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## **Touch Panels with TFT-Display**

User manual

# User manual

## Touch Panels with TFT-Display

2018-01-23

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Designation: UM EN BTP 2XXXX

Revision: 00

Order No.: —

This user manual is valid for:

Designation	Order No.
BTP 2043W	1050387
BTP 2070W	1046666
BTP 2102W	1046667

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**BTP 2XXXX**

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# Table of Contents

1	Important Notes .....	7
	1.1 Symbols .....	7
	1.2 Safety Notes .....	7
	1.3 Intended Use .....	8
	1.4 Target Group .....	8
2	Installation and Commissioning .....	9
	2.1 Unpacking the Device.....	9
	2.2 Mounting the Device.....	10
	2.2.1 Mounting Cutout .....	11
	2.2.2 Side View, Mounting Depth .....	14
	2.3 Connecting the Device .....	17
	2.3.1 Supply Voltage .....	17
	2.4 Switching On .....	18
	2.4.1 Settings and Functions .....	19
	2.5 Visualization .....	25
	2.5.1 System Variables .....	26
	2.6 Identification .....	28
3	Control and Display Elements .....	29
	3.1 Touchscreen .....	29
	3.2 Display.....	29
4	Interfaces of the Device .....	31
	4.1 USB (HOST).....	32
	4.1.1 Cable .....	32
	4.2 USB (SLAVE) .....	32
	4.2.1 Cable .....	32
	4.3 Ethernet.....	33
	4.3.1 Pin Assignment .....	33
	4.3.2 Cable .....	33
	4.4 RS-232 / RS-422 / RS-485 (COM1/COM2) .....	34
	4.4.1 Pin Assignment .....	34
	4.5 Memory Card.....	35
	4.6 Shielding D-SUB Connectors .....	35
5	Maintenance and Servicing .....	37
	5.1 Maintenance Interval .....	37

5.2	Front Panel .....	37
5.3	Battery .....	37
6	Technical Data .....	39
6.1	General.....	39
6.2	BTP 2043W .....	41
6.3	BTP 2070W .....	42
6.4	BTP 2102W .....	43



# 1 Important Notes

## 1.1 Symbols

The symbols in this manual are used to draw your attention on notes and dangers.



This symbol indicates hazards that could lead to personal injury.

There are three signal words indicating the severity of a potential injury.

### **DANGER**

Indicates a hazard with a high risk level. If this hazardous situation is not avoided, it will result in death or serious injury.

### **WARNING**

Indicates a hazard with a medium risk level. If this hazardous situation is not avoided, it could result in death or serious injury.

### **CAUTION**

Indicates a hazard with a low risk level. If this hazardous situation is not avoided, it could result in minor or moderate injury.



This symbol together with the **NOTE** signal word alerts the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.



Here you will find additional information or detailed sources of information.

## 1.2 Safety Notes

- Read this manual carefully before using the operating device. Keep this manual in a place where it is always accessible to all users.
- Proper transportation, handling and storage, placement and installation of this product are prerequisites for its subsequent flawless and safe operation.
- This user manual contains the most important information for the safe operation of the device.
- The user manual, in particular the safety notes, must be observed by all personnel working with the device.
- Observe the accident prevention rules and regulations that apply to the operating site.
- Installation and operation must only be carried out by qualified and trained personnel.



The following notes apply to use in hazardous locations (UL / cUL Class I, Division 2, Groups A, B, C and D). Suitable operating devices for this area are labeled accordingly. In addition, the approvals for your operating device can be found in the technical data in the user manual.



**WARNING: Explosion hazard**

Labeled and approved devices are suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only.

Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations.

Substitution of components may impair suitability for Class I, Division 2.

USB ports may only be connected or disconnected in an area known to be non-hazardous.

This product contains batteries, they must only be changed in an area known to be non-hazardous and may only be replaced by qualified service personal.

### 1.3 Intended Use

- The device is designed for use in the industry.
- The device is state-of-the art and has been built to the latest standard safety requirements. However, dangerous situations or damage to the machine itself or other property can arise from the use of this device.
- The device fulfills the requirements of the EMC directives and harmonized European standards. Any modifications to the system can influence the EMC behavior.



