

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LCD Display and Profibus DP Interface

## User's Manual



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## Table of Contents

<b>1</b>	<b>GENERAL</b>	<b>4</b>
<b>2</b>	<b>TECHNICAL INFORMATION</b>	<b>5</b>
2.1	LED / Button Assignment	6
2.2	LCD Display	7
2.3	SD Card	7
2.4	CSV File	7
2.5	Starting Procedure	7
<b>3</b>	<b>PROFIBUS DP INTERFACE</b>	<b>8</b>
<b>3.1</b>	<b>Operation Mode “Standard”</b>	<b>8</b>
3.1.1	Configuration Data	8
3.1.2	Diagnosis Data	8
3.1.3	User Parameter Data	8
3.1.4	DP Output Data	9
3.1.5	DP Input Data	10
3.1.6	Examples	11
<b>3.2</b>	<b>Operation Mode “Legacy”</b>	<b>12</b>
3.2.1	Configuration Data	12
3.2.2	Diagnosis Data	12
3.2.3	User Parameter Data	12
3.2.4	DP Output Data	13
3.2.5	DP Input Data	13
<b>4</b>	<b>CONNECTOR PIN ASSIGNMENTS / SETTINGS</b>	<b>14</b>
4.1	Connectors	15
4.2	Switches	17
4.3	LEDs	18

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

<b>5</b>	<b>MOUNTING OPTIONS</b>	<b>19</b>
5.1	Panel Mounting	19
5.2	Housing	20
5.3	Pedestal	21
<b>6</b>	<b>APPENDIX</b>	<b>22</b>
6.1	Maintenance and Care	22
6.2	Declaration of Conformity	23
6.3	Warranty / Liability	24
6.4	Versions Overview	25

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 1 General

The mitas BBT32-T-DP control panel reduces previous wiring and installation efforts to a minimum.

34 buttons and LED indication form the concept of the basic unit. This unit is operated via a Profibus DP interface.

Fault or information messages can be displayed on the integrated LCD display. Multi-line messages can be read with the buttons “+” and “-“. The messages must be stored in a CSV file on a SD card.

Additionally, 3 digital inputs and 3 digital outputs are available (e.g. to connect a key switch).

