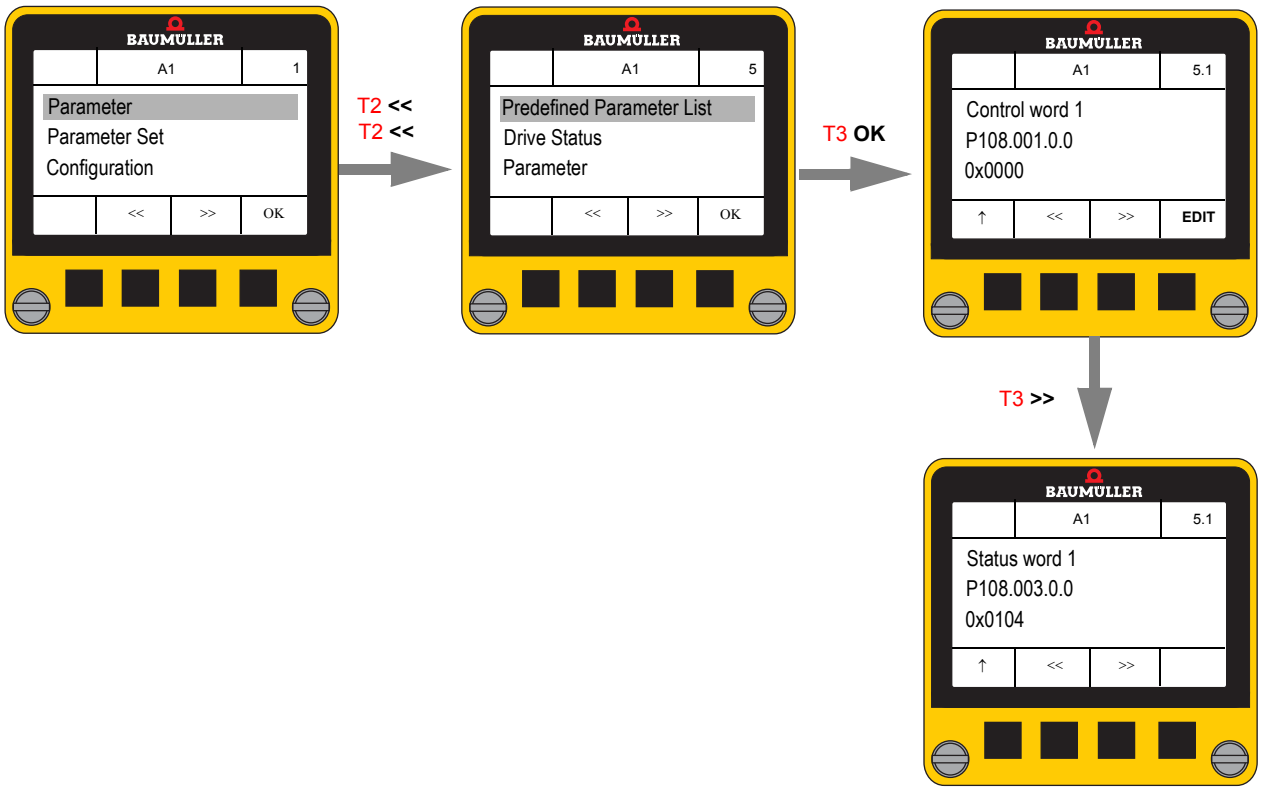



Note:

When resetting the **Control Panel** a set write-protection is disabled, too.

### 7.4.5 Predefined parameter list

This dialog displays the list of parameters set in „configuration / predefined parameter list“ (see ▹Predefined parameter list◃ on page 49).




- The keys **PREV <<** (T2) / **NEXT >>** (T3) navigate in the list.

- The **EDIT** key opens the parameter edit dialog (see ▹Edit parameter value◃ on page 37). The soft key **EDIT** is only available, if the parameter is not read-only **and** no write protection is activated (see ▹Write-protection◃ on page 45).