**NOTICE: Radio Interference**

This is a class A device. This device may cause radio interference in residential areas. In this case, the user may be required to introduce appropriate countermeasures, and to bear the cost of same.

### 1.4 Target Group

The use of products described in this manual is oriented exclusively to:

- Qualified electricians or persons instructed by them. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.
- Qualified application programmers and software engineers. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.

## 2 Installation and Commissioning

### 2.1 Unpacking the Device

Unpack all parts carefully and check the contents for any visible damage in transit. Also check whether the shipment matches the specifications on your delivery note.

If you notice damages in transit or discrepancies, please contact us immediately.

## 2.2 Mounting the Device


**NOTICE: Damage**

When installing the device, leave a gap of at least 30 mm (1.181") around the device to ensure sufficient air circulation.


**NOTICE: Damage**

When the operating device is installed horizontally, please note that additional sources of heat beneath the operating device may result in heat accumulation.

Make sure to allow sufficient heat dissipation!

Please observe the permissible temperature range specified in the technical data when operating the device.


**NOTICE: Damage**

In order to ensure the degree of protection specified in the technical data, observe the following points:

- A tolerance of +0,5 / -0 mm is maintained for the mounting cutout.
- The seal lies flat against the mounting surface.
- All mounting brackets are used.
- The threaded pins of the mounting brackets are tightened uniformly to a maximum torque of 0,4 Nm.

The device enables quick and easy mounting. A panel thickness of 1 mm to 6 mm is permitted for proper mounting.

1. Cut the mounting cutout in the housing for the device size to be installed.

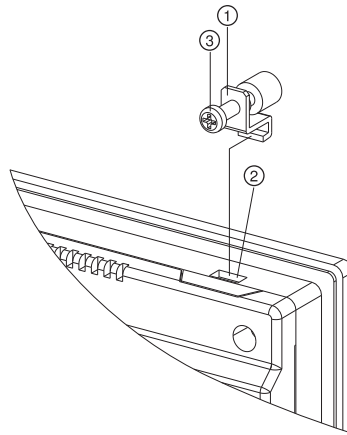


Figure 2-1 Mounting the device using a mounting clamp

2. Push the device from the front through the mounting cutout.
3. Ensure that the gasket is properly positioned in the groove and against the panel.
4. Insert the mounting clamps (1) into the recesses (2) provided.
5. Tighten the screws (3) on all mounting clamps, alternating from one side to the other until the front bezel is secure against the installation surface. Torque the screws to 0,4 Nm.

