
Power Panel 500

User's Manual

Version: **1.00 (March 2011)**

Order nr.: **MAPP500-ENG**

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Chapter 1 • General information

1 Manual history

Version	Date	Change
0.10 Preliminary	2010-11-19	- First version
0.20 Preliminary	2010-12-15	- Technical data for the display in the 5.7" and 7" system units corrected. - Technical data for the 5PP5IO.GNAC-00 I/O board corrected. - The dimension diagram "5PP520.0573-01 - Dimensions" was corrected.
0.21 Preliminary	2010-12-21	- Specifications for the graphic memory of the CPU board corrected.
0.50 Preliminary	2010-12-23	- The section 1 "BIOS options", on page 131 was updated.
0.51 Preliminary	2011-01-24	- The description of the menu items "PCI Express Root Port 1", on page 161 and "PCI Express Root Port 2", on page 164 in the section 1 "BIOS options" was updated. - Section 2.3 "Serial number sticker", on page 28 was updated. - Section 1 "Maintenance Controller Extended (MTCX)", on page 226 was revised.
1.00	2011-03-29	- Sections 5 "Windows Embedded Standard 7", on page 196 and 4 "Windows Embedded Standard 2009", on page 193 were in chapter Chapter 4 "Software" added. - The ambient temperatures of the PP500 system units without keys were added to the technical data. - The vibration and shock specifications and the starting current of the PP500 system units were added to the technical data. - Dimension diagrams for the system units 5PP520.1214-00, 5PP552.0573-00, 5PP580.1043-00, 5PP580.1505-00, 5PP581.1043-00, 5PP581.1505-00 and 5PP582.1043-00 added. - The technical data for the system units was expanded to include the attribute "Altitude" in the category "Environmental conditions" and "Protection in accordance with EN 60529" in the category "Operational conditions". - The description of the Mode / Node switch in the "FF" setting was changed, see " Mode/Node switches", on page 40. - The system unit 5PP520.0573-01, the section "I/O boards" and the section "I/O board insert" were removed. - BIOS updated to version N0.15. - The section 2 "Mounting orientation", on page 125 was in chapter Chapter 3 "Commissioning" added. - The info text in section 2.4.9 " Power button", on page 39 was removed. The backup BIOS will now be automatically loaded if a BIOS update error occurs. - The section 6 " Automation Runtime", on page 199 in chapter Chapter 4 "Software" was updated. - The max. specified temperatures for the temperature sensors in the section 2.1.1 " Temperature sensor locations", on page 26 were added. - The section 2.4.11 " Mode/Node switches", on page 40 was changed.

Table 1: Manual history

2 Safety notices

2.1 Intended use

Programmable logic controllers (PLCs), operating and monitoring devices (industrial PCs, Power Panels, Mobile Panels, etc.), and B&R uninterruptible power supplies have been designed, developed, and 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, as well as flight control systems, flight safety, the control of mass transit systems, medical life support systems and the control of weapons systems.

2.2 Protection against electrostatic discharge

Electrical components that are vulnerable to electrostatic discharge (ESD) must be handled accordingly.

2.2.1 Packaging

- **Electrical components with a housing**
do not require special ESD packaging, but must be handled properly (see "Electrical components with housing").
- **Electrical components without housing**
must be protected by ESD-suitable packaging.

2.2.2 Guidelines for proper ESD- handling

Electrical components with housing

- Do not touch the connector contacts on connected cables.
- Do not touch the contact tips on the circuit boards.

Electrical components with housing

The following is valid in addition to "Electrical components with housing"

- Any persons handling electrical components or devices that will be installed in the electrical components must be grounded.
- Components can only be touched on the small sides or on the front plate.
- Components should always be stored in a suitable medium (ESD packaging, conductive foam, etc.). Metallic surfaces are not suitable storage surfaces!
- Electrostatic discharges should be avoided on the components (e.g. through charged plastics).
- A minimum distance of 10 cm must be kept from monitors and TV sets.

- Measurement devices and equipment must be grounded.
- Measurement probes on potential-free measurement devices 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.).
- The increased ESD protective measures for individual components are not necessary for our customers for handling B&R products.

2.3 Polocy and procedures

Electronic devices are generally not failsafe. In the event of a failure on the programmable control system, operating or monitoring device, or uninterruptible power supply, the user is responsible for ensuring that other devices that may be connected, e.g. motors, are in a secure state.

Both when using programmable logic controllers and when using operating and monitoring devices as control systems in conjunction with a soft PLC (e.g. B&R Automation Runtime or comparable products) or a slot PLC (e.g. B&R LS251 or comparable products), the safety precautions applying 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 installation, commissioning, and maintenance are only permitted to be carried out by qualified personnel. Qualified personnel are persons familiar with transport, mounting, installation, commissioning, and operation of the product who also have the respective qualifications (e.g. IEC 60364). National accident prevention guidelines must be followed. The safety guidelines, 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.

2.4 Transport and storage

During transport and storage, devices must be protected from excessive stress (mechanical load, temperature, humidity, aggressive atmospheres, etc.).

2.5 Mounting

- Installation must take place according to the documentation, using suitable equipment and tools.
- Devices must be installed without voltage applied and by qualified personnel. Before installation, voltage to the switching cabinet should be switched off and prevented from being switched on again.

- General safety regulations and nationally applicable accident prevention guidelines must be observed.
- Electrical installation must be carried out according to the relevant guidelines (e.g. line cross section, fuse, protective ground connection).

2.6 Operation

2.6.1 Protection against touching electrical parts

To operate programmable logic controllers, operating and monitoring devices or uninterruptible power supplies, certain components must carry dangerous voltage levels of over 42 VDC. A life-threatening electrical shock could occur if you come into contact with these parts. This could result in death, severe injury or material damage.

Before turning on the programmable logic controller, the operating and monitoring devices and the uninterruptible power supply, ensure that the housing is properly grounded (PE rail). The ground connection must be established when testing the operating and monitoring devices or the uninterruptible power supply, even when operating them for only a short time.

Before turning the device on, make sure that all parts with voltage applied are securely covered. During operation, all covers must remain closed.

2.6.2 Environmental conditions - Dust, humidity, aggressive gases

Use of operating and 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 influences their function and, especially in systems with active cooling (fans), sufficient cooling cannot be guaranteed.

The presence of aggressive gases in the environment can also lead to malfunctions. When combined with high temperature and humidity, aggressive gases - e.g. with sulfur, nitrogen and chlorine components - start chemical processes that can damage electronic components very quickly. Signs of the presence of aggressive gases are blackened copper surfaces and cable ends on existing installations.

For operation in dusty or humid conditions, correctly installed (cutout installation) operating and monitoring devices like Automation Panel or Power Panel are protected on the front side. The rear side of all devices must be protected from dust and humidity and must be cleaned at suitable intervals.

2.6.3 Programs, viruses and dangerous programs

The system is subject to potential danger 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 preventative measures such as virus protection programs, firewalls, etc. and obtaining software from reliable sources.

2.7 Environmentally-friendly disposal

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

2.7.1 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 and monitoring devices Uninterruptible power supply Batteries & rechargeable batteries Cables	Electronics recycling
Cardboard box / paper packaging	Paper / cardboard recycling
Plastic packaging	Plastic recycling

Table 2: Environmentally-friendly separation of materials

Disposal must comply with the respective legal regulations.

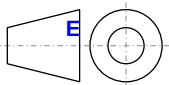
3 Organization of safety notices

The safety notices in this manual are organized as follows:

Safety notice	Description
Danger!	Disregarding the safety regulations and guidelines can be life-threatening.
Caution!	Disregarding the safety regulations and guidelines can result in severe injury or major damage to material.
Warning!	Disregarding the safety regulations and guidelines can result in injury or damage to material.
Information:	Important information for preventing errors.

Table 3: Organization of safety notices

4 Guidelines



European dimension standards apply to all of the dimension diagrams in this document.

All dimensions in mm.

Nominal measurement area	General tolerance according to DIN ISO 2768 medium
Up to 6 mm	± 0.1 mm
for 6 to 30 mm	± 0.2 mm
for 30 to 120 mm	± 0.3 mm
for 120 to 400 mm	± 0.5 mm
for 400 to 1000 mm	± 0.8 mm

Table 4: Nominal measurement areas

5 Overview

Product ID	Short description	on page
5PP551.0573-00	Power Panel 551 5.7" VGA TFT display; 22 function keys and 20 system keys; connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	48
5PP552.0573-00	Power Panel 552 5.7" VGA TFT display; 20 function keys and 20 system keys; connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	54
5PP580.1043-00	Power Panel 580 10.4" VGA TFT display with touch screen (resistive); 22 function keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	71
5PP580.1505-00	Power Panel 580 15" XGA TFT display with touch screen (resistive); 32 function keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	101
5PP581.1043-00	Power Panel 581 10.4" VGA TFT display with touch screen (resistive); 38 function keys and 20 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDCm plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	77
5PP581.1505-00	Power Panel 581 15" XGA TFT display with touch screen (resistive); 32 function keys and 92 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	107
5PP582.1043-00	Power Panel 582 10.4" VGA TFT display with touch screen (resistive); 44 function keys and 20 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	83
Accessories		
5AC900.1201-00	USB Cover M20 IP65 flat	219
5AC900.1201-01	ESB Kappe M20 IP65 bombiert	219
5AC900.BLOC-00	Mounting block with wings 10pcs Spare part.	220
5AC900.BLOC-01	Spare mounting block w/o wings P 10pcs	220
5AC900.CLIP-01	Spare Retaining clip plastic 10pcs	221
Automation Runtime		
1A4600.10-5		199
1A4601.06-5		199
1A4601.06-T		199
Batteries		
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	201
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	201
CPU boards		
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	113
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	113
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	113
CompactFlash		
5CFCRD.0064-03	CompactFlash 64 MB Western Digital	211
5CFCRD.0128-03	CompactFlash 128 MB Western Digital	211
5CFCRD.016G-04	CompactFlash 16 GB B&R	206
5CFCRD.0256-03	CompactFlash 256 MB Western Digital	211
5CFCRD.0512-03	CompactFlash 512 MB Western Digital	211
5CFCRD.0512-04	CompactFlash 512 MB B&R	206
5CFCRD.1024-03	CompactFlash 1 GB Western Digital	211
5CFCRD.1024-04	CompactFlash 1 GB B&R	206

Product ID	Short description	on page
5CFCRD.2048-03	CompactFlash 2 GB Western Digital	211
5CFCRD.2048-04	CompactFlash 2 GB B&R	206
5CFCRD.4096-03	CompactFlash 4 GB Western Digital	211
5CFCRD.4096-04	CompactFlash 4 GB B&R	206
5CFCRD.8192-03	CompactFlash 8 GB Western Digital	211
5CFCRD.8192-04	CompactFlash 8 GB B&R	206
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	116
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	118
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWERLINK	120
Main memory		
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	115
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	115
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	115
System units		
5PP520.0573-00	Power Panel 520 5.7" VGA TFT display with touch screen (resistive); connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	43
5PP520.0702-00	Power Panel 520 7" WVGA TFT display with touch screen (resistive); connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	60
5PP520.1043-00	Power Panel 520 10.4" VGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	65
5PP520.1214-00	Power Panel 520 12.1" SVGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	89
5PP520.1505-00	Power Panel 520 15" XGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	95
Terminal Blocks		
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	203
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	203
USB Zubehör		
5MMUSB.2048-01	USB Memory Stick 2048MB B&R	216
Windows 7		
5SWWI7.0100-ENG	Microsoft OEM Windows 7 Professional 32-bit, DVD, English. Only available with a new device.	191
5SWWI7.0100-GER	Microsoft OEM Windows 7 Professional 32-bit, DVD, German. Only available with a new device.	191
5SWWI7.0300-MUL	Microsoft OEM Windows 7 Ultimate 32-bit, DVD, multilanguage. Only available with a new device.	191
Windows Embedded Standard 2009		
5SWWXP.0736-ENG	Microsoft OEM Windows Embedded Standard 2009, English; for PP500; please order CompactFlash separately (minimum 1 GB).	193
Windows Embedded Standard 7		
5SWWI7.0536-ENG	Microsoft OEM Windows Embedded Standard 7 32-bit, English; for PP500; please order CompactFlash separately (minimum 8 GB).	196
5SWWI7.0736-MUL	Microsoft OEM Windows Embedded Standard 7 Premium 32-bit, multilanguage; for PP500; please order CompactFlash separately (minimum 8 GB).	196
Windows XP Professional		
5SWWXP.0600-ENG	Microsoft OEM Windows XP Professional Service Pack 3, CD, English. Only available with a B&R device.	189

Product ID	Short description	on page
5SWWXP.0600-GER	Microsoft OEM Windows XP Professional Service Pack 3, CD, German. Only available with a device.	189
5SWWXP.0600-MUL	Microsoft OEM Windows XP Professional Service Pack 3, CD, multilanguage. Only available with a B&R device.	189

Chapter 2 • Technical data

1 Introduction

1.1 The right device for any automation task

Now more than ever, competitive control and visualization solutions must be complete, scalable and tailored to match the specific application. A wide range of product types and various possibilities for flexible system expansion are extremely important for machine manufacturing. For this reason, intelligent all-in-one solutions that offer users the highest level of freedom with regard to the control topology are important components for automation. Cost-effective solutions can be implemented through precise adaptation to the respective application, as is proven by the vast number of Power Panels operating in the field.

Integrating control, visualization and drive technology into one device makes it possible to offer intelligent complete solutions that provide maximum uniformity and can be easily connected to various automation infrastructures. Compact Power Panel devices are designed for use in the harshest industrial environments and ensure the highest level of operating comfort. Complete project engineering and integrated language options make B&R control panels the worldwide industry standard.

1.2 Panels with the performance of an industrial PC

The new Power Panel 500 series with Intel® Atom™ architecture advances into areas that were previously only handled by industrial PCs. The Intel® Atom™ Z5xx processor used in the Power Panel 500 has plenty of power, even for challenging applications. There is also plenty of RAM—up to 2 GB. The extensive product range includes panels ranging from 5.7" VGA to 15" XGA displays with intuitive touch screen and function keys. Gigabit Ethernet ensures fast communication over the plant network. Optional fieldbus interfaces or another gigabit Ethernet interface can also be added if needed. When designing the Power Panel 500, a great deal of attention was given to minimizing installation depth so that it can also be used in tight spaces.

1.3 A complete solution with the highest degree of flexibility.

As a central operating and control unit, B&R Power Panel devices combine control, visualization and drive technology into a single package. From embedded processors to full PC power, this product range always provides an optimal system architecture, enabling cost-effective solutions for machine manufacturing.

If expansions are required, remote I/O and drives can be easily connected using modular fieldbus interfaces. Depending on requirements, Power Panels can be expanded with POWER-LINK, CAN bus, Profibus DP or other fieldbus interfaces. This allows additional topologies to be implemented at a later date without problems.

Several distributed operating stations are often used in order to guarantee reliable operation of complex machines. That means they can be easily accessed by operating personnel and that process information is available on the machine where it is needed.

1.4 Open system platform

In addition to providing complete automation solutions, Power Panel devices are also an optimal platform for open operating systems. This provides users with the highest degree of flexibility because different software architectures can be implemented on the same system platform.

Regardless of whether they are used to automate complete systems, as intelligent visualization terminals or together with open PC operating systems, the Power Panel series offers the right tool for any situation. A complete solution with the highest degree of flexibility.

1.5 Features

- Intel® Atom™ Z510, Z520 or Z530 processor
- Up to 2 GB SDRAM
- 5.7" VGA to 15" XGA displays
- 2x USB 2.0 (5.7" and 7" devices), 3x USB 2.0 (10.4", 12.1" and 15" devices)
- 1x RS232
- 1x Ethernet 10/100/1000 MBit/s
- Optional I/O and interface boards
- 1 CompactFlash slot (type I)
- 24 VDC supply voltage
- Operation without fan or heatsink
- BIOS (Insyde)
- Real-time clock, RTC (battery-buffered)

1.6 System components / configuration

The PP500 system can be assembled to meet individual requirements and operating conditions.

The following components are absolutely essential for operation:

- System unit
- CPU board
- Main memory
- Drive (mass memory such as CompactFlash card) for the operating system
- Supply voltage connector (terminal block)

1.6.1 Configuration - Basic system

Konfiguration - Grundsistem					
Systemeinheit	1 auswählen				
Eine Systemeinheit besteht aus Gehäuse und Display. Varianten: PP500 mit Steckplatz für Interface Board: 5PP5xx.xxxx-00 PP500 mit Steckplatz für Interface & I/O Board: 5PP5xx.xxxx-01	5,7"	7"	10,4"	12,1"	15"
					
	5PP520.0573-00	5PP520.0702-00	5PP520.1043-00	5PP520.1214-00	5PP520.1505-00
	5PP551.0573-00	5PP552.0573-00	5PP580.1043-00	5PP581.1043-00	5PP580.1505-00
CPU Board - Hauptspeicher					
CPU Board	1 auswählen				
	5PP5CP.US15-00 - 1100 MHz 5PP5CP.US15-01 - 1330 MHz 5PP5CP.US15-02 - 1600 MHz				
Hauptspeicher	1 auswählen				
	5MMDDR.0512-01 5MMDDR.1024-01 5MMDDR.2048-01				

Image 1: Configuration - Basic system

1.6.2 Configuration software, accessories

Configuration - Software, accessories					
Systemeinheit	Select 1				
Eine Systemeinheit besteht of a housing and display. Variants: PP500 mit Steckplatz für Interface board: 5PP5xx.xxxx-00 PP500 mit Steckplatz für Interface & I/O board: 5PP5xx.xxxx-01	5.7" 	7" 	10.4"  	12.1" 	15"  
	5PP520.0573-00	5PP520.0702-00	5PP520.1043-00	5PP520.1214-00	
	5PP551.0573-00		5PP580.1043-00		5PP520.1505-00
	5PP552.0573-00		5PP581.1043-00		5PP580.1505-00
			5PP582.1043-00		5PP581.1505-00
Interface board	Select 1				
	5PP5IF.CETH-00 - 1x ETH 10/100/100 5PP5IF.CHDA-00 - 1x HDA sound 5PP5IF.FPLM-00 - 2x POWERLINK				
CompactFlash	Select 1				
	5CFCRD.0512-04 5CFCRD.4096-04 5CFCRD.1024-04 5CFCRD.8192-04 5CFCRD.2048-04 5CFCRD.016G-04				
USB accessories	Select 1				
	5MMUSB.2048-01				
Software	Select 1				
 Windows XP  Windows 7  Windows Embedded Standard 2009  Windows Embedded Standard 7  Automation Runtime	Windows XP 5SWWXP.0600-ENG 5SWWXP.0600-GER 5SWWXP.0600-MUL		Windows Embedded Standard 2009 5SWWXP.0736-ENG		
	Windows 7 5SWWI7.0100-ENG 5SWWI7.0100-GER 5SWWI7.0300-MUL		Windows Embedded Standard 7 5SWWI7.0536-ENG 5SWWI7.0736-MUL		
			Automation Runtime 1A4600.10-5 1A4601.06-5 1A4601.06-T		
Terminal blocks	Select 1				
	0TB103.9 0TB103.91				

Image 2: Configuration - Software, accessories

1.7 Differences between Power Panel 500 and Power Panel 300/400

1.7.1 General

Like the B&R Automation PCs and B&R Panel PCs, the new Power Panel device family PP500 can also have a custom configuration. Customers can choose from three different CPU boards and main memory variations. It is also possible to connect interface boards and, in some devices (devices whose model number ends in -01, e.g. 5PP5xx.xxx-01), also I/O boards. For detailed information regarding configuration, see section 1.6 "System components / configuration", on page 23.

1.7.2 Mechanical

The Power Panel 500 is mechanically mounting-compatible with the Power Panel 300/400, but not connection-compatible (interface, plug and key positions are positioned differently). An overview of the mounting compatibility is documented in section 5 "Mounting compatibilities", on page 232 .

2 Entire device

2.1 Temperature specifications

2.1.1 Temperature sensor locations

Sensors show temperature values in a variety of locations (USB ports, main memory) in the PP500. The temperatures¹⁾ can be read in approved Microsoft Windows and Automation Runtime operating systems using the B&R Control Center²⁾.

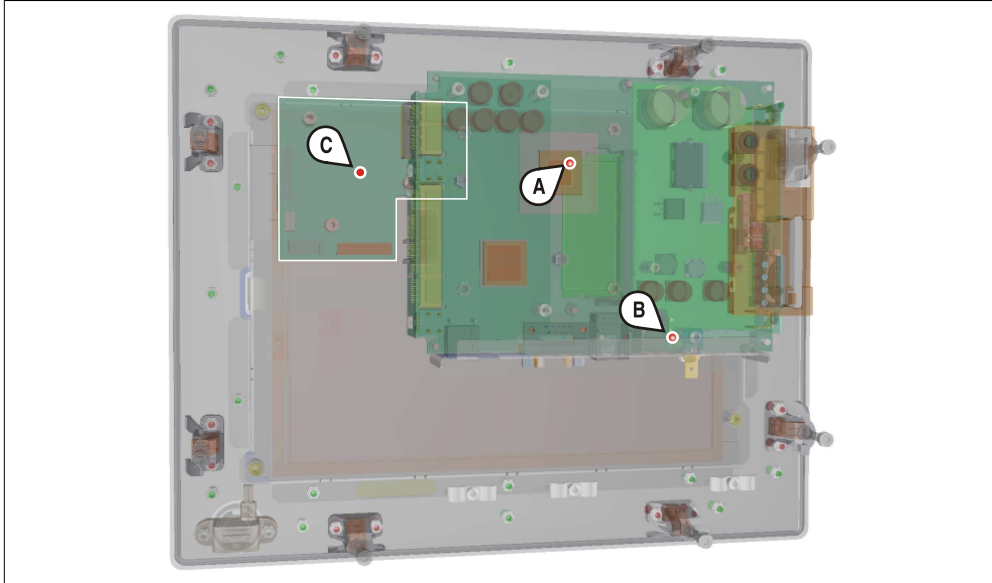


Image 3: Temperature sensor locations

Position	Measurement point for	measurement	Max. specified
A	CPU Main memory	Temperature of the processor and ambient temperature of the main memory (sensor integrated in the processor).	100°C: 5PP5CP.US15-00, 5PP5CP.US15-01 90°C: 5PP5CP.US15-02
B	Interfaces	Temperature of the interfaces (sensor integrated beside USB ports).	80°C
C	Display	Temperature of the display (sensor integrated on the display board - the exact position depends on the display diagonal).	80°C: Diagonals 5.7", 7", 10.4", 15"
	Interface board	Temperature of an interface board (sensor integrated on the interface board).	dependent on the board

Table 5: Temperature sensor locations

¹⁾ The measured temperature is a guideline for the immediate ambient temperature, but can be influenced by neighboring components.

²⁾ The B&R Control Center - ADI driver - can be downloaded for free from the download area on the B&R homepage (www.br-automation.com).

2.1.2 Temperature monitoring

Sensors monitor temperature values in various places (CPU, interfaces, display, interface board) in the PP500. The locations of the temperature sensors can be found in figure "Image 3: Temperature sensor locations", on page 26 . The value listed in the table represents the defined maximum temperature for this measurement point¹⁾ . An alarm is not triggered when this temperature is exceeded. The temperatures can be read in BIOS or in approved Microsoft Windows operating system and Automation Runtime, using B&R Control Center.

2.2 Humidity specifications

The following table displays the minimum and maximum relative humidity for the individual components that are relevant for the humidity limitations of the entire device. The lowest and highest common values are always used when establishing these limits.

Component		Operation	Storage / Transport
System units (all models)		TBD	TBD
US15W - CPU boards		TBD	TBD
Main memory for CPU boards		10 to 90%	5 to 95%
Interface boards	5PP5IF.CETH-00	TBD	TBD
	5PP5IF.CHDA-00	TBD	TBD
	5PP5IF.FPLM-00	TBD	TBD
Accessories	CompactFlash cards 5CFCRD.xxxx-04	85%	85%
	CompactFlash cards - 5CFCRD.xxxx-03	8 to 95%	8 to 95%
	Flash drive 5MMUSB.2048-01	10 to 90%	5 to 90%

Table 6: Overview of humidity specifications for individual components

The listed specifications correspond to the relative humidity at an ambient temperature of 30°C. More detailed information about the specific temperature-dependent humidity values can be found in the technical data for the individual components.

¹⁾ The measured temperature is a guideline for the immediate ambient temperature, but can be influenced by neighboring components.

2.3 Serial number sticker

Each B&R device is given a unique Serial number sticker with Barcodes (type 128), which allows it to be clearly identified. This serial number represents all of the components built into the system (model number, name, revision, serial number and order number).

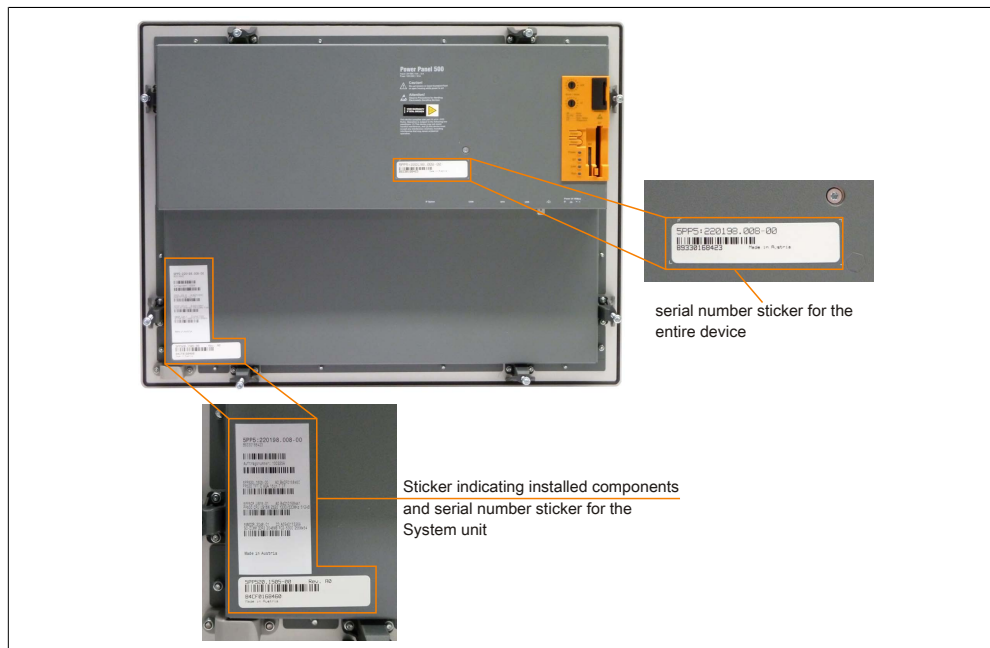


Image 4: Serial number sticker

This information can also be found on the B&R homepage. On the start page www.br-automation.com the serial number must be entered for the entire device in the serial number search field. The search provides you with a detailed list of the individual components.

Home | Kontakt | Sprache | Login
Perfection in Automation
www.br-automation.com


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Industrie PCs

Visualisieren und Bedienen

- Automation Panel 800
- Automation Panel 900
- Mobile Panel 50
- Mobile Panel 100/200
- Power Panel 15/21/35/41
- Power Panel 45
- Power Panel 65
- Power Panel 300/400
- Power Panel 500**
- PANELWARE
- Powered by Wonderware
- Steuerungssysteme
- I/O Systeme
- Sicherheitstechnik
- Antriebstechnik
- Netzwerke und Feldbus Module
- Software
- Prozessleittechnik
- Stromversorgungen
- Zubehör

automationLETTER
Wenn Sie regelmäßig über die Neuheiten von BR informiert werden möchten, tragen Sie bitte untenstehend Ihre E-Mail-Adresse ein.
Ihre e-Mail Adresse

Visualisieren und Bedienen > Power Panel 500 > Systemeinheiten > SPP520.1505-00

Basisinformation Technische Daten



Materialnummer: SPP520.1505-00

Beschreibung:
Power Panel 520 15" XGA TFT Display mit Touch Screen (resistiv); Anschlüsse für 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; erweiterbar mit einem Interface Board; Schutzart IP65 (frontseitig); 24 VDC Stecker für Spannungsversorgung gesondert bestellen (Schraubklemme: OTB103.9; Federzugklemme: OTB103.91).

REKLAMATION ERSTELLEN

Serialnummer	Materialnummer	Rev	Auslieferungsdatum	Gewährleistungsende
B9330168423	SPPS:220198.008-00	C0	*N/V	*N/V

*Kundenvereinbarung untersagt die Ausgabe des Datums
Dieses Material ist Bestandteil eines konfigurierten Materials und wurde in folgender Konfiguration ausgeliefert.

Serialnummer	Materialnummer	Rev	Auslieferungsdatum	Gewährleistungsende
B9330168423	SPPS:220198.008-00	C0	*N/V	*N/V
B4CF0168460	SPP520.1505-00	A0	*N/V	*N/V
B4CD10168441	SPPSCP.US15-01	A0	*N/V	*N/V
A3E40173269	SMMDOR.2048-01	C0	*N/V	*N/V

Suche

Materialnummer

Suche

Zubehör

erforderlich

- CPU Boards
- Feldklemmen
- Hauptspeicher

optional

- Batterien
- CompactFlash
- Interface Boards
- USB Zubehör

Downloads

- PP500 US15W Grafiktreiber (Win7 - 32bit)
- PPC800/PP500 HDA Audiotreiber (Win7 - 32/64bit)
- Power Panel 500 Anwenderhandbuch
- PP500 Intel® 82574 für ETH (Win7 - 32bit)
- PP500 US15W Grafiktreiber (Windows XP/XP64)
- PP500 Intel® 82574 für ETH (Windows XP/XP64)
- PPC800/PP500 HDA Audiotreiber (Windows XP/XP64)

Serialnummerneingabe
z.B. B9330168423

Auflistung der verbauten
Komponenten nach der
Serialnummersuche

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Image 5: Serial number search

2.4 Device interfaces

2.4.1 Overview - Device interfaces

Interfaces for system units with interface board

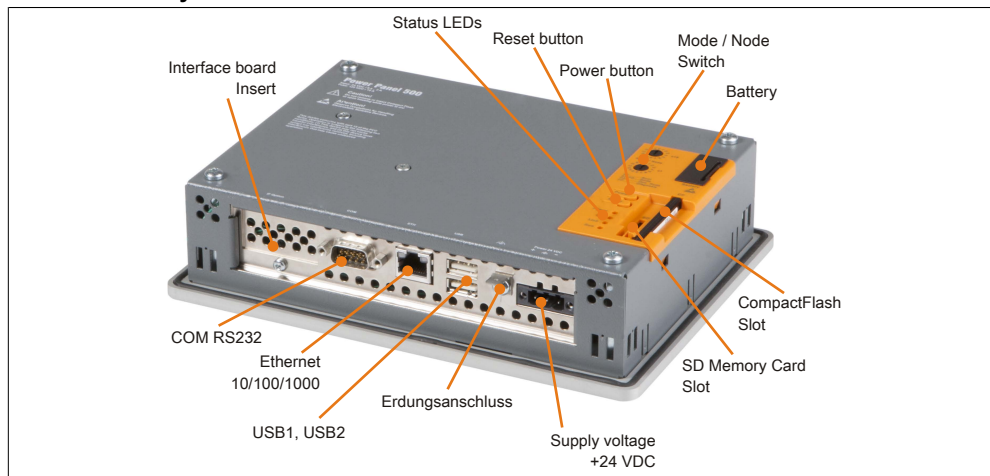


Image 6: Interfaces - PP500 with interface board

Back cover of the system units

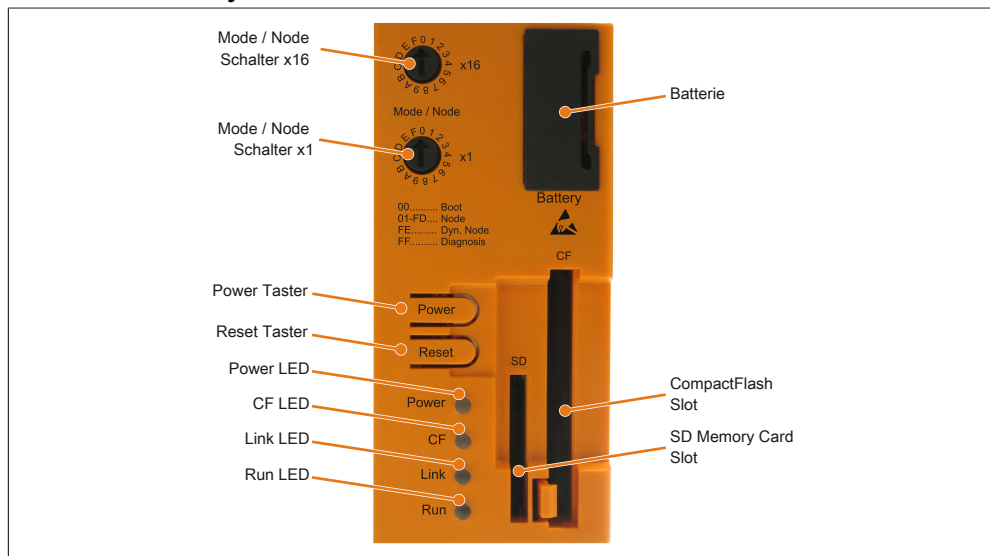


Image 7: PP500 - Back cover

2.4.2 Supply voltage +24 VDC

The 3-pin socket required for the supply voltage connection is not included in delivery. This can be ordered from B&R using the model number 0TB103.9 (screw clamp) or 0TB103.91 (cage clamp).

The pin assignments can be found either in the following table or printed on the PP500 housing. The supply voltage is protected internally by a soldered fuse (10A, fast-acting), so that the device cannot be damaged if there is 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 because of an error.

Supply voltage		3-pin, male
Protected against reverse polarity		
Pin	Description	
1	+	
2	Functional ground	
3	-	
Accessories		
0TB103.9	Plug 24 V 5.08 3-pin screw clamp	
0TB103.91	Plug 24 V 5.08 3-pin cage clamp	

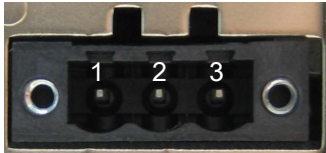


Table 7: Supply voltage connection + 24VDC

2.4.2.1 Ground

Caution!

The pin's connection to the functional ground (pin 2) should be as short as possible (e.g. in the control cabinet). We recommend using the largest possible conductor cross section on the supply plug.

The grounding connection is located on the back of the PP500 systems.

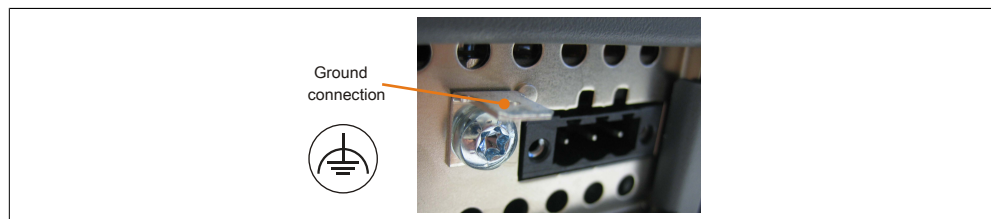


Image 8: Ground connection

The M4 self-locking nut can be used, for example, to fasten a copper strip that is built into the PP500 at a central grounding point in the control cabinet or system. The largest possible conductor cross section should be used (at least 2.5 mm²).

2.4.3 Serial interface COM

Serial interface COM	
	RS232
Type	RS232, modem-capable, not electrically isolated
UART	16550-compatible, 16-byte FIFO
Transfer rate	Max. 115 kBaud
Cable length	Max. 15 meters
Pin	Assignment
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

9-pin DSUB plug

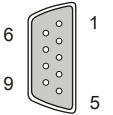


Table 8: Pin assignments - COM

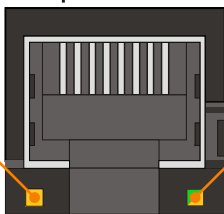
2.4.4 Ethernet (ETH)

This Ethernet controller is integrated in the CPU board and is fed outwards via the CPU board.

Ethernet connection (ETH)			
Controller	Intel 82574		
Cabling	S/STP (Cat5e)		
Transfer rate	10/100/1000 Mbit/s ¹⁾		
Cable length	max. 100 m (min. Cat5e)		
Speed LED	On	Off	
Green	100 Mbit/s	10 Mbit/s ²⁾	
Orange	1000 Mbit/s	-	
Link LED	On	Off	
Orange	Link (Ethernet network connection available)	Activity (blinking - data transfer in progress)	

RJ45 twisted pair (10BaseT/100BaseT), female

1



Link LED

Speed LED

Table 9: Ethernet connection (ETH)

1) Switching takes place automatically.

2) The 10 Mbit/s transfer speed / connection is only present if the Link LED is simultaneously active.

Driver support

A special driver is necessary for operating the Intel Ethernet controller 82574. The necessary drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

2.4.5 USB Ports (USB1, 2, 3)

The PP500 devices have a USB 2.0 (Universal Serial Bus) host controller with multiple USB ports, two of which on the PP500 devices are on the outside for easy access. PP500 devices with a display diagonal of 10.4", 12.1" and 15" are additionally equipped with a front USB port.

Warning!

Peripheral USB devices can be connected to the USB interfaces. Due to the vast number of USB devices available on the market, B&R cannot guarantee their performance. B&R does ensure the performance of all USB devices that they provide.

Caution!

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

USB1, 2

Universal Serial Bus (USB1, USB2) ¹⁾		
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)	2x USB Type A, female  USB1 USB2
Power supply ²⁾ USB1, USB2	Max. 1 A	
Cable length	max. 5 m (without hub)	

Table 10: USB1, USB2 port

1) The interfaces, etc. available on the device or module were numbered accordingly for easy identification. This numbering can differ from the numbering used by the particular operating system.

2) For safety, every USB port is equipped with a maintenance free "USB current-limiting circuit breaker" (max. 500 mA or 1 A).

USB3

This front USB port is only provided on the PP500 devices with a display diagonal of 10.4", 12.1" or 15".

Universal Serial Bus (USB3) ¹⁾		
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)	1x USB type A, female 
Power supply ²⁾ USB3	Max. 1 A	
Cable length	max. 5 m (without hub)	

Table 11: USB3 port

1) The interfaces, etc. available on the device or module were numbered accordingly for easy identification. This numbering can differ from the numbering used by the particular operating system.

2) For safety, the USB port is equipped with a maintenance free "USB current-limiting circuit breaker" (max. 1 A)

2.4.6 Battery

The lithium battery located behind the black cover (3 V, 950 mAh) buffers the internal real-time clock (RTC) as well as the data in the SRAM of interface cards. The buffer duration of the battery is at least TBD years (at 50°C, 8.5 µA current requirements of the supplied components and a self discharge of 40%). The battery is subject to wear and should be replaced regularly (at least following the specified lifespan).

Battery		
Battery Type Removable Service life	Renata 950 mAh Yes, accessible from the outside TBD years ¹⁾	
Accessories	Short description	
0AC201.91	Lithium batteries, 4 pcs. Lithium batteries, 4 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	Lithium batteries, 1 pcs. Lithium batteries, 1 pcs., 3 V / 950 mAh, button cell	

Table 12: Battery

1) At 50°C, 8.5 µA of the supplied components and a self discharge of 40%.

Battery status evaluation

The battery status is evaluated immediately following start-up of the device and is subsequently checked by the system every 24 hours. The battery is subjected to a brief load (1 second) during the measurement and then evaluated. The evaluated battery status is displayed in the BIOS Setup pages (under TBD) and in the B&R Control Center (ADI driver), but can also be read in a customer application via the ADI Library.

Battery status	Meaning
N/A	Hardware, i.e. firmware used is too old and does not support read.
GOOD	Data buffering is guaranteed.
BAD	Data buffering is guaranteed for approx. another 500 hours from the point in time that the battery capacity is determined to be BAD (insufficient).

Table 13: Meaning of battery status

From the point when battery capacity is recognized as insufficient, data buffering is guaranteed for approximately another 500 hours. When changing the battery, data is buffered for approximately another 10 minutes by a gold leaf capacitor.

2.4.7 CompactFlash Slot

This CompactFlash slot is a fixed part of an PPC500 system and is internally connected with the chipset via IDE PATA. Type I CompactFlash cards are supported.

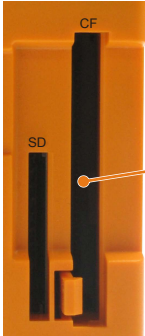
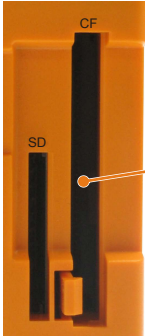
CompactFlash slot		
Connection	PATA Master	
CompactFlash Type	Type I	
Accessories	Short description	
5CFCRD.0512-04	512 MB B&R CompactFlash card	
5CFCRD.1024-04	1024 MB B&R CompactFlash card	
5CFCRD.2048-04	2048 MB B&R CompactFlash card	
5CFCRD.4096-04	4096 MB B&R CompactFlash card	
5CFCRD.8192-04	8192 MB B&R CompactFlash card	
5CFCRD.016G-04	16 GB B&R CompactFlash card	

Table 14: CompactFlash slot

Warning!

Turn off power before inserting or removing the CompactFlash card!

2.4.8 SD Memory Card Slot

Caution!

The SD Memory Card Slot has not yet been released because it is still in development. Inserting an SD memory card can cause the device to malfunction! Therefore, the use of SD Memory cards is not permitted.

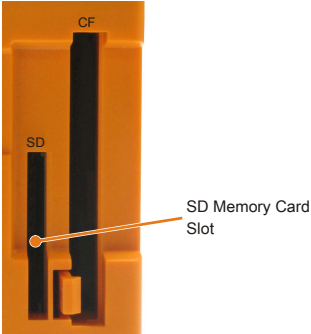
SD Memory Card Slot		
		

Table 15: SD Memory Card Slot

2.4.9 Power button

The power button has a variety of functions due to full ATX power supply support.

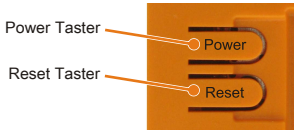
Power button	
The power button acts like the on/off switch on a normal desktop PC with ATX power supply: Press and release ... Switches on PP500 or shuts down operating system and switches off the PP500. Press and hold ... ATX power supply switches off without shutting down the PP500 (data could be lost!). Pressing the power button does not reset the MTCX processor.	 The diagram shows a rectangular button with two horizontal slots. The top slot is labeled 'Power' and the bottom slot is labeled 'Reset'. Two lines point from the labels 'Power Taster' and 'Reset Taster' to the respective slots.

Table 16: Power button

2.4.10 Reset button

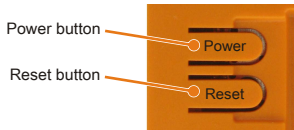
Reset button	
Pushing the reset button triggers a hardware and PCI reset. The PP500 restarts (cold restart). The MTCX processor is not reset when the reset button is pressed.	 The diagram shows a rectangular button with two horizontal slots. The top slot is labeled 'Power' and the bottom slot is labeled 'Reset'. Two lines point from the labels 'Power button' and 'Reset button' to the respective slots.

Table 17: Reset button

Warning!

A system reset can result in data loss!

2.4.11 Mode/Node switches

2.4.12 Status LEDs

The status LEDs are located on the back of the system unit.

Status LEDs			
LED	Color	Status	Meaning
Power	Green	On	Supply voltage OK
	Green	Blinking	The device has booted, the battery status is "BAD" - for more information, see see "Battery", on page 36.
	Red	On	The system is in standby mode (S5: soft-off mode or S4: hibernate mode -Suspend-to-Disk)
	Red	Blinking	The MTCX is running, the battery status is "BAD" - for more information, see see "Battery", on page 36.
	Red / green	Blinking	Service function for MTCX upgrade: A red/green blinking power LED indicates a faulty or incomplete MTCX upgrade. The MTCX runs using the firmware version installed when delivered. This could be caused by a power failure during an MTCX upgrade. An MTCX upgrade must be performed again.
CF	Yellow	On	Indicates IDE drive access (CF)
Link	Yellow	On	Indicates an active SDL connection on the monitor / panel plug.
		Blinking	An active SDL connection has been interrupted by a loss of power in the display unit.
Run	Green	On	Application running
		Off	Application is not running

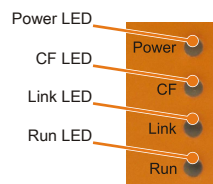


Table 18: Data - status LEDs

2.4.13 Interface board Insert

Interface board insert		Interface board insert with installed interface board 
Accessories	Short description	
5PP5IF.CETH-00	PP500 interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 interface board; connection for 1x MIC, 1x Line IN, 1x Line OUT	
5PP5IF.FPLM-00	PP500 interface board; connections for 2x POWERLINK	

Table 19: Interface board insert

Info:

Installation and replacement of interface boards **ONLY** possible at the B&R plant.

