Power Panel T30

User's manual

Version: **1.20 (November 2015)**
Model no.: **MAPPT30-ENG**

1 General information

Information:

B&R keeps the printed version of user's manuals as current as possible. If a newer version of the user's manual is available, it can always be downloaded in electronic form (PDF) from the B&R website www.br-automation.com

1.1 Manual history

Version	Date	Comment
0.10	August 2014	First edition
0.20	September 2014	Updated "Technical data" and "Connection elements".
0.30	September 2014	Updated "Technical data", "Humidity diagram, "Installation guidelines" and "Mounting orientations".
0.40	December 2014	Updated "Installation".
0.50	February 2015	Updated "Installation and "Accessories".
0.60	March 2015	Updated "T-Series" and "Installation".
0.70	May 2015	Added new sections to "General information" and "Installation". Updated "Technical data" and "Installation".
1.00	May 2015	Added new section "Automation Studio and Automation Runtime dependencies". Updated "Installation".
1.10	September 2015	Added new section "Operating the Power Panel with a USB mouse". Updated "Technical data", "Dependencies to Automation Studio and Automation Runtime" and "Commissioning".
1.20	November 2015	Updated "Commissioning" and "Standards and certifications".

Table 1: Manual history

1.2 Safety guidelines

1.2.1 Introduction

Programmable logic controllers (PLCs), operating and monitoring devices (industrial PCs, Power Panels, Mobile Panels, etc.), as well as the B&R uninterruptible power supplies have been designed, developed or manufactured for conventional use in industry. They were not designed, developed and manufactured for any use involving serious risks or hazards that could lead to death, injury, serious physical damage or loss of any kind without the implementation of exceptionally stringent safety precautions. In particular, such risks and hazards include the use of these devices to monitor nuclear reactions in nuclear power plants, their use in flight control or flight safety systems as well as in the control of mass transportation systems, medical life support systems or weapons systems.

When using programmable logic controllers or operating/monitoring devices as control systems together with a Soft PLC (e.g. B&R Automation Runtime or comparable product) or Slot PLC (e.g. B&R LS251 or comparable product), safety precautions relevant to industrial control systems (e.g. the provision of safety devices such as emergency stop circuits, etc.) must be observed in accordance with applicable national and international regulations. The same applies to all other devices connected to the system, such as drives.

All tasks such as the installation, commissioning and servicing of devices are only permitted to be carried out by qualified personnel. Qualified personnel are those familiar with the transport, mounting, installation, commissioning and operation of devices who also have the appropriate qualifications (e.g. IEC 60364). National accident prevention regulations must be observed.

The safety notices, connection descriptions (type plate and documentation) and limit values listed in the technical data are to be read carefully before installation and commissioning and must be observed.

1.2.2 Intended use

Electronic devices are never completely failsafe. If the programmable control system, operating/monitoring device or uninterruptible power supply fails, the user is responsible for ensuring that other connected devices, e.g. motors, are brought to a secure state.

1.2.3 Protection against electrostatic discharge

Electrical components that can be damaged by electrostatic discharge (ESD) must be handled accordingly.

1.2.3.1 Packaging

- Electrical components with a housing
  … do not require special ESD packaging, but they still must be handled properly (see "Electrical components with a housing" on page 6).
- Electrical components without a housing
  … are protected by ESD-suitable packaging.

1.2.3.2 Guidelines for proper ESD handling

Electrical components with a housing

- Do not touch the connector contacts on the device (bus data contacts).
- Do not touch the connector contacts on connected cables.
- Do not touch the contact tips on circuit boards.

Electrical components without a housing

The following points apply in addition to the points listed under "Electrical components with a housing":

- Any persons handling electrical components or devices with installed electrical components must be grounded.
- Components are only permitted to be touched on their narrow sides or front plate.
- Components should always be stored in a suitable medium (ESD packaging, conductive foam, etc.).
  Information: Metallic surfaces are not suitable storage surfaces!
- Components should not be subjected to electrostatic discharge (e.g. through the use of charged plastics).
- Ensure a minimum distance of 10 cm from monitors and TV sets.
- Measuring instruments and equipment must be grounded.
- Probes on potential-free measuring instruments must be discharged on sufficiently grounded surfaces before taking measurements.

Individual components

- ESD protective measures for individual components are thoroughly integrated at B&R (conductive floors, footwear, arm bands, etc.).
- These increased ESD protective measures for individual components are not necessary for customers handling B&R products.

1.2.4 Policies and procedures

Electronic devices are never completely failsafe. If the programmable control system, operating/monitoring device or uninterruptible power supply fails, the user is responsible for ensuring that other connected devices, e.g. motors, are brought to a secure state.

When using programmable logic controllers or operating/monitoring devices as control systems together with a soft PLC (e.g. B&R Automation Runtime or comparable product) or slot PLC (e.g. B&R LS251 or comparable product), safety precautions relevant to industrial control systems (e.g. the provision of safety devices such as emergency stop circuits, etc.) must be observed in accordance with applicable national and international regulations. The same applies for all other devices connected to the system, such as drives.

All tasks such as the installation, commissioning and servicing of devices are only permitted to be carried out by qualified personnel. Qualified personnel are those familiar with the transport, mounting, installation, commissioning and operation of devices who also have the appropriate qualifications (e.g. IEC 60364). National accident prevention regulations must be observed.
The safety notices, connection descriptions (type plate and documentation) and limit values listed in the technical data are to be read carefully before installation and commissioning and must be observed.

1.2.5 Transport and storage

During transport and storage, devices must be protected against undue stress (mechanical loads, temperature, moisture, corrosive atmospheres, etc.).

Devices contain components sensitive to electrostatic charges that can be damaged by inappropriate handling. It is therefore necessary to provide the required protective measures against electrostatic discharge when installing or removing these devices (see "Protection against electrostatic discharge" on page 5).

1.2.6 Installation

- Installation must be performed according to this documentation using suitable equipment and tools.
- Devices are only permitted to be installed by qualified personnel without voltage applied.
- General safety guidelines and national accident prevention regulations must be observed.
- Electrical installation must be carried out in accordance with applicable guidelines (e.g. line cross sections, fuses, protective ground connections).
- Take the necessary steps to protect against electrostatic discharges (see "Protection against electrostatic discharge" on page 5).

1.2.7 Operation

1.2.7.1 Protection against touching electrical parts

To operate programmable logic controllers, operating and monitoring devices, and uninterruptible power supplies, certain components must carry dangerous voltage levels over 42 VDC. Touching one of these parts can result in a life-threatening electric shock. This could lead to death, severe injury or damage to equipment.

Before turning on the programmable logic controller, operating/monitoring devices or uninterruptible power supply, the housing must be properly grounded (PE rail). Ground connections must be established even when testing or operating operating/monitoring devices or the uninterruptible power supply for a short time!

Before switching on the device, all parts that carry voltage must be securely covered. During operation, all covers must remain closed.

1.2.7.2 Environmental conditions - Dust, moisture, corrosive gases

The use of operating/monitoring devices (e.g. industrial PCs, Power Panels, Mobile Panels, etc.) and uninterruptible power supplies in very dusty environments should be avoided. Dust collection on the devices can affect functionality and may prevent sufficient cooling, especially in systems with active cooling systems (fans).

The presence of corrosive gases can also lead to malfunctions. When combined with high temperature and humidity, corrosive gases – e.g. with sulfur, nitrogen and chlorine components – can induce chemical reactions that can damage electronic components very quickly. Signs of the presence of corrosive gases are blackened copper surfaces and cable ends on existing equipment.

For operation in dusty or moist conditions, correctly installed (e.g. cutout installations) operating/monitoring devices like the Automation Panel or Power Panel are protected on the front. The back of all devices must be protected from dust and moisture and cleaned at suitable intervals.

1.2.7.3 Viruses and dangerous programs

This system is subject to potential risk each time data is exchanged or software is installed from a data medium (e.g. diskette, CD-ROM, USB flash drive, etc.), a network connection or the Internet. The user is responsible for assessing these dangers, implementing preventive measures such as virus protection programs, firewalls, etc. and making sure that software is only obtained from trusted sources.

1.2.8 Environmentally friendly disposal

All B&R programmable controllers, operating/monitoring devices and uninterruptible power supplies are designed to inflict as little harm as possible on the environment.

1.2.8.1 Separation of materials

It is necessary to separate different materials so the device can undergo an environmentally friendly recycling process.

Component	Disposal
Programmable logic controllers Operating/Monitoring devices Uninterruptible power supply Batteries and rechargeable batteries Cables	Electronics recycling
Cardboard box / Paper packaging	Cardboard box / Paper recycling
Plastic packaging	Plastic recycling

Table 2: Environmentally friendly separation of materials

Disposal must comply with applicable legal regulations.

1.2.9 Organization of safety notices

Safety notices in this manual are organized as follows:

Safety notice	Description
Danger!	Disregarding these safety guidelines and notices can be life-threatening.
Caution!	Disregarding these safety guidelines and notices can result in severe injury or substantial damage to equipment.
Warning!	Disregarding these safety guidelines and notices can result in injury or damage to equipment.
Information:	This information is important for preventing errors.

Table 3: Organization of safety notices

2 Power Panel T-Series

2.1 System features

B&R has added the Power Panel T-Series to its Power Panel family. The Power Panel T30 terminal is equipped with an embedded browser and can also be used as a Visual Components client. The terminal series has 2 Ethernet and 2 USB interfaces as well as various configuration options.

Figure 1: T-Series

2.1.1 Compact solution

With an extremely compact design, minimal installation depth and intelligent cable outlet arrangement, Power Panels are extreme space-savers that are very easy to install. They also have no hard disks, fans or batteries, which makes them maintenance-free. The front of the panel provides IP65 protection, making these devices extremely well-suited for harsh industrial environments.

2.1.2 Simple programming

The complete integration of the HMI application in the Automation Studio development environment goes without saying. The same is true for programming in all of the IEC languages offered by B&R as well as Automation Basic and ANSI C.

2.1.3 Power Panel T30

The Power Panel T30 is a dedicated HMI device that can be operated in 2 different modes. On one hand, it operates as a web browser device using standard technology (frameless full screen mode). On the other hand, the terminal can also be used optimally with Visual Components.

Figure 2: Power Panel T30

2.1.4 Flexibility

The Power Panel T-Series is available in 4 different display sizes.

- 4.3" variant
- 5.7" variant
- 7.0" variant
- 10.1" variant

A touch button is integrated in the panel overlay at the lower right corner of the display. This element can be incorporated as an elegant feature of the HMI application for quick navigation or easy access to the home screen or help system.

The ability to choose between portrait and landscape format adds even more flexibility to the machine layout. It is easy to switch between panel models depending on the machine. When it comes to color, users can select between two pinstripe options: anthracite gray or aluminum white.

Regardless of model, size and color, what all these devices have in common are a shallow installation depth and minimized border width. At the same time, there were no compromises made with regard to stability or seal integrity.

2.1.5 Model number key

X	X	X	X	X	X	.	X	X	X	X	-	X	X	X	X	X	X	
																		Product area
6																		Browser device
																		Product family
	P	P																Power Panel
																		Model
			T															T-Series
																		Model (processor)
				3	0													ARM low performance
																		Display size
							0	4	3									4.3"
							0	5	7									5.7"
							0	7	0									7.0"
							1	0	1									10.1"
																		Resolution
										2								WVGA (800 x 480) landscape
										3								VGA (640 x 480) landscape
										F								WQVGA (480 x 272) landscape
										G								WSVGA (1024 x 600) landscape
										K								WQVGA (242 x 480) portrait
										L								VGA (480 x 640) portrait
										M								WVGA (480 x 800) portrait
										N								WSVGA (600 x 1024) portrait
Standard variants																		
																		Display / touch screen technology and memory
																		Standard memory
												2						TFT color + analog resistive touch screen
																		Interfaces on option board
													0					No option board
Overlays and custom variants																		
																		Standard panel overlay variants
														W				Aluminum white
														B				Anthracite
																		Customer-specific
																		Custom panel overlay
														F	.	.	.	Sequential number [F][0..Z][0..Z][0..Z]
																		Customization going beyond custom overlay
														C	.	.	.	Sequential number [C][0..Z][0..Z][0..Z]
Follow-up model variants or I/O configuration																		
																		Base model
															-	0	1	Derivative: Sequential number [0]

Figure 3: Model number key

2.2 Power Panel T-Series

2.2.1 Selecting a Power Panel

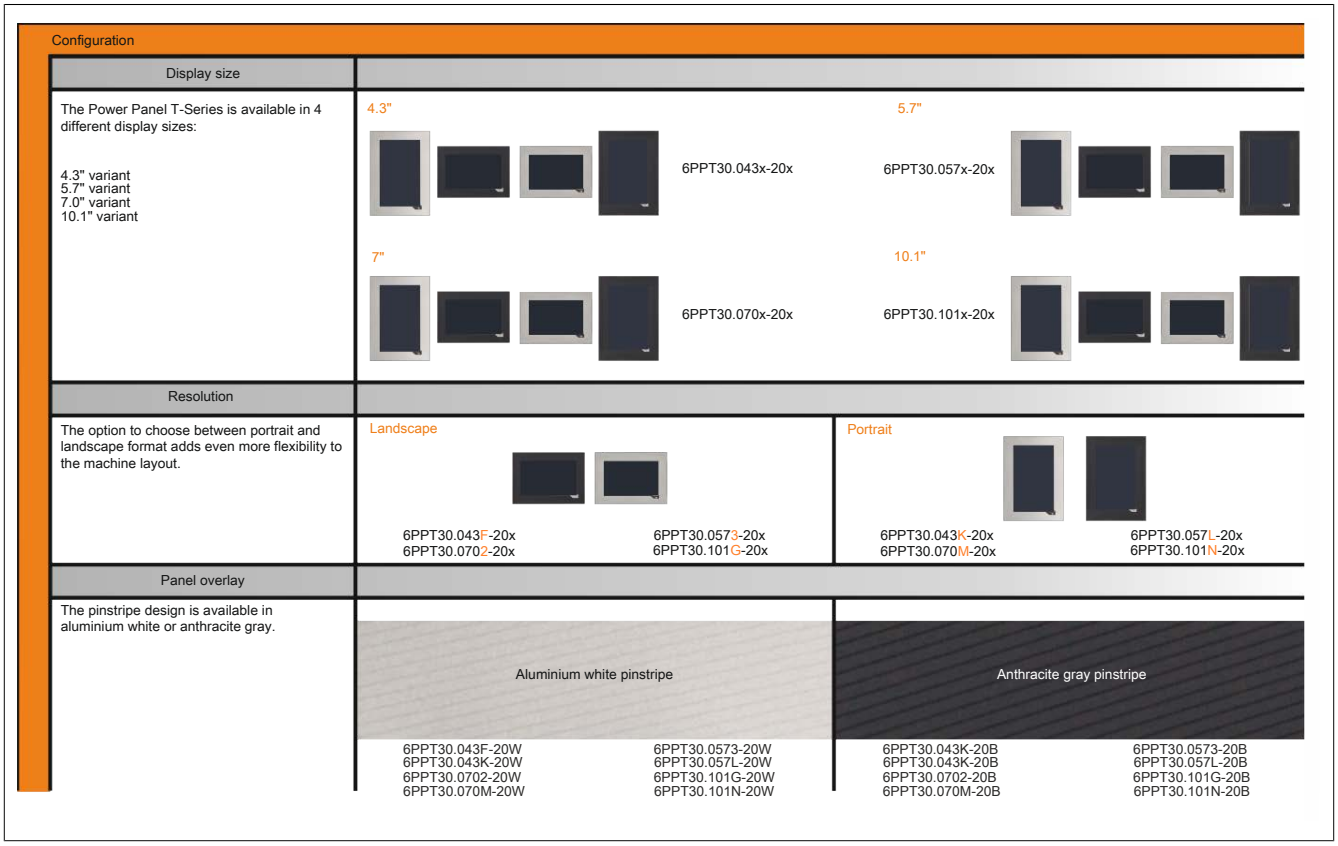


Figure 4: Selecting a Power Panel

2.2.2 General technical data

Name	Description
Processor	ARM Cortex A8 600 MHz / 1 GHz
Memory	256 MB DDRAM
Interfaces	2 Ethernet interfaces 10/100BASE-T 2 USB 2.0 interfaces
Other	**IP65 protection (front)** Temperature range from -20 to 60°C Fanless 8 to 32 VDC power supply

Table 4: Power Panel T-Series - General technical data

2.2.3 Overview

2.2.3.1 6PPT30.043x - Overview

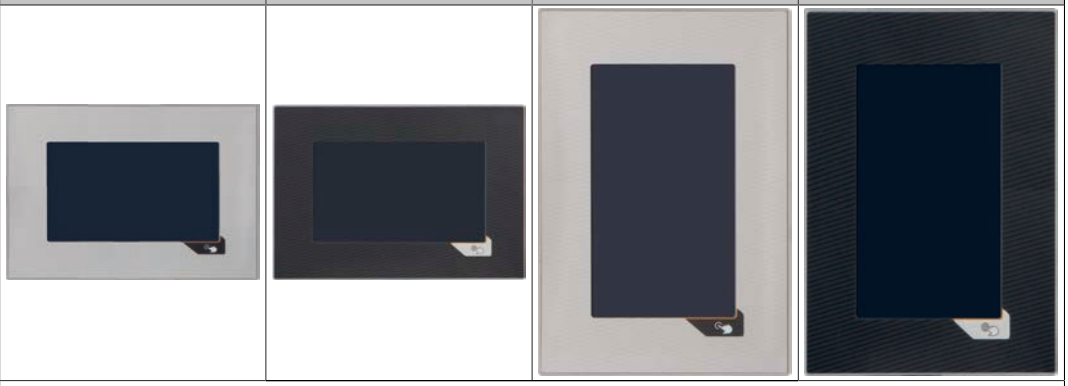
Model number	6PPT30.043F-20W	6PPT30.043F-20B	6PPT30.043K-20W	6PPT30.043K-20B
Figure				
Display	TFT color			
Resolution	WQVGA			
Display size	4.3"			
Touch screen	Analog resistive			
Format	Landscape		Portrait	
Color	Aluminum white	Anthracite	Aluminum white	Anthracite
Page	16			

Table 5: 6PPT30.043x - Overview

2.2.3.2 6PPT30.057x - Overview

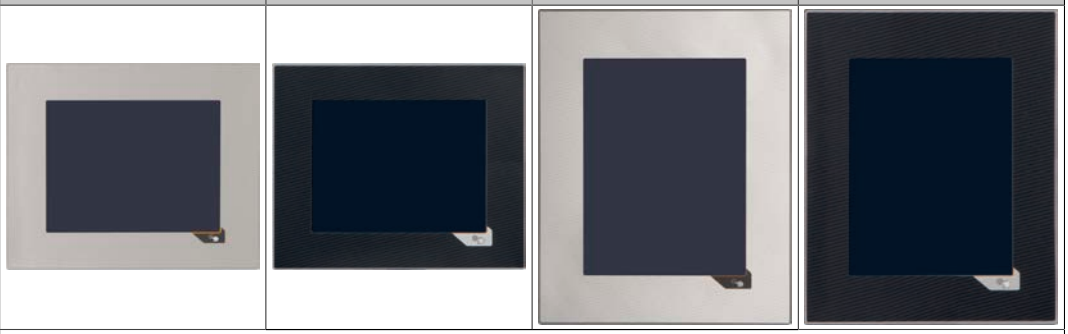
Model number	6PPT30.0573-20W	6PPT30.0573-20B	6PPT30.057L-20W	6PPT30.057L-20B
Figure				
Display	TFT color			
Resolution	VGA			
Display size	5.7"			
Touch screen	Analog resistive			
Format	Landscape		Portrait	
Color	Aluminum white	Anthracite	Aluminum white	Anthracite
Page	19			

Table 6: 6PPT30.057x - Overview

2.2.3.3 6PPT30.070x - Overview

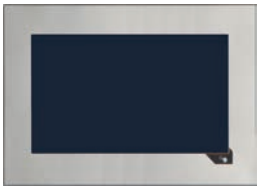
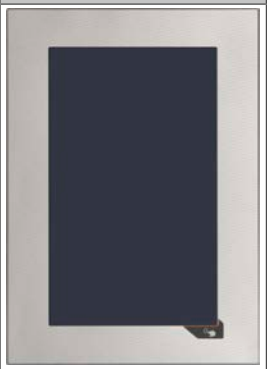
Model number	6PPT30.0702-20W	6PPT30.0702-20B	6PPT30.070M-20W	6PPT30.070M-20B
Figure				
Display	TFT color			
Resolution	WVGA			
Display size	7.0"			
Touch screen	Analog resistive			
Format	Landscape		Portrait	
Color	Aluminum white	Anthracite	Aluminum white	Anthracite
Page	22			

Table 7: 6PPT30.070x - Overview

2.2.3.4 6PPT30.101x - Overview

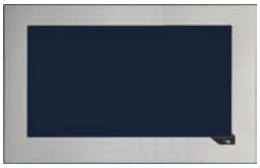
Model number	6PPT30.101G-20W	6PPT30.101G-20B	6PPT30.101N-20W	6PPT30.101N-20B
Figure				
Display	TFT color			
Resolution	WSVGA			
Display size	10.1"			
Touch screen	Analog resistive			
Format	Landscape		Portrait	
Color	Aluminum white	Anthracite	Aluminum white	Anthracite
Page	25			

Table 8: 6PPT30.101x - Overview

2.2.3.5 Interfaces

Model number	6PPT30.xxxx-20x
Figure	
Ethernet interfaces 10/100BASE-T	2
USB 2.0 interfaces	2

Table 9: Interfaces

2.2.4 Automation Studio and Automation Runtime dependencies

The Power Panel functions below refer to the most recent version of the PPT image. The following table shows dependencies between these functions and other components (e.g. AS, AR).

Function	Starting with AS version	Starting with AR version
Updating with Automation Studio and data generated for USB flash drive	AS 4.2.1	-
Support for "Load settings from PLC"	AS 4.2.3	AR A4.23
Adding a boot logo for Power Panels in portrait format	AS 4.2.4	-

Table 10: Automation Studio and Automation Runtime dependencies

2.2.5 6PPT30.xxxx-20x

2.2.5.1 6PPT30.043x-20x

2.2.5.1.1 6PPT30.043x-20x - Order data

Model number	Short description	Figure
	Power Panel T30	
6PPT30.043F-20W	Power Panel T30, 4.3", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, aluminum white pinstripe	
6PPT30.043F-20B	Power Panel T30, 4.3", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, anthracite gray pinstripe	
6PPT30.043K-20W	Power Panel T30, 4.3", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, aluminum white pinstripe	
6PPT30.043K-20B	Power Panel T30, 4.3", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, anthracite gray pinstripe	
	Required accessories	
	Terminal blocks	
0TB6102.2010-01	Accessory terminal block, 2-pin (3.81), screw clamp, 1.5 mm²	
0TB6102.2110-01	Accessory terminal block, 2-pin (3.81), cage clamp, 1.5 mm²	
	Optional accessories	
	Miscellaneous	
9A0013.01	Stylus pen for resistive touch screen	
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive, 2048 MB, B&R	
5MMUSB.4096-01	USB 2.0 flash drive, 4096 MB, B&R	

Table 11: 6PPT30.043F-20W, 6PPT30.043F-20B, 6PPT30.043K-20W, 6PPT30.043K-20B - Order data

2.2.5.1.2 6PPT30.043x-20x - Technical data

Product ID	6PPT30.043F-20W	6PPT30.043F-20B	6PPT30.043K-20W	6PPT30.043K-20B
General information				
Cooling	Fanless			
LED status indicators	Ethernet			
B&R ID code	0xE589	0xE58A	0xE58B	0xE58C
Power button	No			
Reset button	No			
Buzzer	Yes			
Electrical isolation				
24 VDC - USB	No			
USB - Ethernet	Yes			
Ethernet - 24 VDC	Yes			
Certification				
CE	Yes			
cULus	Yes			
GOST-R	Yes			
Controller				
Operating system	T30 image			
DRAM	256 MB			
Real-time clock	No			
Processor				
Type	ARM Cortex A8			
Clock frequency	600 MHz			
L1 cache	64 kB			
L2 cache	256 kB			
Flash	512 MB			
Cooling	Passive			
Mode/Node switches	No			
Interfaces				
Switch				
Interface A	IF1 interface			
Interface B	IF2 interface			
IF1 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF2 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A [1)]			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A [2)]			
Display				
Type	TFT color			
Display size	4.3"			
Colors	16.7 M			
Resolution	WQVGA, 480 x 272 pixels		WQVGA, 272 x 480 pixels	
Contrast	Typ. 350:1			
Viewing angles				
Horizontal	Direction R / Direction L = typ. 70°		Direction R = typ. 45° / Direction L = typ. 65°	
Vertical	Direction U = typ. 45° / Direction D = typ. 65°		Direction U / Direction D = typ. 70°	

Table 12: 6PPT30.043F-20W, 6PPT30.043F-20B, 6PPT30.043K-20W, 6PPT30.043K-20B - Technical data

Product ID	6PPT30.043F-20W	6PPT30.043F-20B	6PPT30.043K-20W	6PPT30.043K-20B
Backlight				
Type	LED			
Brightness	Typ. 350 cd/m²			
Half-brightness time 3)	30,000 h			
Touch screen				
Type	AMT			
Technology	Analog resistive			
Controller	B&R, 12-bit			
Transmittance	80% ±3%			
Screen rotation	No			
Electrical characteristics				
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	230 mA			
Max. power consumption	5.5 W			
Operating conditions				
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions				
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Storage	-20 to 60°C			
Transport	-20 to 60°C			
Relative humidity				
Operation	See humidity diagram			
Storage	See humidity diagram			
Transport	See humidity diagram			
Mechanical characteristics				
Note	Order terminal blocks 1x 0TB6102.2010-01 and 1x 0TB6102.2110-01 separately			
Front				
Design	Aluminum white pinstripe	Anthracite gray pinstripe	Aluminum white pinstripe	Anthracite gray pinstripe
Dimensions				
Width	140 mm		96 mm	
Height	96 mm		140 mm	
Depth	38.3 mm			
Weight	0.3 kg			

Table 12: 6PPT30.043F-20W, 6PPT30.043F-20B, 6PPT30.043K-20W, 6PPT30.043K-20B - Technical data

1) The maximum current load is 0.1 A for hardware revisions less than B0.
2) The maximum current load is 0.1 A for hardware revisions B0 to B2.
The maximum current load is 0.5 A for hardware revisions less than B0.
3) At an ambient temperature of 25°C. Reducing the brightness by 50% can result in an approximately 50% increase in the half-brightness time.

