

Power Panel 500

User's Manual

Version: **0.51 Preliminary (January 2011)**

Order nr.: **MAPP500-ENG**

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Chapter 1: General information

Chapter 2: Technical data

Chapter 3: Commissioning

Chapter 4: Software

Chapter 5: Accessories

Chapter 6: Maintenance / Servicing



Appendix A

Chapter 1: General information.....	11
1 Manual history.....	11
2 Safety notices.....	12
2.1 Intended use.....	12
2.2 Protection against electrostatic discharge.....	12
2.2.1 Packaging.....	12
2.2.2 Guidelines for proper ESD- handling.....	12
2.3 Policy and procedures.....	13
2.4 Transport and storage.....	13
2.5 Mounting.....	13
2.6 Operation.....	14
2.6.1 Protection against touching electrical parts.....	14
2.6.2 Environmental conditions - Dust, humidity, aggressive gases.....	14
2.6.3 Programs, viruses and dangerous programs.....	14
2.7 Environmentally-friendly disposal.....	15
2.7.1 Separation of materials.....	15
3 Organization of safety notices.....	16
4 Guidelines.....	16
5 Overview.....	17
 Chapter 2: Technical data.....	 20
1 Introduction.....	20
1.1 The right device for any automation task.....	20
1.2 Panels with the performance of an industrial PC.....	20
1.3 A complete solution with the highest degree of flexibility.....	20
1.4 Open system platform.....	21
1.5 Features.....	21
1.6 System components / configuration.....	22
1.6.1 Configuration - Basic system.....	22
1.6.2 Configuration software, accessories.....	23
1.7 Differences between Power Panel 500 and Power Panel 300/400.....	24
1.7.1 General.....	24
1.7.2 Mechanical.....	24
2 Entire device.....	25
2.1 Temperature specifications.....	25
2.1.1 Temperature sensor locations.....	25
2.1.2 Temperature monitoring.....	26
2.2 Humidity specifications.....	27
2.3 Serial number sticker.....	28
2.4 Device interfaces.....	30
2.4.1 Overview - Device interfaces.....	30
2.4.2 Supply voltage +24 VDC.....	32
2.4.3 Serial interface COM.....	33

2.4.4 Ethernet (ETH).....	34
2.4.5 USB Ports (USB1, 2, 3).....	35
2.4.6 Battery.....	37
2.4.7 CompactFlash Slot.....	38
2.4.8 SD Memory Card Slot.....	39
2.4.9 Power button.....	40
2.4.10 Reset button.....	40
2.4.11 Mode/Node switches.....	41
2.4.12 Status LEDs.....	42
2.4.13 Interface board Insert.....	43
2.4.14 I/O board Insert.....	43
3 Individual components.....	44
3.1 System units.....	44
3.1.1 5.7" system units.....	44
3.1.2 7" system unit.....	67
3.1.3 10.4" system units.....	73
3.1.4 12.1" system unit.....	94
3.1.5 15" system units.....	99
3.2 US15W - CPU boards.....	115
3.2.1 General information.....	115
3.2.2 Order data.....	115
3.2.3 Technical data.....	116
3.3 Main memory.....	117
3.3.1 General information.....	117
3.3.2 Order data.....	117
3.3.3 Technical data.....	117
3.4 Interface boards.....	118
3.4.1 5PP5IF.CETH-00.....	118
3.4.2 5PP5IF.CHDA-00.....	120
3.4.3 5PP5IF.FPLM-00.....	122
3.5 I/O boards.....	125
3.5.1 5PP5IO.GNAC-00.....	125
Chapter 3: Commissioning.....	131
1 Installation.....	131
1.1 Mounting with retaining clips.....	131
1.2 Mounting with terminal blocks.....	131
1.3 Important mounting information.....	132
2 Touch screen calibration.....	133
2.1 Windows XP Professional.....	133
2.2 Windows 7.....	133
3 User tips for increasing the display lifespan.....	134
3.1 Backlight.....	134
3.1.1 How can the lifespan of backlights be extended?.....	134

3.2 Image sticking.....	134
3.2.1 What causes image sticking?.....	134
3.2.2 How can image sticking be avoided?.....	134
4 Pixel error.....	135

Chapter 4: Software..... 136

1 BIOS options.....	136
1.1 General information.....	136
1.2 BIOS setup and start procedure.....	136
1.2.1 BIOS setup keys.....	137
1.3 Main.....	139
1.4 OEM Features.....	140
1.4.1 Baseboard Features.....	141
1.4.2 Display Features.....	145
1.4.3 IO Module Features.....	149
1.4.4 IF Module Features.....	151
1.4.5 RAM Features.....	153
1.5 Advanced.....	154
1.5.1 Boot Configuration.....	155
1.5.2 Peripheral Configuration.....	156
1.5.3 IDE Configuration.....	157
1.5.4 Video Configuration.....	160
1.5.5 USB Configuration.....	161
1.5.6 SDIO Configuration.....	163
1.5.7 ACPI Table/Features Control.....	164
1.5.8 PCI Express Root Port 1.....	165
1.5.9 PCI Express Root Port 2.....	168
1.6 Security.....	171
1.7 Power.....	172
1.7.1 Advanced CPU Control.....	173
1.7.2 Platform Power Management.....	176
1.8 Boot.....	178
1.8.1 Legacy.....	179
1.9 Exit.....	184
1.10 BIOS default settings.....	185
1.10.1 Main.....	185
1.10.2 OEM Features.....	185
1.10.3 Advanced.....	187
1.10.4 Power.....	190
1.10.5 Boot.....	190
2 Windows XP Professional.....	191
2.1 Order data.....	191
2.2 Overview.....	191
2.3 Installation.....	192

2.4 Drivers.....	192
3 Windows 7.....	193
3.1 Order data.....	193
3.2 Overview.....	193
3.3 Installation.....	193
3.4 Drivers.....	193
3.5 Special considerations, limitations.....	193

Chapter 5: Accessories.....194

1 Replacement CMOS batteries.....	194
1.1 0AC201.91 / 4A0006.00-000.....	194
1.2 General information.....	194
1.3 Order data.....	194
1.4 Technical data.....	194
2 Supply voltage connectors.....	196
2.1 0TB103.9x.....	196
2.1.1 General information.....	196
2.1.2 Order data.....	196
2.1.3 Technical data.....	196
3 CompactFlash cards.....	197
3.1 General information.....	197
3.2 Basics.....	197
3.2.1 Flash technology.....	197
3.2.2 Wear leveling.....	197
3.2.3 ECC error correction.....	198
3.2.4 Maximum reliability.....	198
3.3 5CFCRD.xxxx-04.....	199
3.3.1 General information.....	199
3.3.2 Order data.....	199
3.3.3 Technical data.....	199
3.3.4 Temperature humidity diagram.....	202
3.3.5 Dimensions.....	202
3.3.6 Benchmark.....	203
3.4 5CFCRD.xxxx-03.....	204
3.4.1 General information.....	204
3.4.2 Order data.....	204
3.4.3 Technical data.....	205
3.4.4 Temperature humidity diagram.....	207
3.4.5 Dimensions.....	207
3.5 Known problems / issues.....	208
4 USB flash drive.....	209
4.1 5MMUSB.2048-01.....	209
4.1.1 General information.....	209
4.1.2 Order data.....	209

4.1.3 Technical data.....	210
4.1.4 Temperature humidity diagram.....	211
5 USB port cap.....	212
5.1 5AC900.1201-00.....	212
5.1.1 General information.....	212
5.1.2 Order data.....	212
5.2 5AC900.1201-01.....	212
5.2.1 General information.....	212
5.2.2 Order data.....	212
6 Terminal block.....	213
6.1 5AC900.BLOC-00.....	213
6.1.1 General information.....	213
6.1.2 Order data.....	213
6.2 5AC900.BLOC-01.....	213
6.2.1 General information.....	213
6.2.2 Order data.....	214
7 Clip.....	215
7.1 5AC900.CLIP-01.....	215
7.1.1 General information.....	215
7.1.2 Order data.....	215
Chapter 6: Maintenance / Servicing.....	216
1 Cleaning.....	216
2 Changing the battery.....	217
2.1 Battery status evaluation.....	217
2.2 Procedure.....	218
Appendix A.....	220
1 Maintenance Controller Extended (MTCX).....	220
2 Membrane.....	222
3 Viewing angles.....	223
4 Mounting compatibilities.....	224
4.1 Compatibility overview.....	224
4.2 Compatibility details.....	226
4.2.1 Example.....	226
4.2.2 5.7" devices.....	226
4.2.3 10.4" devices.....	228
4.2.4 12.1" devices.....	230
4.2.5 15" devices.....	231
5 Abbreviations.....	233
6 Glossary.....	234

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. - Dimension diagram 3.1.1.2.4 "Image 11: 5PP520.0573-01 - Dimensions" 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 136 was updated.
0.51 Preliminary	2011-01-24	- The description of the menu items " PCI Express Root Port 1", on page 165 and " PCI Express Root Port 2", on page 168 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 220 was revised.

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 Policy 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.

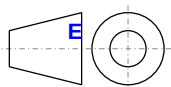
3 Organization of safety notices

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)	56
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)	62
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)	79
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)	105
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)	84
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)	110
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)	89
5PP5IO.GNAC-00	PP500 I/O Board; connections for 1x USB 2.0, 1x RS232/422/485, HDA Sound, Smart Display Link/DVI/Monitor	125
Accessories		
5AC900.1201-00	USB Cover M20 IP65 flat	212
5AC900.1201-01	USB Cover M20 IP65 raised	212
5AC900.BLOC-00	Mounting block with wings 10pcs Spare part.	213
5AC900.BLOC-01	Spare mounting block w/o wings P 10pcs	214
5AC900.CLIP-01	Spare Retaining clip plastic 10pcs	215
Batteries		
0AC201.91	Lithium Battery 4 pieces, 3 V / 950 mAh button cell	194
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	194
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	115
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	115
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	115
CompactFlash		
5CFCRD.0064-03	CompactFlash 64 MB Western Digital	204
5CFCRD.0128-03	CompactFlash 128 MB Western Digital	204
5CFCRD.016G-04	CompactFlash 16 GB B&R	199
5CFCRD.0256-03	CompactFlash 256 MB Western Digital	204
5CFCRD.0512-03	CompactFlash 512 MB Western Digital	204
5CFCRD.0512-04	CompactFlash 512 MB B&R	199
5CFCRD.1024-03	CompactFlash 1 GB Western Digital	204
5CFCRD.1024-04	CompactFlash 1 GB B&R	199
5CFCRD.2048-03	CompactFlash 2 GB Western Digital	204
5CFCRD.2048-04	CompactFlash 2 GB B&R	199
5CFCRD.4096-03	CompactFlash 4 GB Western Digital	204

Product ID	Short description	on page
5CFCRD.4096-04	CompactFlash 4 GB B&R	199
5CFCRD.8192-03	CompactFlash 8 GB Western Digital	204
5CFCRD.8192-04	CompactFlash 8 GB B&R	199
Interface boards		
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	118
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	120
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWERLINK	122
Main memory		
5MMDDR.0512-01	SO-DIMM DDR2 RAM 512 MB PC2-5300	117
5MMDDR.1024-01	SO-DIMM DDR2 RAM 1024 MB PC2-5300	117
5MMDDR.2048-01	SO-DIMM DDR2 RAM 2048 MB PC2-5300	117
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)	44
5PP520.0573-01	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 and I/O board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (screw clamp: 0TB103.9; cage clamp: 0TB103.91)	50
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)	67
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)	73
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)	94
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)	99
Terminal Blocks		
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	196
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	196
USB Zubehör		
5MMUSB.2048-01	USB Memory Stick 2048MB B&R	209
Windows 7		
5SWWI7.0100-ENG	Microsoft OEM Windows 7 Professional 32-bit, DVD, English. Only available with a new device.	193
5SWWI7.0100-GER	Microsoft OEM Windows 7 Professional 32-bit, DVD, German. Only available with a new device.	193
5SWWI7.0300-MUL	Microsoft OEM Windows 7 Ultimate 32-bit, DVD, multilaguange. Only available with a new device.	193
Windows XP Professional		
5SWWXP.0500-ENG	Microsoft OEM Windows XP Professional Service Pack 2c, CD, English. Only available with a B&R device.	191
5SWWXP.0500-GER	Microsoft OEM Windows XP Professional Service Pack 2c, CD, German. Only available with a B&R device.	191
5SWWXP.0500-MUL	Microsoft OEM Windows XP Professional Service Pack 2c, CD, Multilaguange Only available with a B&R device.	191
5SWWXP.0600-ENG	Microsoft OEM Windows XP Professional Service Pack 3, CD, English. Only available with a B&R device.	191
5SWWXP.0600-GER	Microsoft OEM Windows XP Professional Service Pack 3, CD, German. Only available with a device.	191

Product ID	Short description	on page
5SWWXP.0600-MUL	Microsoft OEM Windows XP Professional Service Pack 3, CD, multilanguage. Only available with a B&R device.	191

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 POWERLINK, 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

Configuration - Basic system					
System unit	Select 1				
A system unit consists of a housing and display. Variants: PP500 with slot for Interface board: 5PP5xx.xxxx-00 PP500 with slot for Interface & I/O board: 5PP5xx.xxxx-01	5.7"	7"	10.4"	12.1"	15"
					
	5PP520.0573-00 5PP520.0573-01	5PP520.0702-00	5PP520.1043-00 5PP580.1043-00	5PP520.1214-00	5PP520.1505-00 5PP580.1505-00
	5PP551.0573-00 5PP552.0573-00		5PP581.1043-00 5PP582.1043-00		5PP581.1505-00
CPU board - Main memory					
CPU board	Select 1				
	5PP5CP.US15-00 - 1100 MHz 5PP5CP.US15-01 - 1330 MHz 5PP5CP.US15-02 - 1600 MHz				
Main memory	Select 1				
	5MMDDR.0512-01 5MMDDR.1024-01 5MMDDR.2048-01				

Image 1: Configuration - Basic system

Configuration - Software, accessories					
System unit	Select 1				
A system unit consists of a housing and display. Variants: PP500 with slot for Interface board: 5PP5xx.xxxx-00 PP500 with slot for Interface & I/O board: 5PP5xx.xxxx-01	5.7" 5PP520.0573-00 5PP520.0573-01 5PP551.0573-00 5PP552.0573-00	7" 5PP520.0702-00	10.4" 5PP520.1043-00 5PP580.1043-00 5PP581.1043-00 5PP582.1043-00	12.1" 5PP520.1214-00	15" 5PP520.1505-00 5PP580.1505-00 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				
I/O board ¹⁾	Select 1				
	5PP5IO.GNAC-00				
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 7	Windows XP 5SWWXP.0500-ENG 5SWWXP.0600-ENG 5SWWXP.0500-GER 5SWWXP.0600-GER 5SWWXP.0500-MUL 5SWWXP.0600-MUL			Windows 7 5SWWI7.0100-ENG 5SWWI7.0100-GER 5SWWI7.0300-MUL	
Terminal blocks	Select 1				
	0TB103.9 0TB103.91				

1) I/O boards can only be operated in system units with an I/O slot.

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 22.

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 4 "Mounting compatibilities", on page 224 .

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 operating systems using the B&R Control Center²⁾.

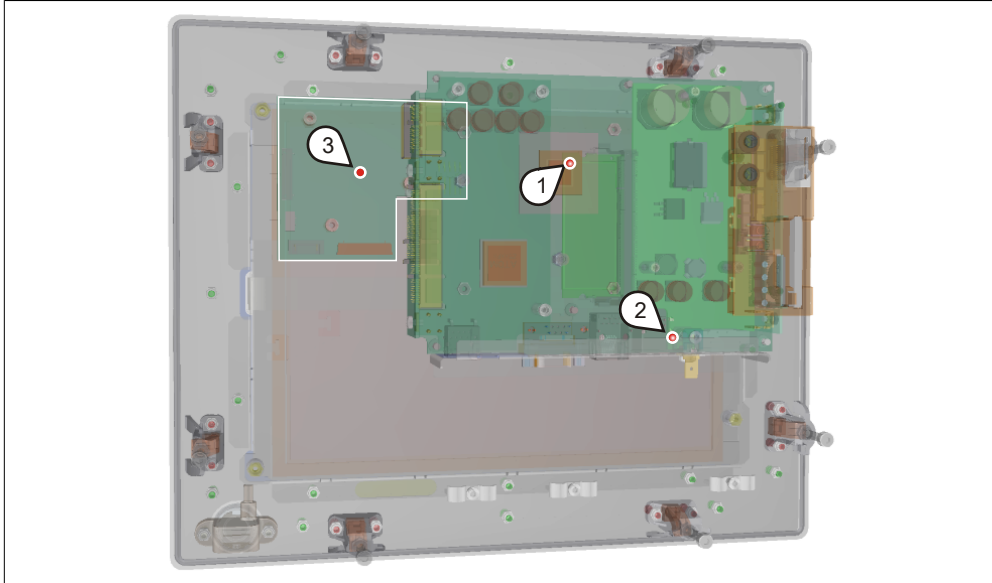


Image 3: Temperature sensor locations

Position	Measurement point for	measurement	Max. specified
1	CPU Main memory	Temperature of the processor and ambient temperature of the main memory (sensor integrated in the processor).	TBD
2	Interfaces	Temperature of the interfaces (sensor integrated beside USB ports).	TBD
3	Display	Temperature of the display (sensor integrated on the display board - the exact position depends on the display diagonal).	TBD
	Interface board	Temperature of an interface board (sensor integrated on the interface board).	dependent on the board
	I/O board	Temperature of an I/O board (sensor integrated on the I/O 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, I/O board) in the PP500. The locations of the temperature sensors can be found in figure "Image 3: Temperature sensor locations", on page 25 . 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, using B&R Control Center.

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

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		10 to 90%	5 to 95%
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
I/O boards	5PP5IO.GNAC-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.

2.3 Serial number sticker

Each B&R device is given a unique Serial number sticker barcode (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).

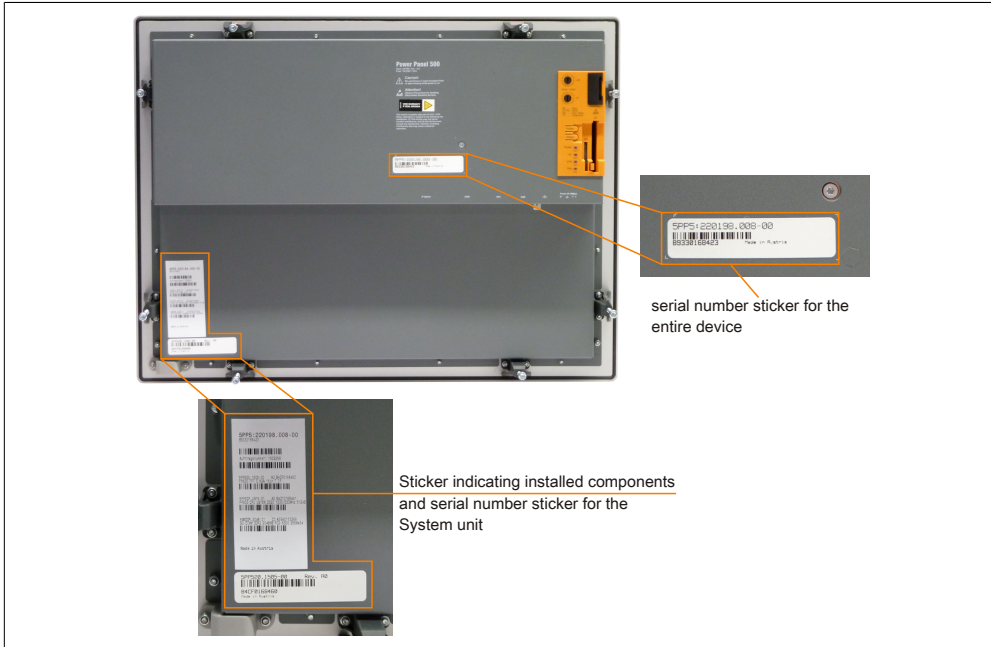


Image 4: Serial number sticker

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.

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[Automation Panel 800](#)

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[Mobile Panel 50](#)

[Mobile Panel 100/200](#)

[Power Panel 15/21/35/45](#)

[Power Panel 45](#)

[Power Panel 65](#)

[Power Panel 300/400](#)

[Power Panel 500](#)

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Ihre e-Mail Adresse

[Visualisieren und Bedienen > Power Panel 500 > Systemeinheiten > SPP520.1505-00](#)

[Suche](#)

Serialnummer

Materialnummer

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: 0TB103.9; Federzugklemme: 0TB103.91).