## 2.2.1 Mounting Cutout

### 2.2.1.1 BTP 2043W

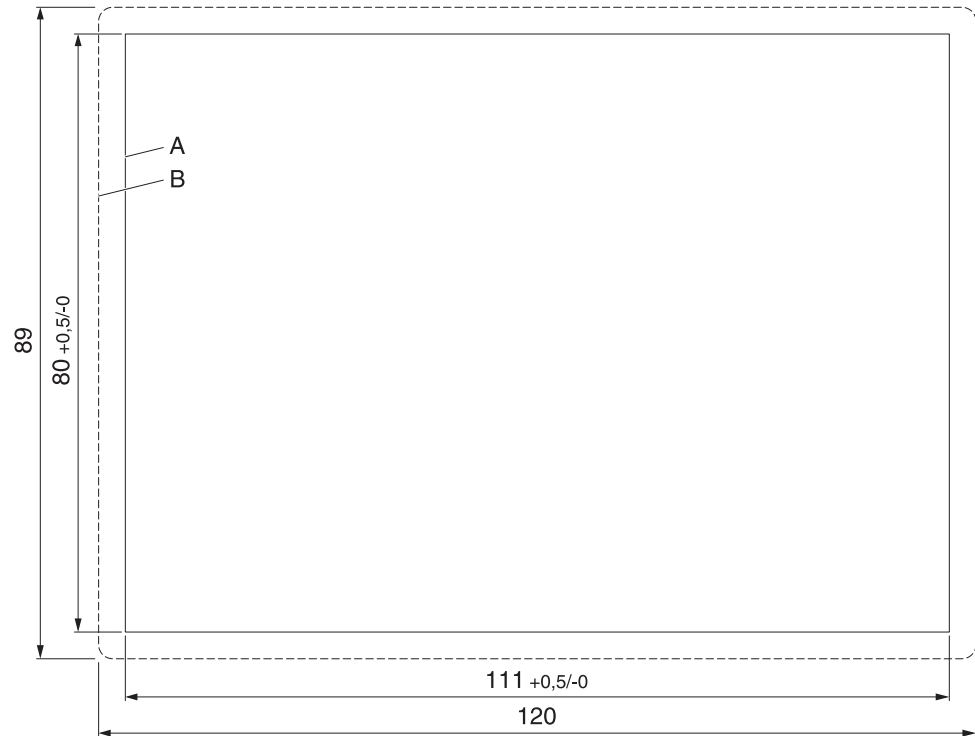


Figure 2-2 Mounting cutout (dimensions in mm)

**A** Mounting Cutout

**B** Front Panel

2.2.1.2 BTP 2070W

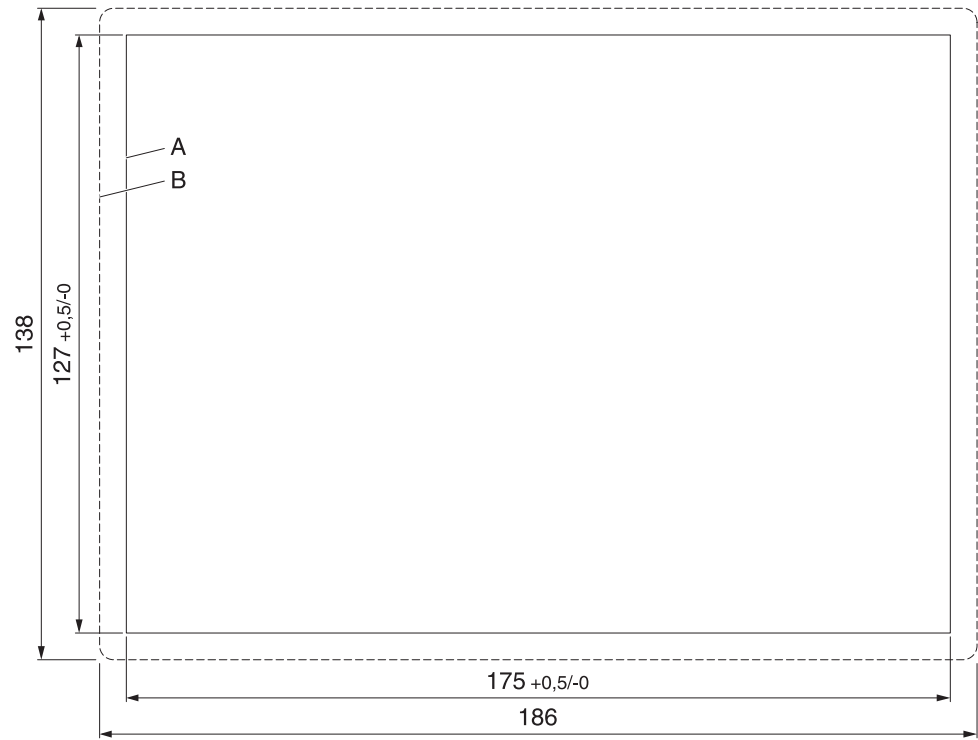


Figure 2-3 Mounting cutout (dimensions in mm)