2.2.5.2 6PPT30.057x-20x

2.2.5.2.1 6PPT30.057x-20x - Order data

Model number	Short description	Figure
	Power Panel T30	
6PPT30.0573-20W	Power Panel T30, 5.7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, aluminum white pinstripe	
6PPT30.0573-20B	Power Panel T30, 5.7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, anthracite gray pinstripe	
6PPT30.057L-20W	Power Panel T30, 5.7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, aluminum white pinstripe	
6PPT30.057L-20B	Power Panel T30, 5.7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, anthracite gray pinstripe	
	Required accessories	
	Terminal blocks	
0TB6102.2010-01	Accessory terminal block, 2-pin (3.81), screw clamp, 1.5 mm²	
0TB6102.2110-01	Accessory terminal block, 2-pin (3.81), cage clamp, 1.5 mm²	
	Optional accessories	
	Miscellaneous	
9A0013.01	Stylus pen for resistive touch screen	
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive, 2048 MB, B&R	
5MMUSB.4096-01	USB 2.0 flash drive, 4096 MB, B&R	

Table 13: 6PPT30.0573-20W, 6PPT30.0573-20B, 6PPT30.057L-20W, 6PPT30.057L-20B - Order data

2.2.5.2.2 6PPT30.057x-20x - Technical data

Product ID	6PPT30.0573-20W	6PPT30.0573-20B	6PPT30.057L-20W	6PPT30.057L-20B
General information				
Cooling	Fanless			
LED status indicators	Ethernet			
B&R ID code	0xE58D	0xE58E	0xE58F	0xE590
Power button	No			
Reset button	No			
Buzzer	Yes			
Electrical isolation				
24 VDC - USB	No			
USB - Ethernet	Yes			
Ethernet - 24 VDC	Yes			
Certification				
CE	Yes			
cULus	Yes			
GOST-R	Yes			
Controller				
Operating system	T30 image			
DRAM	256 MB			
Real-time clock	No			
Processor				
Type	ARM Cortex A8			
Clock frequency	600 MHz			
L1 cache	64 kB			
L2 cache	256 kB			
Flash	512 MB			
Cooling	Passive			
Mode/Node switches	No			
Interfaces				
Switch				
Interface A	IF1 interface			
Interface B	IF2 interface			
IF1 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF2 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A [1)]			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A [2)]			
Display				
Type	TFT color			
Display size	5.7"			
Colors	262,000			
Resolution	VGA, 640 x 480 pixels		VGA, 480 x 640 pixels	
Contrast	Typ. 850:1			
Viewing angles				
Horizontal	Direction R / Direction L = typ. 80°			
Vertical	Direction U / Direction D = typ. 80°			

Table 14: 6PPT30.0573-20W, 6PPT30.0573-20B, 6PPT30.057L-20W, 6PPT30.057L-20B - Technical data

Product ID	6PPT30.0573-20W	6PPT30.0573-20B	6PPT30.057L-20W	6PPT30.057L-20B
Backlight				
Type	LED			
Brightness	Typ. 400 cd/m²			
Half-brightness time 3)	50,000 h			
Touch screen				
Type	AMT			
Technology	Analog resistive			
Controller	B&R, 12-bit			
Transmittance	80% ±3%			
Screen rotation	No			
Electrical characteristics				
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	319 mA			
Max. power consumption	7.66 W			
Operating conditions				
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions				
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Storage	-20 to 60°C			
Transport	-20 to 60°C			
Relative humidity				
Operation	See humidity diagram			
Storage	See humidity diagram			
Transport	See humidity diagram			
Mechanical characteristics				
Note	Order terminal blocks 1x 0TB6102.2010-01 and 1x 0TB6102.2110-01 separately			
Front				
Design	Aluminum white pinstripe	Anthracite gray pinstripe	Aluminum white pinstripe	Anthracite gray pinstripe
Dimensions				
Width	172 mm		140 mm	
Height	140 mm		172 mm	
Depth	48 mm			
Weight	0.5 kg			

Table 14: 6PPT30.0573-20W, 6PPT30.0573-20B, 6PPT30.057L-20W, 6PPT30.057L-20B - Technical data

1) The maximum current load is 0.1 A for hardware revisions less than B0.
2) The maximum current load is 0.1 A for hardware revisions B0 to B2.
The maximum current load is 0.5 A for hardware revisions less than B0.
3) At an ambient temperature of 25°C. Reducing the brightness by 50% can typically result in an approximately 50% increase in the half-brightness time.

2.2.5.3 6PPT30.070x-20x

2.2.5.3.1 6PPT30.070x-20x - Order data

Model number	Short description	Figure
	Power Panel T30	
6PPT30.0702-20W	Power Panel T30, 7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, aluminum white pinstripe	
6PPT30.0702-20B	Power Panel T30, 7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, anthracite gray pinstripe	
6PPT30.070M-20W	Power Panel T30, 7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, aluminum white pinstripe	
6PPT30.070M-20B	Power Panel T30, 7", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, anthracite gray pinstripe	
	Required accessories	
	Terminal blocks	
0TB6102.2010-01	Accessory terminal block, 2-pin (3.81), screw clamp, 1.5 mm²	
0TB6102.2110-01	Accessory terminal block, 2-pin (3.81), cage clamp, 1.5 mm²	
	Optional accessories	
	Miscellaneous	
9A0013.01	Stylus pen for resistive touch screen	
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive, 2048 MB, B&R	
5MMUSB.4096-01	USB 2.0 flash drive, 4096 MB, B&R	

Table 15: 6PPT30.0702-20W, 6PPT30.0702-20B, 6PPT30.070M-20W, 6PPT30.070M-20B - Order data

2.2.5.3.2 6PPT30.070x-20x - Technical data

Product ID	6PPT30.0702-20W	6PPT30.0702-20B	6PPT30.070M-20W	6PPT30.070M-20B
General information				
Cooling	Fanless			
LED status indicators	Ethernet			
B&R ID code	0xE591	0xE592	0xE593	0xE594
Power button	No			
Reset button	No			
Buzzer	Yes			
Electrical isolation				
24 VDC - USB	No			
USB - Ethernet	Yes			
Ethernet - 24 VDC	Yes			
Certification				
CE	Yes			
cULus	Yes			
GOST-R	Yes			
Controller				
Operating system	T30 image			
DRAM	256 MB			
Real-time clock	No			
Processor				
Type	ARM Cortex A8			
Clock frequency	1 GHz [1)]			
L1 cache	64 kB			
L2 cache	256 kB			
Flash	512 MB			
Cooling	Passive			
Mode/Node switches	No			
Interfaces				
Switch				
Interface A	IF1 interface			
Interface B	IF2 interface			
IF1 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF2 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A [2)]			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A [3)]			
Display				
Type	TFT color			
Display size	7"			
Colors	16.2 M			
Resolution	WVGA, 800 x 480 pixels		WVGA, 480 x 800 pixels	
Contrast	Typ. 600:1			
Viewing angles				
Horizontal	Direction R / Direction L = typ. 60°		Direction R / Direction L = typ. 70°	
Vertical	Direction U / Direction D = typ. 70°		Direction U / Direction D = typ. 60°	

Table 16: 6PPT30.0702-20W, 6PPT30.0702-20B, 6PPT30.070M-20W, 6PPT30.070M-20B - Technical data

Product ID	6PPT30.0702-20W	6PPT30.0702-20B	6PPT30.070M-20W	6PPT30.070M-20B
Backlight				
Type	LED			
Brightness	Typ. 500 cd/m²			
Half-brightness time [4]	50,000 h			
Touch screen				
Type	AMT			
Technology	Analog resistive			
Controller	B&R, 12-bit			
Transmittance	80% ±3%			
Screen rotation	No			
Electrical characteristics				
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	389 mA			
Max. power consumption	9.34 W			
Operating conditions				
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions				
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Storage	-20 to 60°C			
Transport	-20 to 60°C			
Relative humidity				
Operation	See humidity diagram			
Storage	See humidity diagram			
Transport	See humidity diagram			
Mechanical characteristics				
Note	Order terminal blocks 1x 0TB6102.2010-01 and 1x 0TB6102.2110-01 separately			
Front				
Design	Aluminum white pinstripe	Anthracite gray pinstripe	Aluminum white pinstripe	Anthracite gray pinstripe
Dimensions				
Width	197 mm		140 mm	
Height	140 mm		197 mm	
Depth	48 mm			
Weight	0.6 kg			

Table 16: 6PPT30.0702-20W, 6PPT30.0702-20B, 6PPT30.070M-20W, 6PPT30.070M-20B - Technical data

1) The maximum clock frequency is 600 MHz for hardware revisions less than C0.
2) The maximum current load is 0.1 A for hardware revisions less than B0.
3) The maximum current load is 0.1 A for hardware revisions B0 to B2.
   The maximum current load is 0.5 A for hardware revisions less than B0.
4) At an ambient temperature of 25°C.

2.2.5.4 6PPT30.101x-20x

2.2.5.4.1 6PPT30.101x-20x - Order data

Model number	Short description	Figure
	Power Panel T30	
6PPT30.101G-20W	Power Panel T30, 10.1", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, aluminum white pinstripe	
6PPT30.101G-20B	Power Panel T30, 10.1", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, landscape format, anthracite gray pinstripe	
6PPT30.101N-20W	Power Panel T30, 10.1", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, aluminum white pinstripe	
6PPT30.101N-20B	Power Panel T30, 10.1", analog resistive touch screen, 2 Ethernet interfaces, internal switch, 2 USB 2.0 interfaces, embedded client software: - VNC client mode - Embedded web browser on board, portrait format, anthracite gray pinstripe	
	Required accessories	
	Terminal blocks	
0TB6102.2010-01	Accessory terminal block, 2-pin (3.81), screw clamp, 1.5 mm²	
0TB6102.2110-01	Accessory terminal block, 2-pin (3.81), cage clamp, 1.5 mm²	
	Optional accessories	
	Miscellaneous	
9A0013.01	Stylus pen for resistive touch screen	
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive, 2048 MB, B&R	
5MMUSB.4096-01	USB 2.0 flash drive, 4096 MB, B&R	

Table 17: 6PPT30.101G-20W, 6PPT30.101G-20B, 6PPT30.101N-20W, 6PPT30.101N-20B - Order data

2.2.5.4.2 6PPT30.101x-20x - Technical data

Product ID	6PPT30.101G-20W	6PPT30.101G-20B	6PPT30.101N-20W	6PPT30.101N-20B
General information				
Cooling	Fanless			
LED status indicators	Ethernet			
B&R ID code	0xE595	0xE596	0xE597	0xE598
Power button	No			
Reset button	No			
Buzzer	Yes			
Electrical isolation				
24 VDC - USB	No			
USB - Ethernet	Yes			
Ethernet - 24 VDC	Yes			
Certification				
CE	Yes			
cULus	Yes			
GOST-R	Yes			
Controller				
Operating system	T30 image			
DRAM	256 MB			
Real-time clock	No			
Processor				
Type	ARM Cortex A8			
Clock frequency	1 GHz [1)]			
L1 cache	64 kB			
L2 cache	256 kB			
Flash	512 MB			
Cooling	Passive			
Mode/Node switches	No			
Interfaces				
Switch				
Interface A	IF1 interface			
Interface B	IF2 interface			
IF1 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF2 interface				
Type	Ethernet			
Design	1x RJ45 shielded			
Cable length	Max. 100 m between 2 stations (segment length)			
Max. transfer rate	10/100 Mbit/s			
Transmission				
Physical layer	10BASE-T / 100BASE-TX			
Half-duplex	Yes			
Full-duplex	Yes			
Autonegotiation	Yes			
Auto-MDI / MDIX	Yes			
IF3 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.5 A [2)]			
IF4 interface				
Type	USB 2.0			
Design	Type A			
Current load	0.2 A [3)]			
Display				
Type	TFT color			
Display size	10.1"			
Colors	256 k			
Resolution	WSVGA, 1024 x 600 pixels		WSVGA, 600 x 1024 pixels	
Contrast	Typ. 500:1			
Viewing angles				
Horizontal	Direction R / Direction L = typ. 80°			
Vertical	Direction U / Direction D = typ. 80°			

Table 18: 6PPT30.101G-20W, 6PPT30.101G-20B, 6PPT30.101N-20W, 6PPT30.101N-20B - Technical data

Product ID	6PPT30.101G-20W	6PPT30.101G-20B	6PPT30.101N-20W	6PPT30.101N-20B
Backlight				
Type	LED			
Brightness	Typ. 500 cd/m²			
Half-brightness time [4]	50,000 h			
Touch screen				
Type	AMT			
Technology	Analog resistive			
Controller	B&R, 12-bit			
Transmittance	80% ±3%			
Screen rotation	No			
Electrical characteristics				
Nominal voltage	8 to 32 VDC			
Max. current at nominal voltage	429 mA			
Max. power consumption	10.3 W			
Operating conditions				
EN 60529 protection	Back: IP20 Front: IP65			
Environmental conditions				
Temperature				
Operation				
Horizontal installation	-20 to 60°C			
Vertical installation	-20 to 60°C			
Storage	-20 to 60°C			
Transport	-20 to 60°C			
Relative humidity				
Operation	See humidity diagram			
Storage	See humidity diagram			
Transport	See humidity diagram			
Mechanical characteristics				
Note	Order terminal blocks 1x 0TB6102.2010-01 and 1x 0TB6102.2110-01 separately			
Front				
Design	Aluminum white pinstripe	Anthracite gray pinstripe	Aluminum white pinstripe	Anthracite gray pinstripe
Dimensions				
Width	276 mm		172 mm	
Height	172 mm		276 mm	
Depth	48 mm			
Weight	0.9 kg			

Table 18: 6PPT30.101G-20W, 6PPT30.101G-20B, 6PPT30.101N-20W, 6PPT30.101N-20B - Technical data

1) The maximum clock frequency is 600 MHz for hardware revisions less than C0.
2) The maximum current load is 0.1 A for hardware revisions less than B0.
3) The maximum current load is 0.1 A for hardware revisions B0 to B2.
   The maximum current load is 0.5 A for hardware revisions less than B0.
4) At an ambient temperature of 25°C.

2.2.5.5 Temperature/Humidity diagram

6PPT30.043x-20x

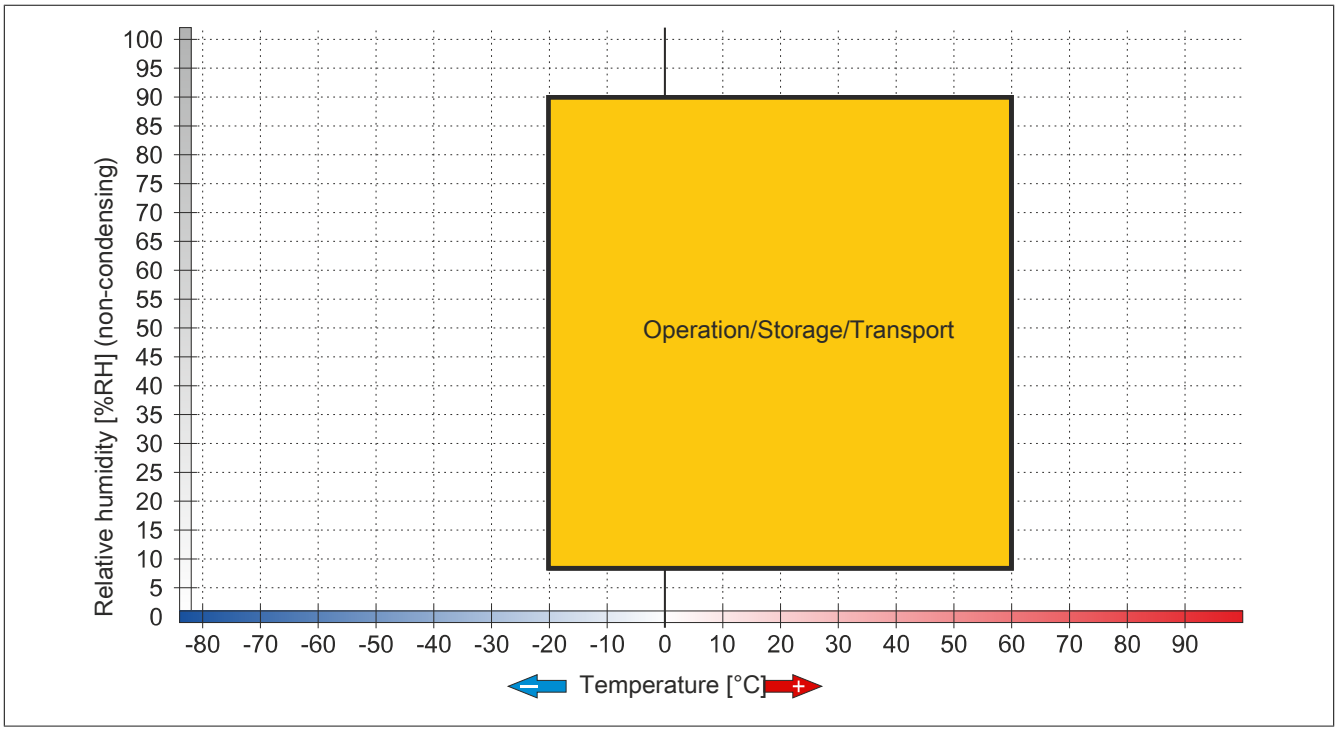


Figure 5: 6PPT30.043x-20x - Temperature/Humidity diagram

6PPT30.057x-20x

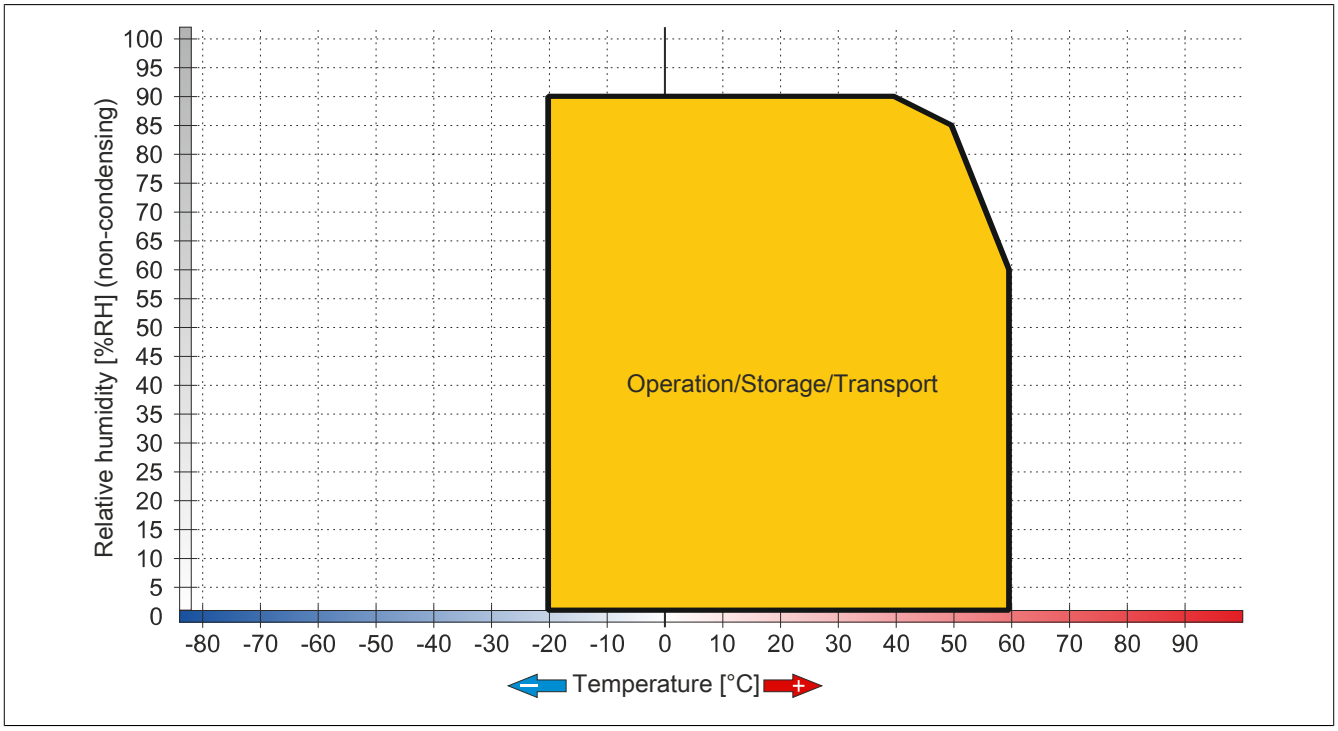


Figure 6: 6PPT30.057x-20x - Temperature/Humidity diagram

6PPT30.070x-20x

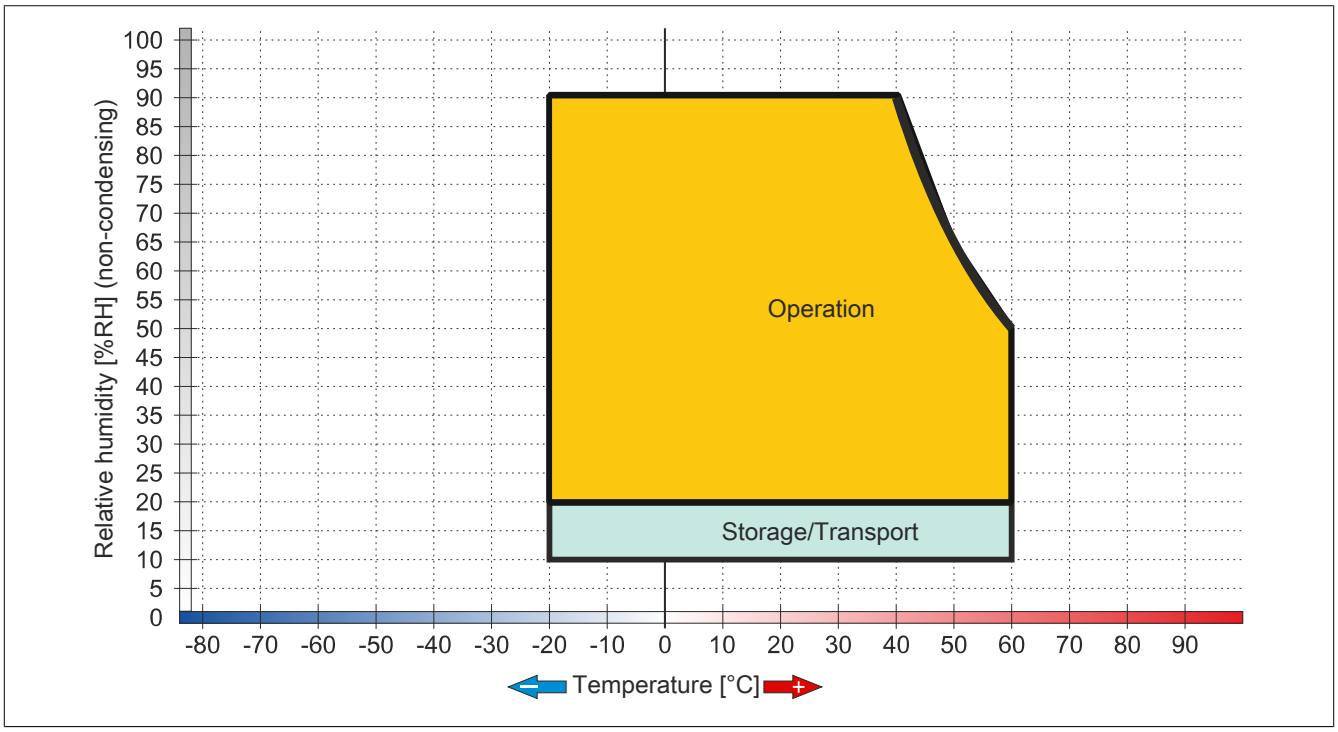


Figure 7: 6PPT30.070x-20x - Temperature/Humidity diagram

6PPT30.101x-20x

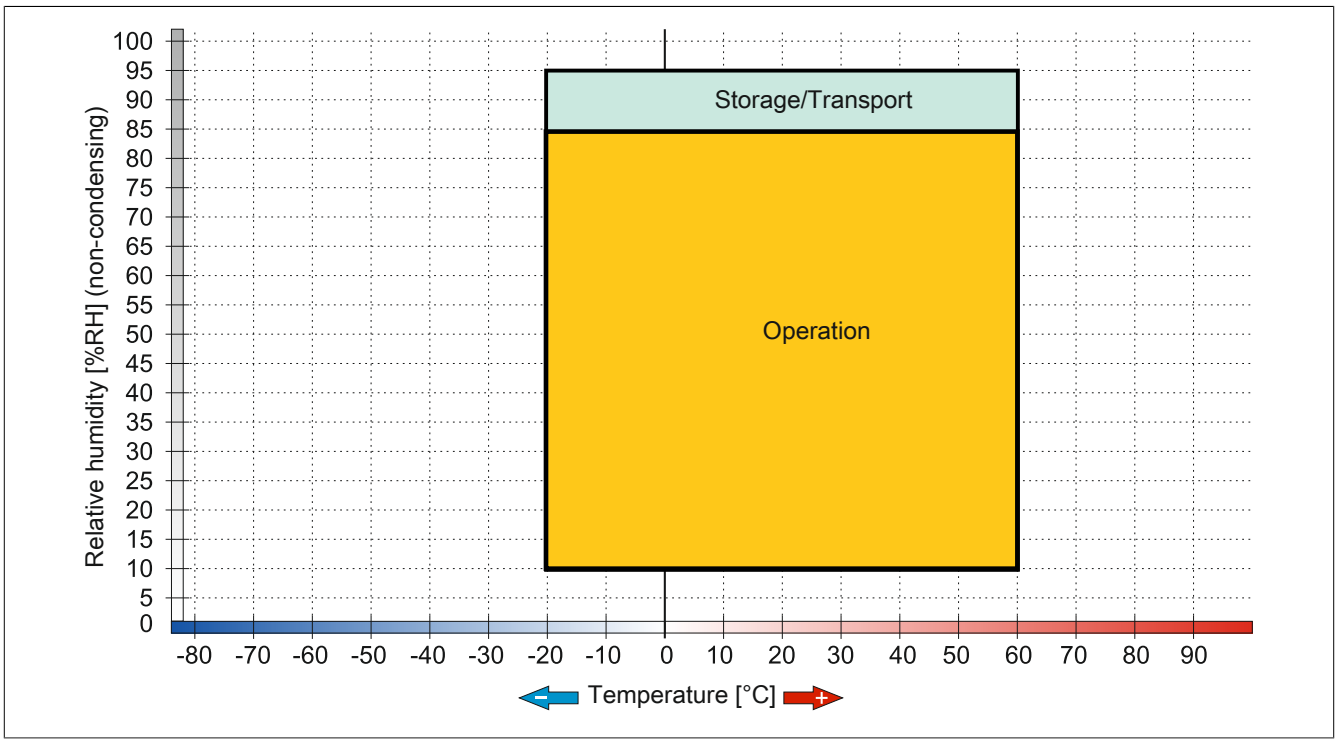


Figure 8: 6PPT30.101x-20x - Temperature/Humidity diagram

2.2.5.6 Connection elements

2.2.5.6.1 Ethernet interface

Interface	Pinout		
Ethernet interface	Terminal	Ethernet	
	1	RXD	Receive signal
	2	RXD\	Receive signal inverted
	3	TXD	Transmit signal
	4	Termination	Termination
	5	Termination	Termination
	6	TXD\	Transmit signal inverted
	7	Termination	Termination
Shielded RJ45 (10BASE-T /100BASE-TX)	8	Termination	Termination

Table 19: Ethernet interface - Pinout

2.2.5.6.2 USB interface

This Power Panel is equipped with a USB 2.0 (Universal Serial Bus) host controller with 2 USB interfaces that are accessible externally for the user.

Figure 9: USB interface

	USB interface
Transfer rate[1]	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), high speed (480 Mbit/s)
Power supply	Max. 0.5 A (IF3) or 0.1 A (IF4) per interface[2]

Table 20: USB interface

1 The actual value depends on the operating system or driver being used.
2 Each USB interface is protected by a maintenance-free "USB current-limiting circuit breaker" (max. 0.5 A @ IF3 / max. 0.1 A @ IF4).

Warning!

Peripheral USB devices can be connected to the USB interfaces on this device. Due to the vast number of USB devices available on the market, B&R cannot guarantee their performance.

Important!

Because of general PC specifications this interface should be handled with extreme care with regard to EMC, location of cables etc.

2.2.5.6.3 Power supply

Figure 10: Power supply

The pinout is listed in the following table and printed on the housing. The supply voltage is protected internally by a soldered fuse (4 A, fast-acting) to prevent damage to the device in the event of an overload (fuse replacement necessary) or if the voltage supply is connected incorrectly (reverse polarity protection -> fuse replacement not necessary). The device must be returned to B&R for repairs if the fuse is blown in the event of an error.

Pinout		
Terminal	**Assignment**	
1	+	24 VDC
2	-	GND
Required accessories		
0TB6102.2010-01	Accessory terminal block, 2-pin (3.81), screw clamps 1.5 mm²	
0TB6102.2110-01	Accessory terminal block, 2-pin (3.81), cage clamps 1.5 mm²	

Table 21: Power supply

Important!

The ground potential (which has a spade terminal) must be connected to ground (e.g. control cabinet) using the shortest possible path.