REKLAMATION ERSTELLEN

Serialnummer	Materialnummer	Rev	Auslieferungsdatum	Gewährleistungsende
B9330168423	SPP5:220198.008-00	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	SPP5:220198.008-00	C0	*N/V	*N/V
B4CF0168460	SPP520.1505-00	A0	*N/V	*N/V
B4D10168441	SPP5CP.US15-01	A0	*N/V	*N/V
A3E40173269	5MMDDR.2048-01	C0	*N/V	*N/V

Materialnummer

Suche

Zubehör

erforderlich

[Feldklemmen](#)

optional

[Batterien](#)

[CompactFlash](#)

[USB Zubehör](#)

Entering serial numbers
e.g. B9330168423

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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

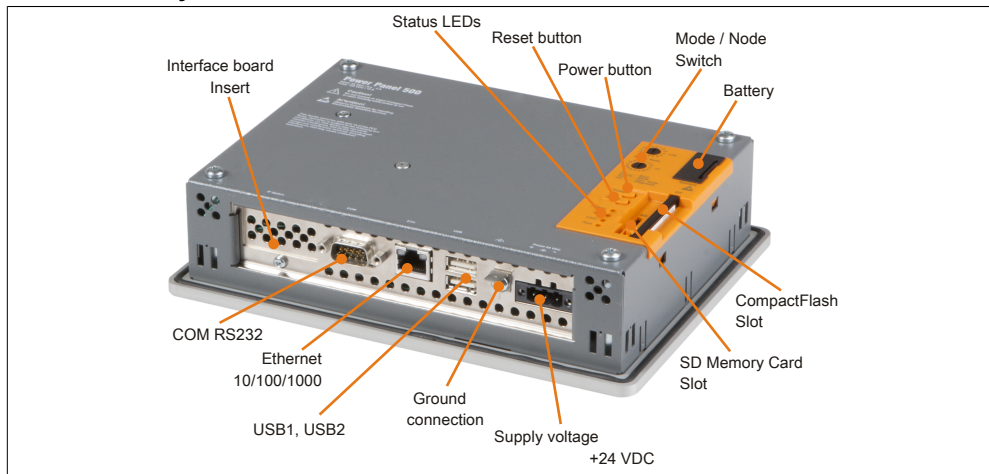


Image 6: Interfaces - PP500 with interface board

Back cover of the system units

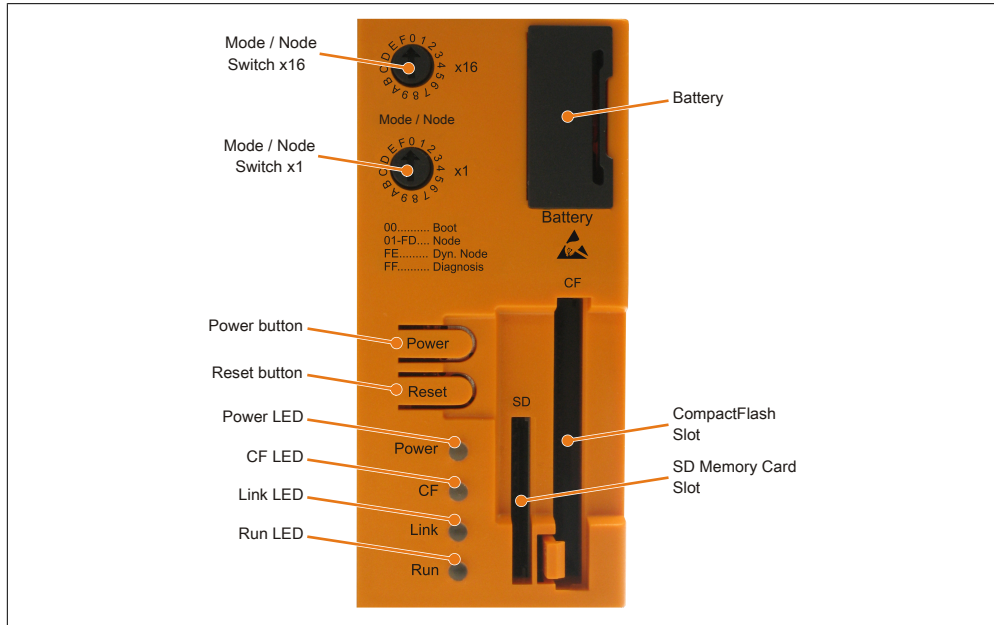


Image 7: PP500 - Back cover

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 (15A, 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.

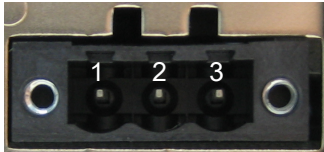
Supply voltage		3-pin, male
Protected against reverse polarity		
Pin	Description	
1	+	
2	Functional ground	
3	-	
Accessories		
0TB103.9	Plug 24 V 5.08 3-pin screw clamp	
0TB103.91	Plug 24 V 5.08 3-pin cage clamp	

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.

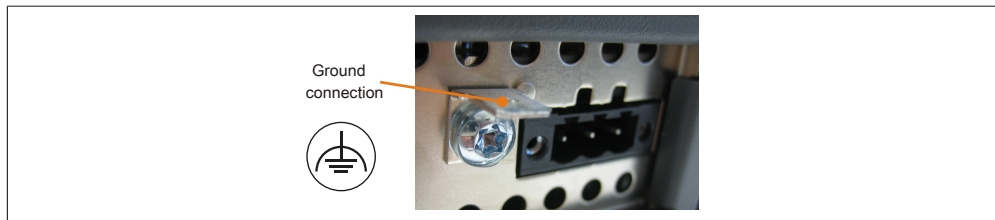


Image 8: Ground connection

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

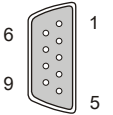


Table 8: Pin assignments - COM

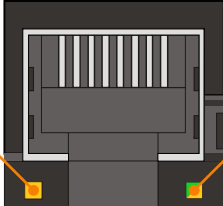
2.4.4 Ethernet (ETH)

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

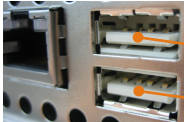
Universal Serial Bus (USB1, USB2) ¹⁾		
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)	2x USB Type A, female  USB1 USB2
Power supply ²⁾ USB1, USB2	Max. 1 A	
Cable length	max. 5 m (without hub)	

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 (3 V, 950 mAh) buffers the internal real-time clock (RTC) as well as the individually saved BIOS settings and is located behind the black cover. The buffer duration of the battery is at least TBD years (at 50°C, 8.5 μ A 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 μ A 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.

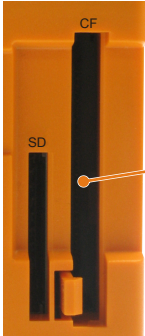
CompactFlash slot		
Connection	PATA Master	
CompactFlash Type	Type I	
Accessories	Short description	
5CFCRD.0512-04	512 MB B&R CompactFlash card	
5CFCRD.1024-04	1024 MB B&R CompactFlash card	
5CFCRD.2048-04	2048 MB B&R CompactFlash card	
5CFCRD.4096-04	4096 MB B&R CompactFlash card	
5CFCRD.8192-04	8192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

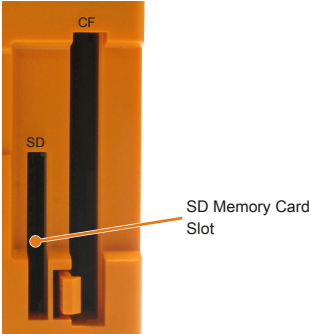
SD Memory Card Slot		
		

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.

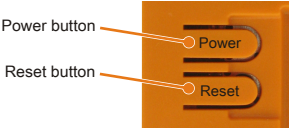
Power button	
The power button acts like the on/off switch on a normal desktop PC with ATX power supply: Press and release ... Switches on PP500 or shuts down operating system and switches off the PP500. Press and hold ... ATX power supply switches off without shutting down the PP500 (data could be lost!). Pressing the power button does not reset the MTCX processor.	

Table 16: Power button

Info:

The PP500 will boot in BIOS Backup mode if the supply voltage connector is unplugged and the power and reset buttons are both pressed for 2 seconds while the supply voltage connector is plugged back into the Power Panel 500. This will load a second BIOS. If access to BIOS is prevented or if the BIOS update procedure is not executed properly, then we recommend booting with the BIOS Backup and performing the BIOS Update from there.

The type of BIOS (Normal or Backup Boot) is indicated in the BIOS in the 1.4 " OEM Features", on page 140 menu.

2.4.10 Reset button

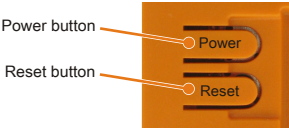
Reset button	
Pushing the reset button triggers a hardware and PCI reset. The PP500 restarts (cold restart). The MTCX processor is not reset when the reset button is pressed.	

Table 17: Reset button

Warning!

A system reset can result in data loss!

2.4.11 Mode/Node switches

The back side of the Power Panel devices contain two 16-position hex selections switches. These can be used as operating mode switches. Switch positions 00 up to FF are available for any purpose in an application. The switch's position can be evaluated from an application program.

Mode/Node switches		
Switch position		
x16	x1	Description
0	0	Boot Starts the device in boot mode.
0...F	1...D	Node
F	E	Dyn. Node
F	F	Diagnostics Starts the internal Debug version.

Mode / Node
Switch x16



Mode / Node
Switch x1



00..... Boot

01-FD.... Node

FE..... Dyn. Node

FF..... Diagnosis

Table 18: 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 37.
	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 37.
	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

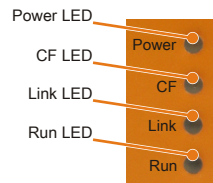


Table 19: Data - status LEDs

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 20: Interface board insert

Info:

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

2.4.14 I/O board Insert

I/O board insert	
Accessories	Short description
5PP5IO.GNAC-00	PP500 I/O board; connections for 1x USB 2.0, 1x RS232/422/485, HDA sound, Smart Display Link/DVI/Monitor

Table 21: I/O board insert

Info:

Installation and replacement of I/O 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 22: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 22: 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	TBD
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 23: 5PP520.0573-00 - Technical data

Product ID	5PP520.0573-00
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	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	
Brightness	400 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	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
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: 5PP520.0573-00 - Technical data

Product ID	5PP520.0573-00
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 23: 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

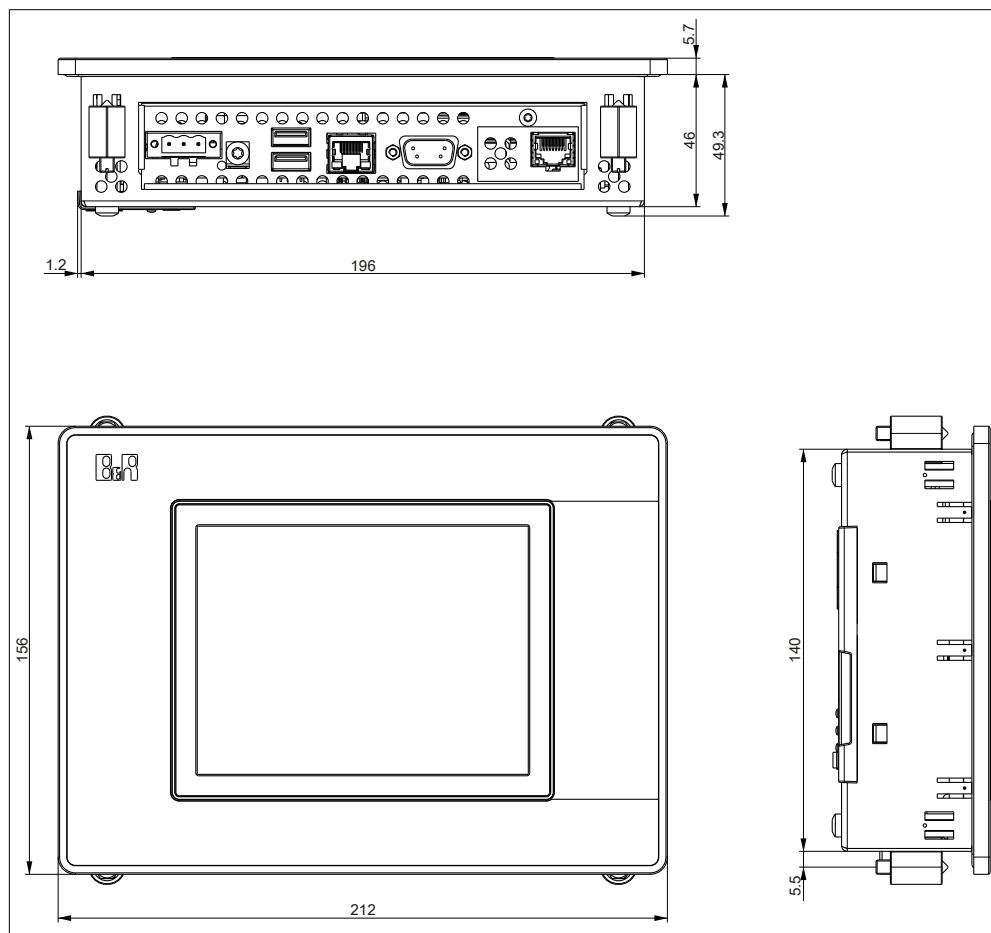


Image 9: 5PP520.0573-00 - Dimensions

3.1.1.1.5 Cutout

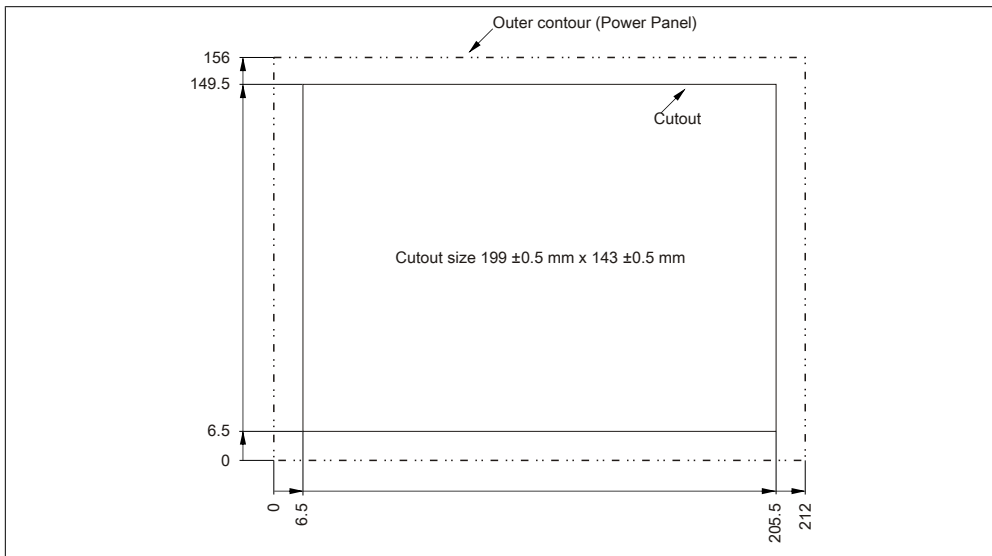


Image 10: 5PP520.0573-00 - Cutout installation

3.1.1.2 5PP520.0573-01

3.1.1.2.1 General information

- 5.7" TFT VGA color display
- Analog resistive touch screen
- Intel® Atom™ technology
- Small installation depth
- Fan-free operation
- Can be expanded by adding an interface or I/O board

3.1.1.2.2 Order data

Model number	Short description	Figure
	System units	
5PP520.0573-01	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 and I/O 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	
5PP5IO.GNAC-00	PP500 I/O Board; connections for 1x USB 2.0, 1x RS232/422/485, HDA Sound, Smart Display Link/DVI/ Monitor	
	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 24: 5PP520.0573-01 - 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 24: 5PP520.0573-01 - Order data

3.1.1.2.3 Technical data

Product ID	5PP520.0573-01
General information	
B&R ID code	\$B4CC
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	TBD
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: 5PP520.0573-01 - Technical data

Product ID	5PP520.0573-01
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	
Brightness	400 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	80% ±3%
Keys	
Function keys	No
System keys	No
Lifespan	-
LED brightness	-
Inserts	
Interface board	Yes
I/O board	Yes
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
Environmental conditions	
Temperature	
Operation	0 to 55°C
Storage	-20 to 60°C
Transport	-20 to 60°C
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD

Table 25: 5PP520.0573-01 - Technical data

Product ID	5PP520.0573-01
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	75 mm
Weight	1400 g

Table 25: 5PP520.0573-01 - 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

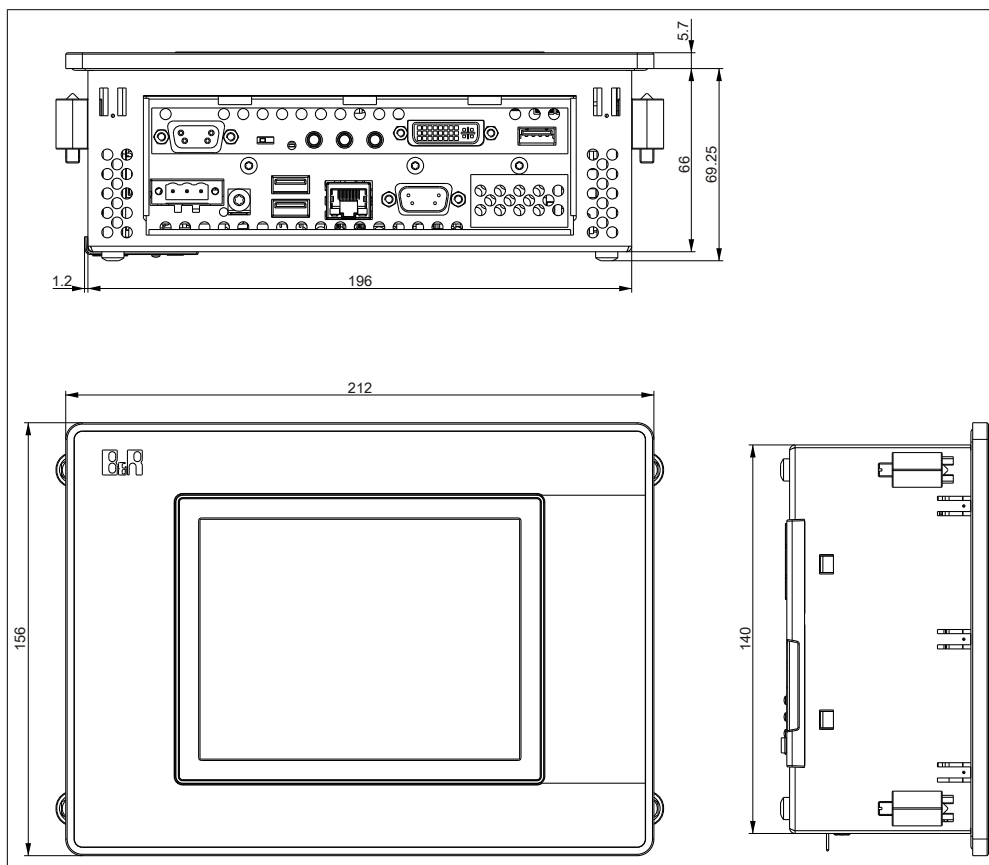


Image 11: 5PP520.0573-01 - Dimensions

3.1.1.2.5 Cutout

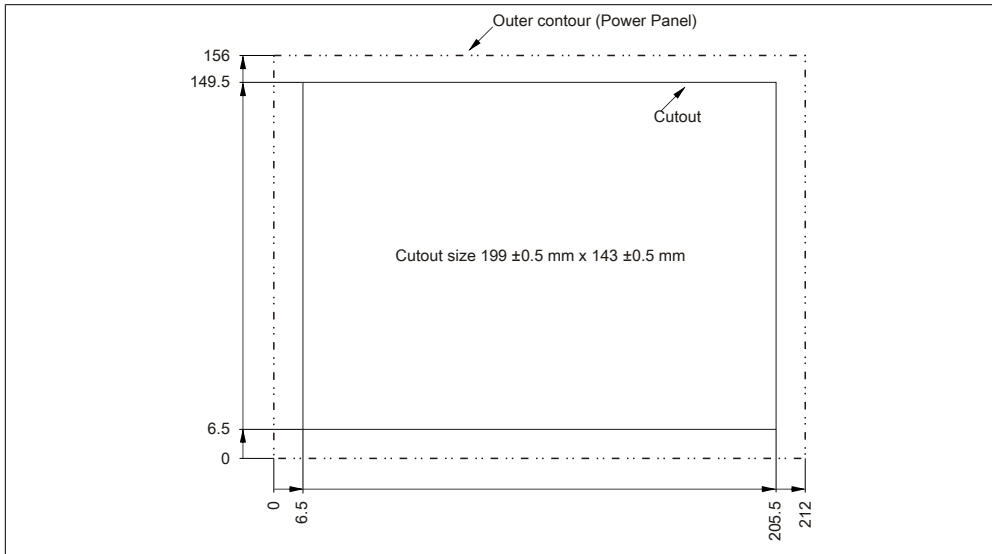


Image 12: 5PP520.0573-01 - Cutout installation

3.1.1.3 5PP551.0573-00

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
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 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 26: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 26: 5PP551.0573-00 - Order data

3.1.1.3.3 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	TBD
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
CompactFlash slot 1	
Type	Type I

Table 27: 5PP551.0573-00 - Technical data

Product ID	5PP551.0573-00
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	
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	TBD
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 27: 5PP551.0573-00 - Technical data

Product ID	5PP551.0573-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 27: 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.