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 2 Technical Information

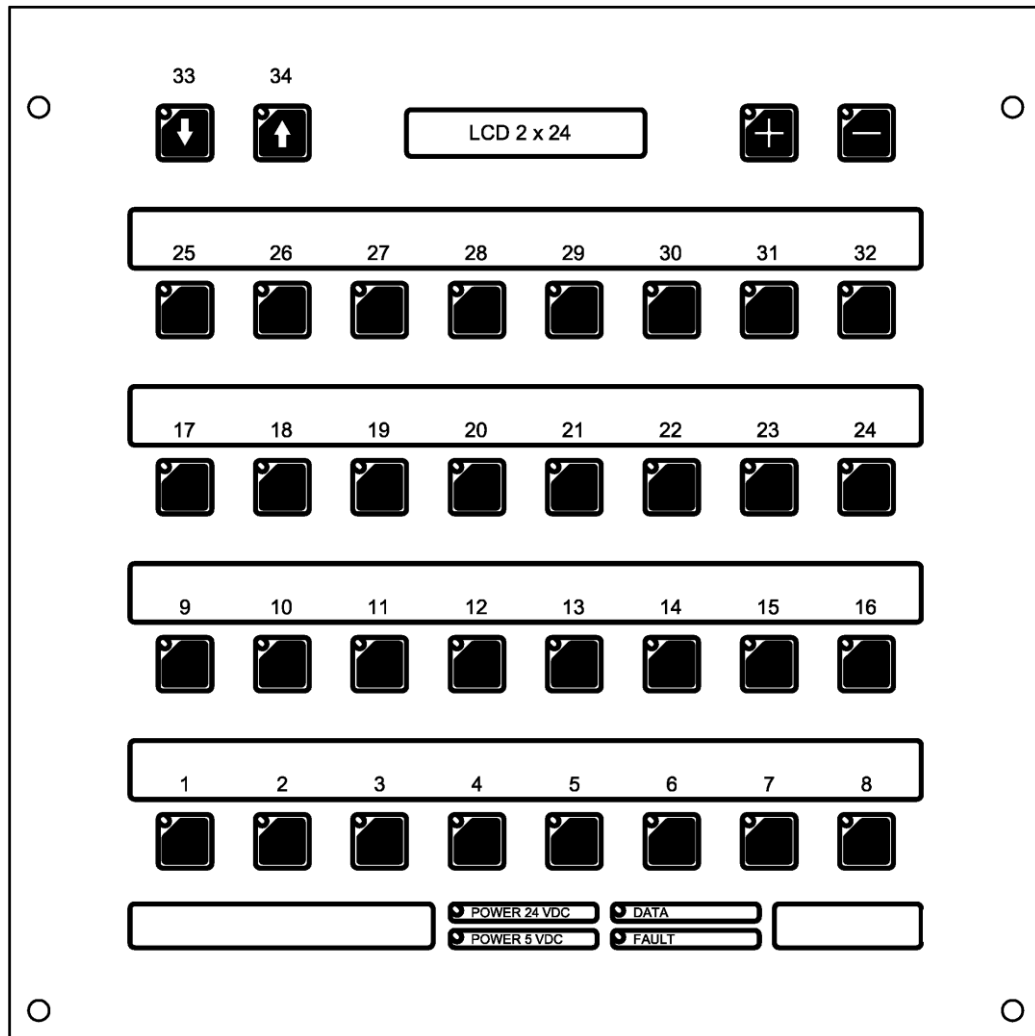
### General Specifications

Interface:	Profibus-DP
Baud rate:	9.6 kBaud ... 12 MBaud
Addresses:	0 ... 126
Buttons/LEDs:	8 x 4 + 2 + 2 Buttons, 8 x 4 + 2 + 2 LEDs + 4 LEDs for status display (2x POWER, FAULT und DATA)
Display:	LCD, two lines with 24 characters each, white LED backlight
Digital inputs:	quantity: 3 (24 VDC) with additional common 0V connection
Digital outputs:	quantity: 3 (24 VDC, max. 200 mA per output)
Text memory:	1024 messages on a SD card (max. 2 GB); 1 message can extend up to 8 lines
Labeling:	labeling strips
Operating voltage:	24 VDC $\pm$ 20%, protected against polarity reversal
Power consumption:	max. approx. 200 mA at 24 VDC operating voltage + current for the digital outputs (depending on the load)
Mounting:	panel mounting
Protection:	front panel IP65
Housing:	without; option: - housing (powder coated sheet steel), colour: RAL 7016 (anthracite) - housing with pole (powder coated sheet steel), colour: RAL 7016 (anthracite)
Housing dimensions:	see chapter "Mounting Options"
Operating temperature:	0 to +50 °C
Storage temperature:	-25 to +60 °C

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 2.1 LED / Button Assignment



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 2.2 LCD Display

- 2 lines with 24 characters each
- white backlight
- 2 buttons “+” and “-“ for scrolling multiline messages

## 2.3 SD Card

- Type: commercial cards up to 2 GB
- Formatting: FAT
- 1024 messages storable
- A message can have up to 8 lines with 24 characters each

## 2.4 CSV File

Messages can be created in an Excel table.

The file name must be “Texte.csv”.

The first column contains the message number (0 to 1023).

The second column contains the first line of the message (24 characters max.).

The third column contains the second line of the message (24 characters max.).

:

The ninth column contains the eighth line of the message (24 characters max.).

Lines without message number in the first column are not evaluated. So, even headlines are possible. The message number must be ascending.

Example:

Alert	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8
0	Text1, Line1	Text1, Line2	Text1, Line3	Text1, Line4	Text1, Line5	Text1, Line6	Text1, Line7	Text1, Line8
1	Text2, Line1	Text2, Line2	Text2, Line3	Text2, Line4	Text2, Line5	Text2, Line6	Text2, Line7	Text2, Line8
2	Text3, Line1	Text3, Line2	Text3, Line3	Text3, Line4	Text3, Line5	Text3, Line6	Text3, Line7	Text3, Line8
3	Text4, Line1	Text4, Line2	Text4, Line3	Text4, Line4	Text4, Line5	Text4, Line6	Text4, Line7	Text4, Line8
Error	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8
4	Text5, Line1	Text5, Line2	Text5, Line3	Text5, Line4	Text5, Line5	Text5, Line6	Text5, Line7	Text5, Line8
5	Text6, Line1	Text6, Line2	Text6, Line3	Text6, Line4	Text6, Line5	Text6, Line6	Text6, Line7	Text6, Line8

## 2.5 Starting Procedure

The display shows a starting message with the versions number and the interface parameters (not relevant for Profibus users).