Figure 11: Grounding

2.2.5.7 Dimensions

2.2.5.7.1 6PPT30.043x-20x - Dimensions

Landscape

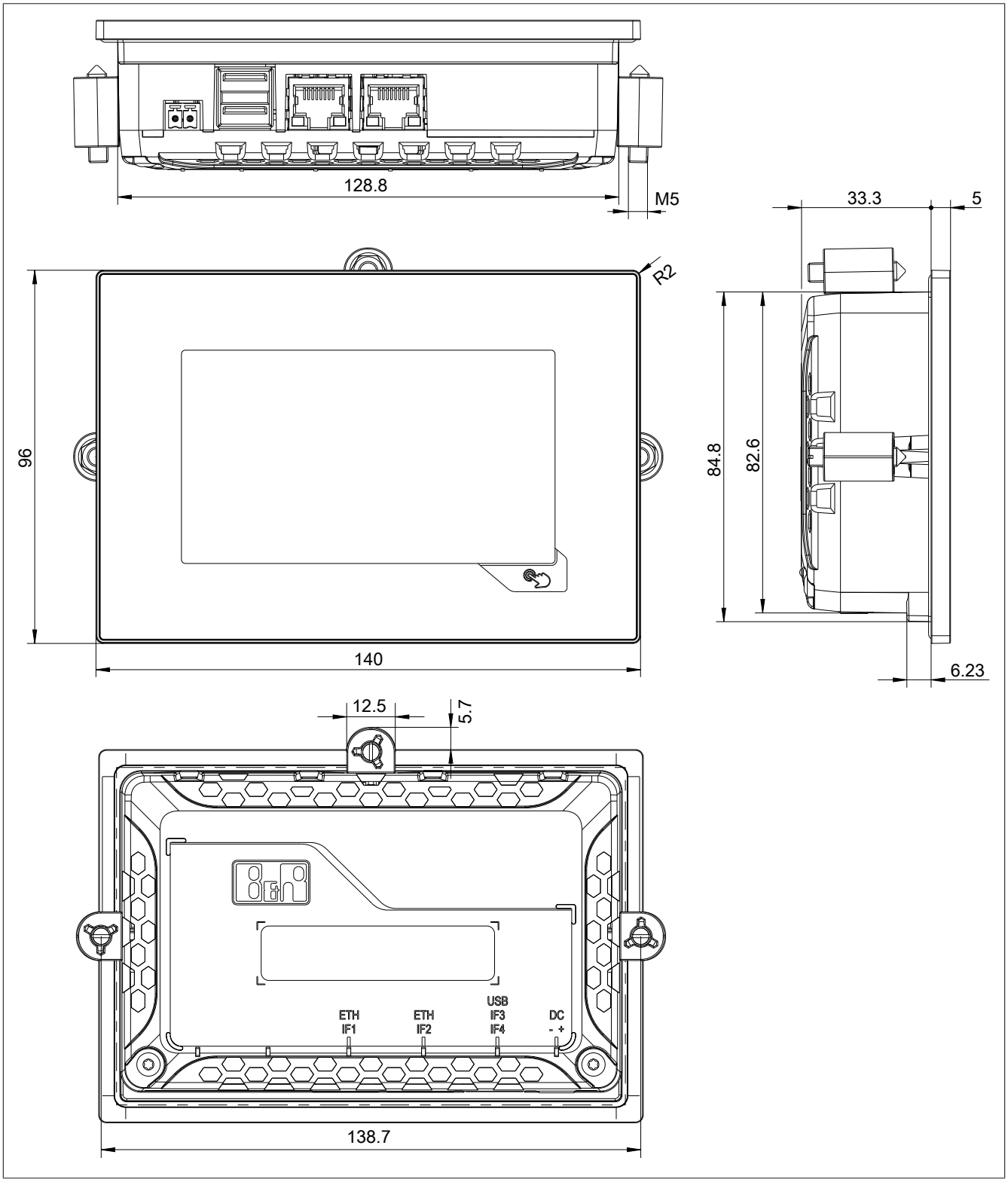


Figure 12: 6PPT30.043x-20x - 6PPT30.043F - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 130.8 mm ±1 x 86.8 mm ±1

Portrait

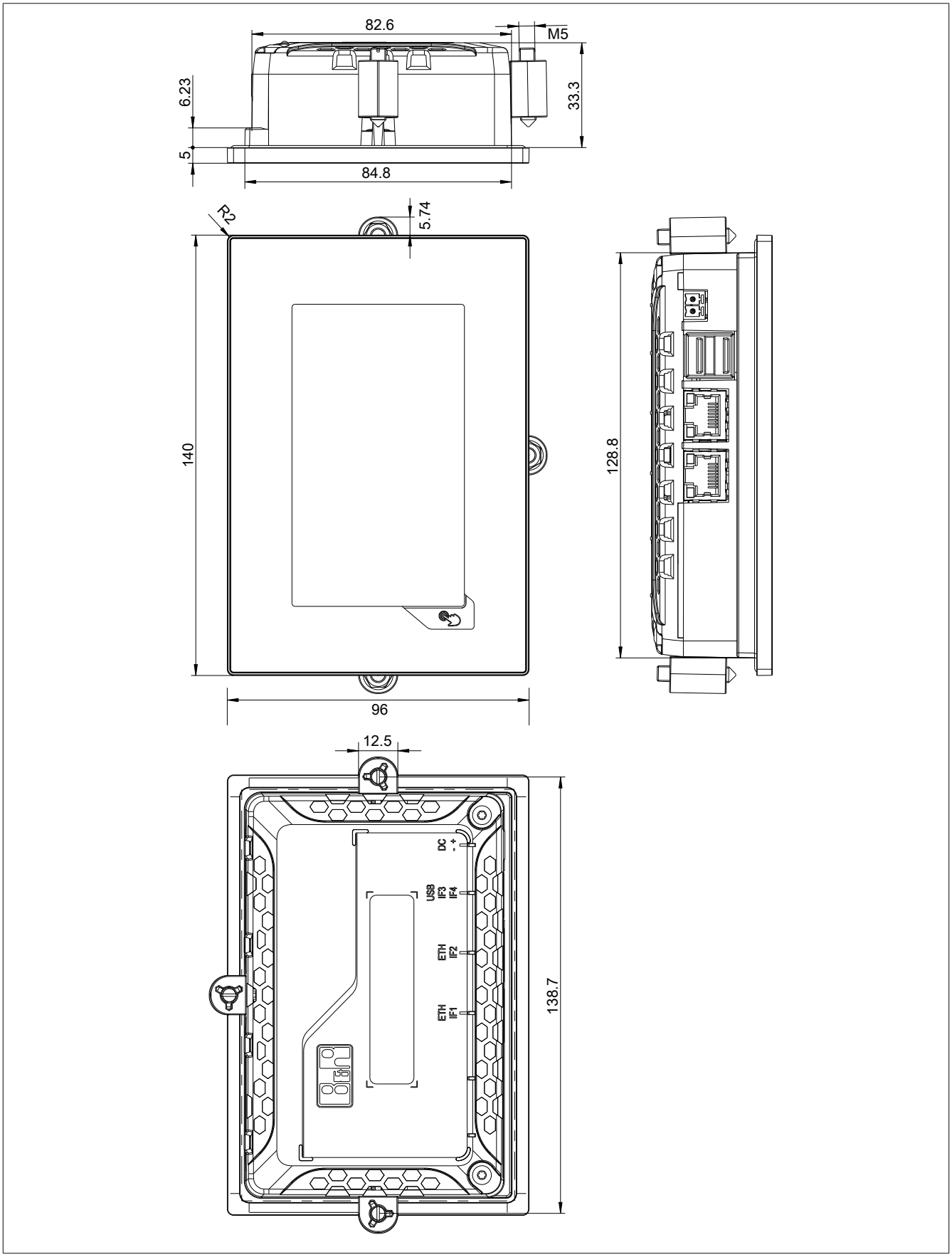


Figure 13: 6PPT30.043x-20x - 6PPT30.043K - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 86.8 mm ±1 x 130.8 mm ±1

2.2.5.7.2 6PPT30.057x-20x - Dimensions

Landscape

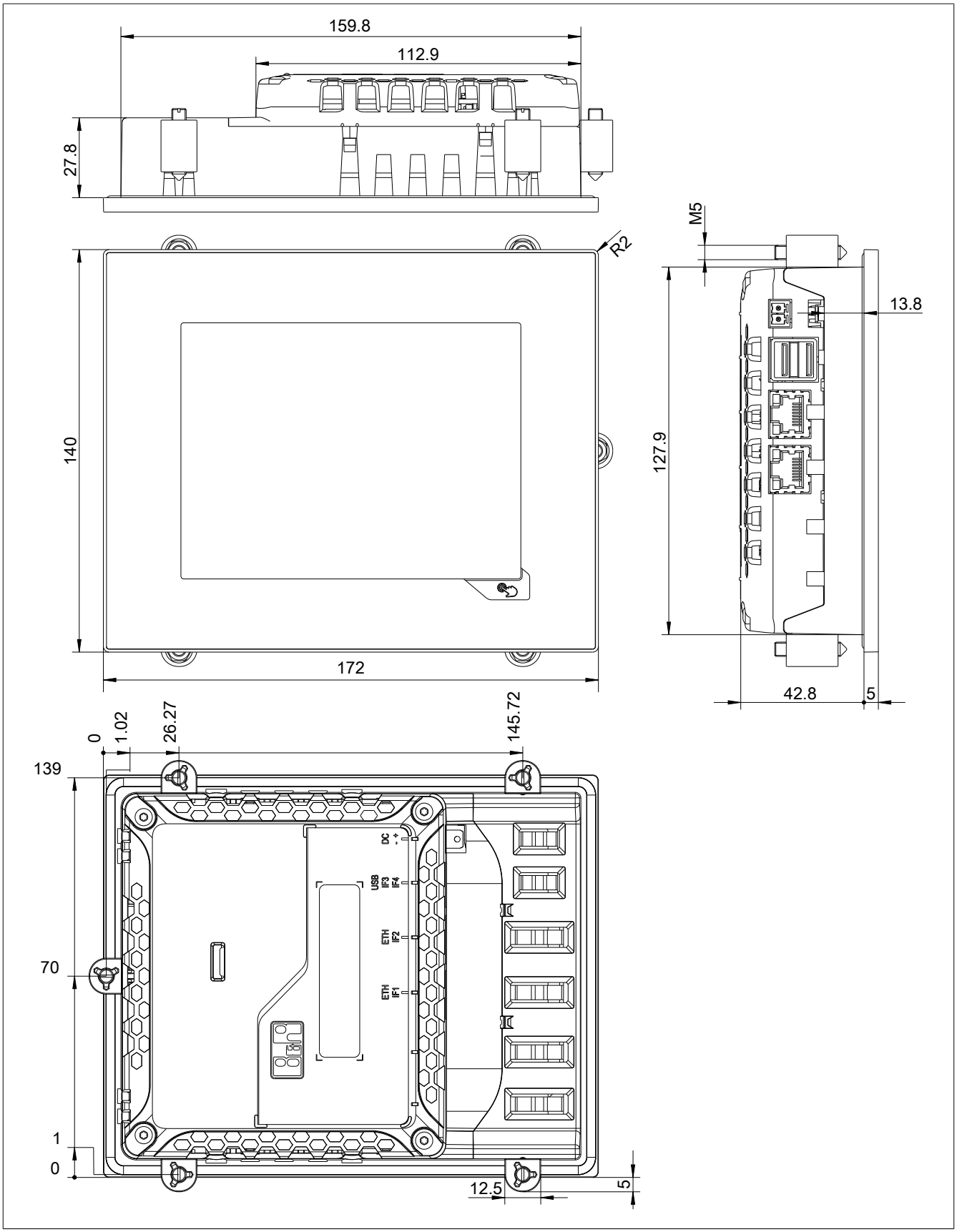


Figure 14: 6PPT30.057x-20x - 6PPT30.0573 - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 161.8 mm ±1 x 129.9 mm ±1

Portrait

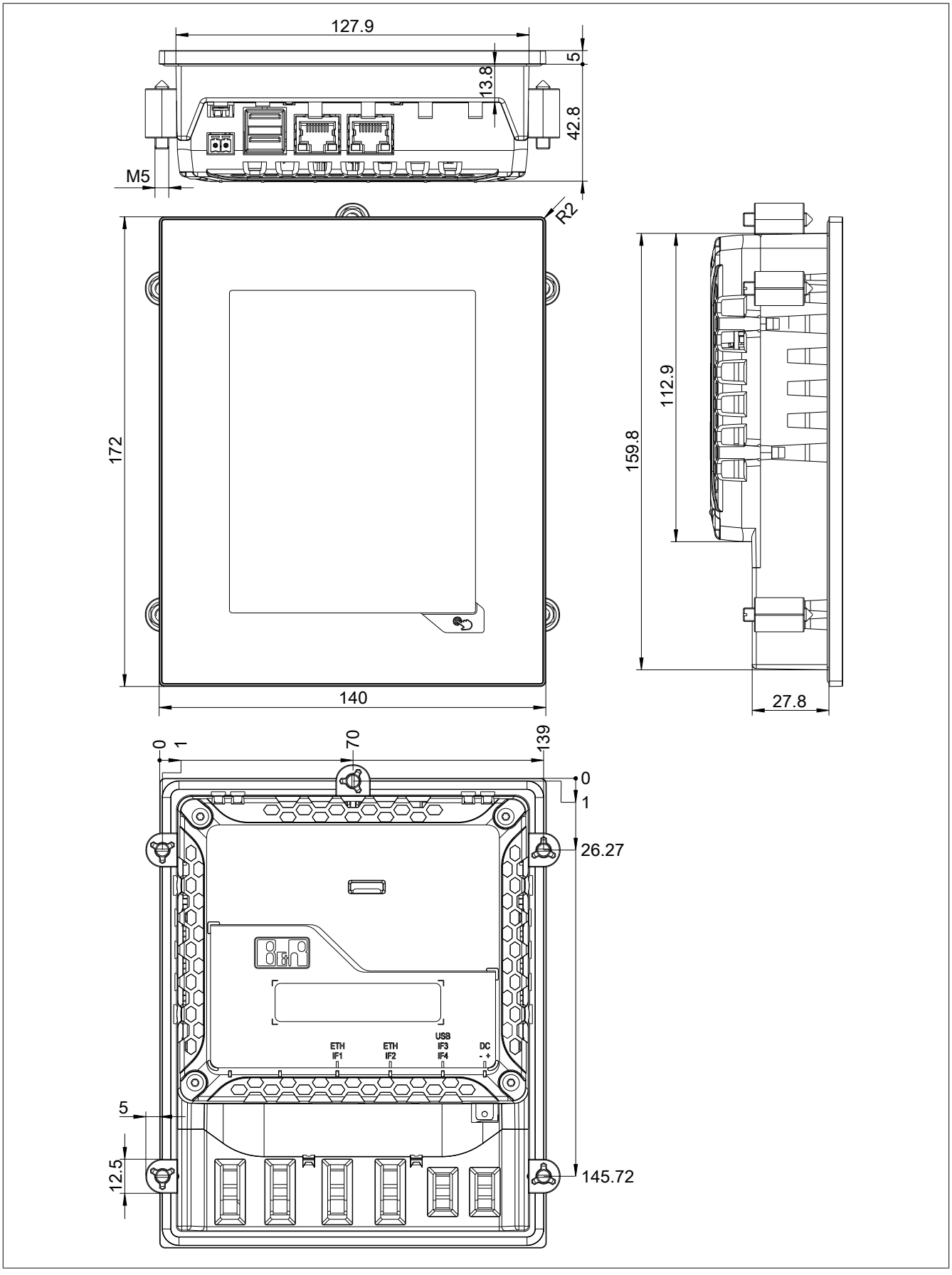


Figure 15: 6PPT30.057x-20x - 6PPT30.057L - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 129.9 mm ±1 x 161.8 mm ±1

2.2.5.7.3 6PPT30.070x-20x - Dimensions

Landscape

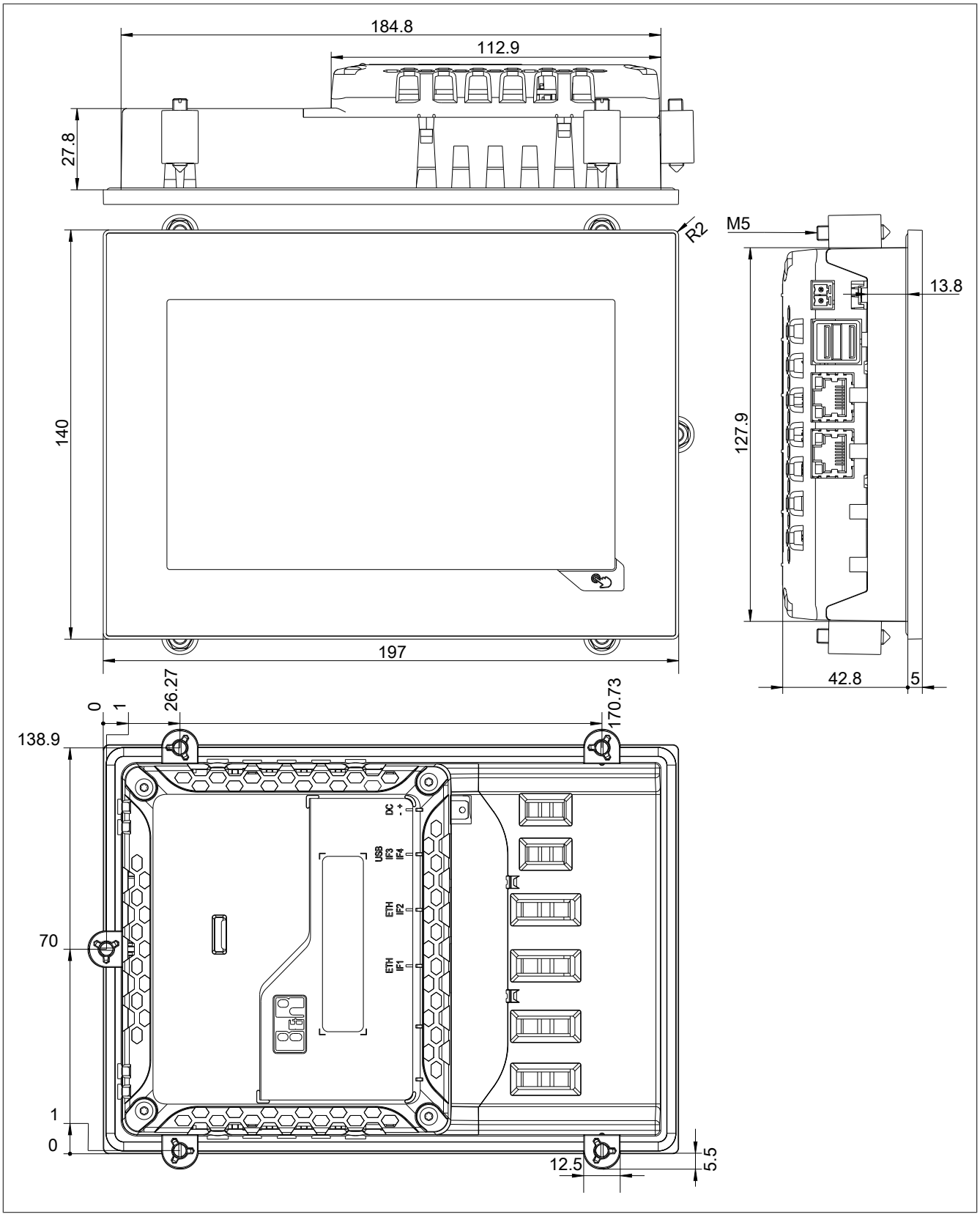


Figure 16: 6PPT30.070x-20x - 6PPT30.0702 - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 186.8 mm ±1 x 129.8 mm ±1

Portrait

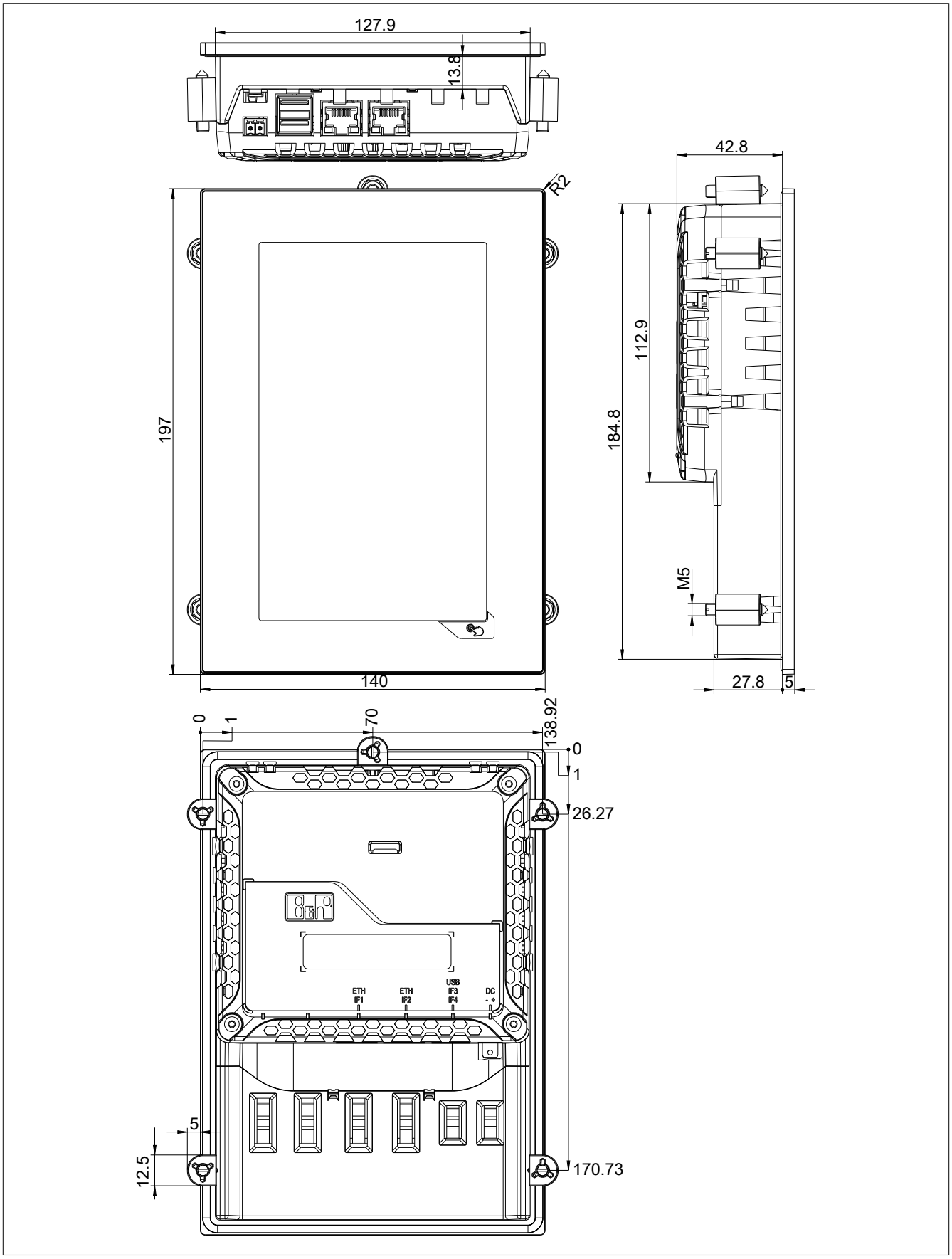


Figure 17: 6PPT30.070x-20x - 6PPT30.070M - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 129.8 mm ±1 x 186.8 mm ±1

2.2.5.7.4 6PPT30.101x-20x - Dimensions

Landscape

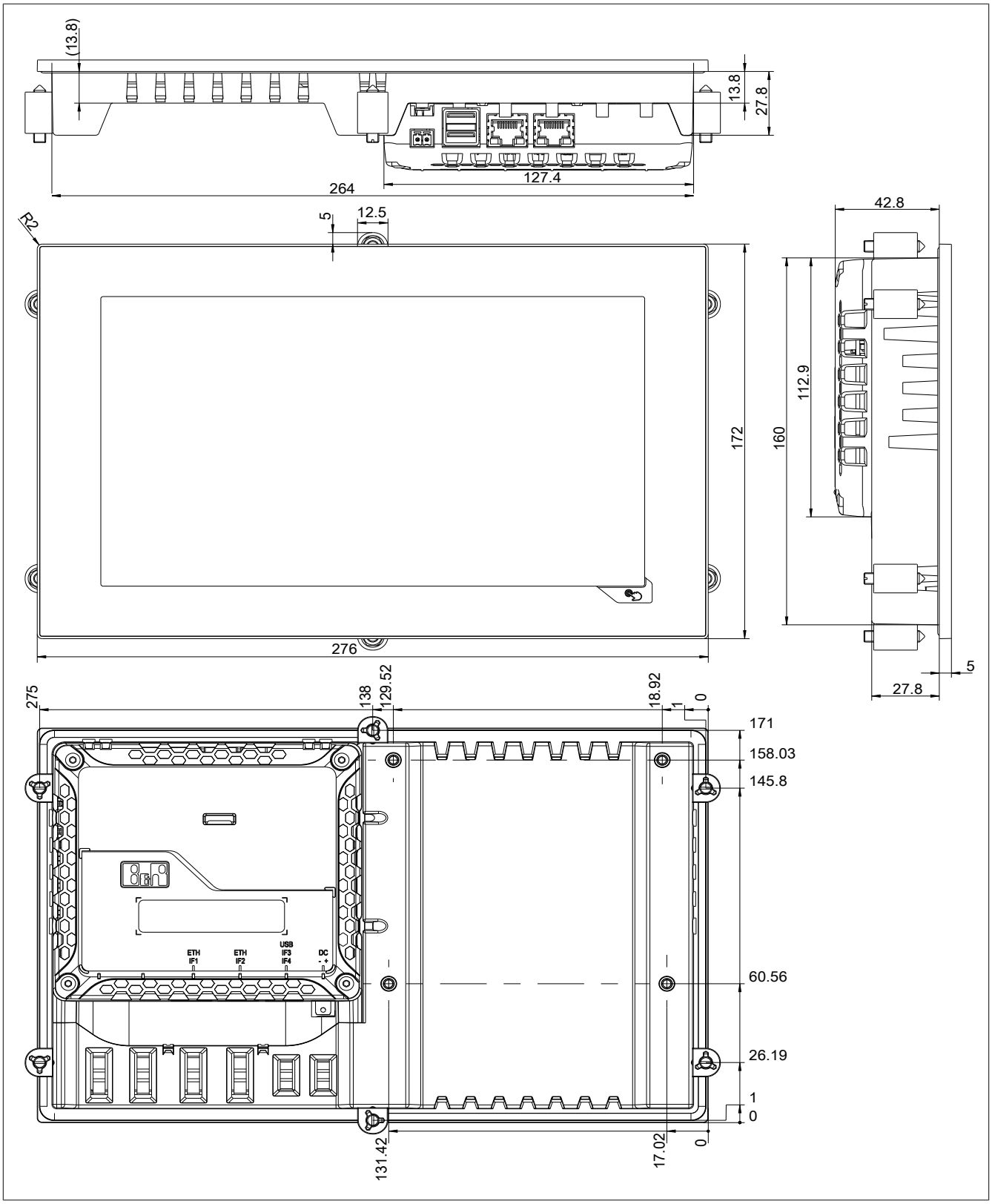


Figure 18: 6PPT30.101x-20x - 6PPT30.101G - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 265.9 mm ±1 x 161.9 mm ±1

Portrait

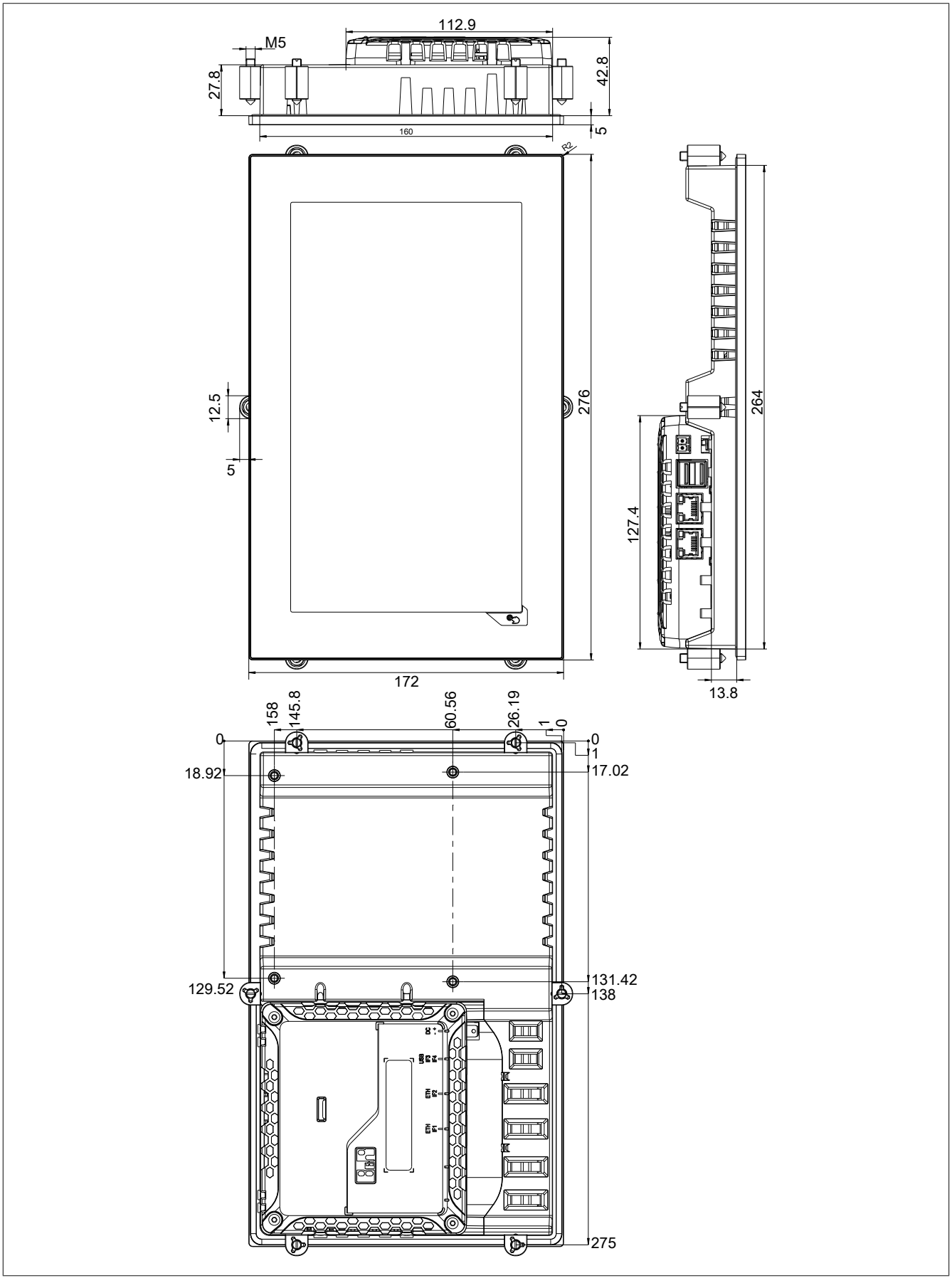


Figure 19: 6PPT30.101x-20x - 6PPT30.101N - Dimensions

Max. control cabinet thickness: 6 mm

Cutout dimensions: 161.9 mm ±1 x 265.9 mm ±1

3 Installation

3.1 Installation

Danger!