3 Individual components

3.1 System units

3.1.1 5.7" system units

3.1.1.1 5PP520.0573-00

3.1.1.1.1 General information

- 5.7" TFT VGA color display
- Analog resistive touch screen
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.1.1.2 Order data

Model number	Short description	Figure
	System units	
5PP520.0573-00	Power Panel 520 5.7" VGA TFT display with touch screen (resistive); connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	

Table 20: 5PP520.0573-00 - Order data

Model number	Short description	Figure
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 20: 5PP520.0573-00 - Order data

3.1.1.1.3 Technical data

Product ID	5PP520.0573-00
General information	
B&R ID code	\$B4CB
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500

Table 21: 5PP520.0573-00 - Technical data

Product ID	5PP520.0573-00
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	2
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	5.7" (144 mm)
Colors	262,144
Resolution	VGA, 640 x 480 pixels
Contrast	850:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U / direction D = 80°
Background lighting	
Method	LED
Brightness	400 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	No
System keys	No
Lifespan	-
LED brightness	-
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	23 W

Table 21: 5PP520.0573-00 - Technical data

Product ID	5PP520.0573-00
Electrical isolation	Yes
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	212 mm
Height	156 mm
Depth	55 mm
Weight	1287 g

Table 21: 5PP520.0573-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.1.1.4 Dimensions

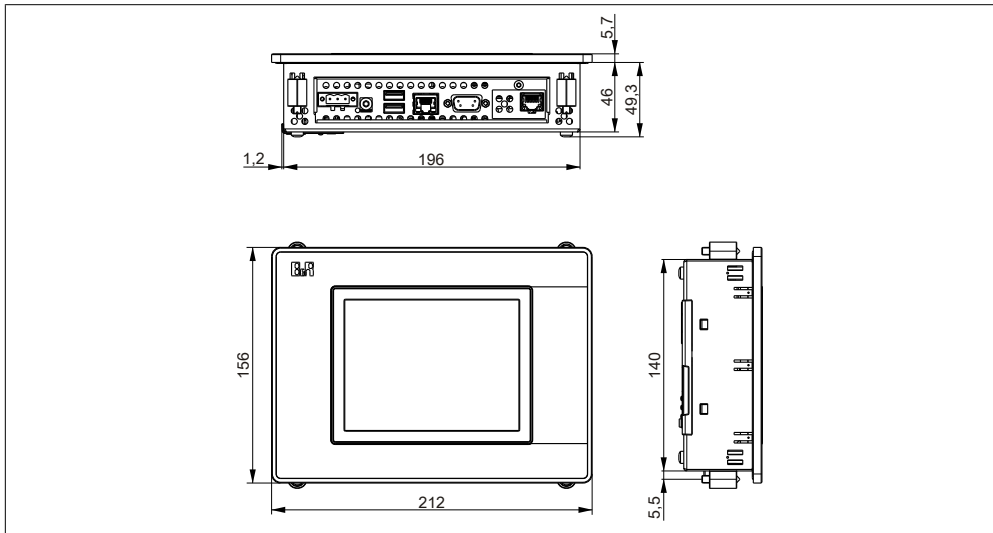


Image 9: 5PP520.0573-00 - Dimensions

3.1.1.1.5 Cutout

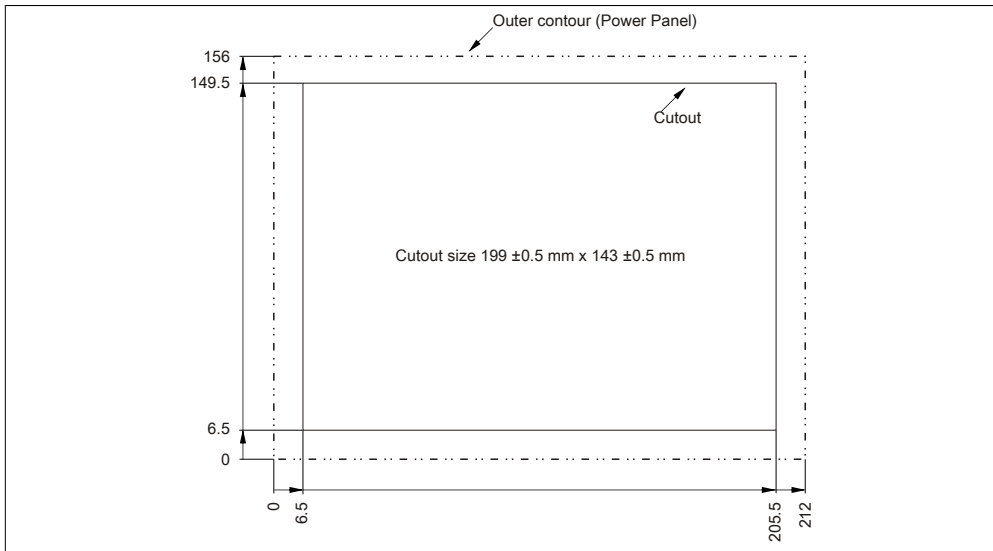


Image 10: 5PP520.0573-00 - Cutout installation

3.1.1.2 5PP551.0573-00

3.1.1.2.1 General information

- 5.7" TFT VGA color display
- Function and system keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.1.2.2 Order data

Model number	Short description	Figure
5PP551.0573-00	Power Panel 551 5.7" VGA TFT display; 22 function keys and 20 system keys; connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	

Table 22: 5PP551.0573-00 - Order data

Model number	Short description	Figure
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 22: 5PP551.0573-00 - Order data

3.1.1.2.3 Technical data

Product ID	5PP551.0573-00
General information	
B&R ID code	\$B604
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s

Table 23: 5PP551.0573-00 - Technical data

Product ID	5PP551.0573-00
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	2
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	5.7" (144 mm)
Colors	262,144
Resolution	VGA, 640 x 480 pixels
Contrast	850:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U / direction D = 80°
Background lighting	
Method	LED
Brightness	400 cd/m²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	-
Technology	-
Controllers	-
Degree of transmission	-
Keys	
Function keys	22 with LED (yellow)
System keys	Numeric keys, cursor block
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.1 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	26 W
Electrical isolation	Yes
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side

Table 23: 5PP551.0573-00 - Technical data

Product ID	5PP551.0573-00
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	212 mm
Height	245 mm
Depth	54.95 mm
Weight	1750 g

Table 23: 5PP551.0573-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.1.2.4 Dimensions

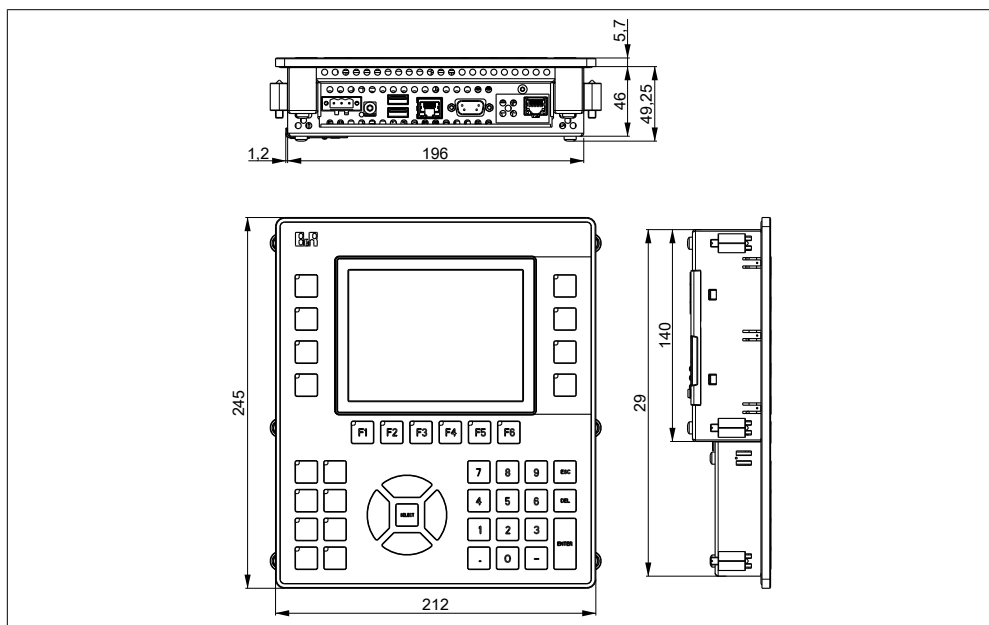


Image 11: 5PP551.0573-00 - Dimensions

3.1.1.2.5 Cutout

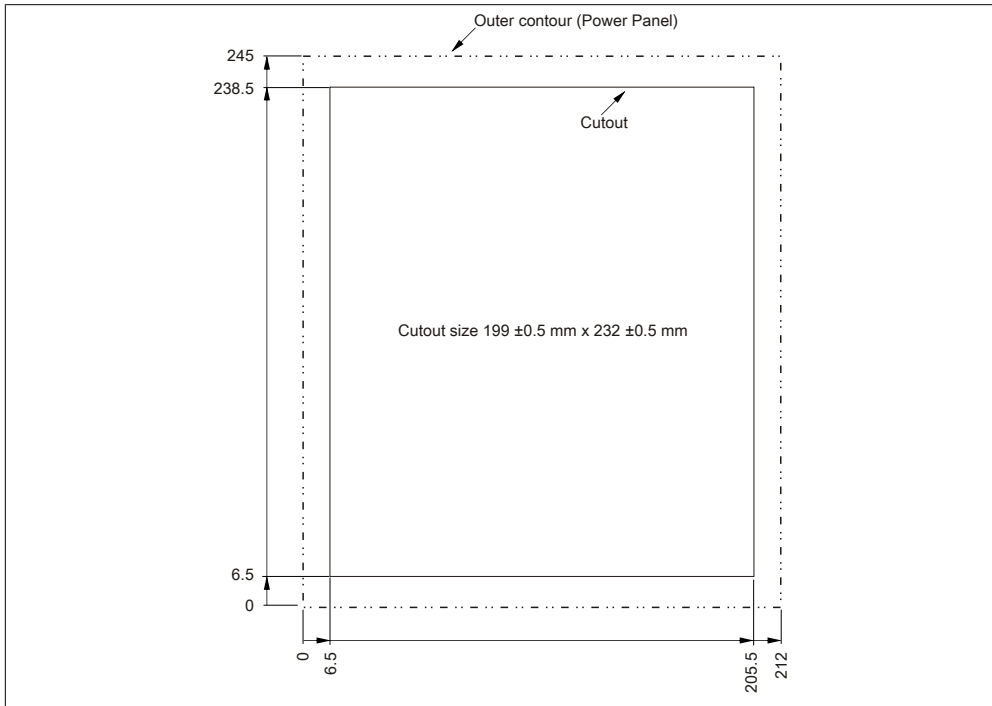


Image 12: 5PP551.0573-00 - Cutout installation

3.1.1.3 5PP552.0573-00

3.1.1.3.1 General information

- 5.7" TFT VGA color display
- Function and system keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.1.3.2 Order data

Model number	Short description	Figure
5PP552.0573-00	Power Panel 552 5.7" VGA TFT display; 20 function keys and 20 system keys; connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
Mandatory accessory		
CPU boards		
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
Main memory		
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
Terminal Blocks		
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
Optional accessory		
Batteries		
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
CompactFlash		
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	

Table 24: 5PP552.0573-00 - Order data

Model number	Short description	Figure
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 24: 5PP552.0573-00 - Order data

3.1.1.3.3 Technical data

Product ID	5PP552.0573-00
General information	
B&R ID code	\$B605
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s

Table 25: 5PP552.0573-00 - Technical data

Product ID	5PP552.0573-00
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	2
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	5.7" (144 mm)
Colors	262,144
Resolution	VGA, 640 x 480 pixels
Contrast	850:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U / direction D = 80°
Background lighting	
Method	LED
Brightness	400 cd/m²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	-
Technology	-
Controllers	-
Degree of transmission	-
Keys	
Function keys	20 with LED (yellow)
System keys	Numeric keys, cursor block
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.1 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	26 W
Electrical isolation	Yes
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side

Table 25: 5PP552.0573-00 - Technical data

Product ID	5PP552.0573-00
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	302 mm
Height	187 mm
Depth	55 mm
Weight	1750 g

Table 25: 5PP552.0573-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.1.3.4 Dimensions

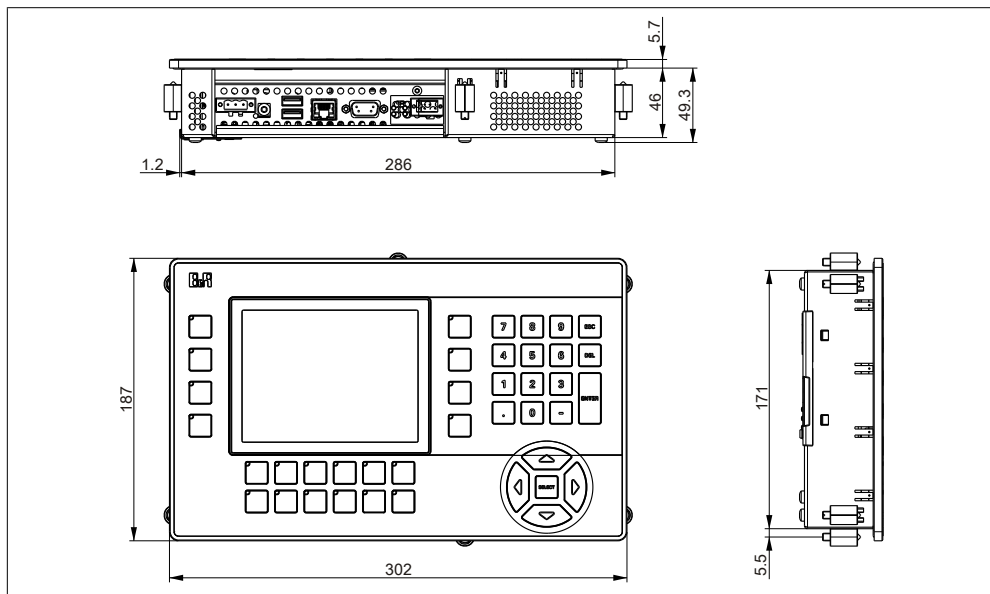


Image 13: 5PP552.0573-00 - Dimensions

3.1.1.3.5 Cutout

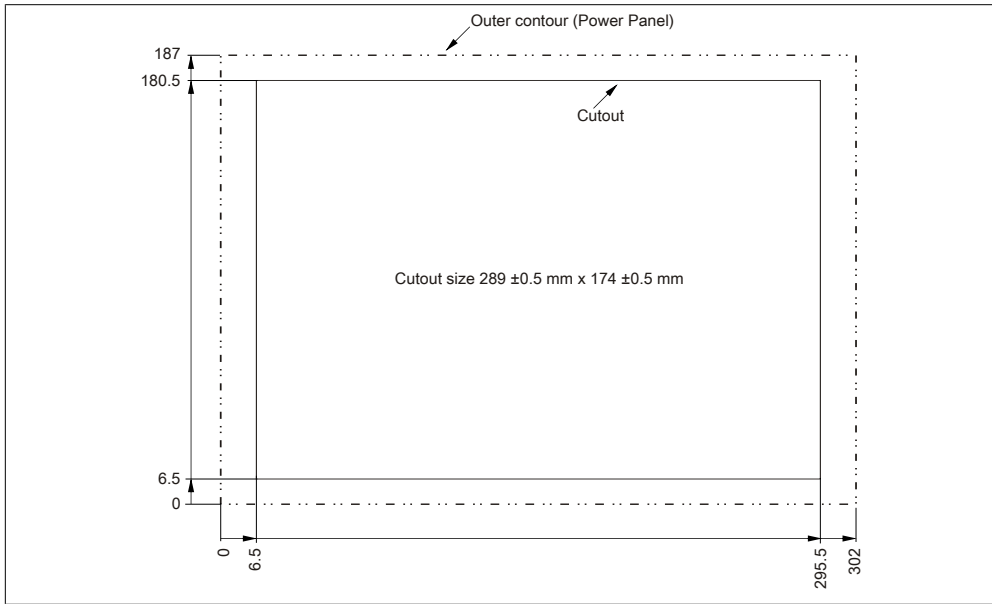


Image 14: 5PP552.0573-00 - Cutout installation

3.1.2 7" system unit

3.1.2.1 5PP520.0702-00

3.1.2.1.1 General information

- 7" TFT WVGA color display
- Analog resistive touch screen
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.2.1.2 Order data

Model number	Short description	Figure
	System units	
5PP520.0702-00	Power Panel 520 7" WVGA TFT display with touch screen (resistive); connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	

Table 26: 5PP520.0702-00 - Order data

Model number	Short description	Figure
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 26: 5PP520.0702-00 - Order data

3.1.2.1.3 Technical data

Product ID	5PP520.0702-00
General information	
B&R ID code	\$B4CD
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 27: 5PP520.0702-00 - Technical data

Product ID	5PP520.0702-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	2
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	7" (177.8 mm)
Colors	16 million
Resolution	WVGA, 800 x 480 pixels
Contrast	600:1
Viewing angles	
Horizontal	Direction R / direction L = 70°
Vertical	Direction U / direction D = 60°
Background lighting	
Method	LED
Brightness	500 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	No
System keys	No
Lifespan	-
LED brightness	-
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	24 W
Electrical isolation	Yes

Table 27: 5PP520.0702-00 - Technical data

Product ID	5PP520.0702-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	212 mm
Height	156 mm
Depth	55 mm
Weight	1200 g

Table 27: 5PP520.0702-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.2.1.4 Dimensions

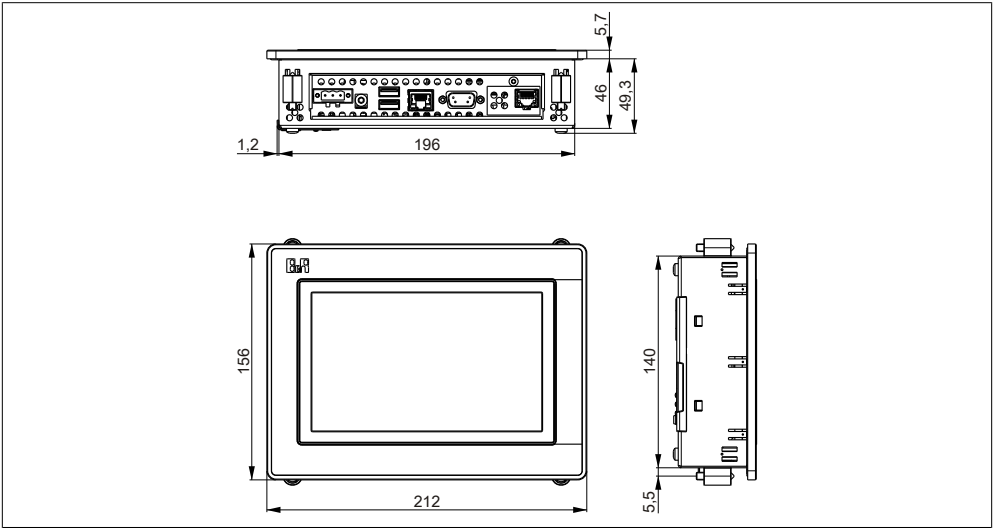


Image 15: 5PP520.0702-00 - Dimensions

3.1.2.1.5 Cutout

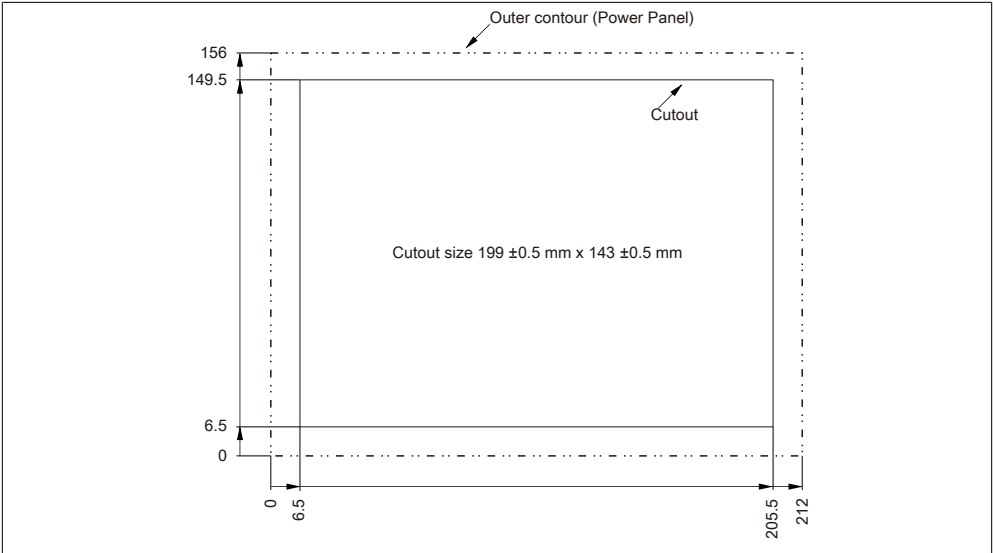


Image 16: 5PP520.0702-00 - Cutout installation

3.1.3 10.4" system units

3.1.3.1 5PP520.1043-00

3.1.3.1.1 General information

- 10.4" TFT VGA color display
- Analog resistive touch screen
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.3.1.2 Order data

Model number	Short description	Figure
	System units	
5PP520.1043-00	Power Panel 520 10.4" VGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	

Table 28: 5PP520.1043-00 - Order data

Model number	Short description	Figure
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 28: 5PP520.1043-00 - Order data

3.1.3.1.3 Technical data

Product ID	5PP520.1043-00
General information	
B&R ID code	\$B4CE
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 29: 5PP520.1043-00 - Technical data

Product ID	5PP520.1043-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	10.4" (264 mm)
Colors	16 million
Resolution	VGA, 640 x 480 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 60° / direction D = 80°
Background lighting	
Method	LED
Brightness	450 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R; serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	No
System keys	No
Lifespan	-
LED brightness	-
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.2 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	25.5 W
Electrical isolation	Yes

Table 29: 5PP520.1043-00 - Technical data

Product ID	5PP520.1043-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	323 mm
Height	260 mm
Depth	59.7 mm
Weight	2750 g

Table 29: 5PP520.1043-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.3.1.4 Dimensions

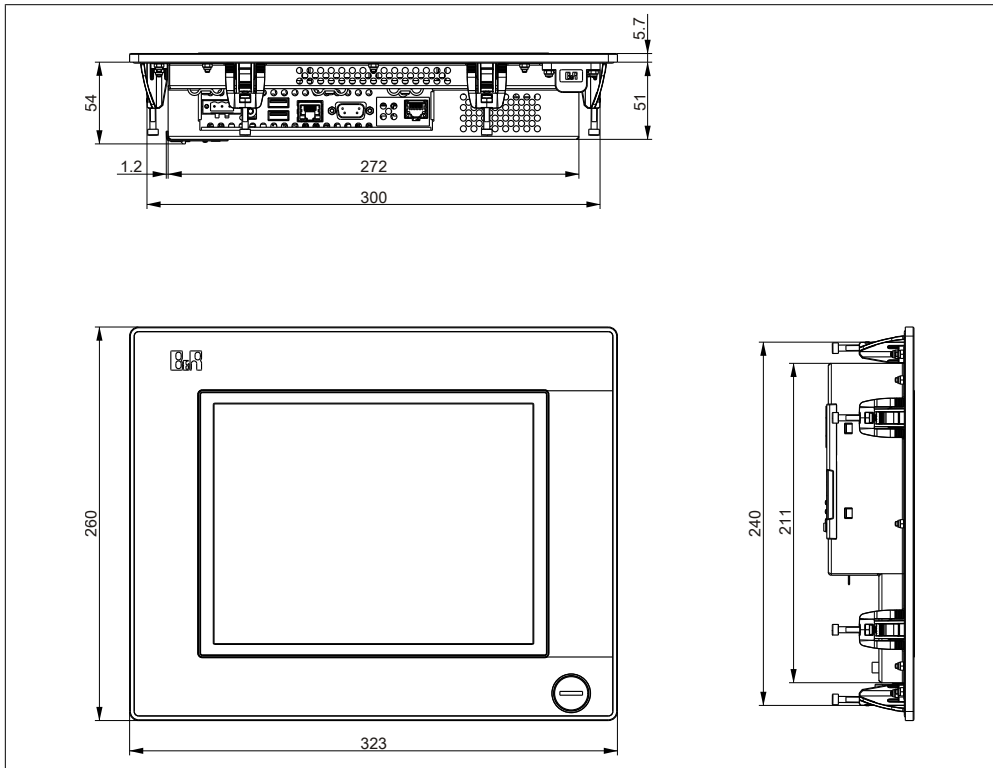


Image 17: 5PP520.1043-00 - Dimensions

3.1.3.1.5 Cutout

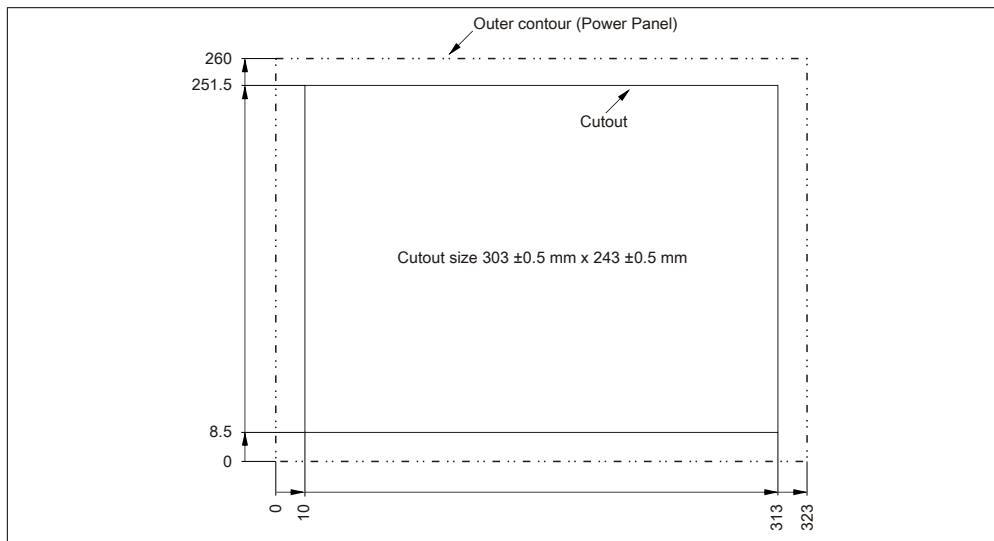


Image 18: 5PP520.1043-00 - Cutout installation

3.1.3.2 5PP580.1043-00

3.1.3.2.1 General information

- 10.4" TFT VGA color display
- Analog resistive touch screen and function keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.3.2.2 Order data

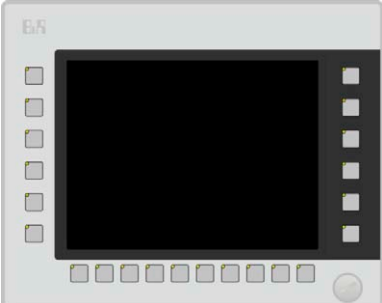
Model number	Short description	Figure
5PP580.1043-00	Power Panel 580 10.4" VGA TFT display with touch screen (resistive); 22 function keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	

Table 30: 5PP580.1043-00 - Order data

Model number	Short description	Figure
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 30: 5PP580.1043-00 - Order data

3.1.3.2.3 Technical data

Product ID	5PP580.1043-00
General information	
B&R ID code	\$B606
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	Renata 950 mAh Lithium Ion 4 years Yes, accessible from the outside
Type	
Method	
Lifespan	
removable	
Certification	In preparation
CE	
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	MTCX ¹⁾ 10 ms
Controllers	
Buffer time	
Graphics	Intel® Graphics Media Accelerator 500
Controllers	
Memory	DDR2 SDRAM Max. 2 GB
Type	
Size	

Table 31: 5PP580.1043-00 - Technical data

Product ID	5PP580.1043-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	10.4" (264 mm)
Colors	16 million
Resolution	VGA, 640 x 480 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 60° / direction D = 80°
Background lighting	
Method	LED
Brightness	450 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	22 with LED (yellow)
System keys	No
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.2 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	28.5 W
Electrical isolation	Yes

Table 31: 5PP580.1043-00 - Technical data

Product ID	5PP580.1043-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	323 mm
Height	260 mm
Depth	59.7 mm
Weight	2650 g

Table 31: 5PP580.1043-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.3.2.4 Dimensions

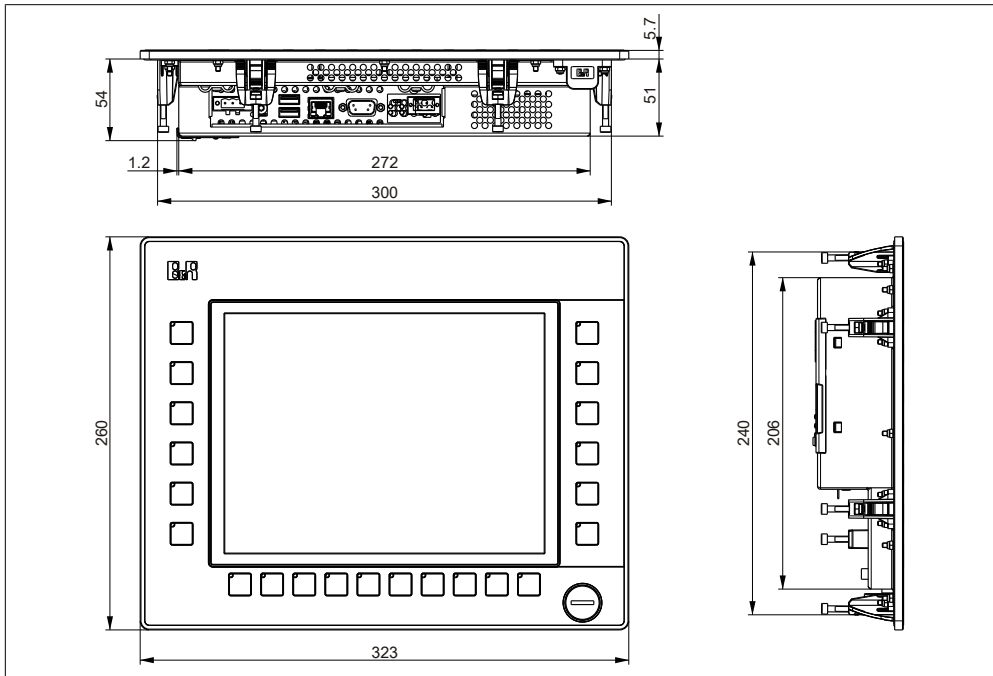


Image 19: 5PP580.1043-00 - Dimensions

3.1.3.2.5 Cutout

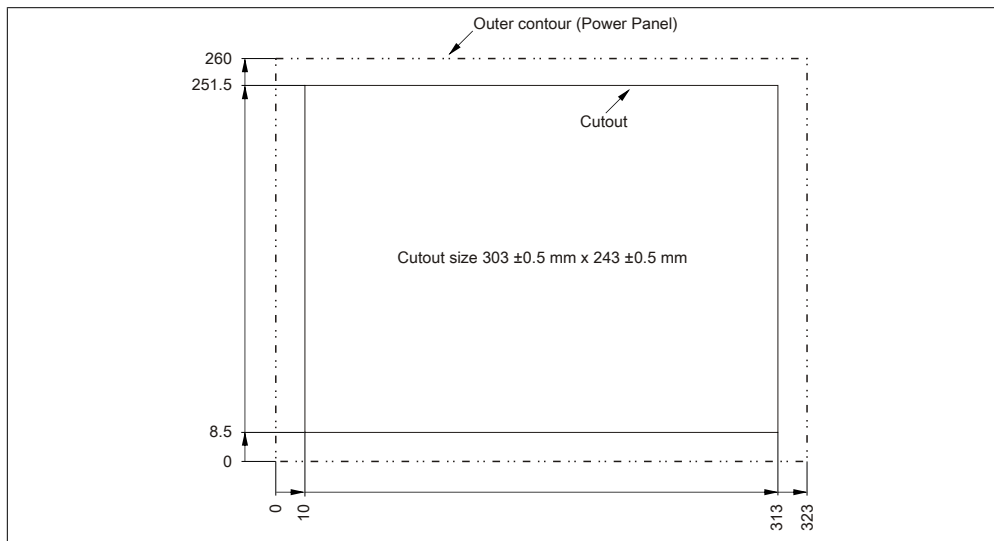


Image 20: 5PP580.1043-00 - Cutout installation

3.1.3.3 5PP581.1043-00

3.1.3.3.1 General information

- 10.4" TFT VGA color display
- Analog resistive touch screen plus function and system keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.3.3.2 Order data

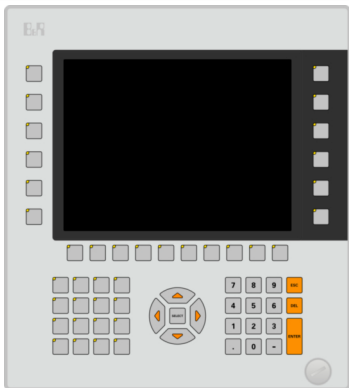
Model number	Short description	Figure
5PP581.1043-00	Power Panel 581 10.4" VGA TFT display with touch screen (resistive); 38 function keys and 20 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDCm plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	

Table 32: 5PP581.1043-00 - Order data

Model number	Short description	Figure
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 32: 5PP581.1043-00 - Order data

3.1.3.3.3 Technical data

Product ID	5PP581.1043-00
General information	
B&R ID code	\$B608
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 33: 5PP581.1043-00 - Technical data

Product ID	5PP581.1043-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	10.4" (264 mm)
Colors	16 million
Resolution	VGA, 640 x 480 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 60° / direction D = 80°
Background lighting	
Method	LED
Brightness	450 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	38 with LED (yellow)
System keys	Numeric keys, cursor block
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.2 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	28.5 W
Electrical isolation	Yes

Table 33: 5PP581.1043-00 - Technical data

Product ID	5PP581.1043-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	323 mm
Height	358 mm
Depth	59.7 mm
Weight	3350 g

Table 33: 5PP581.1043-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.3.3.4 Dimensions

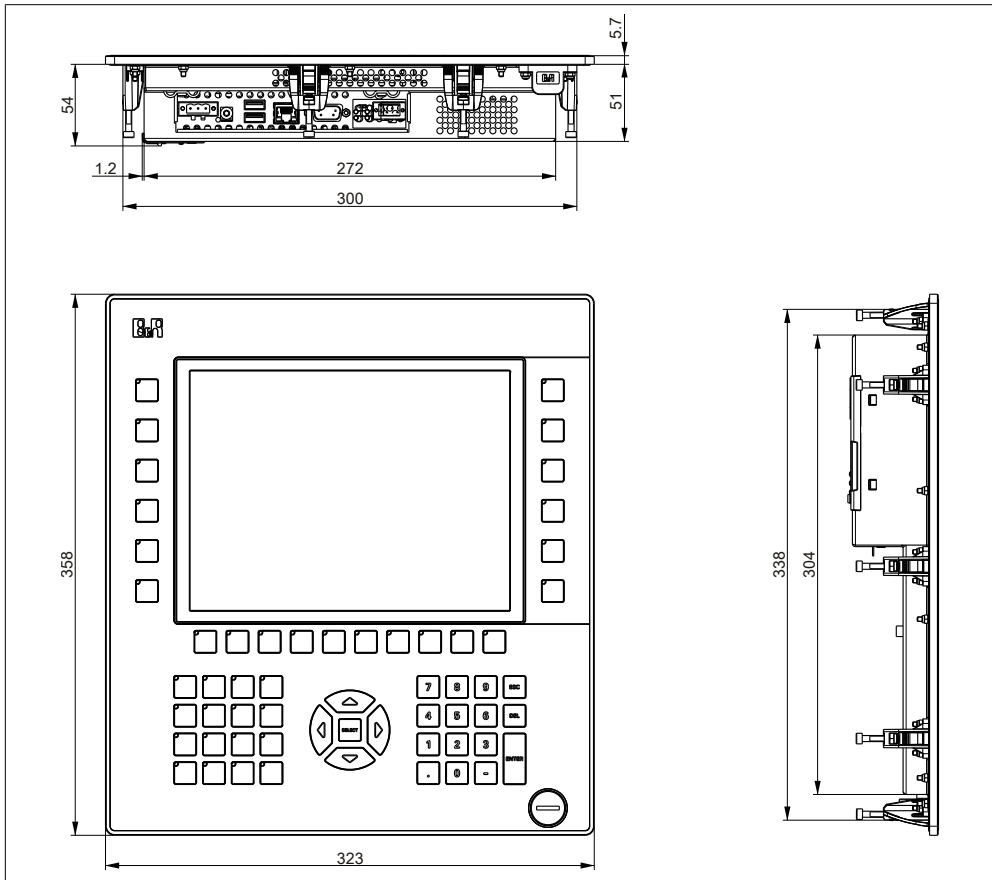


Image 21: 5PP581.1043-00 - Dimensions

3.1.3.3.5 Cutout

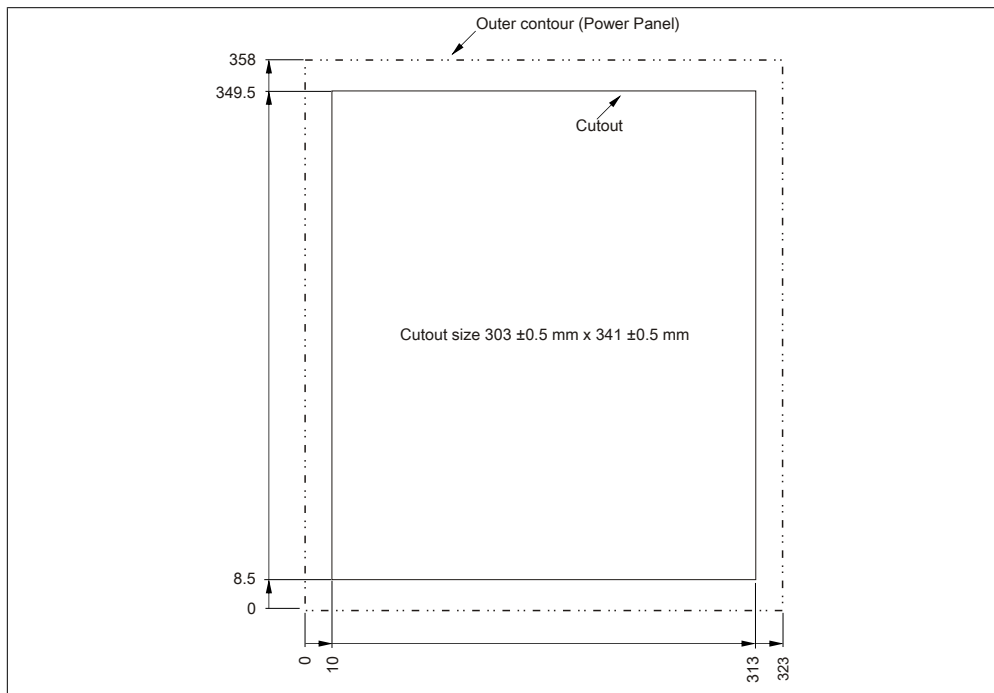


Image 22: 5PP581.1043-00 - Cutout installation

3.1.3.4 5PP582.1043-00

3.1.3.4.1 General information

- 10.4" TFT VGA color display
- Analog resistive touch screen plus function and system keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.3.4.2 Order data

Model number	Short description	Figure
5PP582.1043-00	Power Panel 582 10.4" VGA TFT display with touch screen (resistive); 44 function keys and 20 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	

Table 34: 5PP582.1043-00 - Order data

Model number	Short description	Figure
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 34: 5PP582.1043-00 - Order data

3.1.3.4.3 Technical data

Product ID	5PP582.1043-00
General information	
B&R ID code	\$B609
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 35: 5PP582.1043-00 - Technical data

Product ID	5PP582.1043-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	10.4" (264 mm)
Colors	16 million
Resolution	VGA, 640 x 480 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 60° / direction D = 80°
Background lighting	
Method	LED
Brightness	450 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	44 with LED (yellow)
System keys	Numeric keys, cursor block
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.2 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	28.5 W
Electrical isolation	Yes

Table 35: 5PP582.1043-00 - Technical data

Product ID	5PP582.1043-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	423 mm
Height	288 mm
Depth	59.7 mm
Weight	3500 g

Table 35: 5PP582.1043-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.3.4.4 Dimensions

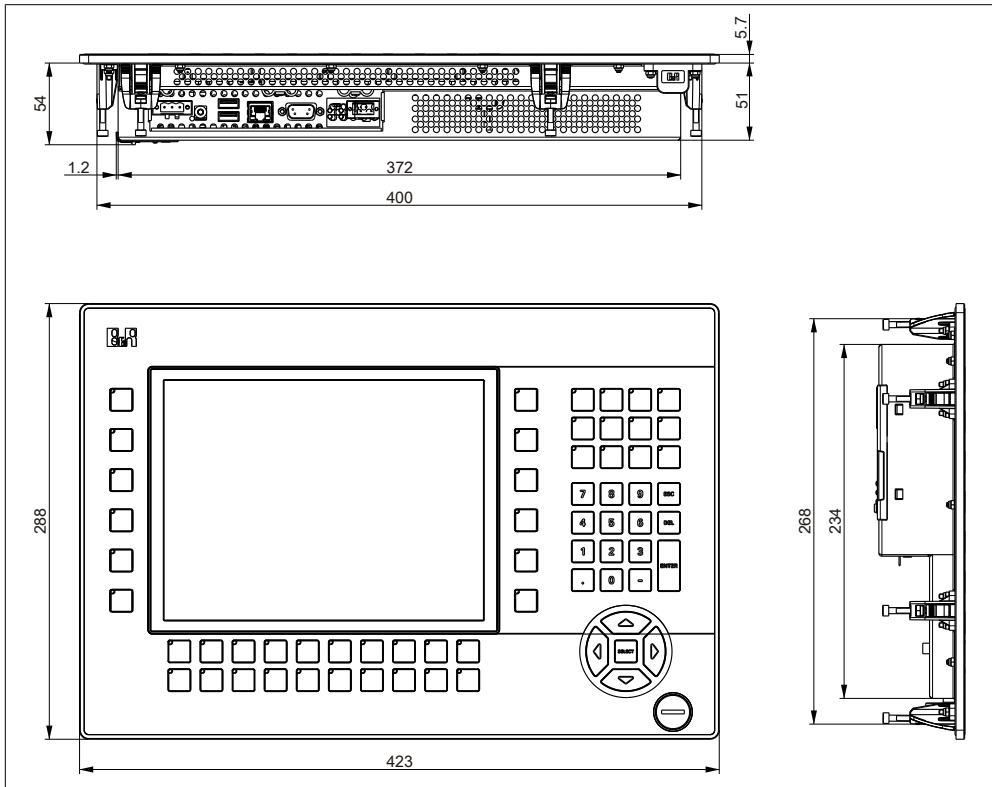


Image 23: 5PP582.1043-00 - Dimensions

3.1.3.4.5 Cutout

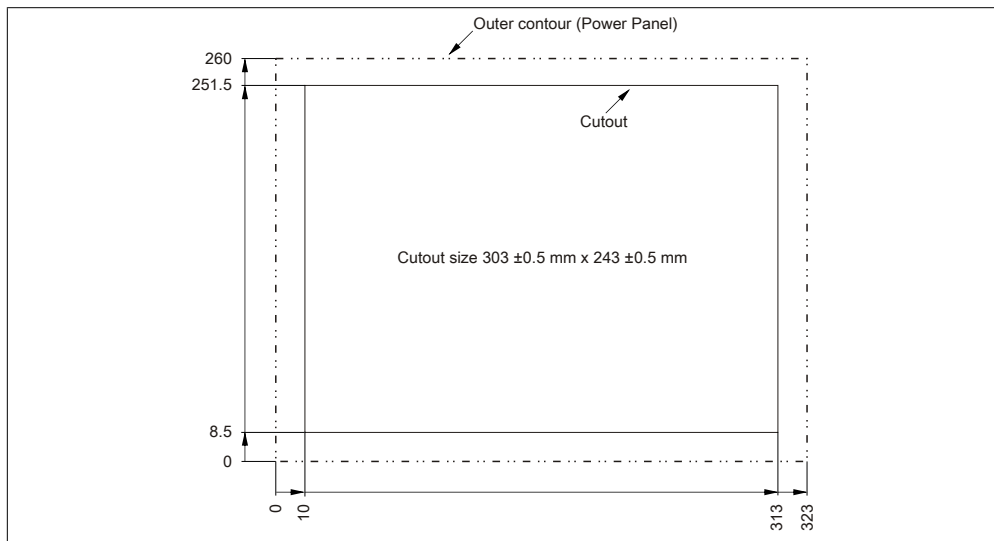


Image 24: 5PP582.1043-00 - Cutout installation

3.1.4 12.1" system unit

3.1.4.1 5PP520.1214-00

3.1.4.1.1 General information

- 12.1" TFT SVGA color display
- Analog resistive touch screen
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.4.1.2 Order data