- A Mounting Cutout
- B Front Panel

2.2.1.3 BTP 2102W

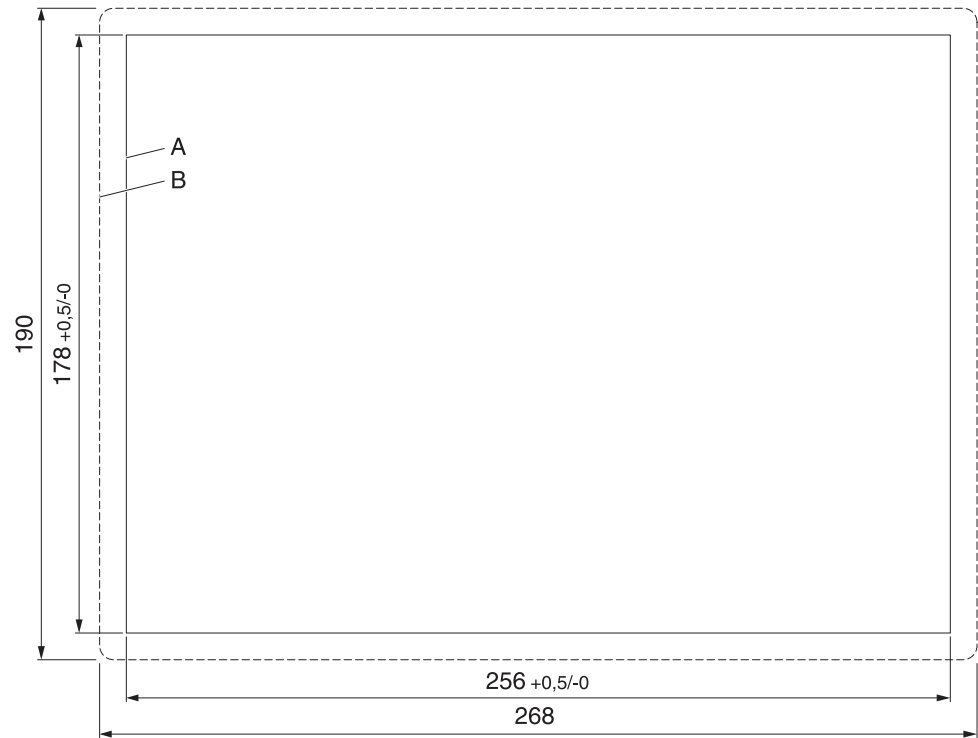


Figure 2-4 Mounting cutout (dimensions in mm)

- A** Mounting Cutout
- B** Front Panel

## 2.2.2 Side View, Mounting Depth

### 2.2.2.1 BTP 2043W

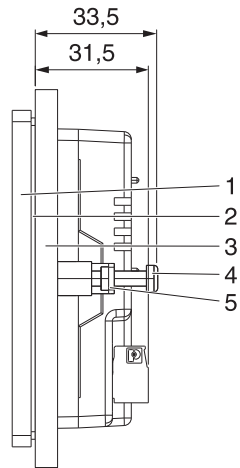


Figure 2-5 Mounting depth (dimensions in mm)

- 1 Front Panel
- 2 Circumferential Seal
- 3 Mounting Surface Thickness 1 mm to 6 mm
- 4 Screw
- 5 Mounting Bracket



2.2.2.2 BTP 2070W

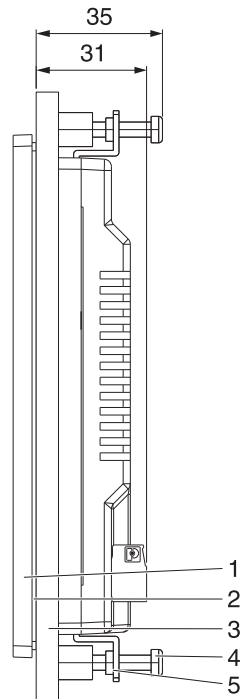


Figure 2-6 Mounting depth (dimensions in mm)

- 1 Front Panel
- 2 Circumferential Seal
- 3 Mounting Surface Thickness 1 mm to 6 mm
- 4 Screw
- 5 Mounting Bracket