- **All supplied power must be disconnected before removing device covers or components or installing/removing accessories, hardware or cables.**
- **The power cable must be disconnected from the device and from the voltage supply.**
- **All covers, components, accessories, hardware and cables must be installed or connected before the device can be connected to the power supply and turned on.**

3.1.1 Important installation information

- Environmental conditions must be taken into consideration.
- When installed in an enclosure, enough space must be available for air to circulate sufficiently.
- This device must be installed on a flat, clean and burr-free surface.
- Ventilation holes must not be covered.
- This device must be installed using one of the approved mounting orientations.
- The flex radius of connected cables must not be exceeded.
- This device must be installed in a position and orientation that make viewing as easy as possible for the operator.

3.1.2 Mounting with retaining clips

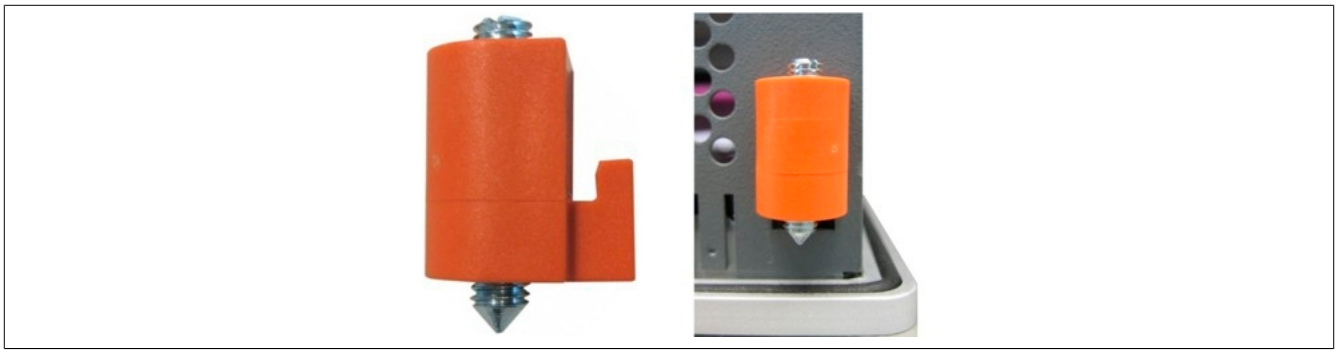


Figure 20: Cover retaining clip

Retaining clips are designed to clamp a maximum thickness of 6 mm and minimum thickness of 2 mm.

A large flat-blade screwdriver is needed to tighten and loosen the screws. The maximum tightening torque for the retaining clips is 0.6 Nm.

Devices must be installed on a flat, clean and burr-free surface; uneven areas can cause damage to the display when the screws are tightened or the intrusion of dust and water.

3.1.2.1 Procedure

1. Insert the device into the front side of the smooth, flat installation cutout. The required dimensions of the installation cutout can be found in the "Dimensions" section.
2. Place the retaining clips on the B&R device. To do this, insert the clips into the openings on the sides of the B&R device (indicated by the orange circles). The number of openings may vary depending on the size of the device.

Figure 21: Inserting the retaining clips

3. Slide the retaining clips all the way to the back of the openings.

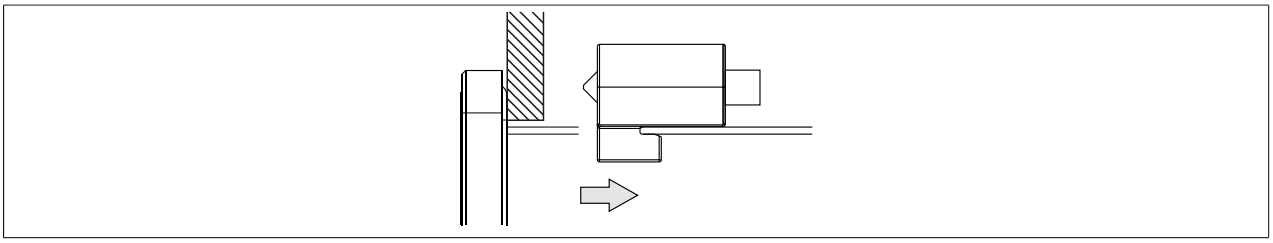


Figure 22: Sliding the retaining clips back

4. Now fasten the retaining clips to the wall or control cabinet by tightening the screws with a flat-blade screwdriver. The tightening torque should be approximately 0.6 Nm.

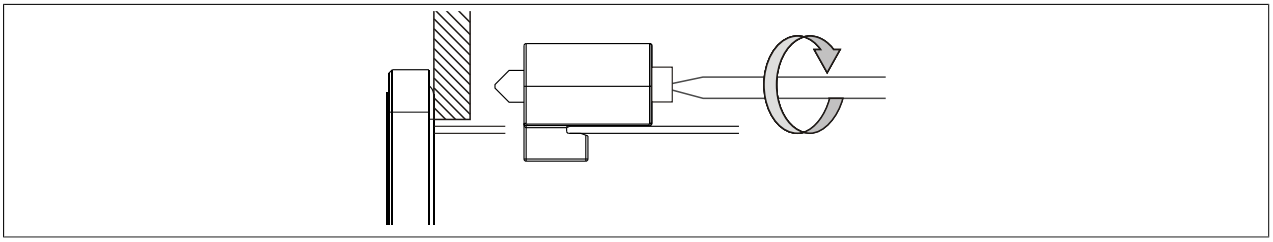


Figure 23: Mounting with retaining clamps

3.1.3 Installation instructions

The Power Panel must be mounted using the retaining clips included in delivery (with a torque of 0.6 Nm).

In order to guarantee sufficient air circulation, the specified amount of space above, below, to the side and behind the Power Panel must be provided. The minimum specified spacing is indicated in the following diagrams. This applies to all Power Panel variants.

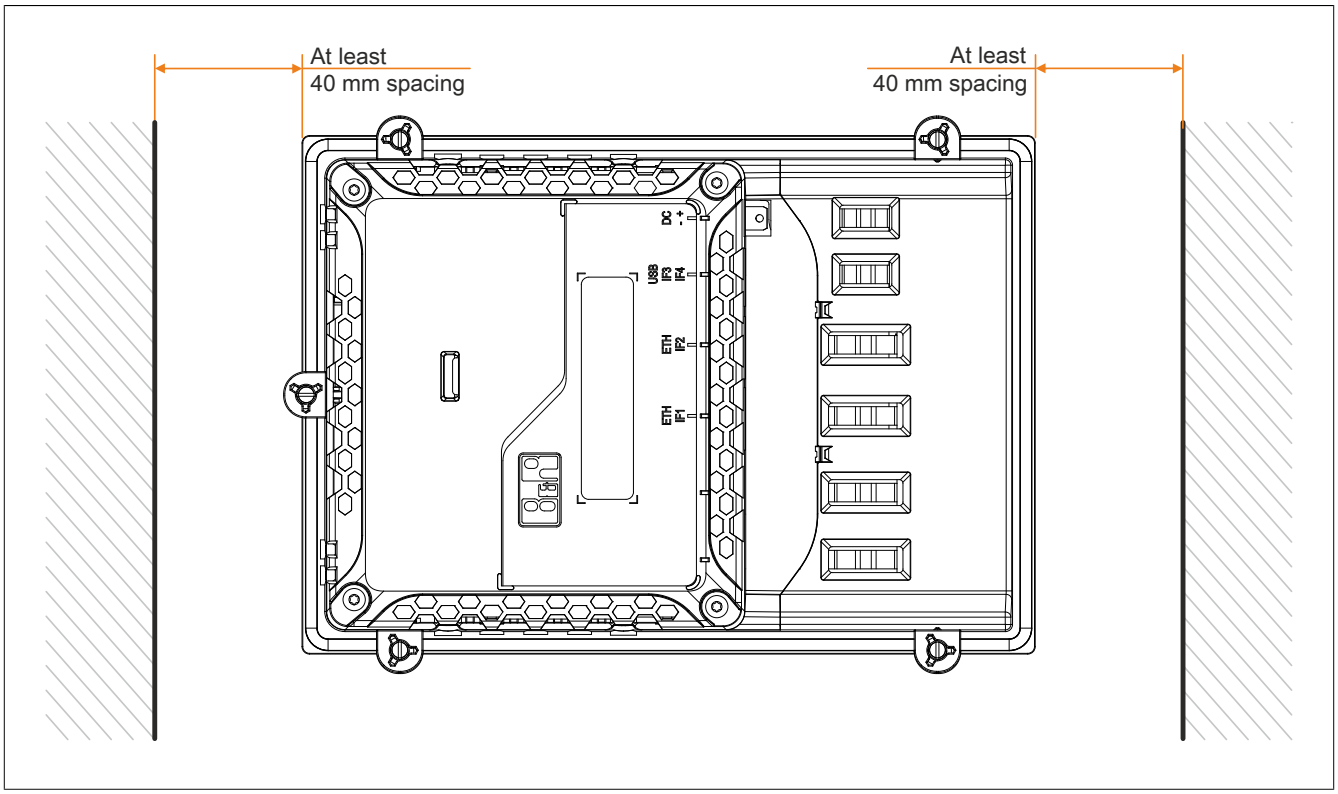


Figure 24: Spacing for air circulation - Rear view

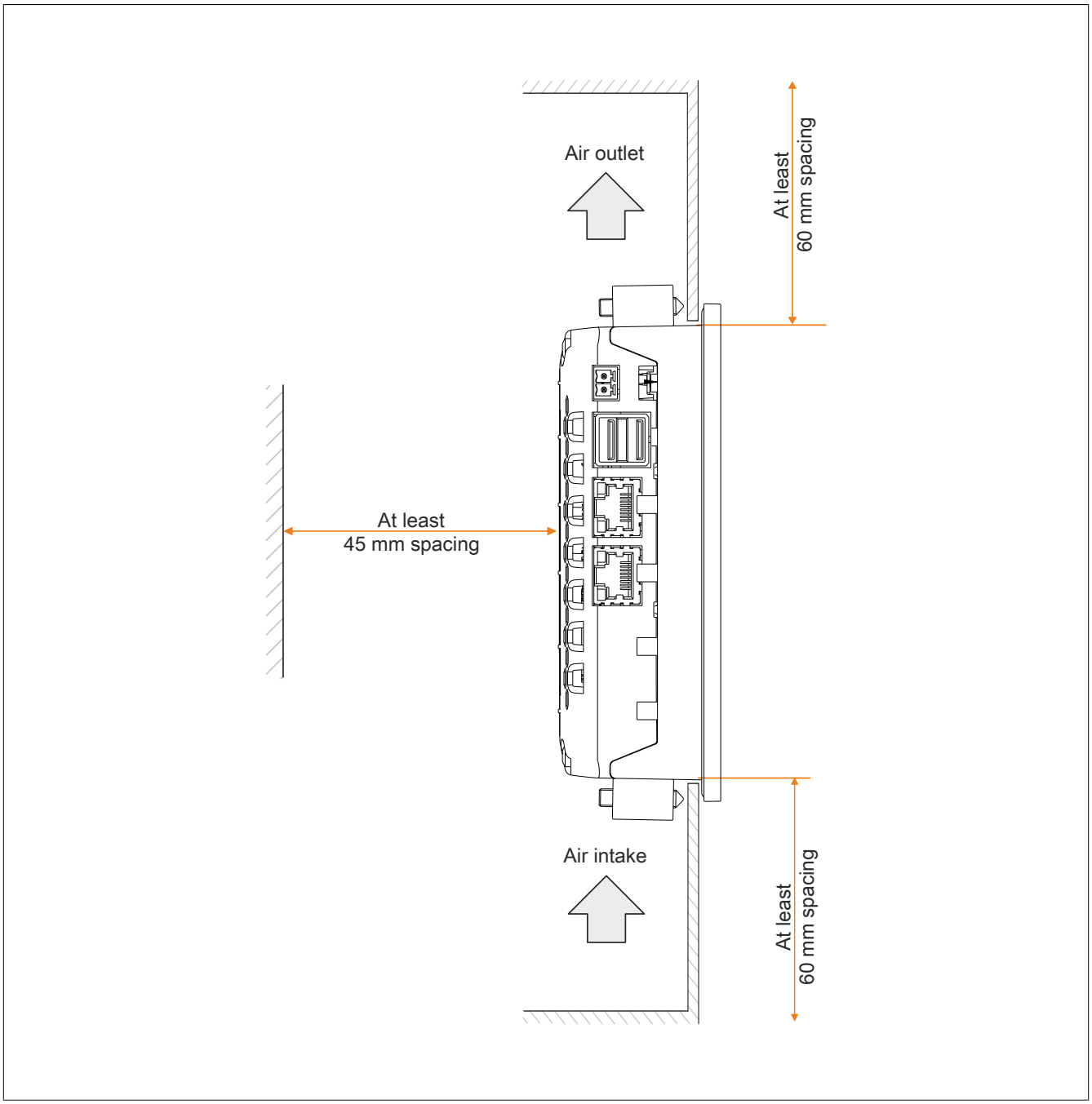


Figure 25: Spacing for air circulation - Side view

The spacing specifications for air circulation are based on the worst-case scenario for operation at the maximum specified ambient temperature (see "Temperature specifications" under "Technical data").

If the spacing specifications for air circulation cannot be adhered to, then the maximum specified temperatures for the temperature sensor ("TemperatureEnvironmental" max. 85°C, can be read with RfbExtTemperatureValue() function block) must be monitored by the user and appropriate measures taken if this value is exceeded.

3.1.4 Mounting orientations

The following diagram displays the specified mounting orientation for the Power Panel. These mounting orientations apply to all Power Panel variants.

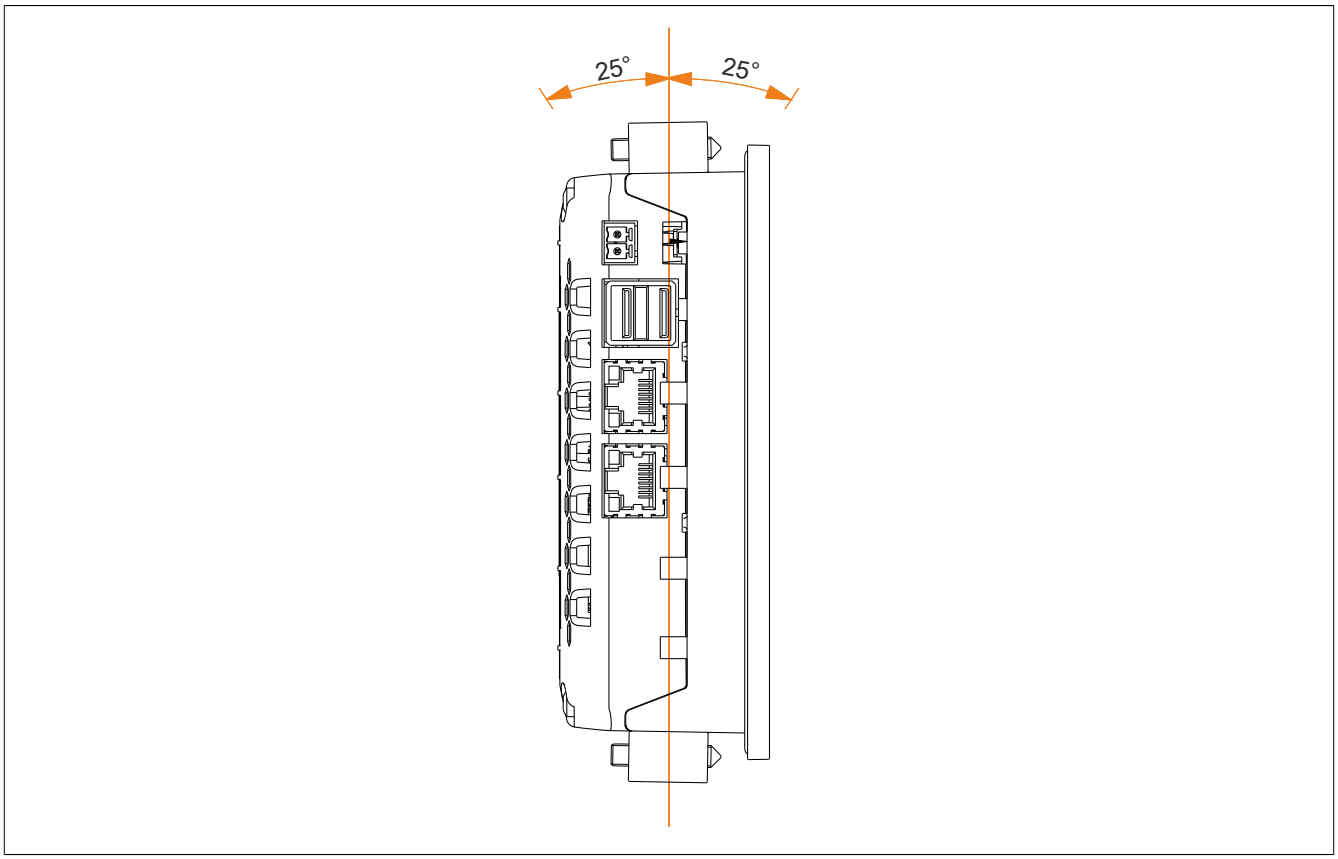


Figure 26: Power Panel - Mounting orientations

Caution!

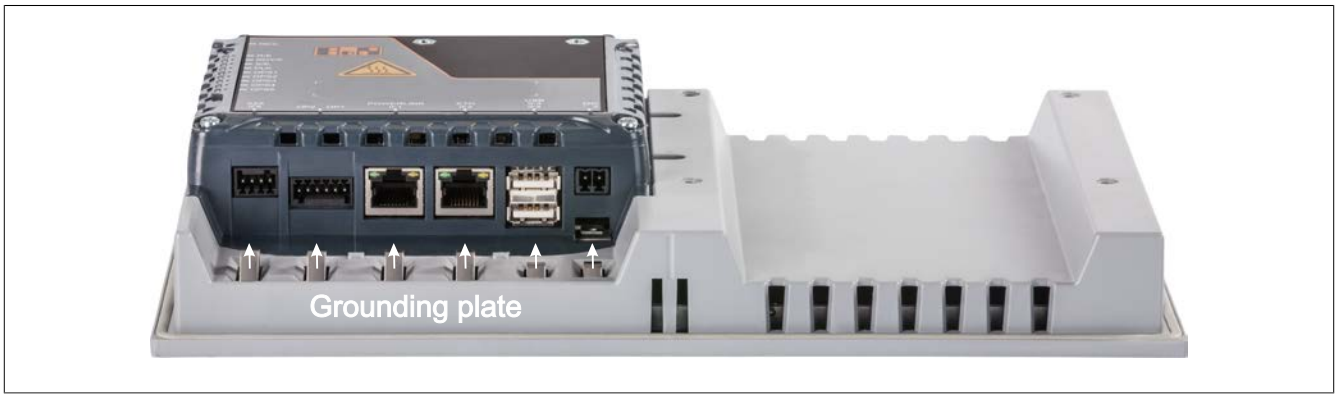
The maximum permitted ambient temperature can be found in the technical data for the respective Power Panel.

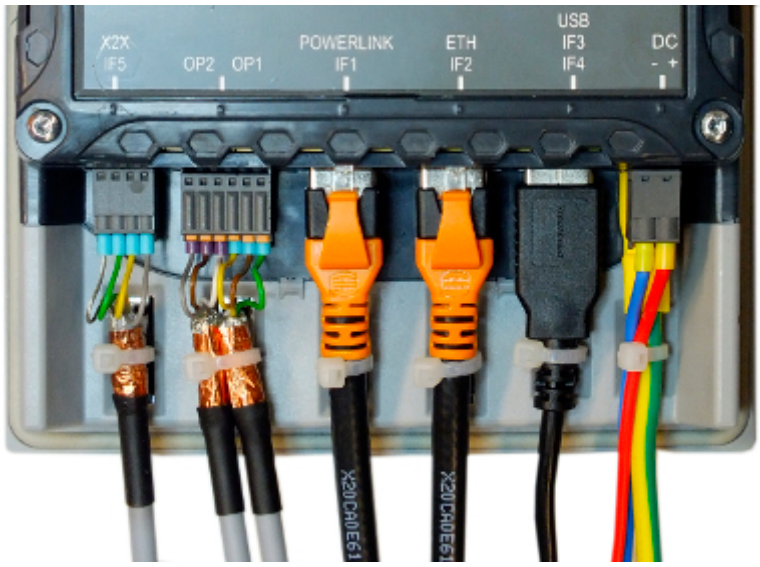
3.2 Grounding

Grounding tongues on the circuit board ensure effective prevention of signal interference. The shielding of the various cables (Ethernet) is connected to the grounding plate. Additional information about electromagnetic compatibility is available in the "INSTALLATION / EMC GUIDE - MAEMV-ENG" user's manual.

Information:

Ground and ground potential are connected to each other internally in Power Panel systems.





Unshielded lines

- All unshielded lines must be relieved of tension by using a cable tie to tie them to the grounding plate.

Shielded lines

- A central ground connection is available to effectively deflect interference. All cable shields must be connected to ground with good conductivity using a cable tie on the grounding plate or some other method.

Grounding

- The connection to ground potential must be as short as possible and sufficiently strong (≥4 mm²) over the intended spade terminal (Faston 6.3 mm).

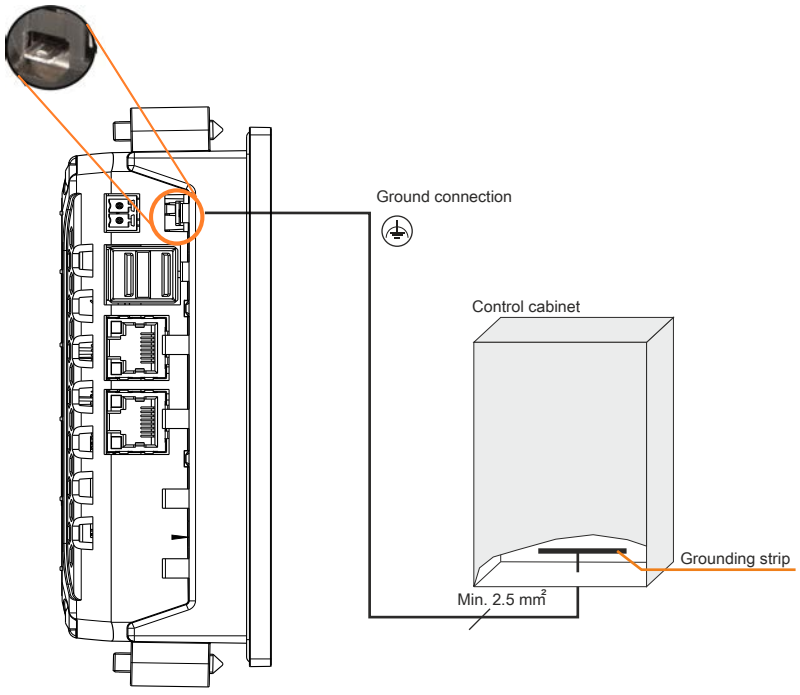


Figure 27: Power Panel - Ground connection

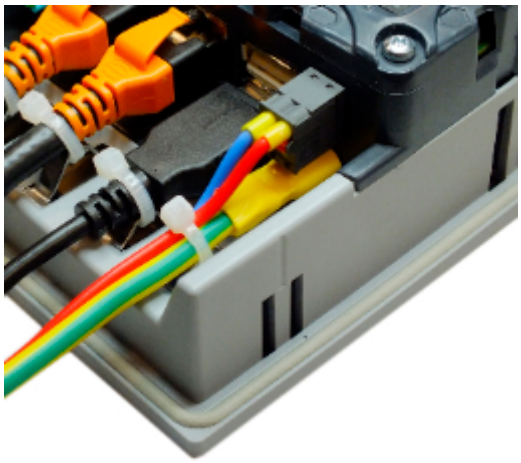


Figure 28: Power Panel - Grounding

Information:

On the Power Panel, the protective earth and functional earth are connected internally. A power supply with electrical isolation must therefore be used.

3.3 Touch screen

3.3.1 Touch calibration

B&R touch screen devices are equipped with a touch controller that supports hardware calibration. As a result, devices are pre-calibrated when delivered. This is an advantageous feature when replacing devices of the same model or type since it avoids having to recalibrate the new device. Nevertheless, calibrating the device is still recommended in order to achieve the best results and to better adapt the touch screen to the user's preferences.

3.3.2 Operating the touch screen

The analog resistive touch screen is executed about 1 cm over the edge of the display. If you press on 2 positions simultaneously, then the midpoint of the touch screen is controlled and selected.