3.1.1.3.4 Dimensions

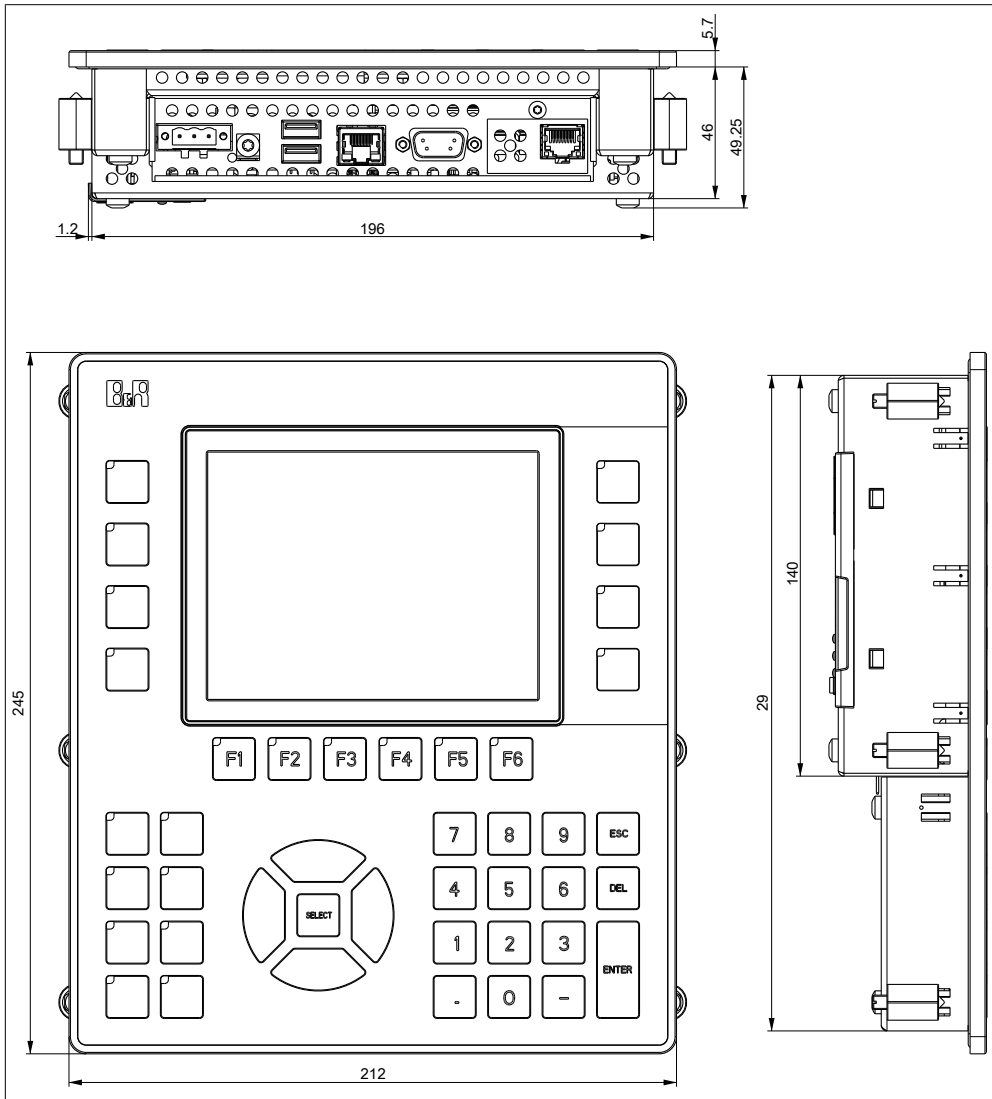


Image 13: 5PP551.0573-00 - Dimensions

3.1.1.3.5 Cutout

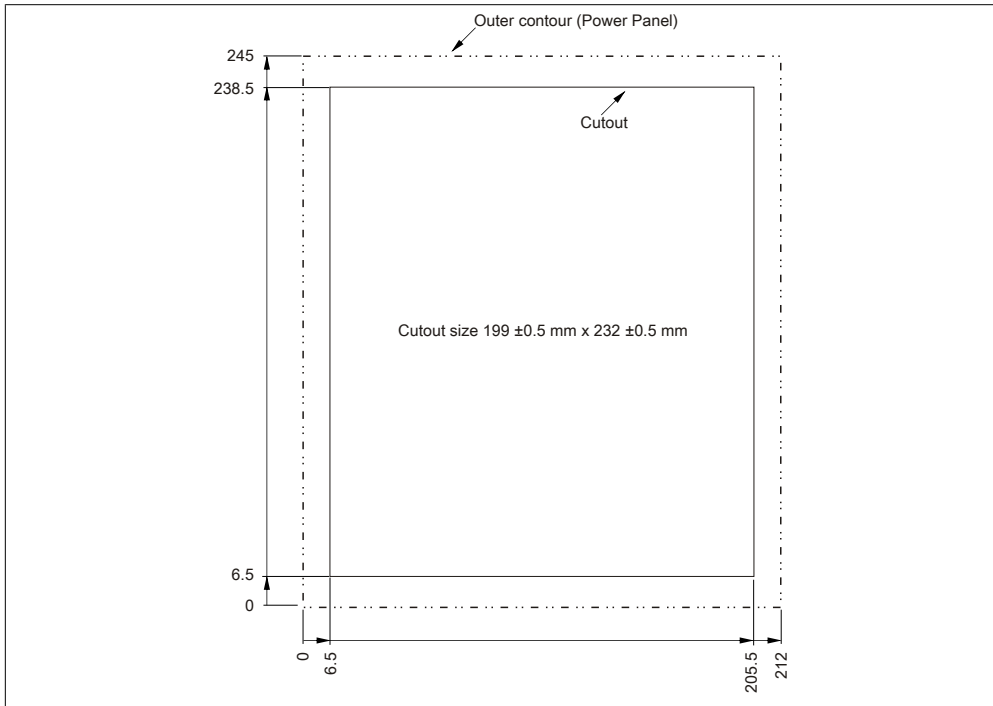


Image 14: 5PP551.0573-00 - Cutout installation

3.1.1.4 5PP552.0573-00

3.1.1.4.1 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

3.1.1.4.2 Order data

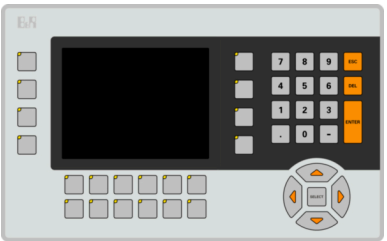
Model number	Short description	Figure
5PP552.0573-00	Power Panel 552 5.7" VGA TFT display; 20 function keys and 20 system keys; connections for 1x RS232, 2x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage separately (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 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 28: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 28: 5PP552.0573-00 - Order data

3.1.1.4.3 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	TBD
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
CompactFlash slot 1	
Type	Type I

Table 29: 5PP552.0573-00 - Technical data

Product ID	5PP552.0573-00
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	
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	TBD
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 29: 5PP552.0573-00 - Technical data

Product ID	5PP552.0573-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 29: 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.

3.1.1.4.4 Dimensions

TBD

3.1.1.4.5 Cutout

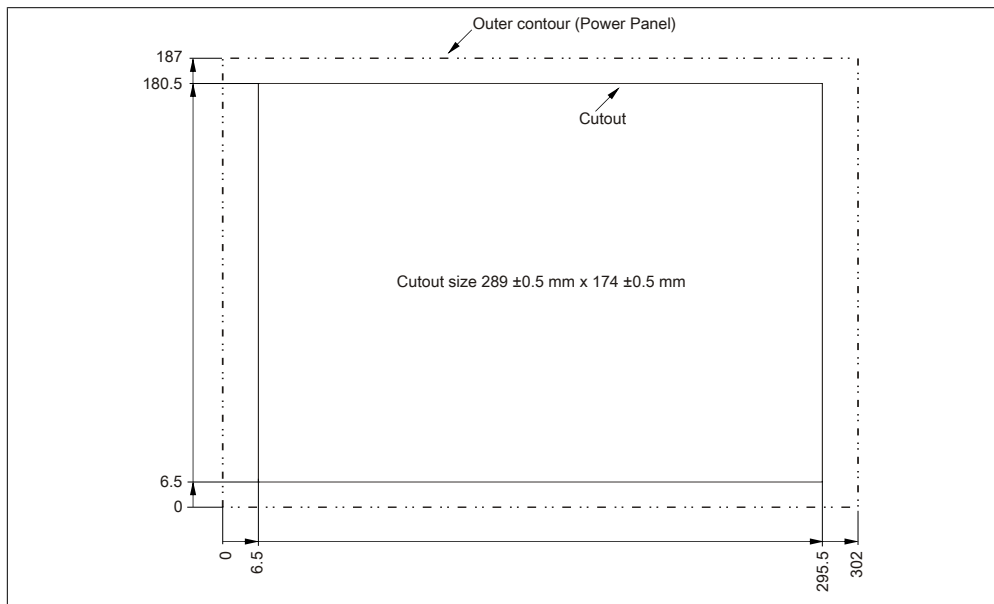


Image 15: 5PP552.0573-00 - Cutout installation

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 30: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 30: 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	TBD
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 31: 5PP520.0702-00 - Technical data

Product ID	5PP520.0702-00
CompactFlash slot 1 Type	Type I
USB Type Amount Design Transfer rate Current load	USB 2.0 2 Type A Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s) Max. 1 A per connection
Ethernet Amount Controllers Design Transfer rate	1 Intel 82574 Shielded RJ45 port 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 Vertical	Direction R / direction L = 70° Direction U / direction D = 60°
Background lighting Brightness Half-brightness time ²⁾	500 cd/m ² 50,000 h
Touch screen ³⁾ Type Technology Controllers Degree of transmission	AMT Analog, resistive B&R, serial, 12-bit 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
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 Storage Transport	0 to 55°C -20 to 60°C -20 to 60°C

Table 31: 5PP520.0702-00 - Technical data

Product ID	5PP520.0702-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 31: 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

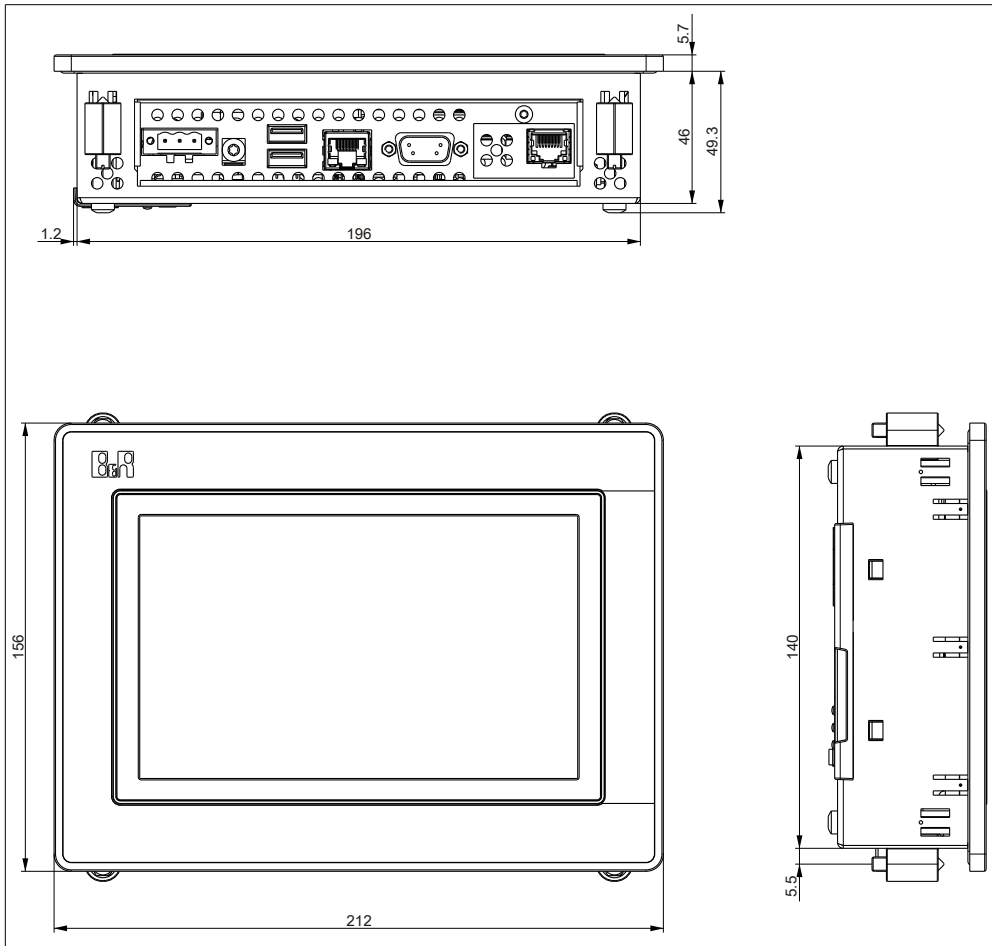


Image 16: 5PP520.0702-00 - Dimensions

3.1.2.1.5 Cutout

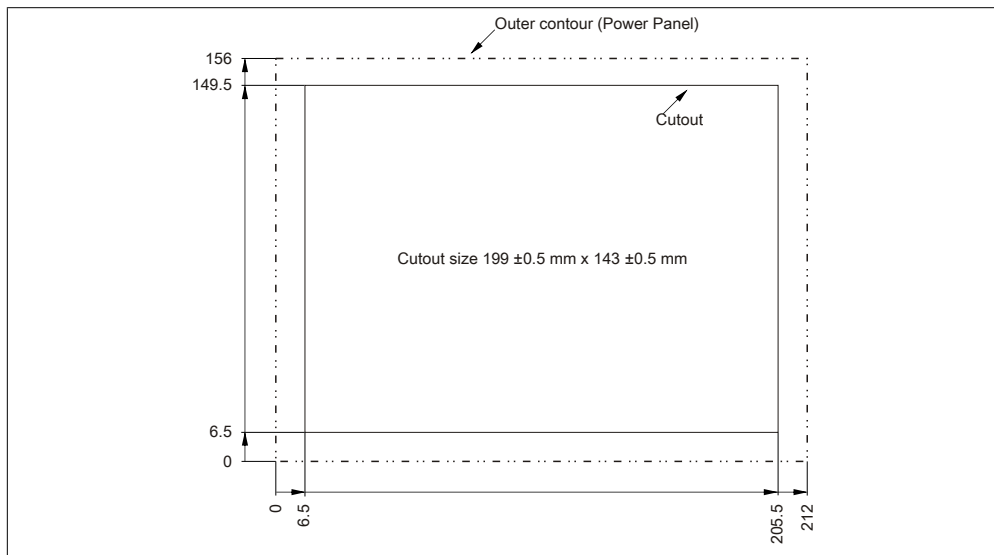


Image 17: 5PP520.0702-00 - Cutout installation

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 32: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 32: 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	TBD
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 33: 5PP520.1043-00 - Technical data

Product ID	5PP520.1043-00
CompactFlash slot 1 Type	Type I
USB Type Amount Design Transfer rate Current load	USB 2.0 3 Type A Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s) Max. 1 A per connection
Ethernet Amount Controllers Design Transfer rate	1 Intel 82574 Shielded RJ45 port 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 Vertical	Direction R / direction L = 80° Direction U = 60° / direction D = 80°
Background lighting Brightness Half-brightness time ²⁾	450 cd/m ² 50,000 h
Touch screen ³⁾ Type Technology Controllers Degree of transmission	AMT Analog, resistive B&R, serial, 12-bit 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
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 Storage Transport	0 to 55°C -20 to 60°C -20 to 60°C

Table 33: 5PP520.1043-00 - Technical data

Product ID	5PP520.1043-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 33: 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

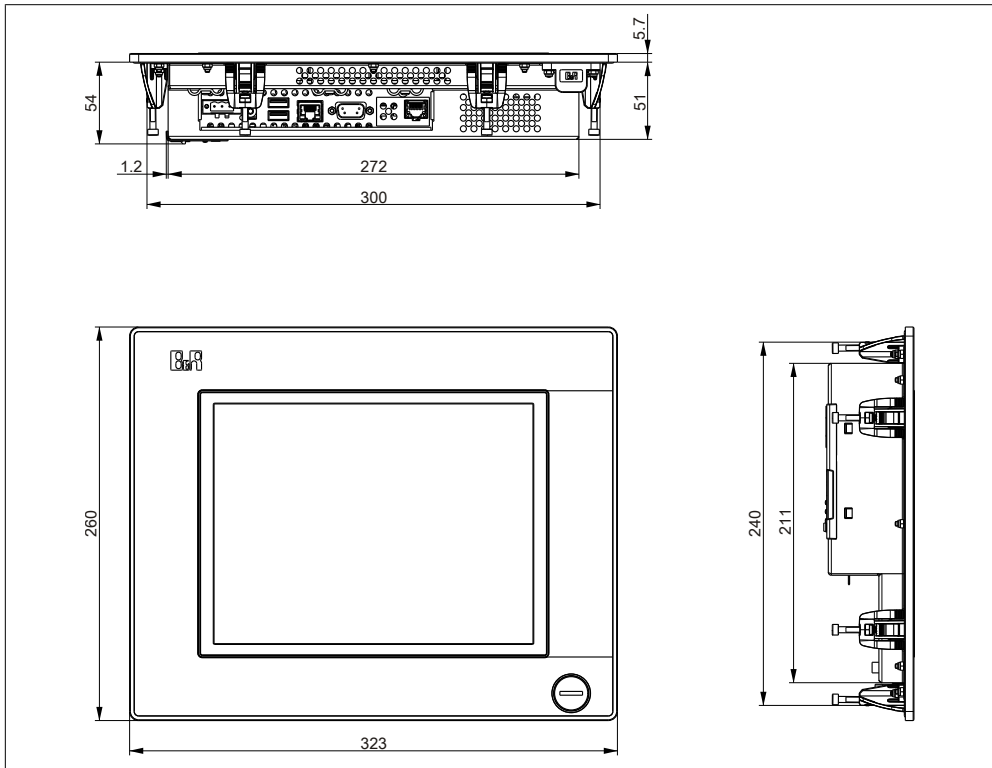


Image 18: 5PP520.1043-00 - Dimensions

3.1.3.1.5 Cutout

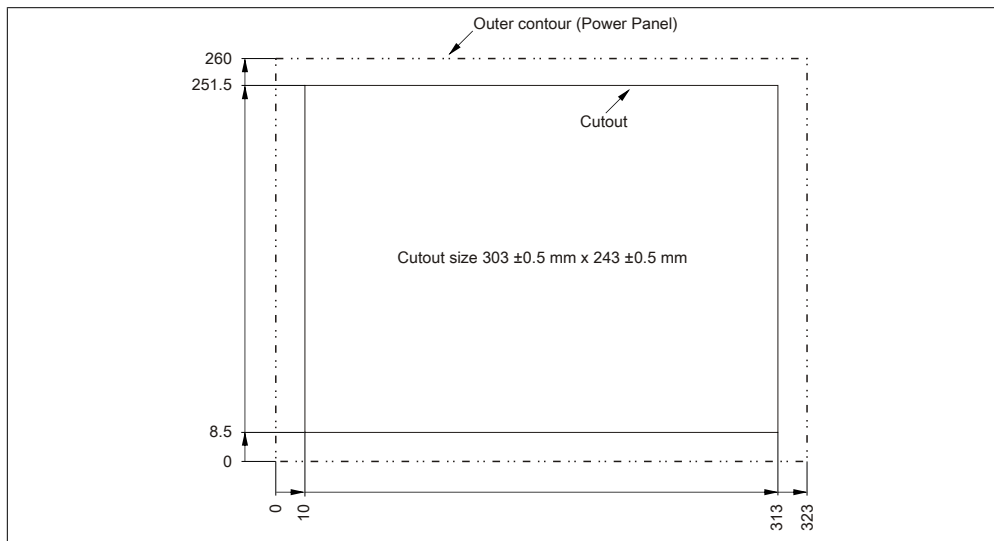


Image 19: 5PP520.1043-00 - Cutout installation

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 34: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 34: 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	
Type	Renata 950 mAh
Method	Lithium Ion
Lifespan	TBD
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
CompactFlash slot 1	
Type	Type I

Table 35: 5PP580.1043-00 - Technical data

Product ID	5PP580.1043-00
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	
Brightness	450 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	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	TBD
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 35: 5PP580.1043-00 - Technical data

Product ID	5PP580.1043-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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	TBD

Table 35: 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

TBD

3.1.3.2.5 Cutout

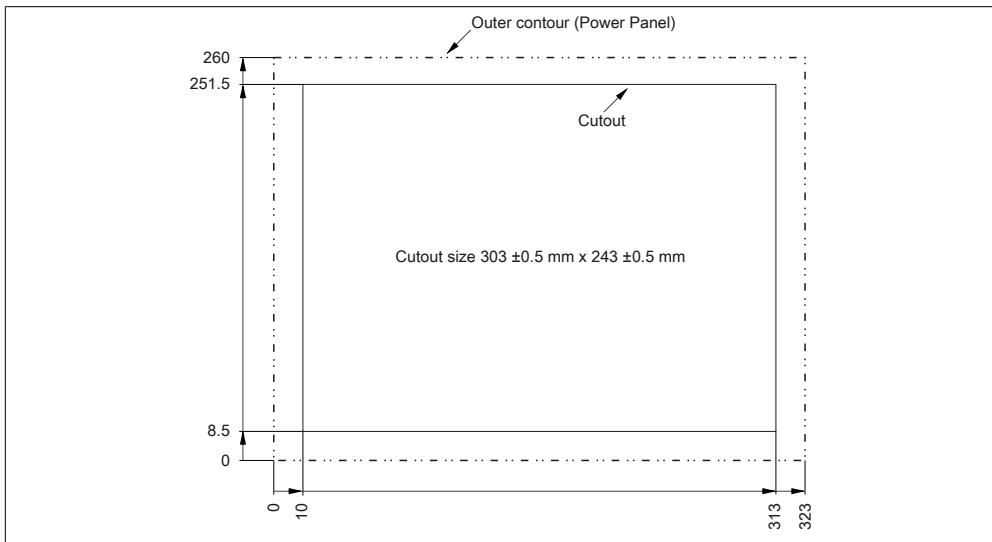


Image 20: 5PP580.1043-00 - Cutout installation

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

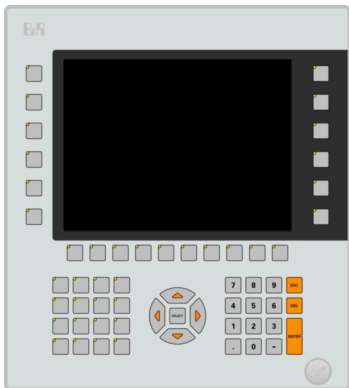
Model number	Short description	Figure
5PP581.1043-00	Power Panel 581 10.4" VGA TFT display with touch screen (resistive); 38 function keys and 20 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDCm 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 36: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 36: 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	TBD
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
CompactFlash slot 1	
Type	Type I

Table 37: 5PP581.1043-00 - Technical data

Product ID	5PP581.1043-00
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	
Brightness	450 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	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	TBD
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 37: 5PP581.1043-00 - Technical data

Product ID	5PP581.1043-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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	TBD