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 3 Profibus DP Interface

The device has the operation modes "Standard" and "Legacy". The selection happens with several DIP switches (see below). The factory setting is "Standard". The Profibus controlling depends on operation mode and is described in the following chapters.

### 3.1 Operation Mode "Standard"

This operation mode supports all functions of the control panel.

#### 3.1.1 Configuration Data

For configuration, please use the enclosed GSD file "IFBBT32T.GSD" (from 14.08.2012).

For the control panel, use the following modules:

- Index 0: "Steuerung Index 0" = 0x31 = 2 I/O bytes
- Index 1: "BBT32-T Index 1 bis 8" = 0x35 = 6 I/O bytes

So, at the whole 8 output and 8 input bytes are used.

Remark: In principle, the Profibus interface is able to control up to 8 BBT32 devices (via RS485/422). However, this is **not** described in this manual. Here, only **one** BBT32 device is connected with the interface.

#### 3.1.2 Diagnosis Data

The interface does not support any extended diagnosis data. Default diagnosis is utilised.

#### 3.1.3 User Parameter Data

User parameter data are not utilised by the interface. However, a test is run to determine whether or not user parameter data are transferred by the Profibus master. If user parameter data are transferred, Profibus initialisation is disabled and the slave's parameters must be reconfigured.

**Note:**

Standard parameters configuration is required and is normally installed by the utilised DP configurators.



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 3.1.4 DP Output Data

Byte 0	Byte 1	B. 2	B. 3	B. 4	B. 5	B. 6	B. 7
Enabling	RES	D1	D2	D3	D4	D5	D6
00H: not issued (=> D1...6 = 0) 01H: issued	00H: reserved	Data bytes according to the following table					

	<i>Bit 7</i>	<i>Bit 6</i>	<i>Bit 5</i>	<i>Bit 4</i>	<i>Bit 3</i>	<i>Bit 2</i>	<i>Bit 1</i>	<i>Bit 0</i>
<i>D1</i>	LED 8	LED 7	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1
<i>D2</i>	LED 16	LED 15	LED 14	LED 13	LED 12	LED 11	LED 10	LED 9
<i>D3</i>	LED 24	LED 23	LED 22	LED 21	LED 20	LED 19	LED 18	LED 17
<i>D4</i>	LED 32	LED 31	LED 30	LED 29	LED 28	LED 27	LED 26	LED 25
<i>D5</i>	Message Bit 9	Message Bit 8	Display ON	Output 3	Output 2	Output 1	LED 34	LED 33
<i>D6</i>	Message Bit 7	Message Bit 6	Message Bit 5	Message Bit 4	Message Bit 3	Message Bit 2	Message Bit 1	Message Bit 0

### LED

A LED lights, if it's corresponding bit is set.

### Message

A message is called with a message number. It is defined with 10 bits.

### Display ON

The display is switched-on, if the bit is set.

### Output

An output is set with its corresponding bit.

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 3.1.5 DP Input Data

Byte 0	Byte 1	B. 2	B. 3	B. 4	B. 5	B. 6	B. 7
Device Status	RES	A1	A2	A3	A4	A5	A6
00H: no (valid) response from the BBT32 control board to the Profibus interface 01H: response exists and is OK	00H: reserved	Response bytes according to the following table, if enabling issued (else 0 each).					

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
A1	Button 8	Button 7	Button 6	Button 5	Button 4	Button 3	Button 2	Button 1
A2	Button 16	Button 15	Button 14	Button 13	Button 12	Button 11	Button 10	Button 9
A3	Button 24	Button 23	Button 22	Button 21	Button 20	Button 19	Button 18	Button 17
A4	Button 32	Button 31	Button 30	Button 29	Button 28	Button 27	Button 26	Button 25
A5	Message Bit 9	Message Bit 8	Display ON	Input 3	Input 2	Input 1	Button 34	Button 33
A6	Message Bit 7	Message Bit 6	Message Bit 5	Message Bit 4	Message Bit 3	Message Bit 2	Message Bit 1	Message Bit 0

### Button

If a button is pressed, its corresponding bit is set.

### Message

Number of current displayed message (10 bits).

### Display ON

The display is currently switched-on if this bit is set.

### Input

A set bit means, the input is set.