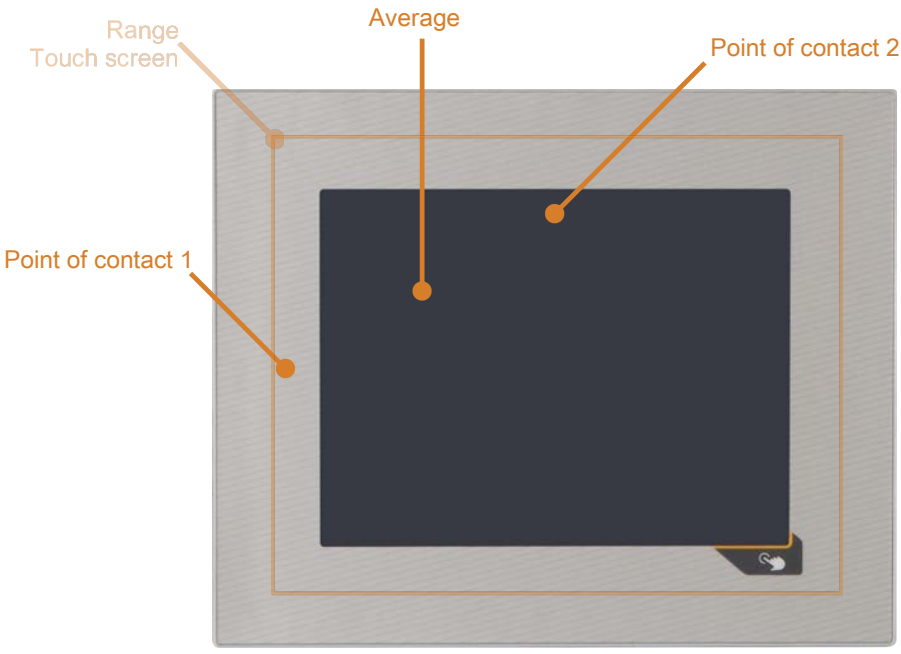


Figure 29: The midpoint between 2 points of contact

Note:

The touch screen goes beyond the inner edge of the panel overlay. When operating the touch screen, the selection is moved if the Power Panel is held in your hands and the panel overlay is touched.

3.3.3 Service life and surface quality

Service life

The maximum service life of the analog resistive touch screen is 10 million actuations.

The following graph shows the force required to activate the touch screen over the course of its service life. The requirements are similar to those for the specified 10 million actuations.

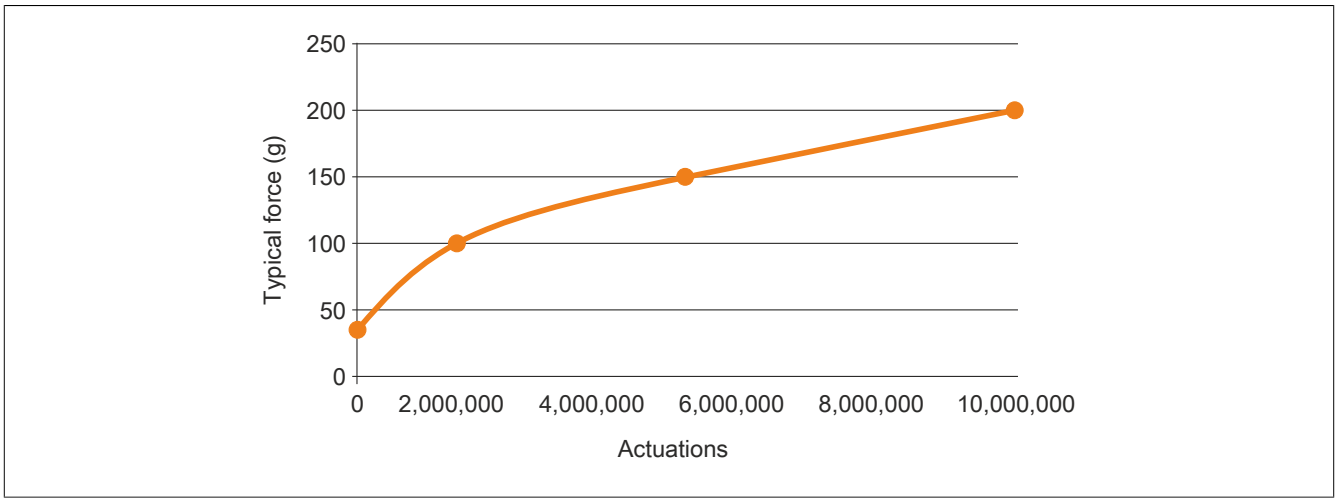


Figure 30: Life span graph

Surface quality

The surface of the analog resistive touch screen is resistant to the following chemicals at a temperature of 25°C for a duration of 1 hour.

- Acetone
- Methylene chloride
- Butanone
- Isopropyl alcohol
- Hexane
- Turpentine
- Mineral spirit
- Unleaded gasoline
- Diesel fuel
- Motor oil
- Transmission fluid
- Antifreeze
- Ammonia-based glass cleaner
- Washing agents
- Household cleaners
- Vinegar
- Coffee
- Tea
- Lubricating grease
- Cooking oil
- Salt

3.4 Operating the Power Panel with a USB mouse

The mouse cursor automatically appears if a USB mouse is connected to the T30. In this mode, the Power Panel can be operated with the USB mouse and/or touch screen.

Pressing the left and right buttons of the mouse simultaneously for two seconds opens up the service page.

3.5 Cover design

Only two screws are needed in order to adhere to the mechanical characteristics. For this reason, the cover of the Power Panel is installed and delivered with two screws. The two unused drill holes can therefore be used for additional installation purposes.

Figure 31: Cover design

3.6 Configuration

3.6.1 Configuration - Possible operating modes

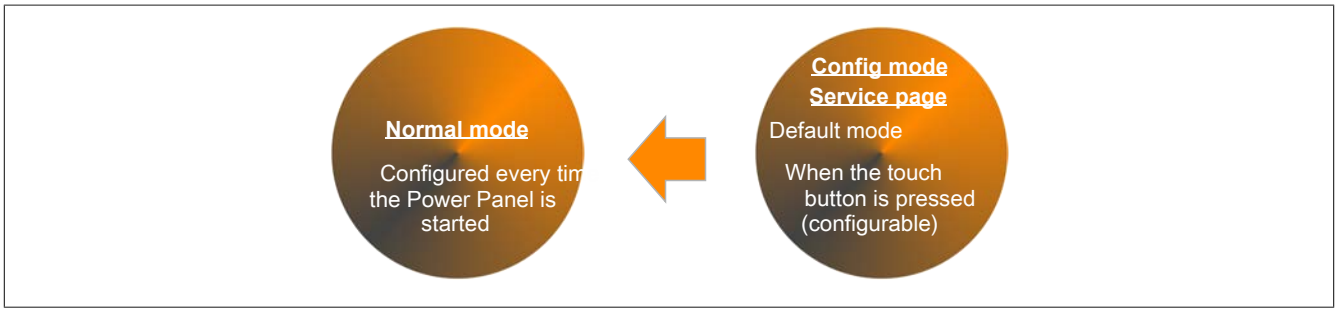
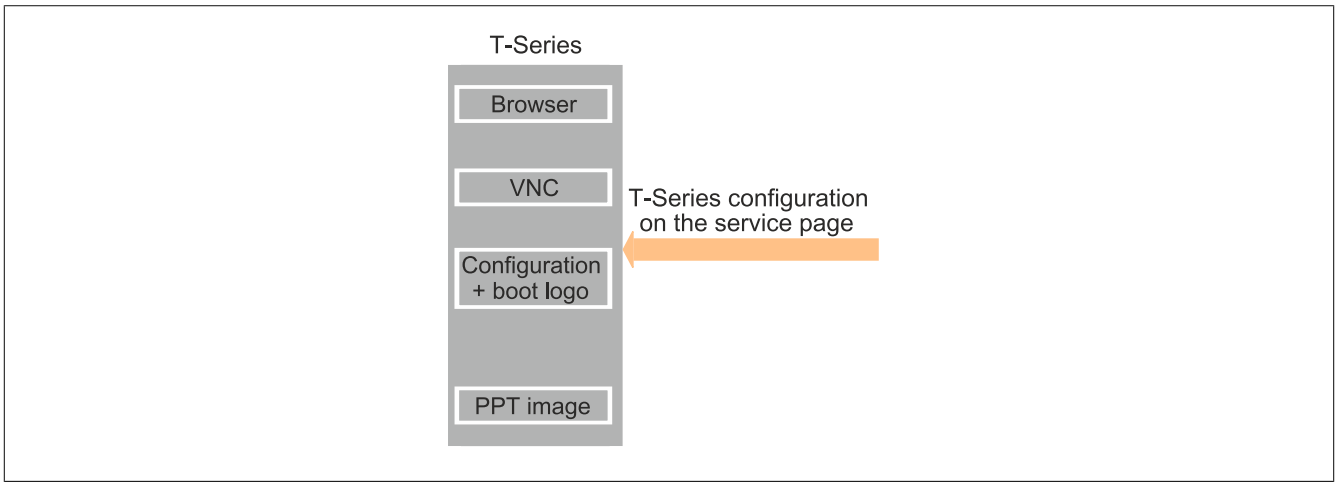


Figure 32: Configuration - Possible operating modes

3.6.1.1 Variants for updating the Power Panel

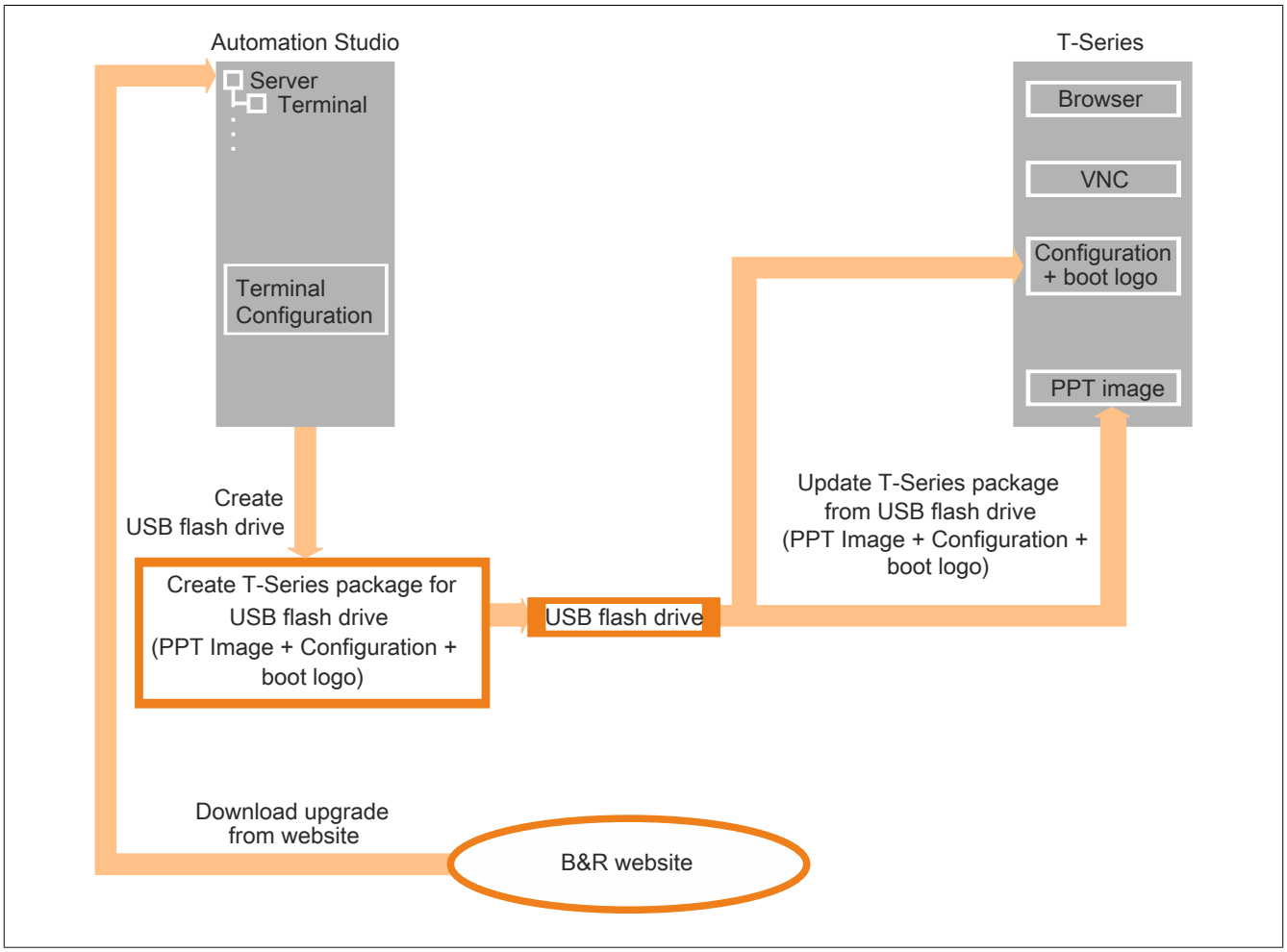
When updating the Power Panel with data on a USB flash drive, it is important to note that the drive must have a capacity of at least 256 MB. In addition, an industrial-grade UBS flash drive must be used (see "Data storage devices" on page 76).

Manually configuring the Power Panel from the service page



The Power Panel is configured from the configuration page.

Updating with Automation Studio and USB flash drive data (AS 4.2.1 or higher)

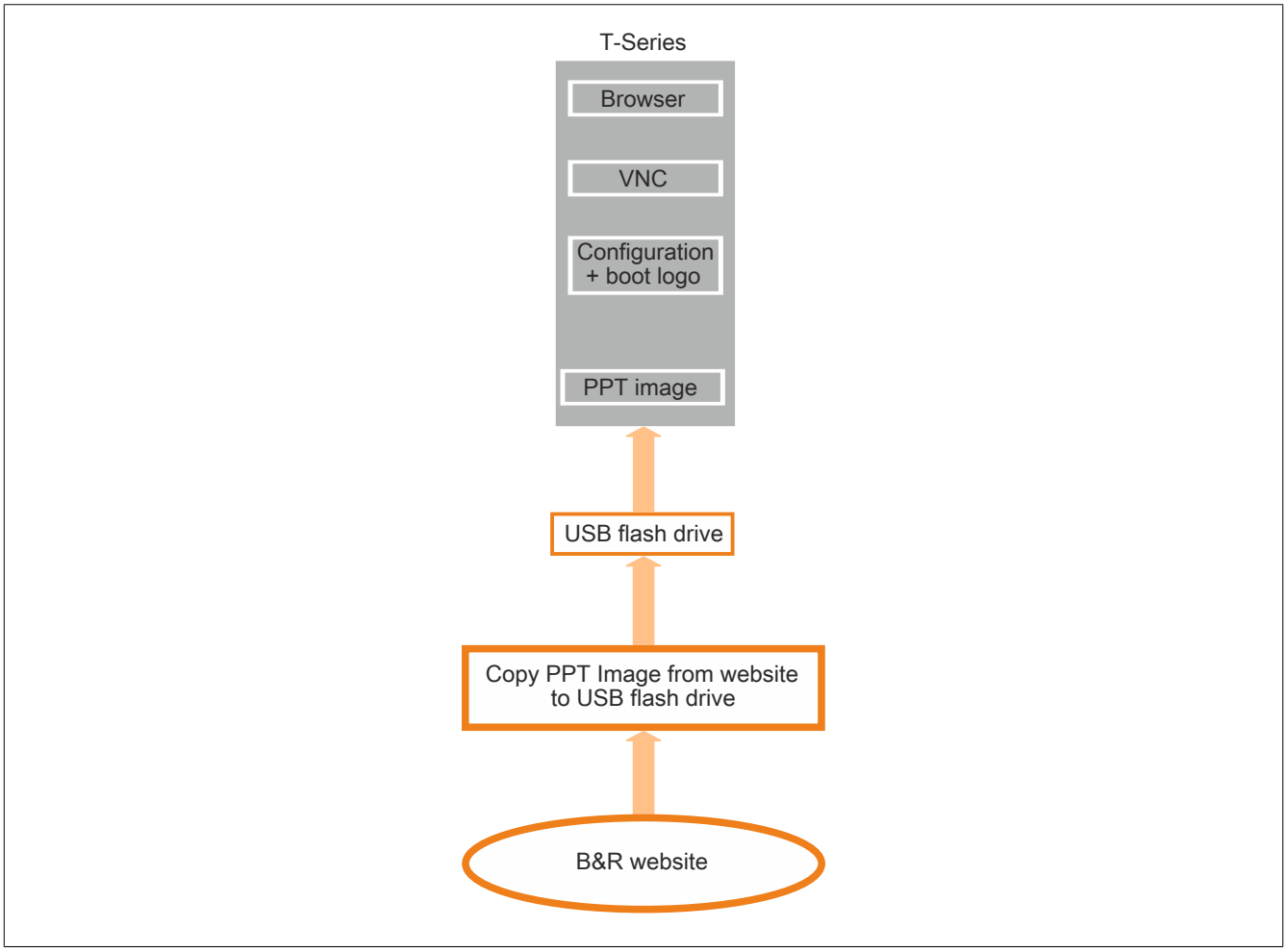


The USB flash drive data is generated for the PPT image and configuration as well as the boot logo update in AS. The Power Panel is then updated by connecting the USB flash drive.

Caution!

Any saved data is deleted, and new content is created.

Update using website (download) and USB flash drive data

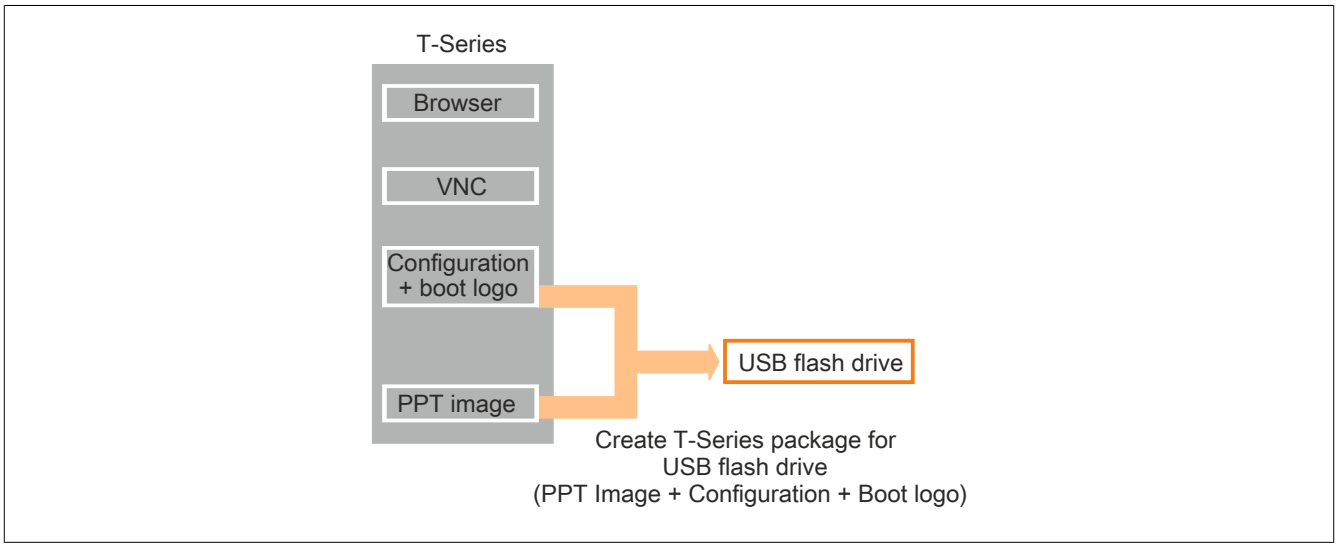


USB flash drive data is generated for the PPT image update via download from the B&R website. The Power Panel is then updated by connecting the USB flash drive.

Decompress the zipped PPT image folder and copy to the root directory of the USB flash drive. Connect the USB flash drive to the Power Panel and select "Update settings / Boot logo / System" in the "Update" menu on the service page via the touch screen (see "Update" on page 65).

An update is started after one or two minutes (including restarts). After the update has completed, the Power Panel will start with the new service page. The PPT image (and USB flash drive) can be used for all T-Series variants.

Duplicating an existing setup with USB flash drive data



The USB flash drive data is generated for the PPT image and configuration and boot logo update for completely assembled Power Panels (via the configuration page). All additional Power Panels are then updated by connecting the USB flash drive.

3.6.1.2 Service page / Configuration mode

If Auto-configuration mode fails or the Hand button is pressed (configurable, see "Hand button" on page 60), then the Power Panel will start with the service page / configuration mode. The settings for the Power Panel can then be made manually.

3.6.1.3 Normal mode

If the Power Panel is already configured, then it will start automatically in the configured operating mode (see "Startup" on page 53).

3.6.2 Service page / Configuration mode

3.6.2.1 General information

The language used on the Power Panel is English.

The Power Panel is operated using the touch screen. Text can be entered using the on-screen keyboard or by connecting a USB keyboard.

The service page can be opened in two ways:

- Pressing the Hand button (see "Hand button" on page 60)
- If no configuration for the Power Panel exists and Auto-configuration mode fails

3.6.2.2 Menu options

Figure 33: Menu options

3.6.2.2.1 Startup

All general settings are made here.

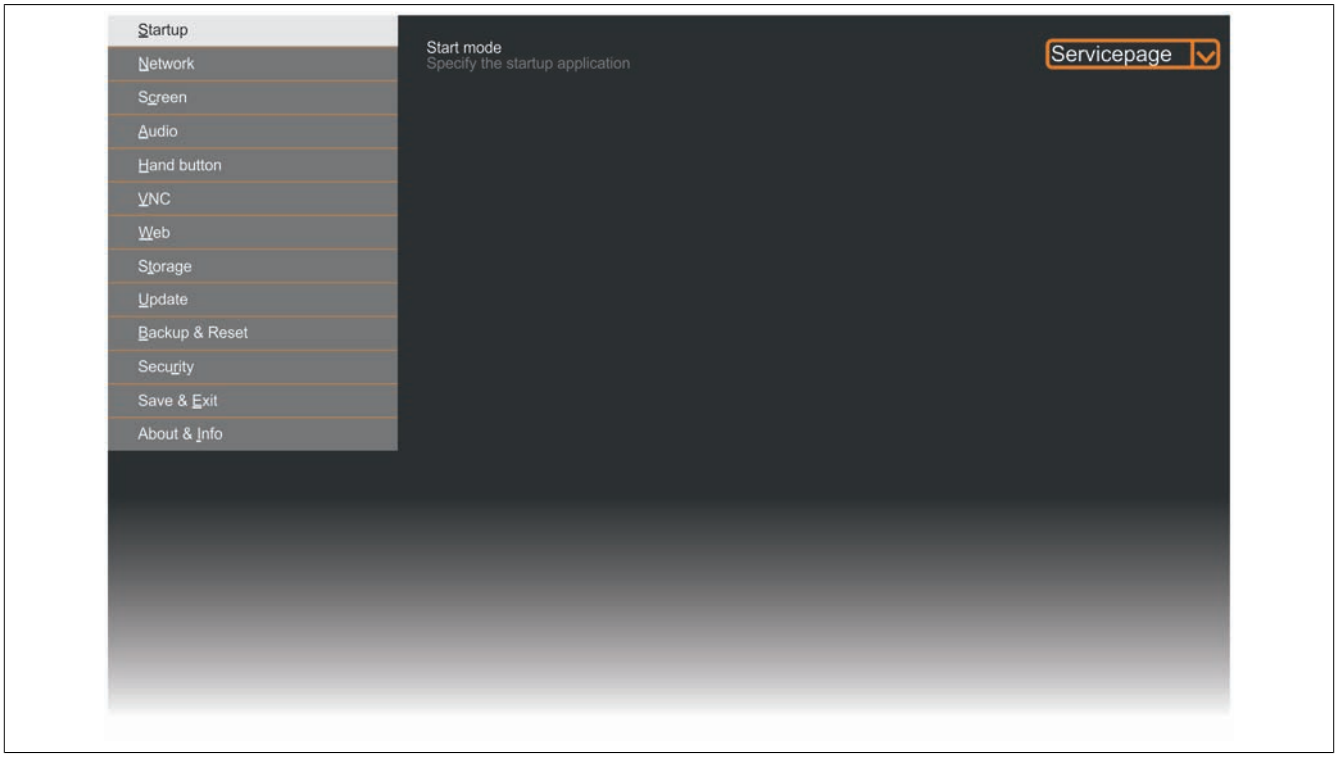


Figure 34: Startup

Parameter	Options
Start mode	• VNC - Starts the Power Panel with the VNC Viewer after a restart • Web - Starts the Power Panel with the web browser after a restart • Service page (default) - Starts the Power Panel with the service page after a restart

Table 22: Startup - Settings

3.6.2.2.2 Network

Network settings are made here.

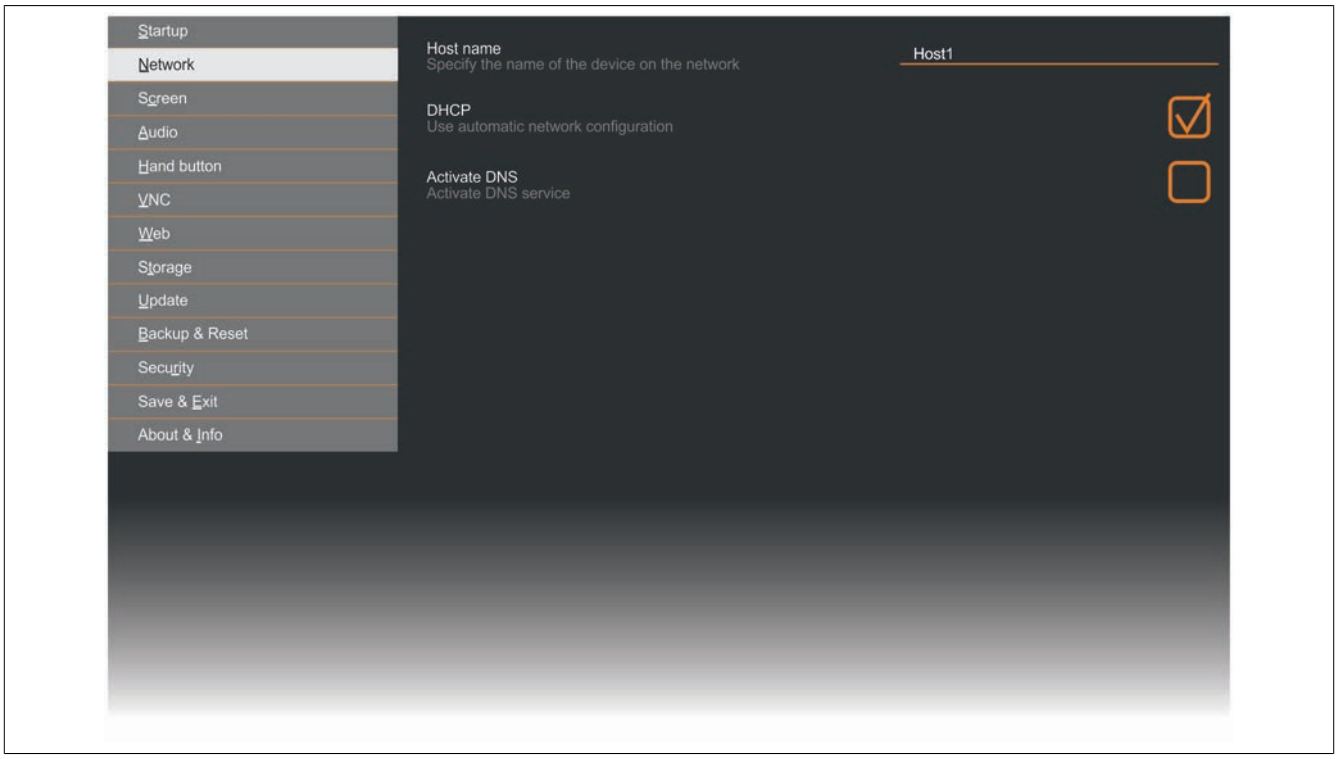


Figure 35: Network - View 1

In this example, the Power Panel obtains the IP address from the DHCP server and has hostname "Host1".