Model number	Short description	Figure
	System units	
5PP520.1214-00	Power Panel 520 12.1" SVGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	

Table 36: 5PP520.1214-00 - Order data

Model number	Short description	Figure
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 36: 5PP520.1214-00 - Order data

3.1.4.1.3 Technical data

Product ID	5PP520.1214-00
General information	
B&R ID code	\$B4E0
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 37: 5PP520.1214-00 - Technical data

Product ID	5PP520.1214-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	12.1" (307 mm)
Colors	262,144
Resolution	SVGA, 800 x 600 pixels
Contrast	800:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 35° / direction D = 60°
Background lighting	
Method	LED
Brightness	450 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	80% ±3%
Keys	
Function keys	No
System keys	No
Lifespan	-
LED brightness	-
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	TBD
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
Electrical isolation	Yes

Table 37: 5PP520.1214-00 - Technical data

Product ID	5PP520.1214-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	362 mm
Height	284 mm
Depth	60.2 mm
Weight	3350 g

Table 37: 5PP520.1214-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.4.1.4 Dimensions

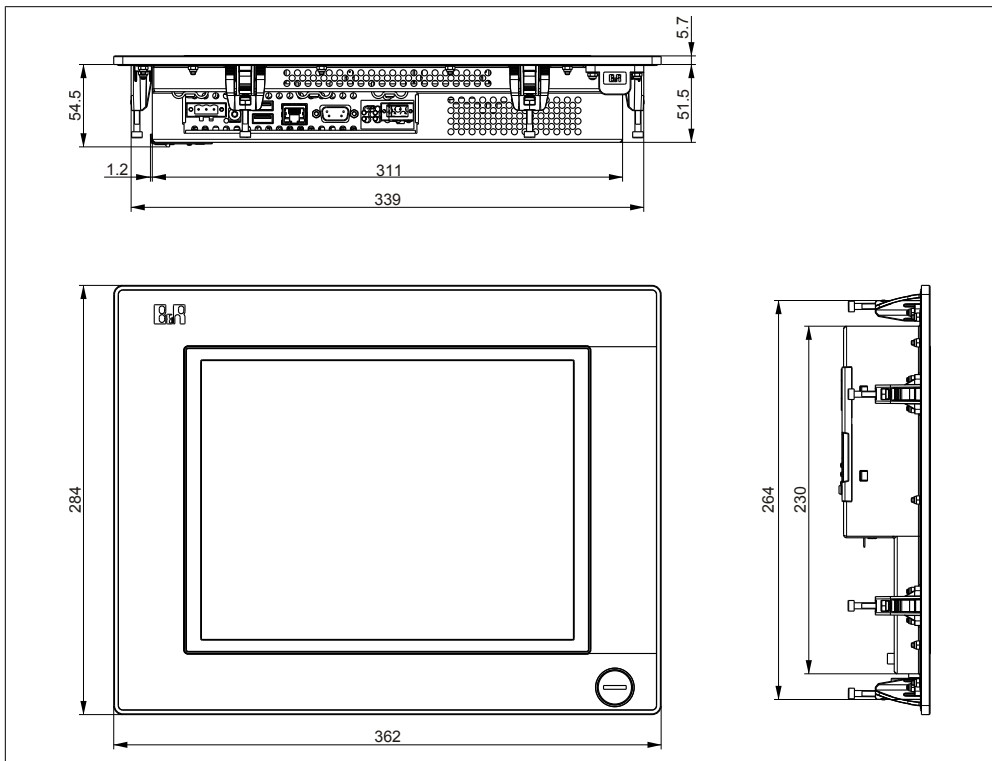


Image 25: 5PP520.1214-00 - Dimensions

3.1.4.1.5 Cutout

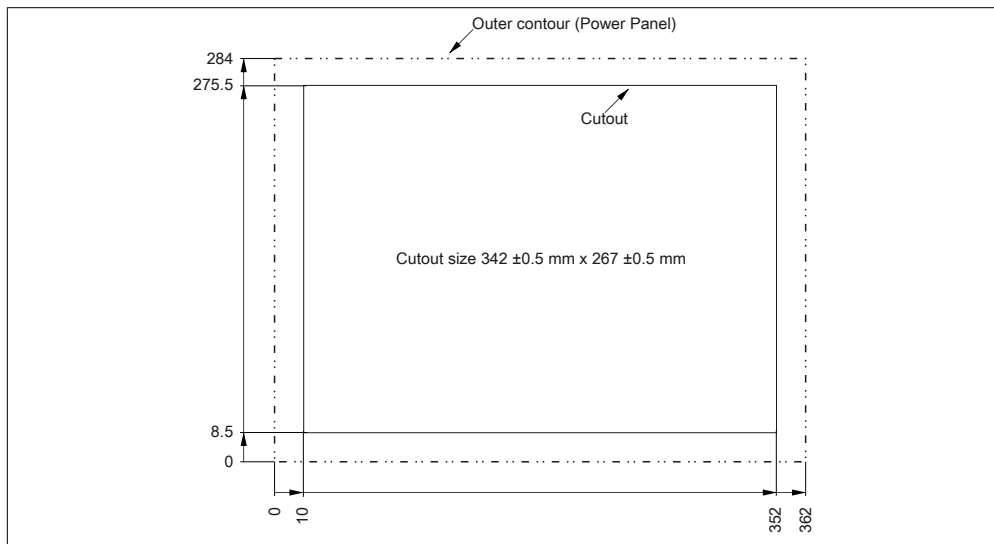


Image 26: 5PP520.1214-00 - Cutout installation

3.1.5 15" system units

3.1.5.1 5PP520.1505-00

3.1.5.1.1 General information

- 15" TFT XGA color display
- Analog resistive touch screen
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.5.1.2 Order data

Model number	Short description	Figure
	System units	
5PP520.1505-00	Power Panel 520 15" XGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separatelyn (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	

Table 38: 5PP520.1505-00 - Order data

Model number	Short description	Figure
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 38: 5PP520.1505-00 - Order data

3.1.5.1.3 Technical data

Product ID	5PP520.1505-00
General information	
B&R ID code	\$B4CF
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 39: 5PP520.1505-00 - Technical data

Product ID	5PP520.1505-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	15" (381 mm)
Colors	16 million
Resolution	XGA, 1024 x 768 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 80° / direction D = 60°
Background lighting	
Method	LED
Brightness	350 cd/m ²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	81% ±3%
Keys	
Function keys	No
System keys	No
Lifespan	-
LED brightness	-
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.5 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	31 W
Electrical isolation	Yes

Table 39: 5PP520.1505-00 - Technical data

Product ID	5PP520.1505-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	435 mm
Height	330 mm
Depth	62.7 mm
Weight	5100 g

Table 39: 5PP520.1505-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.5.1.4 Dimensions

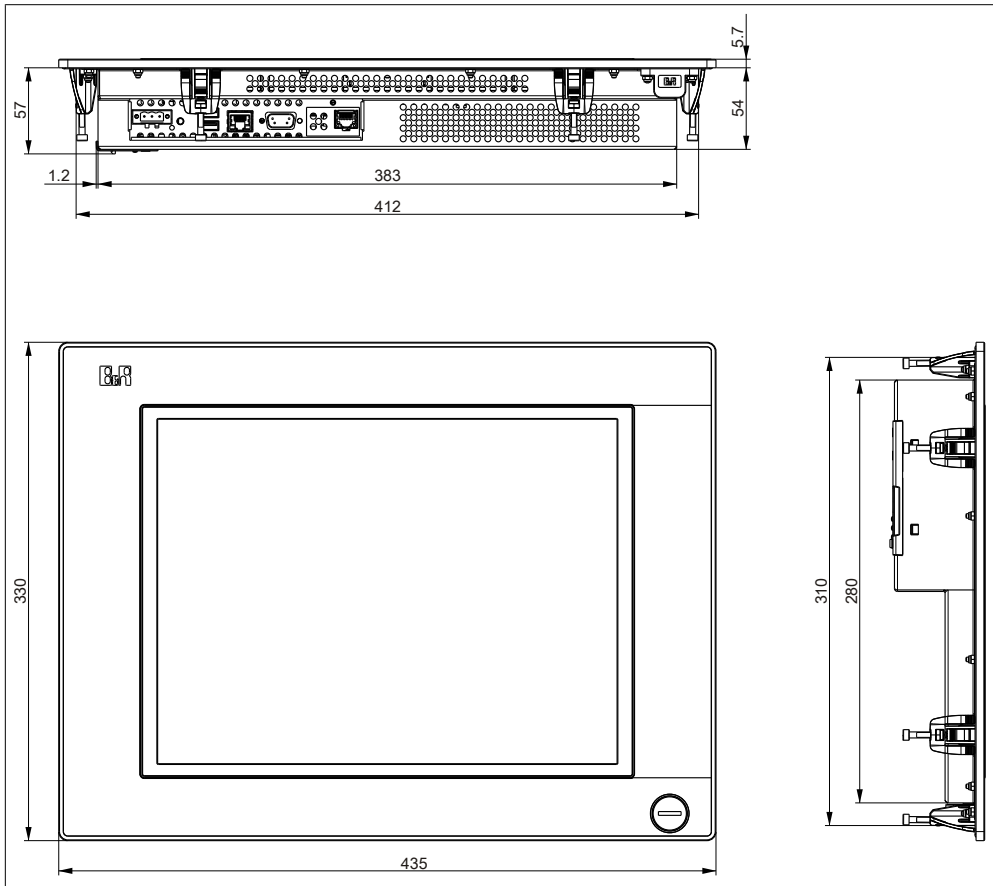


Image 27: 5PP520.1505-00 - Dimensions

3.1.5.1.5 Cutout

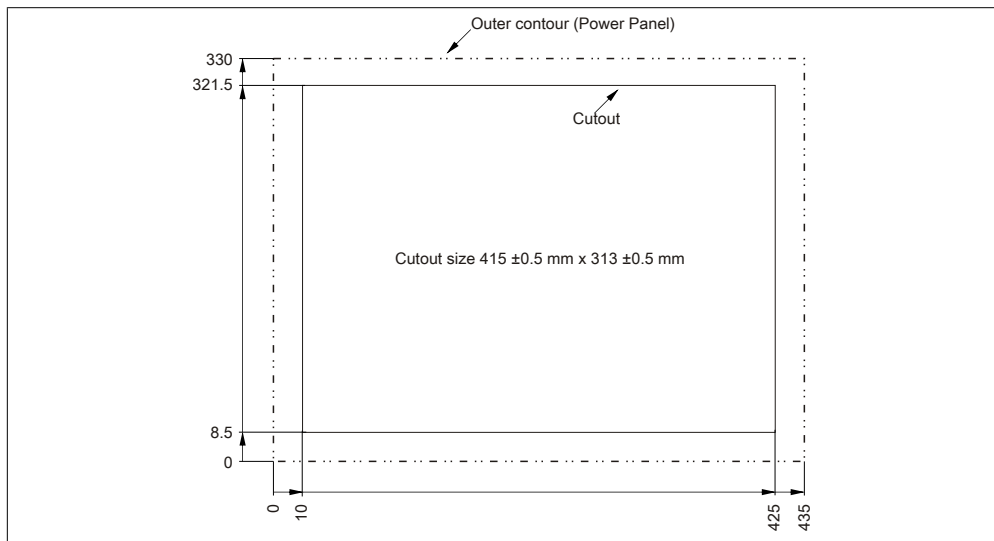


Image 28: 5PP520.1505-00 - Cutout installation

3.1.5.2 5PP580.1505-00

3.1.5.2.1 General information

- 15" TFT XGA color display
- Analog resistive touch screen and function keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.5.2.2 Order data

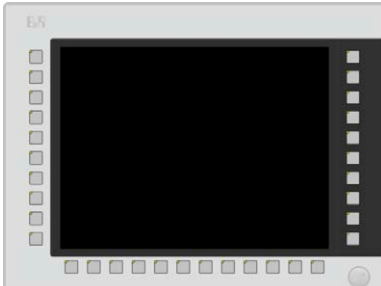
Model number	Short description	Figure
		
5PP580.1505-00	Power Panel 580 15" XGA TFT display with touch screen (resistive); 32 function keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	

Table 40: 5PP580.1505-00 - Order data

Model number	Short description	Figure
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 40: 5PP580.1505-00 - Order data

3.1.5.2.3 Technical data

Product ID	5PP580.1505-00
General information	
B&R ID code	\$B607
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 41: 5PP580.1505-00 - Technical data

Product ID	5PP580.1505-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	15" (381 mm)
Colors	16 million
Resolution	XGA, 1024 x 768 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 80° / direction D = 60°
Background lighting	
Method	LED
Brightness	350 cd/m²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	81% ±3%
Keys	
Function keys	32 with LED (yellow)
System keys	No
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.4 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	34 W
Electrical isolation	Yes

Table 41: 5PP580.1505-00 - Technical data

Product ID	5PP580.1505-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	435 mm
Height	330 mm
Depth	62.7 mm
Weight	4900 g

Table 41: 5PP580.1505-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.5.2.4 Dimensions

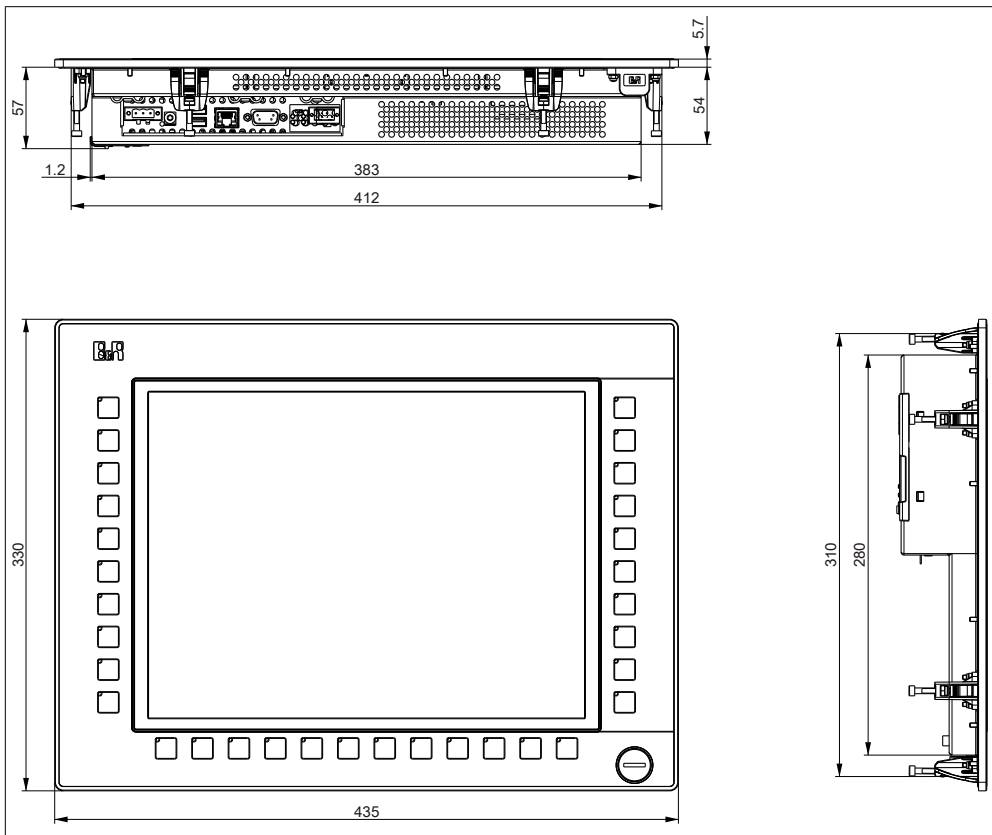


Image 29: 5PP580.1505-00 - Dimensions

3.1.5.2.5 Cutout

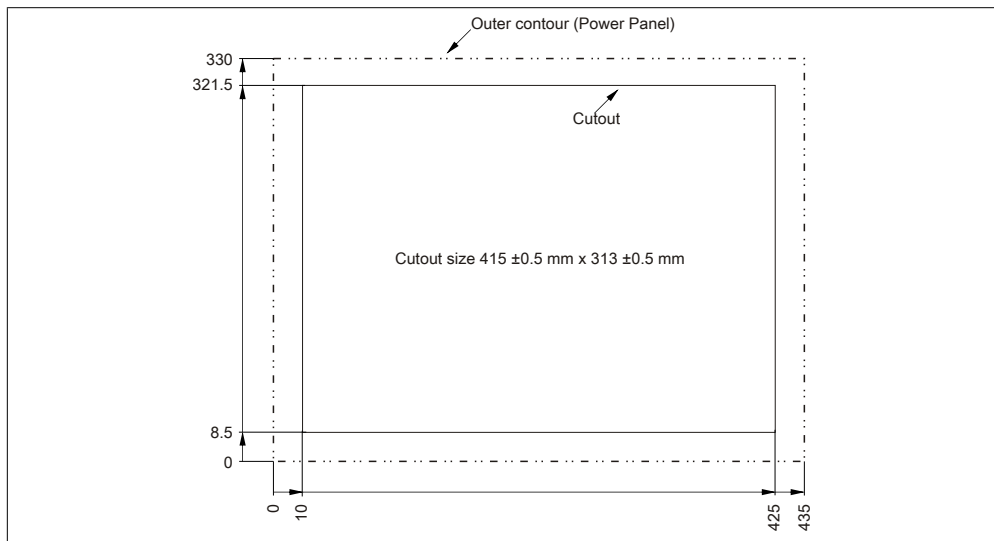


Image 30: 5PP580.1505-00 - Cutout installation

3.1.5.3 5PP581.1505-00

3.1.5.3.1 General information

- 15" TFT XGA color display
- Analog resistive touch screen plus function and system keys
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expand via interface board

3.1.5.3.2 Order data

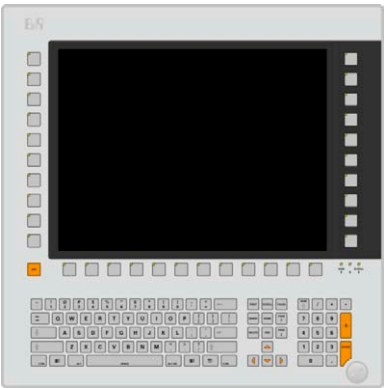
Model number	Short description	Figure
5PP581.1505-00	Power Panel 581 15" XGA TFT display with touch screen (resistive); 32 function keys and 92 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	
	Mandatory accessory	
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm², protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm², protected against vibration by the screw flange	
	Optional accessory	
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.0512-04	CompactFlash 512 MB B&R	

Table 42: 5PP581.1505-00 - Order data

Model number	Short description	Figure
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	
5PP5IF.FCAN-00	PP500 Interface board; connection for 1x CAN master	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
5PP5IF.FX2X-00	PP500 Interface board; connection for 1x X2X master	
5PP5IF.FXCM-00	PP500 IF X2X Master CAN Master SRAM	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 42: 5PP581.1505-00 - Order data

3.1.5.3.3 Technical data

Product ID	5PP581.1505-00
General information	
B&R ID code	\$B60A
Cooling	Fan-free
LEDs	Power, CF, Link, Run
Power button	Yes
Reset button	Yes
Buzzer	Yes
Battery	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	4 years
removable	Yes, accessible from the outside
Certification	
CE	In preparation
Controllers	
Bootloader	BIOS
Mode/Node switch	2, 16 positions each (back side)
Watchdog	MTCX
Power failure logic	
Controllers	MTCX ¹⁾
Buffer time	10 ms
Graphics	
Controllers	Intel® Graphics Media Accelerator 500
Memory	
Type	DDR2 SDRAM
Size	Max. 2 GB

Table 43: 5PP581.1505-00 - Technical data

Product ID	5PP581.1505-00
Interfaces	
COM1	
Type	RS232, modem-capable, not electrically isolated
Design	9-pin DSUB plug
UART	16550-compatible, 16-byte FIFO
Max. baud rate	115 kbit/s
CompactFlash slot 1	
Type	Type I
USB	
Type	USB 2.0
Amount	3
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Current load	Max. 1 A per connection
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Transfer rate	10/100/1000 Mbit/s
Display	
Type	Color TFT
Diagonal	15" (381 mm)
Colors	16 million
Resolution	XGA, 1024 x 768 pixels
Contrast	700:1
Viewing angles	
Horizontal	Direction R / direction L = 80°
Vertical	Direction U = 80° / direction D = 60°
Background lighting	
Method	LED
Brightness	350 cd/m²
Half-brightness time ²⁾	50,000 h
Touch screen ³⁾	
Type	AMT
Technology	Analog, resistive
Controllers	B&R, serial, 12-bit
Degree of transmission	81% ±3%
Keys	
Function keys	32 with LED (yellow)
System keys	Alphanumeric keys, numeric keys, cursor block
Lifespan	> 1,000,000 actuations with 1 ±0.3 N to 3 ±0.3 N operating force
LED brightness	
Yellow	Typ. 38 mcd
Inserts	
Interface board	Yes
I/O board	No
Electrical properties	
Rated voltage	24 VDC ±25%
Rated current	1.4 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	34 W
Electrical isolation	Yes

Table 43: 5PP581.1505-00 - Technical data

Product ID	5PP581.1505-00
Operating conditions	
EN 60529 protection	IP20 back side (only with an inserted CF card or IF board, or with an optional IF cover) IP65 / NEMA 250 type 4X, protection from dust and sprayed water on front side
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	siehe Temperatur Luftfeuchtediagramm
Storage	siehe Temperatur Luftfeuchtediagramm
Transport	siehe Temperatur Luftfeuchtediagramm
Vibration	
Operation (continuous)	2 to 9 Hz: 1.75 mm amplitude / 9 to 200 Hz: 0.5 g
Operation (occasional)	2 to 9 Hz: 3.5 mm amplitude / 9 to 200 Hz: 1 g
Storage	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Transport	2 to 8 Hz: 7.5 mm amplitude / 8 to 200 Hz: 2 g / 200 to 500 Hz: 4 g
Shock	
Operation	15 g, 11 ms
Storage	30 g, 15 ms
Transport	30 g, 15 ms
Altitude	
Operation	max. 3000 m (component-dependent) ⁴⁾
Mechanical characteristics	
Housing	
Item	Aluminum paint
Front ⁵⁾	
Frame	Naturally anodized aluminum
Membrane	
Item	Polyester
Light background	RAL 9006
Dark gray border around display	RAL 7024
Gasket	Flat gasket around display front
Dimensions	
Width	435 mm
Height	430 mm
Depth	62.7 mm
Weight	5800 g

Table 43: 5PP581.1505-00 - Technical data

- 1) Maintenance controller extended.
- 2) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.
- 3) Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).
- 4) Derating the maximum ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).
- 5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

3.1.5.3.4 Dimensions

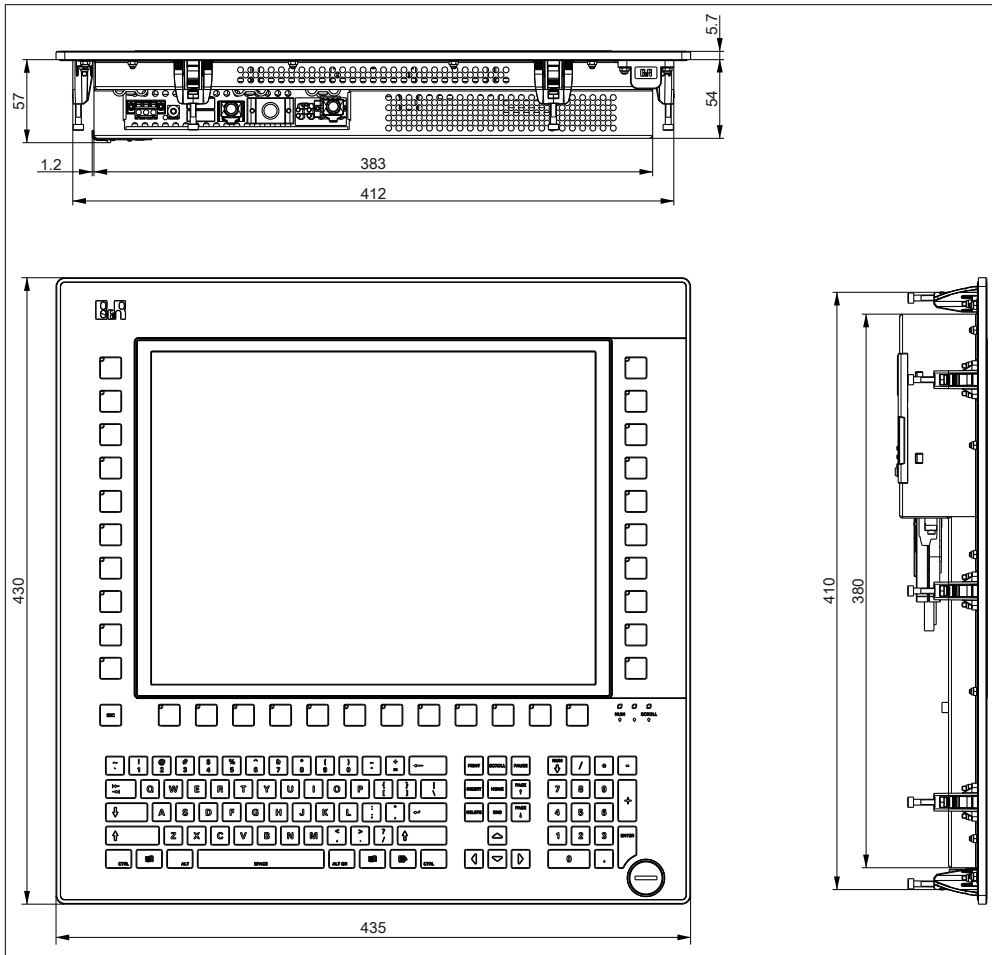


Image 31: 5PP581.1505-00 - Dimensions

3.1.5.3.5 Cutout

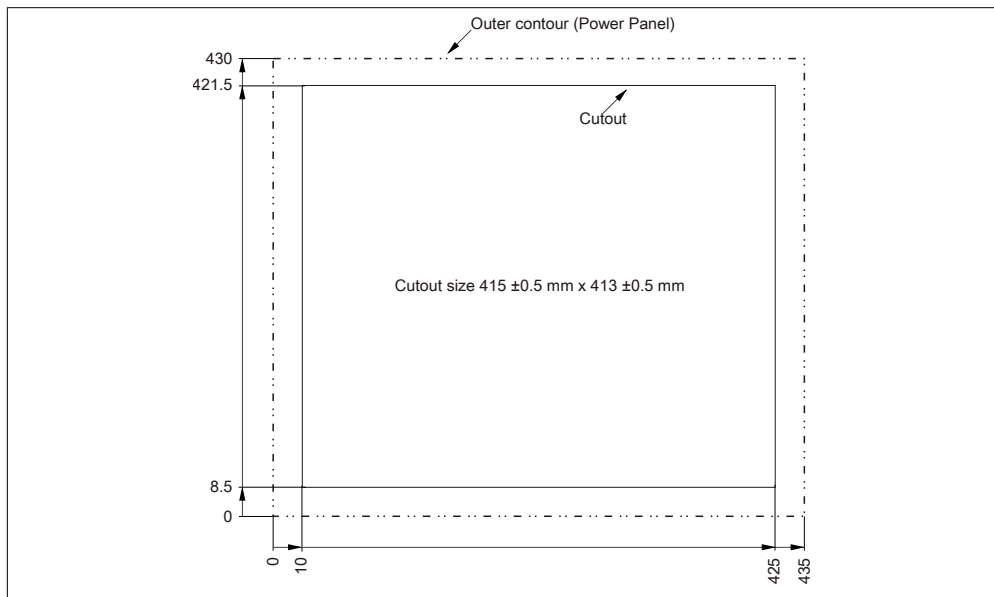


Image 32: 5PP581.1505-00 - Cutout installation

3.2 US15W - CPU boards

3.2.1 General information

PP500 CPU boards are based on the Intel® US15W chipset and contain one DDR2 memory location for a maximum of 2 GB. Additionally, the Intel® GMA 500 with 128 MB RAM is also integrated.

- Insyde BIOS
- Intel® US15W chipset
- 1x DDR2 memory socket
- Intel® GMA 500
- Gigabit Ethernet
- Intel® Atom™ technology

3.2.2 Order data

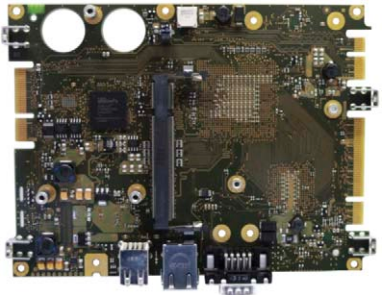
Model number	Short description	Figure
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-02	PP500 CPU board Intel Atom Z530, 1600 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
	Mandatory accessory	
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	

Table 44: 5PP5CP.US15-00, 5PP5CP.US15-01, 5PP5CP.US15-02 - Order data

3.2.3 Technical data

Product ID	5PP5CP.US15-00	5PP5CP.US15-01	5PP5CP.US15-02
Controllers			
Bootloader	BIOS Insyde		
Processor			
Type	Intel® Atom™ Z510	Intel® Atom™ Z520	Intel® Atom™ Z530
Clock frequency	1100 MHz	1330 MHz	1600 MHz
Architectures		45 nm	
L1 cache		32 kB	
L2 cache		512 kB	
External bus	400 MHz		533 MHz
Intel 64 architecture		No	
Expanded command set	Intel® virtualization technology, enhanced SpeedStep technology SSE, SSE2, SSE3		
Chipset	Intel® US15W		
Real-time clock			
Accuracy	At 25°C: typ. 12 ppm (1 seconds) per day ¹⁾		
Battery-buffered	Yes		
Memory socket			
Type	DDR2		
Size	Max. 2 GB		
Graphics			
Controllers	Intel® Graphics Media Accelerator 500		
Memory	Up to 256 MB ²⁾		
Color depth	Max. 32-bit		
Resolution			
GE1 = LVDS ³⁾	Depends on the system unit used		
Power management	ACPI 3.0		

Table 45: 5PP5CP.US15-00, 5PP5CP.US15-01, 5PP5CP.US15-02 - Technical data

1) At 50°C, 8.5 A of the supplied components and a self discharge of 40%.

2) Allocated in main memory.

3) GE = Graphics engine

3.3 Main memory

3.3.1 General information

The CPU Boards offer room for one main memory module.

3.3.2 Order data

Model number	Short description	Figure
	Main memory	
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	

Table 46: 5MMDDR.0512-01, 5MMDDR.1024-01, 5MMDDR.2048-01 - Order data

3.3.3 Technical data

Product ID	5MMDDR.0512-01	5MMDDR.1024-01	5MMDDR.2048-01
General information			
Type	SO-DIMM DDR2 SDRAM		
Memory size	512 MB	1 GB	2 GB
Construction	200-pin		
Organization	64M x 64 bit	128M x 64 bit	256M x 64-bit
Speed	DDR2-667 (PC2-5300)		
Certification	Yes		
CE			

Table 47: 5MMDDR.0512-01, 5MMDDR.1024-01, 5MMDDR.2048-01 - Technical data

Info:

A main memory module can only be replaced at the B&R plant.

3.4 Interface boards

Info:

Installation and replacement of interface boards **ONLY** possible at the B&R plant.

3.4.1 5PP5IF.CETH-00

3.4.1.1 General information

The PP500 interface board 5PP5IF.CETH-00 has a 10/100/1000 Mbit/s network connection and can be inserted in a Power Panel 500 and operated as an additional network interface.

- 1 network connection (10/100/1000 Mbit/s)
- mounting compatible in PP500

3.4.1.2 Order data

Model number	Short description	Figure
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	

Table 48: 5PP5IF.CETH-00 - Order data

3.4.1.3 Technical data

Product ID	5PP5IF.CETH-00
General information	
B&R ID code	\$B4D5
Diagnostics	
Data transfer	Yes, with status LED
Certification	
CE	In preparation
Interfaces	
Ethernet	
Amount	1
Controllers	Intel 82574
Design	Shielded RJ45 port
Cable length	max. 100 m (min. Cat5e)
Transfer rate	10/100/1000 Mbit/s
Electrical properties	
Power consumption	2 W

Table 49: 5PP5IF.CETH-00 - Technical data

Product ID	5PP5IF.CETH-00
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	5 to 90%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing

Table 49: 5PP5IF.CETH-00 - Technical data

3.4.1.3.1 Ethernet (ETH)

Ethernet interface			
Controller	Intel 82574		
Cabling	S/STP (Cat5e)		
Transfer rate	10/100/1000 Mbit/s ¹		
Cable length	max. 100 m (min. Cat5e)		
Speed LED	On	Off	
Green	100 Mbit/s	10 Mbit/s ²	
Orange	1000 Mbit/s	-	
Link LED	On	Off	
Orange	Link (Ethernet network connection available)	Activity (blinking - data transfer in progress)	

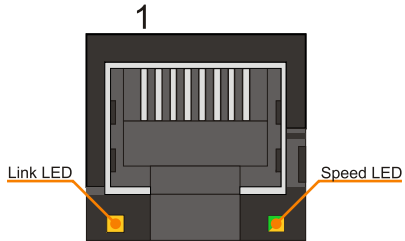


Table 50: 5PP5IF.CETH-00 - Ethernet connection

1) Switching takes place automatically.

2) The 10 Mbit/s transfer speed / connection is only present if the IF slot Link LED is simultaneously active.

A special driver is necessary for operating the Intel Ethernet controller 82574. The necessary drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

3.4.2 5PP5IF.CHDA-00

3.4.2.1 General information

The PP500 interface board 5PP5IF.CHDA-00 has a HDA soundchip with which the channels MIC, Line IN and Line OUT are externally accessible.

- 1x MIC
- 1x Line IN
- 1x Line OUT
- mounting compatible in PP500

3.4.2.2 Order data

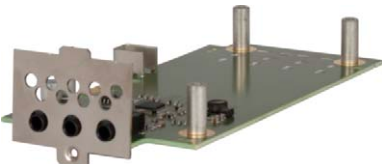
Model number	Short description	Figure
	Interface boards	
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	

Table 51: 5PP5IF.CHDA-00 - Order data

3.4.2.3 Technical data

Product ID	5PP5IF.CHDA-00
General information	
B&R ID code	\$B4D6
Certification CE	In preparation
Interfaces	
Audio Type Controllers Inputs Outputs	HDA Sound Realtek ALC 662 Microphone, Line in Line Out
Electrical properties	
Power consumption	2 W
Environmental conditions	
Temperature Operation Storage Transport	0 to 55°C -20 to 60°C -20 to 60°C

Table 52: 5PP5IF.CHDA-00 - Technical data

Product ID	5PP5IF.CHDA-00
Relative humidity	
Operation	5 to 90%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing

Table 52: 5PP5IF.CHDA-00 - Technical data

3.4.2.3.1 MIC, Line IN, Line OUT

MIC, Line IN, Line OUT		
Controller	Realtek ALC 662	3.5 mm jack, female
MIC	Connection of a mono microphone with a 3.5 mm stereo (headphone) jack.	
Line IN	Stereo Line IN signals supplied via 3.5 mm jack.	
Line OUT	Connection of a stereo sound device (e.g. amplifier) via a 3.5 mm jack.	

Table 53: MIC, Line IN, Line OUT

A special driver is necessary for operating the audio controller. The necessary drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

3.4.3 5PP5IF.FPLM-00

3.4.3.1 General information

The PP500 interface board 5PP5IF.FPLM-00 has two POWERLINK-connections and 512 kB SRAM.

- 2x POWERLINK- connections
- 512 KB SRAM
- mounting compatible in PP500

3.4.3.2 Order data

Model number	Short description	Figure
	Interface boards	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	

Table 54: 5PP5IF.FPLM-00 - Order data

3.4.3.3 Technical data

Product ID	5PP5IF.FPLM-00
General information	
B&R ID code	\$B4D8
Diagnostics	
Data transfer	Yes, with status LED
Certification	
CE	In preparation
Controllers	
SRAM	
Size	512 kB
Interfaces	
POWERLINK	
Amount	2
Design	Shielded RJ45 port
Electrical properties	
Power consumption	3 W
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C

Table 55: 5PP5IF.FPLM-00 - Technical data

Product ID	5PP5IF.FPLM-00
Relative humidity	
Operation	5 to 90%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing

Table 55: 5PP5IF.FPLM-00 - Technical data

3.4.3.3.1 POWERLINK

POWERLINK Interface Board 2 connections		
Cabling	S/STP (Cat5e)	
Cable length	max. 100 m (min. Cat5e)	
Speed LED	On	Off
Green / red	see Status / Error LED	
Link LED	On	Off
Yellow	Link (POWERLINK network connection available)	Activity (blinking - data transfer in progress)

1

Link LED

Speed LED

Table 56: POWERLINK Interface Board 2port connection

3.4.3.3.2 Status / Error LED

The status/error LED is a green/red LED.

Red - error	Description
On	The POWERLINK interface has encountered an error (failed Ethernet frames, increased number of collisions on the network, etc.).

Table 57: Status / Error LED as error LED - POWERLINK operating mode

Green - status	Description
Off NOT_ACTIVE	Managing Node (MN) The bus is monitored for POWERLINK frames. If a frame is not received within the configured time window (timeout), the interface goes directly into PRE_OPERATIONAL_1 status (single flash). If, however, POWERLINK communication is detected before this time passes, the interface goes directly into the BASIC_ETHERNET status (flickering). Controlled Node (CN) The bus is monitored for POWERLINK frames. If a frame is not received within the configured time window (timeout), the interface goes directly into BASIC_ETHERNET status (flickering). If, however, POWERLINK communication is detected during this time, the interface goes directly into the PRE_OPERATIONAL_1 status (single flash).
Green flickering (approx. 10 Hz) BASIC_ETHERNET	The interface is in BASIC_ETHERNET status, and is operated purely as an Ethernet TCP/IP interface. Managing Node (MN) This status can only be changed by resetting the interface. Controlled Node (CN) If POWERLINK communication is detected while in this status, the interface goes into the PRE_OPERATIONAL_1 state (single flash).

Table 58: Status/Error LED as status LED - POWERLINK operating mode

Green - status	Description
Single flash (approx. 1 Hz) PRE_OPERATIONAL_1	The interface status is PRE_OPERATIONAL_1. Managing Node (MN) The MN starts the operation of the "reduced cycle". Collisions are allowed on the bus. There is not yet any cyclic communication. Controlled Node (CN) The CN waits until it receives an SoC frame and then switches to PRE_OPERATIONAL_2 status (double flash).
Double flash (approx. 1 Hz) PRE_OPERATIONAL_2	The interface status is PRE_OPERATIONAL_2. Managing Node (MN) The MN begins with the cyclic communication (cyclic input data is not yet evaluated). The CNs are configured in this status. Controlled Node (CN) In this status, the interface is normally configured by the manager. After this, a command changes the status to PRE_OPERATIONAL_3 (triple flash).
Double flash (approx. 1 Hz) PRE_OPERATIONAL_2	The interface status is READY_TO_OPERATE. Managing Node (MN) Normal cyclic and asynchronous communication. Received PDO data is ignored. Controlled Node (CN) The configuration of the interface is complete. Normal cyclic and asynchronous communication. The PDO data sent corresponds to the PDO mapping used. However, cyclic data is not yet evaluated.
On OPERATIONAL	The interface status is OPERATIONAL.
Blinking (approx. 2.5 Hz) STOPPED	The interface status is STOPPED. Managing Node (MN) This status is not possible for the MN. Controlled Node (CN) No output data is produced and no input data is received. Only the appropriate command from the manager can enter or leave this state.

Table 58: Status/Error LED as status LED - POWERLINK operating mode

Chapter 3 • Commissioning

1 Installation

Power Panel 500 devices are best mounted in a housing cutout using the mounting clamps and terminal blocks found on the housing (different designs possible).

1.1 Mounting with retaining clips

Mounting with terminal blocks is used on PP500 devices with a diagonal of 5.7" and 7".

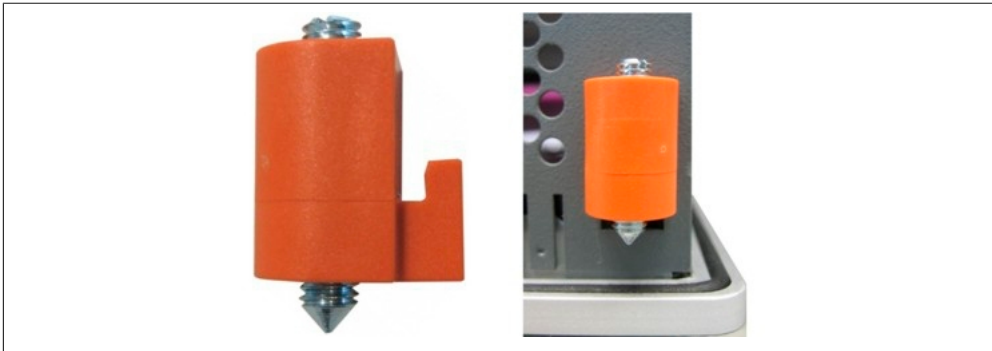


Image 33: Retaining clips

1.2 Mounting with terminal blocks

Mounting with terminal blocks is used on PP500 devices with a diagonal of 10.4", 12" and 15".

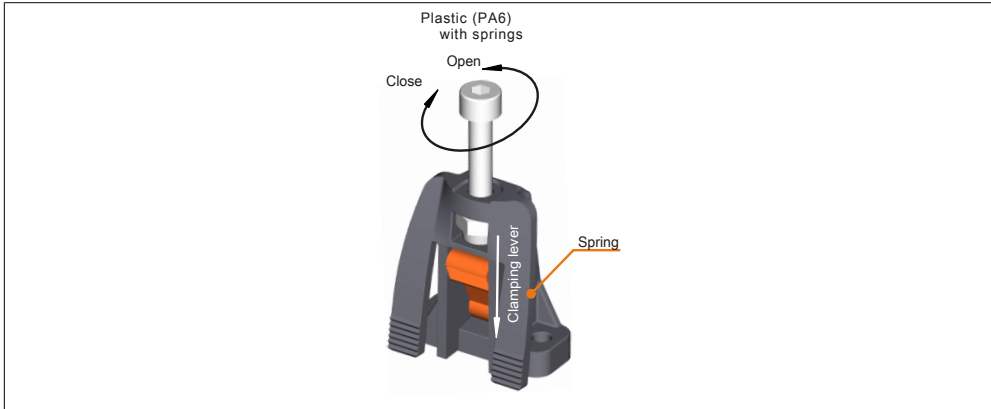


Image 34: Terminal block for the Power Panel 500

The terminal blocks are designed for a maximum thickness of 10 mm for the material where the device is being clamped.

In order to tighten or loosen the screws, a hex key (size 3) is required for the plastic clamps and a Torx screwdriver (size 20) or a large flat-head screwdriver for the aluminum die casting.

The maximum torque when tightening the clamp is 0.5 Nm. A Power Panel 500 unit must be mounted to a flat surface. Uneven areas can cause damage to the display when the screws are tightened.

1.3 Important mounting information

- The environmental conditions must be taken into consideration.
- The PP500 must be mounted to a planar surface.
- The PP500 is only certified for operation in closed rooms.
- The PP500 cannot be situated in direct sunlight.
- The ventilation holes cannot be covered.
- When mounting the device, only the specified mounting orientations are permitted.
- Be sure the wall or control cabinet can withstand four times the total weight of the the PP500.
- When connecting certain cable types (DVI, SDL, USB, etc.), keep the flex radius in mind.

2 Mounting orientation

The following diagrams show the specified mounting orientation for the Power Panel 500 device. The mounting orientations apply for all Power Panel devices.