2.2.2.3 BTP 2102W

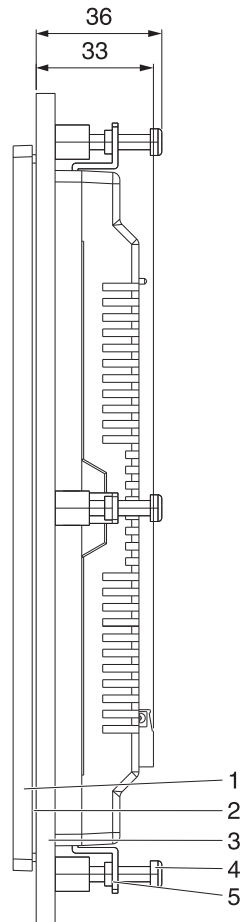


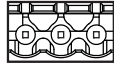
Figure 2-7 Mounting depth (dimensions in mm)

- 1 Front Panel
- 2 Circumferential Seal
- 3 Mounting Surface Thickness 1 mm to 6 mm
- 4 Screw
- 5 Mounting Bracket

## 2.3 Connecting the Device

### 2.3.1 Supply Voltage

The supply voltage is supplied via pin strip. A suitable socket strip is supplied.



1

Figure 2-8 3 pin male connector

Refer to the technical data for the permissible supply voltage of the operating device.



The device has reverse polarity protection. In case of wrong polarity, the device will not operate.

Connector in the operating device: 3 pin male connector

Table 2-1 Pin assignment supply voltage

Pin	Function
24V	Supply voltage $\overline{\text{---}}$ 24 V
0V	Supply voltage 0 V
	Protective ground



**DANGER: Hazardous voltages**

Hazardous voltages can exist inside electrical installations that can pose a danger to humans. Coming in contact with live parts may result in electric shock!



**NOTICE: Damage**

Cables with finely stranded copper conductors with a minimum cross-section of 0.75 mm<sup>2</sup> (18 AWG) and a maximum cross-section of 2.5 mm<sup>2</sup> (14 AWG) must be used for the supply voltage.

You must adhere to the following torques at the connector:

Screw connection of terminal blocks: 0.5 Nm (minimal) to 0.6 Nm (maximum)

Use the following procedure to connect the device to the supply voltage:

- Strip approx. 30 mm (1.181") off the outer cable sheath and approx. 5 mm (0.197") off the wires.

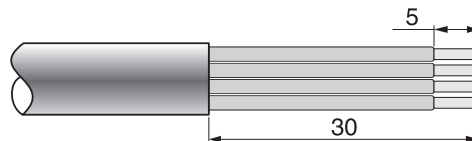


Figure 2-9 Preparing the cable

- Fit the wires with wire end ferrules and connect the wires to the socket strip.
- Plug the socket strip into the pin strip on the operating device.
- Secure the socket strip against slipping out with screws.

## 2.4 Switching On

The Windows CE operating system is installed on the operating device. Running on the operating system is the visualization runtime software Visu+.

The operating device allows you - by starting the cockpit during the startup phase - to make changes to the device configuration.

### Cockpit at system startup

To start the cockpit, do the following:

1. Wait during the startup phase until the following dialog is displayed.



Figure 2-10 Cockpit startup phase



2. Press the button to start the cockpit before the progress bar is down.

You can customize the language of the cockpit interface with the **Regional settings** menu item.



3. Press the button **Regional Settings**.

4. Select the desired language.



5. Confirm your selection with the green check.

### Using desktop icon to start cockpit

You can start the cockpit via the desktop icon at already started operating devices with active desktop:



1. Briefly press twice on the desktop icon.



2. Press the button to start the cockpit before the progress bar is down.

You can customize the language of the cockpit interface with the **Regional settings** menu item.



3. Press the button **Regional Settings**.

4. Select the desired language.



5. Confirm your selection with the green check.

## 2.4.1 Settings and Functions



Some settings are password-protected. The default password is "+++".

### 2.4.1.1 Information



This category offers the following informations:

- Data to the operating device
- Contact Information

#### System

The following informations are displayed:

- Device type
- Article number
- Serial number
- Hardware / firmware version
- Image version and date
- Operating system
- Runtime version
- Software bundle

### 2.4.1.2 Basic Settings



This category offers the following functions:

- Configure the dynamic / static IP address

#### Use Dynamic IP (DHCP)

1. Select the radio button to automatically receive the network configuration from the DHCP server.
2. Confirm your selection with the green check.