### 7.4.6 Drive status

This dialog displays all parameters relevant for drive status and complies with the drive manager page of ProDrive.

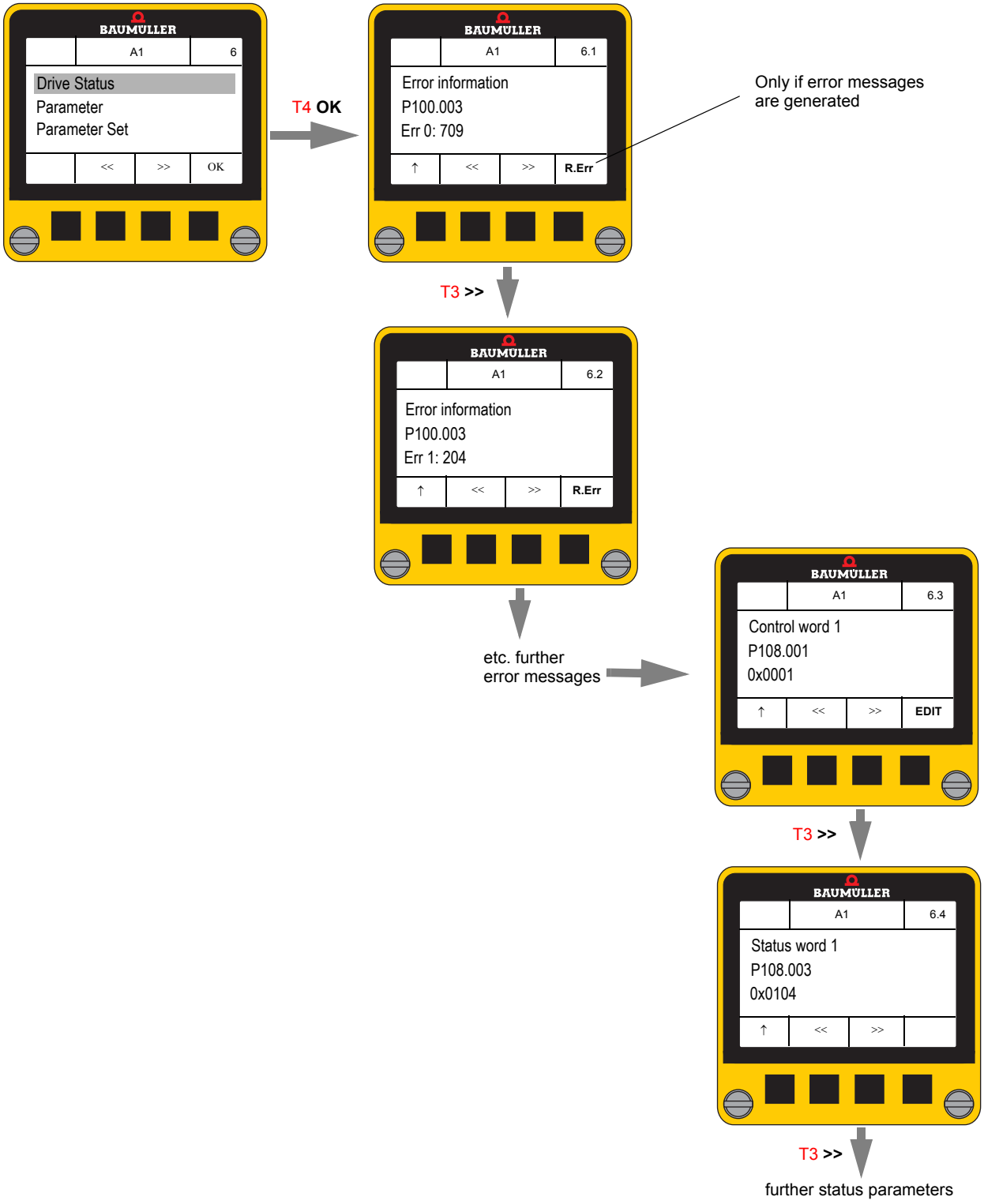
The parameters, displayed in this list can be configured as well (see ▹Drive status◃ on page 46). The first displayed parameter cannot be configured, always parameter Error information P100.003 is displayed.