Table 37: 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

TBD

3.1.3.3.5 Cutout

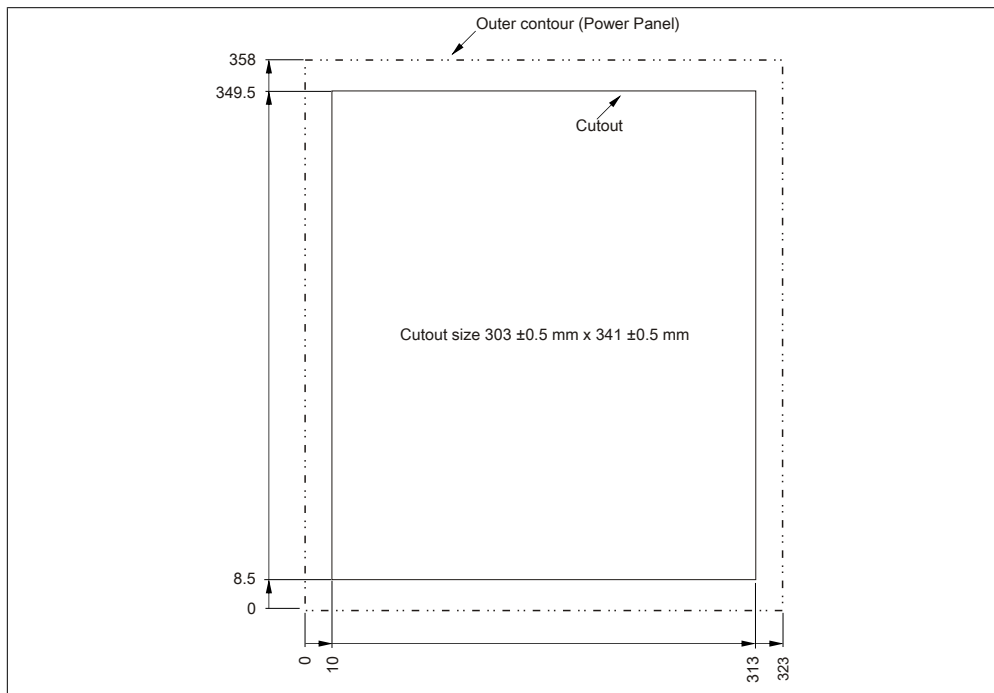


Image 21: 5PP581.1043-00 - Cutout installation

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

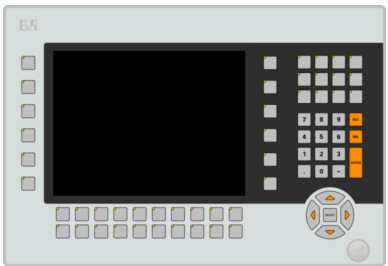
Model number	Short description	Figure
5PP582.1043-00	Power Panel 582 10.4" VGA TFT display with touch screen (resistive); 44 function keys and 20 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC 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 38: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 38: 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	TBD
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
CompactFlash slot 1	
Type	Type I

Table 39: 5PP582.1043-00 - Technical data

Product ID	5PP582.1043-00
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	
Brightness	450 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	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	TBD
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 39: 5PP582.1043-00 - Technical data

Product ID	5PP582.1043-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 39: 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

TBD

3.1.3.4.5 Cutout

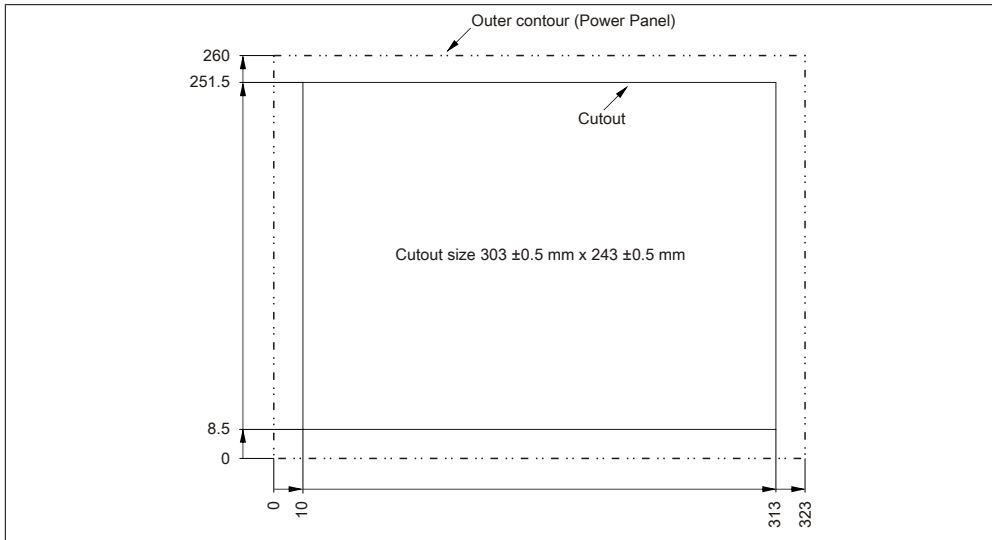


Image 22: 5PP582.1043-00 - Cutout installation

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

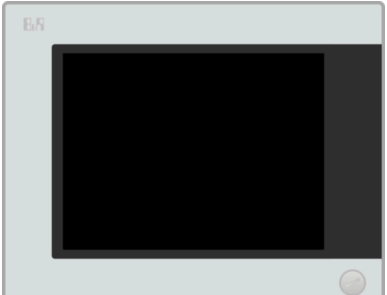
Model number	Short description	Figure
	System units	
5PP520.1214-00	Power Panel 520 12.1" SVGA TFT display with touch screen (resistive); connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage 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 40: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 40: 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	TBD
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 41: 5PP520.1214-00 - Technical data

Product ID	5PP520.1214-00
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	
Brightness	450 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	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
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

Table 41: 5PP520.1214-00 - Technical data

Product ID	5PP520.1214-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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	TBD

Table 41: 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

TBD

3.1.4.1.5 Cutout

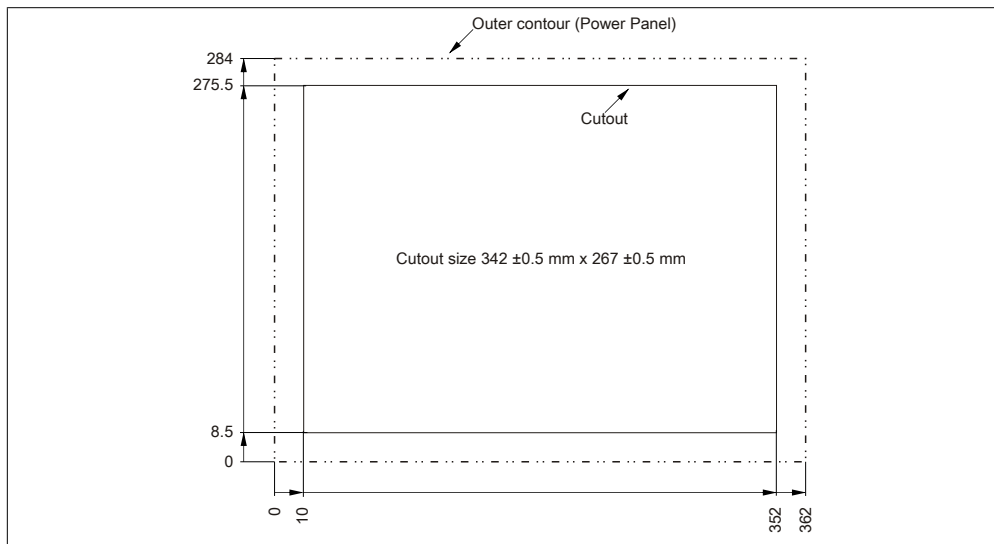


Image 23: 5PP520.1214-00 - Cutout installation

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 42: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
USB Accessories		
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 42: 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	TBD
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 43: 5PP520.1505-00 - Technical data

Product ID	5PP520.1505-00
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	
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	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	Component-dependent
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

Table 43: 5PP520.1505-00 - Technical data

Product ID	5PP520.1505-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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 43: 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

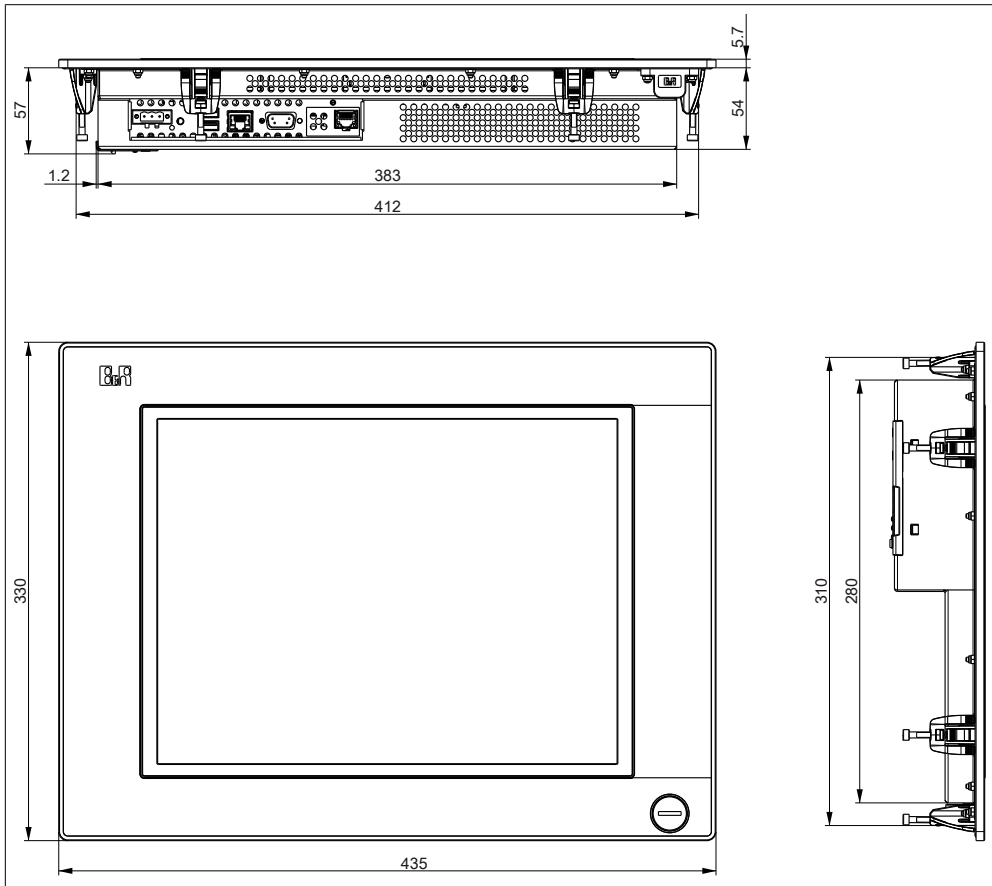


Image 24: 5PP520.1505-00 - Dimensions

3.1.5.1.5 Cutout

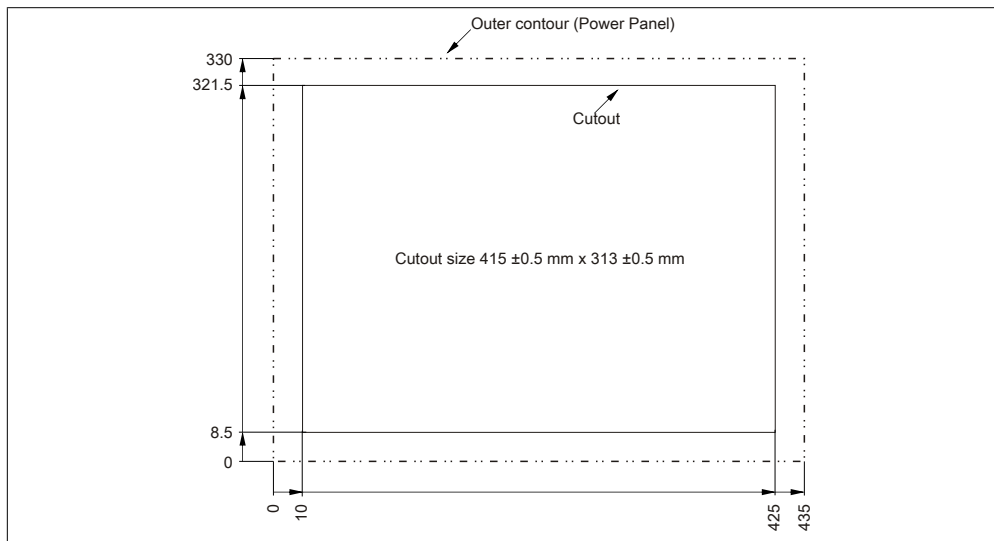


Image 25: 5PP520.1505-00 - Cutout installation

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

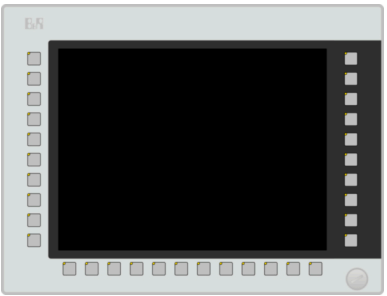
Model number	Short description	Figure
5PP580.1505-00	Power Panel 580 15" XGA TFT display with touch screen (resistive); 32 function keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC plug for supply voltage 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 44: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 44: 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	TBD
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
CompactFlash slot 1	
Type	Type I

Table 45: 5PP580.1505-00 - Technical data

Product ID	5PP580.1505-00
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	
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	1.5 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 45: 5PP580.1505-00 - Technical data

Product ID	5PP580.1505-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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	TBD

Table 45: 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

TBD

3.1.5.2.5 Cutout

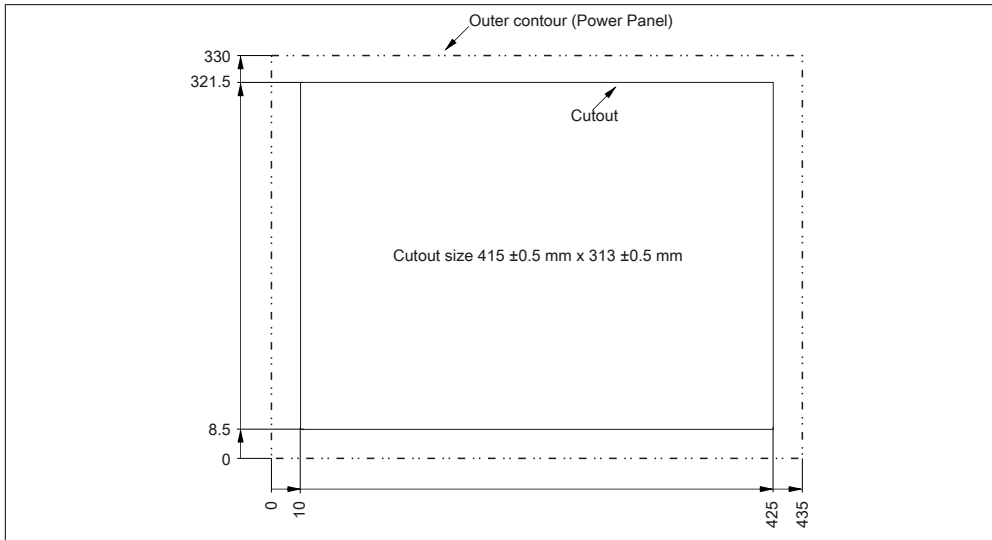


Image 26: 5PP580.1505-00 - Cutout installation

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

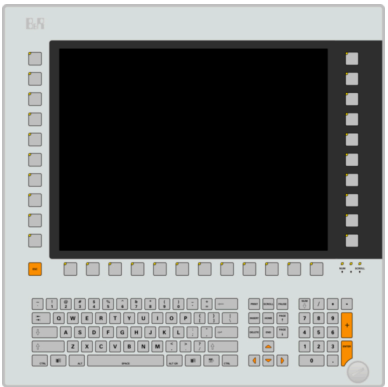
Model number	Short description	Figure
5PP581.1505-00	Power Panel 581 15" XGA TFT display with touch screen (resistive); 32 function keys and 92 system keys; connections for 1x RS232, 3x USB 2.0, 1x Ethernet 10/100/1000; can be expanded with interface board; IP65 protection (front side); order 24 VDC 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 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	

Table 46: 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.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	
	USB Accessories	
5MMUSB.2048-01	USB 2.0 Memory Stick 2048 MB B&R	

Table 46: 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	TBD
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
CompactFlash slot 1	
Type	Type I

Table 47: 5PP581.1505-00 - Technical data

Product ID	5PP581.1505-00
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	
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	1.5 A
Starting current	Typ. 3 A, max. 50 A for <300 µs
Power consumption	Component-dependent
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	TBD
Storage	TBD
Transport	TBD

Table 47: 5PP581.1505-00 - Technical data

Product ID	5PP581.1505-00
Relative humidity	
Operation	TBD
Storage	TBD
Transport	TBD
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	TBD

Table 47: 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

TBD

3.1.5.3.5 Cutout

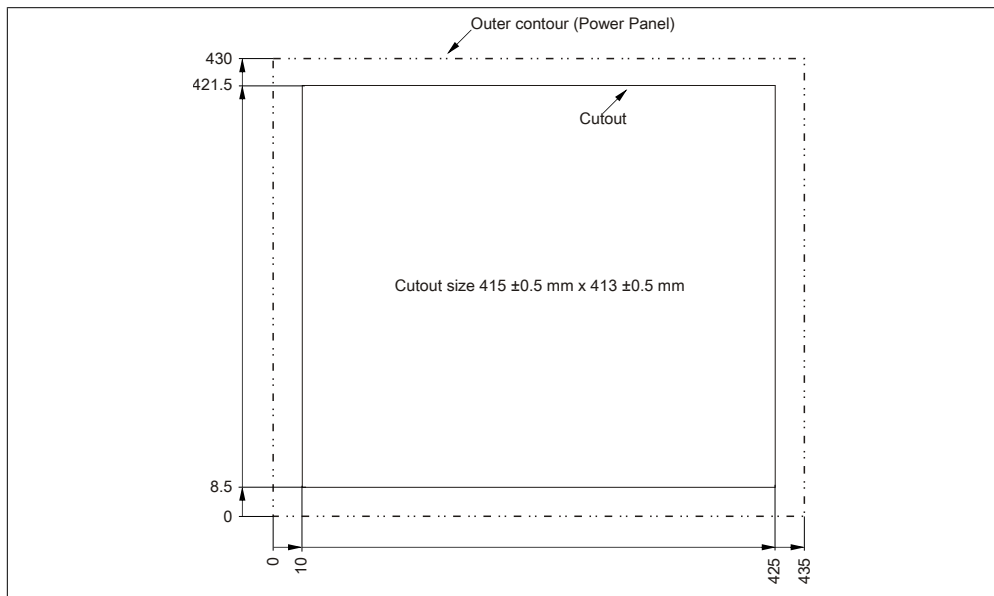


Image 27: 5PP581.1505-00 - Cutout installation

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

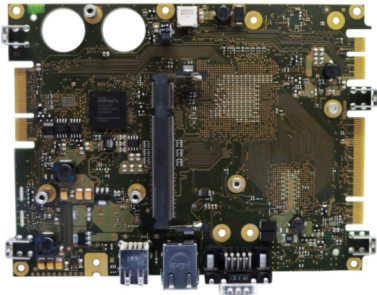
Model number	Short description	Figure
	CPU boards	
5PP5CP.US15-00	PP500 CPU board Intel Atom Z510, 1100 MHz, 400 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket for SO-DIMM DDR2 RAM module	
5PP5CP.US15-01	PP500 CPU board Intel Atom Z520, 1330 MHz, 533 MHz FSB, 512 kB L2 cache; chipset US15W; 1 socket 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 48: 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		TBD	
Battery-buffered		Yes	
Memory socket			
Type	DDR2		
Size	Max. 2 GB		
Graphics			
Controllers	Intel® Graphics Media Accelerator 500		
Memory	Up to 256 MB ¹⁾		
Color depth	Max. 32-bit		
Resolution			
GE1 = LVDS ²⁾	Depends on the system unit used		
Power management	ACPI 3.0		

Table 49: 5PP5CP.US15-00, 5PP5CP.US15-01, 5PP5CP.US15-02 - Technical data

1) Allocated in main memory.

2) 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 50: 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 51: 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

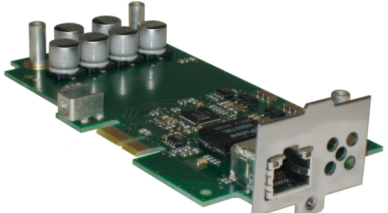
Model number	Short description	Figure
	Interface boards	
5PP5IF.CETH-00	PP500 Interface board; connection for 1x Ethernet 10/100/1000	

Table 52: 5PP5IF.CETH-00 - Order data

3.4.1.3 Technical data

Product ID	5PP5IF.CETH-00
General information	
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

Table 53: 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)	

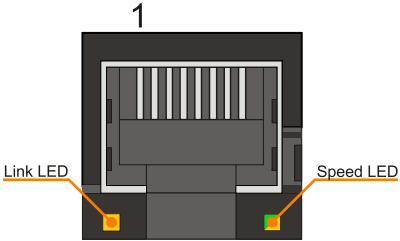


Table 54: 5PP5IF.CETH-00 - Ethernet connection

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

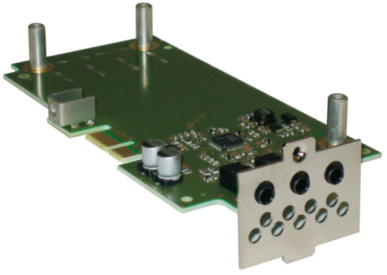
Model number	Short description	Figure
Interface boards		
5PP5IF.CHDA-00	PP500 Interface board; connection for 1x HDA sound	

Table 55: 5PP5IF.CHDA-00 - Order data

3.4.2.3 Technical data

Product ID	5PP5IF.CHDA-00
General information	
Certification CE	In preparation
Interfaces	
Audio	
Type	HDA Sound
Controllers	Realtek ALC 662
Inputs	Microphone, Line in
Outputs	Line Out

Table 56: 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 57: 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

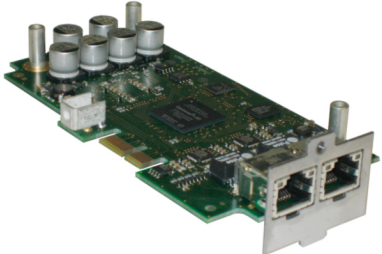
Model number	Short description	Figure
	Interface boards	
5PP5IF.FPLM-00	PP500 Interface board; connections for 2x POWER-LINK	

Table 58: 5PP5IF.FPLM-00 - Order data

3.4.3.3 Technical data

Product ID	5PP5IF.FPLM-00
General information	
Certification CE	In preparation
Controllers	
SRAM Size	512 kB
Interfaces	
POWERLINK Amount Design	2 Shielded RJ45 port

Table 59: 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)

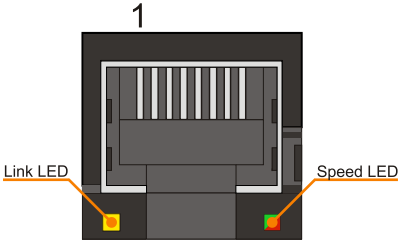


Table 60: POWERLINK Interface Board 2port connection

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 61: 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).
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).