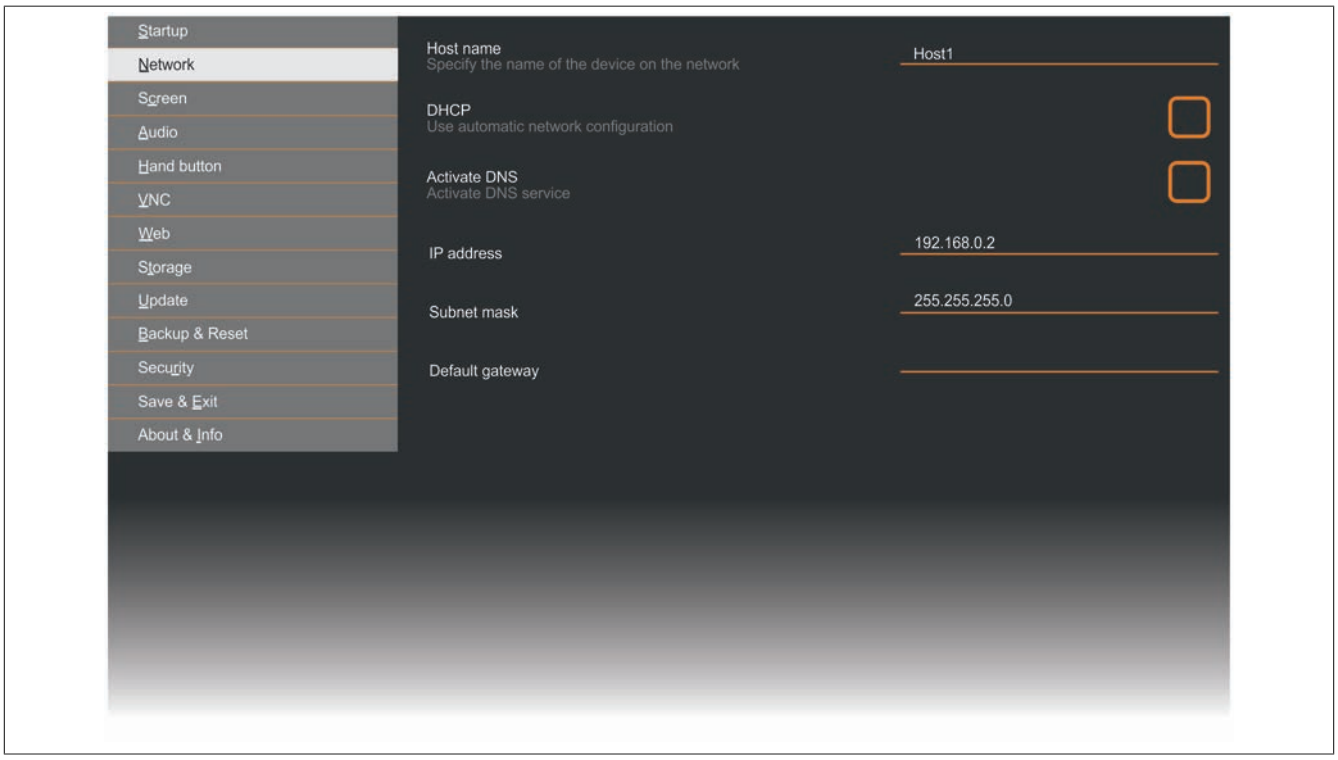


Figure 36: Network - View 2

In this example, the Power Panel has IP address "192.168.0.2" and hostname "Host1".

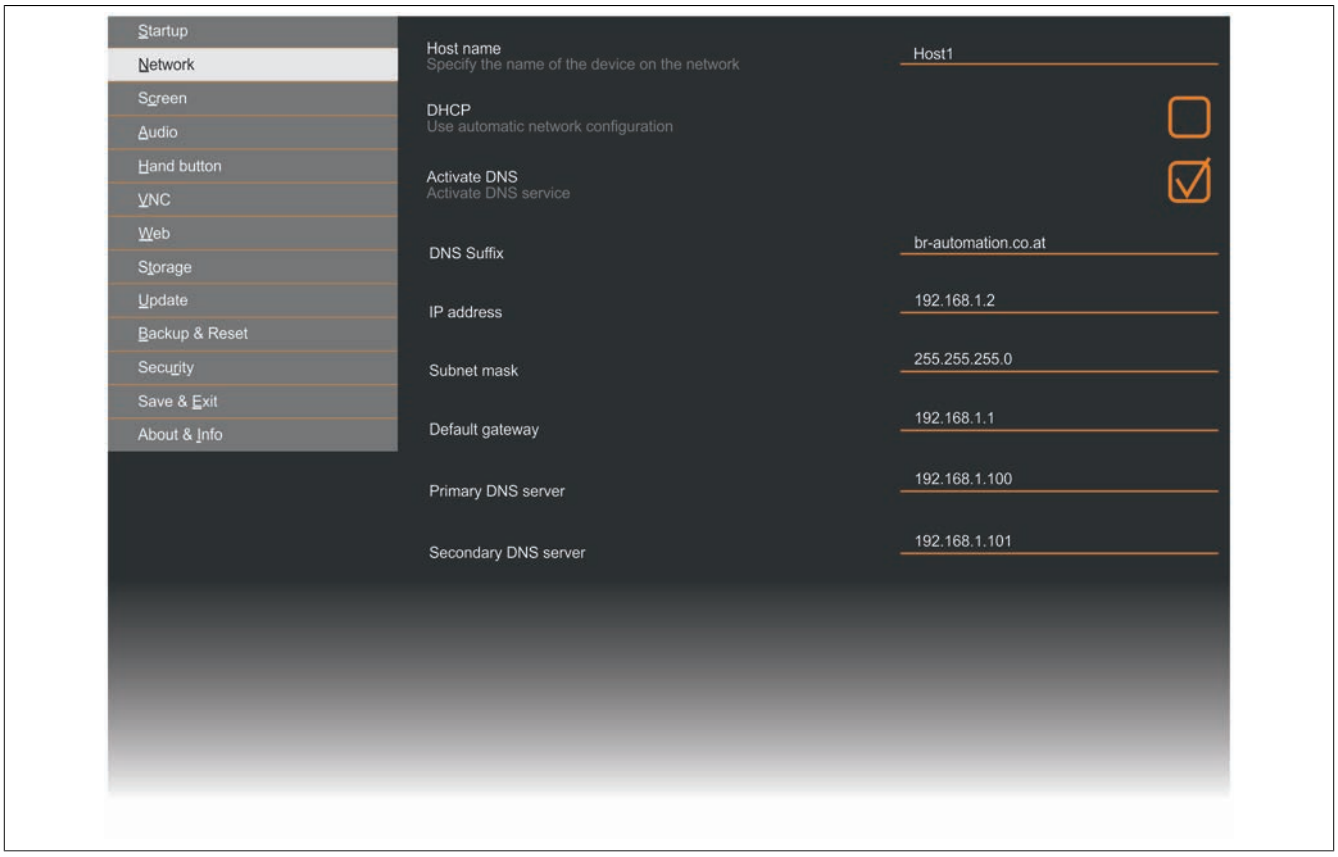


Figure 37: Network - View 3

In this example, the Power Panel has IP address "192.168.1.2" and hostname "Host1". The DNS server is also configured.

Parameter	Options
Hostname	Used to uniquely identify the terminal (server-client assignment) and specifies the name of the Power Panel in the network. Up to 64 characters can be entered (no default). This name can be used to find the Power Panel in search queries.
DHCP	• On (default) - Loads the IP address from the DHCP server • Off - Uses a static IP address Additional configuration options: ° DNS suffix ° IP address ° Subnet mask ° Default gateway ° Get DNS from DHCP server ° Primary DNS server ° Secondary DNS server **Note:** **The Power Panel does not have to be restarted. Changed parameters are applied immediately.**
Activate DNS	• Off (default) - Uses DNS (Domain Name System) to identify the domain name. It allows domain names (FQDNs) to be converted into IP addresses (or vice versa). • On - Shows the following parameters and groups
DNS suffix	The DNS suffix is connected to the hostname in order to uniquely identify the terminal in the network.
Get DNS from DHCP server	• On/Off (default) - Obtains DNS data (server address, domain name) from the DHCP server. The target system must be configured as a DHCP client for this.
Server <index>	Specifies the IP address of the DNS server. The specified DNS servers are contacted in the order specified here.

Table 23: Network - Settings

3.6.2.2.3 Screen

Screen settings are made here.

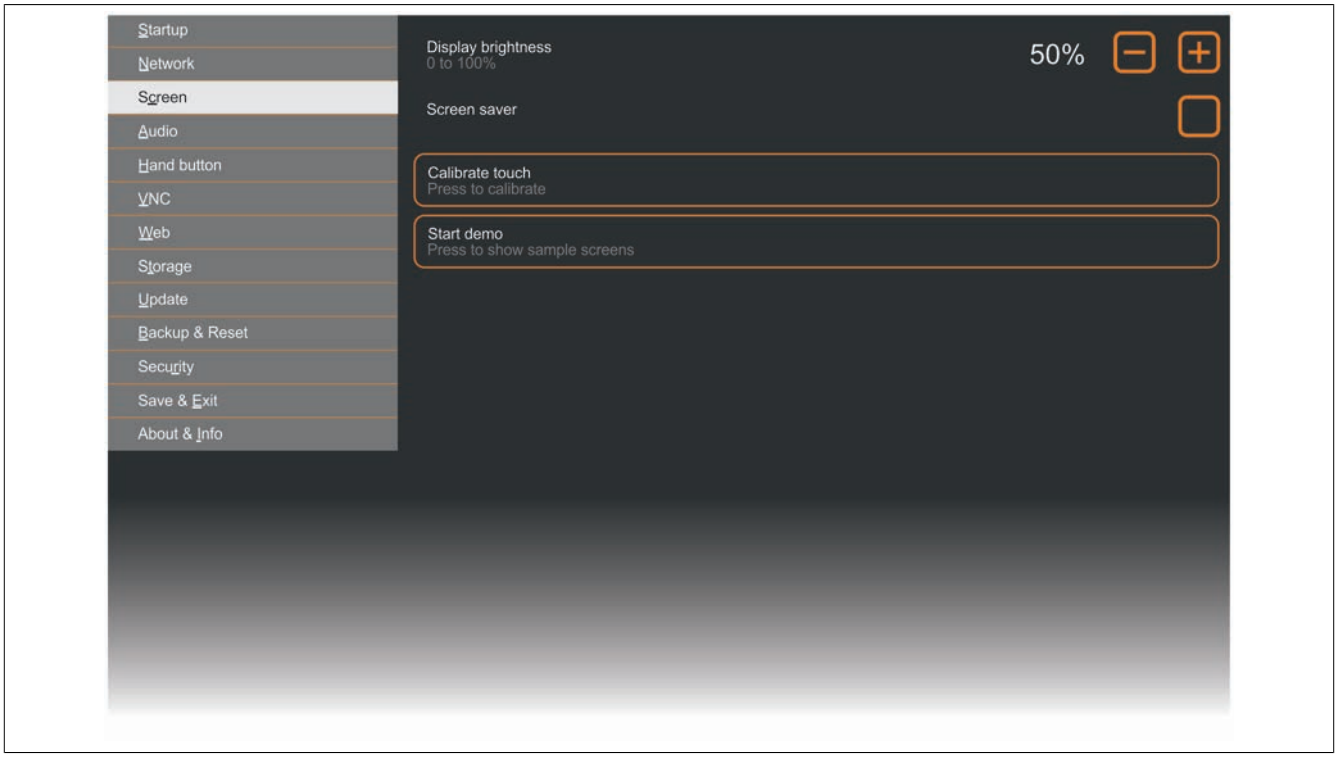


Figure 38: Screen - View 1

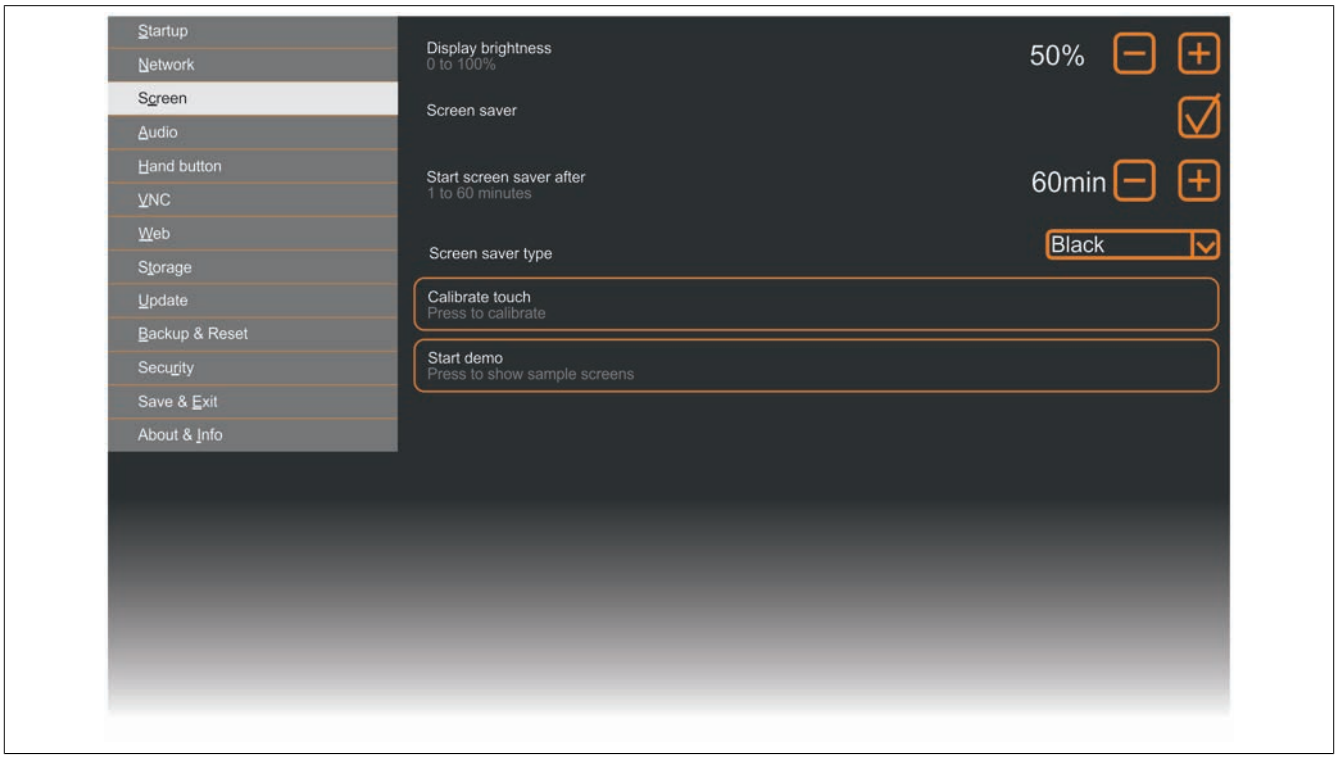


Figure 39: Screen - View 2

Parameter	Option
Display brightness	0 to 100 [brightness specification in %]
Screensaver	• On - Enables the screensaver after a period of time defined by the user. Additional settings are possible. • Off (default) - No screensaver
Start screensaver after	1 to 60 [time specification in min] Time until the screensaver is enabled (default = 15).
Screensaver type	• Black (default) - Black background • Off - Switches off the backlight
Calibrate touch	Accessing this function starts the touch screen calibration process. **Information:** **A stylus pen is recommended for touch screen calibration (e.g. 9A0013.01).**
Start demo	Accessing the start demo shows two example images that can be stepped through using touch.

Table 24: Screen - Settings

3.6.2.2.4 Audio

The settings for the buzzer are made here.

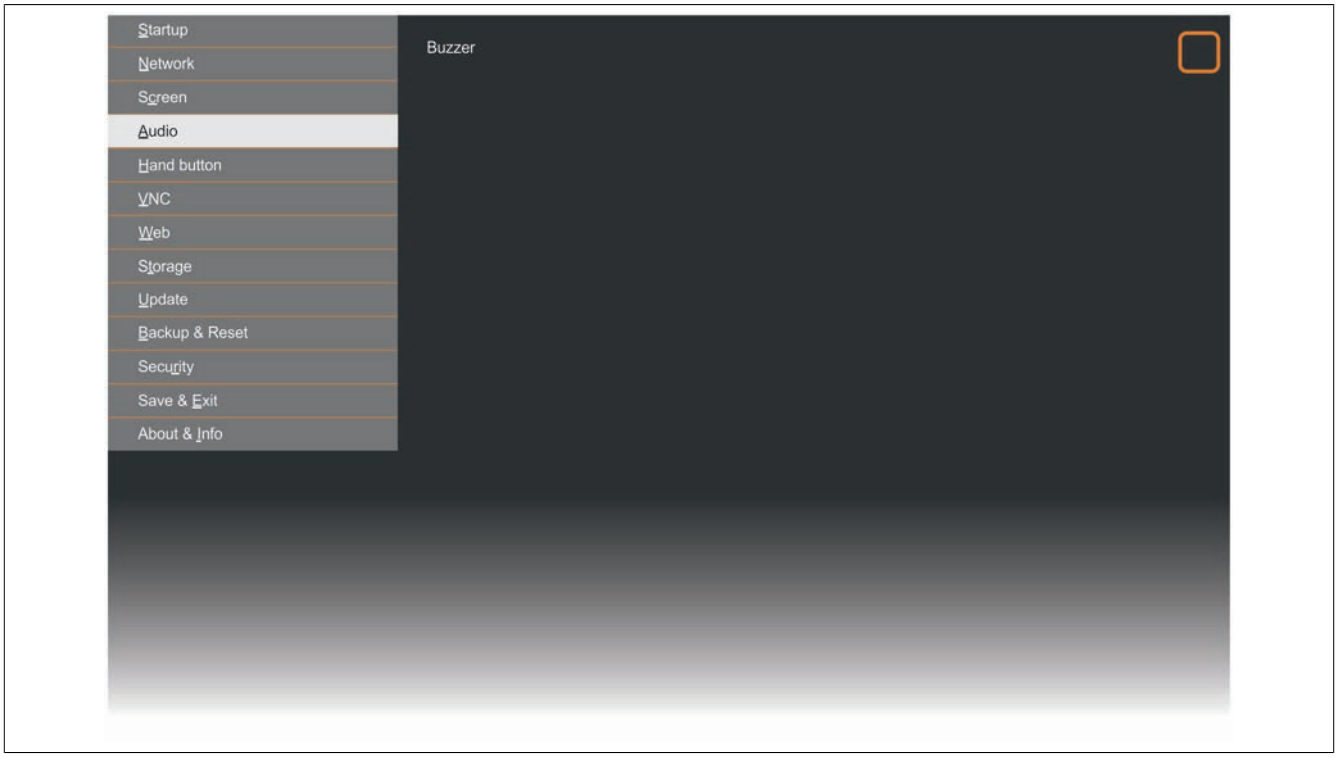


Figure 40: Audio - View 1

The buzzer is disabled in this example.

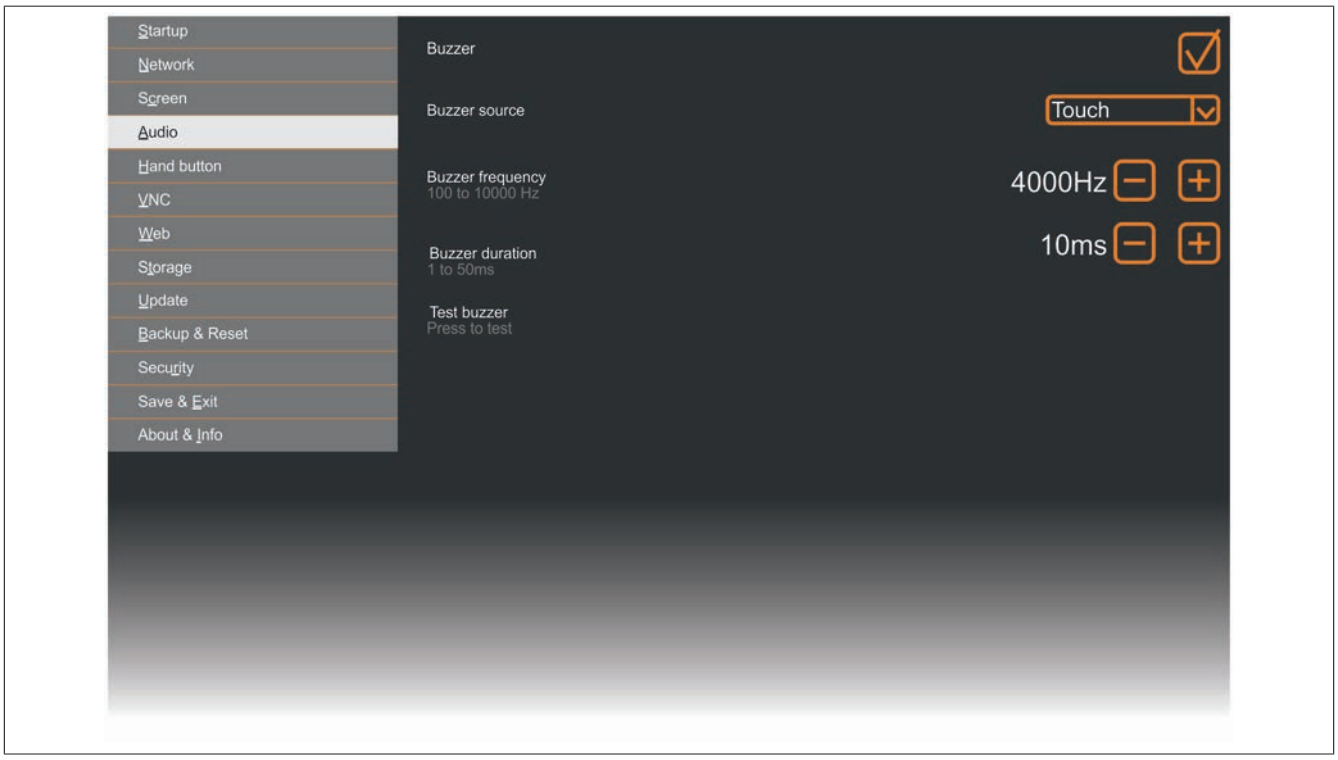


Figure 41: Audio - View 2

The buzzer is enabled in this example.

Parameter	Option
Buzzer	• On - Enables the buzzer. Additional settings are possible. • Off (default) - Disables the buzzer.
Buzzer source	• Buzzer - Operates the buzzer from the selected application (VNC/web) • Touch (default) - Enables the buzzer on touch
Buzzer frequency	[Buzzer frequency specified in Hz]
Buzzer duration	[Buzzer duration specified in ms]
Test buzzer	Outputs the buzzer tone

Table 25: Audio - Settings

3.6.2.2.5 Hand button

All settings for the Hand button are made here.

Figure 42: Hand button

Parameter	Option
Use button on server	• Not selected (local, default) - Switches to the service page when the Hand button is pressed • Selected (remote) - Transfers the action to the server when the button is **released** after being pressed for <5 s. If the Hand button is pressed longer (5 s), then the screen switches to the service page.

Table 26: Hand button - Settings

3.6.2.2.6 VNC

All VNC client settings are made here.

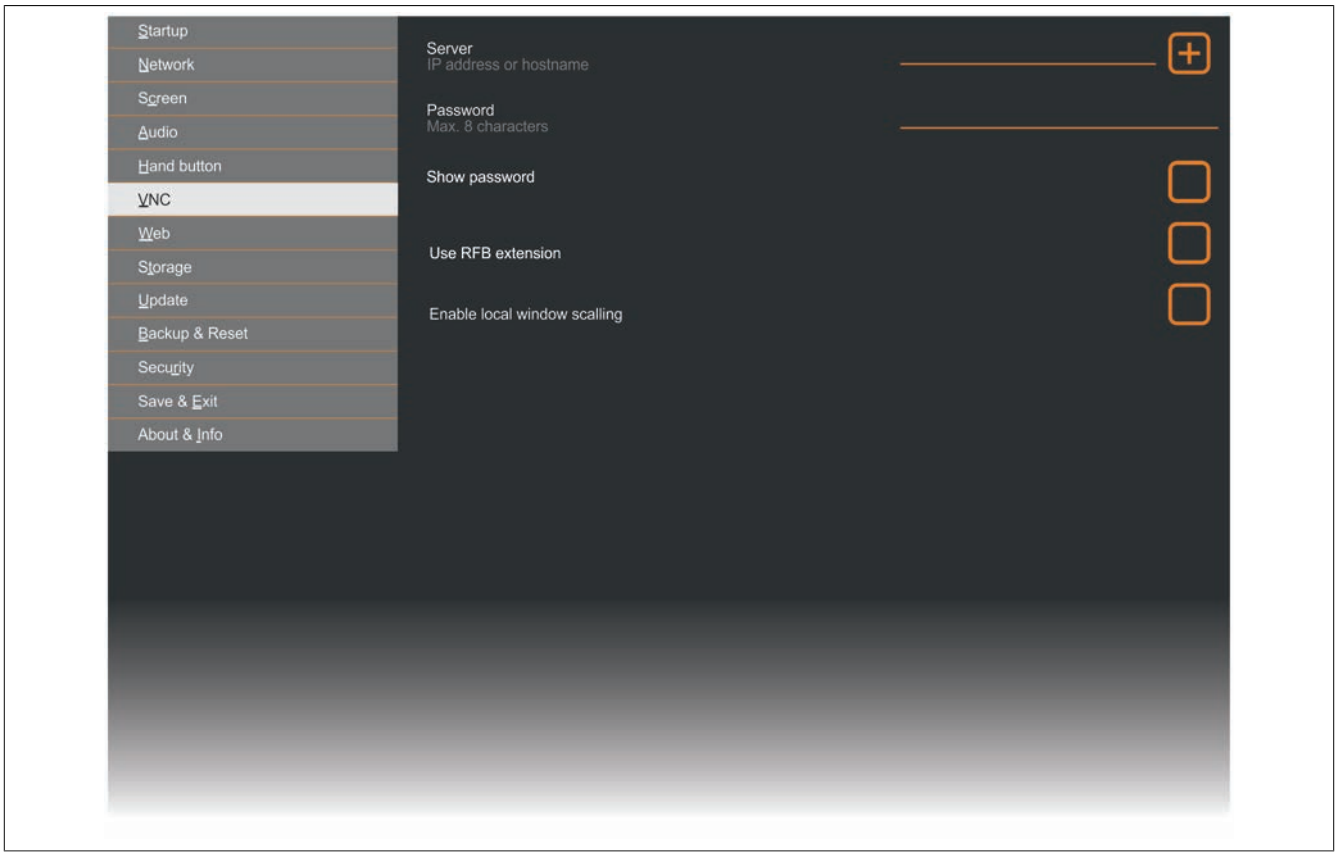


Figure 43: VNC

In this example, "VNCServer1" is selected as the server. The additional favorites (VNCServerx) are already pre-configured and can be selected as needed.