2.1 Mounting orientation 0°

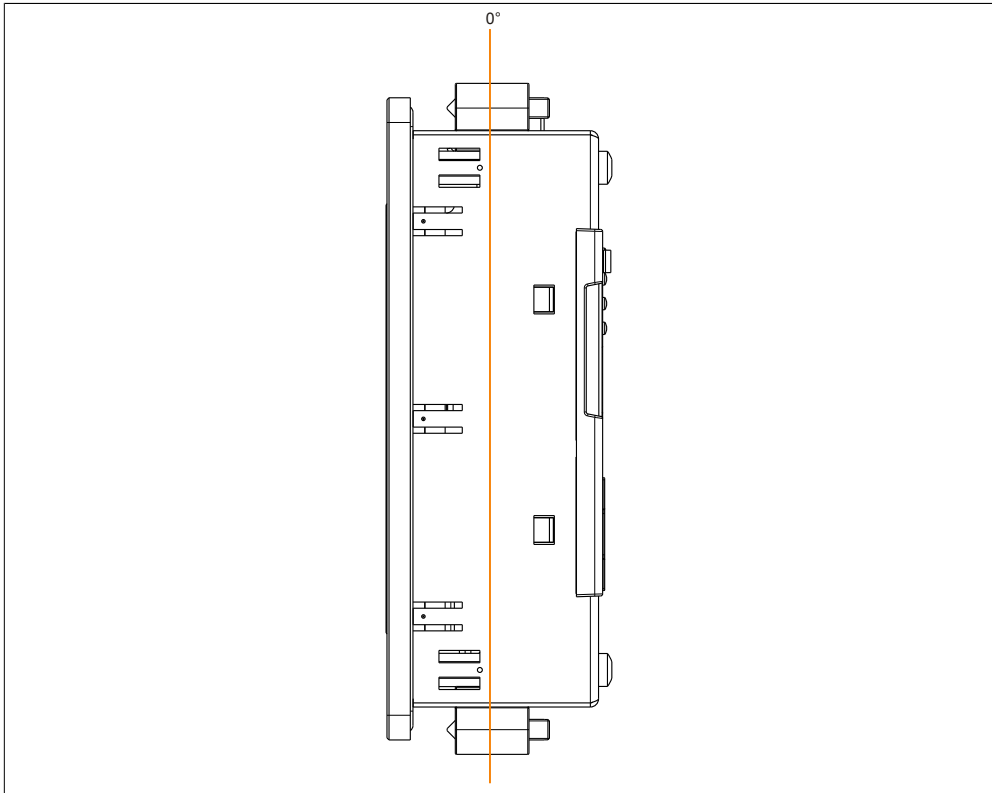


Image 35: Mounting orientation 0°

2.2 Mounting orientation 45°

The maximum Ambient temperature specification with a mounting orientation of 45° must be **lowered by 5°C**.

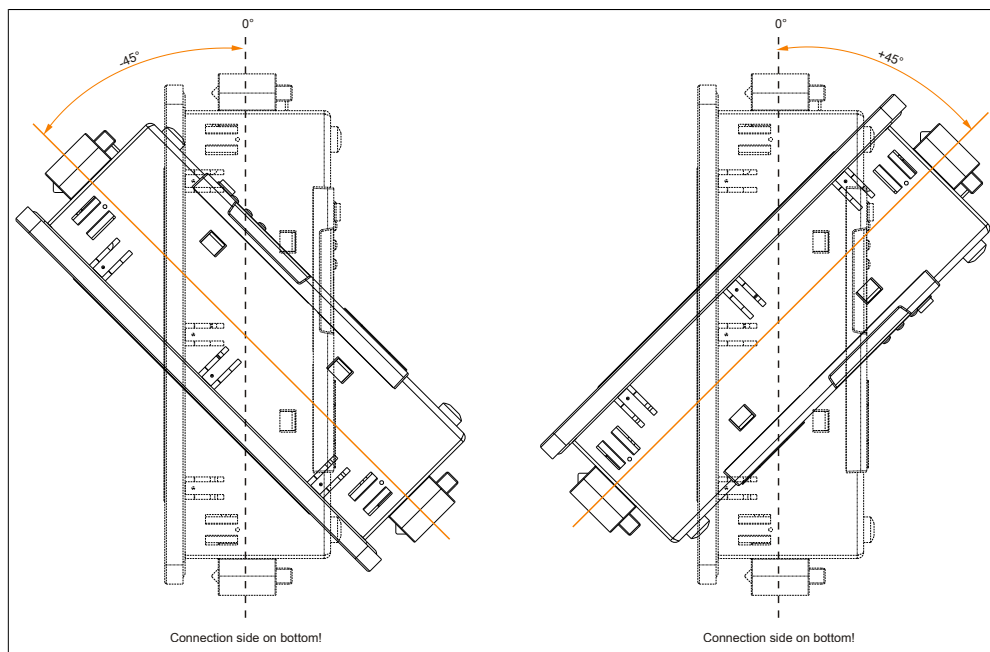


Image 36: Mounting orientation -45° and +45°.

2.3 Mounting orientation 90°

The maximum Ambient temperature specification with a mounting orientation of 90° (horizontal) must be **lowered by 10°C**.

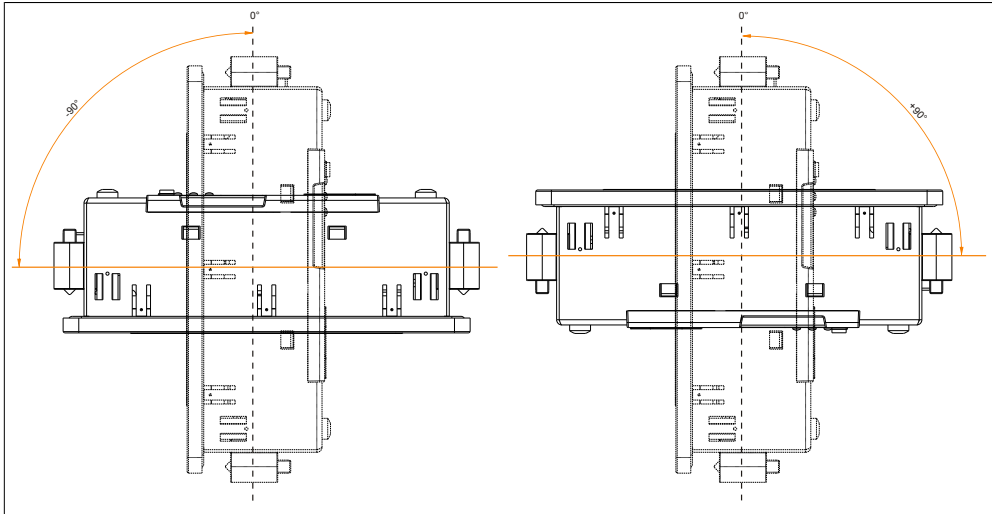


Image 37: Mounting orientation -90° and +90°.

3 Touch screen calibration

B&R touch screen devices are equipped with a B&R touch controller that supports hardware calibration. This means that the devices are precalibrated from stock. This feature proves advantageous in the case of a replacement part because a new calibration is no longer required when exchanging devices (identical model / type). Nevertheless, we recommend calibrating the device in order to achieve the best results and to better readjust the touch screen to the user's preferences.

3.1 Windows XP Professional

After installing Windows XP Professional, the touch screen driver must be installed in the device in order to operate the touch screen. The corresponding drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

3.2 Windows Embedded Standard 2009

After first starting Windows Embedded Standard 2009 (First Boot Agent), the touch screen driver must be installed in the device in order to operate the touch screen. The corresponding drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

3.3 Windows 7

After installing Windows 7, the touch screen driver must be installed in the device in order to operate the touch screen. The corresponding drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

3.4 Windows Embedded Standard 7

A touch screen driver will be automatically installed if a touch controller is detected during the Windows Embedded Standard 7 setup.

The touch screen driver must be installed manually if a touch controller was not detected during the Windows Embedded Standard 7 setup or if an Automation Panel 800/900 has been connected after setup. The corresponding drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

3.5 Automation Runtime / Visual Components

The first time the touch screen is used, it must be calibrated once in the customer application for the existing device and project.

4 User tips for increasing the display lifespan

4.1 Backlight

The lifespan of the backlight is specified in "Half Brightness Time". An operating time of 50,000 hours would mean that the display brightness would still be 50% after this time.

4.1.1 How can the lifespan of backlights be extended?

- Set the display brightness to the lowest value that is still comfortable for the eyes
- Use dark images
- Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

4.2 Image sticking

Image sticking is the "burning in" of a static image on a display after being displayed for a prolonged period of time. However, this does not only occur with static images. Image sticking is known in technical literature as the "burn-in effect", "image retention", "memory effect", "memory sticking" or "ghost image".

There are 2 types of this:

- Area type: This is seen with a dark gray image. The effect disappears if the display is switched off for a longer period of time.
- Line type: This can cause lasting damage.

4.2.1 What causes image sticking?

- Static images
- Screensaver not enabled
- Sharp contrast transitions (e.g. black / white)
- High ambient temperatures
- Operation outside of the specifications

4.2.2 How can image sticking be avoided?

- Continual change between static and dynamic images
- avoiding excessive brightness contrast between foreground and background display
- use of colors with similar brightness
- use of complementary colors in subsequent images
- use of screensavers

5 Pixel error

Info:

Displays can contain flawed pixels caused during (Pixel error) production. These flaws are not grounds claiming reclamation or warranty.

Chapter 4 • Software

1 BIOS options

Info:

The following diagrams and BIOS menu items including descriptions refer to BIOS version N0.15. It is therefore possible that these diagrams and BIOS descriptions do not correspond with the installed BIOS version.

1.1 General information

BIOS stands for "Basic Input Output System". It is the most basic standardized communication between the user and the system (hardware). The BIOS system used in this B&R industrial PC is produced by Insyde.

The BIOS Setup Utility lets you modify basic system configuration settings. These settings are stored in CMOS and in EEPROM (as a backup).

The CMOS data is buffered by a battery (if present), and remains in the B&R industrial PC even when the power is turned off (no 24 VDC supply).

1.2 BIOS setup and start procedure

BIOS is immediately activated when switching on the power supply of the B&R industrial PC or pressing the power button. The system checks if the setup data from the EEPROM is "OK". If the data is "OK", then it is transferred to the CMOS. If the data is "not OK", then the CMOS data is checked for validity. An error message is output if the CMOS data contains errors and the boot procedure can be continued by pressing the <F1> key. To prevent the error message from appearing at each restart, open the BIOS setup by pressing the key and re-save the settings.

BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the Power On Self Test (POST).

When these "preliminaries" are finished, BIOS seeks an operating system in the data storage devices available (hard drive, floppy drive, etc.). BIOS launches the operating system and hands over control of system operations to it.

To enter BIOS Setup, the <F2> key must be pressed after the USB controller has been initialized as soon as the following message appears on the monitor (during POST): "Press F2 go to Setup Utility"

Info:

The POST screen is only displayed for a fraction of a second due to optimized boot procedures. It is however, still possible to enter BIOS.

```
BIOS Build : 08/03/2011

Processor Type : Intel(R) Atom(TM) CPU Z520 @ 1.33GHz

System Memory Speed : 533 MHz


CPUID : 106C2

F2 is pressed. Go to Setup Utility.

Other Device      1 : BR-SSD-C004G-01-0101
```

1.2.1 BIOS setup keys

The following keys are enabled during the POST:

Info:

The key signals from the USB keyboard are only registered after the USB controller has been initialized.

Keys	Function
F2	Enters the BIOS setup menu.
F12	Cues the boot menu. Lists all bootable devices that are connected to the system. Select the device to boot from with cursor ↑, cursor ↓ and <ENTER>. Use the ESC key to exit the boot menu. 
<Pause>	Pressing the <Pause> key stops the POST. Press any other key to resume the POST.

Table 59: BIOS-relevant keys for POST

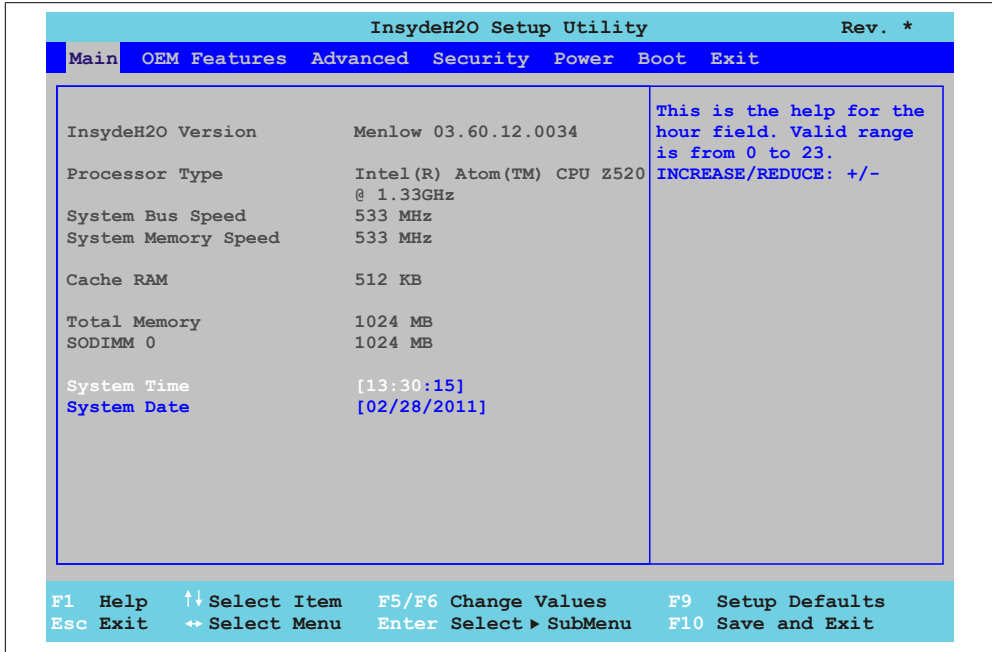
The following keys can be used after entering the BIOS setup:

Key	Function
F1	General help.
Cursor ↑	Moves to the previous item.
Cursor ↓	Go to the next item.
Cursor ←	Moves to the previous menu.
Cursor →	Go to the next menu.
F5/F6	Change BIOS settings.
Enter	Changes to the selected menu.
F9	These settings are loaded for all BIOS configurations.
F10	Save and close.
Esc	Exits the submenu.

Table 60: BIOS-relevant keys in the BIOS menu

1.3 Main

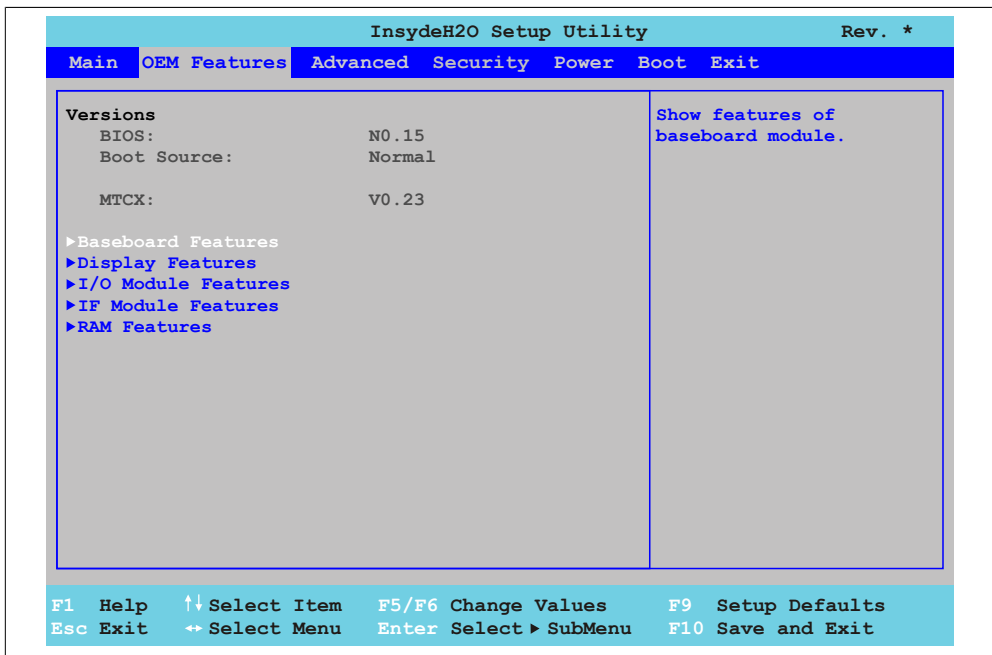
Immediately after the <F2> key is pressed during startup, the main BIOS setup menu appears.



BIOS setting	Meaning	Setting options	Effect
InsydeH2O Version	Displays the BIOS InsydeH2O version.	None	-
Processor type	Displays the processor type.	None	-
System Bus Speed	Displays the System Bus speed		
System Memory Speed	Displays the system memory size.	None	-
Cache RAM	Displays the Cache RAM in the system.	None	-
Total Memory	Displays the entire system memory size.	None	-
SODIMM 0	Displays the amount of RAM in the SODIMM 0 slot.	None	-
System Time	This is the current system time setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Adjustment of the system time	Set the system time in the format Hour:Minute:Second (hh:mm:ss).
System Date	This is the current system date setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Changes to the system date	Sets the system date in the format Month:Day:Year (mm:dd:yyyy).

Table 61: US15W Main - Menu setting options

1.4 OEM Features



BIOS setting	Meaning	Setting options	Effect
BIOS	Displays the B&R BIOS boot version.	None	-
Boot Source	Displays whether boot source is "normal" BIOS version (Normal) or the Backup BIOS version (Backup)		Info: If a BIOS update failed, then the backup BIOS will be loaded automatically. The BIOS update can then be attempted again.
MTCX	Displays the MTCX version that is installed.	None	
Baseboard Features	Displays device specific information and setup of device specific values.	Enter	
Display Features	Configuration of the display features.	Enter	Opens the submenu See "Display Features", on page 141
I/O Module Features	Configuration of the I/O module features.	Enter	Opens the submenu See "IO Module Features", on page 145
IF Module Features	Configuration of the IF module features.	Enter	Opens the submenu See "IF Module Features", on page 147
RAM Features	Displays the RAM features.	Enter	Opens the submenu See "RAM Features", on page 149

Table 62: US15W OEM Features - Menu setting options

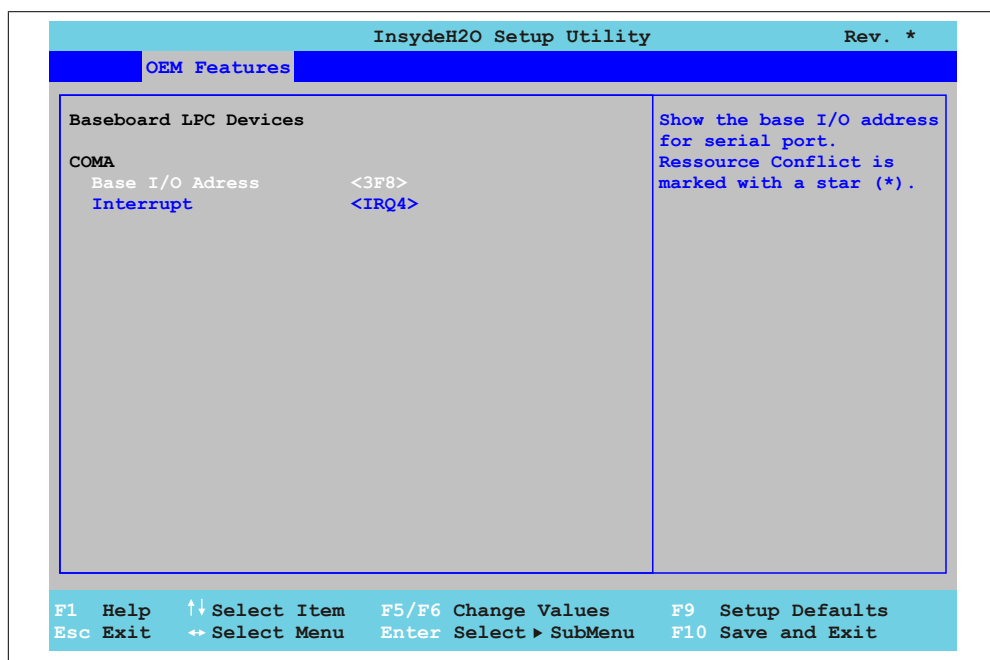
1.4.1 Baseboard Features

InsydeH2O Setup Utility		Rev. *
OEM Features		
Baseboard Features Device ID: 0000B4D1 Compatibility ID: 0000 Vendor ID: 00000000 Hardware Revision: A0 Serial Number: B4D10168431 Product Name: 5PP5CP.US15-01 Hardware Number: 00201ADB Parent Device ID: FFFFFFFF Parent Compatib. ID: FFFF LAN1 MAC ADDRESS: 00:60:65:0D:07:FE ▶LPC Devices ▶Statistical Values ▶Temperature Values ▶Baseboard Monitor		Show and configure available LPC devices.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit		

BIOS setting	Meaning	Setting options	Effect
Device ID	Displays the device ID of the CPU board.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Vendor ID	Displays the Vendor ID.	None	-
Hardware revision	Displays the CPU board hardware revision.	None	-
Serial number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
Hardware Number	Displays the CPU board hardware number.	None	-
Parent Device ID	Displays the manufacturer number.	None	-
Parent Compatib. ID	Displays the manufacturer ID.	None	-
LAN1 MAC ADDRESS	Displays the MAC addresses assigned for the ETH interface.	None	-
LPC Devices	Configuration of the LPC Devices.	Enter	Opens the submenu See "LPC Devices", on page 137
Statistical Values	Displays the statistical values.	Enter	Opens the submenu See "Statistical Values", on page 138
Temperature Values	Displays the current temperature values.	Enter	Opens the submenu See "Temperature Values", on page 139
Baseboard monitor	Displays the current voltage values on the CPU board being used.	Enter	Opens the submenu See "Baseboard Monitor", on page 140

Table 63: US15W OEM Features - Baseboard Features setting options

1.4.1.1 LPC Devices



BIOS setting	Meaning	Setting options	Effect
COMA	Settings for the COM serial interface in the system.	None	-
Base I/O address	Selection of the base I/O address for the COM port.	Disabled, 238, 2E8, 2F8, 328, 338, 3E8, 3F8	Disables or assigns the selected base I/O address.
Interrupt	Selection of the interrupt for the COM port.	IRQ3, IRQ4, IRQ5, IRQ6, IRQ10, IRQ11, IRQ12	Selected interrupt is assigned.

Table 64: US15W OEM Features - Baseboard Features - LPC Devices setting options

Info:

A resource conflict can occur regarding the Base I/O address or Interrupt settings, which will cause a warning. In order to make the settings anyways, the setting must first be made on the Base I/O address or Interrupt being that is used.

1.4.1.2 Statistical Values

InsydeH2O Setup Utility

Rev. *

OEM Features

Baseboard Statistical Values

Temperature Minimum/Maximum

Sensor 1:24°C / 31°C75°F / 87°F

Sensor 2:23°C / 32°C73°F / 89°F

Sensor 3:34°C / 50°C93°F / 122°F

Operating Time

Total Hours:241

Power On Cycles:20

Shows statistical values of chosen module.

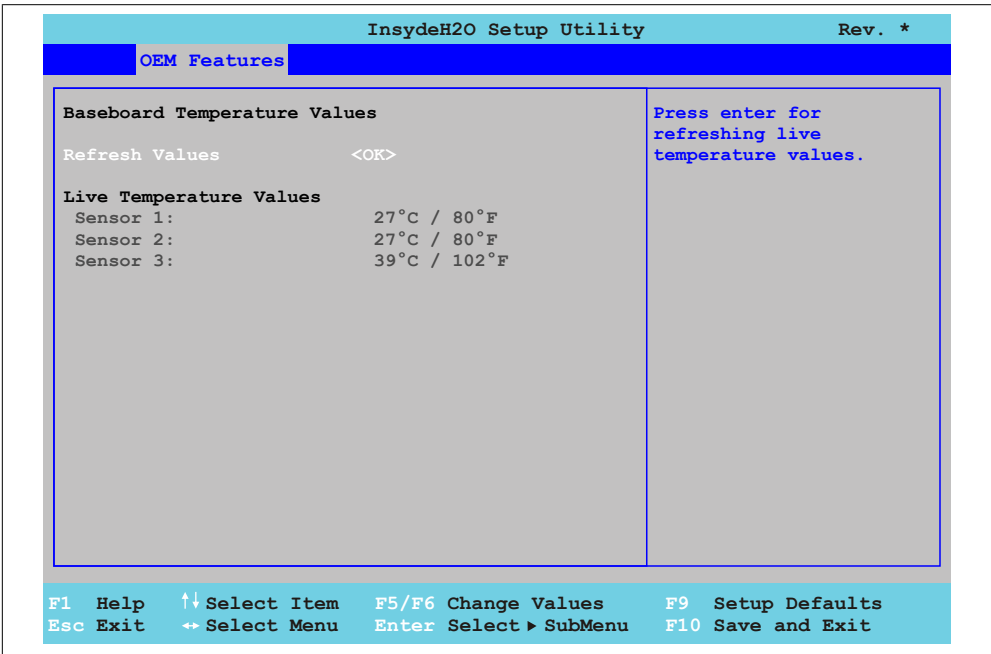
F1 Help↑↓ Select ItemF5/F6 Change ValuesF9 Setup Defaults

Esc Exit↔ Select MenuEnter Select ► SubMenuF10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
Sensor 1	Displays the minimum and maximum temperature of sensor 1 (interfaces) in °C and °F.	None	-
Sensor 2	Displays the minimum and maximum temperature of sensor 2 (CPU) in °C and °F.	None	-
Sensor 3	Displays the minimum and maximum temperature of sensor 3 (main memory) in °C and °F.	None	-
Total Hours	Displays the runtime in whole hours.	None	-
Power on cycles	Displays the Power On Cycles - each restart increases the counter by one.	None	-

Table 65: US15W OEM Features - Baseboard Features - Statistical Values setting options

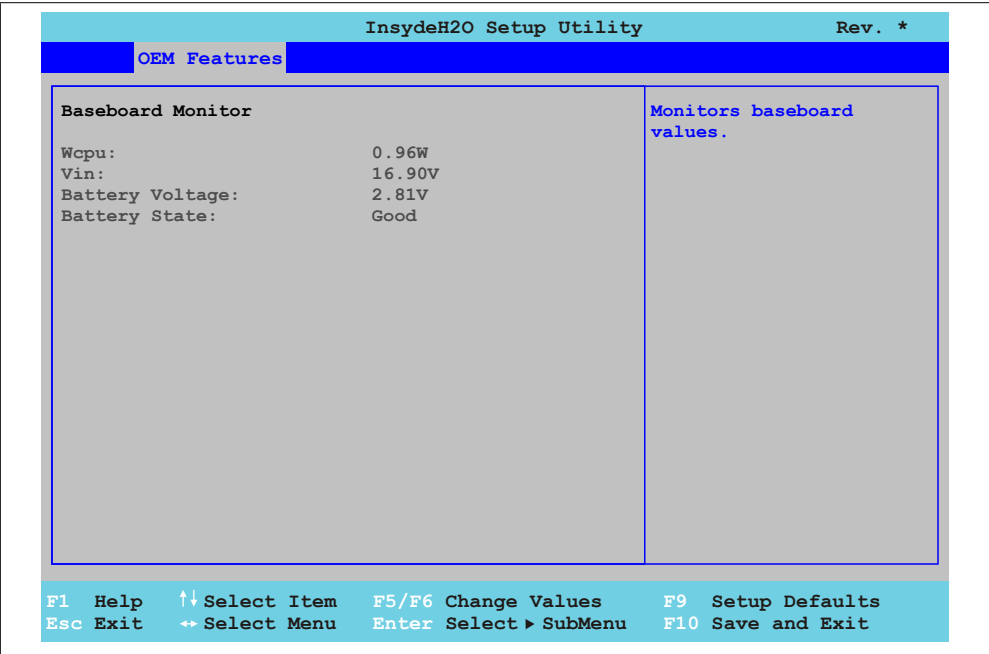
1.4.1.3 Temperature Values



BIOS setting	Meaning	Setting options	Effect
Refresh Values	Option for refreshing the temperature values.	OK	Refreshes the temperature values shown bellow.
Sensor 1	Displays the current temperature of sensor 1 (interfaces) in °C and °F.	None	-
Sensor 2	Displays the current temperature of sensor 2 (CPU) in °C and °F.	None	-
Sensor 3	Displays the current temperature of sensor 3 (main memory) in °C and °F.	None	-

Table 66: US15W OEM Features - Baseboard Features - Temperature Values setting options

1.4.1.4 Baseboard Monitor



BIOS setting	Meaning	Setting options	Effect
Wcpu:	Displays the CPU power consumption in watts.	None	-
Vin:	Displays the current voltage of the power supply in volts.	None	-
Battery voltage:	Displays the battery voltage (in volts).	None	-
Battery state:	Displays the battery status.	None	-

Table 67: US15W OEM Features - Baseboard Features - Baseboard Monitor setting options

1.4.2 Display Features

InsydeH2O Setup Utility		Rev. *
OEM Features		
Display Features Device ID: 0000B4CB Compatibility ID: 0000 Vendor ID: 00000000 Hardware Revision: A0 Serial Number: B4CB0168435 Product Name: 5PP520.0573-01 Hardware Number: 00201849 Parent Device ID: FFFFFFFF Parent Compatib. ID: FFFF Brightness: <Auto> ▶LPC Devices ▶Statistical Values ▶Temperature Values		Adjust the brightness of the local panel.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit		

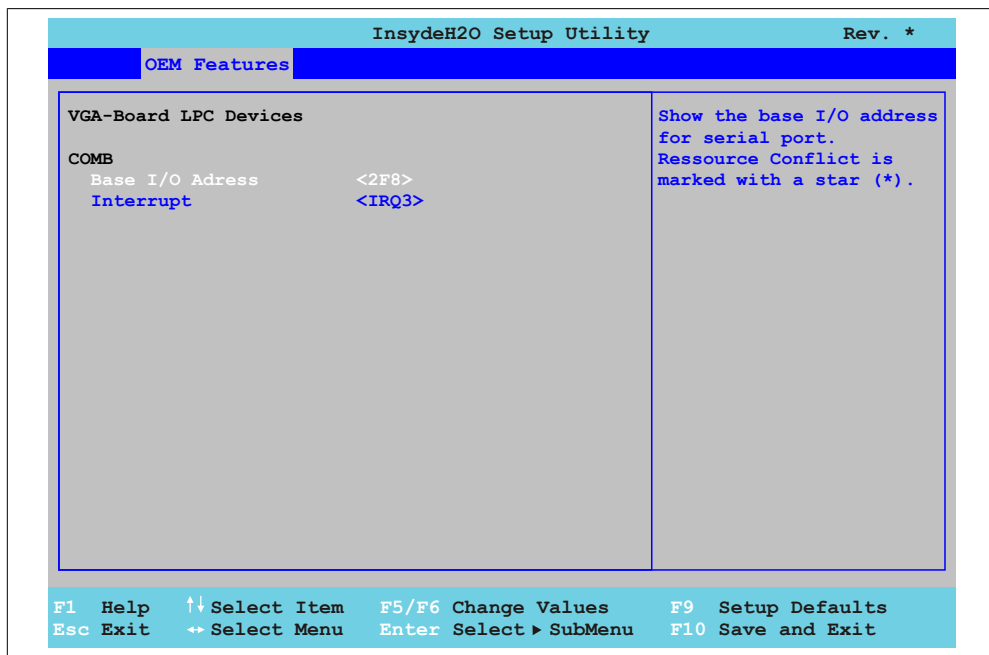
BIOS setting	Meaning	Setting options	Effect
Device ID	Displays the device code of the Power Panel device.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Vendor ID	Displays the Vendor ID.	None	-
Hardware revision	Displays the system unit hardware revision.	None	-
Serial number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
Hardware Number	Displays the system unit hardware number.	None	-
Parent Device ID	Displays the manufacturer number.	None	-
Parent Compatib. ID	Displays the manufacturer ID.	None	-
Brightness	Option for setting the background lighting of the display.	Auto	The optimal brightness is automatically configured using the factory settings. A brightness value between 100% and 0% is set.
		0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%	Manual setting of the desired brightness within factory settings limits.
LPC Devices	Configuration of the LPC Devices.	Enter	Opens the submenu See "LPC Devices", on page 142

Table 68: US15W OEM Features - Display Features setting options

BIOS setting	Meaning	Setting options	Effect
Statistical Values	Displays the statistical values.	Enter	Opens the submenu See "Statistical Values", on page 143
Temperature Values	Displays the current temperature values.	Enter	Opens the submenu See "Temperature Values", on page 144

Table 68: US15W OEM Features - Display Features setting options

1.4.2.1 LPC Devices



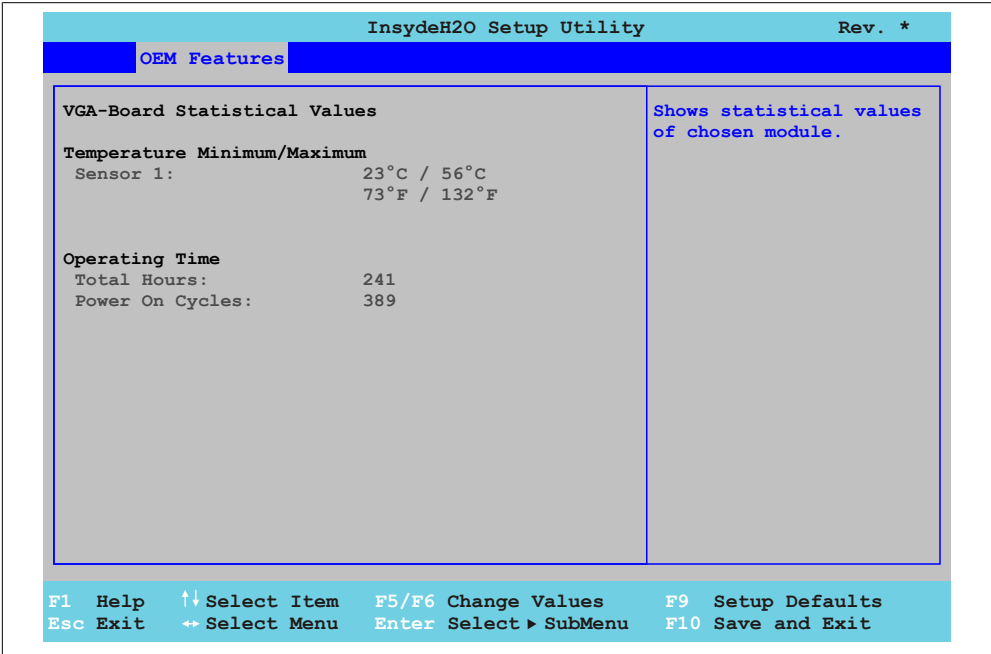
BIOS setting	Meaning	Setting options	Effect
COMB	Settings for the COM serial interface in the system.	None	-
Base I/O address	Selection of the base I/O address for the COM port.	Disabled, 238, 2E8, 2F8, 328, 338, 3E8, 3F8	Disables or assigns the selected base I/O address.
Interrupt	Selection of the interrupt for the COM port.	IRQ3, IRQ4, IRQ5, IRQ6, IRQ10, IRQ11, IRQ12	Selected interrupt is assigned.

Table 69: US15W OEM Features - Display Features - LPC Devices setting options

Info:

A resource conflict can occur regarding the Base I/O address or Interrupt settings, which will cause a warning. In order to make the settings anyways, the setting must first be made on the Base I/O address or Interrupt being that is used.

1.4.2.2 Statistical Values



BIOS setting	Meaning	Setting options	Effect
Sensor 1	Displays the minimum and maximum sensor temperature 1 in °C and °F.	None	-
Total Hours	Displays the runtime in whole hours.	None	-
Power on cycles	Displays the Power On Cycles - each restart increases the counter by one.	None	-

Table 70: US15W OEM Features - Display Features - Statistical Values setting options

1.4.2.3 Temperature Values

InsydeH2O Setup Utility		Rev. *	
OEM Features			
VGA-Board Temperature Values		Press enter for refreshing live temperature values.	
Refresh Values	<OK>		
Live Temperature Values			
Sensor 1:	27°C / 80°F		
F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	↔ Select Menu	Enter Select ► SubMenu	F10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
Refresh Values	Option for refreshing the temperature values.	OK	Refreshes the temperature values shown bellow.
Sensor 1	Displays the current sensor temperature 1 in °C and °F.	None	-

Table 71: US15W OEM Features - Display Features - Temperature Values setting options

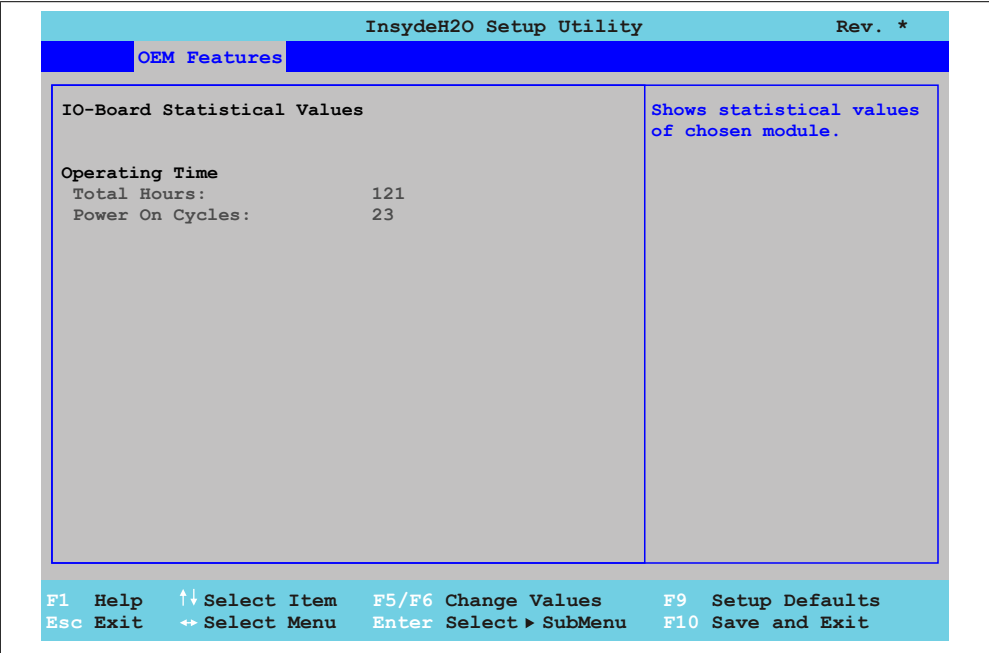
1.4.3 IO Module Features

InsydeH2O Setup Utility		Rev. *
OEM Features		
IO Module Features Device ID: 0000B4D5 Compatibility ID: 0000 Vendor ID: 00000000 Hardware Revision: A0 Serial Number: 01234567890 Product Name: 5PP5IO.GNAC-00 Hardware Number: 00000000 Parent Device ID: FFFFFFFF Parent Compatib. ID: FFFF ▶Statistical Values		Show statistical values of chosen module.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit		

BIOS setting	Meaning	Setting options	Effect
Device ID	Displays the device ID of the IO board.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Vendor ID	Displays the Vendor ID.	None	-
Hardware revision	Displays the IO board hardware revision.	None	-
Serial number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
Hardware Number	Displays the IO board hardware number.	None	-
Parent Device ID	Displays the manufacturer number.	None	-
Parent Compatib. ID	Displays the manufacturer ID.	None	-
Statistical Values	Displays the statistical values.	Enter	Opens the submenu See "Statistical Values", on page 146

Table 72: US15W OEM Features - IO Module Features setting options

1.4.3.1 Statistical Values



BIOS setting	Meaning	Setting options	Effect
Total Hours	Displays the runtime in whole hours.	None	-
Power on cycles	Displays the Power On Cycles - each restart increases the counter by one.	None	-

Table 73: US15W OEM Features - IO Module Features - Statistical Values setting options

1.4.4 IF Module Features

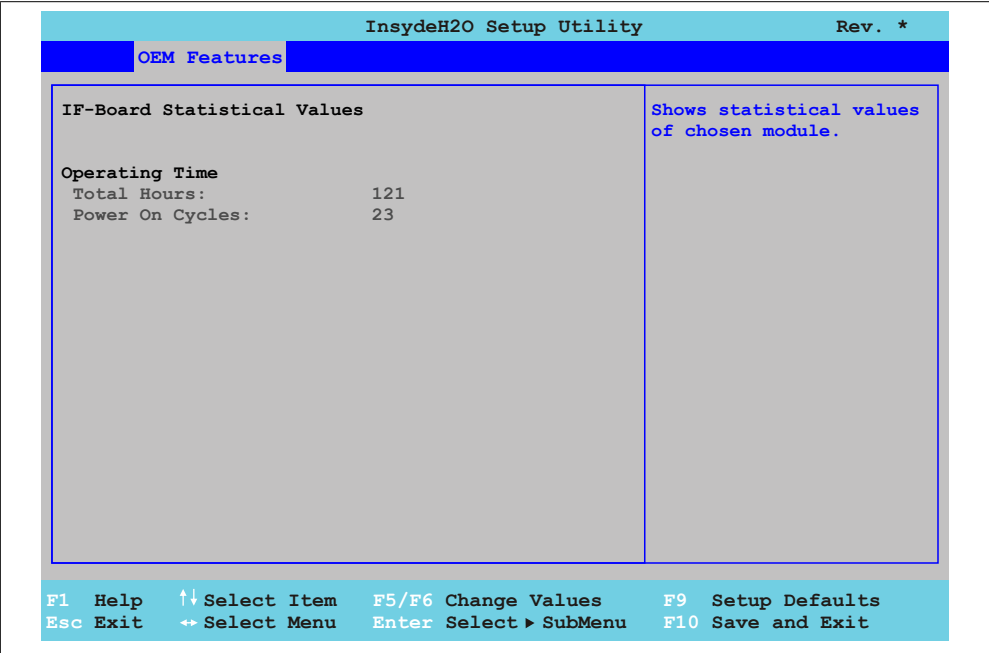
InsydeH2O Setup Utility		Rev. *
OEM Features		
IF Module Features Device ID: 0000B4D5 Compatibility ID: 0000 Vendor ID: 00000000 Hardware Revision: A0 Serial Number: 01234567890 Product Name: 5PP5IF.CETH-00 Hardware Number: 00000000 Parent Device ID: FFFFFFFF Parent Compatib. ID: FFFF LAN2 MAC ADDRESS: 00:60:65:0D:55:0C ▶Statistical Values		Show statistical values of chosen module.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit		

BIOS setting	Meaning	Setting options	Effect
Device ID	Displays the device ID of the IF board.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Vendor ID	Displays the Vendor ID.	None	-
Hardware revision	Displays the IF board hardware revision.	None	-
Serial number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
Hardware Number	Displays the IF board hardware number.	None	-
Parent Device ID	Displays the manufacturer number.	None	-
Parent Compatib. ID	Displays the manufacturer ID.	None	-
LAN2 MAC ADDRESS ¹⁾	Displays the MAC addresses assigned for the ETH interface.	None	-
Statistical Values	Displays the statistical values.	Enter	Opens the submenu See "Statistical Values", on page 148

Table 74: US15W OEM Features - IF Module Features setting options

1) The LAN2 MAC ADDRESS is only displayed with the interface board 5PP5IF.CETH-00.