19 parameter can be selected/displayed in addition.

**No error message**

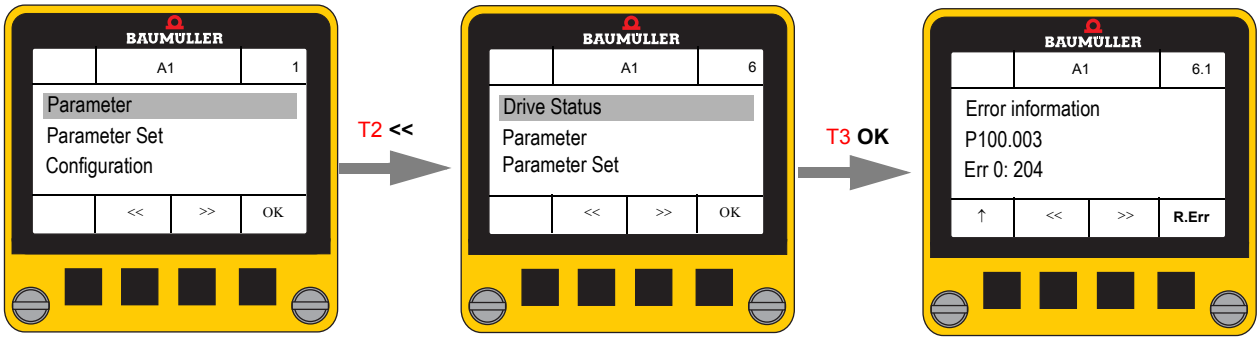

- The keys **PREV <<** (T2) / **NEXT >>** (T2) navigate through the list.

## Error message generated



### 7.4.6.1 Reset error messages

- **R.Err** (T4) resets all error messages.




Error codes and further information for resetting, see instruction handbooks or parameter handbooks.

## 7.5 Quick guide

The most important operations are summarized below.

Start menu is always the basic menu.
Go back to the basic menu by pressing the ESC key (↑ T1) several times.

**1 Transmit a parameter set from the controller to the Control Panel**

- Basic menu „Parameter Set“
- Sub-menu „Load From Controller“
- Select data set No. (Select with **<<** T2 or **>>** T3)
  - Data set empty [empty]
  - Used data set [used] is overwritten with security query
- Start transmission controller → **Control Panel** with **OK** T4

**2 Transmit parameter set from the Control Panel to the controller**

- Basic menu „Parameter Set“
- Sub-menu „Save To Controller“
- Select existing data set in **Control Panel** (select with **<<** T2 or **>>** T3)
  - No parameter set existing → Message: No Parameter Set existing
  - T3 switches between
    **F** transmit data set to the controller flash and
    **F + R** transmit data set tot the controller flash and load in controller RAM
- Start transmission **Control Panel** → controller with **OK** T4

**3 Read error list**

- Basic menu „Drive Status“
  - First entry always error information
- No error → Message **No errors**
- Error messages existing → Display of the error list: Err 0: xxxx → Err 1: xxxx, ....

**4 Reset/quit errors**

- Basic menu „Drive Status“
- All generated errors are reset with **R.Err** (T4).
  - Value 128 and 0 is set in the control word
- Only possible, if the **Control Panel**’s write access to the control word is enabled.

**5 Change axis (only double axis devices)**

- Simultaneous keystroke of **<<** (T2) and **>>** (T3)
  - Change active axis - display active axis in the middle of the status bar changes A1 (axis 1) ↔A2 (axis 2) or vice versa.