Parameter	Option
Server	Manages several VNC servers in a list. The list contains at least ten entries, one of which is used when starting the browser.
Password	The password consists of a maximum eight characters (no default). If a password is configured, then the VNC client is connected to the VNC server without additional password queries. **Note:** **The password applies to all favorites.**
Show password	• On - Displays the entered password in plain text • Off (default) - Displays the entered password with "•"
Use RFB extension	• On - Uses the RFB extension and transfers device-specific data to the VNC server • Off (default) - Does not use the RFB extension **Important!** **Using the RFB extension does not allow a connection to a standard VNC server to be established. Only a Power Panel with RFB extensions enabled can be operated via B&R VNC server.** The Remote Frame Buffer (RFB) protocol provides additional options for controlling VNC based visualizations and evaluating any additional input devices that are connected to the client. RFB extensions offer the following basic functions: • Evaluate additional control devices on the Power Panel (e.g. hand button). • Read or limit the number of connected clients or disconnect all clients from server. • Start any process on the client. **Functionality** During startup, the Visual Components' VNC server creates a shared memory that receives cyclically transferred data from the client (Power Panel). The AsRfbExt library connects to this memory and provides the values via functions. The data is transferred from the client to the server during the idle time and monitored with a timeout. This means that if the data is older than the specified timeout, the key matrix is reset (no keys actuated) and the values of the hand button, etc. can no longer be read. This state can occur at any time by the following actions: • Disconnects the client(s) from the server • Interruptions by tasks with a higher priority • Network problems **Note:** **More information pertaining to RFB extensions and to programming the AsRfbExt can be found in the documentation of the AsRfbExt in the AS help system.** **The following temperatures can be queried with the RfbExtTemperatureValue() function block and the index:** • **Index 0: TemperatureEnvironmental is read** • **Index 1: TemperatureCPUCase is read** **Information:** **The TemperatureCPUCase can reach more than 100°C in the worst-case scenario.**
Enable local window scaling	• On - The Power Panel scales the VNC application to the display size. • Off (default) - The VNC is displayed in its original size. **Information:** **Enabling window scaling increases the amount of computation necessary to compose the image on the Power Panel.**

Table 27: VNC - Settings

3.6.2.2.7 Web

All web browser settings are made here.

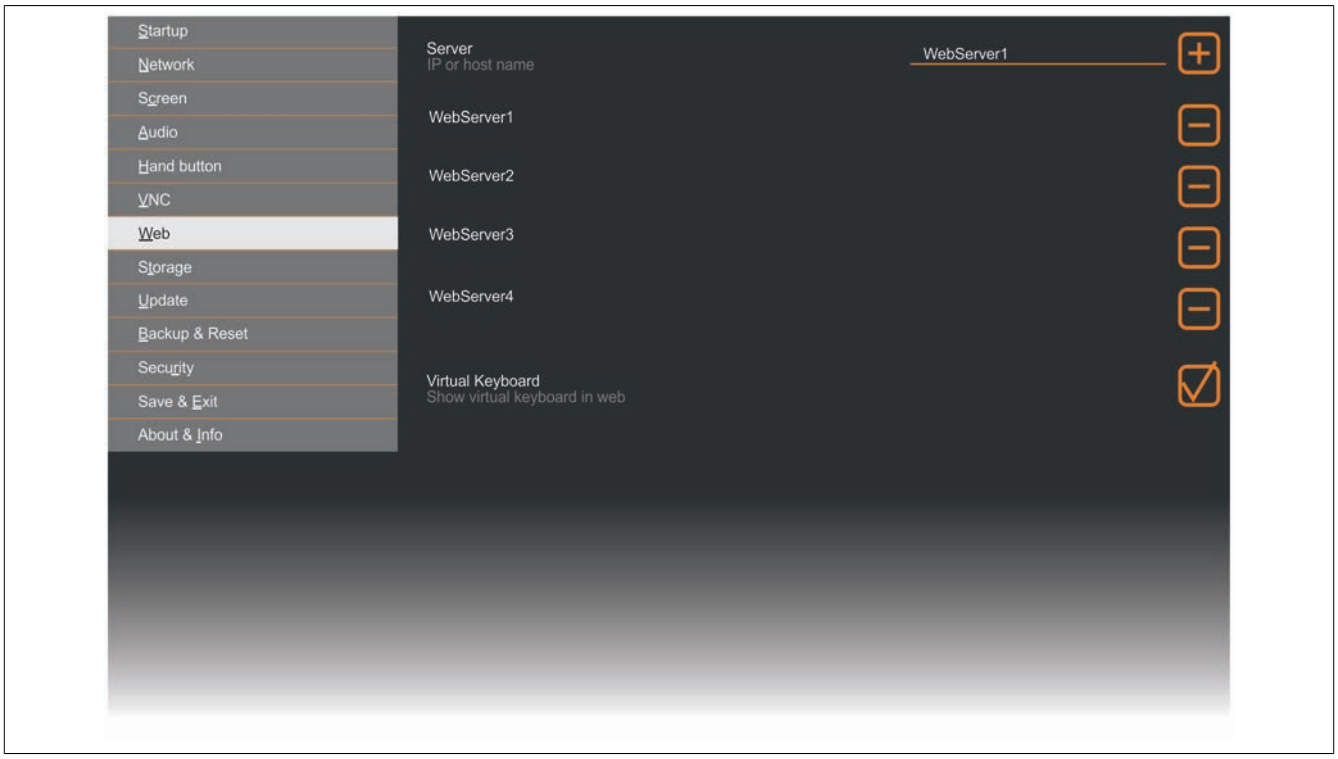


Figure 44: Web

In this example, "WebServer1" is selected as the server. Additional favorites (WebServerx) are already preconfigured and can be selected as needed.

Parameter	Option
Server	Manages several websites (URLs) in a list. The list contains maximum ten entries, one of which is used when starting the browser.
Virtual keyboard	• On - The virtual keyboard is opened by clicking on the input field in the web. • Off (default) - The virtual keyboard is not shown.

Table 28: Web - Settings

The following features are not currently supported:

- Java[1)]
- Flash

[1)] JavaScript is supported

3.6.2.2.8 Storage

Access settings are made here.

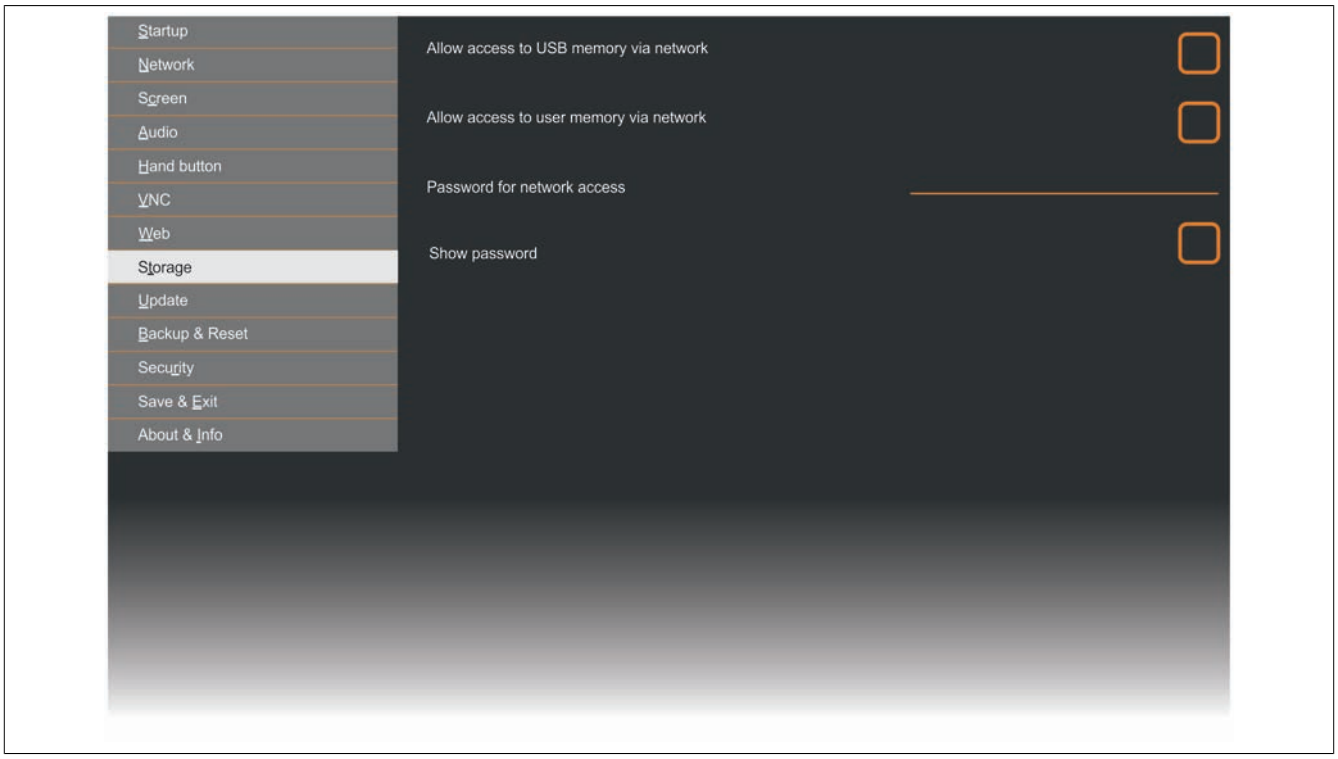


Figure 45: Storage

Parameter	Option
Allow access to USB memory via network	Allows access to the USB flash drive via the network
Allow access to user memory via network	Allows access to the user area of internal memory via the network ("CIFS" enabled)
Password for network access	Password for network access ("CIFS" enabled)
Show password	• On - Displays the entered password in plain text • Off (default) - Displays the entered password with "•"

Table 29: Storage - Settings

Information:

The "CIFS" user cannot be configured on the Power Panels. "ppts30-user" must always be used as the "CIFS" user.

CIFS sharing:

Shared path USB1 (IF3) = usbshare

Shared path USB2 (IF4) = usbshare2

Shared path, internal user memory (flash) = usershare

File system format of USB flash drive = FAT32

3.6.2.2.9 Update

Data from the Power Panel can be (manually) updated here.

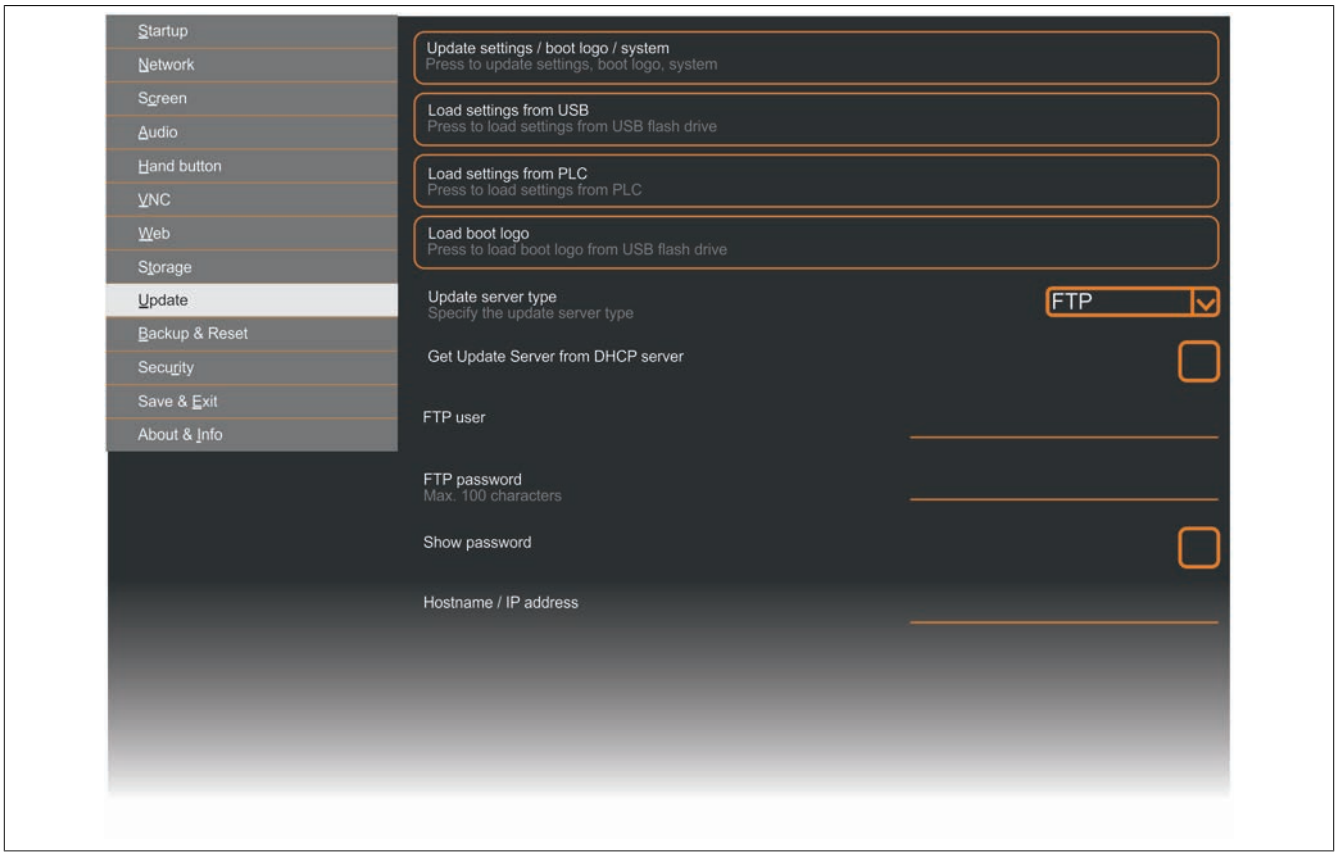


Figure 46: Update - View 1

Parameter	Option
Update settings / boot logo / system	Downloads all existing update files (e.g. settings, boot logo, system) from a USB flash drive. An existing configuration is not overwritten for a system update without a configuration.
Load settings from USB	Accessing this function downloads settings from the USB flash drive.
Load settings from PLC	When this function is selected, controllers are searched for in the network that have a valid configuration for a Power Panel. After the search is complete (about 3 seconds), the discovered controllers are listed. When an entry is selected, a list with the Power Panel configurations on the controller are shown (see figure "Update - View 2"). The names of the listed configurations match the names of the configurations in Automation Studio (see "Update - View 2" - "Update - Physical View"). When an entry is selected, a dialog box appears with the request to confirm the installation of the configuration. If the data is loaded successfully, then the application switches to the "Save & Exit" page and the data can be saved. Alternatively, the user can check all settings in all menu items once more before saving.

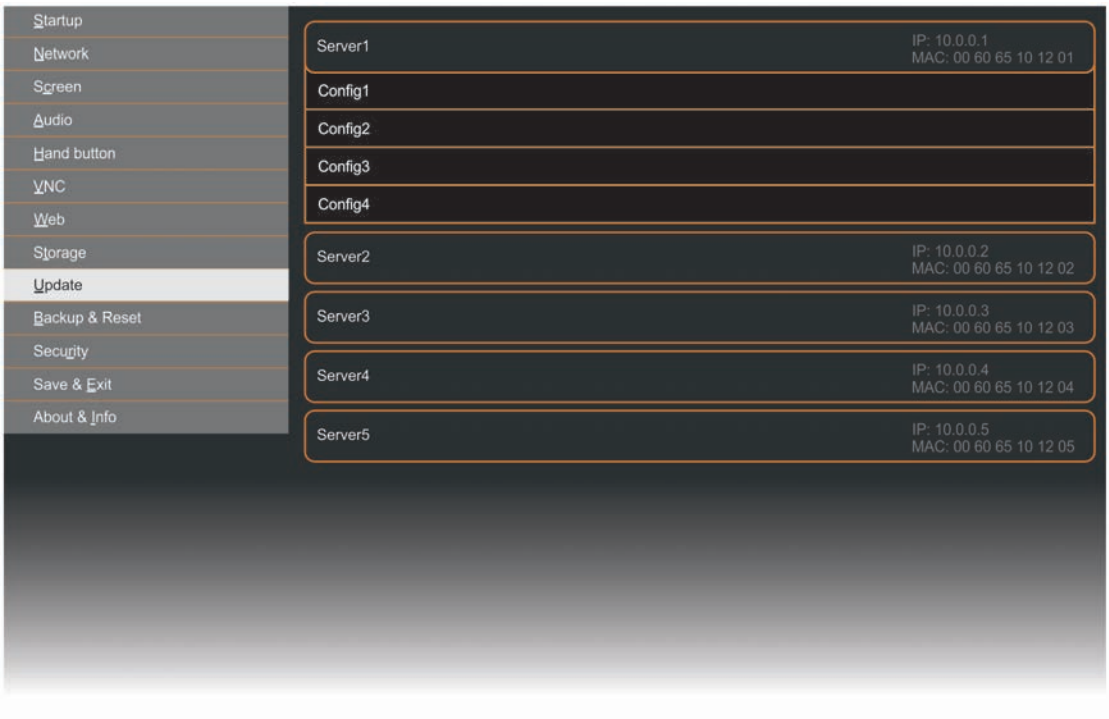


Figure 47: Update - View 2

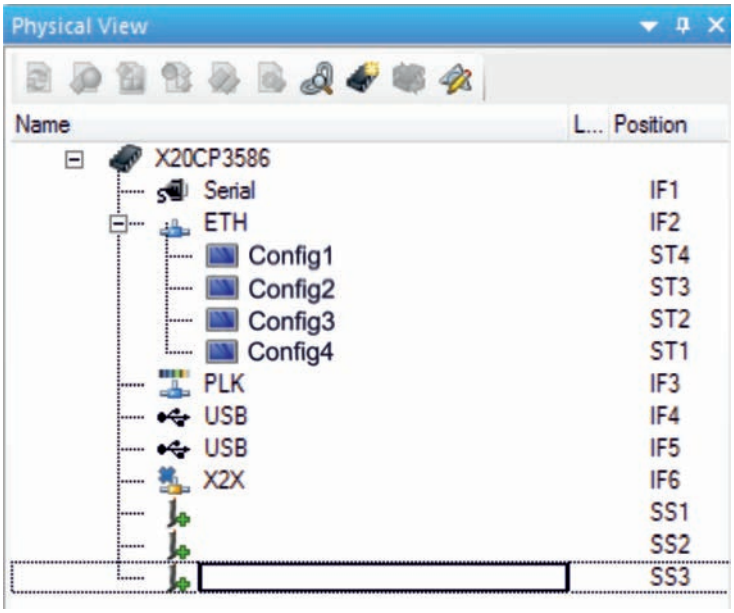


Figure 48: Update - Physical View

Note:

If the Power Panel is started for the first time, then the ServiceApp starts on the "Update" page.

Table 30: Update - Settings

<table>
<tr><th>Parameter</th><th>Option</th></tr>
<tr><td>Load boot logo</td><td>Accessing this function downloads the boot logo from the USB flash drive.
A customized boot logo can be loaded from the USB flash drive or controller (see "Variants for updating the Power Panel " on page 48) to the Power Panel.
Via Automation Studio: A boot logo in 24-bit BMP format can be added to Automation Studio's Logical View using drag-and-drop. The boot logo must have the same resolution as the Power Panel (e.g. 6PPT30.043F-20B - 480 x 272 pixels). This boot logo must then be selected in the configuration of the respective Power Panel. Then the boot logo can be loaded from the USB flash drive or controller (see "Variants for updating the Power Panel " on page 48) to the Power Panel.
Without Automation Studio: A boot logo in 24-bit BMP format, with the name "PPTLogo.bmp.gz" (compressed in GZ format) must be saved in the root directory of the USB flash drive. The boot logo must have the same resolution as the Power Panel (e.g. 6PPT30.043F-20B - 480 x 272 pixels). Then the boot logo can be loaded from the USB flash drive or controller (see "Variants for updating the Power Panel " on page 48) to the Power Panel.
Information:
For Power Panels in portrait format, this function is only available beginning with hardware revision C3.</td></tr>
<tr><td>Update server type</td><td>• FTP (default) - If an FTP server is used as an update server, then the FTP setting must be effected.
• TFTP - If a TFTP server is used as an update server, then the TFTP setting must be effected.</td></tr>
<tr><td>Get update server from DHCP server for FTP</td><td>• On (default) - This setting must be made if the information from the update server is made available by the DHCP server.
• Off - This setting must be made if the information from the update server is not made available by the DHCP server.
<table>
<tr><th>Parameter</th><th>Option</th></tr>
<tr><td>FTP user</td><td>The FTP user can be configured here.</td></tr>
<tr><td>FTP password</td><td>The FTP password can be configured here.</td></tr>
<tr><td>Show password</td><td>• On - Displays the entered password in plain text
• Off (default) - Displays the entered password with "•"</td></tr>
<tr><td>Hostname / IP address</td><td>The FTP hostname/IP address can be configured here.</td></tr>
</table></td></tr>
<tr><td>Get update server from DHCP server For TFTP</td><td>• On (default) - This setting must be made if the information from the update server is made available by the DHCP server.
• Off - This setting must be made if the information from the update server is not made available by the DHCP server.
<table>
<tr><th>Parameter</th><th>Option</th></tr>
<tr><td>Hostname / IP address</td><td>The FTP hostname/IP address can be configured here.</td></tr>
</table></td></tr>
</table>

Table 30: Update - Settings

3.6.2.2.10 Backup & Reset

It is possible to reset the system to its default factory settings here.

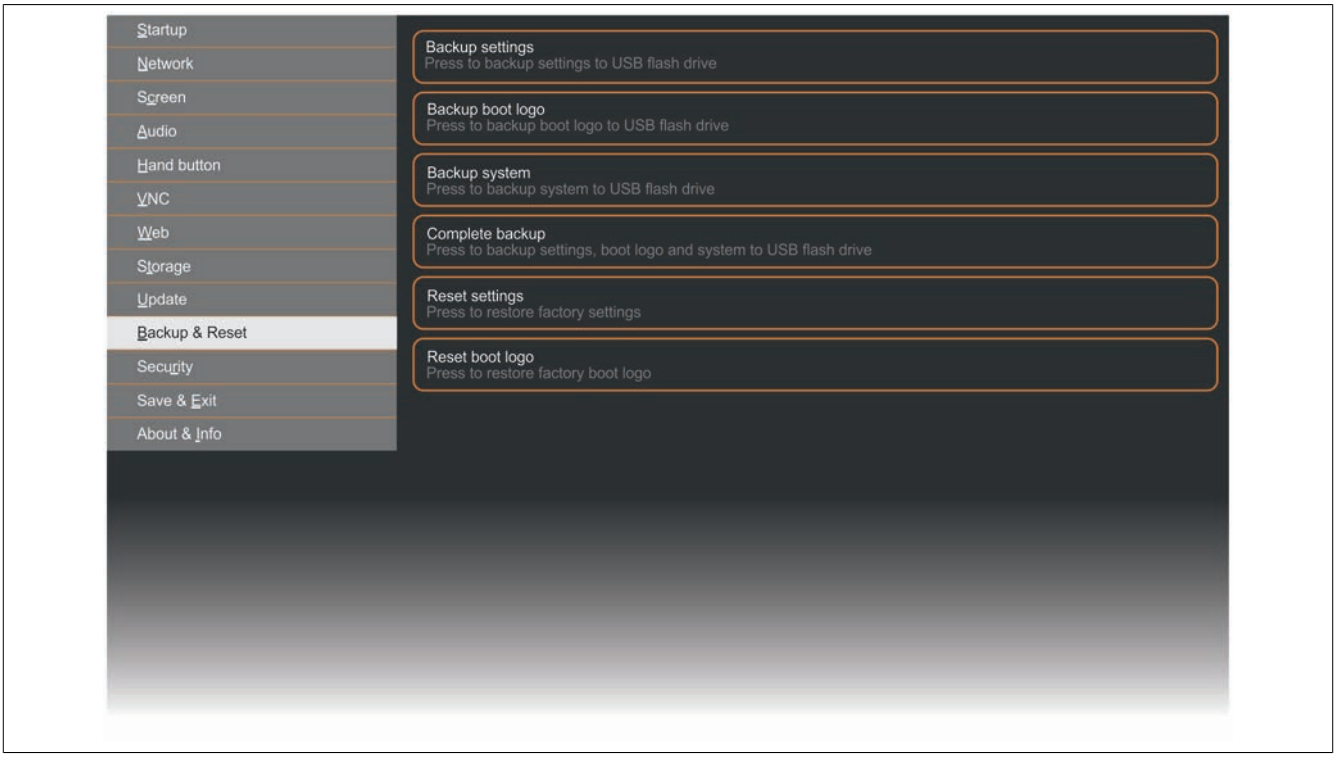


Figure 49: Backup & Reset

Parameter	Option
Backup settings	Accessing this function creates a backup of the settings and stores it on the USB flash drive.
Backup boot logo	Accessing this function creates a backup of the boot logo and stores it on the USB flash drive.
Backup system	Accessing this function creates a backup of the system (PPT image) and stores it on the USB flash drive. **Note:** **Creating a backup can take several minutes.**
Complete backup	Accessing this function creates a backup of the system, its settings and the boot logo and stores it on the USB flash drive. **Note:** **Creating a backup can take several minutes.**
Reset settings	Accessing this function loads the factory default settings (settings). **Important!** **Settings are lost.**
Reset boot logo	Accessing this function resets the boot logo to the factory default.

Table 31: Backup & Reset - Settings

3.6.2.2.11 Security

The password for the service page is configured here.

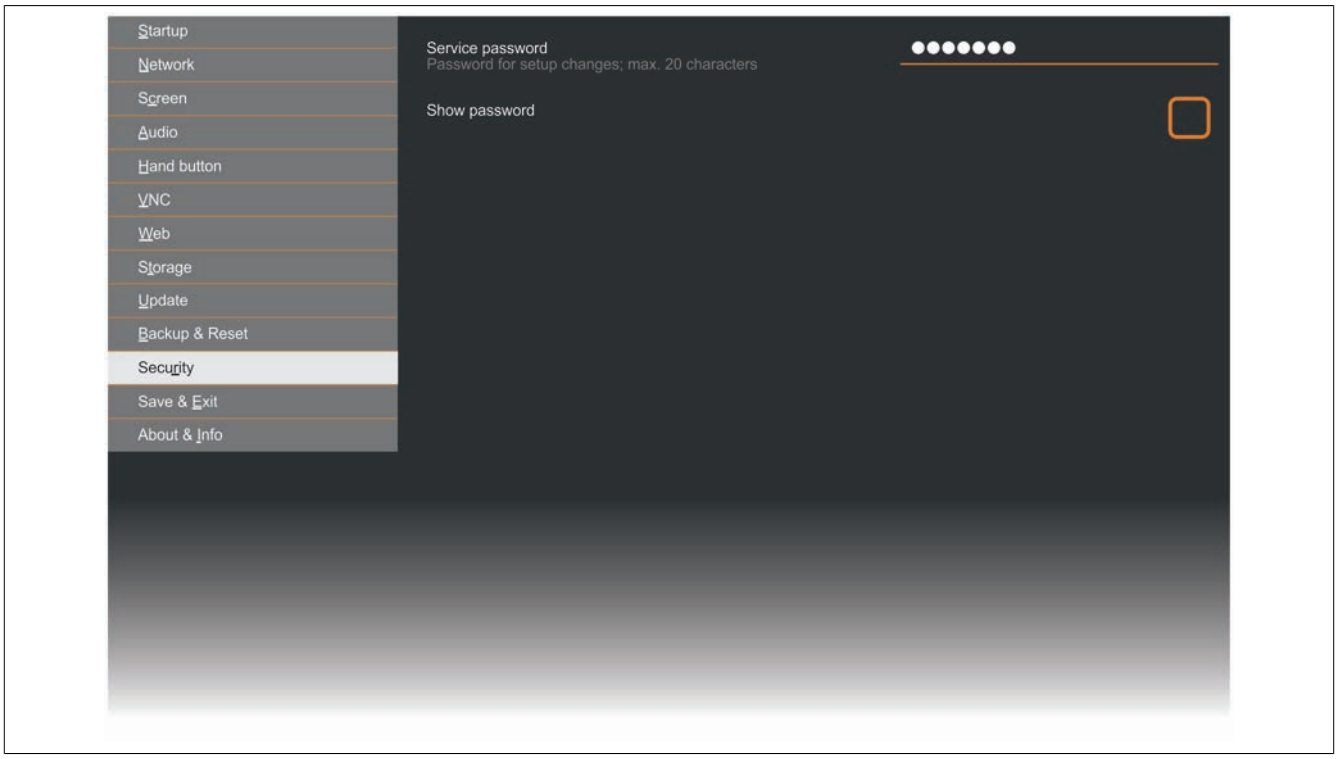


Figure 50: Security - View 1

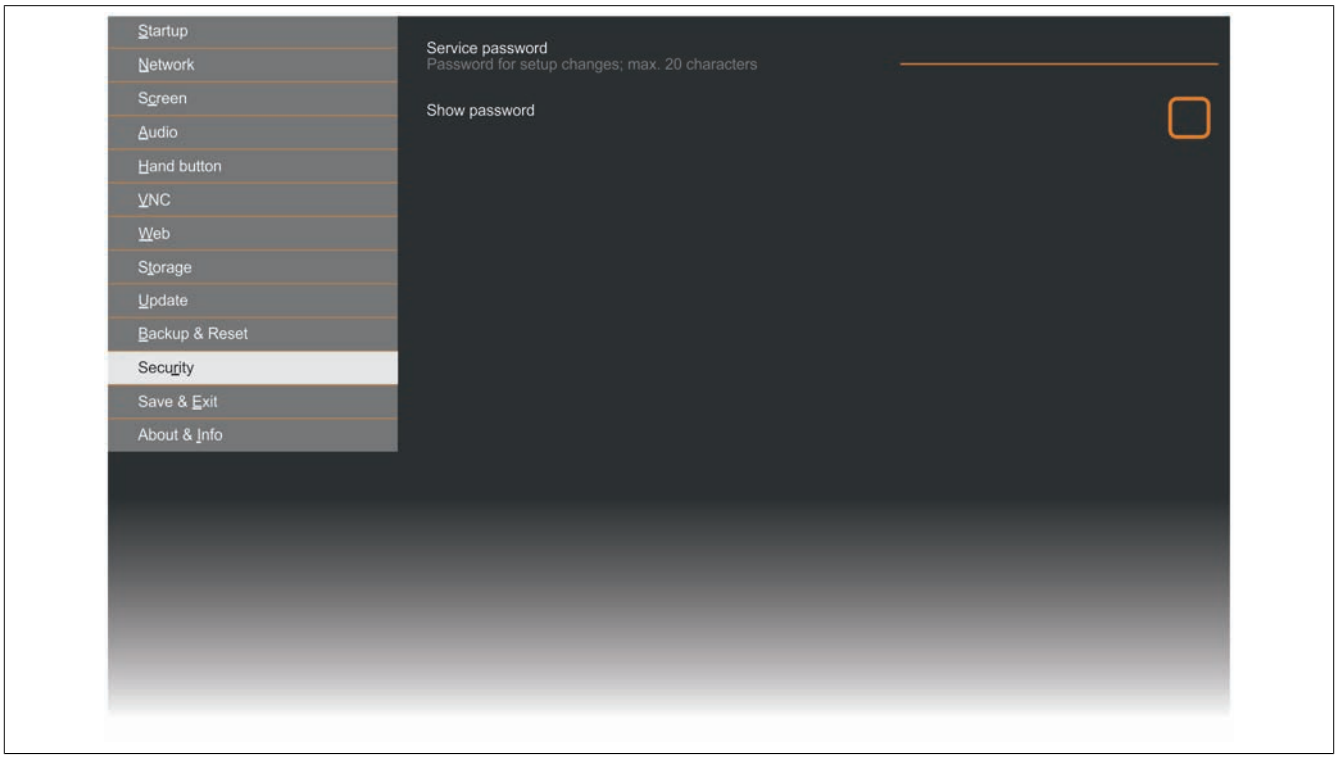


Figure 51: Security - View 2

Parameter	Option
Service password	The password specified here for accessing the service page consists of maximum 20 characters (no default, see "Password query" on page 72).
Show password	• On - Displays the entered password in plain text • Off (default) - Displays the entered password with "•"

Table 32: Security - Settings

3.6.2.2.12 Save & Exit

All settings for saving are made here.