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 3.1.6 Examples

### Output Data:

#### Switch-on LED 10:

01 00 00 02 00 00 00 00

#### Set output 1:

01 00 00 00 00 00 04 00

#### Switch display on and show message 3:

01 00 00 00 00 00 20 03

### Input Data:

#### Button 4 is pressed:

01 00 08 00 00 00 00 00

#### Input 3 is set:

01 00 00 00 00 00 10 00

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 3.2 Operation Mode “Legacy”

This operation mode emulates the functionality of the control panel “mitas DP BBT32” (32 buttons, 32 LEDs), which is not available anymore (former designation was also “BBT32\_DP”).

The additional buttons and the LCD display at the top of the control panel can then not be used!

Please consider the necessary DIP/HEX switch settings, which differ from the factory settings (see below).

### 3.2.1 Configuration Data

For configuration, please use the enclosed GSD file “DPIFBBT12M.GSD” or “DPIFBBT.GSD” (from 05.02.2004 each).

For the control panel, use the following module:

- “DPIFBBT32” = 0x10, 0x10, 0x10, 0x10, 0x20, 0x20, 0x20, 0x20

So, at the whole 4 input and 4 output bytes are used.

### 3.2.2 Diagnosis Data

The interface does not support any extended diagnosis data. Default diagnosis is utilised.

### 3.2.3 User Parameter Data

User parameter data are not utilised by the interface. However, a test is run to determine whether or not user parameter data are transferred by the Profibus master. If user parameter data are transferred, Profibus initialisation is disabled and the slave’s parameters must be reconfigured.

**Note:**

Standard parameters configuration is required and is normally installed by the utilised DP configurators.

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 3.2.4 DP Output Data

Byte Index	<i>Bit 7</i>	<i>Bit 6</i>	<i>Bit 5</i>	<i>Bit 4</i>	<i>Bit 3</i>	<i>Bit 2</i>	<i>Bit 1</i>	<i>Bit 0</i>
0	LED 8	LED 7	LED 6	LED 5	LED 4	LED 3	LED 2	LED 1
1	LED 16	LED 15	LED 14	LED 13	LED 12	LED 11	LED 10	LED 9
2	LED 24	LED 23	LED 22	LED 21	LED 20	LED 19	LED 18	LED 17
3	LED 32	LED 31	LED 30	LED 29	LED 28	LED 27	LED 26	LED 25

A LED lights, if it's corresponding bit is set.

## 3.2.5 DP Input Data

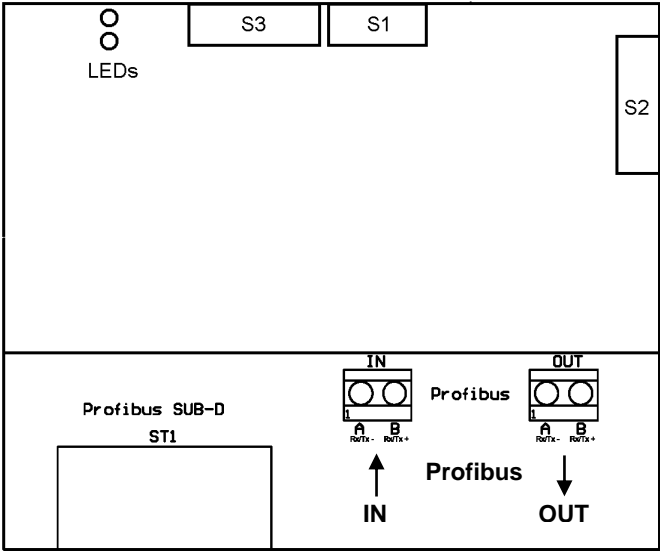
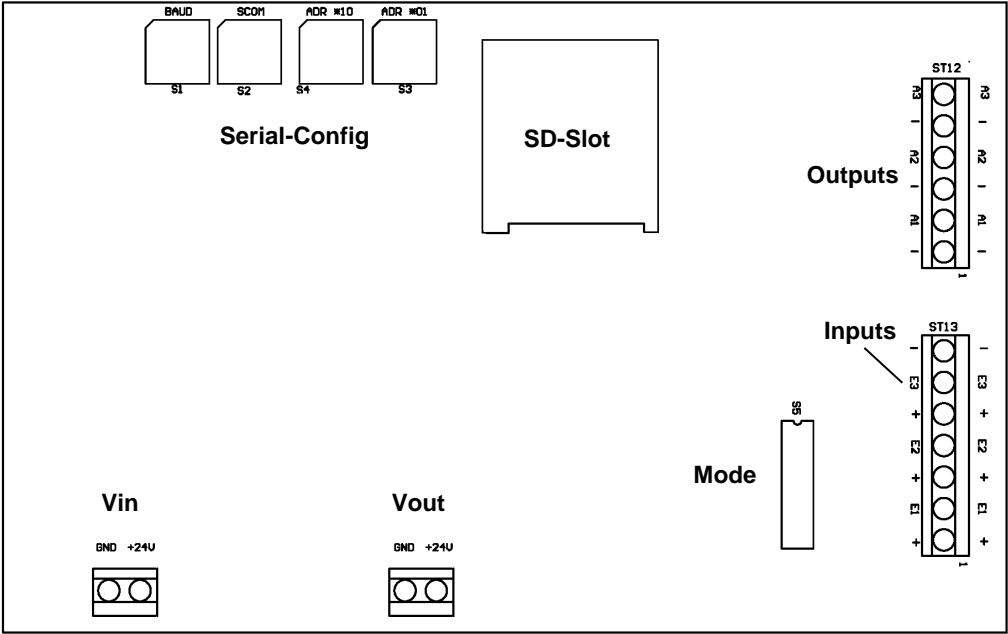
Byte Index	<i>Bit 7</i>	<i>Bit 6</i>	<i>Bit 5</i>	<i>Bit 4</i>	<i>Bit 3</i>	<i>Bit 2</i>	<i>Bit 1</i>	<i>Bit 0</i>
0	Button 8	Button 7	Button 6	Button 5	Button 4	Button 3	Button 2	Button 1
1	Button 16	Button 15	Button 14	Button 13	Button 12	Button 11	Button 10	Button 9
2	Button 24	Button 23	Button 22	Button 21	Button 20	Button 19	Button 18	Button 17
3	Button 32	Button 31	Button 30	Button 29	Button 28	Button 27	Button 26	Button 25