Table 62: Status/Error LED as status LED - POWERLINK operating mode

Green - status	Description
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 62: Status/Error LED as status LED - POWERLINK operating mode

3.5 I/O boards

Info:

Installation and replacement of I/O boards **ONLY** possible at the B&R plant.

3.5.1 5PP5IO.GNAC-00

3.5.1.1 General information

The PP500 I/O board 5PP5IO.GNAC-00 has 1x RS232/422/485 interface, 1x USB 2.0 port, 1x HDA sound connection and 1x Smart Display Link/DVI socket. The I/O board can be connected to and operated on Power Panel 500 devices with an I/O board slot.

- 2x USB 2.0
- 1x RS232/422/485
- 1x HDA Sound
- 1x Smart Display Link/DVI
- mounting compatible in PP500

3.5.1.2 Order data

Model number	Short description	Figure
5PP5IO.GNAC-00	PP500 I/O Board; connections for 1x USB 2.0, 1x RS232/422/485, HDA Sound, Smart Display Link/DVI/Monitor	

Table 63: 5PP5IO.GNAC-00 - Order data

3.5.1.3 Technical data

Product ID	5PP5IO.GNAC-00
General information	
Certification CE	In preparation
Interfaces	
COM1 Type Design UART Max. baud rate	RS232/422/485 9-pin DSUB plug 16550-compatible, 16-byte FIFO 115 kbit/s

Table 64: 5PP5IO.GNAC-00 - Technical data

Product ID	5PP5IO.GNAC-00
USB	
Amount	1
Design	Type A
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Panel/Monitor interface	
Design	DVI-I socket
Type	SDL/DVI
Audio	
Type	HDA Sound
Inputs	Microphone, Line in
Outputs	Line Out

Table 64: 5PP5IO.GNAC-00 - Technical data

3.5.1.3.1 Panel connection - SDL (Smart Display Link / DVI)

Panel connection - SDL (Smart Display Link / DVI)		
The following will provide an overview of the video signals available on the monitor/panel output. For details, see technical data for the CPU board being used.		
CPU board	Video signals with all system unit variations	
5PP5CP.US15-00	DVI, SDL	
5PP5CP.US15-01	DVI, SDL	
5PP5CP.US15-02	DVI, SDL	

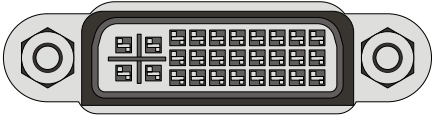


Table 65: Panel connection - DVI, SDL

3.5.1.3.2 Serial interface COM

Serial interface COM

	RS232	RS422/485
Type	RS232; not modem capable; electrically isolated	
UART	16550-compatible, 16-byte FIFO	
Transfer rate	Max. 115 kbit/s	
Bus length	Max. 15 m	Max. 1200 m
Pin	Assignments (RS232)	Assignments (RS422)
1	n.c.	TXD\
2	RXD	n.c.
3	TXD	n.c.
4	n.c.	TXD
5	GND	GND
6	n.c.	RXD\
7	RTS	n.c.
8	CTS	n.c.
9	n.c.	RXD

9-pin DSUB plug

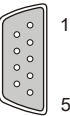


Table 66: Pin assignments - COM

3.5.1.3.3 I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	TBD	TBD
TBD	TBD	TBD

Table 67: RS232/422/485 - I/O address and IRQ

3.5.1.3.4 Bus length and cable type RS232

The maximum transfer rate of 115 kBit/s depends on the cable type being used.

Extension	Transfer rate
≤ 15 m	typ. 64 kbit/s
≤ 10 m	typ. 115 kbit/s
≤ 5 m	typ. 115 kbit/s

Table 68: RS232 - Bus length and transfer rate

The material used for the cable should preferably have all or most of the following properties in order to reach an optimal transfer rate.

RS232 cable	Property
Signal lines	
Cable cross section	4x 0.16 mm ² (26AWG), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 82 Ω/ km
Stranding	Wires stranded in pairs
Shielding	Paired shield with aluminum foil
Grounding line	
Cable cross section	1x 0,34 mm ² (22AWG/19), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 59 Ω/km
Outer sheathing	
Material	PUR mixture
Characteristics	Halogen free
Total shielding	From tinned cu wires

Table 69: RS232 - Cable requirements

3.5.1.3.5 RS422 - Bus length and cable type

The RTS line must be switched on to activate the sender.

The maximum transfer rate of 115 kBit/s depends on the cable type being used.

Extension	Transfer rate
1200 m	typ. 115 kbit/s

Table 70: RS422 - Bus length and transfer rate

The material used for the cable should preferably have all or most of the following properties in order to reach an optimal transfer rate.

RS422 cable	Property
Signal lines Cable cross section Wire insulation Conductor resistance Stranding Shielding	4x 0.25 mm ² (24AWG/19), tinned Cu wire PE ≤ 82 Ω/km Wires stranded in pairs Paired shield with aluminum foil
Grounding line Cable cross section Wire insulation Conductor resistance	1x 0.34 mm ² (22AWG/19), tinned Cu wire PE ≤ 59 Ω/km
Outer sheathing Material Characteristics Total shielding	PUR mixture Halogen free From tinned cu wires

Table 71: RS422 - Cable requirements

3.5.1.3.6 Operation as RS485 Interface

The pins of the RS422 default interface (1, 4, 6 and 9) should be used for operation. The pins should be connected as shown.

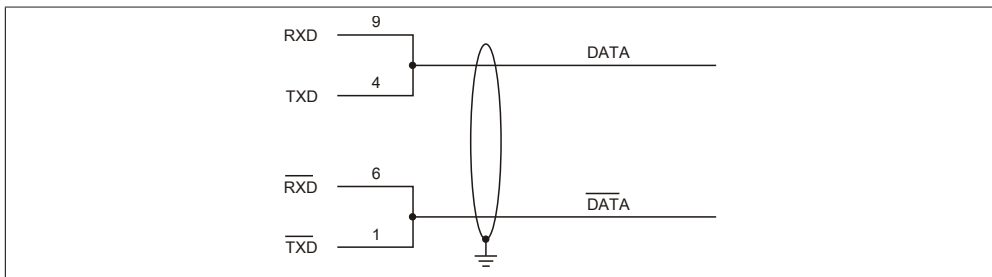


Image 28: RS232/422/485 interface - operated in RS485 mode

The RTS line must be switched each time the driver is sent and received; there is no automatic switch back. This cannot be configured in Windows.

The voltage drop caused by long line lengths can lead to greater potential differences between the bus stations, which can hinder communication. This can be improved by running ground wire with the others.

The line ends of the RS485 interface should (at least for longer line lengths or larger transfer rates) be closed. Normally a passive terminator can be used on the bus ends by connecting each of the signal lines with 120 Ω resistor.

3.5.1.3.7 RS485 - Bus length and cable type

The maximum transfer rate of 115 kBit/s depends on the cable type being used.

Extension	Transfer rate
1200 m	typ. 115 kbit/s

Table 72: RS485 - Bus length and transfer rate

The material used for the cable should preferably have all or most of the following properties in order to reach an optimal transfer rate.

RS485 cable	Property
Signal lines Cable cross section Wire insulation Stranding Shielding	4x 0.25 mm ² (24AWG/19), tinned Cu wire PE ≤ 82 Ω/km Wires stranded in pairs Paired shield with aluminum foil
Grounding line Cable cross section Wire insulation Conductor cross section	1x 0,34 mm ² (22AWG/19), tinned Cu wire PE ≤ 59 Ω/km
Outer sheathing Material Characteristics Total shielding	PUR mixture Halogen free From tinned cu wires

Table 73: RS485 - Cable requirements

3.5.1.3.8 USB Interface (USB1)

The PP500 I/O board 5PP5IO.GNAC-00 device has a USB 2.0 (Universal Serial Bus) host controller with multiple USB ports, one of which is on the outside for easy access.

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.

Universal Serial Bus (USB1) 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⁾ USB1	Max. 1 A	
Cable length	max. 5 m (without hub)	

Table 74: USB1 connection

1) The interfaces, etc. available on the I/O board 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. 1 A)

3.5.1.3.9 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 75: 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.

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".

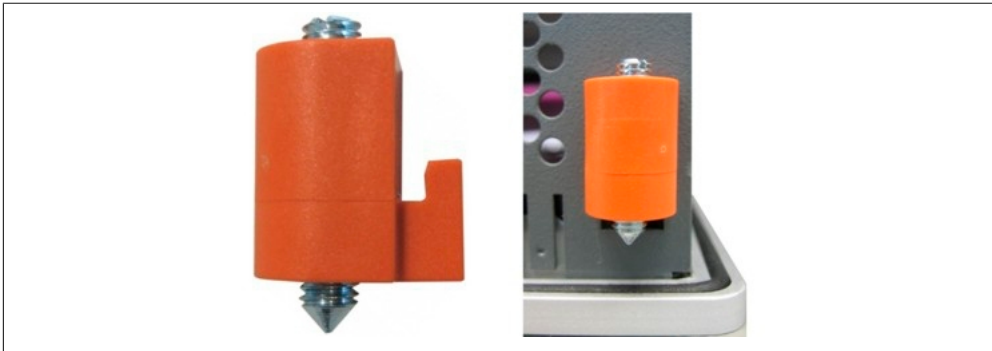


Image 29: Retaining clips

1.2 Mounting with terminal blocks

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

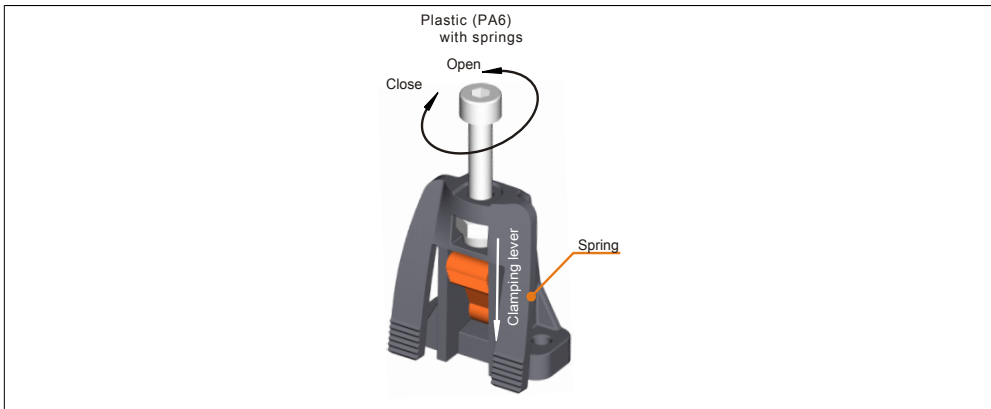


Image 30: Terminal block for the Power Panel 500

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 Touch screen calibration

B&R touch screen devices are equipped with a 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.

Regardless of this, the touch screen driver requires calibration following installation.

2.1 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 driver can be downloaded from the download area on the B&R homepage (www.br-automation.com). The touch screen should be calibrated during driver installation.

2.2 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 driver can be downloaded from the download area on the B&R homepage (www.br-automation.com). The touch screen should be calibrated during driver installation.

3 User tips for increasing the display lifespan

3.1 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.

3.1.1 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.

3.2 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.

3.2.1 What causes image sticking?

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

3.2.2 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

4 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 N0.12. 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.

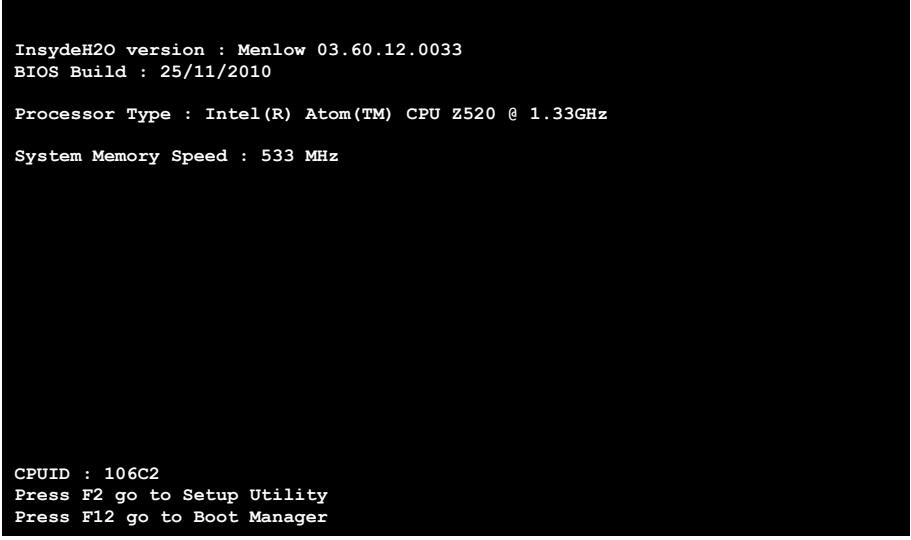
BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the Power On Self Test (POST).

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.



```
InsydeH2O version : Menlow 03.60.12.0033
BIOS Build : 25/11/2010

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

System Memory Speed : 533 MHz
```

```
CPUID : 106C2
Press F2 go to Setup Utility
Press F12 go to Boot Manager
```

Image 31: Bootscreen

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.

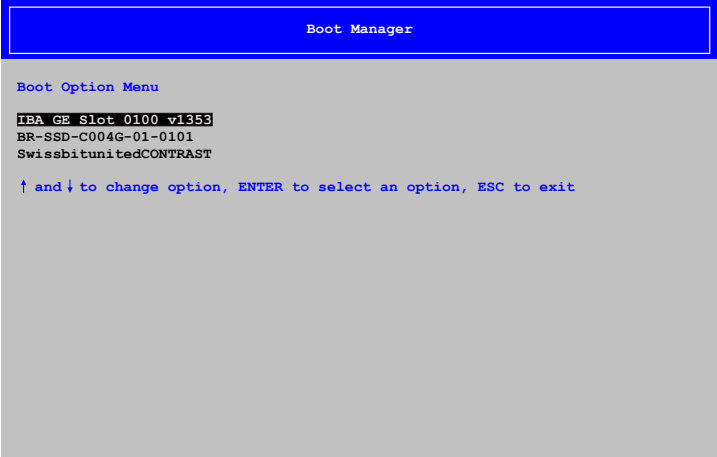
Keys	Function
F2	Enters the BIOS setup menu.
F12	Cues the boot menu. Lists all bootable devices that are connected to the system. Select the device to boot from with cursor ↑, cursor ↓ and <ENTER>. Use the ESC key to exit the boot menu. 
<Pause>	Pressing the <Pause> key stops the POST. Press any other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

Table 76: 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 77: 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.

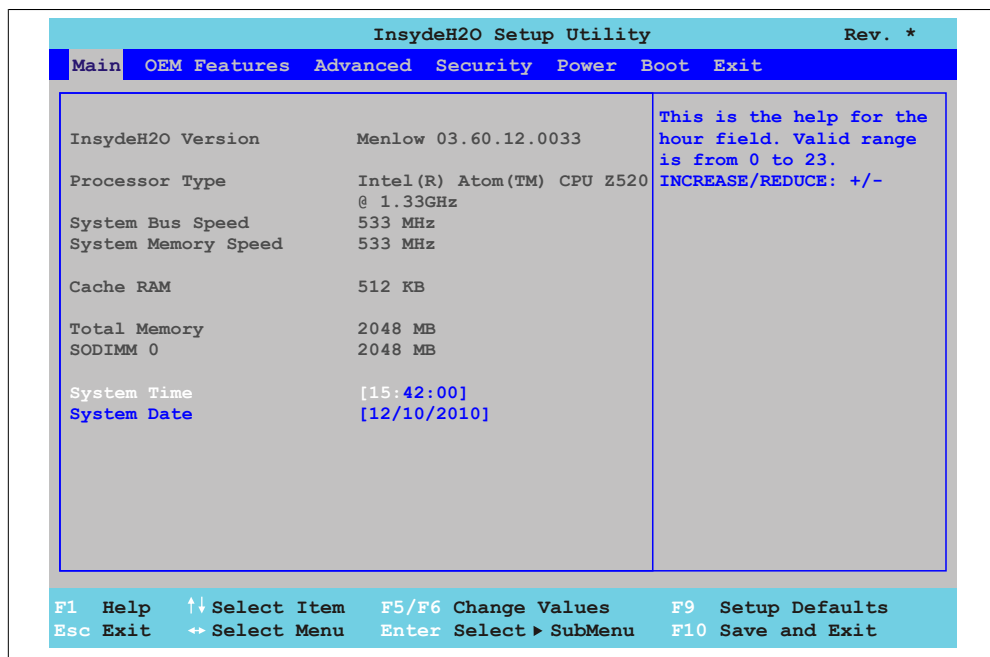


Image 32: US15W Main - Menu

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 78: US15W Main - Menu setting options

1.4 OEM Features

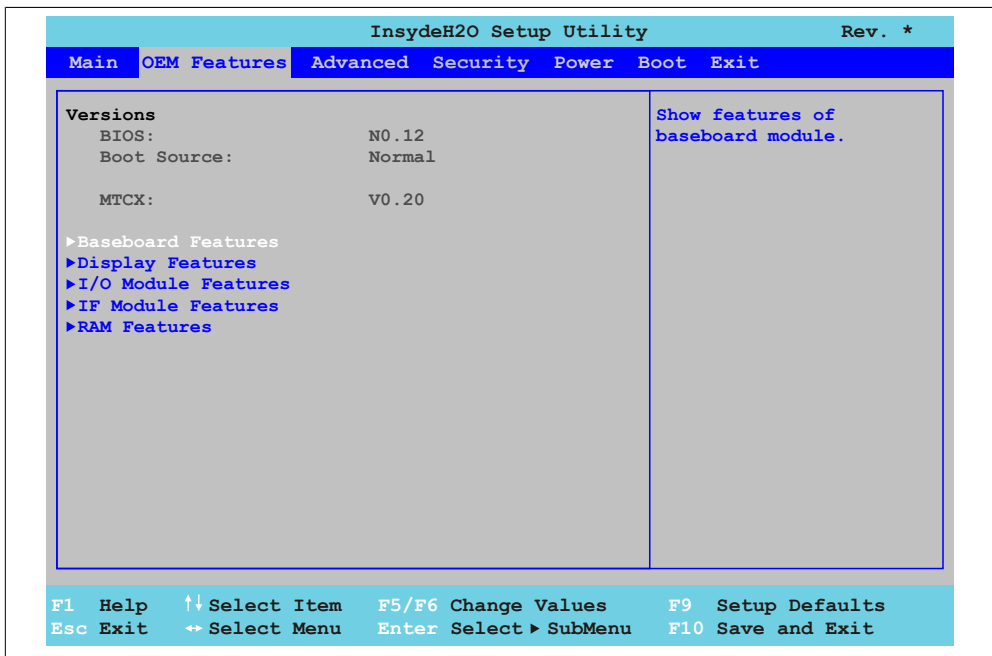


Image 33: US15W OEM Features - Menu

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: The PP500 will boot in BIOS Backup mode if the supply voltage connector is unplugged and the power and reset buttons are both pressed for 2 seconds while the supply voltage connector is plugged back into the Power Panel 500. This will load a second BIOS. If access to BIOS is prevented or if the BIOS update procedure is not executed properly, then we recommend booting with the BIOS Backup and performing the BIOS Update from there.
MTCX	Displays the MTCX version that is installed.	None	-
Baseboard Features	Displays device specific information and setup of device specific values.	Enter	Opens the submenu See "Baseboard Features", on page 141

Table 79: US15W OEM Features - Menu setting options

BIOS setting	Meaning	Setting options	Effect
Display Features	Configuration of the display features.	Enter	Opens the submenu See "Display Features", on page 145
I/O Module Features	Configuration of the I/O module features.	Enter	Opens the submenu See "IO Module Features", on page 149
IF Module Features	Configuration of the IF module features.	Enter	Opens the submenu See "IF Module Features", on page 151
RAM Features	Displays the RAM features.	Enter	Opens the submenu See "RAM Features", on page 153

Table 79: US15W OEM Features - Menu setting options

1.4.1 Baseboard Features

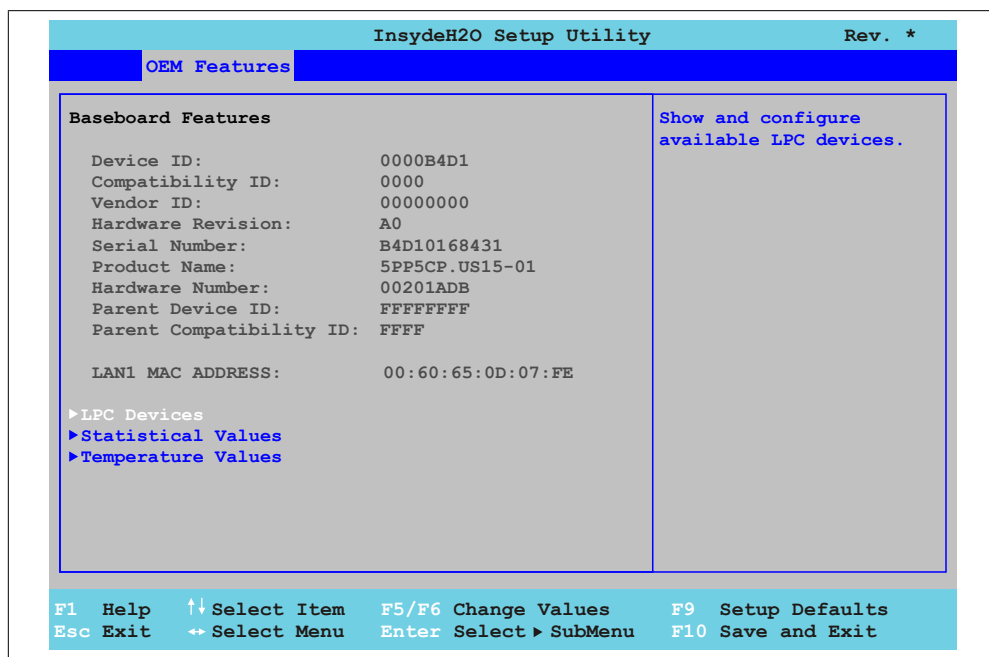


Image 34: US15W OEM Features - Baseboard Features

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	-

Table 80: US15W OEM Features - Baseboard Features setting options

BIOS setting	Meaning	Setting options	Effect
Hardware Number	Displays the CPU board hardware number.	None	-
Parent Device ID	Displays the manufacturer number.	None	-
Parent Compatibility 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 142
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 80: US15W OEM Features - Baseboard Features setting options