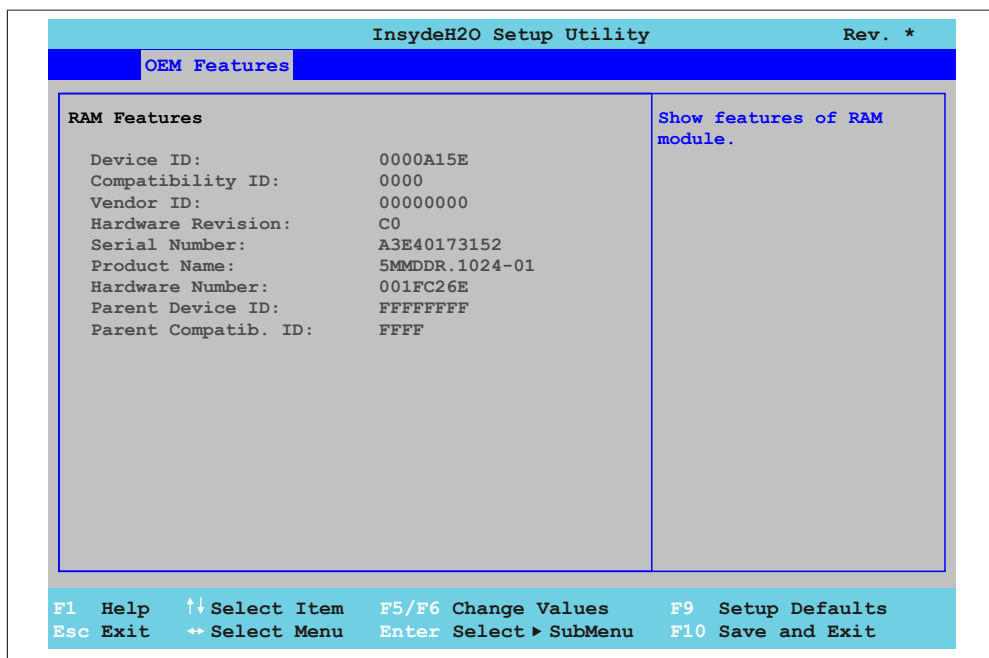
1.4.4.1 Statistical Values



BIOS setting	Meaning	Setting options	Effect
Total Hours	Displays the runtime in whole hours.	None	-
Power on cycles	Displays the Power On Cycles - each restart increases the counter by one.	None	-

Table 75: US15W OEM Features - IF Module Features - Statistical Values setting options

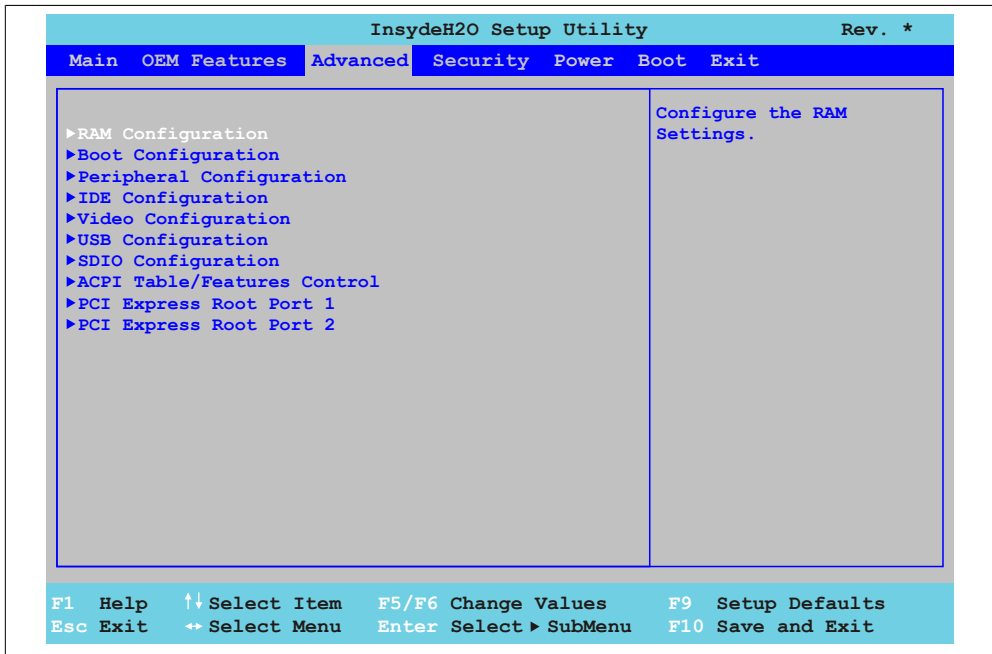
1.4.5 RAM Features



BIOS setting	Meaning	Setting options	Effect
Device ID	Displays the device ID of the RAM.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Vendor ID	Displays the Vendor ID.	None	-
Hardware revision	Displays the main memory hardware revision.	None	-
Serial number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
Hardware Number	Displays the main memory hardware number.	None	-
Parent Device ID	Displays the manufacturer number.	None	-
Parent Compatib. ID	Displays the manufacturer ID.	None	-

Table 76: US15W OEM Features - RAM Features setting options

1.5 Advanced



BIOS setting	Meaning	Setting options	Effect
RAM Configuration	Configures the RAM settings.	Enter	Opens the submenu See " RAM configuration", on page 151
Boot Configuration	Configures the boot settings.	Enter	Opens the submenu See " Boot Configuration", on page 152
Peripheral Configuration	Configures the peripheral settings.	Enter	Opens the submenu See " Peripheral Configuration", on page 153
IDE Configuration	Configures the IDE functions.	Enter	Opens the submenu See " IDE Configuration", on page 154
Video Configuration	Configures the graphics settings.	Enter	Opens the submenu See " Video Configuration", on page 157
USB configuration	Configures the USB settings.	Enter	Opens the submenu See " USB Configuration", on page 158
SDIO Configuration¹⁾	Configures the SDIO settings.	Enter	Opens the submenu See " SDIO Configuration", on page 159
ACPI Table/Features Control Configuration	Configures the ACPI Table/Features.	Enter	Opens the submenu See " ACPI Table/Features Control", on page 160

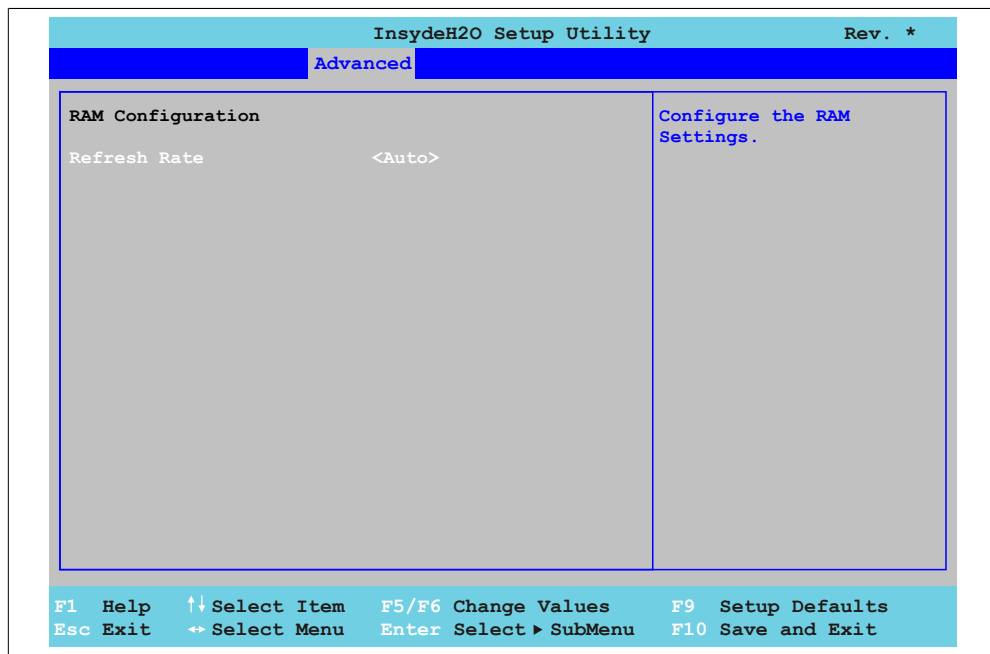
Table 77: US15W Advanced - Menu setting options

BIOS setting	Meaning	Setting options	Effect
PCI Express Root Port 1	Configures the PCI Express settings on Port 1. Warning! Making settings carelessly can cause instability or device problems. Therefore, it is strongly recommended that these settings only be changed by experienced users.	Enter	Opens the submenu See "PCI Express Root Port 1", on page 161
PCI Express Root Port 2	Configures the PCI Express settings on Port 2. Warning! Making settings carelessly can cause instability or device problems. Therefore, it is strongly recommended that these settings only be changed by experienced users.	Enter	Opens the submenu See "PCI Express Root Port 2", on page 164

Table 77: US15W Advanced - Menu setting options

1) SDIO - Secure Digital Input Output

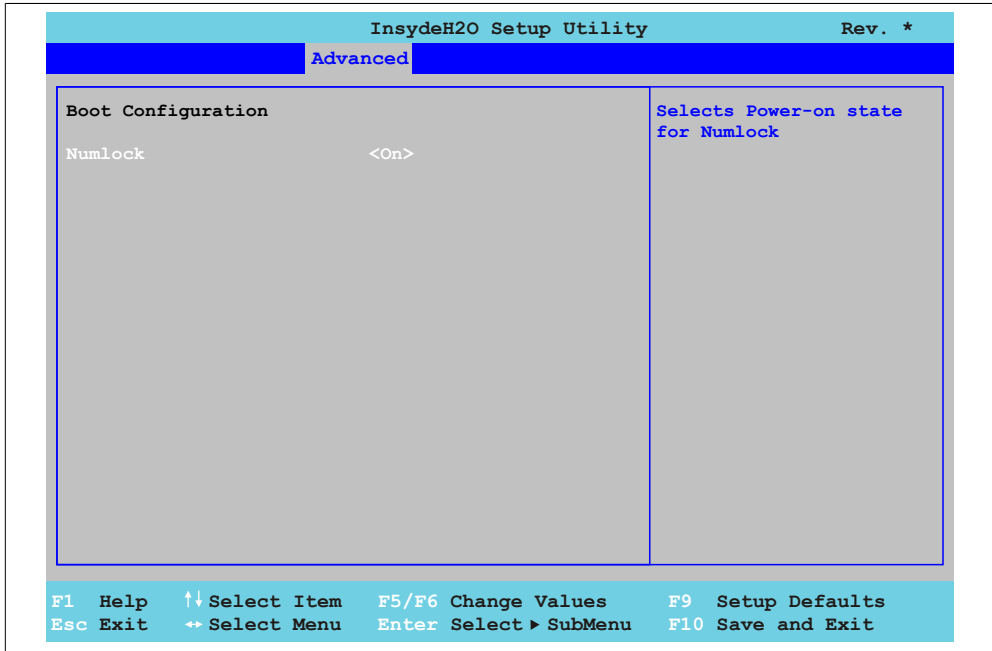
1.5.1 RAM configuration



BIOS setting	Meaning	Setting options	Effect
Refresh rate	Option for setting the DRAM refresh rate.	Auto	DRAM Refresh is read from the SPD data of the DRAM module.
		7.8 μ s	Manual setting for the DRAM refresh rate.
		3.9 μ s	Manual setting for the DRAM refresh rate.

Table 78: US15W Advanced - RAM Configuration setting options

1.5.2 Boot Configuration



BIOS setting	Meaning	Setting options	Effect
NumLock	With this field you can define the state of the NumLock key when booting.	On	Numeric keypad is enabled.
		Off	Only the cursor functions of the numerical keypad are activated.

Table 79: US15W Advanced - Boot Configuration setting options

1.5.3 Peripheral Configuration

InsydeH2O Setup UtilityRev. *

Advanced

Peripheral Configuration

High Definition Audio <Auto>

AUTO: Auto detect HD Audio, if available.
DISABLED: Disable HD Audio, if available.

F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ► SubMenu F10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
High Definition Audio	The audio mode can be turned on or off here.	Disabled	Disables the audio controller.
		Auto	Enables High Definition Audio (HDA) Sound. The HDA controller automatically detects installed audio devices.

Table 80: US15W Advanced - Peripheral Configuration setting options

1.5.4 IDE Configuration

InsydeH2O Setup UtilityRev. *

Advanced

IDE Configuration

▶Channel 1 Master[BR-SSD-C004G-01-0101]

▶Channel 1 Slave[Not Installed]

F1 Help↑↓ Select ItemF5/F6 Change ValuesF9 Setup Defaults

Esc Exit↔ Select MenuEnter Select ▶ SubMenuF10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
Channel 1 Master	Displays the drive that is connected to Channel 1 Master.	Enter	Opens the submenu See " Channel 1 Master", on page 155
Channel 1 Slave	Displays the drive that is connected to Channel 1 Slave.	Enter	Opens the submenu See " Channel 1 slave", on page 156

Table 81: US15W Advanced - IDE Configuration setting options

1.5.4.1 Channel 1 Master

InsydeH2O Setup UtilityRev. *

Advanced

Channel 1 Master[BR-SSD-C004G-01-0101]

Transfer Mode:<Ultra DMA ATA-66>

Security Mode:Uninstall

F1 Help↑↓ Select ItemF5/F6 Change ValuesF9 Setup Defaults

Esc Exit↔ Select MenuEnter Select ► SubMenuF10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
Transfer mode	Displays the communication path between the Channel 1 Master drive and the system memory.	None	-
Security Mode		None	-

Table 82: US15W Advanced - IDE Configuration - Channel 1 Master setting options

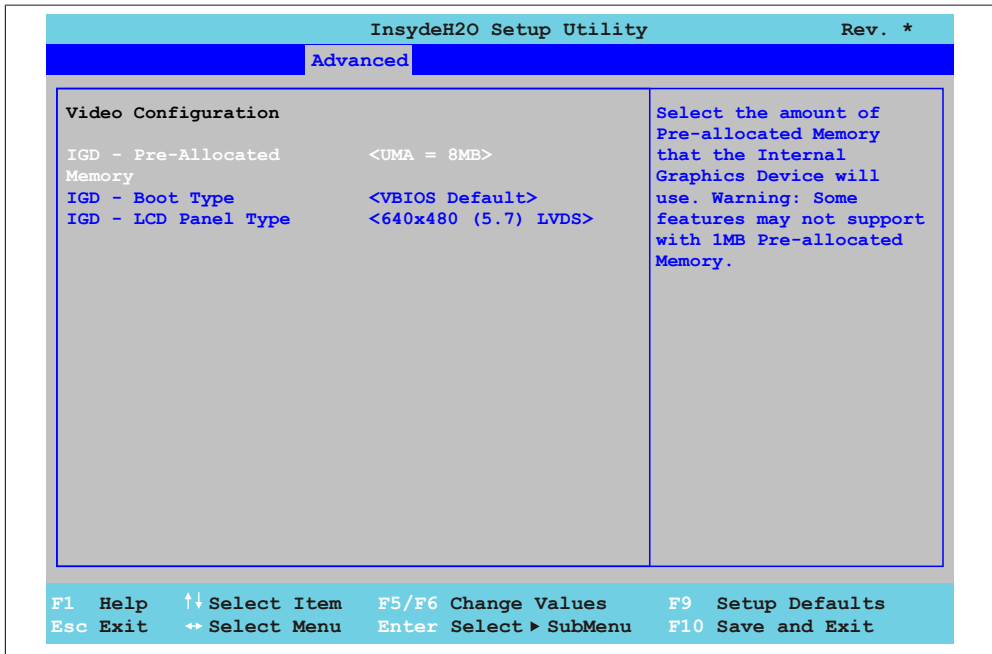
1.5.4.2 Channel 1 slave

InsydeH2O Setup Utility		Rev. *	
Advanced			
Channel 1 Slave		[BR-SSD-C004G-01-0101]	
Transfer Mode:		<Ultra DMA ATA-66>	
Security Mode:		Uninstall	
F1 Help		↑↓ Select Item	F5/F6 Change Values
Esc Exit		↔ Select Menu	Enter Select ► SubMenu
		F9 Setup Defaults	
		F10 Save and Exit	

BIOS setting	Meaning	Setting options	Effect
Transfer mode	Displays the communication path between the Channel 1 Slave drive and the system memory.	None	-
Security Mode		None	-

Table 83: US15W Advanced - IDE Configuration - Channel 1 Slave setting options

1.5.5 Video Configuration



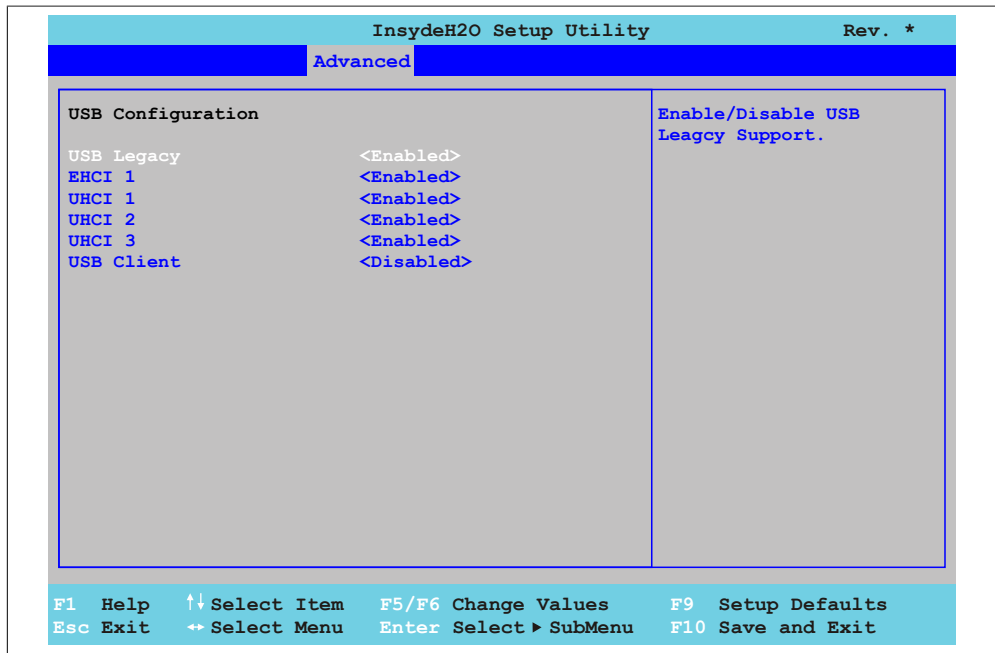
BIOS setting	Meaning	Setting options	Effect
IGD - Pre-allocated memory	Info: Some functions are not supported with the setting "UMA = 1MB".	UMA = 1MB	1 MByte main memory provided.
		UMA = 4MB	4 MByte main memory provided.
		UMA = 8MB	8 MByte main memory provided.
IGD - Boot Type	This option determines the order in which the devices on the connected channels LFP and SDVO should be checked and booted.	VBIOS Default	One of the panels listed under "IGD - LCD Panel Type" will be automatically selected.
		LFP - SDVO	It is possible to boot from the LFP (Local Flat Panel) as well as the SDVO (Serial Digital Video Output) channel.
IGD - LCD Panel Type	Option for setting the display resolution.	640x480 (5.7) LVDS	Resolution at 640 x 480 pixels (for 5.7" display)
		800x480 (7.0) LVDS	Resolution at 800 x 480 pixels (for 7" display)
		800x600 (8.4) LVDS	Resolution at 800 x 600 pixels (for 8.4" display)

Table 84: US15W Advanced - Video Configuration setting options

BIOS setting	Meaning	Setting options	Effect
	Info: If the display setting is present in the EPROM data, then this setting has no effect on the display resolution because the EPROM data is loaded each time the system is restarted and the BIOS setting is overwritten.	640x480 (10.4) LVDS	Resolution at 640 x 480 pixels (for 10.4" display)
		800x600 (12.0) LVDS	Resolution at 800 x 600 pixels (for 12.0" display)
		1024x768 (15.0) LVDS	Resolution at 1024 x 768 pixels (for 15" display)

Table 84: US15W Advanced - Video Configuration setting options

1.5.6 USB Configuration



BIOS setting	Meaning	Setting options	Effect
USB Legacy	Legacy USB support can be enabled/disabled here. USB ports do not function during startup. USB is supported again after the operating system has started. A USB keyboard is still recognized during the POST.	Enabled	Enables this function.
		Disabled	Disables this function.
EHCI 1	The support for the operating system can be set up without the fully automatic EHCI function.	Enabled	Enables USB support. USB 2.0 support is enabled as soon as a USB 2.0 device is connected to the interface.
		Disabled	Disables USB 2.0 support.

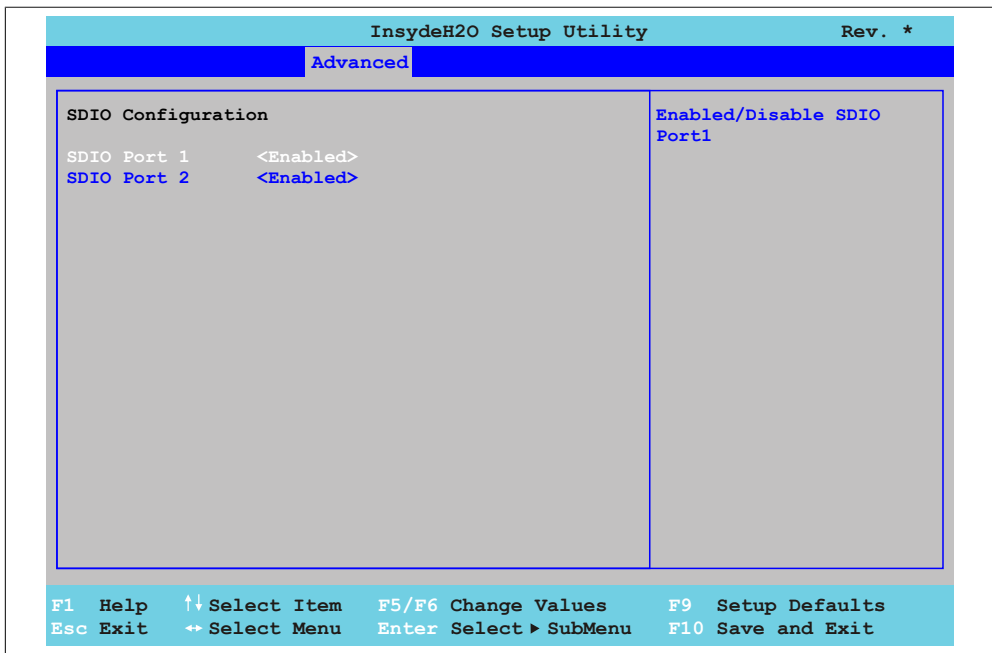
Table 85: US15W Advanced - USB Configuration setting options

BIOS setting	Meaning	Setting options	Effect
UHCI 1	Configuration of the USB UHCI controller 1 for USB port 2 and 3.	Enabled	Enables USB support.
		Disabled	Deactivates the USB support.
Warning! If this setting is <i>Disabled</i>, then the settings <i>UHCI 2</i> and <i>UHCI 3</i> will be set to <i>Disabled</i> and all USB ports will be disabled. As a result, it will no longer be possible to enter BIOS. However, if UHCI 1 has been disabled, then you can use the Back-up BIOS to once again enter BIOS. For more information, please see "OEM Features", on page 135			
UHCI 2 ¹⁾	UHCI 2 is not currently in use.	Enabled	-
		Disabled	-
UHCI 3 ¹⁾	Configuration of the USB UHCI controller 3 for USB port 3.	Enabled	Enables USB support.
		Disabled	Deactivates the USB support.
USB client	Setting for USB Client support.	Enabled	Enables USB Client support.
		Disabled	Disables USB Client support.

Table 85: US15W Advanced - USB Configuration setting options

1) These settings are only possible if *UHCI 1* is set to *Enabled*.

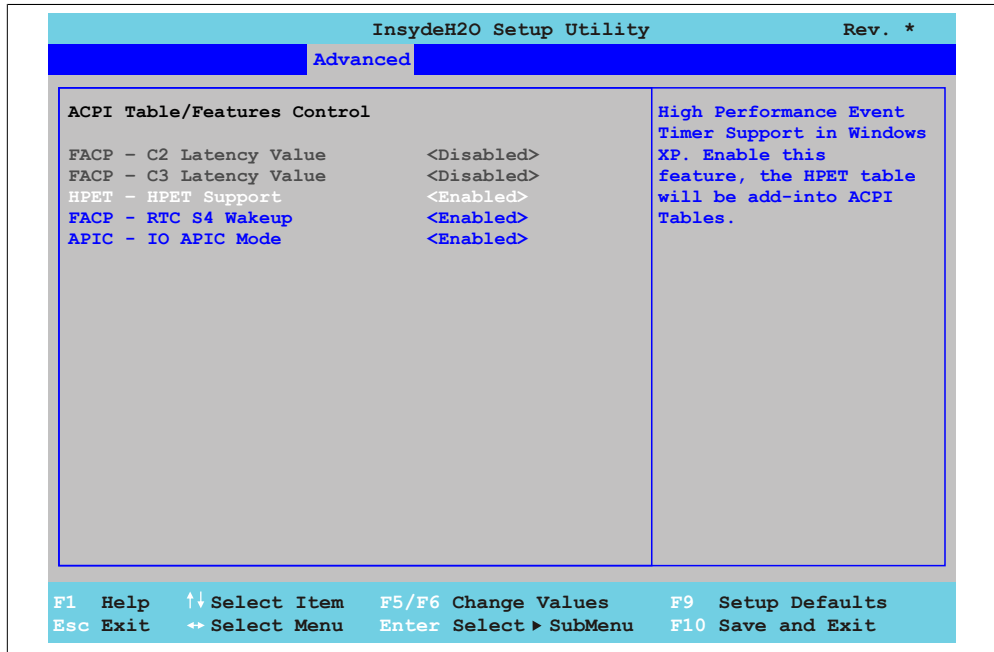
1.5.7 SDIO Configuration



BIOS setting	Meaning	Setting options	Effect
SDIO Port 1	SDIO Port 1 (Secure Digital Input Output - SD Memory Card Slot) can be enabled/disabled here.	Enabled	Enables this function.
		Disabled	Disables this function.
SDIO Port 2	SDIO Port 2 (Secure Digital Input Output - SD Memory Card Slot) can be enabled/disabled here.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 86: US15W Advanced - SDIO Configuration setting options

1.5.8 ACPI Table/Features Control



BIOS setting	Meaning	Setting options	Effect
FACP - C2 Latency Value ¹⁾	Option for setting a latency period in the C2 state.	Enabled	Enables this function. A latency of 1 μs is set (i.e. the C2 state will be entered within 1 μs and exited again within 1 μs).
		Disabled	Disables this function.
FACP - C3 Latency Value ¹⁾	Option for setting a latency period in the C3 state.	Enabled	Enables this function. A latency of 85 μs is set (i.e. the C3 state will be entered within 85 μs and exited again within 85 μs).
		Disabled	Disables this function.
HPET - HPET Support	The HPET is a timer inside the PC. It is able to trigger an interrupt with a high degree of accuracy, which allows other programs to better synchronize a variety of applications.	Enabled	Enables this function. This function is recommended for multi-media applications.
		Disabled	Disables this function.

Table 87: US15W Advanced - ACPI Table/Features Control setting options

BIOS setting	Meaning	Setting options	Effect
FACP - RTC S4 Wake-up	Option for starting from S4 standby into "normal operation" through the RTC (Real Time Clock).	Enabled	Enables this function.
		Disabled	Disables this function.
APIC - I/O APIC mode	This option controls the support of the advanced programmable interrupt controller in the processor.	Enabled	Enables this function.
		Disabled	Disables this function.

Warning!

Windows XP will not be started if this setting is disabled.

Table 87: US15W Advanced - ACPI Table/Features Control setting options

1) These settings are only possible if C-States is set to *Enabled* in the menu item *Power - Advanced CPU Control*.

1.5.9 PCI Express Root Port 1

Warning!

Making settings carelessly can cause instability or device problems. Therefore, it is strongly recommended that these settings only be changed by experienced users.

InsydeH2O Setup Utility
Rev. *

Advanced

```

PCI Express Root Port 1  <Enabled>
Interrupt Pin 0          <Auto>
VC1 Enable               <Disabled>
ASPM                     <Disabled>
URR                      <Disabled>
FER                      <Disabled>
NFER                     <Disabled>
CER                      <Disabled>
CT0                      <Disabled>
SEFE                     <Disabled>
SENFE                    <Disabled>
SECE                     <Disabled>
PME Interrupt            <Disabled>
PME SCI                  <Disabled>
Hot Plug SCI             <Disabled>

```

Control the PCI Express Root Port.

F1 Help

Esc Exit

↑↓ Select Item

↔ Select Menu

F5/F6 Change Values

Enter Select ► SubMenu

F9 Setup Defaults

F10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
PCI Express Root Port 1	This option is used to enable/disable PCI Express Root Port 1.	Enabled	PCI Express Root Port 1 enabled.
		Disabled	PCI Express Root Port 1 and 2 disabled.
Interrupt pin 0	Info: This function must be disabled when using ARwin and/or a field-bus card.	Auto	IRQ enabled for Root Port 1.
		Disabled	IRQ disabled for Root Port 1.
VC1 Enable	Virtual Channel 1	Auto	Setting the mapping via the BIOS setting "VC1/TC Mapping".
		Disabled	Disables this function. The TC0 Traffic class is automatically used and mapped to the VC0 Virtual Channel.
VC1/TC Mapping ¹⁾	This option is used to define which traffic will be mapped to which Virtual Channel.	TC0	TBD
		TC1	The TC1 traffic class is mapped manually to the VC1 Virtual Channel.
		TC2	The TC2 traffic class is mapped manually to the VC1 Virtual Channel.
		TC3	The TC3 traffic class is mapped manually to the VC1 Virtual Channel.
		TC4	The TC4 traffic class is mapped manually to the VC1 Virtual Channel.
		TC5	The TC5 traffic class is mapped manually to the VC1 Virtual Channel.
		TC6	The TC6 traffic class is mapped manually to the VC1 Virtual Channel.
		TC7	The TC7 traffic class is mapped manually to the VC1 Virtual Channel.
ASPM	<i>Active State Power Management</i> Option for setting a power saving function (L0s/L1) for PCIe links if they do not require full power.	Enabled	Enables this function.
		Disabled	Disables this function.
Automatic ASPM ²⁾	Option for configuring automatic or manual assignment of the ASPM.	Auto	Automatic assignment by the BIOS and operating system.
		Manual	Setting for assignment under the BIOS setting "ASPM L0s" and "ASPM L1".
ASPM L0s ³⁾	Option for setting the L0 power saving function.	Disabled	Disables this function.
		Root Port Only	Enables the power saving function for the Root port.
		Endpoint Port Only	Enables the power saving function for the Endpoint port.
		Root&Endpoint Ports	Enables the power saving function for the Root and Endpoint ports.
ASPM L1 ³⁾	Option for setting the L1 power saving function. Power consumption is lower than with L0, but the exit latency higher.	Enabled	Enables this function.
		Disabled	Disables this function.
URR	<i>Unsupported Request (UR) Reporting</i> Option for reporting unsupported requests. Logging of error messages received by the Root Port is controlled exclusively by the Root Control Register.	Enabled	Enables this function.
		Disabled	Disables this function.
FER	<i>Fatal Error Reporting</i>	Enabled	Enables this function.

Table 88: US15W Advanced - PCI Express Root Port 1 setting options

BIOS setting	Meaning	Setting options	Effect
	Option for reporting fatal errors. All of the functions in a multifunction device will be monitored. The report for the Root Port takes place internally inside the Root Complex.	Disabled	Disables this function.
NFER	<i>Non-Fatal Error Reporting</i> Option for reporting non-fatal errors. All of the functions in a multifunction device will be monitored. The report for the Root Port takes place internally inside the Root Complex.	Enabled	Enables this function.
		Disabled	Disables this function.
CER	<i>Correctable Error Reporting</i> Option for reporting non-fatal errors. All of the functions in a multifunction device will be monitored. The report for the Root Port takes place internally inside the Root Complex.	Enabled	Enables this function.
		Disabled	Disables this function.
CT0	<i>PCI Express Completion Timer T0</i> This option is used to enable/disable PCI Express Completion Timer. Info: If the system detected an ROB (Processor Reorder Buffer) Timeout, then this setting should be set to Enabled.	Enabled	Enables this function.
		Disabled	Disables this function.
SEFE	<i>System Error on Fatal Error</i> Option for generating a System Error, if a fatal error is registered by a device on the Root Port or on the Root Port itself.	Enabled	Enables this function.
		Disabled	Disables this function.
SENF	<i>System Error on Non-Fatal Error</i> Option for generating a System Error, if a non-fatal error is registered by a device on the Root Port or on the Root Port itself.	Enabled	Enables this function.
		Disabled	Disables this function.
SECE	<i>System Error on Correctable Error</i> Option for generating a System Error, if a correctable error is registered by a device on the Root Port or on the Root Port itself.	Enabled	Enables this function.
		Disabled	Disables this function.
PME Interrupt	<i>Power Management Event Interrupt</i> Option for generating a PME Interrupt. An Interrupt is generated when a PME Message is received from a PCIe device.	Enabled	Enables this function. A PME Interrupt is generated when a PME message is received.
		Disabled	Disables this function.
PME SCI	Option for generating an SCI if Power Management is detected.	Enabled	Enables this function. The Root Port is enabled to generate SCI if Power Management is detected.
		Disabled	Disables this function.
Hot Plug SCI	Option for generating an SCI if a Hot-Plug is detected.	Enabled	Enables this function. The Root Port is enabled to generate SCI if a Hot-Plug is detected.
		Disabled	Disables this function.

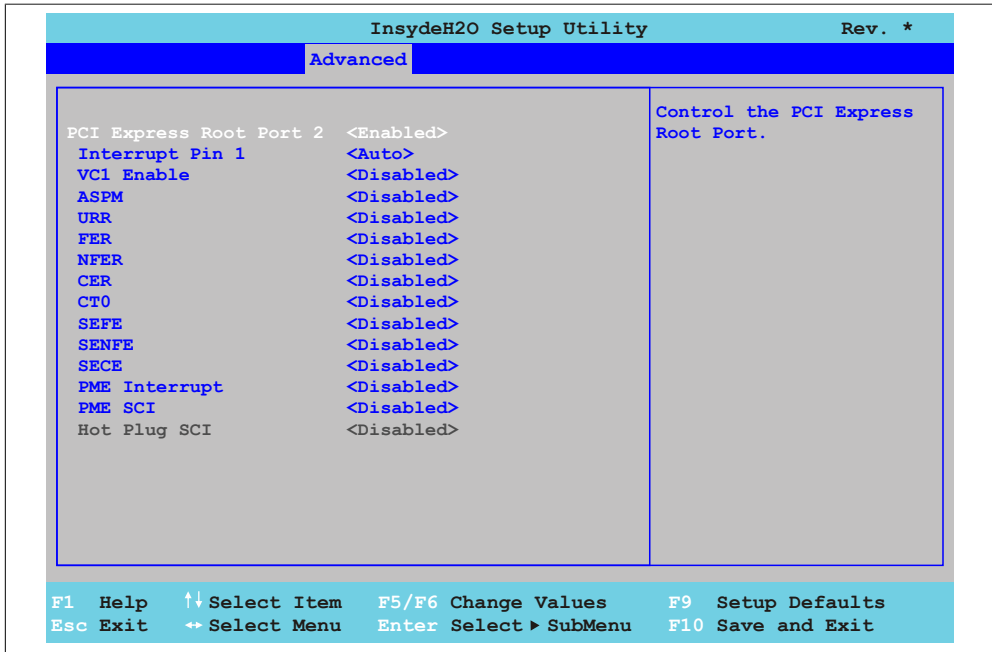
Table 88: US15W Advanced - PCI Express Root Port 1 setting options

- 1) These settings are only possible if *VC1 Enable* is set to *Auto*.
- 2) These settings are only possible if *ASPM* is set to *Enabled*.
- 3) These settings are only possible if *Automatic ASPM* is set to *Manual*.

1.5.10 PCI Express Root Port 2

Warning!

Making settings carelessly can cause instability or device problems. Therefore, it is strongly recommended that these settings only be changed by experienced users.



BIOS setting	Meaning	Setting options	Effect
PCI Express Root Port 2	This option is used to enable/disable PCI Express Root Port 2.	Enabled	PCI Express Root Port 2 enabled.
		Disabled	PCI Express Root Port 2 disabled.
Interrupt pin 1	Info: This function must be disabled when using ARwin and/or a field-bus card.	Auto	IRQ enabled for Root Port 2.
		Disabled	IRQ disabled for Root Port 2.
VC1 Enable	Virtual Channel 1	Auto	Setting the mapping via the BIOS setting "VC1/TC Mapping".
		Disabled	Disables this function. The TC0 Traffic class is automatically used and mapped to the VC0 Virtual Channel.
VC1/TC Mapping ¹⁾	This option is used to define which traffic will be mapped to which Virtual Channel.	TC0	TBD
		TC1	The TC1 traffic class is mapped manually to the VC1 Virtual Channel.
		TC2	The TC2 traffic class is mapped manually to the VC1 Virtual Channel.

Table 89: US15W Advanced - PCI Express Root Port 2 setting options

BIOS setting	Meaning	Setting options	Effect
		TC3	The TC3 traffic class is mapped manually to the VC1 Virtual Channel.
		TC4	The TC4 traffic class is mapped manually to the VC1 Virtual Channel.
		TC5	The TC5 traffic class is mapped manually to the VC1 Virtual Channel.
		TC6	The TC6 traffic class is mapped manually to the VC1 Virtual Channel.
		TC7	The TC7 traffic class is mapped manually to the VC1 Virtual Channel.
ASPM	<i>Active State Power Management</i> Option for setting a power saving function (L0s/L1) for PCIe links if they do not require full power.	Enabled	Enables this function.
		Disabled	Disables this function.
Automatic ASPM ²⁾	Option for configuring automatic or manual assignment of the ASPM.	Auto	Automatic assignment by the BIOS and operating system.
		Manual	Setting for assignment under the BIOS setting "ASPM L0s" and "ASPM L1".
ASPM L0s ³⁾	Option for setting the L0 power saving function.	Disabled	Disables this function.
		Root Port Only	Enables the power saving function for the Root port.
		Endpoint Port Only	Enables the power saving function for the Endpoint port.
		Root&Endpoint Ports	Enables the power saving function for the Root and Endpoint ports.
ASPM L1 ³⁾	Option for setting the L1 power saving function. Power consumption is lower than with L0, but the exit latency higher.	Enabled	Enables this function.
		Disabled	Disables this function.
URR	<i>Unsupported Request (UR) Reporting</i> Option for reporting unsupported requests. Logging of error messages received by the Root Port is controlled exclusively by the Root Control Register.	Enabled	Enables this function.
		Disabled	Disables this function.
FER	<i>Fatal Error Reporting</i> Option for reporting fatal errors. All of the functions in a multifunction device will be monitored. The report for the Root Port takes place internally inside the Root Complex.	Enabled	Enables this function.
		Disabled	Disables this function.
NFER	<i>Non-Fatal Error Reporting</i> Option for reporting non-fatal errors. All of the functions in a multifunction device will be monitored. The report for the Root Port takes place internally inside the Root Complex.	Enabled	Enables this function.
		Disabled	Disables this function.
CER	<i>Correctable Error Reporting</i> Option for reporting non-fatal errors. All of the functions in a multifunction device will be monitored. The report for the Root Port takes place internally inside the Root Complex.	Enabled	Enables this function.
		Disabled	Disables this function.
CT0	<i>PCI Express Completion Timer T0</i>	Enabled	Enables this function.

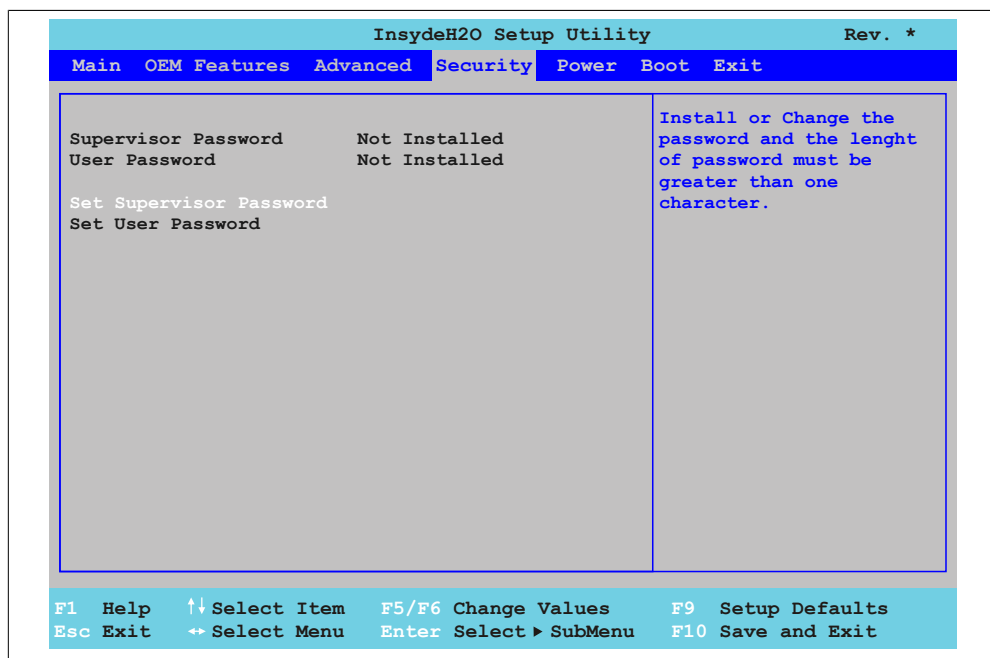
Table 89: US15W Advanced - PCI Express Root Port 2 setting options

BIOS setting	Meaning	Setting options	Effect
	This option is used to enable/disable PCI Express Completion Timer. Info: If the system detected an ROB (Processor Reorder Buffer) Timeout, then this setting should be set to Enabled.	Disabled	Disables this function.
SEFE	<i>System Error on Fatal Error</i> Option for generating a System Error, if a fatal error is registered by a device on the Root Port or on the Root Port itself.	Enabled	Enables this function.
		Disabled	Disables this function.
SENF	<i>System Error on Non-Fatal Error</i> Option for generating a System Error, if a non-fatal error is registered by a device on the Root Port or on the Root Port itself.	Enabled	Enables this function.
		Disabled	Disables this function.
SECE	<i>System Error on Correctable Error</i> Option for generating a System Error, if a correctable error is registered by a device on the Root Port or on the Root Port itself.	Enabled	Enables this function.
		Disabled	Disables this function.
PME Interrupt	<i>Power Management Event Interrupt</i> Option for generating a PME Interrupt. An Interrupt is generated when a PME Message is received from a PCIe device.	Enabled	Enables this function. A PME Interrupt is generated when a PME message is received.
		Disabled	Disables this function.
PME SCI	Option for generating an SCI if Power Management is detected.	Enabled	Enables this function. The Root Port is enabled to generate SCI if Power Management is detected.
		Disabled	Disables this function.
Hot Plug SCI	Option for generating an SCI if a Hot-Plug is detected.	Enabled	Enables this function. The Root Port is enabled to generate SCI if a Hot-Plug is detected.
		Disabled	Disables this function.

Table 89: US15W Advanced - PCI Express Root Port 2 setting options

- 1) These settings are only possible if *VC1 Enable* is set to *Auto*.
- 2) These settings are only possible if *ASPM* is set to *Enabled*.
- 3) These settings are only possible if *Automatic ASPM* is set to *Manual*.

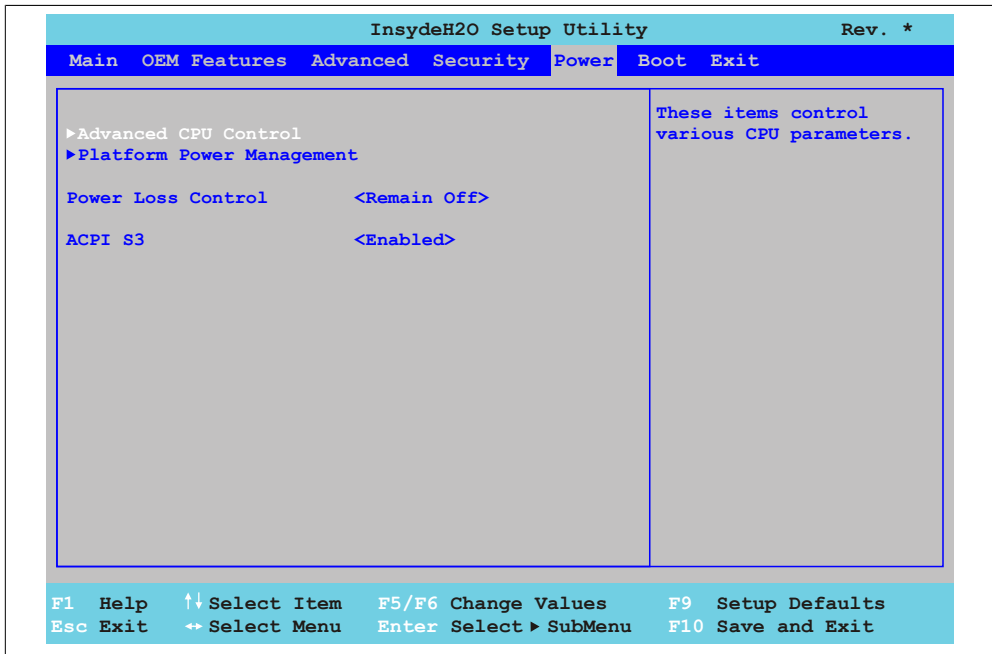
1.6 Security



BIOS setting	Meaning	Setting options	Effect
Supervisor Password	Displays whether or not a supervisor password has been set.	None	-
User Password	Displays whether or not a user password has been set.	None	-
Set supervisor password	To enter/change a supervisor password. A supervisor password is necessary to edit all BIOS settings.	Enter	Enter password.
Set user password	To enter/change a user password. A user password allows the user to edit only certain BIOS settings.	Enter	Enter password.