If a button is pressed, its corresponding bit is set.

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 4 Connector Pin Assignments / Settings



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 4.1 Connectors

### Vin, Vout (power supply)

Connect the power supply (24 VDC) with Vin. Vout serves for forwarding the power.

### Profibus IN / OUT

Connectors for the Profibus. IN is the input. OUT the output.

### Profibus SUB-D

Alternative connector for the Profibus

Pin	Assignment
1	
2	
3	Rx+ / Tx+
4	RTS
5	GND, electrically isolated
6	+5V, electrically isolated
7	
8	Rx- / Tx-
9	

### Outputs (ST12)

The outputs supply 24 VDC; maximum current load is 200 mA per output.

Pin	Labeling	Assignment
1		GND
2	A1	Output 1
3		GND
4	A2	Output 2
5		GND
6	A3	Output 3

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## Inputs (ST13)

Inputs are set (via Vout) with +24 VDC.

The common GND pin is used for the connection of initiators.

Pin	Labeling	Assignment
1	+	Vout
2	E1	Input 1
3	+	Vout
4	E2	Input 2
5	+	Vout
6	E3	Input 3
7	-	GND

## SD Slot

Slot for commercial SD cards with up to 2 GB memory. The SD cards must be formatted with the FAT file system.



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 4.2 Switches

Factory Settings: grey-coloured

### Profibus Interface:

#### S1

DIP Switch	Function	OFF	ON
1	internal (do not change)	X	
2	“		X
3	“		X
4	“		X
5	“		X
6	“		X

#### S2

DIP Switch	Function	OFF	ON
1	DP address ID no.: $2^0$	0	1 <sub>D</sub>
2	DP address ID no.: $2^1$	0	2 <sub>D</sub>
3	DP address ID no.: $2^2$	0	4 <sub>D</sub>
4	DP address ID no.: $2^3$	0	8 <sub>D</sub>
5	DP address ID no.: $2^4$	0	16 <sub>D</sub>
6	DP address ID no.: $2^5$	0	32 <sub>D</sub>
7	DP address ID no.: $2^6$	0	64 <sub>D</sub>
8	reserved	X	
9	internal Profibus bus termination	not set	set
10			

Only DP addresses from 0...126 are valid!

At the beginning and at the end of the Profibus cable, a bus termination must be set (either internal or external)!