1.4.1.1 LPC Devices

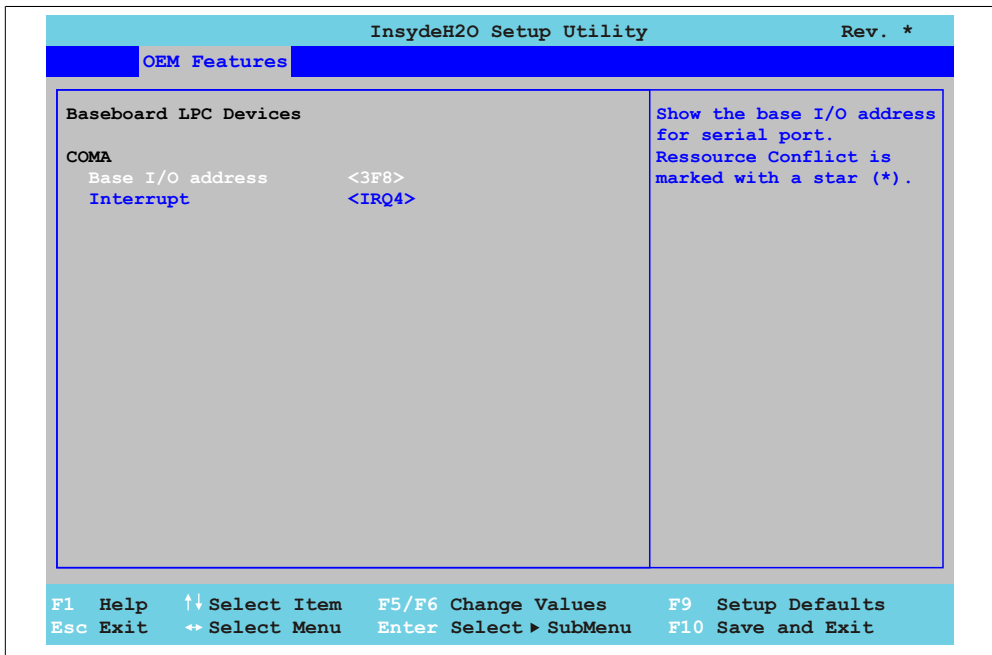


Image 35: US15W OEM Features - Baseboard Features - LPC Devices

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 81: 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

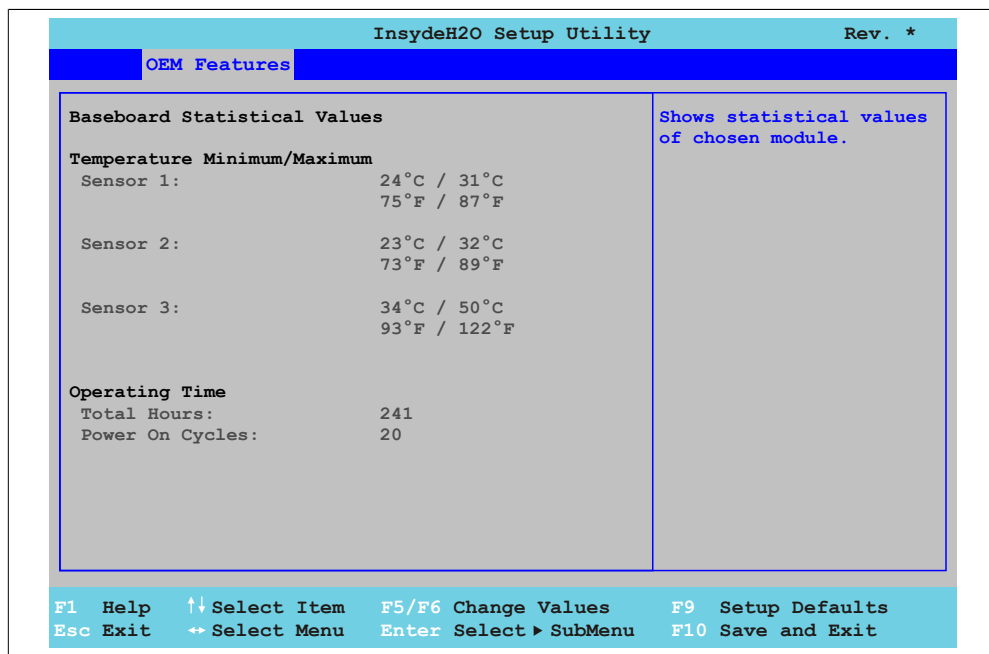


Image 36: US15W OEM Features - Baseboard Features - Statistical Values

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 82: US15W OEM Features - Baseboard Features - Statistical Values setting options

1.4.1.3 Temperature Values

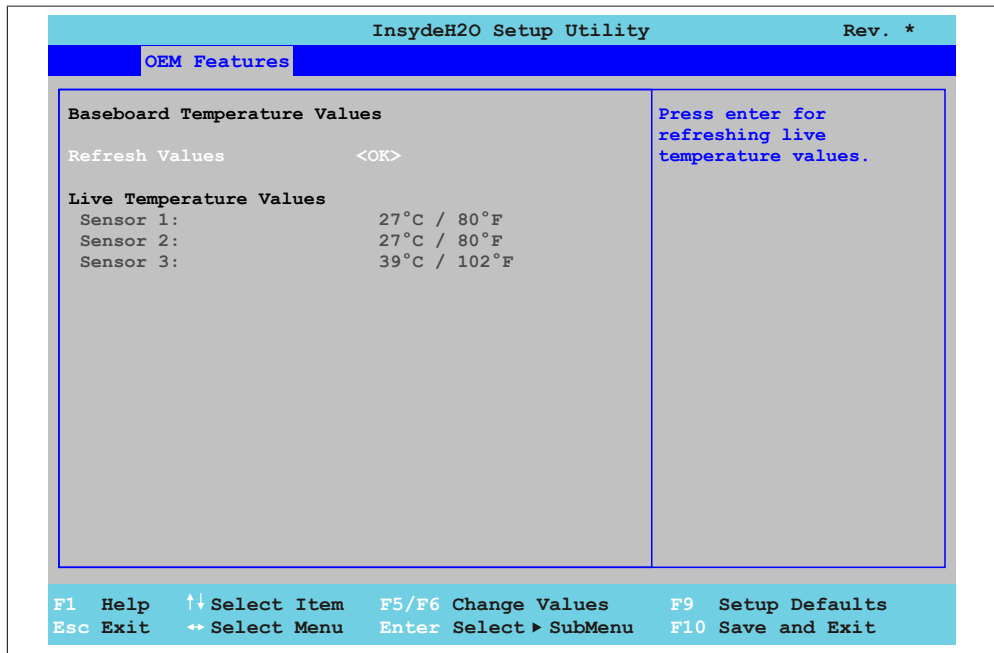


Image 37: US15W OEM Features - Baseboard Features - Temperature Values

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

Table 83: US15W OEM Features - Baseboard Features - Temperature Values setting options

BIOS setting	Meaning	Setting options	Effect
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 83: US15W OEM Features - Baseboard Features - Temperature Values setting options

1.4.2 Display Features

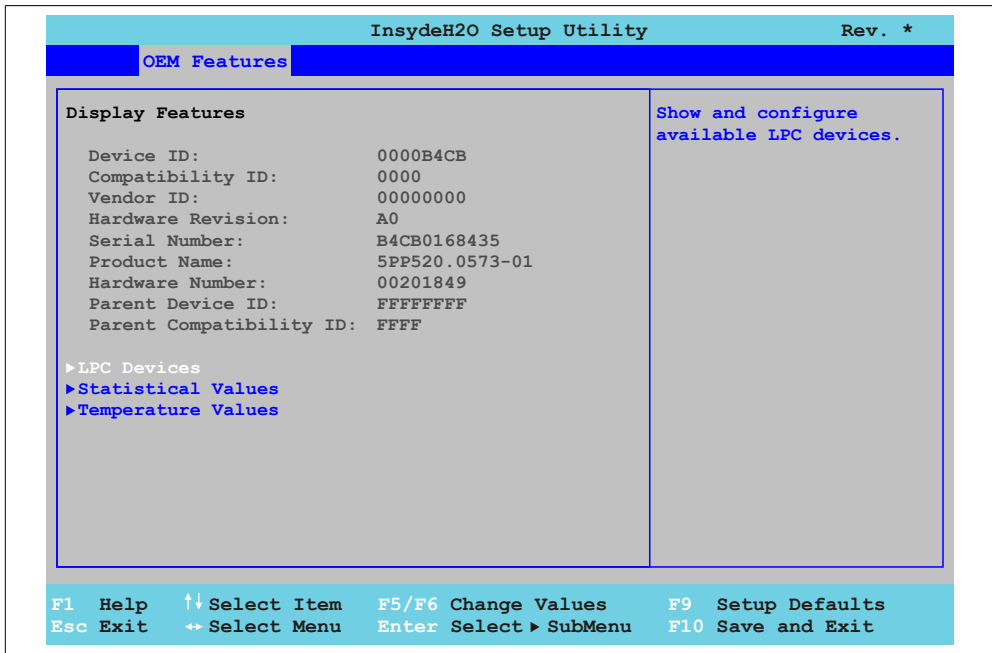


Image 38: US15W OEM Features - Display Features

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 Compatibility ID	Displays the manufacturer ID.	None	-

Table 84: US15W OEM Features - Display Features setting options

BIOS setting	Meaning	Setting options	Effect
LPC Devices	Configuration of the LPC Devices.	Enter	Opens the submenu See "LPC Devices", on page 146
Statistical Values	Displays the statistical values.	Enter	Opens the submenu See "Statistical Values", on page 147
Temperature Values	Displays the current temperature values.	Enter	Opens the submenu See "Temperature Values", on page 148

Table 84: US15W OEM Features - Display Features setting options

1.4.2.1 LPC Devices

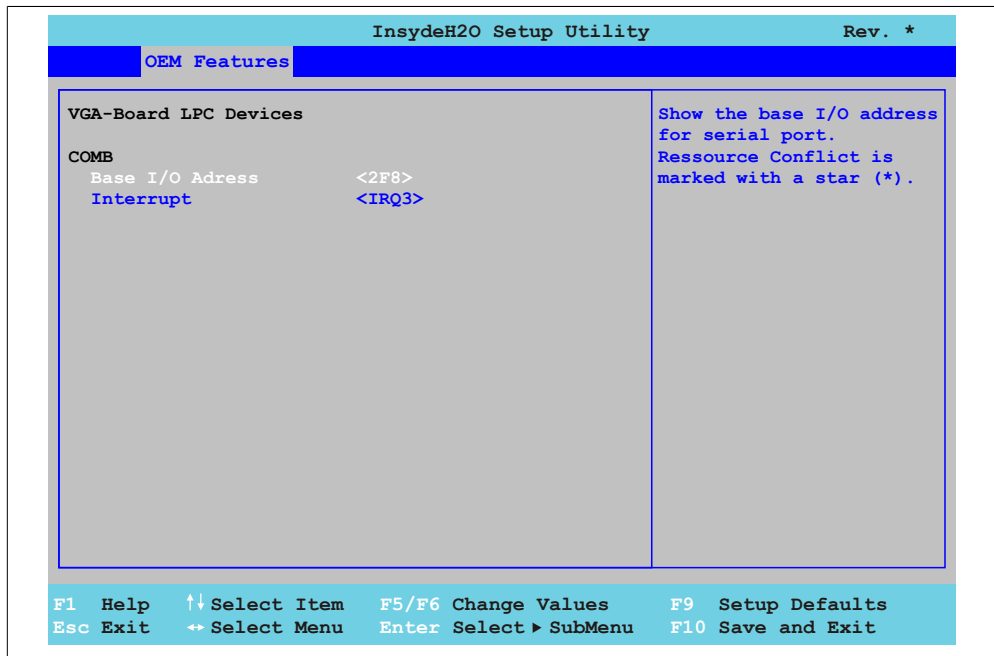


Image 39: US15W OEM Features - Display Features - LPC Devices

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 85: 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

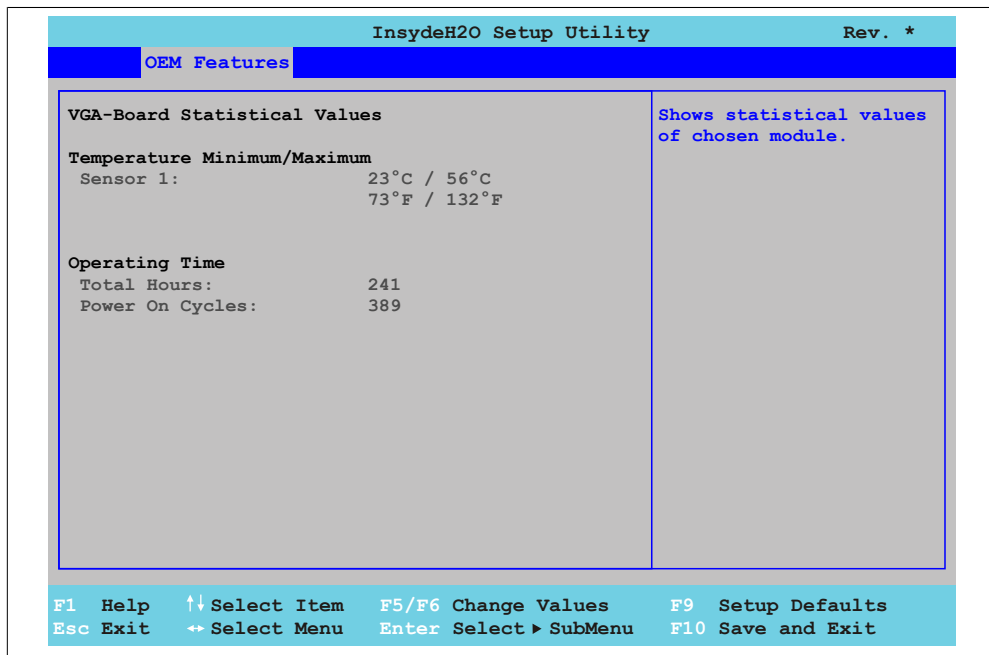


Image 40: US15W OEM Features - Display Features - Statistical Values

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 86: US15W OEM Features - Display Features - Statistical Values setting options

1.4.2.3 Temperature Values

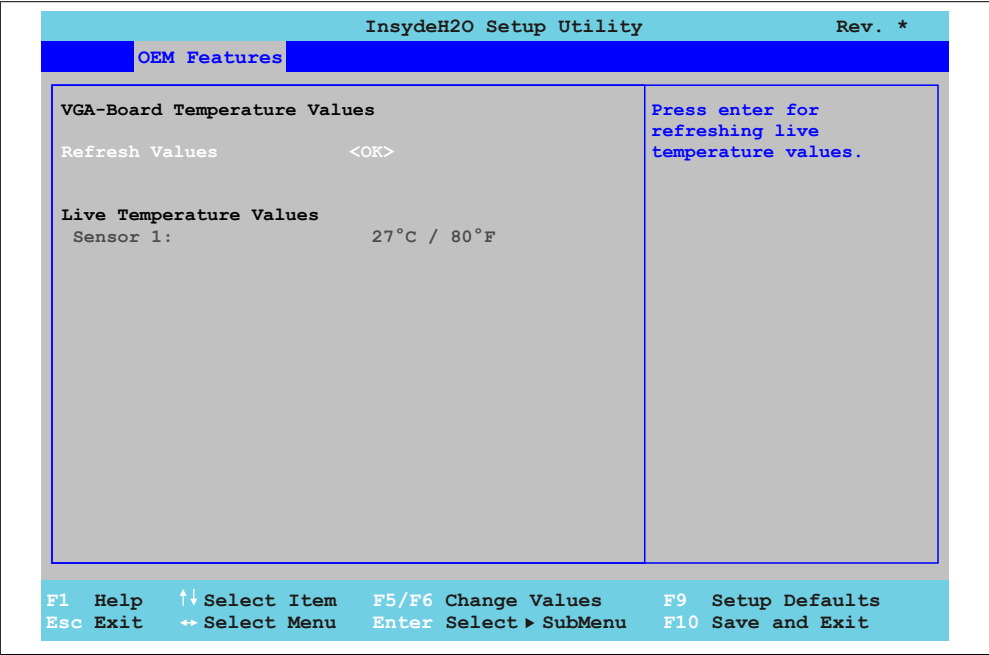


Image 41: US15W OEM Features - Display Features - Temperature Values

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 sensor temperature 1 in °C and °F.	None	-

Table 87: US15W OEM Features - Display Features - Temperature Values setting options

1.4.3 IO Module Features

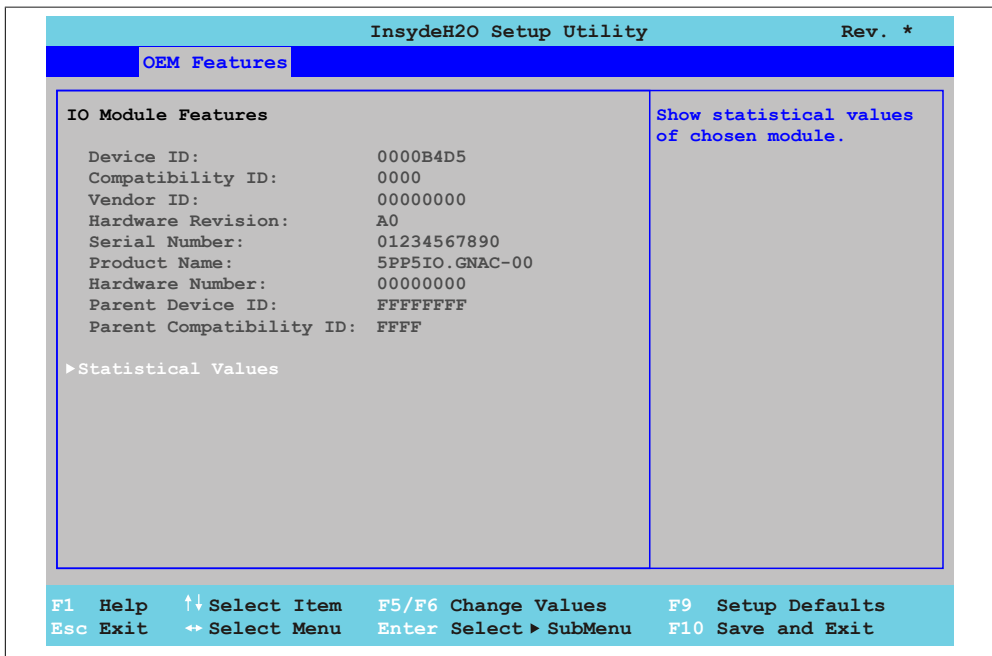


Image 42: US15W OEM Features - IO Module Features

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 Compatibility ID	Displays the manufacturer ID.	None	-
Statistical Values	Displays the statistical values.	Enter	Opens the submenu See "Statistical Values", on page 150

Table 88: US15W OEM Features - IO Module Features setting options

1.4.3.1 Statistical Values

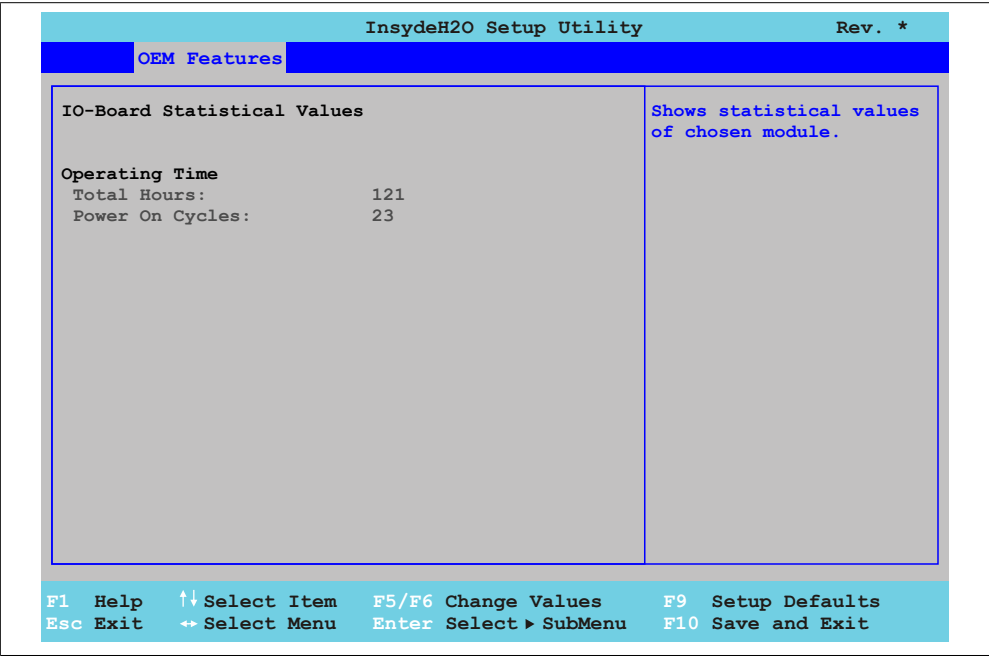


Image 43: US15W OEM Features - IO Module Features - Statistical Values

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 89: US15W OEM Features - IO Module Features - Statistical Values setting options