Table 90: US15W Security - Menu setting options

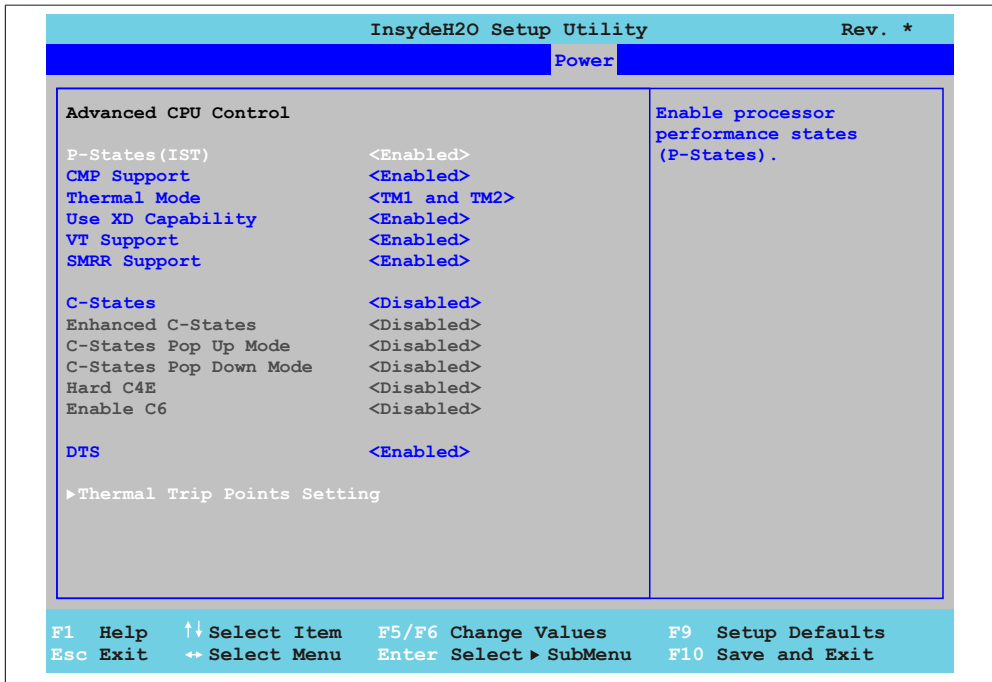
1.7 Power



BIOS setting	Meaning	Setting options	Effect
Advanced CPU Control	Configuration of the Advanced CPU Control settings.	None	Opens the submenu See "Advanced CPU Control", on page 169
Platform Power Management	Configuration of the Platform Power Management settings.	None	Opens the submenu See "Platform Power Management", on page 172
Power Loss Control	This option determines what should occur after a power failure.	Remain Off	Device remains off.
		Turn On	The device turns back on.
ACPI S3	This option is used to determine whether or not the operating system should be written to the RAM, in which case only the RAM should be supplied with power.	Enabled	Enables this function.
		Disabled	Disables the function

Table 91: US15W Power - Menu setting options

1.7.1 Advanced CPU Control



BIOS setting	Meaning	Setting options	Effect
P-States (IST)	Option for controlling the Intel(R) SpeedStep(TM) technology. The processor clock speed is increased or decreased according to the amount of calculations that must be made. As a result, the power consumption depends largely on the processor load.	Enabled	The processor speed is regulated by the operating system.
		Disabled	Disables SpeedStep technology.
CMP Support	This option supports the use of multiple CPUs (CMP=core multi-processing).	Enabled	Enables this function.
		Disabled	Disables this function.
Thermal Mode ¹⁾	Option for configuring the temperature monitoring.	Info: In order to use ARwin, CMP support must be turned off. Otherwise, runtime violations may occur.	
		Disabled	Temperature monitoring disabled.
		TM1	Intel Thermal Mode 1 enabled. If the CPU reaches excessive temperatures, the processor speed will be reduced by 50%.
		TM2	Intel Thermal Mode 2 enabled. If the CPU reaches excessive temperatures, the Intel SpeedStep technology will be activated.

Table 92: US15W Power - Advanced CPU Control setting options

BIOS setting	Meaning	Setting options	Effect
	Info: To operate the processor within the specified values, we recommend not changing the default setting (TM1 and TM2).	TM1 and TM2	Intel Thermal Mode 1 and 2 enabled. If the CPU reaches excessive temperatures, TM1 reduces the processor speed by 50% and TM2 activates the Intel SpeedStep technology.
Use XD Capability	This option is a safety feature that protects specific data regions of the system memory from potentially damaging code.	Enabled	Enables this function.
		Disabled	Disables this function.
VT Support	Option for activating or deactivating a virtual machine. Info: You must restart in order to apply changes made to this setting.	Enabled	If the function is enabled, a virtual machine can use the additional hardware capacity.
		Disabled	Disables this function.
SMRR Support	The SMRR (System Management Range Register) limits cacheable references of addresses in SMRAM in order to keep the code running in SMM (System Management Mode). In some circumstances, an intruder who is logged on as administrator could configure the Intel processor to gain access to the SMM. Implementation of SMRR reduces this risk of unauthorized access.	Enabled	Enables this function.
		Disabled	Disables this function.
C-States	This setting allows the operating system to set processor clock rates on its own, thereby saving energy.	Enabled	Enables this function. The processors are run at different frequencies, thereby saving energy.
		Disabled	Disables this function. Both processors are run at the same frequency.
Enhanced C-States ²⁾	This setting allows the operating system to set processor clock rates on its own, thereby saving energy.	Enabled	Enables this function.
		Disabled	Disables this function.
C-State Pop Up Mode	This setting makes it possible to detect Bus Master requests and to assign processor clock frequencies. This can be done to save energy.	Enabled	If ICH receives a Bus Master request, then the system changes from C3/C4 state to C2 state and the Bus Master is automatically activated.
		Disabled	Bus Master data transfer is a Break Event and ICH will attempt to return to the C0 state.
C-State Pop Down Mode ³⁾	This setting makes it possible to detect Bus Master requests and to assign processor clock frequencies. This can be done to save energy.	Enabled	If ICH does not receive a Bus Master request, then the system will be set back to C3/C4 state.
		Disabled	ICH will not attempt to automatically return to C3/C4 state.
Hard C4E ⁴⁾	Power Management for the Intel Atom processor - Enhanced C4 support.	Enabled	Enables this function. CPU voltage is reduced and the Memory Cache is turned off.
		Disabled	Disables this function.
Enable C6	Power Management for the Intel Atom processor - C6 support.	Enabled	Enables this function. The internal CPU voltage is reduced (can also be 0 V).
		Disabled	Disables this function.

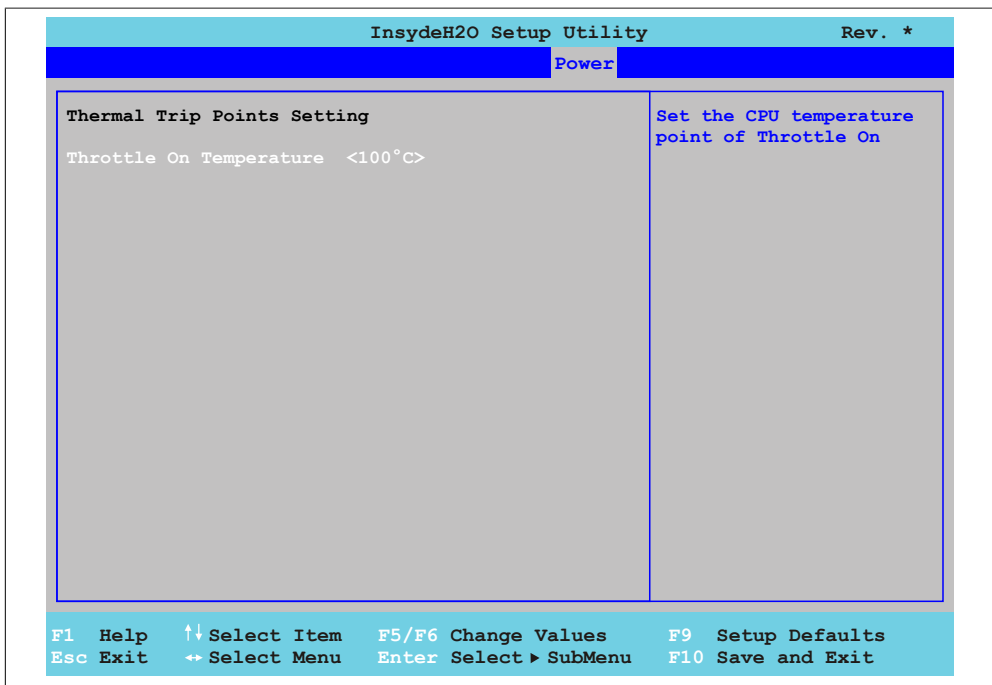
Table 92: US15W Power - Advanced CPU Control setting options

BIOS setting	Meaning	Setting options	Effect
DTS	Option for enabling or disabling the CPU Digital Thermal Sensor function.	Enabled	Enables this function.
		Disabled	Disables this function.
Thermal Trip Points Setting ⁵⁾	Configuration of the Thermal Trip Points settings.	Enter	Opens the submenu See "Thermal Trip Points Settings", on page 171

Table 92: US15W Power - Advanced CPU Control setting options

- 1) These settings are only possible if *P-States(IST)* is set to *Enabled*.
- 2) These settings are only possible if *C-States* is set to *Enabled*.
- 3) These settings are only possible if *C-States Pop Up Mode* is set to *Enabled*.
- 4) These settings are only possible if *Enhanced C-States* is set to *Enabled*.
- 5) These settings are only possible if *DTS* is set to *Enabled*.

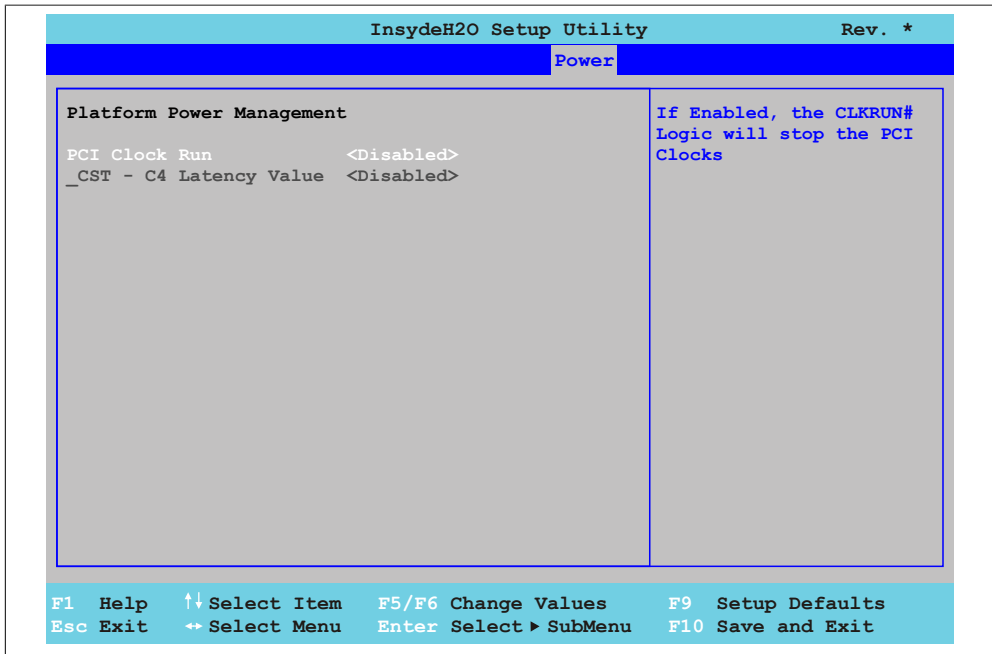
1.7.1.1 Thermal Trip Points Settings



BIOS setting	Meaning	Setting options	Effect
Throttle On Temperature	With this function, a temperature can be set at which the operating system throttles the system.	40°C, 45°C, 50°C, 55°C, 60°C, 65°C, 70°C, 75°C, 80°C, 85°C, 90°C, 95°C, 100°C	Temperature setting for the thermal trip point. Can be set in 5 degree increments.

Table 93: US15W Power - Advanced CPU Control - Thermal Trip Points Settings options

1.7.2 Platform Power Management



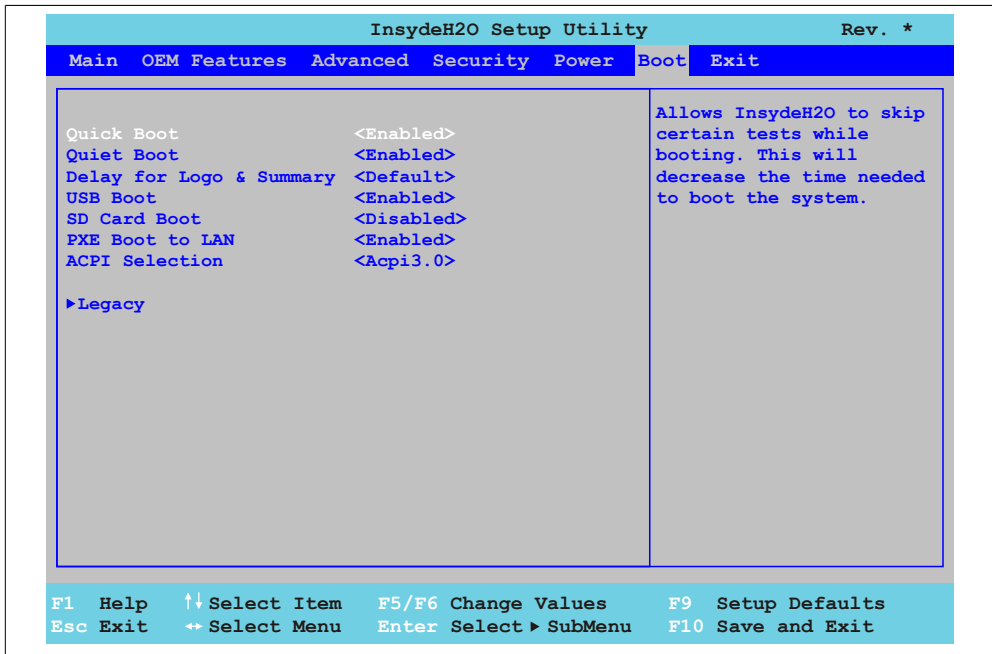
BIOS setting	Meaning	Setting options	Effect
PCI Clock Run	Option for enabling / disabling the PCI Clocks to save energy.	Enabled	Enables this function.
		Disabled	Disables this function.
_CST - C4 Latency Value ¹⁾	Option for enabling / disabling the latency period for C4 C-States in the ACPI _CST object.	Enabled	Enables this function.
		Disabled	Disables this function.
	Info: For more detailed information about this setting, see the ACPI specification (www.acpi.info).		
C4 on C3 - Deeper Sleep ²⁾	Fine-tunes the power saving function on an ACPI operating system.	Enabled	Processor is needed in C4 if the operating system is initiated in a C3 state.
		Disabled	Disables this function.

Table 94: US15W Power - Platform Power Management setting options

1) These settings are only possible if C-States is set to *Enabled* in the menu item *Advanced CPU Control*.

2) These settings are only possible if _CST - C4 Latency Value is set to *Enabled*.

1.8 Boot



BIOS setting	Meaning	Setting options	Effect
Quick Boot	This function reduces the boot time by skipping some POST tests.	Enabled	Enables this function.
		Disabled	Disables this function.
Quiet Boot	Determines if POST message or OEM logo (default = black background) is displayed.	Enabled	OEM logo display instead of POST message.
		Disabled	POST message display.
Delay for Logo & Summary	Option for setting the display duration of the logo and summary screen.	Default	The display duration is minimized for a quick boot procedure.
		1 Sec., 1.5 Sec., 2 Sec., 2.5 Sec., 3 Sec., 4 Sec., 5 Sec., 10 Sec., 20 Sec.	A display duration of x seconds can be defined.
USB Boot	This function can be used to enable / disable the option of booting from USB devices.	Enabled	Enables this function.
		Disabled	Disables this function.
SD Card Boot	This function can be used to enable / disable the option of booting from SD cards.	Enabled	Enables this function.
		Disabled	Disables this function.

Warning!

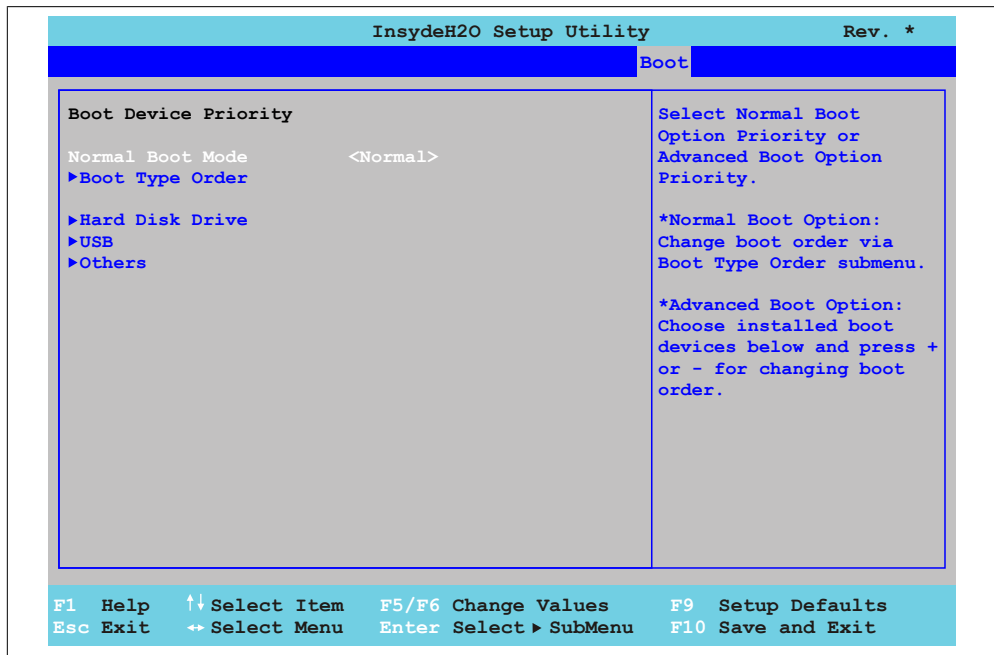
The SD Memory Card Slot has not yet been released because it is still in development. Inserting an SD memory card can cause the device to malfunction! Therefore, the use of SD Memory cards is not permitted.

Table 95: US15W Boot - Menu setting options

BIOS setting	Meaning	Setting options	Effect
PXE Boot to LAN	This function can be used to enable / disable the option of booting from LAN (ETH).	Enabled	Enables this function.
		Disabled	Disables this function.
ACPI Selection	Option for setting the power option specifications to be supported. The ACPI functions must be supported by the drivers and operating systems being used.	Acpi 1.0B	ACPI functions in accordance with v1.0B
		Acpi 3.0	ACPI functions in accordance with v3.0
		Acpi 4.0	ACPI functions in accordance with v4.0
Legacy	Configuration and display of the Boot sequence.	Enter	Opens the submenu See "Legacy", on page 174

Table 95: US15W Boot - Menu setting options

1.8.1 Legacy



BIOS setting	Meaning	Setting options	Effect
Normal Boot Mode	Boot mode configuration.	Normal	Displays the submenus for changing the boot sequence settings.
		Advanced	Displays only the product names of the bootable connected devices. The boot sequence can be defined right here.
Boot Type Order ⁽¹⁾	Configuration of Boot Type Order settings.	Enter	Opens the submenu See "Boot Type Order", on page 175
Hard Disk Drive ⁽¹⁾⁽²⁾	Displays the inserted CompactFlash cards.	Enter	Opens the submenu See "Hard Disk Drive", on page 176

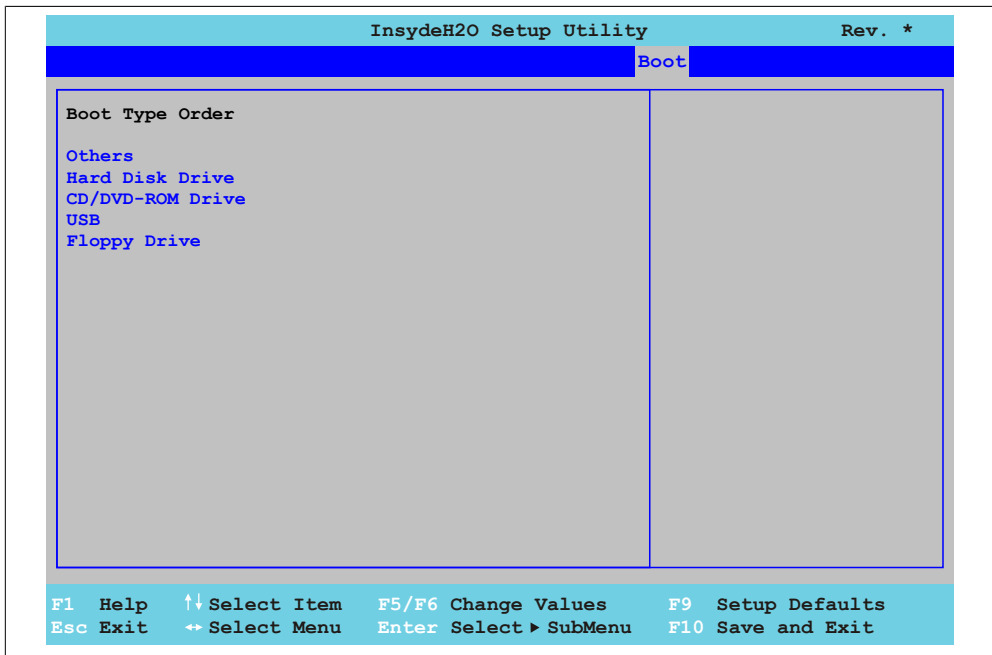
Table 96: US15W Boot - Legacy setting options

BIOS setting	Meaning	Setting options	Effect
USB ¹³⁾	Displays connected USB flash drives.	Enter	Opens the submenu See "USB", on page 177
Others ¹⁴⁾	Displays the CPU Boards / Baseboards for PXE Boot with the onboard Ethernet interfaces.	Enter	Opens the submenu See "Others", on page 178

Table 96: US15W Boot - Legacy setting options

- 1) These submenus are only shown if *Normal Boot Mode* is set to *Normal*.
 2) Only shown if a CompactFlash card is connected.
 3) Only shown if a USB flash drive is connected.
 4) Only shown if *PXE Boot to LAN* is set to *Enabled* in the boot menu.

1.8.1.1 Boot Type Order



BIOS setting	Meaning	Setting options	Effect
Others	The boot drives can be set using this option.	Others	Select the desired sequence.
Hard Disk Drive		Hard Disk Drive	
CD/DVD ROM drive		CD/DVD ROM drive	
USB		USB	
Floppy Drive		Floppy Drive	

Table 97: US15W Boot - Legacy - Boot Type Order setting options

1.8.1.2 Hard Disk Drive

InsydeH2O Setup Utility				Rev. *
			Boot	
Hard Disk Drive				
BR-SSD-C004G-01-0101				
F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults	
Esc Exit	↔ Select Menu	Enter Select ► SubMenu	F10 Save and Exit	

BIOS setting	Meaning	Setting options	Effect
	Displays the inserted CompactFlash cards.	None	-

Table 98: US15W Boot - Legacy - Hard Disk Drive setting options

1.8.1.3 USB

InsydeH2O Setup Utility				Rev. *
Boot				
USB				
SwissbitunitedCONTRAST				
F1 Help	↑↓ Select Item	F5/F6 Change Values	F9 Setup Defaults	
Esc Exit	↔ Select Menu	Enter Select ► SubMenu	F10 Save and Exit	

BIOS setting	Meaning	Setting options	Effect
	Displays connected USB flash drives.	None	-

Table 99: US15W Boot - Legacy - USB setting options

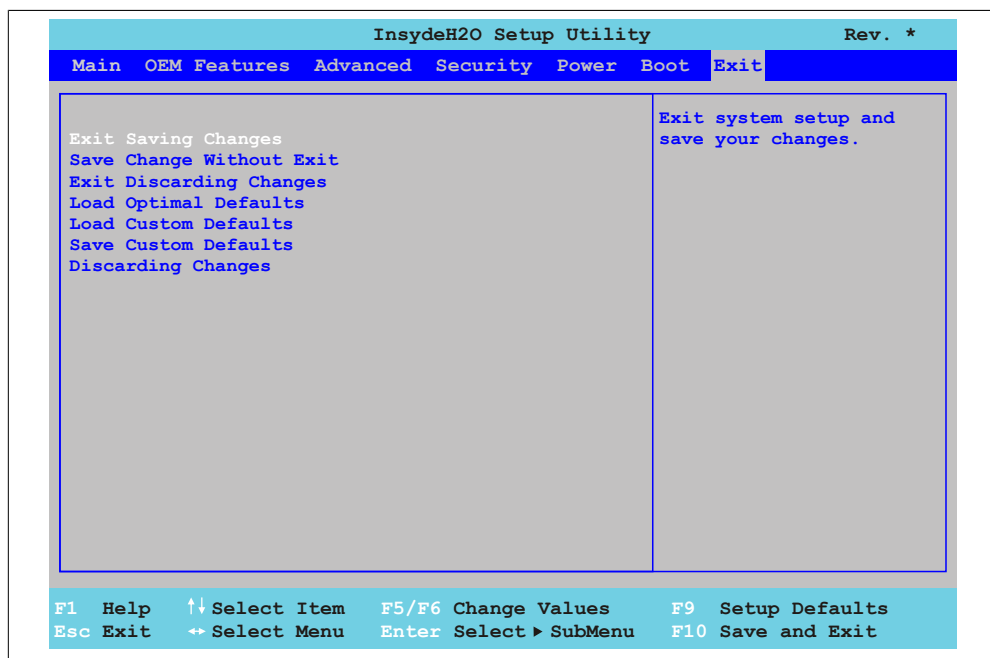
1.8.1.4 Others

InsydeH2O Setup Utility		Rev. *	
		Boot	
Others			
IBA GE Slot 0100 v1353			
F1 Help		↑↓ Select Item	F5/F6 Change Values
Esc Exit		↔ Select Menu	Enter Select ► SubMenu
		F9 Setup Defaults	F10 Save and Exit

BIOS setting	Meaning	Setting options	Effect
-	Displays the CPU Boards / Baseboards for PXE Boot with the onboard Ethernet interfaces.	None	-

Table 100: US15W Boot - Legacy - Others setting options

1.9 Exit



BIOS setting	Meaning	Setting options	Effect
Exit saving changes	BIOS setup is closed with this item. Changes made are saved in CMOS after confirmation, and the system is rebooted.	OK / Cancel	
Save Change Without Exit	After this is confirmed, any changes that have been made will be saved to the CMOS.	OK / Cancel	
Exit discarding changes	With this item you can close BIOS setup without saving the changes made. The system is then rebooted.	OK / Cancel	
Load Optimal Defaults	This item loads the CMOS default values, which are defined by the Mode / Node switch settings. These settings are loaded for all BIOS configurations.	OK / Cancel	
Load Custom Defaults	This item loads the CMOS values, which are defined by the Mode / Node switch settings. These settings are loaded for all BIOS configurations.	OK / Cancel	
Save Custom Defaults	This saves defined CMOS values. These settings are saved for all BIOS configurations.	OK / Cancel	
Discarding Changes	In the event that settings were made which the user can no longer remember, changes can be reset as long as they haven't been saved.	OK / Cancel	

Table 101: US15W Exit - Menu setting options

1.10 BIOS default settings

If the function "load setup defaults" is chosen in the main BIOS setup menu, or if exit is selected (or <F9> is pressed) in the individual setup screens, the following BIOS settings are the optimized values that will be used.

1.10.1 Main

Setting / View	Profile 0	My setting
InsydeH2O Version	-	
Processor type	-	
System Bus Speed	-	
System Memory Speed	-	
Cache RAM	-	
Total Memory	-	
SODIMM 0	-	
System Time	-	
System Date	-	

Table 102: US15W - Main profile setting overview

1.10.2 OEM Features

Setting / View	Profile 0	My setting
BIOS	-	
Boot Source	-	
MTCX	-	

Table 103: US15W - OEM Features profile setting overview

1.10.2.1 Baseboard Features

Setting / View	Profile 0	My setting
Device ID	-	
Compatibility ID	-	
Vendor ID	-	
Hardware revision	-	
Serial number	-	
Product name	-	
Hardware Number	-	
Parent Device ID	-	
Parent Compatib. ID	-	
LAN1 MAC ADDRESS	-	
LPC Devices		
COMA	-	
Base I/O Address	3F8	
Interrupt	IRQ4	
Statistical Values		
Sensor 1	-	
Sensor 2	-	
Sensor 3	-	

Table 104: US15W - Baseboard Features profile setting overview

Setting / View	Profile 0	My setting
Total Hours	-	
Power On Cycles	-	
Temperature Values		
Refresh Values	-	
Sensor 1	-	
Sensor 2	-	
Sensor 3	-	
Temperature Values		
Wcpu	-	
Vin	-	
Battery voltage	-	
Battery state	-	

Table 104: US15W - Baseboard Features profile setting overview

1.10.2.2 Display Features

Setting / View	Profile 0	My setting
Device ID	-	
Compatibility ID	-	
Vendor ID	-	
Hardware revision	-	
Serial number	-	
Product name	-	
Hardware Number	-	
Parent Device ID	-	
Parent Compatib. ID	-	
Brightness	Auto	
LPC Devices		
COMB	-	
Base I/O Address	2F8	
Interrupt	IRQ3	
Statistical Values		
Sensor 1	-	
Total Hours	-	
Power on cycles	-	
Temperature Values		
Refresh Values	-	
Sensor 1	-	

Table 105: US15W - Display Features profile setting overview

1.10.2.3 IF Module Features

Setting / View	Profile 0	My setting
Device ID	-	
Compatibility ID	-	
Vendor ID	-	
Hardware revision	-	
Serial number	-	

Table 106: US15W - IF Module Features profile setting overview

Setting / View	Profile 0	My setting
Product name	-	
Hardware Number	-	
Parent Device ID	-	
Parent Compatib. ID	-	
LAN2 MAC ADDRESS	-	
Statistical Values		
Total Hours	-	
Power on cycles	-	

Table 106: US15W - IF Module Features profile setting overview

1.10.2.4 RAM Features

Setting / View	Profile 0	My setting
Device ID	-	
Compatibility ID	-	
Vendor ID	-	
Hardware revision	-	
Serial number	-	
Product name	-	
Hardware Number	-	
Parent Device ID	-	
Parent Compatib. ID	-	

Table 107: US15W - RAM Features profile setting overview

1.10.3 Advanced

1.10.3.1 RAM Configuration

Setting / View	Profile 0	My setting
Refresh rate	Auto	

Table 108: US15W - RAM Configuration profile setting overview

1.10.3.2 Boot Configuration

Setting / View	Profile 0	My setting
NumLock	On	

Table 109: US15W - Boot Configuration profile setting overview

1.10.3.3 Peripheral Configuration

Setting / View	Profile 0	My setting
High Definition Audio	Auto	

Table 110: US15W - Peripheral Configuration profile setting overview

1.10.3.4 IDE Configuration

Setting / View	Profile 0	My setting
Channel 1 Master		
Transfer mode	-	
Security Mode	-	
Channel 1 Slave		
Transfer mode	-	
Security Mode	-	

Table 111: US15W - IDE Configuration profile setting overview

1.10.3.5 Video Configuration

Setting / View	Profile 0	My setting
IGD - Pre-allocated memory	UMA = 8MB	
IGD - Boot Type	VBIOS Default	
IGD - LCD Panel Type	640x480 (5.7) LVDS	

Table 112: US15W - Video Configuration profile setting overview

1.10.3.6 USB configuration

Setting / View	Profile 0	My setting
USB Legacy	Enabled	
EHCI 1	Enabled	
UHCI 1	Enabled	
UHCI 2	Enabled	
UHCI 3	Enabled	
USB client	Disabled	

Table 113: US15W - USB Configuration profile setting overview

1.10.3.7 SDIO Configuration

Setting / View	Profile 0	My setting
SDIO Port 1	Enabled	
SDIO Port 2	Enabled	

Table 114: US15W - SDIO Configuration profile setting overview

1.10.3.8 ACPI Table/Features Control

Setting / View	Profile 0	My setting
FACP - C2 Latency Value	Enabled	
FACP - C3 Latency Value	Enabled	
HPET - HPET support	Enabled	
FACP - RTC S4 Wakeup	Enabled	
APIC - I/O APIC mode	Enabled	

Table 115: US15W - ACPI Table/Features Control profile setting overview

1.10.3.9 PCI Express Root Port 1

Setting / View	Profile 0	My setting
PCI Express Root Port 1	Enabled	
Interrupt pin 0	Auto	
VC1 Enable	Disabled	
VC1/TC Mapping	Disabled	
ASPM	Disabled	
Automatic ASPM	Disabled	
ASPM L0s	Disabled	
ASPM L1s	Disabled	
URR	Disabled	
FER	Disabled	
NFER	Disabled	
CER	Disabled	
CT0	Disabled	
SEFE	Disabled	
SENF	Disabled	
SECE	Disabled	
PME Interrupt	Disabled	
PME SCI	Disabled	
Hot Plug SCI	Disabled	

Table 116: US15W - PCI Express Root Port 1 profile setting overview

1.10.3.10 PCI Express Root Port 2

Setting / View	Profile 0	My setting
PCI Express Root Port 2	Enabled	
Interrupt pin 1	Auto	
VC1 Enable	Disabled	
VC1/TC Mapping	Disabled	
ASPM	Disabled	
Automatic ASPM	Disabled	
ASPM L0s	Disabled	
ASPM L1s	Disabled	
URR	Disabled	
FER	Disabled	
NFER	Disabled	
CER	Disabled	
CT0	Disabled	
SEFE	Disabled	
SENF	Disabled	
SECE	Disabled	
PME Interrupt	Disabled	
PME SCI	Disabled	
Hot Plug SCI	Disabled	

Table 117: US15W - PCI Express Root Port 2 profile setting overview

1.10.4 Power

Setting / View	Profile 0	My setting
Power Loss Control	Remain Off	
ACPI S3	Enabled	

Table 118: US15W - Power profile setting overview

1.10.4.1 Advanced CPU Control

Setting / View	Profile 0	My setting
P-States(IST)	Enabled	
CMP Support	Enabled	
Thermal Mode	TM1 and TM2	
Use XD Capability	Enabled	
VT Support	Enabled	
SMRR Support	Enabled	
C-States	Disabled	
Enhanced C-States	Disabled	
C-States Pop Up Mode	Disabled	
C-States Pop Down Mode	Disabled	
Hard C4E	Disabled	
Enable C6	Disabled	
DTS	Enabled	
Thermal Trip Point Settings		
Throttle On Temperature	100°C	

Table 119: US15W - Advanced CPU Control profile setting overview

1.10.4.2 Platform Power Management

Setting / View	Profile 0	My setting
PCI Clock Run	Disabled	
_CST - C4 Latency Value	Disabled	
C4 on C3 - Deeper Sleep	Disabled	

Table 120: US15W - Platform Power Management profile setting overview

1.10.5 Boot

Setting / View	Profile 0	My setting
Quick Boot	Enabled	
Quiet Boot	Enabled	
Delay for Logo & Summary	Default	
USB Boot	Enabled	
SD Card Boot	Disabled	
PXE Boot to LAN	Disabled	
ACPI Selection	Acpi3.0	

Table 121: US15W - Boot profile setting overview

1.11 Distribution of resources

1.11.1 RAM address assignment

RAM address	Address in Hex	Resource
(TOM - FB ¹⁾) – TOM ²⁾	N.A.	ACPI reclaim, MPS and NVS area ³⁾
(TOM - FB - TSEG ⁴⁾) – (TOM - FB)	N.A.	VGA frame buffer ⁵⁾
1024 kB – (TOM - 8 MB - 192 kB)	100000h - N.A.	Extended memory
869 kB – 1024 kB	0E0000h - 0FFFFFh	Runtime BIOS
832 kB – 869 kB	0D0000h - 0DFFFFh	Upper memory
640 kB – 832 kB	0A0000h - 0CFFFFh	Video memory and BIOS
639 kB – 640 kB	09FC00h - 09FFFFh	Extended BIOS data
0 – 639 kB	000000h - 09FC00h	Conventional memory

Table 122: RAM address assignment

- 1) FB - VGA frame buffer
 2) TOM - Top of memory: max. installed DRAM
 3) Only if ACPI Aware OS is set to "YES" in the setup.
 4) TSEG - Intended internally for SMI handling in system BIOS.
 5) The VGA frame buffer can be reduced to 1 MB in the setup.

1.11.2 I/O address assignment

I/O address	Resource
0000h - 00FFh	Motherboard resources
01F0h - 01F7h	Primary IDE channel
03B0h - 03DFh	Video system
03F6h - 03F6h	Primary IDE channel command port
03F7h - 03F7h	Primary IDE channel status port
03F8h - 03FFh	COM1
0480h - 04BFh	Motherboard resources
04D0h - 04D1h	Motherboard resources
0800h - 087Fh	Motherboard resources
0CF8h - 0CFBh	PCI config address register
0CFCh - 0CFFh	PCI config data register
0D00h - FFFFh	PCI / PCI Express bus ¹⁾
4100h - 417Fh	MTCX
FF00h - FF07h	IDE bus master register

Table 123: I/O address assignment

- 1) The BIOS assigns the PCI and PCI Express Bus I/O resources from FFF0h downward. Devices that are not compatible with PnP/PCI/PCI Express cannot use the I/O resources in this area.

1.11.3 Interrupt assignmentone in PIC mode

IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	NMI	NONE
System timer	•																	
Keyboard		•																
IRQ cascade			•															
COM1 (Serial port A)				◦	•	◦	◦				◦	◦	◦					
COM2 (Serial port B)				•	◦	◦	◦				◦	◦	◦					
ACPI ¹⁾										•								

Table 124: IRQ interrupt assignments PIC Mode

IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	NMI	NONE
Real-time clock									•									
Coprocessor (FPU)														•				
Primary IDE channel															•			
Secondary IDE channel																•		

Table 124: IRQ interrupt assignments PIC Mode

1) Advanced Configuration and Power Interface.

- ... Standard setting
- ... Optional setting

1.11.4 Interrupt assignments in APIC mode

A total of 23 IRQs are available in the APIC mode (Advanced Programmable Interrupt Controller). The activation of this option is only effective if it takes place before the operating system is activated.

IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	NMI	NONE
System timer	•																									
Keyboard		•																								
IRQ cascade			•																							
COM1 (Serial port A)				○	•	○	○				○	○	○													
COM2 (Serial port B)				•	○	○	○				○	○	○													
ACPI ¹⁾									•																	
Real-time clock								•																		
Coprocessor (FPU)													•													
Primary IDE channel														•												
Secondary IDE channel															•											
PIRQ A ²⁾																	•									
PIRQ B ³⁾																		•								
PIRQ C ⁴⁾																			•							
PIRQ D ⁵⁾																				•						
PIRQ E ⁶⁾																					•					
PIRQ F ⁷⁾																						•				
PIRQ G ⁸⁾																							•			
PIRQ H ⁹⁾																								•		

Table 125: IRQ interrupt assignments in APIC mode

1) Advanced Configuration and Power Interface.

2) PIRQ A: for IF board; GMA500 graphics controller, LPC, root port 1, Ethernet controller, USB client

3) PIRQ B: for IF board; root port 2

4) PIRQ C: for IF board

5) PIRQ D: for IF board; HDA audio

6) PIRQ E: UHCI host controller 0, SDIO 0 controller

7) PIRQ F: UHCI host controller 1, SDIO 1 controller

8) PIRQ G: UHCI host controller 2, SDIO 2 controller

9) PIRQ H: EHCI host controller

- ... Standard setting
- ... Optional setting

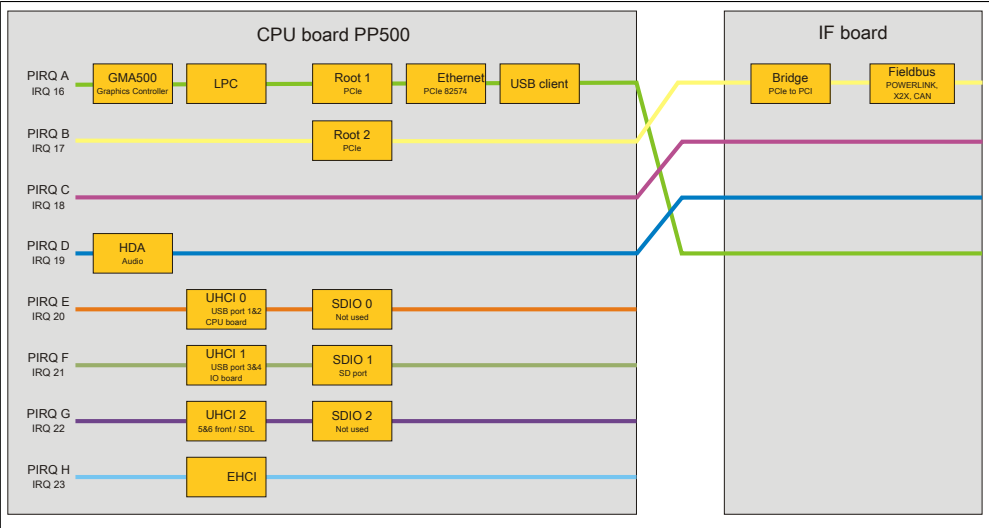


Image 38: Interrupt routing with activated APIC - BIOS version N0.15 and higher

2 Windows XP Professional

2.1 Order data

Model number	Short description	Figure
	Windows XP Professional	
5SWWXP.0600-ENG	Microsoft OEM Windows XP Professional Service Pack 3, CD, English. Only available with a B&R device.	
5SWWXP.0600-GER	Microsoft OEM Windows XP Professional Service Pack 3, CD, German. Only available with a device.	
5SWWXP.0600-MUL	Microsoft OEM Windows XP Professional Service Pack 3, CD, multilanguage. Only available with a B&R device.	
	Mandatory accessory	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.4096-03	CompactFlash 4 GB Western Digital	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-03	CompactFlash 8 GB Western Digital	
5CFCRD.8192-04	CompactFlash 8 GB B&R	

Table 126: 5SWWXP.0600-ENG, 5SWWXP.0600-GER, 5SWWXP.0600-MUL - Order data

2.2 Overview

Model number	Type	Target system	CPU board	Pre-installed	Memory required on CF/HDD	Minimum amount of RAM
5SWWXP.0600-ENG	WinXP Pro SP3 CD	APC620 APC810 APC820 PPC700 PPC725 PPC800 PP500		Optional	≤ 2.1 GB	128 MB
5SWWXP.0600-GER	WinXP Pro SP3 CD	APC620 APC810 APC820 PPC700 PPC725 PPC800 PP500		Optional	≤ 2.1 GB	128 MB
5SWWXP.0600-MUL	WinXP Pro SP3 CD	APC620 APC810 APC820 PPC700 PPC725 PPC800 PP500		Optional	≤ 2.1 GB	128 MB

2.3 Installation

Upon request, B&R can pre-install the required Windows XP Professional version on the desired mass memory (e.g. CompactFlash card, etc.). All of the drivers required for operation (graphics, network, etc.) are also installed when doing so.

2.4 Drivers

The latest drivers for all released operating systems can be found in the download area (Service - Material Related Downloads - BIOS / Drivers / Updates) on the B&R homepage www.br-automation.com .

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

3 Windows 7

3.1 General Information

Windows® 7 offers a wealth of innovative features and performance improvements. Faster switching to power saving mode, quicker restores, less memory usage, and high-speed detection of USB devices are just a few of the advantages provided by Windows® 7. Both German and English are available in Windows® 7 Professional, while Windows® 7 Ultimate supports up to 35 different languages. Product activation is not necessary on B&R PCs, which is a huge advantage for simple logistical procedures relating to machine automation.

All of the Windows® operating systems offered by B&R are from the Microsoft Embedded division. This guarantees much longer availability, especially when compared to products offered on the consumer market.

3.2 Order data

Model number	Short description	Figure
	Windows 7	 Windows 7
5SWWI7.0100-ENG	Microsoft OEM Windows 7 Professional 32-bit, DVD, English. Only available with a new device.	
5SWWI7.0100-GER	Microsoft OEM Windows 7 Professional 32-bit, DVD, German. Only available with a new device.	
5SWWI7.0300-MUL	Microsoft OEM Windows 7 Ultimate 32-bit, DVD, multilanguage. Only available with a new device.	

Table 127: 5SWWI7.0100-ENG, 5SWWI7.0100-GER, 5SWWI7.0300-MUL - Order data

3.3 Overview

Model number	Type	Edition	Target system	Chipset	Pre-installed	Minimum size of CF/HDD	Minimum size of RAM
5SWWI7.0100-ENG	Win7 Pro 32bit DVD	Professional	PPC800 APC810 PP500	945GME GM45 US15W	Optional	16 GB	1 GB
5SWWI7.0100-GER	Win7 Pro 32bit DVD	Professional	PPC800 APC810 PP500	945GME GM45 US15W	Optional	16 GB	1 GB
5SWWI7.0300-MUL	Win7 Ult 32bit DVD	Ultimate	PPC800 APC810 PP500	945GME GM45 US15W	Optional	16 GB	1 GB

3.4 Installation

Upon request, B&R can pre-install the required Windows 7 version on the desired mass memory (e.g. CompactFlash card, etc.). All of the drivers required for operation (graphics, network, etc.) are also installed when doing so.

3.5 Drivers

The latest drivers for all released operating systems can be found in the download area (Service - Material Related Downloads - BIOS / Drivers / Updates) on the B&R homepage www.br-automation.com .

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

3.6 Special considerations, limitations

- Windows 7 does not contain a Beep.sys file, which means that audible signal is no longer played (i.e. when touching a key or button).

4 Windows Embedded Standard 2009

4.1 General information

Windows® Embedded Standard 2009 is the modular version of Windows® XP Professional. It's used if XP applications require a smaller operating system size to run. Together with CompactFlash memory, Windows® Embedded Standard 2009 makes it possible to use the Microsoft desktop operating system in rough environmental conditions. In addition to the familiar features included in Windows® XP Professional, Windows® Embedded Standard 2009 has been improved with regard to dependability by adding a write filter for individual memory partitions. By protecting individual partitions such as the boot partition, the PC system can be started without any problems, even after an unexpected power failure. B&R offers complete images for industrial PCs, Power Panel and Mobile Panel devices to make the transition to Windows® Embedded Standard 2009 as easy as possible. In addition to Windows® Embedded Standard 2009, the standard Windows® XP Professional operating system is also available in English, German and multilanguage.