#### S3

DIP Switch	Function	OFF	ON
1	<b>Mode</b>	Normal	Test
2	internal (do not change)		X
3	“		X
4	<b>Operation Mode</b>	Standard	Legacy
5	internal (do not change)	X	
6	reserved	X	
7	reserved	X	
8	reserved	X	

In Test-Mode, a LED lights up, if it's corresponding button is pressed. The text with message number 1023 is shown and can be scrolled with the buttons +/-.

The operation mode “Legacy” supports only the lower 32 buttons and LEDs.

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## BBT32 Control Board:

### HEX Switch

	Function	
BAUD	<b>Operation Mode</b>	B: Standard 7: Legacy
SCOM	internal (do not change)	5
ADR * 10	"	0
ADR * 01	"	1

### S5

DIP Switch	Function	OFF	ON
1	internal (do not change)	X	
2	"	X	
3	"		X
4	"		X
5	<b>Operation Mode</b>	Legacy	Standard
6	internal (do not change)	X	
7	"		X
8	"		X

## 4.3 LEDs

### Frontside LEDs

LED	Meaning
POWER 24VDC	lights static green if the supply power +24 VDC is connected
POWER 5VDC	lights static green, if the supply power +5 VDC is internally created
DATA	lights yellow at every received frame
FAULT	lights red, if it came to communication problems

### Profibus LEDs

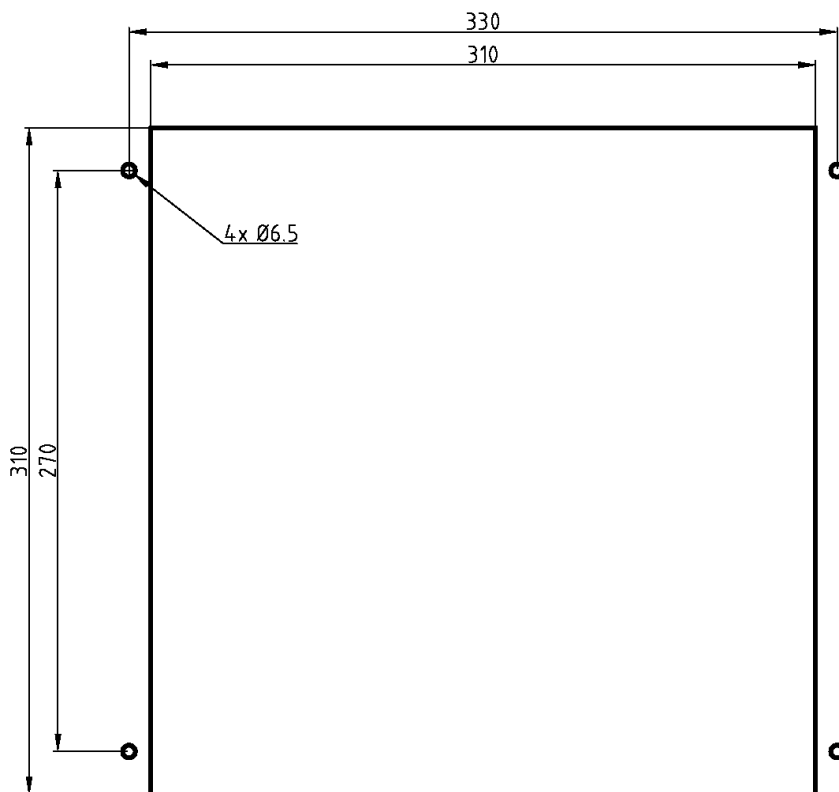
LED	LED Monitor	State
red	ERROR	Blinking: no response from the BBT32 control board ON: no Profibus DP connection OFF: everything is OK
green	STATUS	OFF: controller not started (hardware error) ON: controller started Temporary OFF (flickering): BBT32 communication cycle passed