Note that the IP address is only indicated if the operating device is physically connected to the network.

#### Use Static IP

1. Select the radio button to assign an IP address and subnet mask to the operating device.
2. Confirm your selection with the green check.



Note that the IP address is only indicated if the operating device is physically connected to the network.

### 2.4.1.3 Regional Settings



This category offers the following functions:

- Configuration of the cockpit language
- Set date and time
- Configuration of the user interface and input language
- Loading of additional fonts

#### Language



1. Select the desired language.
2. Confirm your selection with the green check.

#### Date and Time



1. Press the **Open "Date and Time"** button.

The system dialog for date and time opens.

2. Set the date and time.
3. Press the **OK** button.
4. Confirm your selection with the green check.

#### Format



1. Press the **Open "Regional Settings"** button.

The system dialog for the regional and language settings will open.

2. Adjust the settings for your region.
3. Press the **OK** button.
4. Confirm your selection with the green check.

#### Fonts

##### Use additional fonts

The fonts in the default or user-specific directory will be installed automatically when you start the operating device.

Depending on the number and size of fonts, the system start-up take correspondingly more time.

##### Don't use additional fonts

No additional fonts are installed.

##### Choose fonts directory

The fonts in this directory are used if the "Use additional fonts" option is active. If no directory is given the appropriate default directory (\FlashDrv\Fonts\) is used.

#### 2.4.1.4 File Manager



Use the file manager to copy files and directories between the storage medias (USB stick <-> device memory). You can also delete files and directories.

##### Copy



1. Select one or multiple files / folders.
2. Press the buttons to copy the data to the external storage medium or to the device memory.

##### Delete

1. Select one or multiple file(s) / folder(s).
2. Press the **Delete** button to delete the data from the external storage medium or the device memory.

#### 2.4.1.5 Password



The category **Password** allows you to protect certain menu items in the cockpit with a password.

##### Current password



1. Enter a password for the protected categories.
2. Confirm your selection with the green check.

##### Password protected



1. Select the menu items which shall get a password protection.
2. Confirm your selection with the green check.

#### 2.4.1.6 Administration



This category offers the following functions:

- Backup of the data / configuration
- Update of the firmware
- Restore the default registry

## Backup

##### Create backup

1. Insert a USB stick or memory card into the female connector of the operating device.
2. If more than one slot is available, select the storage medium (**HardDisk / Storage-Card**) for the backup.
3. Press the **Create Backup** button.

The files are copied to the directory "Backup" on the storage medium. A dialog lets you know if there is already a directory „Backup“ with data on the storage medium. If you confirm this dialog the backup is overwritten.

The successful backup will be confirmed with a dialog.



**Restore backup****NOTICE**

When restoring the backup all data in the flash memory of the operating device will be deleted.



The process of backup and restore all settings is possible only with identical device types.

1. Insert a USB stick or memory card into the female connector of the operating device.
2. Press the **Restore Backup** button.

**NOTICE**

Do not interrupt the power supply during the process. After canceling an process, the operating device may not be operational anymore.

The backup files are copied from the directory "Backup" to the flash memory of the operating device.

The successful backup will be confirmed with a dialog.

3. Restart the operating device.

**Update****Choose Update File**

Avoid the start of further applications by opening the cockpit directly after a restart. Running applications can impair the update procedure.

1. Copy a valid firmware update file (FW\_xxx.zip) to a USB stick.
2. Insert a USB stick into the female connector of the operating device.
3. Press the **Choose Update File** button.

A selection dialog box appears.

4. Select the firmware update file.
5. Confirm your selection with the green check.



The select firmware update file is displayed in the field **Current file to update**.

**Start update**

1. Press the button **Start update** to run the firmware update with the selected file.

A dialog box appears.

2. Confirm your selection with the green check.

**NOTICE**

Do not interrupt the power supply during the process. After canceling an process, the operating device may not be operational anymore.

The update is carried out automatically. This might take several minutes.

After the update process, a dialog will be displayed.

3. Press the **OK** button to restart the operating device.

**Registry****Save Registry**

The registry is saved completely.