Windows® Embedded Standard 2009 is based on the same binary files as Windows® XP Professional with Service Pack 3 and is optimally tailored to the hardware being used. In other words, only the functions and modules required by the respective device are included. Windows® Embedded Standard 2009 is also based on the same reliable code as Windows® XP Professional with SP3. It provides industry with leading reliability, improvements in security and performance, and the latest technology for Web browsing and extensive device support.

4.2 Order data

Model number	Short description	Figure
	Windows Embedded Standard 2009	 Windows Embedded Standard 2009
5SWWXP.0736-ENG	Microsoft OEM Windows Embedded Standard 2009, English; for PP500; please order CompactFlash separately (minimum 1 GB).	
	Mandatory accessory	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.1024-03	CompactFlash 1 GB Western Digital	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-03	CompactFlash 2 GB Western Digital	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-03	CompactFlash 4 GB Western Digital	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-03	CompactFlash 8 GB Western Digital	
5CFCRD.8192-04	CompactFlash 8 GB B&R	

Table 128: 5SWWXP.0736-ENG - Order data

4.3 Overview

Materialnummer	Type	Zielsystem	Chipsatz	Sprache	Vorinstalliert	Mindestgröße CF/HDD	Mindestgröße Arbeitsspeicher
5SWWXP.0736-ENG	WES2009 PP500 US15W						

4.4 Features with WES2009 (Windows Embedded Standard 2009)

The feature list shows the most important device functions in Windows Embedded Standard 2009.

Function	Present
Enhanced write filter (EWF)	✓
File Based Write Filter (FBWF)	✓
Page file	Configurable
Administrator account	✓
User account	Configurable
Explorer shell	✓
Registry filter	✓
Internet Explorer 7.0	✓
Internet information service (IIS)	-
Terminal service	✓
Windows Firewall	✓
MSN-Explorer	-
Outlook Express	-
Administrative Tools	✓
Remote Desktop	✓
Remote Assistance	-
.NET Framework	-
ASP.NET	-
Local Network Bridge	✓
Codepages/User Locale/Keyboard	✓
Disk Management Service	✓
Windows Installer Service	✓
Class Installer	✓
CoDevice Installer	✓
Media Player 6.4	✓
DirectX 9.0c	✓
Accessories	✓
Number of fonts	89

Table 129: Device functions in Windows Embedded Standard 2009

4.5 Installation

Upon request, Windows Embedded Standard 2009 can be preinstalled at B&R Austria on a suitable CompactFlash card (min. 1GB). The system is then automatically configured after it has been switched on for the first time. This procedure takes approximately 30 minutes, and the device will be rebooted a number of times.

4.6 Drivers

All drivers required for operation are preinstalled on the operating system. If an older driver version is installed, the latest version can be downloaded from the B&R homepage (www.br-automation.com) and installed. A potentially activated "Enhanced Write Filter (EWF)" must be taken into consideration.

4.6.1 Touch screen drivers

The touch screen driver must be manually installed in order to operate Automation Panel 800 or Automation Panel 900 touch screen devices. The driver can be downloaded from the download area on the B&R homepage (www.br-automation.com). A potentially activated "Enhanced Write Filter (EWF)" must be taken into consideration.

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

5 Windows Embedded Standard 7

5.1 General Information

The successor to Windows® XP Embedded has been given the name Windows® Embedded Standard 7. As with previous versions, this embedded operating system offers full system support of Automation PC 810, Panel PC 800 and Power Panel 500 devices. In addition to brand new features that are also included in Windows® 7 Professional, Windows® Embedded Standard 7 includes components such as Enhanced Write Filter, File-Based Write Filter, Registry Filter and USB Boot. Windows® Embedded Standard 7 is available in two different versions. The main difference between them has to do with multilanguage support. Windows® Embedded Standard 7 is only available in a single language, whereas Windows® Embedded Standard 7 Premium supports the installation of several languages simultaneously.

With Windows® Embedded Standard 7, Microsoft has also made substantial improvements in the area of security. The AppLocker program, available in the premium version, can prevent the execution of unknown or potentially unwanted applications that should be installed over a network or from drives that are directly connected. A tiered approach allows the differentiation between scripts (.ps1, .bat, .cmd, .vbs and .js), installer files (.msi, .msp) and libraries (.dll, .ocx). AppLocker can also be configured to record undesired activity and display it in the Event Viewer. Windows® Embedded Standard 7 is available in both 32-bit and 64-bit versions, which ensures that even the most demanding applications have the level of support they need.

5.2 Order data

Model number	Short description	Figure
	Windows Embedded Standard 7	 Windows Embedded Standard 7
5SWWI7.0536-ENG	Microsoft OEM Windows Embedded Standard 7 32-bit, English; for PP500; please order CompactFlash separately (minimum 8 GB).	
5SWWI7.0736-MUL	Microsoft OEM Windows Embedded Standard 7 Premium 32-bit, multilanguage; for PP500; please order CompactFlash separately (minimum 8 GB).	
	Mandatory accessory	
	CompactFlash	
5CFCRD.016G-04	CompactFlash 16 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
	Optional accessory	
	Windows Embedded Standard 7	
5SWWI7.0900-MUL	WES7P 32bit Language Pack DVD	

Table 130: 5SWWI7.0536-ENG, 5SWWI7.0736-MUL - Order data

5.3 Overview

Materialnummer	Edition	Zielsystem	Chipsatz	Architektur	Sprache	Vorinstalliert	Mindestgröße CF/HDD	Mindestgröße Arbeitsspeicher
5SWWI7.0536-ENG								
5SWWI7.0736-MUL								

5.4 Features with WES7 (Windows Embedded Standard 7)

The feature list displays the essential device functions and differences in Windows Embedded Standard 7 and Windows Embedded Standard 7 Premium.

Function	Windows Embedded Standard 7	Windows Embedded Standard 7 Premium
Enhanced write filter (EWF)	✓	✓
File Based Write Filter (FBWF)	✓	✓
Administrator account	✓	✓
User account	Configurable	Configurable
Windows Explorer Shell	✓	✓
Registry filter	✓	✓
Internet Explorer 8.0	✓	✓
Internet Information Service (IIS) 7.0	✓	✓
AntiMalware (Windows Defender)	-	✓
Add-ons (Snipping tool, Sticky Notes)	-	✓
Windows Firewall	✓	✓
.NET Framework 3.5	✓	✓
Remote Desktop Protocol 7.0	✓	✓
File Compression Utility	✓	✓
Windows Installer Service	✓	✓
Windows XP Mode	-	-
Media Player 12	✓	✓
DirectX	✓	✓
Multilingual User Interface Packs in the same image	-	✓
International Components and Language Services	✓	✓
Language Pack Setup	✓	✓
Windows Update	Configurable	Configurable
Windows PowerShell 2.0	✓	✓
BitLocker	-	✓
AppLocker	-	✓
Tablet PC Support	-	✓
Windows Touch	-	✓
Boot from USB Stick	✓	✓
Accessories	✓	✓
Page file	Configurable	Configurable
Number of fonts	134	134

Table 131: Device functions in Windows Embedded Standard 7

5.5 Installation

Upon request, Windows Embedded Standard 7 can be preinstalled at B&R Austria on a suitable CompactFlash card (min. 8 GB). The system is then automatically configured after it has been switched on for the first time. This procedure takes approximately 30 minutes, and the device will be rebooted a number of times.

5.6 Drivers

All drivers required for operation are preinstalled on the operating system. If an older driver version is installed, the latest version can be downloaded from the B&R homepage (www.br-automation.com) and installed. A potentially activated "Enhanced Write Filter (EWF)" must be taken into consideration.

5.6.1 Touch screen drivers

A touch screen driver will be automatically installed if a touch controller is detected during the Windows Embedded Standard 7 setup.

The touch screen driver must be installed manually if a touch controller was not detected during the Windows Embedded Standard 7 setup or if a an Automation Panel 800/900 has been connected after setup. The driver can be downloaded from the download area on the B&R homepage (www.br-automation.com). A potentially activated "Enhanced Write Filter (EWF)" must be taken into consideration.

Info:

Required drivers can only be downloaded from the B&R homepage, not from manufacturers' pages.

6 Automation Runtime

6.1 General Information

A integral component of Automation Studio is the real-time operating system. This real-time operating system makes up the software kernel which allows applications to run on a target system.

- Guaranteed highest possible performance for the hardware being used
- Runs on all B&R target systems
- Makes the application hardware-independent
- Applications can be easily ported between B&R target systems
- Cyclic runtime system guarantees deterministic behavior
- Multitasking according to deterministic runtime rules
- Configure priorities, time classes, and jitter tolerance
- Up to eight different time classes with any subprograms
- Guaranteed response to time violations and exceeding jitter tolerances
- Exception handling
- Configurable jitter tolerance in all task classes
- Supports all relevant programming language such as IEC 61131-3 and ANSI C
- Extensive function library conforming to IEC 61131-3 as well as the expanded Automation library
- Access to all networks and bus systems via function calls or the Automation Studio configuration

B&R Automation Runtime™ is fully embedded in the corresponding target system (this is the hardware where Automation Runtime™ is installed). It allows application programs to access I/O systems (e.g. via fieldbus) and other devices (interfaces, networks, etc.).

6.2 Order data

Model number	Short description	Figure
	Automation Runtime	
1A4600.10-5		
1A4601.06-5		
1A4601.06-T		

Table 132: 1A4600.10-5, 1A4601.06-5, 1A4601.06-T - Order data

6.3 Automation Runtime Windows (ARwin)

The system is supported by ARwin with an AS 3.0.90 / AR 4.00 upgrade.

Info:

Audio output is not supported when using ARwin.

6.4 Automation Runtime Embedded (AREmb)

The system is supported by AREmb with an AS 3.0.90 / AR 4.00 upgrade.

Info:

Audio output is not supported when using AREmb.

Chapter 5 • Accessories

1 Replacement CMOS batteries

1.1 0AC201.91 / 4A0006.00-000

1.2 General information

The lithium battery is needed for buffering the BIOS CMOS data and real-time clock (RTC).

The battery is subject to wear and must be replaced when the battery power ("Bad" status) is insufficient.

1.3 Order data

Model number	Short description	Figure
	Batteries	
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	

Table 133: 0AC201.91, 4A0006.00-000 - Order data

1.4 Technical data

Warning!

Replace battery with Renata, type CR2477N only. Use of another battery may present a risk of fire or explosion.

Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Info:

The following characteristics, features and limit values only apply to this accessory and can deviate those specified for the entire device. For the entire device where this accessory is installed, refer to the data provided specifically for the entire device.

Product ID	0AC201.91	4A0006.00-000
General information		
Storage time	Max. 3 years at 30°C	
Electrical properties		
Capacity	950 mAh	
Self discharging	< 1% per year (at 23°C)	
Voltage range	3V	
Environmental conditions		
Temperature		
Storage	-20 to 60°C	
Relative humidity		
Operation	0 to 95%	
Storage	0 to 95%	
Transport	0 to 95%	

Table 134: 0AC201.91, 4A0006.00-000 - Technical data

2 Supply voltage connectors

2.1 0TB103.9x

2.1.1 General information

The single row 3-pin terminal block TB103 is used to connect the supply voltage.

2.1.2 Order data

Model number	Short description	Figure
	Terminal Blocks	
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	

Table 135: 0TB103.9, 0TB103.91 - Order data

2.1.3 Technical data

Product ID	0TB103.9		0TB103.91	
Terminal block				
Note	Protected against vibration by the screw flange Rated values according to UL			
Number of pins	3 (female)			
Type of terminal	Screw clamps		Cage clamps	
Cable type	Copper wires only (no aluminum wires!)			
Distance between contacts	5.08 mm			
Connection cross section				
AWG wire	26 to 12 AWG			
Wire tip sleeves with plastic covering	0.20 to 1.50 mm²			
Solid wire line	0.20 to 2.50 mm²			
Fine wire line	0.20 to 1.50 mm²		0.20 to 2.50 mm²	
With wire tip sleeves	0.20 to 1.50 mm²			
Electrical properties				
Rated voltage	300 V			
Rated current ¹⁾	10 A / contact			
Contact resistance	≤ 5 mΩ			

Table 136: 0TB103.9, 0TB103.91 - Technical data

1) Please take the respective limit data for the I/O modules into consideration!

3 CompactFlash cards

3.1 General information

CompactFlash cards are easy-to-exchange storage media. Due to their robustness against environmental influences (e.g. temperature, shock, vibration, etc.), CompactFlash cards are ideal for use as storage media in industrial environments.

3.2 Basics

In order to be suited for use in industrial automation, CompactFlash cards must be highly reliable. To make this possible, the following is very important

- Flash technology used
- Efficient algorithm for maximizing the lifespan
- Good mechanisms for detecting and fixing errors in the Flash memory

3.2.1 Flash technology

Currently, CompactFlash cards are available with MLC (Multi Level Cell) and SLC (Single Level Cell) flash blocks.

SLC flash memory has a lifespan that is 10 times longer than MLC, which is why only CompactFlash cards with SLC flash blocks are suited for industrial applications.

3.2.2 Wear leveling

Wear leveling is an algorithm that can be used to maximize the lifespan of a CompactFlash card. There are three different algorithms:

- No Wear Leveling
- Dynamic Wear Leveling
- Static Wear Leveling

The basic idea behind wear leveling is to distribute data over a broad area of blocks or cells on the data carrier so that the same areas don't have to be cleared and reprogrammed over and over again.

3.2.2.1 No Wear Leveling

The earliest CompactFlash cards didn't have an algorithm for maximizing the lifespan. The lifespan of a CompactFlash card was determined only by the guaranteed lifespan of the flash blocks.

3.2.2.2 Dynamic Wear Leveling

Dynamic wear leveling makes it possible to utilize unused flash blocks when writing to a file.

If the data carrier is 80% full with files, then only 20% can be used for wear leveling. The lifespan of the CompactFlash card is therefore dependent on the amount of unused flash blocks.

3.2.2.3 Static wear leveling

Static wear leveling also monitors which data is rarely changed. From time to time, the controller then moves this data to blocks that have already been frequently programmed in order to prevent further wear on those cells.

3.2.3 ECC error correction

Bit errors can be caused by inactivity or when a certain cell is operated. Error Correction Coding (ECC) implemented via hardware or software can detect and correct many errors of this type.

3.2.4 Maximum reliability

CompactFlash cards used by B&R use SLC flash blocks and static wear leveling together with a powerful ECC algorithm to provide maximum reliability.

3.3 5CFCRD.xxxx-04

3.3.1 General information

Info:

B&R CompactFlash cards 5CFCRD.xxxx-04 and CompactFlash cards from a different manufacturer cannot be used in the same system at the same time. Due to differences in technology (older vs. newer technologies), problems can occur during system startup that are caused by the different boot times.

see "Known problems / issues", on page 215

Info:

The 5CFCRD.xxxx-04 CompactFlash cards are supported on B&R devices with WinCE version ≥ 6.0 or higher.

3.3.2 Order data

Model number	Short description	Figure
	CompactFlash	
5CFCRD.0512-04	CompactFlash 512 MB B&R	
5CFCRD.1024-04	CompactFlash 1 GB B&R	
5CFCRD.2048-04	CompactFlash 2 GB B&R	
5CFCRD.4096-04	CompactFlash 4 GB B&R	
5CFCRD.8192-04	CompactFlash 8 GB B&R	
5CFCRD.016G-04	CompactFlash 16 GB B&R	

Table 137: 5CFCRD.0512-04, 5CFCRD.1024-04, 5CFCRD.2048-04, 5CFCRD.4096-04, 5CFCRD.8192-04, 5CFCRD.016G-04 - Order data

3.3.3 Technical data

Caution!

A sudden loss of power can cause data to be lost! In very rare cases, the mass memory may also become damaged.

To prevent damage and loss of data, it is recommended to use a UPS device.

Info:

The following characteristics, features and limit values only apply to this accessory and can deviate those specified for the entire device. For the entire device where this accessory is installed, refer to the data provided specifically for the entire device.

Product ID	5CFCRD.- 0512-04		5CFCRD.- 1024-04		5CFCRD.- 2048-04		5CFCRD.- 4096-04		5CFCRD.- 8192-04		5CFCRD.- 016G-04	
General information												
Data retention	10 years											
Data reliability	< 1 unrecoverable error in 10 ¹⁴ bit read accesses											
Lifetime monitoring	Yes											
MTBF	> 3,000,000 hours (at 25°C)											
Maintenance	None											
Supported operating modes	PIO mode 0-6, Multiword DMA mode 0-4, Ultra DMA mode 0-4											
Continuous reading												
Typical	35 MB/s (240X) ¹⁾				33 MB/s (220X) ¹⁾		27 MB/s (180X) ¹⁾		36 MB/s (240X) ¹⁾			
Maximum	37 MB/s (260X) ¹⁾				34 MB/s (226X) ¹⁾		28 MB/s (186X) ¹⁾		37 MB/s (247X) ¹⁾			
Continuous writing												
Typical	17 MB/s (110X)				16 MB/s (106X)		15 MB/s (100X)		18 MB/s (120X)			
Maximum	20 MB/s (133X)				18 MB/s (120X)		17 MB/s (110X)		19 MB/s (126X)			
Certification CE	Yes											
Endurance												
Guaranteed amount of data												
Guaranteed ²⁾	50 TB	100 TB	200 TB	400 TB	800 TB	1600 TB						
Results in 5 years ²⁾	27.40 GB/day	54.79 GB/day	109.9 GB/day	219.8 GB/day	438.6 GB/day	876.72 GB/day						
Clear/write cycles												
Typical ³⁾	2,000,000											
Guaranteed	100,000											
SLC-Flash	Yes											
Wear leveling	Static											
Error Correction Coding (ECC)	Yes											
Support												
Hardware	-											
Operating Systems												
Windows 7 32-bit	No										Yes	
Windows 7 64-bit	No										Yes	
Windows XP Professional	No	No		-		Yes						
Windows XP Embedded			Yes									
Windows Embedded Stand- ard 2009	No			Yes								
Windows CE 6.0	Yes											
Windows CE 5.0	No											
Software												
PVI Transfer Tool	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)										No	
B&R Embedded OS Installer	-										No	

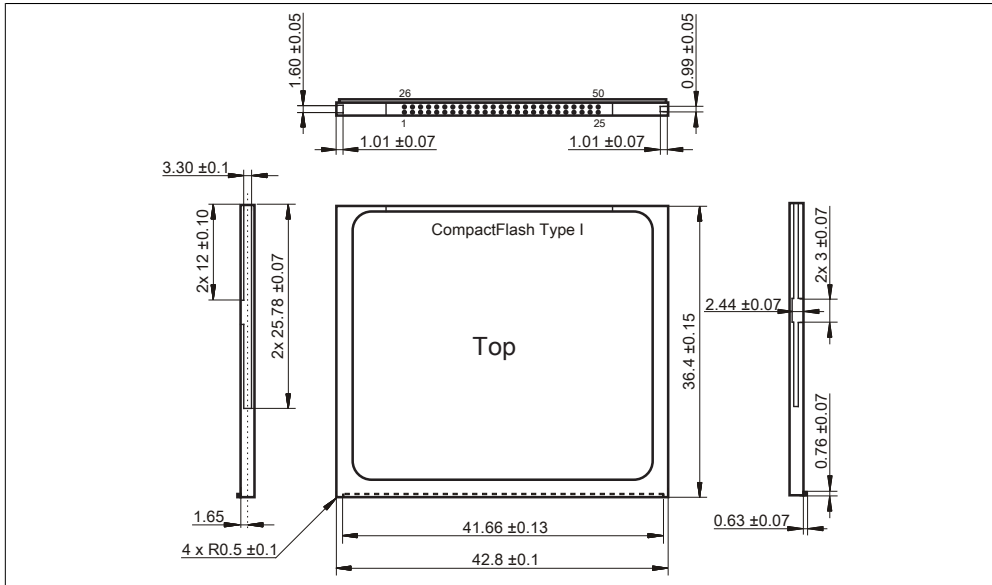
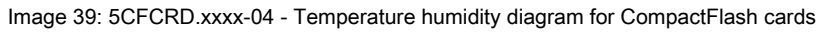
Table 138: 5CFCRD.0512-04, 5CFCRD.1024-04, 5CFCRD.2048-04, 5CFCRD.4096-04, 5CFCRD.8192-04, 5CFCRD.016G-04 - Technical data

Product ID	5CFCRD.- 0512-04	5CFCRD.- 1024-04	5CFCRD.- 2048-04	5CFCRD.- 4096-04	5CFCRD.- 8192-04	5CFCRD.- 016G-04
Environmental conditions						
Temperature						
Operation	0 to 70°C					
Storage	-65 to 150°C					
Transport	-65 to 150°C					
Relative humidity						
Operation	Max. 85% at 85°C					
Storage	Max. 85% at 85°C					
Transport	Max. 85% at 85°C					
Vibration						
Operation	20 g peak, 20 to 2000 Hz, 4 in each direction (JEDEC JESD22, method B103) 5.35 g RMS, 15 min per level (IEC 68-2-6)					
Storage	20 g peak, 20 to 2000 Hz, 4 in each direction (JEDEC JESD22, method B103) 5.35 g RMS, 15 min per level (IEC 68-2-6)					
Transport	20 g peak, 20 to 2000 Hz, 4 in each direction (JEDEC JESD22, method B103) 5.35 g RMS, 15 min per level (IEC 68-2-6)					
Shock						
Operation	1.5 kg peak, 0-5 ms 5x (JEDEC JESD22, B110 method) 30 g, 11 ms 1x (IEC 68-2-27)					
Storage	1.5 kg peak, 0-5 ms 5x (JEDEC JESD22, B110 method) 30 g, 11 ms 1x (IEC 68-2-27)					
Transport	1.5 kg peak, 0-5 ms 5x (JEDEC JESD22, B110 method) 30 g, 11 ms 1x (IEC 68-2-27)					
Altitude						
Operation	Max. 4.572 m					
Mechanical characteristics						
Dimensions						
Width	42.8 ± 0.10 mm					
Length	36.4 ± 0.15 mm					
Height	3.3 ± 0.10 mm					
Weight	10 g					

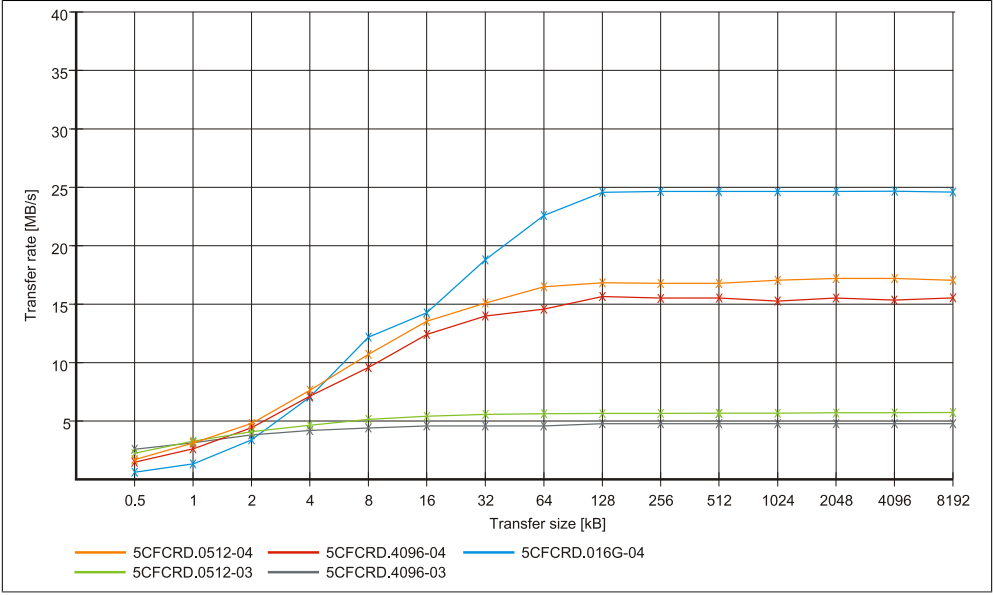
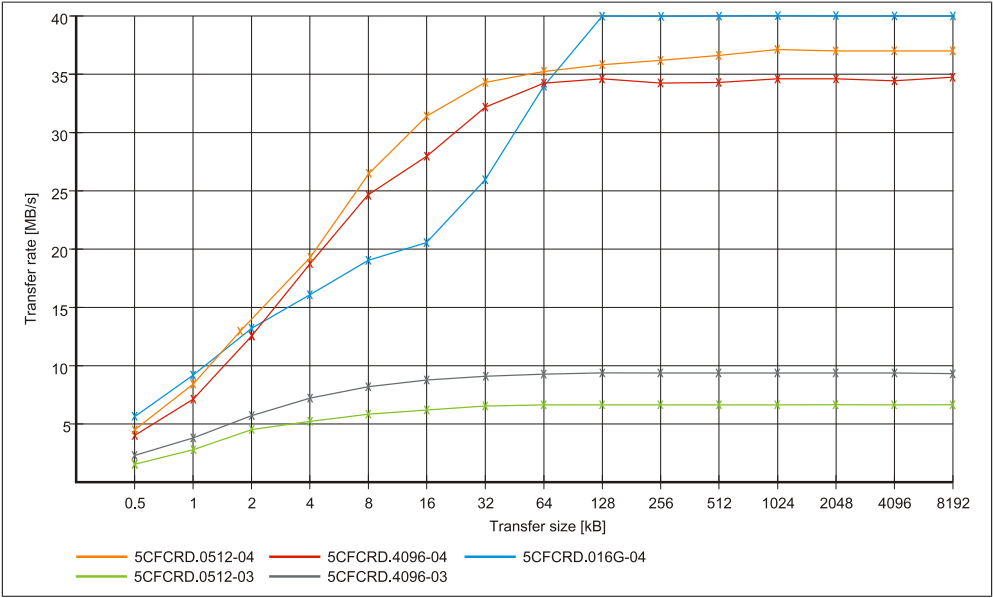
Table 138: 5CFCRD.0512-04, 5CFCRD.1024-04, 5CFCRD.2048-04,
5CFCRD.4096-04, 5CFCRD.8192-04, 5CFCRD.016G-04 - Technical data

- 1) Speed specification with 1X = 150 kB/s. All specifications refer to the Samsung Flash chips, CompactFlash cards in UDMA mode 4, 30 ns cycle time in True-IDE mode with sequential write/read test.
- 2) Endurance of B&R CFs (with linear written block size ≥ 128 kB)
- 3) Depending on the average file size.

3.3.5 Dimensions



3.3.6 Benchmark



3.4 5CFCRD.xxxx-03

3.4.1 General information

Info:

Western Digital CompactFlash cards 5CFCRD.xxxx-03 and CompactFlash cards from a different manufacturer cannot be used in the same system at the same time. Due to differences in technology (older vs. newer technologies), problems can occur during system startup that are caused by the different boot times.

see "Known problems / issues", on page 215

Info:

On Windows CE 5.0 devices, 5CFCRD.xxxx-03 CompactFlash cards up to 1GB are supported.

Info:

On CompactFlash cards 5CFCRD.xxxx-03, only the sticker and the description have changed. The technical data has not been changed.

3.4.2 Order data

Model number	Short description	Figure
	CompactFlash	
5CFCRD.0064-03	CompactFlash 64 MB Western Digital	
5CFCRD.0128-03	CompactFlash 128 MB Western Digital	
5CFCRD.0256-03	CompactFlash 256 MB Western Digital	
5CFCRD.0512-03	CompactFlash 512 MB Western Digital	
5CFCRD.1024-03	CompactFlash 1 GB Western Digital	
5CFCRD.2048-03	CompactFlash 2 GB Western Digital	
5CFCRD.4096-03	CompactFlash 4 GB Western Digital	
5CFCRD.8192-03	CompactFlash 8 GB Western Digital	

Table 139: 5CFCRD.0064-03, 5CFCRD.0128-03, 5CFCRD.0256-03, 5CFCRD.0512-03, 5CFCRD.1024-03, 5CFCRD.2048-03, 5CFCRD.4096-03, 5CFCRD.8192-03 - Order data

3.4.3 Technical data

Caution!

A sudden loss of power can cause data to be lost! In very rare cases, the mass memory may also become damaged.

To prevent damage and loss of data, B&R recommends that you use a UPS device.

Info:

The following characteristics, features and limit values only apply to this accessory and can deviate those specified for the entire device. For the entire device where this accessory is installed, refer to the data provided specifically for the entire device.

Product ID	5CFCRD.- 0064-03	5CFCRD.- 0128-03	5CFCRD.- 0256-03	5CFCRD.- 0512-03	5CFCRD.- 1024-03	5CFCRD.- 2048-03	5CFCRD.- 4096-03	5CFCRD.- 8192-03
General information								
Data retention	10 years							
Data reliability	< 1 unrecoverable error in 10 ¹⁴ bit read accesses							
Lifetime monitoring	Yes							
MTBF	> 4,000,000 hours (at 25°C)							
Maintenance	None							
Supported operating modes	PIO mode 0-4, Multiword DMA mode 0-2							
Continuous reading Typical	8 MB/s							
Continuous writing Typical	6 MB/s							
Certification CE	Yes							
Endurance								
Clear/write cycles Typical	> 2.000.000							
SLC-Flash	Yes							
Wear leveling	Static							
Error Correction Coding (ECC)	Yes							
Support								
Hardware	-							
Operating Systems								
Windows 7 32-bit	No							
Windows 7 64-bit	No							
Windows XP Professional	No			No				Yes
Windows XP Embedded		No				Yes		
Windows Embedded Standard 2009			No				Yes	
Windows CE 6.0					Yes			
Windows CE 5.0			Yes				No	

Table 140: 5CFCRD.0064-03, 5CFCRD.0128-03, 5CFCRD.0256-03, 5CFCRD.0512-03, 5CFCRD.1024-03, 5CFCRD.2048-03, 5CFCRD.4096-03, 5CFCRD.8192-03 - Technical data

Product ID	5CFCRD.- 0064-03	5CFCRD.- 0128-03	5CFCRD.- 0256-03	5CFCRD.- 0512-03	5CFCRD.- 1024-03	5CFCRD.- 2048-03	5CFCRD.- 4096-03	5CFCRD.- 8192-03
Software								
PVI Transfer Tool	≥ V2.57 (part of PVI Development Setup ≥ V2.5.3.3005)							
B&R Embedded OS Installer	≥ V2.21							
Environmental conditions								
Temperature								
Operation	0 to 70°C							
Storage	-50 to 100°C							
Transport	-50 to 100°C							
Relative humidity								
Operation	8 to 95%, non-condensing							
Storage	8 to 95%, non-condensing							
Transport	8 to 95%, non-condensing							
Vibration								
Operation	Max. 16.3 g (159 m/s² 0-peak)							
Storage	Max. 30 g (294 m/s² 0-peak)							
Transport	Max. 30 g (294 m/s² 0-peak)							
Shock								
Operation	Max. 1000 g (9810 m/s² 0-peak)							
Storage	Max. 3000 g (29430 m/s² 0-peak)							
Transport	Max. 3000 g (29430 m/s² 0-peak)							
Altitude								
Operation	Max. 24.383 m							
Mechanical characteristics								
Dimensions								
Width	42.8 ± 0.10 mm							
Length	36.4 ± 0.15 mm							
Height	3.3 ± 0.10 mm							
Weight	11.4 g							

Table 140: 5CFCRD.0064-03, 5CFCRD.0128-03, 5CFCRD.0256-03, 5CFCRD.0512-03, 5CFCRD.1024-03, 5CFCRD.2048-03, 5CFCRD.4096-03, 5CFCRD.8192-03 - Technical data

3.4.4 Temperature humidity diagram

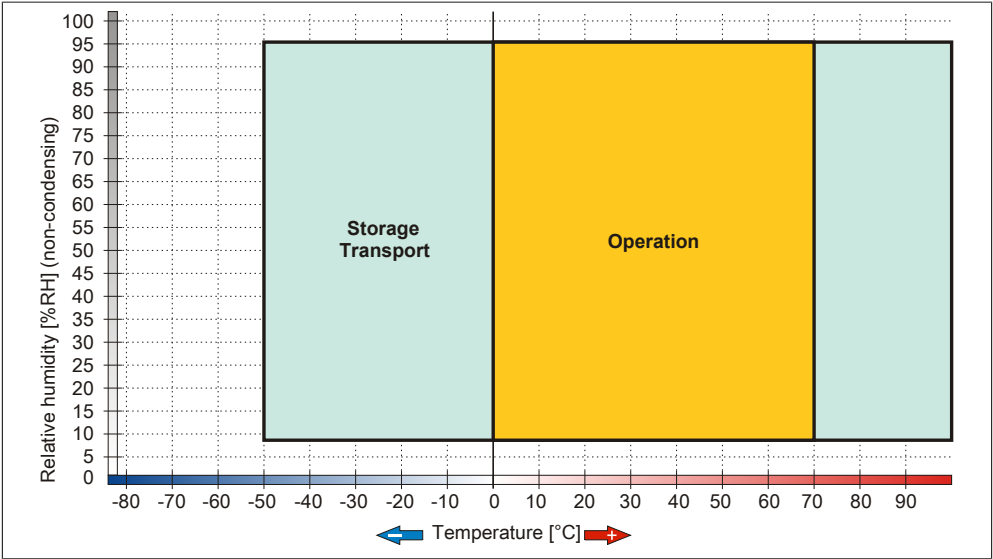
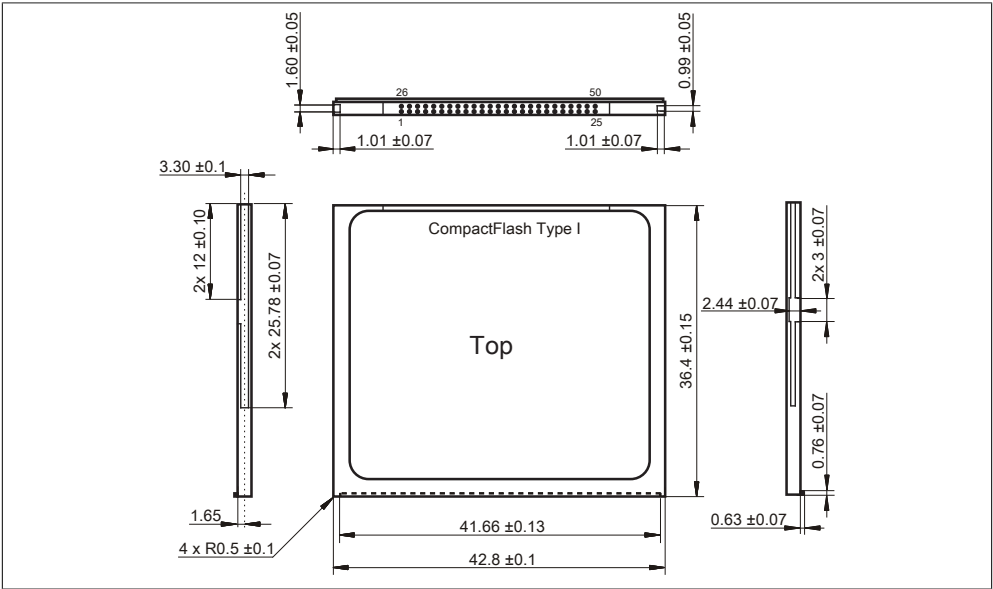


Image 40: 5CFCRD.xxxx-03 - Temperature humidity diagram for CompactFlash cards

3.4.5 Dimensions



3.5 Known problems / issues

The following issue for devices with two CompactFlash slots is known:

- Using two different types of CompactFlash cards can cause problems in Automation PCs and Panel PCs. This can result in one of the two cards not being detected during system startup. This is caused by varying startup speeds. CompactFlash cards with older technology require significantly more time during system startup than CompactFlash cards with newer technology. This behavior occurs near the limits of the time frame provided for startup. The problem described above can occur because the start-up time for the CompactFlash cards fluctuates due to the variance of the components being used. Depending on the CompactFlash cards being used, this error might never, sometimes or always occur.

4 USB flash drive

4.1 5MMUSB.2048-01

4.1.1 General information

USB flash drives are easy-to-exchange storage media. Because of the fast data transfer (USB 2.0), the USB flash drives are ideal for use as a portable memory medium. Without requiring additional drivers ("Hot Plug & Play" - except with Windows 98SE), the USB flash drive can immediately act as an additional drive where data can be read or written.

Info:

We reserve the right to supply alternative products due to the vast quantity of flash drives available on the market and their corresponding short product lifecycle. Therefore, the following measures might be necessary in order to boot from these flash drives:

- The flash drive must be reformatted or in some cases even re-partitioned (set active partition).
- The flash drive must be at the top of the BIOS boot order, or alternatively the IDE controllers can also be deactivated in the BIOS. This can be avoided in most cases if a "fdisk /mbr" command is also executed on the USB flash drive.
- USB 1.1, USB 2.0
- High transfer rate
- High data storage
- Ambient temperature during operation: 0 to 70°C

4.1.2 Order data

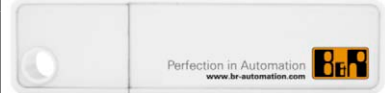
Model number	Short description	Figure
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive 2048 MB B&R	

Table 141: 5MMUSB.2048-01 - Order data

4.1.3 Technical data

Product ID	5MMUSB.2048-01
General information	
Data retention	> 10 years
LEDs	1 LED (green), signals data transfer (send and receive) ¹⁾
MTBF	> 3,000,000 hours
Type	USB 1.1 and 2.0 compatible
Maintenance	None
Interfaces	
USB	
Type	USB 1.1, USB 2.0
Connection	To each USB type A interface
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Sequential reading	Max. 31 MB/s
Sequential writing	Max. 30 MB/s
Support	
Operating systems	
Windows 2000	Yes
Windows ME	Yes
Windows XP Professional	Yes
Windows XP Embedded	Yes
Windows CE 4.2	Yes
Windows CE 5.0	Yes
Electrical characteristics	
Current requirements	Max. 500 µA sleep mode, max. 120 mA read/write
Environmental conditions	
Temperature	
Operation	0 to 70°C
Bearings	-50 to 100°C
Transport	-50 to 100°C
Relative humidity	
Operation	85%, non-condensing
Bearings	85%, non-condensing
Transport	85%, non-condensing
Vibration	
Operation	20 to 2000 Hz: 20 g (peak)
Bearings	20 to 2000 Hz: 20 g (peak)
Transport	20 to 2000 Hz: 20 g (peak)
Shock	
Operation	Max. 1500 g (peak)
Bearings	Max. 1500 g (peak)
Transport	Max. 1500 g (peak)
Altitude	
Operation	Max. 3048 m
Bearings	Max. 12192 m
Transport	Max. 12192 m
Mechanical characteristics	
Dimensions	
Width	17.97 mm
Length	67.85 mm
Height	8.35 mm

Table 142: 5MMUSB.2048-01 - Technical data

1) Signals data transfer (send and receive).

4.1.4 Temperature humidity diagram

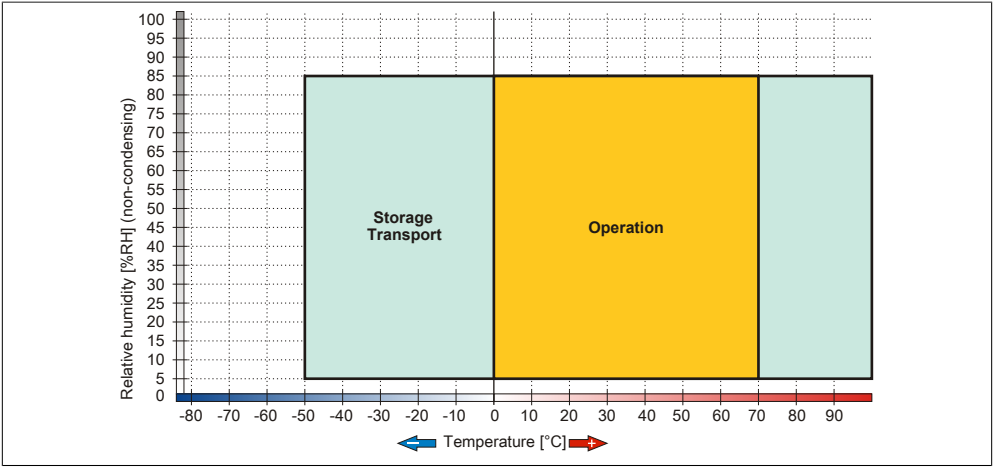


Image 41: 5MMUSB.2048-01 - Temperature humidity diagram

5 USB port cap

5.1 5AC900.1201-00

5.1.1 General information

Front side, flat USB port cap for Automation Panel 900, Power Panel 500 and Panel PC 700 and Panel PC 800 devices.

5.1.2 Order data

Model number	Short description	Figure
	Accessories	Image not found for 5AC900.1201-00!
5AC900.1201-00	USB Cover M20 IP65 flat	

Table 143: 5AC900.1201-00 - Order data

5.2 5AC900.1201-01

5.2.1 General information

Front side, rounded, knurled USB port cap (attached) for Automation Panel 900, Power Panel 500 and Panel PC 700 and Panel PC 800 devices.

5.2.2 Order data

Model number	Short description	Figure
	Accessories	Image not found for 5AC900.1201-01!
5AC900.1201-01	ESB Kappe M20 IP65 bombiert	

Table 144: 5AC900.1201-01 - Order data

6 Terminal block

6.1 5AC900.BLOC-00

6.1.1 General information

These replacement clips are used to fasten B&R panel devices.

6.1.2 Order data

Model number	Short description	Figure
	Accessories	
5AC900.BLOC-00	Mounting block with wings 10pcs Spare part.	

Table 145: 5AC900.BLOC-00 - Order data

6.2 5AC900.BLOC-01

6.2.1 General information

These replacement terminal blocks are used to fasten B&R panel devices.

6.2.2 Order data

Model number	Short description	Figure
	Accessories	
5AC900.BLOC-01	Spare mounting block w/o wings P 10pcs	

Table 146: 5AC900.BLOC-01 - Order data

7 Clip

7.1 5AC900.CLIP-01

7.1.1 General information

These replacement clips are used to fasten B&R panel devices.

7.1.2 Order data

Model number	Short description	Figure
	Accessories	
5AC900.CLIP-01	Spare Retaining clip plastic 10pcs	

Table 147: 5AC900.CLIP-01 - Order data

Chapter 6 • Maintenance / Servicing

The following chapter describes service/maintenance work which can be carried out by a trained, qualified user.

1 Cleaning

Danger!

The unit can only be cleaned when turned off in order to prevent unintentionally executing functions by actuating the touch screen or pressing keys.

A moist towel should be used to clean the device. When moistening the cloth, use only water with detergent, screen cleaning agent, or alcohol (ethanol). The cleaning agent should be applied to the cloth beforehand, not sprayed directly on the device! Never use aggressive solvents, chemicals, scouring agents, pressurized air or steam jet.

Info:

Displays with a touch screen should be cleaned at regular intervals.

2 Changing the battery

The lithium battery buffers the internal real-time clock (RTC) and the CMOS data.

Info:

- The product design allows the battery to be changed with the B&R device switched either on or off. In some countries, safety regulations do not allow batteries to be changed while the module is switched on.
- Any BIOS settings that have been made will remain when the battery is changed with the power turned off (stored in non-volatile EEPROM). The date and time must be reset later because this data is lost when the battery is changed.
- The battery should only be changed by qualified personnel.

Warning!

Replace battery with Renata, type CR2477N only. Use of another battery may present a risk of fire or explosion.

Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

The following replacement lithium batteries are available: 4A0006.00-000 (1 pc.) and 0AC201.91 (4 pcs.).

2.1 Battery status evaluation

The battery status is evaluated immediately following start-up of the device and is subsequently checked by the system every 24 hours. The battery is subjected to a brief load (1 second) during the measurement and then evaluated. The evaluated battery status is displayed in the BIOS Setup pages (under Advanced - Baseboard monitor) and in the B&R Control Center (ADI driver), but can also be read in a customer application via the ADI Library.

Battery status	Meaning
N/A	Hardware, i.e. firmware used is too old and does not support read.
GOOD	Data buffering is guaranteed.
BAD	Data buffering is guaranteed for approx. another 500 hours from the point in time that the battery capacity is determined to be BAD (insufficient).

Table 148: Meaning of battery status

From the point when battery capacity is recognized as insufficient, data buffering is guaranteed for approximately another 500 hours. When changing the battery, data is buffered for approximately another 10 minutes by a gold leaf capacitor.

2.2 Procedure

- Disconnect the B&R industrial PC.

- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Remove the cover from the battery compartment and carefully pull out the battery using the removal strips.