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 5 Mounting Options

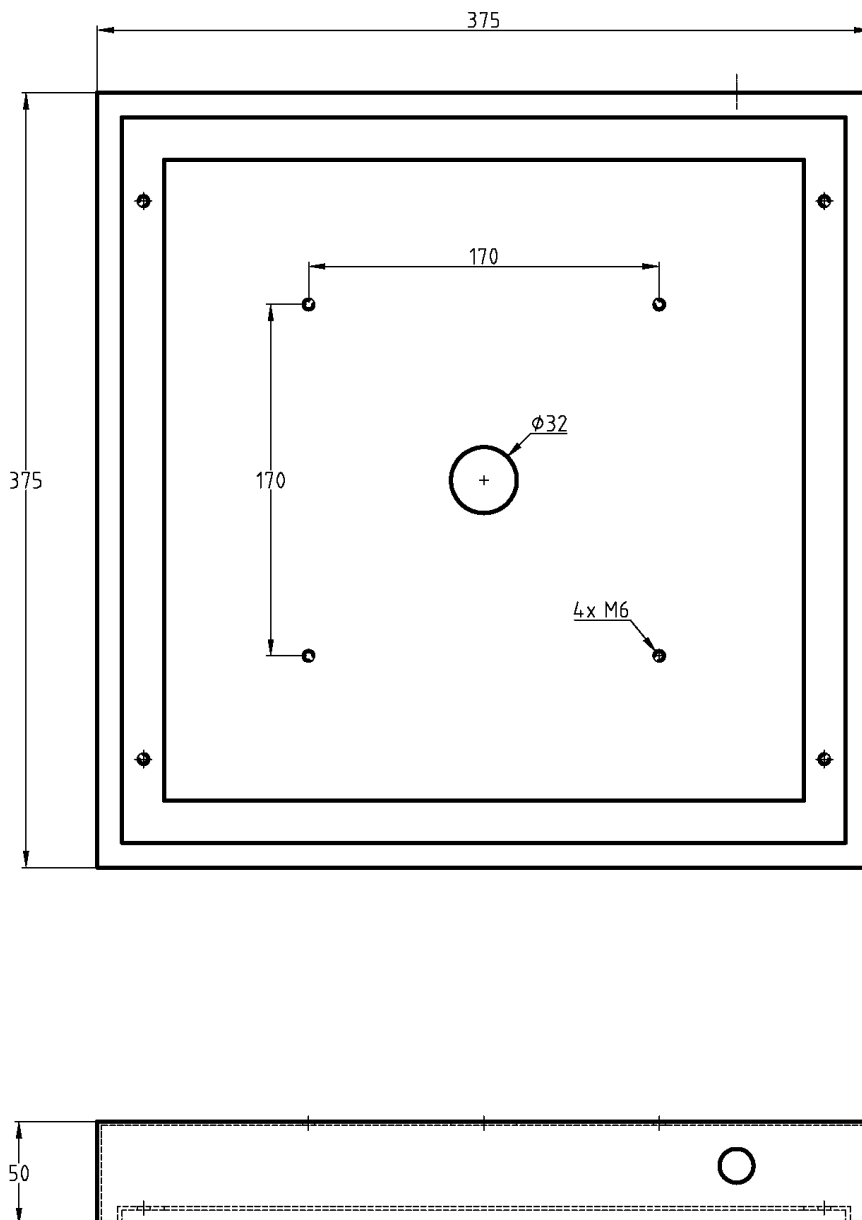
### 5.1 Panel Mounting



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

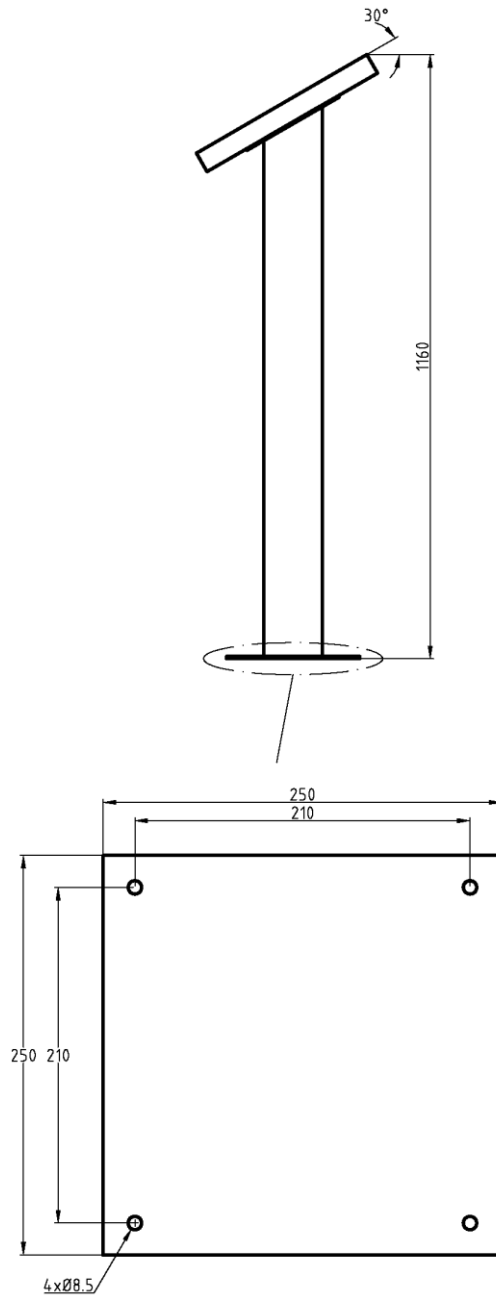
## 5.2 Housing



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Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 5.3 Pedestal