**Restore Default Registry**

Destroys the current registry and activates the default registry of the image.

**2.4.1.7 Network**



You can configure the network settings with the **Network** menu item.

**Device Name**

You can define a device name with a maximum of 15 characters. Via network, the device can be accessed with the device name instead of the ip address.



Confirm your selection with the green check.

**IP Address**

**Use Dynamic IP (DHCP)**

The network configuration is automatically obtained from the DHCP server.



Confirm your selection with the green check.

**Use Static IP**

Manually assign an ip address, subnet mask and gateway of the operating device.



Confirm your selection with the green check.

**WINS / DNS**

Optionally, enter the ip addresses for the WINS / DNS server.



Confirm your selection with the green check.



The input fields are only active when you set up a static ip address.

**SNTP**

Enter the ip address of an intranet or internet time server. Define an interval in milliseconds for time synchronization.



Confirm your selection with the green check.

**2.4.1.8 Display**



This category offers the following functions:  
 – Brightness and orientation of the display  
 – Calibration of the touch

**Brightness**

1. Adjust the brightness using the slider or the buttons.
2. Confirm your selection with the green check.



**Orientation**

1. Turn the orientation using the buttons to the desired position.
2. Confirm your selection with the green check.



Depending on device type, the new orientation is accepted immediately or after a reboot of the operating device.

**Calibrate Touch**

1. Press the **Recalibrate** button.



Calibration is not possible for some device types. In this case the button is disabled.

Depending on device type the calibration is automatically started immediately or after a reboot of the operating device.

2. Press the displayed marks to calibrate the touch screen.

### 2.4.1.9 Default values

The following default settings are configured in the cockpit:

Table 2-2 Default values of Cockpit

Menu item	Setting	Default value	Comment
Display	Brightness	24	
	Orientation	0	
Password	Current password	++-	
	Password protected	Administration, Display, Network, Regional Settings, Password, File Manager	
Regional Settings	Language	English	
	Fonts	Use additional fonts	The fonts in the default or user-specific directory will be installed automatically when you start the operating device.
	Fonts directory	\FlashDr\Fonts	
Network	Device name	WindowsCE60	
	IP address -> Use dynamic IP (DHCP)	Enabled	
	SNTP -> Server	Ntp1.fau.de	
	SNTP -> Interval (ms)	17280000	

## 2.5 Visualization

The BTP 2XXXX devices uses Windows CE as its operating system. Under Windows CE, the functionality of the visualization and the performance compared to TP 3XXXX devices is limited by the hardware used.

Table 2-3 Functionality of VISU+ 2 EXPRESS with BTP 2XXXX

VISU+ Function	BTP 2XXXX	TP 3XXXX
I/O bytes (tags)	256	4096
Process images	Max. 16	Yes
Graphics libraries	Yes	Yes
Templates	Yes	Yes
Alarms	Max. 1024	Yes
Shortcuts and menus	Not available	Not available
Touchscreen support	Yes	Yes
Event logging	Yes (only TXT/XML)	Yes
Language change	Yes	Yes
IL-Logic (SoftLogic)	Yes	Yes
VBA multithreading	Max. 1	Yes
ActiveX-OCX	Not available	Yes
Debugger online / remote	Yes	Yes
IP camera	Yes	Yes
Dundas gauges	Not available	Not available
Speech recognition	Not available	Not available
Dynamic trends	Yes	Yes
Historical trends	Yes (only TXT/XML)	Yes
Recipes	Yes	Yes
OPC DA client	Yes	Yes
OPC XML DA client	Not available	Yes
Modem driver connection	Not available	Not available
Modem RAS service	Not available	Not available
VBA driver interface	Not available	Not available
3D evaluations	Not available	Not available
Networking	Yes	Yes
Data logger	Max. 1 (TXT/XML)	Yes
Reports	Text reports	Text reports, embedded reports
Direct drivers	Max. 2	Max. 2
SMS / voice / fax / e-mail	Not available	Only e-mail
Alarm statistics	Not available	Not available
OPC DA server	Not available	Not available