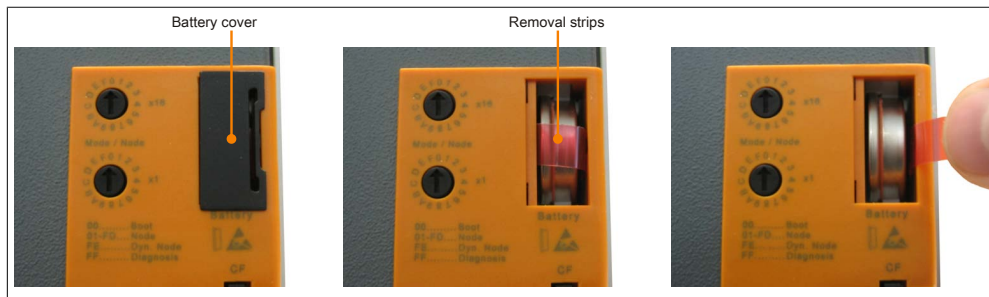


Image 42: Remove battery

- The battery should not be held by its edges. Insulated tweezers may also be used for inserting the battery.

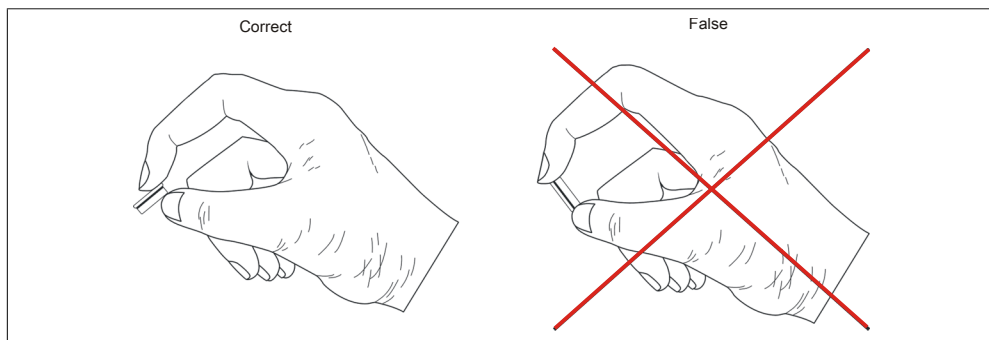


Image 43: Battery handling

- Insert the new battery with correct polarity.

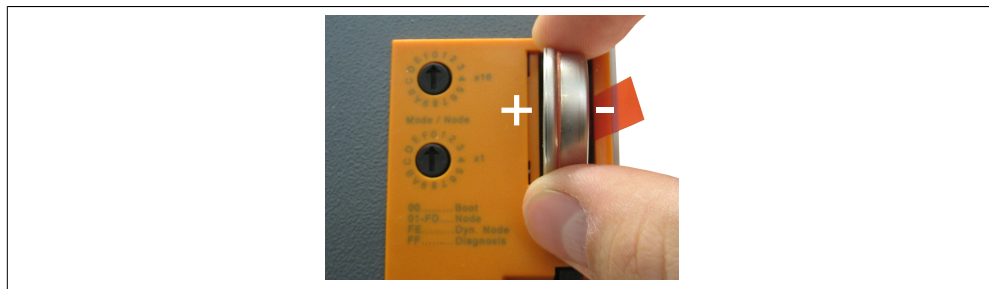


Image 44: Insert battery

- To make the next battery change easier, be sure the removal strip is in place when inserting battery.
- Reconnect power supply to the B&R industrial PC (plug in power cable and press power button).
- Date and time might need to be reset in BIOS.

Warning!

Lithium batteries are considered hazardous waste. Used batteries should be disposed of according to local requirements.

Appendix A

1 Maintenance Controller Extended (MTCX)

The MTCX controller (FPGA processor) is located on the CPU board in the PP500.

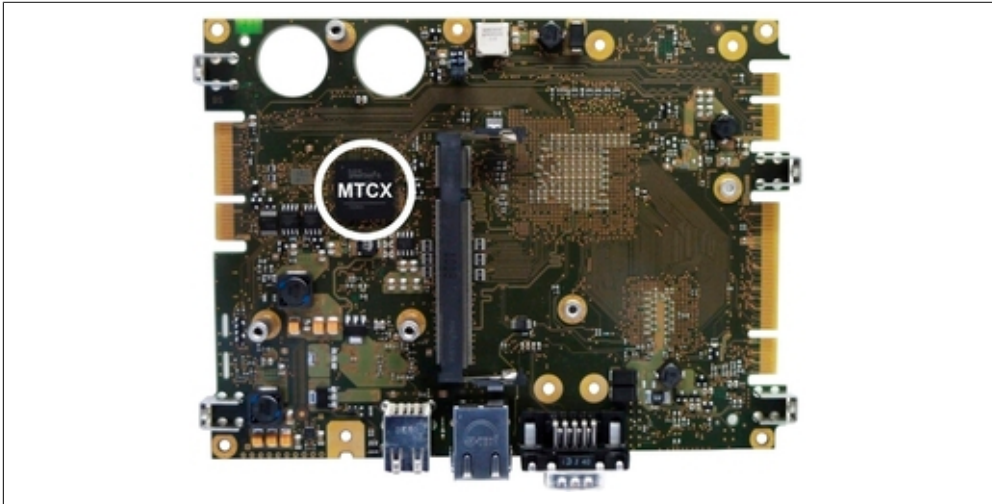


Image 45: MTCX controller location

The MTCX is responsible for the following monitoring and control functions:

- Power failure logic
- Watchdog handling (NMI and reset handling)
- Temperature monitoring (I/O area, power supply)
- Key and LED handling/coordination
- Advanced desktop operation (keys, USB forwarding)
- Daisy chain display operation (touch screen, USB forwarding)
- Panel locking mechanism (configurable using B&R Control Center - ADI driver)
- Backlight control for display
- Statistical data recording (power cycles - each power on, and power on are recorded - every full hour is counted e.g. 50 minutes no increase)
- SDL data transfer (display, matrix keyboard, touch screen, service data, USB)

- Status LEDs (Power, CF, Link, Run)

The functions of the MTCX can be expanded via Firmware¹⁾ upgrade. The version can be determined in the BIOS (menu item " OEM Features", on page 135) or in approved Microsoft operating systems using the B&R Control Center.

The MTCX controller (FPGA processor) is located on the CPU board in the PP500.

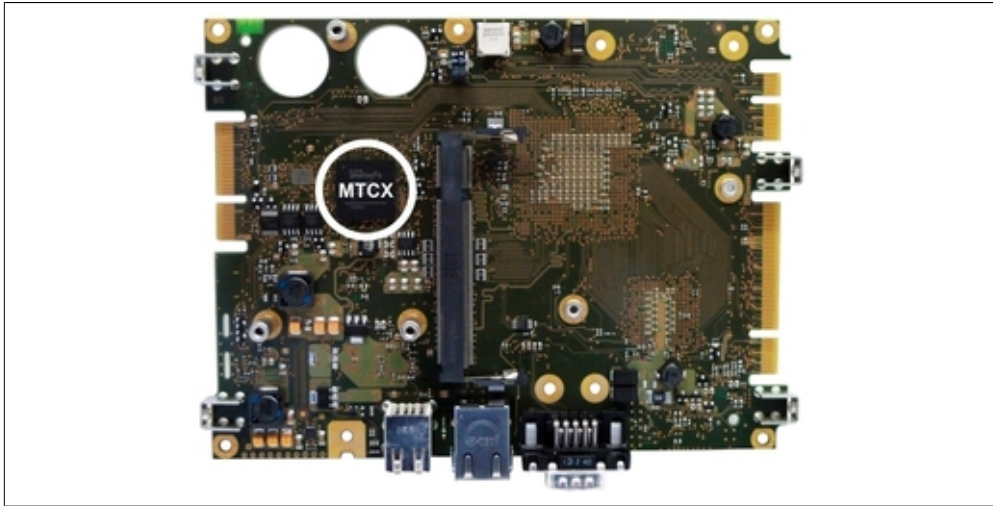


Image 46: MTCX controller location

The MTCX is responsible for the following monitoring and control functions:

- Power failure logic
- Watchdog handling (NMI and reset handling)
- Temperature monitoring (I/O area, power supply)
- Key and LED handling/coordination
- Advanced desktop operation (keys, USB forwarding)
- Backlight control for display
- Statistical data recording (power cycles - each power on, and power on are recorded - every full hour is counted e.g. 50 minutes no increase)
- Status LEDs (Power, CF, Link, Run)

The functions of the MTCX can be expanded via Firmware¹⁾ upgrade. The version can be determined in the BIOS (menu item " OEM Features", on page 135) or in approved Microsoft operating systems using the B&R Control Center.

¹⁾ Can be downloaded from the download area on the B&R homepage (www.br-automation.com).

¹⁾ Can be downloaded from the download area on the B&R homepage (www.br-automation.com).

2 Touch Screen AMT 5-wire

2.1 Technical data

Info:

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

Product ID	Touch Screen AMT 5-wire
General Information	
Certification	
CE	Yes
c-UL-us	Yes
Manufacturer	AMT
Release pressure	< 1 N
Light permeability	81 ±3%
Environmental conditions	
Temperature	
Operation	- 20 to 70°C
Storage	- 40 to 80°C
Transport	- 40 to 80°C
Relative humidity	
Operation	90% at max. 50°C
Storage	90% RH at max. 60°C for 504 hours
Transport	90% RH at max. 60°C for 504 hours
Operating conditions	
Service life	36 million touch operations on the same point (release pressure: 250 g, interval: 2x per second)
Chemical resistance ¹⁾	Acetone, methylene chloride, methyl ethyl ketone, isopropyl alcohol, hexane, turpentine, mineral spirits, unleaded gasoline, diesel, motor oil, gear lubricating oil, antifreeze, ammonia-based glass cleaner, chemical cleaning agents, household cleaning agents, vinegar, coffee, tea, lubricant, cooking oil, salt
Activation	Finger, pointer, credit card, glove
Drivers	Touch screen drivers can be downloaded from the download area on the B&R homepage (www.br-automation.com).

Table 149: Technical data - Touch Screen AMT 5-wire

1) The active area of the touch screen is resistant to these chemicals for a timeframe of one hour at 25°C.

2.2 Temperature humidity diagram

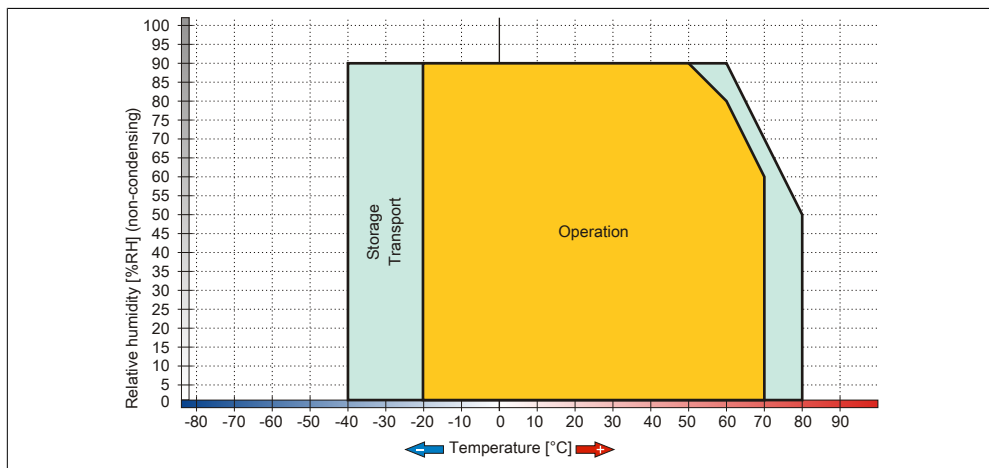


Image 47: Temperature humidity diagram - AMT touch screen 5-wire

2.3 Cleaning

The touch screen should be cleaned with a moist lint-free cloth. When moistening the cloth, use only water with detergent, screen cleaning agent, or alcohol (ethanol). The cleaning agent should be applied to the cloth beforehand and not sprayed directly onto the touch screen itself. Never use aggressive solvents, chemicals, or scouring agents.

3 Membrane

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

Info:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those specified for the entire device.

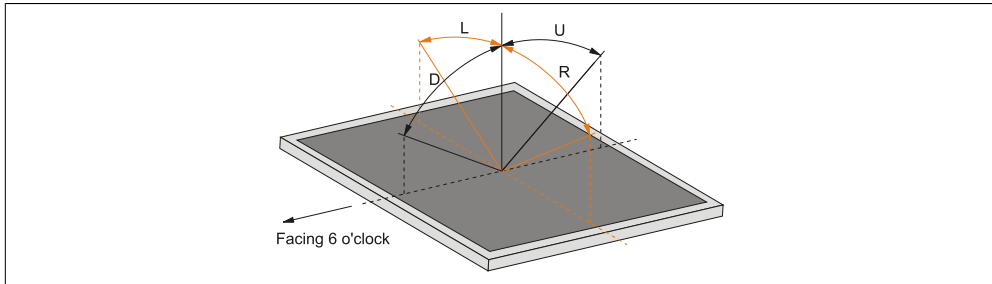
Ethanol Cyclohexanol Diacetone alcohol Glycol Isopropanol Glycerine Methanol Triacetin Dowanol DRM/PM	Formaldehyde 37 to 42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene White spirits	Trichloroethane Ethyl acetate Diethyl ether N-Butyl acetate Amyl acetate Butylcellosolve Ether
Acetone Methyl ethyl ketone Dioxan Cyclohexanone MIBK Isophorone	Formic acid < 50% Acetic acid < 50% Phosphoric acid < 30% Hydrochloric acid < 36% Nitric acid < 10% Trichloroacetic acid < 50% Sulphuric acid < 10%	Sodium hypochlorite < 20% Hydrogen peroxide < 25% Potassium carbonate Washing agents Tenside Fabric conditioner Ferrous chloride (FeCl ₂) Ferrous chloride (FeCl ₃)
Ammonia < 40% Caustic soda < 40% Potassium hydroxide Alkali carbonate Bichromate Potassium Acetonitrile Sodium bisulphate	Cutting oil Diesel oil Linseed oil Paraffin oil Blown castor oil Silicon oil Turpentine oil substitute Universal brake fluid Aviation fuel Gasoline Water Sea water Decon	Dibutyl phthalate Dioctyl phthalate Sodium carbonate

Table 150: Chemical resistance of the décor foil

The décor foil conforms to DIN 42115 section 2 for exposure to glacial acetic acid for less than one hour without visible damage.

4 Viewing angles

The viewing angle information of the display types (R, L, U, D) can be seen in the technical data for the individual components.



5 Mounting compatibilities

This section describes the compatibility of the installation dimensions for the Power Panel 100/200, Power Panel 300/400, Automation Panel 900 and Panel PC 800 units according to the respective device diagonals.

The outer dimensions of the device types are identical for the respective diagonals.

The different device types are abbreviated as follows:

Device type	Abbreviation
Power Panel 100/200	PP100/200
Power Panel 300/400	PP300/400
Power Panel 500	PP500
Automation Panel 900	AP900
Panel PC 700	PPC700
Panel PC 800	PPC800

Table 151: Product abbreviations

5.1 Compatibility overview

The following table offers a brief overview of the devices PP100/200, PP300/400, PP500, AP900, PPC700 and PPC800. For detailed information, see the section 5.2 "Compatibility details", on page 234 .

Compatibility between the device types is represented on each line by matching symbols.

Size	Format	Compatible	PP100/200	PP300/400	PP500	AP900	PPC700	PPC800
5.7"	Horizontal1	Outer dimensions	■	■	■	-	-	-
		Installation dimensions	●	●	●	-	-	-
	Horizontal2	Outer dimensions	■	■	■	-	-	-
		Installation dimensions	●	●	●	-	-	-
	Vertical1	Outer dimensions	■	■	■	-	-	-
		Installation dimensions	●	●	▲	-	-	-
10.4"	Horizontal 1	Outer dimensions	■	■	■	■	■	-
		Installation dimensions	●	●	●	●	●	-
	Horizontal2	Outer dimensions	■	■	■	■	■	-
		Installation dimensions	●	●	▲	▲	▲	-
	Horizontal3	Outer dimensions	■	■	■	■	■	-
		Installation dimensions	●	●	▲	▲	▲	-

Table 152: Device compatibility overview

Size	Format	Compatible	PP100/200	PP300/400	PP500	AP900	PPC700	PPC800
	Vertical1	Outer dimensions	■	■	■	■	■	-
		Installation dimensions	●	●	▲	▲	▲	-
12.1"	Horizontal1	Outer dimensions	■	■	■	■	■	-
		Installation dimensions	●	●	▲	▲	▲	-
15"	Horizontal1	Outer dimensions	■	■	■	■	■	■
		Installation dimensions	●	●	▲	●	●	●
	Vertical1	Outer dimensions	■	■	■	■	■	-
		Installation dimensions	●	●	▲	●	●	-
17"	Horizontal 1	Outer dimensions	-	-	-	■	■	
		Installation dimensions	-	-	-	▲	▲	
19"	Horizontal 1	Outer dimensions	-	-	-	■	■	
		Installation dimensions	-	-	-	▲	-	
21.3"	Horizontal 1	Outer dimensions	-	-	-	■	-	-
		Installation dimensions	-	-	-	▲	-	-

Table 152: Device compatibility overview

5.2 Compatibility details

5.2.1 Example

The measurement values (all in mm) in the following figures have the following meaning.

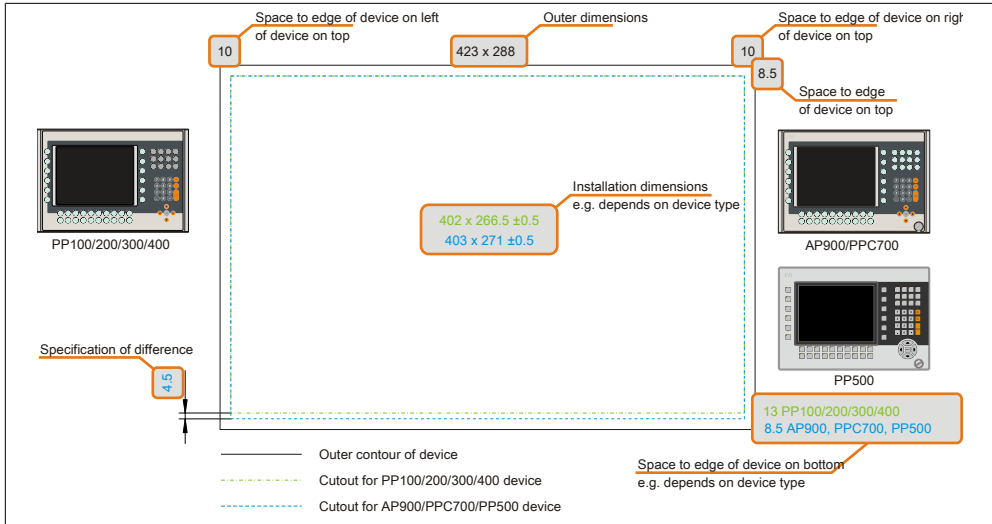


Image 48: Compatibility details - figure structure

5.2.2 5.7" devices

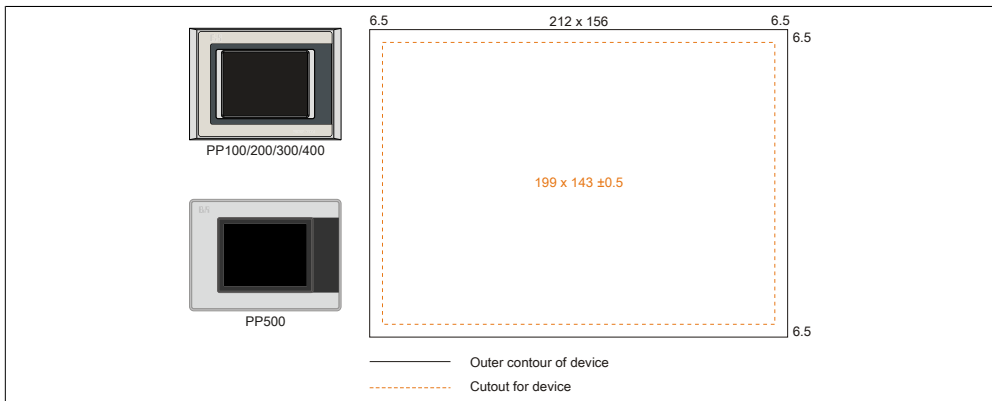


Image 49: Mounting compatibility - 5.7" device format - Horizontal1

5.7" Power Panel 500, Power Panel 300/400 and Power Panel 100/200 devices in Horizontal1 format are 100% mounting compatible.

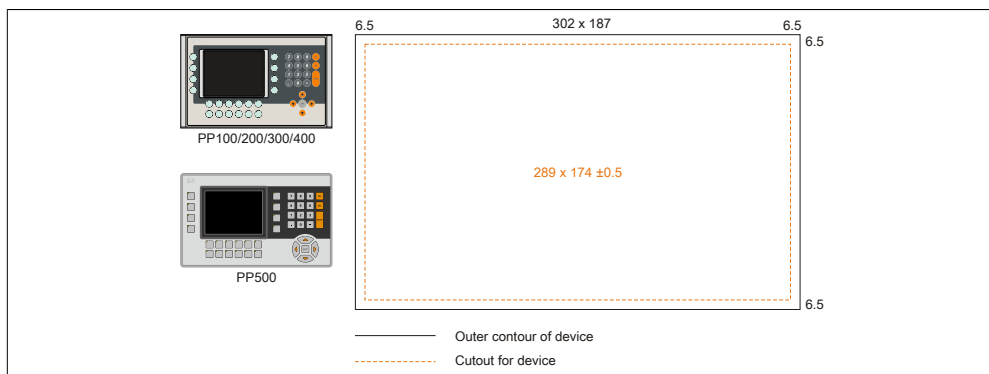


Image 50: Mounting compatibility - 5.7" device format - Horizontal2

5.7" Power Panel 500, Power Panel 300/400 and Power Panel 100/200 devices in Horizontal2 format are 100% mounting compatible.

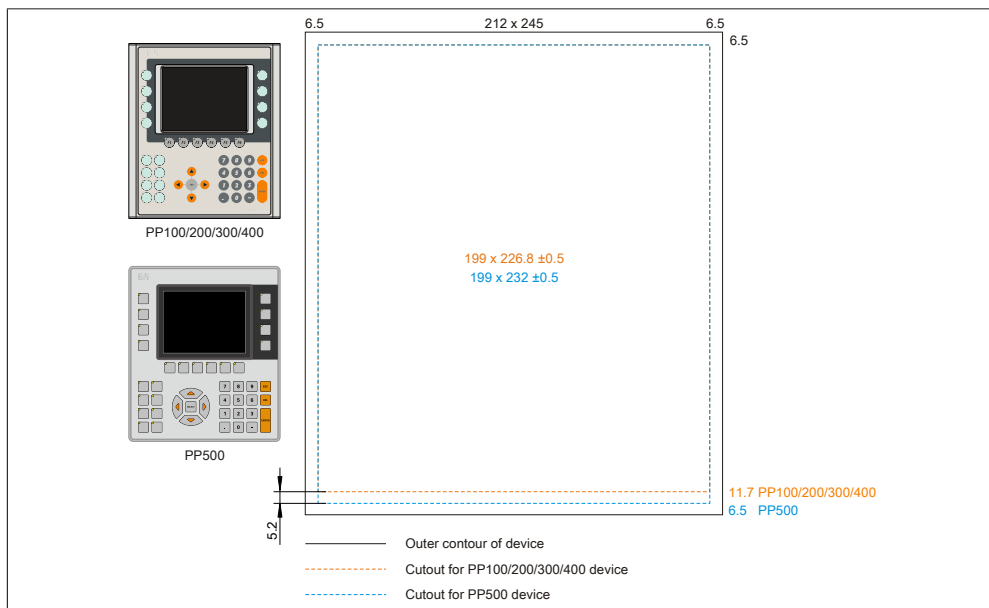


Image 51: Mounting compatibility - 5.7" device format - Vertical1

5.7" Power Panel 500 devices are not 100% mounting compatible with Power Panel 300/400 and Power Panel 100/200 devices in Vertical1 format. The Power Panel 500 devices require a cutout that is 5.2 mm higher (bottom edge).

The larger cutout can be conditionally used for all devices:

- When mounting, make sure that the PP100/200/300/400 devices are placed and mounted as close to the center of the cutout as possible. Failure to do so can prevent

the retaining clips from holding firmly, which means that a firm seal is no longer guaranteed with the gasket (IP65).

5.2.3 10.4" devices

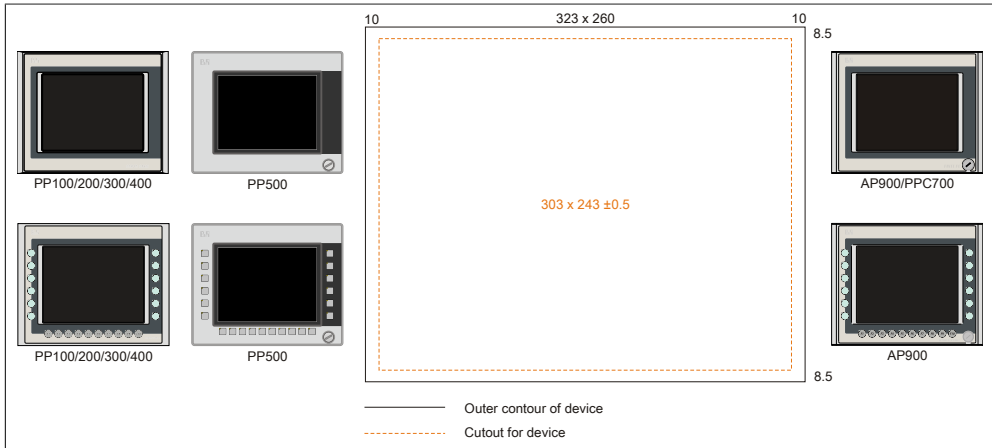


Image 52: Mounting compatibility - 10.4" device format - Horizontal1

10.4" Power Panel 500, Power Panel 300/400 and Power Panel 100/200 devices in Horizontal1 format are 100% mounting compatible.

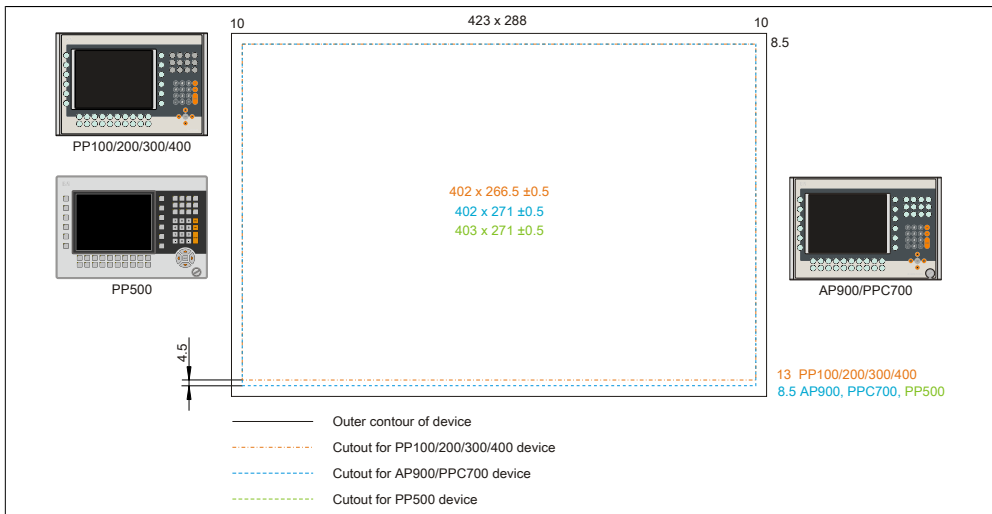


Image 53: Mounting compatibility - 10.4" device format - Horizontal2

The 10.4" Power Panel 500, Automation Panel 900 and Panel PC 700 devices are not 100% mounting compatible with the Power Panel 300/400 or Power Panel 100/200 device format Horizontal2. The Power Panel 500, Automation Panel 900 and Panel PC 700 devices require a cutout that is 4.5 mm higher (bottom edge).

The larger cutout can be conditionally used for all devices:

- When mounting, make sure that the PP100/200/300/400 devices are placed and mounted as close to the center of the cutout as possible. Failure to do so can prevent the retaining clips from holding firmly, which means that a firm seal is no longer guaranteed with the gasket (IP65).

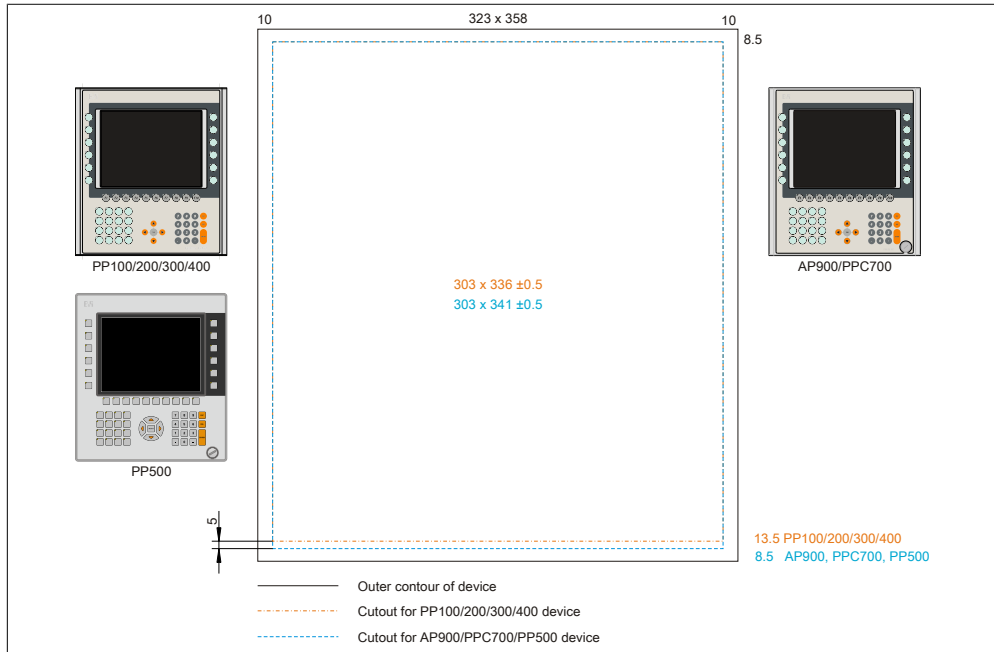


Image 54: Mounting compatibility - 10.4" device format - Vertical1

The 10.4" Power Panel 500, Automation Panel 900 and Panel PC 700 devices are not 100% mounting compatible with the Power Panel 300/400 or Power Panel 100/200 device format Vertical1. The Power Panel 500, Automation Panel 900 and Panel PC 700 devices require a cutout that is 5 mm higher (bottom edge).

The larger cutout can be conditionally used for all devices:

- When mounting, make sure that the PP100/200/300/400 devices are placed and mounted as close to the center of the cutout as possible. Failure to do so can prevent the retaining clips from holding firmly, which means that a firm seal is no longer guaranteed with the gasket (IP65).

5.2.4 12.1" devices

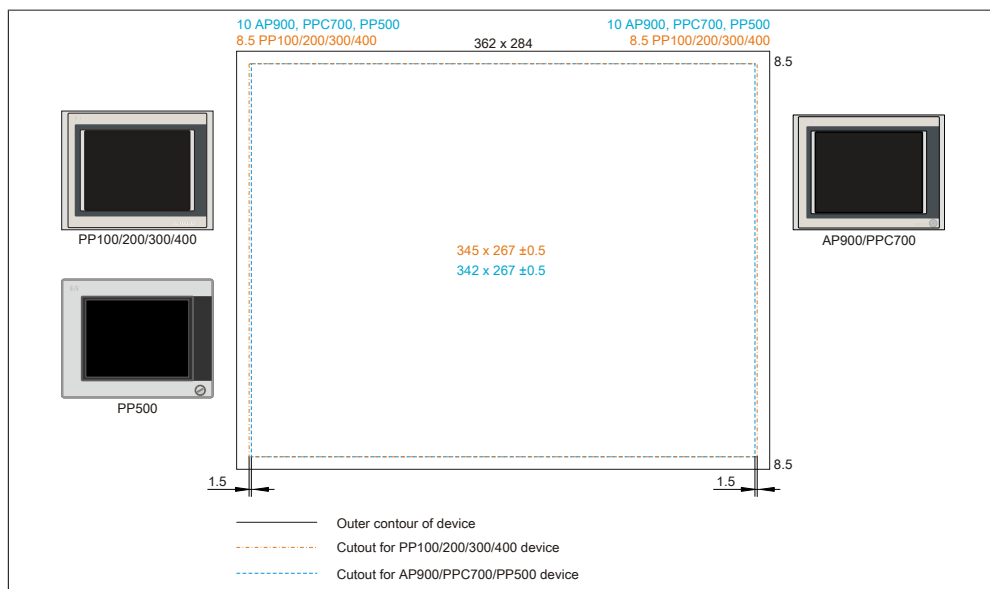


Image 55: Mounting compatibility - 12.1" device format - Horizontal1

The 12.1" Power Panel 500, Automation Panel 900 and Panel PC 700 devices are not 100% mounting compatible with the Power Panel 300/400 or Power Panel 100/200 device format Horizontal1. The Power Panel 300/400 and Power Panel 100/200 devices require a cut that is 1.5 mm wider (left and right).

The larger cutout can be conditionally used for all devices:

- When mounting, make sure that the PP500, AP900 and PPC700 devices are placed and mounted as close to the center of the cutout as possible.

5.2.5 15" devices

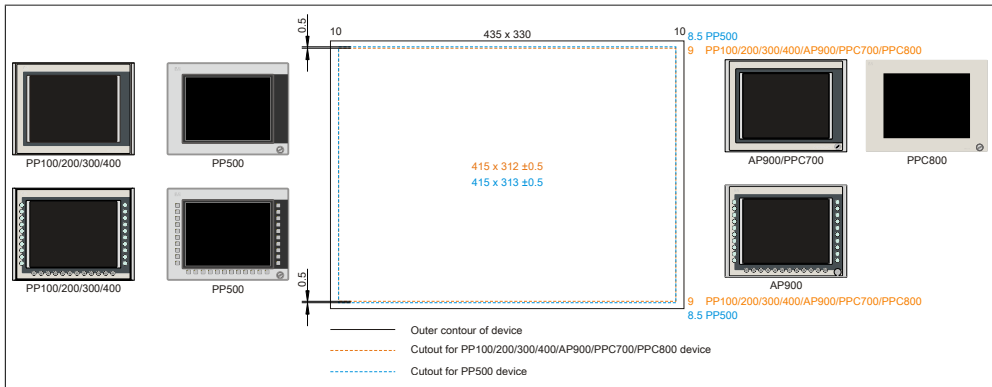


Image 56: Mounting compatibility - 15" device format - Horizontal1

15" Power Panel 500 devices are not 100% mounting compatible with the Power Panel 300/400, Power Panel 100/200, Automation Panel 900, Panel PC 700 and Panel PC 800 device format Vertical1. The Power Panel 500 devices require a cutout that is 0.5 mm higher (top and bottom edge).

The larger cutout can be conditionally used for all devices:

- When mounting, make sure that the PP100/200/300/400, AP900, PPC700 and PPC800 devices are placed and mounted as close to the center of the cutout as possible. Failure to do so can prevent the retaining clips from holding firmly, which means that a firm seal is no longer guaranteed with the gasket (IP65).

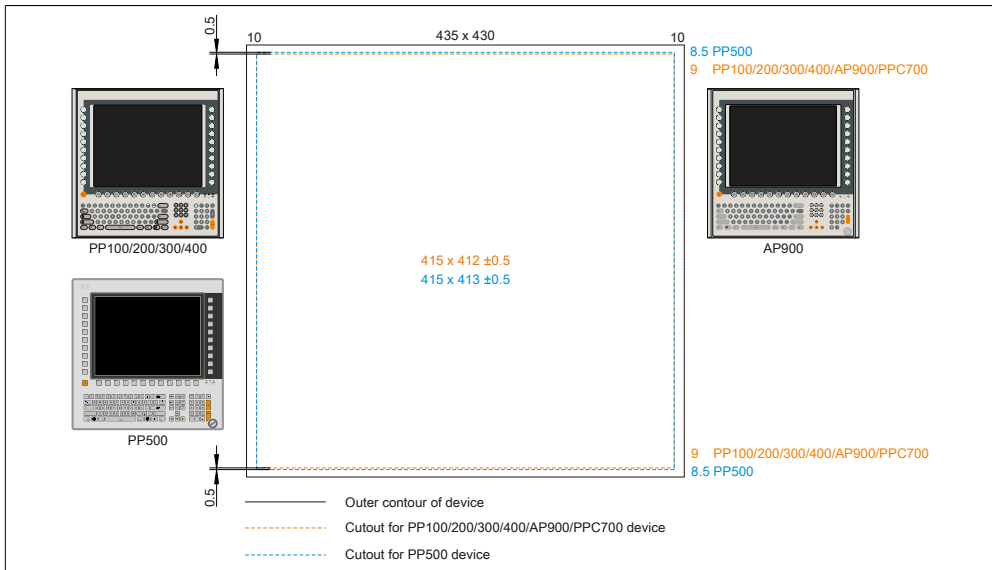


Image 57: Mounting compatibility - 15" device format - Vertical1

15" Power Panel 500 devices are not 100% mounting compatible with the Power Panel 300/400, Power Panel 100/200, Automation Panel 900 and Panel PC 700 device format Vertical1. The Power Panel 500 devices require a cutout that is 0.5 mm higher (top and bottom edge).

The larger cutout can be conditionally used for all devices:

- When mounting, make sure that the PP100/200/300/400, AP900 and PPC700 devices are placed and mounted as close to the center of the cutout as possible. Failure to do so can prevent the retaining clips from holding firmly, which means that a firm seal is no longer guaranteed with the gasket (IP65).

5.2.6 17" devices

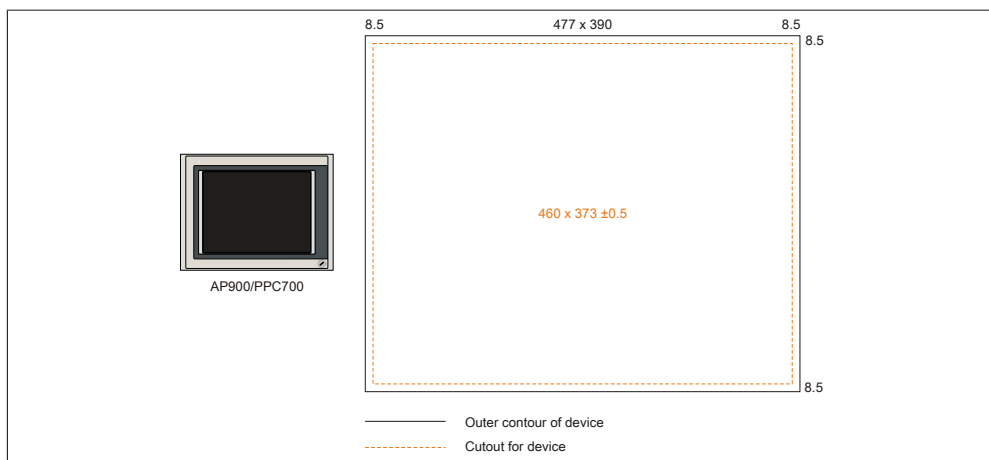


Image 58: Mounting compatibility - 17" device - Horizontal1

17" Automation Panel 900 and Panel PC 700 in Horizontal1 format are 100% mounting compatible.

5.2.7 19" devices

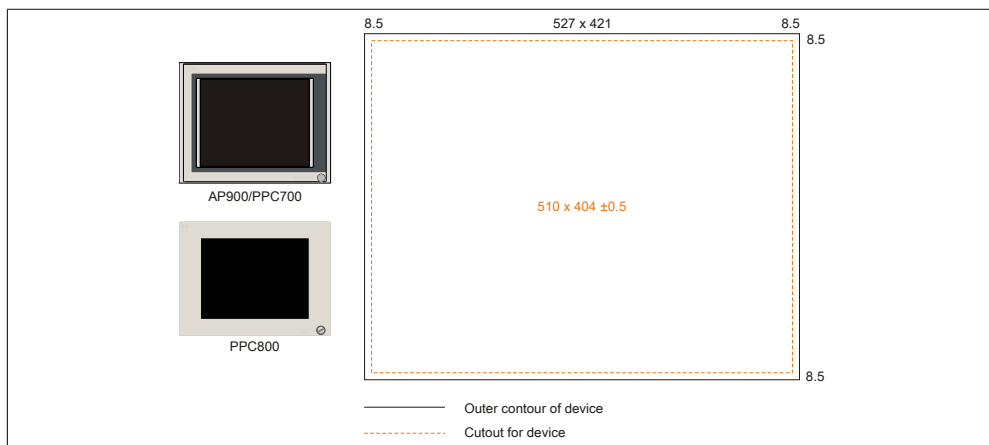


Image 59: Mounting compatibility - 19" device - Horizontal1

19" Automation Panel 900, Panel PC 700 and Panel PC 800 in Horizontal1 format are 100% mounting compatible.

5.2.8 21.3" devices

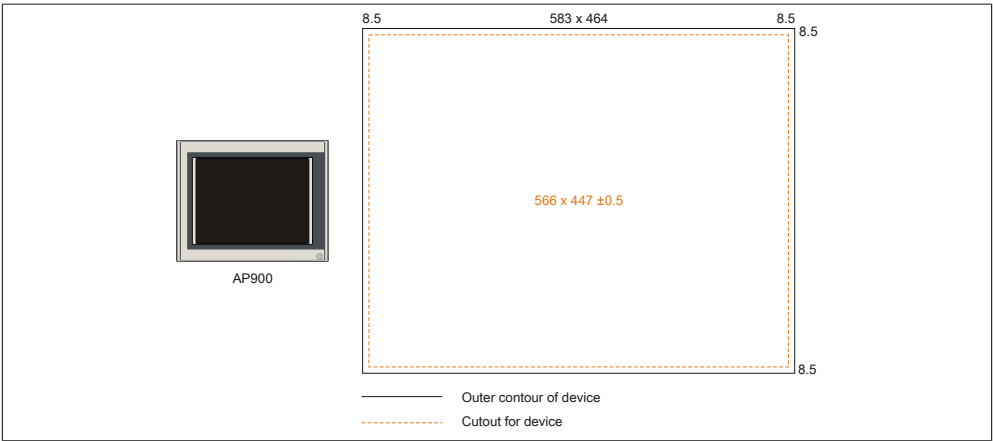


Image 60: Mounting compatibility - 21.1" device - Horizontal1

6 Abbreviations

Abbreviation	Stands for	Description
NC	Normally closed	A normally closed (N.C.) relay contact.
	Not connected	Used in the description of pin assignments if a terminal or pin is not connected to a module.
ND	Not defined	In data tables, this stands for a value that has not been defined. Because a cable manufacturer does not provide certain technical data, for example.
NO	Normally open	A normally open (N.O.) relay contact.
TBD	To be defined	Used in technical data tables when certain information is not yet available. The value will be provided later.

Table 153: Abbreviations used in this User's Manual

7 Glossary

Address	An address is a character string for identifying a memory location or a memory area, where data is stored and can be retrieved. It is also a symbol (e.g. with numerical controllers) for identifying a function unit for which subsequent geometrical or technological data are determined by the symbol.
Algorithms	According to DIN 19226: Algorithms are a finite series of well-defined regulations. The desired output quantities are created from permitted system input quantities. It describes how something is to be done. A procedure must at least satisfy the following requirements to be valid as an algorithm in a mathematical context. <i>Discreteness:</i> An algorithm is made up of a finite series of steps. <i>Determinacy:</i> Under the same start conditions, it always creates the same end result. <i>Clearness:</i> The series of steps is clearly defined. <i>Finiteness:</i> It ends after a finite number of steps. From a quantity theory perspective, an algorithm is clearly defined by a set of sizes [input, intermediate and output sizes], a set of elementary operations and also by a regulation, which specifies when and in what sequence certain operations should be carried out. From a functional perspective, it transfers a set of input sizes into a set of output sizes. It can be represented in text form in a natural or artificial formal language or using graphic representations [graph, program flow chart, structured chart, Petri Nets etc.].
ANSI	American National Standards Institute > this organization promotes and manages American industrial standards.
Automation	According to Brockhaus: The application of technical means, using specific programs that (either partially or totally) do not require human intervention to perform operations.
Automation Runtime	A uniform runtime system for all B&R automation components.
Failure	Failure according to IEC 61508: A function unit loses the ability to perform a required function. In regards to safety-oriented systems, a distinction is made between dangerous and safe failures. This depends on whether the status of the system failure is considered dangerous or safe. The cause of the failure may be load related or age-related, and therefore a random failure, or related to a flaw inherent in the system. In this case, it is known as a systematic failure.

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