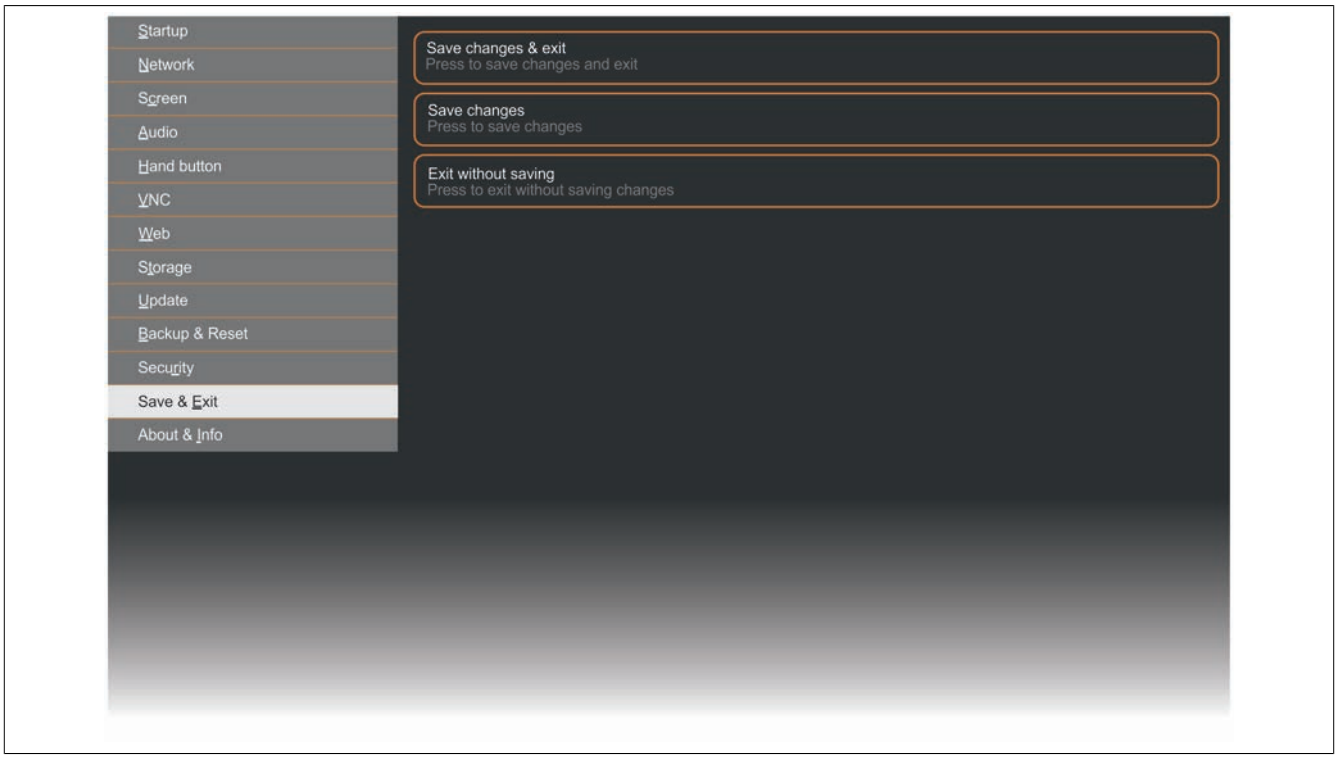


Figure 52: Save & Exit

Parameter	Option
Save changes & exit	Saves all changes made and starts the Power Panel as configured (see "Startup" on page 53)
Save changes	Saves all changes made
Exit without saving	Does not save changes made and starts the Power Panel as configured (see "Startup" on page 53)

Table 33: Save & Exit - Settings

3.6.2.2.13 About & Info

Information about the Power Panel is displayed here.

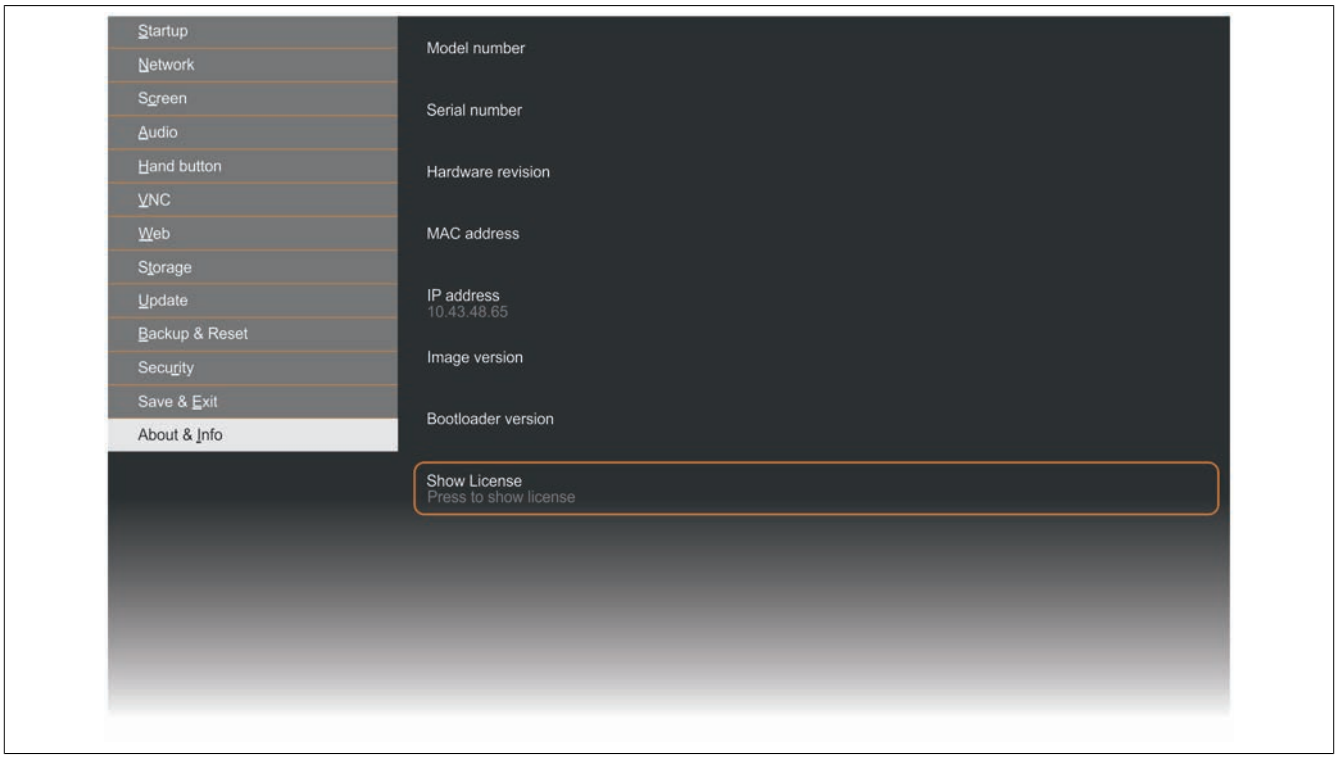


Figure 53: About & Info

Parameter	Option
Model number	The model number of the Power Panel is displayed here.
Serial number	The serial number of the Power Panel is displayed here.
Hardware revision	The hardware revision of the Power Panel is displayed here.
MAC address	The MAC address of the Power Panel is displayed here.
IP address	Displays the current IP address in use for the Power Panel
Image version	The image version of the Power Panel is displayed here.
Bootloader version	The bootloader version of the Power Panel is displayed here.
Show license	Accessing this function displays the licenses of the Power Panel.

Table 34: About & Info - Settings

3.6.2.3 Password query

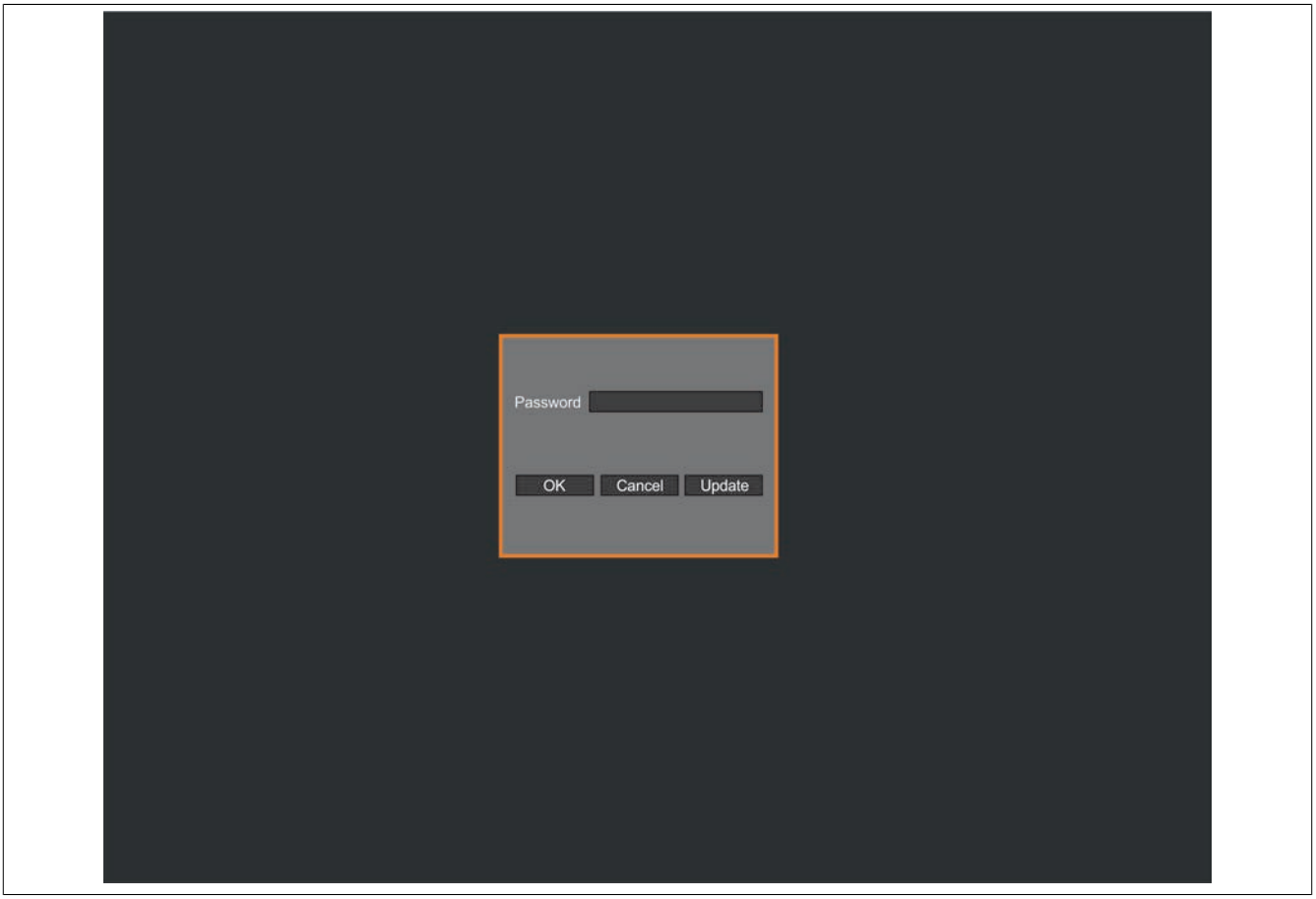


Figure 54: Password query

Parameter	Option
OK	Confirms the input
Cancel	Cancels the procedure
Update	Pressing the Update button causes the Power Panel to attempt an update (see "Update" on page 65). If no updates are found (on the USB flash drive or network), then the Power Panel boots in the configured mode (see "Startup" on page 53). **Important!** **Settings are lost.**

3.7 Touch calibration

B&R touch screen devices are equipped with a touch controller that supports hardware calibration. As a result, devices are pre-calibrated when delivered. This is an advantageous feature when replacing devices of the same model or type since it avoids having to recalibrate the new device. Nevertheless, calibrating the device is still recommended in order to achieve the best results and to better adapt the touch screen to the user's preferences.

3.8 Tips for extending the service life of the display

3.8.1 Backlight

The service life of the backlight is specified by its "half-brightness time". For example, a specified operating time of 50,000 hours means that the display would still retain 50% of its brightness after this time.

3.8.1.1 How can the service life of the backlight be extended?

- By setting the display brightness to the lowest value that is still comfortable for the eyes
- By using dark images
- By reducing the brightness by 50%, which can result in an approximately 50% increase in the half-brightness time

3.8.2 Screen burn-in

Screen burn-in refers to the "burning in" of a static image on a display after being displayed for a prolonged period of time. Nevertheless, static images are not the only cause of screen burn-in. Screen burn-in is also referred to as burn-in effect, image retention, memory effect, memory sticking or ghost image.

There are basically 2 types:

- Area type: This type of screen burn-in is indicated by a dark gray image. The effect will disappear if the display is switched off for a long period of time.
- Line type: This type of screen burn-in can cause lasting damage.

3.8.2.1 What causes screen burn-in?

- Static images
- No screensaver
- Sharp transitions in contrast (e.g. black/white)
- High ambient temperatures
- Operation outside of specifications

3.8.2.2 How can screen burn-in be avoided?

- By constantly changing between static and dynamic images
- By avoiding excessive brightness differences between foreground and background elements
- By using colors with similar brightness
- By using complementary colors in follow-up images
- By using a screensaver

3.9 Pixel errors

Information:

Displays may contain defective pixels (dead/stuck pixels) that result from the manufacturing process. These flaws are not grounds for reclamation or initiating a warranty claim.

4 Standards and certifications

4.1 Applicable European directives

- EMC directive 2004/108/EC
- RoHS directive 2011/65/EU

4.2 Overview of standards

Standard	Description
EN 61131-2	Programmable logic controllers - Part 2: Equipment requirements and tests
EN 61000-6-2	Electromagnetic compatibility (EMC) - Part 2 - Generic standards - Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) - Part 2 - Generic standards - Emission standard for industrial environments
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (RoHS)
EN 60529	Degrees of protection provided by enclosures (IP code)
GOST-R	Certificate of conformity for Russia

Table 35: Overview of standards

4.3 International certifications

B&R products and services comply with applicable standards. This includes international standards from organizations such as ISO, IEC and CENELEC, as well as national standards from organizations such as UL, CSA, VDE, ÖVE, etc. We are committed to ensuring the reliability of our products in an industrial environment.

Certifications	
Europe CE	This mark certifies that all harmonized EN standards for the applicable directives have been met.

Table 36: International certifications

5 Accessories

5.1 T-Series overview

Model number	Product ID	6PPT30.043x-20x	6PPT30.057x-20x	6PPT30.070x-20x	6PPT30.101x-20x	Page
Cage clamp terminal block						
0TB6102.2110-01	2-pin accessory cage clamp terminal block (3.81)	●	●	●	●	76
Screw clamp terminal block						
0TB6102.2010-01	2-pin accessory screw clamp terminal block (3.81)	●	●	●	●	76
USB accessories						
5MMUSB.2048-01	USB 2.0 flash drive, 2048 MB, B&R	●	●	●	●	76
5MMUSB.4096-01	USB 2.0 flash drive, 4096 MB, B&R	●	●	●	●	
POWERLINK cable RJ45 to RJ45						
X20CA0E61.00020	PLK connection cable, RJ45 to RJ45, 0.20 m	●	●	●	●	76
X20CA0E61.00025	PLK connection cable, RJ45 to RJ45, 0.25 m	●	●	●	●	
X20CA0E61.00030	PLK connection cable, RJ45 to RJ45, 0.30 m	●	●	●	●	
X20CA0E61.00035	PLK connection cable, RJ45 to RJ45, 0.35 m	●	●	●	●	
X20CA0E61.00040	PLK connection cable, RJ45 to RJ45, 0.40 m	●	●	●	●	
X20CA0E61.00050	PLK connection cable, RJ45 to RJ45, 0.50 m	●	●	●	●	
X20CA0E61.00100	PLK connection cable RJ45 to RJ45, 1 m	●	●	●	●	
X20CA0E61.00150	PLK connection cable, RJ45 to RJ45, 1.50 m	●	●	●	●	
X20CA0E61.00200	PLK connection cable RJ45 to RJ45, 2 m	●	●	●	●	
X20CA0E61.00300	PLK connection cable RJ45 to RJ45, 3 m	●	●	●	●	
X20CA0E61.00500	PLK connection cable RJ45 to RJ45, 5 m	●	●	●	●	
X20CA0E61.00800	PLK connection cable RJ45 to RJ45, 8 m	●	●	●	●	
X20CA0E61.01000	PLK connection cable RJ45 to RJ45, 10 m	●	●	●	●	
X20CA0E61.01200	PLK connection cable RJ45 to RJ45, 12 m	●	●	●	●	
X20CA0E61.01500	PLK connection cable RJ45 to RJ45, 15 m	●	●	●	●	
X20CA0E61.02000	PLK connection cable RJ45 to RJ45, 20 m	●	●	●	●	
X20CA0E61.0300	PLK connection cable RJ45 to RJ45, 30 m	●	●	●	●	
X20CA0E61.0500	PLK connection cable RJ45 to RJ45, 50 m	●	●	●	●	
X20CA0E61.0600	PLK connection cable RJ45 to RJ45, 60 m	●	●	●	●	
POWERLINK cables, RJ45 to RJ45, can be used in cable drag chains						
X20CA3E61.0100	PLK connection cable, RJ45-RJ45, drag chain, 10 m	●	●	●	●	76
X20CA3E61.0150	PLK connection cable, RJ45-RJ45, drag chain, 15 m	●	●	●	●	
X20CA3E61.0200	PLK connection cable, RJ45-RJ45, drag chain, 0.20 m	●	●	●	●	
POWERLINK cables, RJ45 to M12						
X67CA0E41.0010	PLK attachment cable RJ45 to M12, 1 m	●	●	●	●	76
X67CA0E41.0050	PLK attachment cable RJ45 to M12, 5 m	●	●	●	●	
X67CA0E41.0150	PLK attachment cable RJ45 to M12, 15 m	●	●	●	●	
X67CA0E41.0500	PLK attachment cable RJ45 to M12, 50 m	●	●	●	●	
POWERLINK cable, RJ45 to M12, can be used in cable drag chains						
X67CA3E41.0150	PLK attachment cable RJ45-M12, drag chain, 15 m	●	●	●	●	76
Additional accessories						
9A0013.01	Stylus pen for resistive touch screen	●	●	●	●	

Table 37: T-Series overview

5.2 TB102 2-pin power supply connector

This single-row 2-pin terminal block is used to connect the power supply.

5.2.1 Order data

Model number	Short description	Figure
	Terminal blocks	
0TB6102.2010-01	Accessory terminal block, 2-pin (3.81), screw clamp 1.5 mm²	
0TB6102.2110-01	Accessory terminal block, 2-pin (3.81), cage clamp, 1.5 mm²	

Table 38: 0TB6102.2010-01, 0TB6102.2110-01 - Order data

5.2.2 Technical data

> **Information:**
>
> **The following characteristics, features and limit values only apply to this accessory and can deviate from those specified for the complete system. The data specifications for the complete system take precedence over those of individual components.**
>
> **The technical data in this manual is current as of its creation/publication. We reserve the right to make changes.**

Product ID	0TB6102.2010-01	0TB6102.2110-01
Terminal block		
Number of pins	2 (female)	
Type of terminal block	Screw clamps	Cage clamps
Cable type	Only copper wires (no aluminum wires!)	
Distance between contacts	3.81 mm	
Connection cross section		
AWG wire	28 to 16	
Wire end sleeves with plastic covering	0.25 to 0.5 mm²	
With wire end sleeves	0.25 to 1.5 mm²	
Flexible	0.14 to 1.5 mm²	
Inflexible	0.14 to 1.5 mm²	
Tightening torque	0.22 to 0.25 Nm	-
Electrical characteristics		
Nominal voltage	300 V	
Nominal current [1)]	8 A	

Table 39: 0TB6102.2010-01, 0TB6102.2110-01 - Technical data

1) The limit data for each Power Panel must be taken into consideration.

5.3 Data storage devices

Technical data and additional information about data storage device can be found in the respective documentation. This can be found and downloaded under the model number of the data storage device at www.br-automation.com.

5.4 Cable accessories

Technical data and additional information about POWERLINK and X2X Link cables can be found in the respective documentation. This can be found and downloaded under the model number of the cable on the B&R website at www.br-automation.com.

6 Maintenance

6.1 Cleaning

Danger!

Power Panel devices must be switched off before cleaning in order to prevent unintended functions from being triggered when handling the touch screen or pressing keys.

Power Panel devices should be cleaned with a moist cloth. The cloth should be moistened with water and detergent, a screen cleaning agent or alcohol (ethanol). The cleaning agent should be applied to the cloth beforehand, not sprayed directly on the Power Panel! Aggressive solvents, chemicals, scouring agents, pressurized air or steam jets should never be used.

Information:

Displays with a touch screen should be cleaned regularly.

6.2 Screen burn-in on LCD/TFT monitors

Screen burn-in (afterimages, display memory effect, image retention or image sticking) occurs on LCD/TFT displays if a static image is displayed for a prolonged period of time. This static screen content causes the build-up of parasitic capacitances within the LCD components that prevent liquid crystal molecules from returning to their original state. This condition is unpredictable and can depend on the following factors:

- Type of image displayed
- Color composition of the image
- Length of time that the image is displayed
- Ambient temperature

Preventing screen burn-in

There is no perfect solution. There are ways to significantly reduce this effect, however:

- Avoid static images or screen content.
- Use non-static screensavers when the display is not in use.
- Frequent picture change
- Turn off the display when not in use.

Turning off the backlight does not help prevent screen burn-in.

7 Technical information

7.1 Keypad overlay

The panel overlay conforms to DIN 42115 (Part 2). This means it is resistant to exposure to the following chemicals for a 24-hour period with no visible signs of damage:

Information:

The following characteristics, features and limit values only apply to this individual component and can deviate from those specified for the complete system. For the complete system in which this individual component is used, refer to the data given specifically for that device.

Ethanol Cyclohexanol Diacetone alcohol Glycol Isopropanol Glycerine Methanol Triacetin Dowandol DRM/PM	Formaldehyde 37%-42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene White spirits	Trichloroethane Ethyl acetate Diethyl ether n-Butyl acetate Amyl acetate Butylcellosolve Ether
Acetone Methyl ethyl ketone Dioxan Cyclohexanone Methylisobutylketone (MIBK) Isophorone	Formic acid <50% Acetic acid <50% Phosphoric acid <30% Hydrochloric acid <36% Nitric acid <10% Trichloracetic acid <50% Sulphuric acid <10%	Sodium chloride <20% Hydrogen peroxide <25% Potassium carbonate Washing agents Tenside Fabric conditioner Iron (II) chloride Iron (III) chloride Dibutyl phthalate Dioctyl phthalate Sodium carbonate
Ammonia <40% Caustic soda <40% Potassium hydroxide Alkali carbonate Bichromate Potassium Acetonitrile Sodium bisulphate	Cutting oil Diesel oil Linseed oil Paraffin oil Ricinus oil Silicon oil Turpentine oil substitute Brake fluid Aviation fuel Gasoline Water Sea water Decon	

Table 40: Chemical resistance of the keypad overlay

The panel overlay conforms to DIN 42115 Part 2 for exposure to glacial acetic acid for less than one hour without visible damage.

7.2 Viewing angles

Viewing angle specifications (R, L, U, D) for the display types are listed in the technical data for each device.

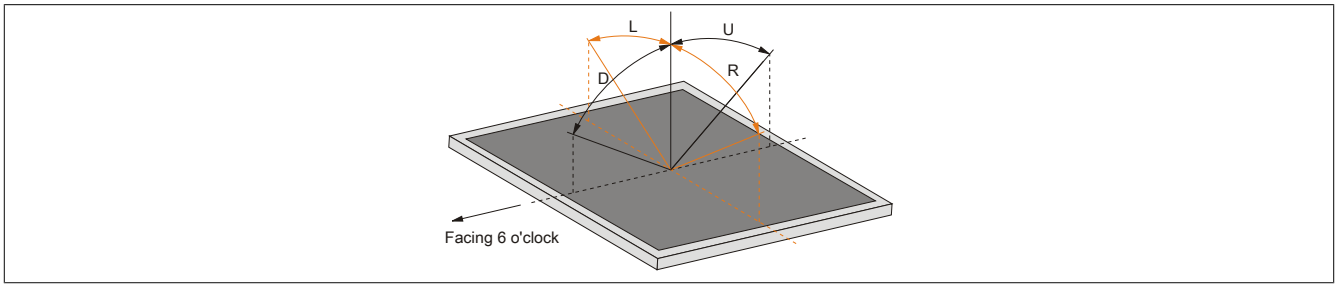


Figure 55: Viewing angles

Table index