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Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 6 Appendix

### 6.1 Maintenance and Care

Observe the following instructions:

- Display quality is impaired by direct illumination with bright light sources and/or direct sunlight.
- The control panel must be switched off before cleaning.
- Protect the control panel from excessive humidity, extreme vibration, direct sunlight and extreme temperatures. Non-observance may lead to malfunctioning or destruction of the device. Under certain circumstances electrical shock, fire and explosion may occur as well. Information concerning allowable ambient conditions, including recommended temperature ranges, can be found in the chapter entitled "Technical Information".
- The control panel may not be placed into service if the device and/or the power cable are known to be damaged.
- Do not attempt to repair the device yourself. The guarantee is rendered null and void if the device is tampered with by unauthorized persons.

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 6.2 Declaration of Conformity

# EU-Konformitätserklärung

## EU Declaration of Conformity

**Produktbezeichnung:** mitas  
*Product name:*

**Typenreihe:** mitas BBT32-T-PB  
*Type code:*

**Hersteller:** microSYST Systemelectronic GmbH  
*Manufacturer:* Am Gewerbepark 11  
 92670 Windischeschenbach

<b>Das bezeichnete Produkt stimmt mit der folgenden Europäischen Richtlinie überein:</b> <i>We herewith confirm that the above mentioned product meets the requirements of the following standard:</i>		<b>Die Übereinstimmung des bezeichneten Produktes mit den Vorschriften der angewandten Richtlinie(n) wird nachgewiesen durch die Einhaltung folgender Normen / Vorschriften:</b> <i>The conformity of the product described above with the provisions of the applied Directive(s) is demonstrated by compliance with the following standards / regulations:</i>
<b>Richtlinien / Directives</b>		<b>Europäische Norm / Standard</b>
<b>EMV Richtlinie</b> <i>EMC Directive</i>	<b>2014/30/EU</b>	EN61000-6-2:2005
		EN61000-6-4:2007 +A1:2011
<b>RoHS Richtlinie</b> <i>RoHS Directive</i>	<b>2011/65/EU</b>	EN50581:2012

Windischeschenbach, 11.12.2017



Manuel Raß

**Geschäftsführer / General Manager**

# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 6.3 Warranty / Liability

For the product, liability is assumed for defects, which existed at the delivery date according to our General Terms and Conditions.

Technically changes as well as errors are excepted. A claim for delivery of a new product does not exist. The buyer has to check the received product immediately and indicate evident defects at the latest 24 hours after detection. Non-observance of notification requirements is equated with acceptance of the defect. Not immediately visible defects have to be indicated immediately after their perception too.

Generally, defects and their symptoms must be described as accurately as possible in order to allow for reproducibility and elimination. The buyer must provide for access to the relevant device and all required and/or useful information at no charge and must make all of the required data and machine time available free of charge.

The guarantee does not cover defects, which result from non-observance of the prescribed conditions of use, or from improper handling.

If the device has been placed at the disposal of the buyer for test purposes and has been purchased subsequent to such testing, both parties agree that the product is to be considered "used" and that it has been purchased "as is". No guarantee claims may be made in such cases.

The General Terms and Conditions of microSYST Systemelectronic GmbH in current version apply as well.



# mitas BBT32-T-PB

Control Panel with 34 Buttons, 34 LEDs, LC-Display and Profibus DP Interface

## 6.4 Versions Overview

Version	Date	Remark, Description
1.01	11.06.10	English version
1.10	25.08.10	Additional information
2.00	26.08.12	Nickl: Changes because of new Profibus interface (HE1003)
2.10	19.03.13	Company address, warranty changed
2.20	22.10.13	Logo
2.30	03.05.16	Declaration of conformity
2.40	11.12.17	Change of address

Certified per **DIN EN ISO 9001**.