**6 Read parameter value**

- Basic menu „Parameter“
- Select axis, only double axis device „Axis Select“
- Sub-menu „Direct Parameter Selection“
- Set parameter function block (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- Set parameter No. (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- Set parameter instance, if necessary (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- Set data set, if necessary (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- **ENTER** (T4 longer than 1 s) displays the parameter value

**7 Modify parameter value**

- Precondition: no write-protection enabled, parameter not read-only
- Basic menu „Parameter“
- Select axis, only double axis device „Axis Select“
- Sub-menu „Direct Parameter Selection“
- Set parameter function block (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- Set parameter No. (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- Set parameter instance, if necessary (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- Set data set, if necessary (select with **<<** T2 or **>>** T3)
  - Continue with **OK** (T4)
- **ENTER** (T4 longer than 1 s) displays the parameter value
- **EDIT** (T4) modifies the parameter value
- The parameter value is not transmitted
  - Cursor is on the first character, that can be modified
  - Modify character with **<<** (T2) or **>>** (T3)
  - Next character with **OK** (T4)
- **ENTER** (T4 longer than 1 s) checks the set value and transmits the parameter value to the controller
  - A corresponding error message is generated, if any error occurs

**8 Start drive**

- Basic menu „Drive Status“
- Possibly generated errors are reset with **R.Err** (T4)
- ↑ ESC (T1)
- Select P 108.001 Control Word 1 (multiple keystroke **>>** T3)
- **EDIT** (T4)
- Set cursor to right character (multiple keystroke **OK** T4)
- Set value **6** (multiple keystroke **>>** T3)
- **ENTER** (T4 longer than 1 s) transmits the parameter value to the controller
  - Display shows control word P 108.001 Control Word 1 again
  - Drive state changes to **2**
- **EDIT** (T4)
- Set cursor to right character (multiple keystroke **OK** T4)
- Set value **F** (multiple keystroke **>>** T3)
- **ENTER** (T4 longer than 1 s) transmits the parameter value to the controller
  - Display shows control word P 108.001 Control Word 1 again
  - Drive state changes to **4**
  - Controller is enabled

**9 Stop drive**

- Basic menu „Drive Status“
- Safe braking of the drive to speed = 0, depending on mode of operation, e.g. if speed control is active, set P110.4 or 110.5 to 0
- Select control word P 108.001 Control Word 1 (multiple keystroke **>>** T3)
- Set cursor to right character (multiple keystroke **OK** T4)
- Set value **0** (multiple keystroke **>>** T3)
- **ENTER** (T4 longer than 1 s) transmits the parameter value to the controller
  - Display shows control word P 108.001 Control Word 1 again
  - Drive state changes to **1**
  - Controller is disabled

8

# TROUBLESHOOTING

## 8.1 Controller error messages

**Error detection**

The lightning-up of the red LED on the controller front signals an error state of the controller (refer to error detection in the operation handbooks BM3000 or BM5000).

The **Control Panel** covers this LED. An error state is displayed by an **F** and the following error code in the status bar of the **Control Panel**.


Display drive status

Drive status of the controller or
in error state display of the error code

using double axis devices 2 characters

Display of all error codes

- Display of error codes, see ▹Read error list◃ on page 57
  - Basic menu drive status (Drive Status)
  - Error information

**Quit errors**

- Quit errors, see ▹Reset/quit errors◃ on page 57
  - Basic menu drive status (Drive Status)
  - Soft key **R. Err** T4

## 8.2 Faults Control Panel

**Error** **Control Panel** does not respond

**Troubleshooting** Restart the **Control Panel**

- Unplug the **Control Panel** from the controller, wait a moment and than plug-on the **Control Panel** again
- Please contact Baumüller Nürnberg GmbH, if the error still remains.

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# Overview of Revisions

| Version | Status | Changes |
|---|---|---|
| 5.12068.01 | 27-May-2014 | Creation |
| | | |

**Notes:**

**be in motion**

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