1.4.4 IF Module Features

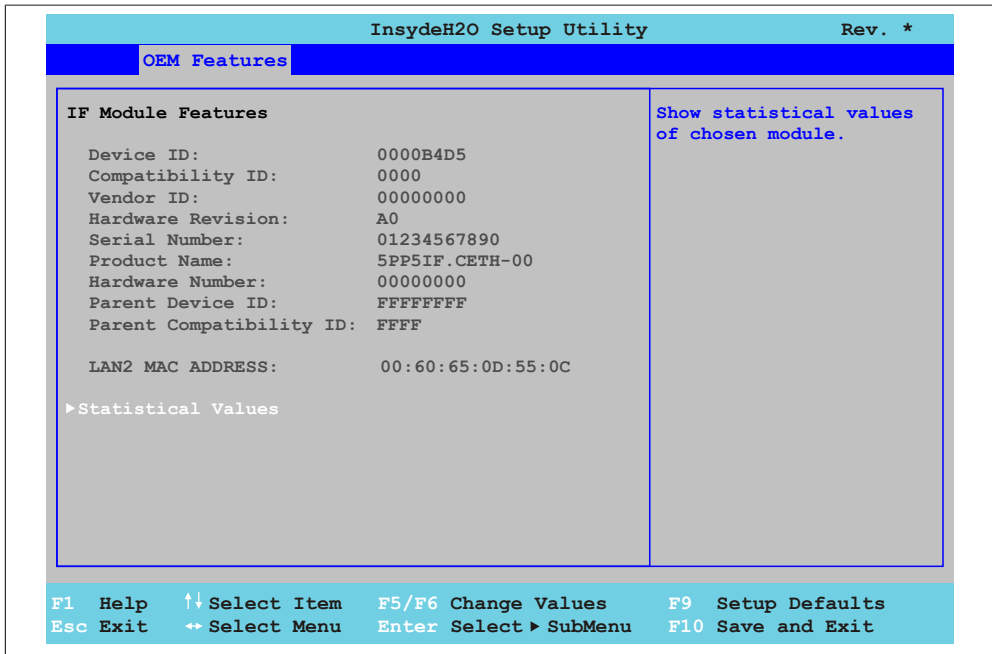


Image 44: US15W OEM Features - IF Module Features

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 Compatibility 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 152

Table 90: 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

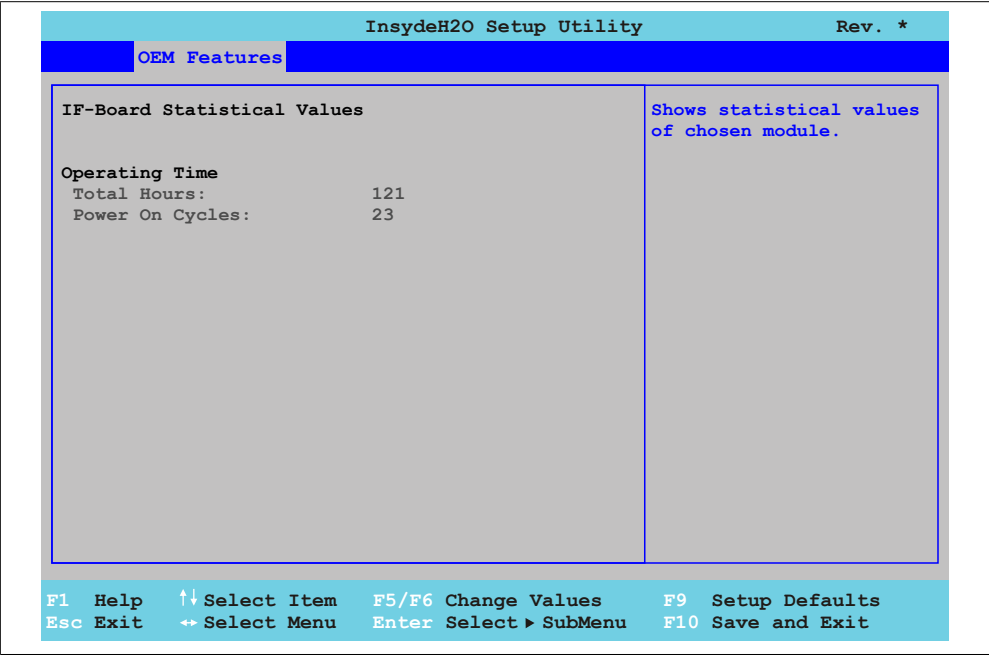


Image 45: US15W OEM Features - IF Module Features - Statistical Values

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 91: US15W OEM Features - IF Module Features - Statistical Values setting options

1.4.5 RAM Features

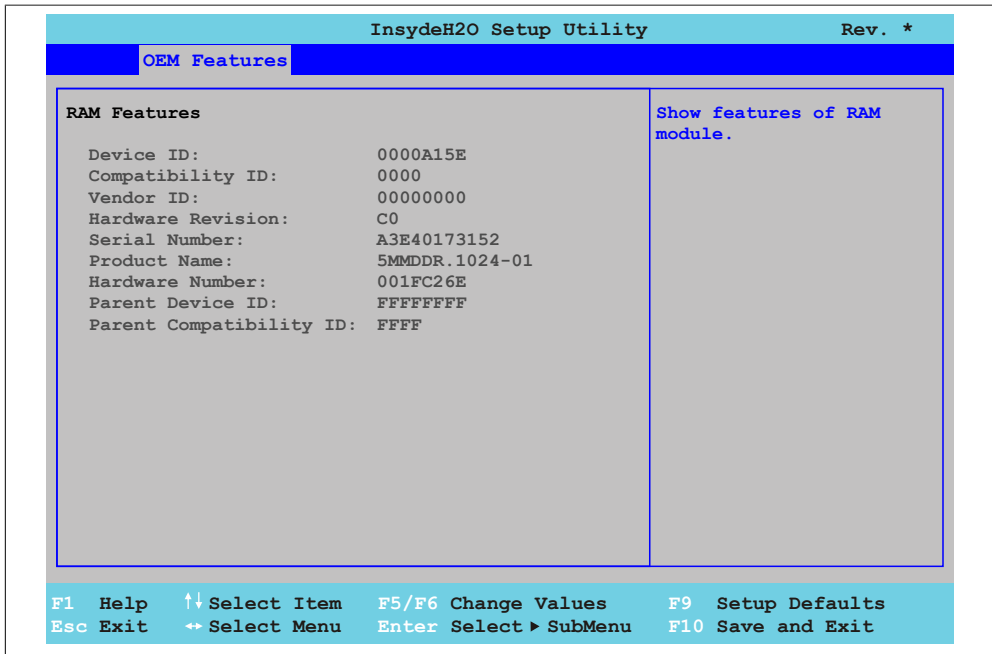


Image 46: US15W OEM Features - RAM Features

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 Compatibility ID	Displays the manufacturer ID.	None	-

Table 92: US15W OEM Features - RAM Features setting options

1.5 Advanced

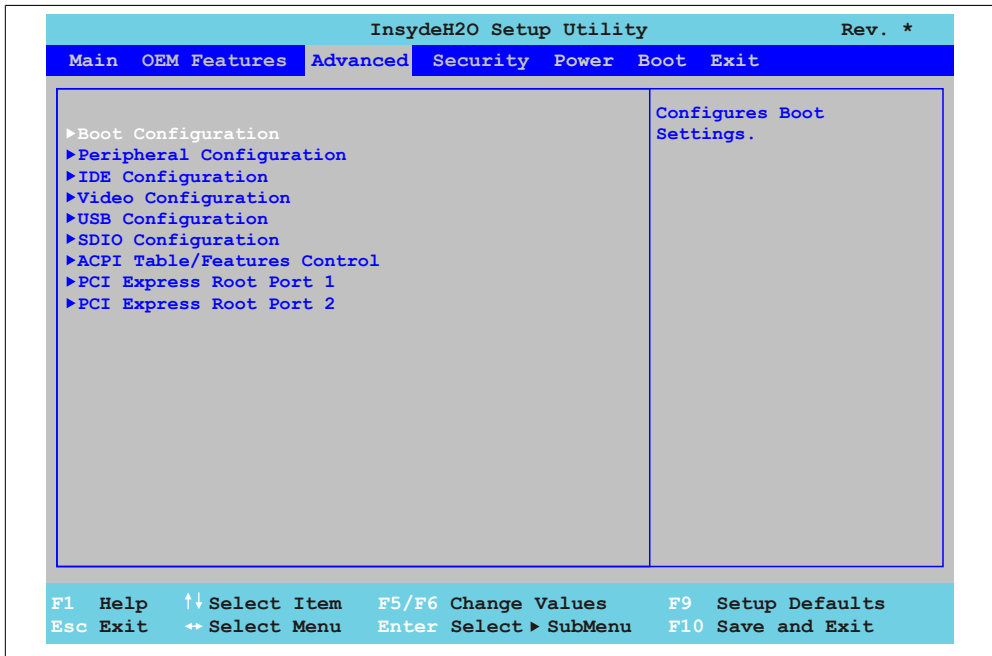


Image 47: US15W Advanced - Menu

BIOS setting	Meaning	Setting options	Effect
Boot Configuration	Configures the boot settings.	Enter	Opens the submenu See " Boot Configuration", on page 155
Peripheral Configuration	Configures the peripheral settings.	Enter	Opens the submenu See " Peripheral Configuration", on page 156
IDE Configuration	Configures the IDE functions.	Enter	Opens the submenu See " IDE Configuration", on page 157
Video Configuration	Configures the graphics settings.	Enter	Opens the submenu See " Video Configuration", on page 160
USB configuration	Configures the USB settings.	Enter	Opens the submenu See " USB Configuration", on page 161
SDIO Configuration¹⁾	Configures the SDIO settings.	Enter	Opens the submenu See " SDIO Configuration", on page 163
ACPI Table/Features Control Configuration	Configures the ACPI Table/Features.	Enter	Opens the submenu See " ACPI Table/Features Control", on page 164

Table 93: 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 165
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 168

Table 93: US15W Advanced - Menu setting options

1) SDIO - Secure Digital Input Output

1.5.1 Boot Configuration

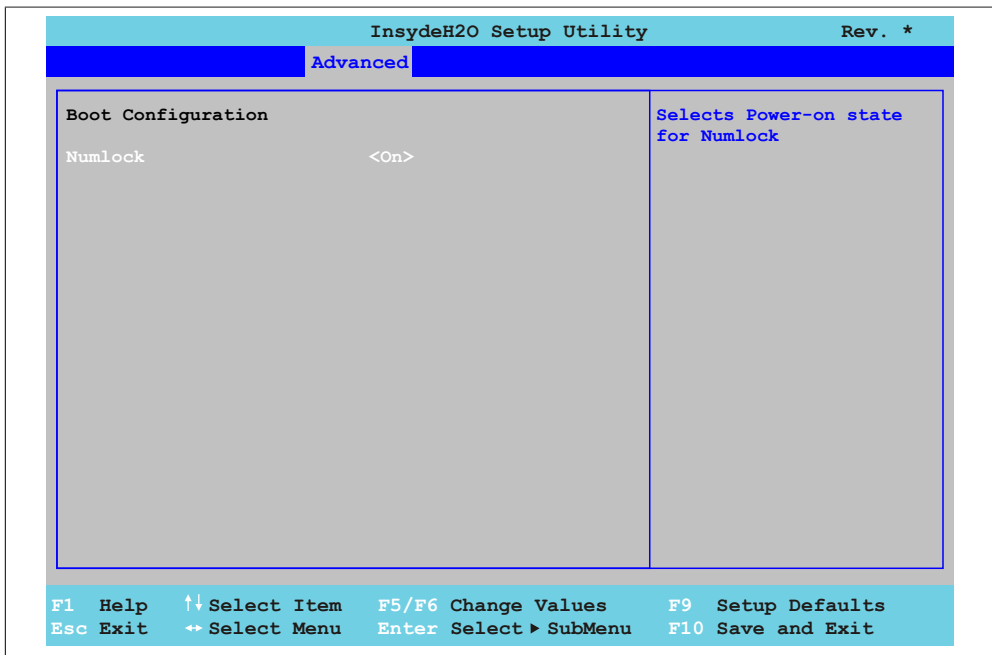


Image 48: US15W Advanced - Boot Configuration

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 94: US15W Advanced - Boot Configuration setting options

1.5.2 Peripheral Configuration

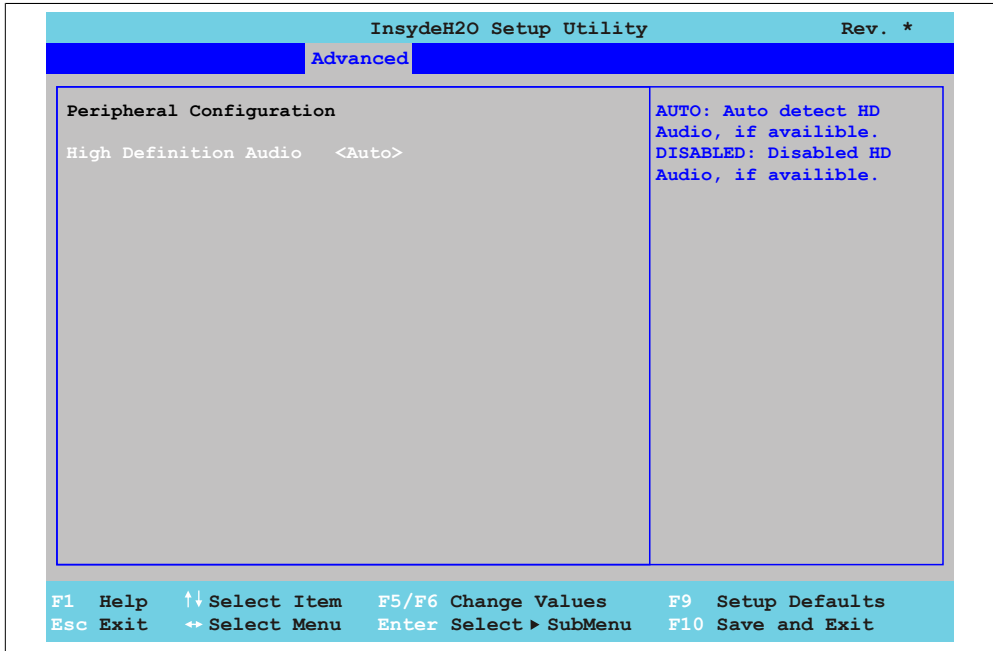


Image 49: US15W Advanced - Peripheral Configuration

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 95: US15W Advanced - Peripheral Configuration setting options

1.5.3 IDE Configuration

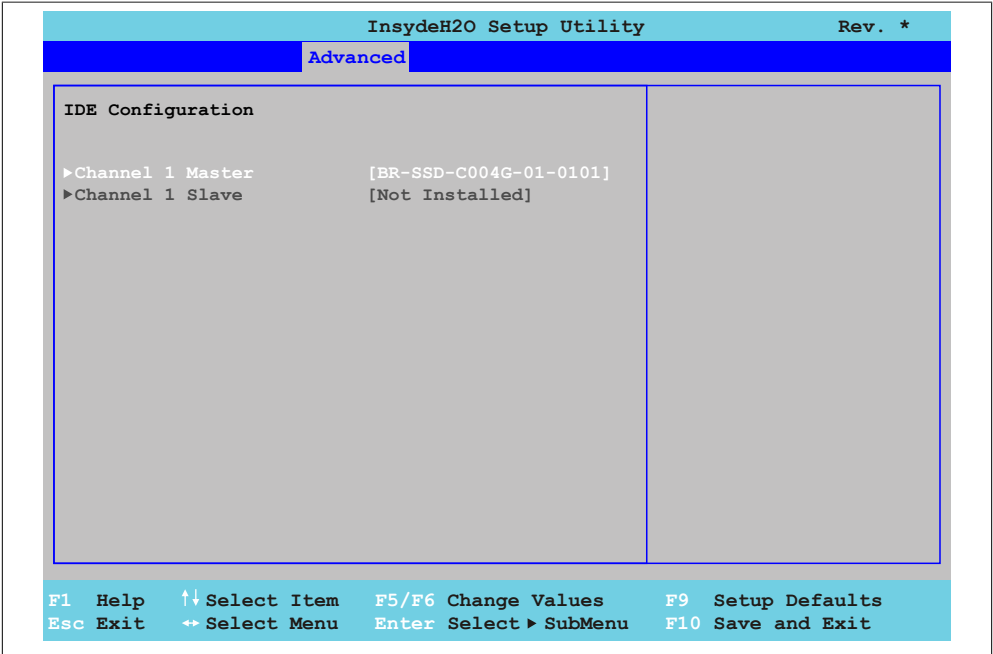


Image 50: US15W Advanced - IDE Configuration

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 158
Channel 1 Slave	Displays the drive that is connected to Channel 1 Slave.	Enter	Opens the submenu See " Channel 1 slave", on page 159

Table 96: US15W Advanced - IDE Configuration setting options

1.5.3.1 Channel 1 Master

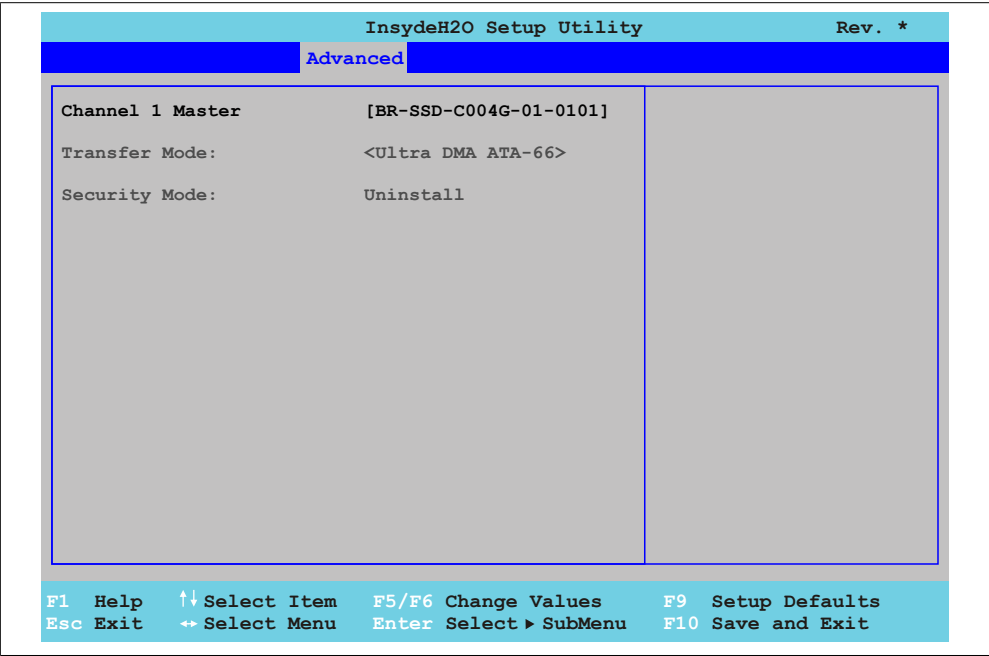


Image 51: US15W Advanced - IDE Configuration - Channel 1 Master

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 97: US15W Advanced - IDE Configuration - Channel 1 Master setting options

1.5.3.2 Channel 1 slave

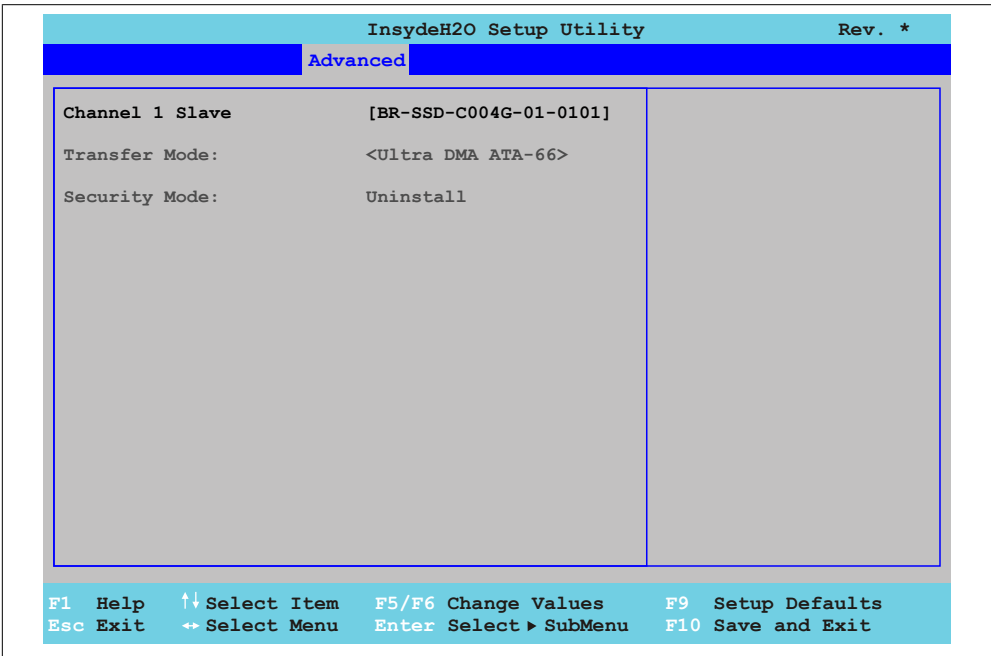


Image 52: US15W Advanced - IDE Configuration - Channel 1 Slave

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 98: US15W Advanced - IDE Configuration - Channel 1 Slave setting options

1.5.4 Video Configuration

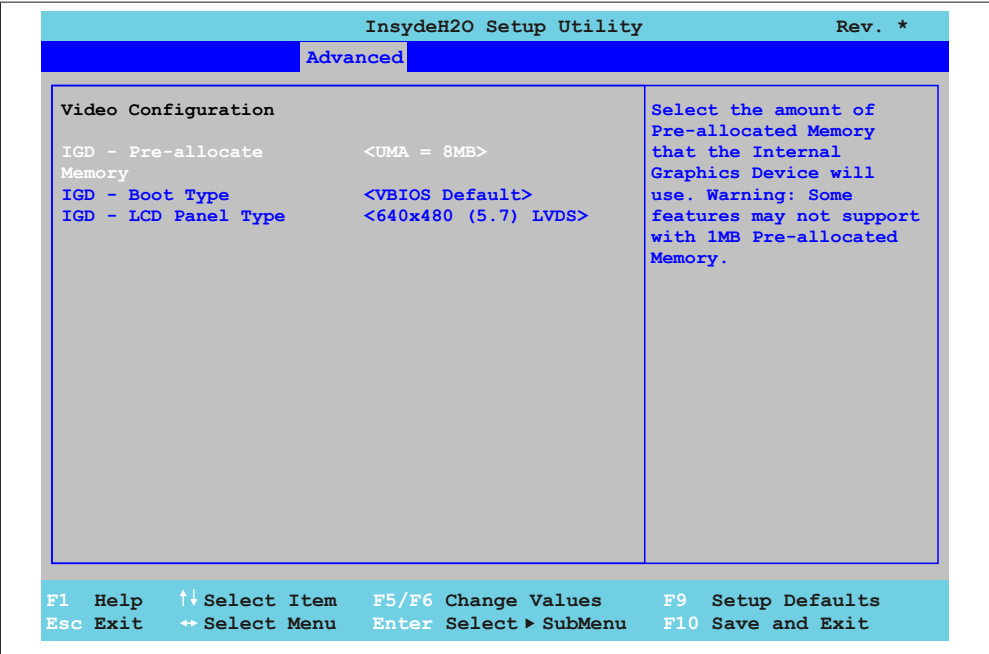


Image 53: US15W Advanced - Video Configuration

BIOS setting	Meaning	Setting options	Effect
IGD - Pre-allocate Memory	Option for setting the memory size that can be used for the internal graphics controller. 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.

Table 99: US15W Advanced - Video Configuration setting options

BIOS setting	Meaning	Setting options	Effect
IGD - LCD Panel Type	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 (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)
		640x480 (10.4) LVDS	Resolution at 640 x 480 pixels (for 10.4" display)
		1024x768 (15.0) LVDS	Resolution at 1024 x 768 pixels (for 15" display)

Table 99: US15W Advanced - Video Configuration setting options

1.5.5 USB Configuration

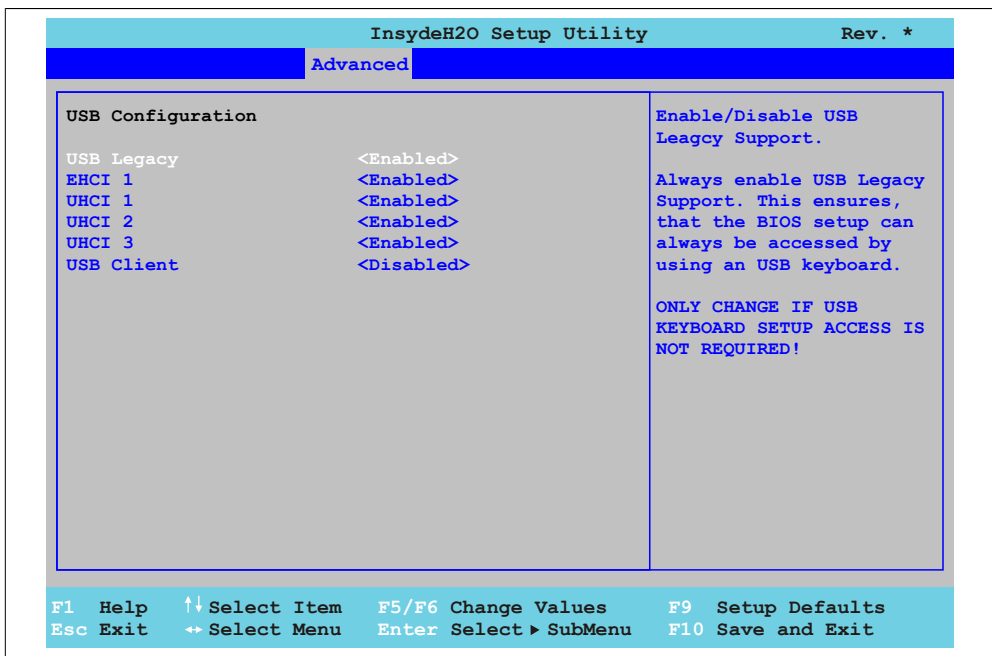


Image 54: US15W Advanced - USB Configuration

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.
Warning! USB Legacy Support must be left enabled or else it will no longer be possible to enter BIOS. However, if USB Legacy Support has been disabled, then you can use the Backup BIOS to once again enter BIOS. For more information, please see " OEM Features", on page 140			
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.
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 Backup BIOS to once again enter BIOS. For more information, please see " OEM Features", on page 140			
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 100: US15W Advanced - USB Configuration setting options

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

1.5.6 SDIO Configuration

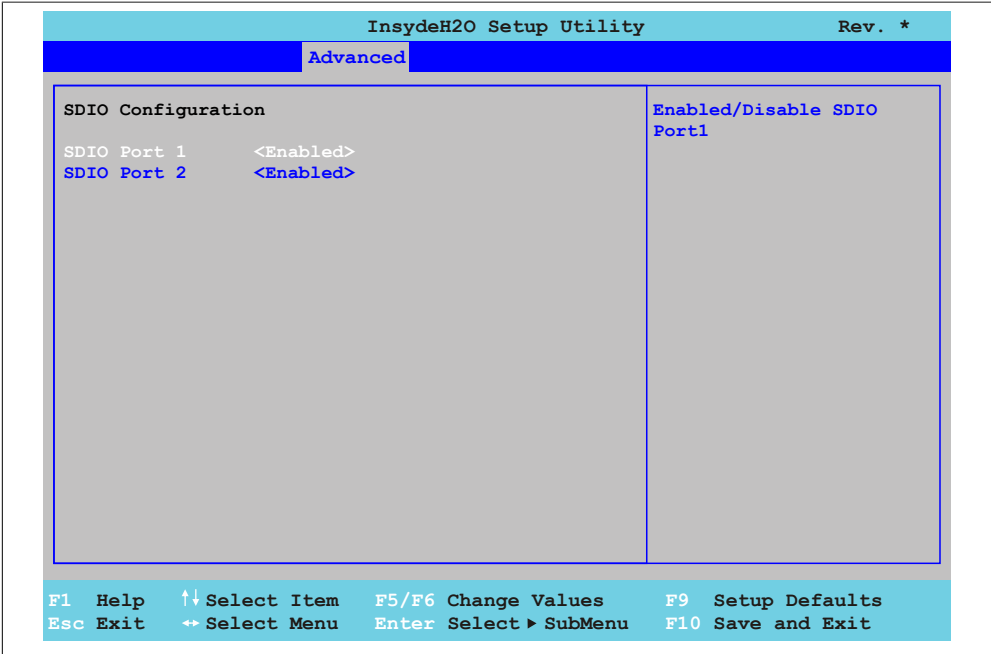


Image 55: US15W Advanced - SDIO Configuration

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 101: US15W Advanced - SDIO Configuration setting options

1.5.7 ACPI Table/Features Control

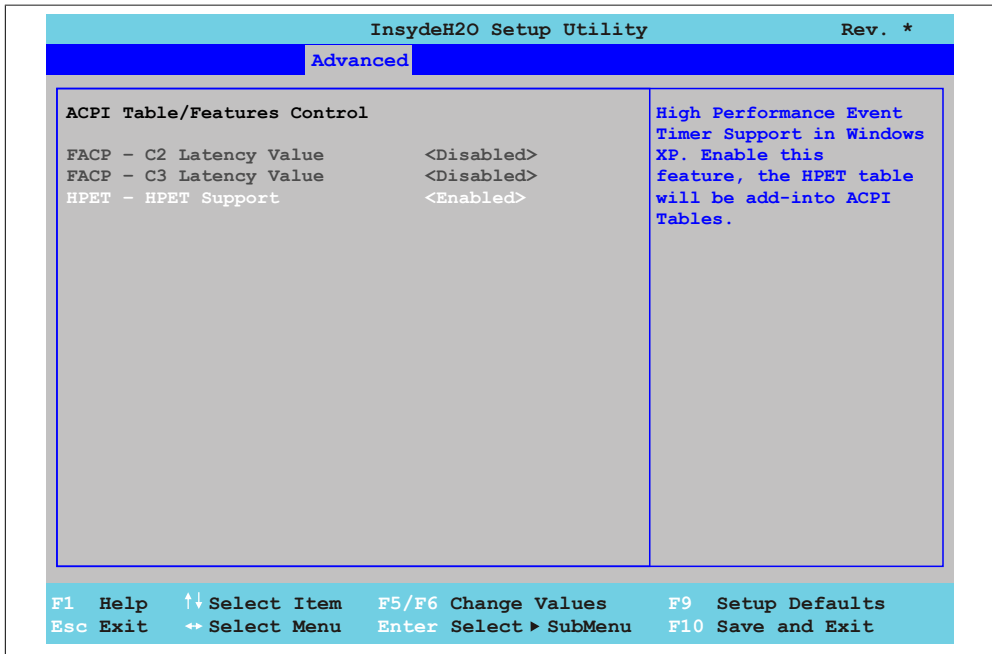


Image 56: US15W Advanced - ACPI Table/Features Control

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 102: 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*.

1.5.8 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.

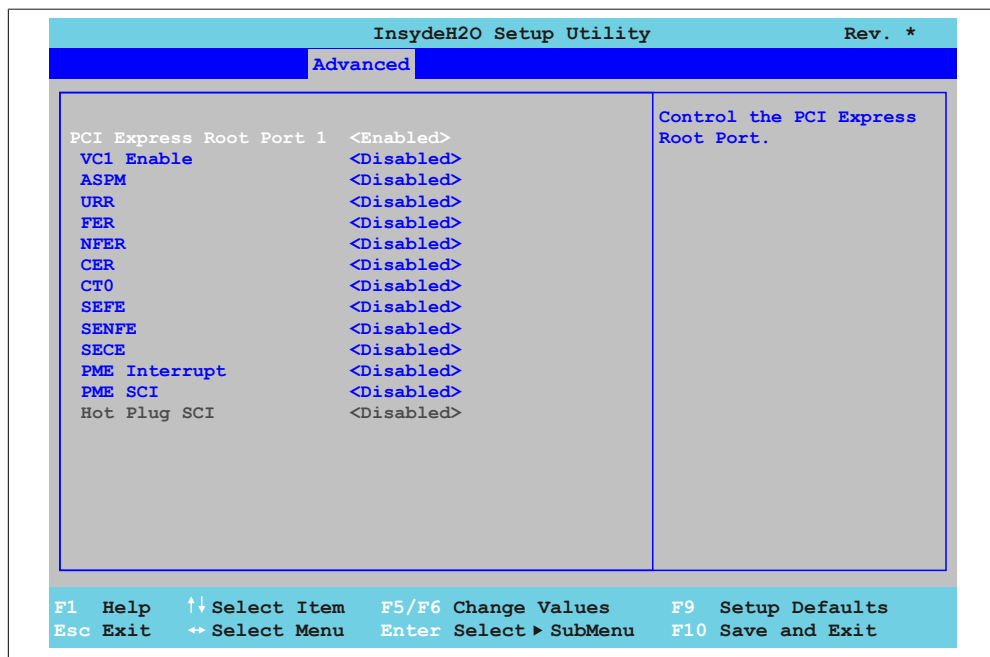


Image 57: US15W Advanced - PCI Express Root Port 1

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.
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.

Table 103: US15W Advanced - PCI Express Root Port 1 setting options

BIOS setting	Meaning	Setting options	Effect
		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.

Table 103: US15W Advanced - PCI Express Root Port 1 setting options

BIOS setting	Meaning	Setting options	Effect
CT0	PCI Express Completion Timer T0 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	System Error on Fatal Error 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	System Error on Non-Fatal Error 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	System Error on Correctable Error 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	Power Management Event Interrupt 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 103: 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*.

1.5.9 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.

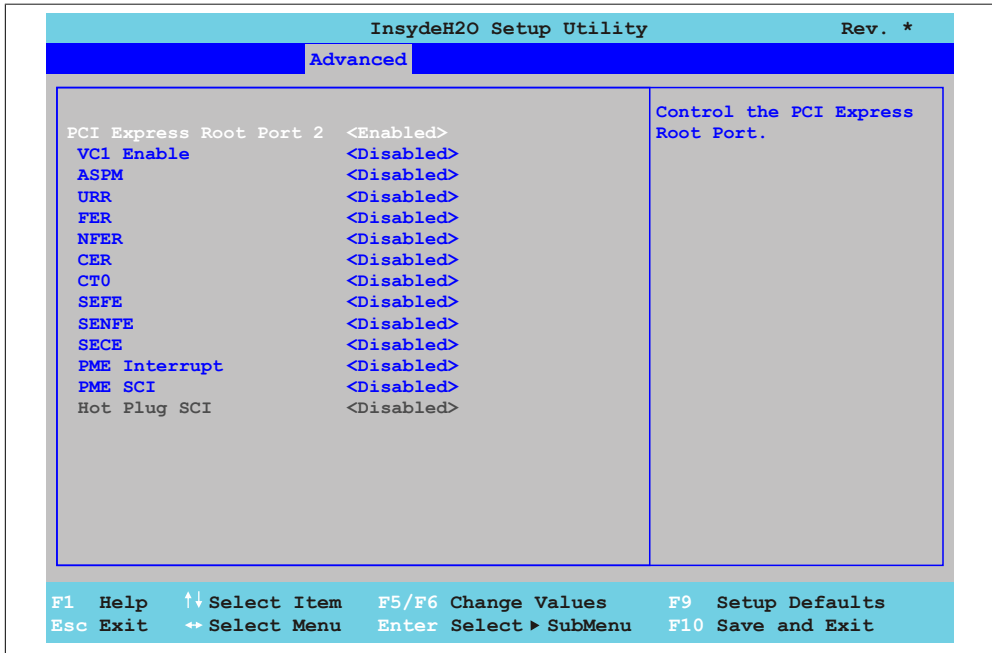


Image 58: US15W Advanced - PCI Express Root Port 2

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.
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.

Table 104: US15W Advanced - PCI Express Root Port 2 setting options

BIOS setting	Meaning	Setting options	Effect
		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	Active State Power Management 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	Unsupported Request (UR) Reporting 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	Fatal Error Reporting 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	Non-Fatal Error Reporting 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	Correctable Error Reporting 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	PCI Express Completion Timer T0 This option is used to enable/disable PCI Express Completion Timer.	Enabled	Enables this function.
		Disabled	Disables this function.
Info: If the system detected an ROB (Processor Reorder Buffer) Timeout, then this setting should be set to Enabled.			

Table 104: US15W Advanced - PCI Express Root Port 2 setting options

BIOS setting	Meaning	Setting options	Effect
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 104: 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

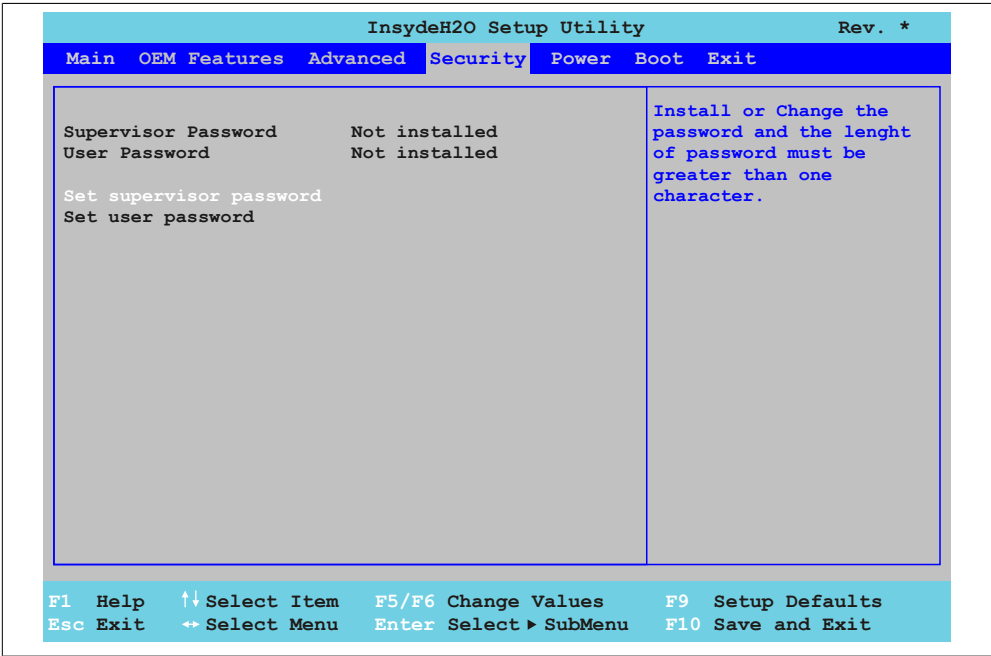


Image 59: US15W Security - Menu

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 105: US15W Security - Menu setting options

1.7 Power

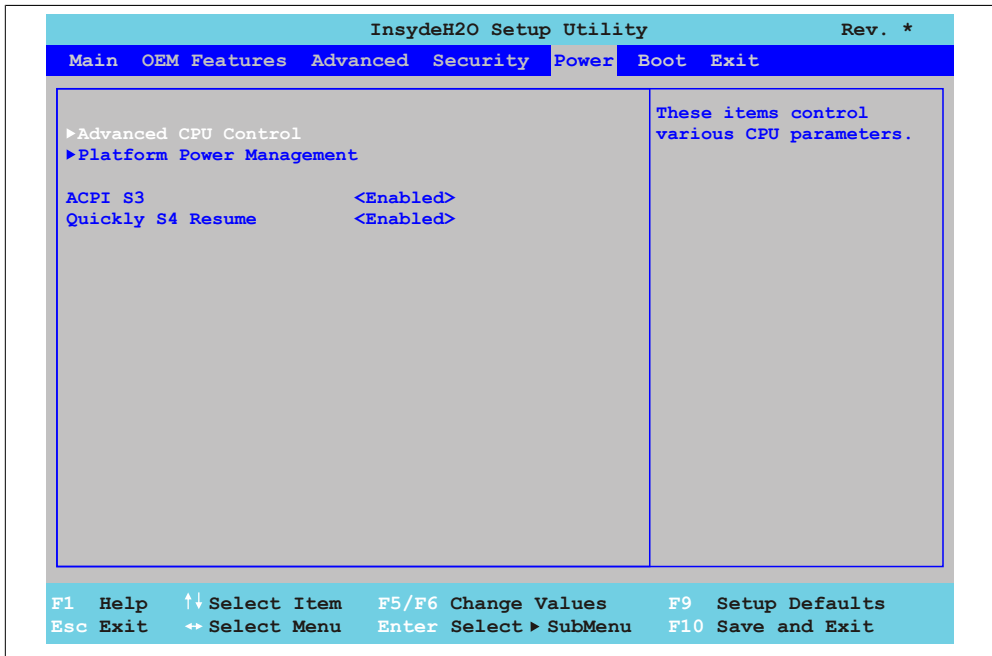


Image 60: US15W Power - Menu

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 173
Platform Power Management	Configuration of the Platform Power Management settings.	None	Opens the submenu See "Platform Power Management", on page 176
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
Quickly S4 Resume	This option is used to determine whether or not to boot from the ACPI Status S4.	Enabled	Enables this function. The current state of the system will be written to a file on the hard drive. The Power Panel will be turned off, this file will be read from upon the next startup and the original state will be restored
		Disabled	Disables the function

Table 106: US15W Power - Menu setting options

1.7.1 Advanced CPU Control

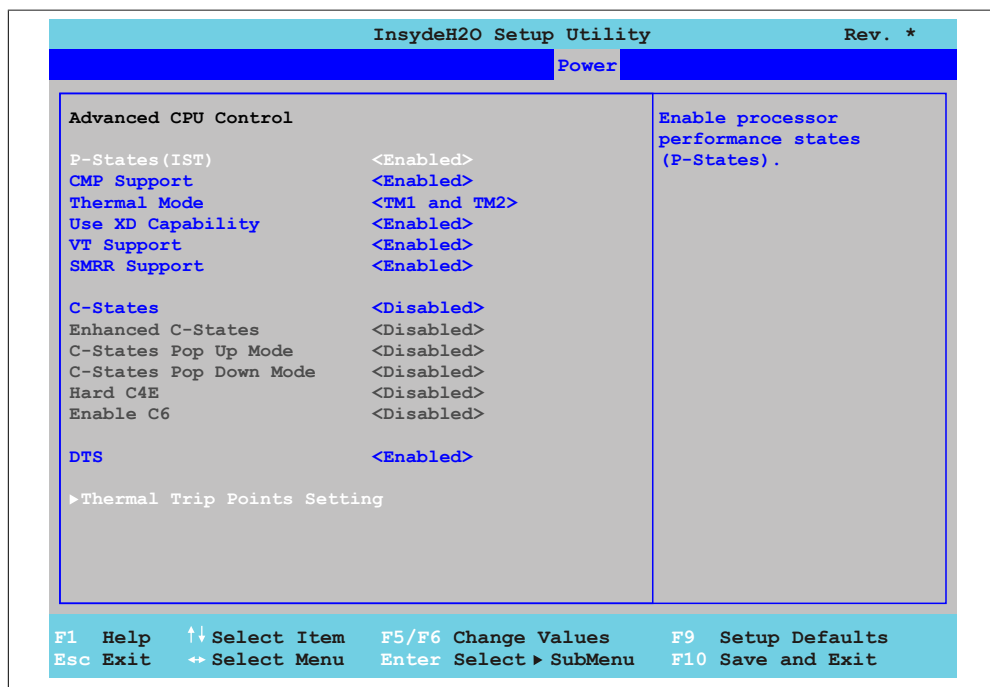


Image 61: US15W Power - Advanced - CPU Control

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). Info: In order to use ARwin, CMP support must be turned off. Otherwise, runtime violations may occur.	Enabled	Enables this function.
		Disabled	Disables this function.
Boot Performance Mode	Option for configuring the boot performance.	Max Performance	The Industrial PC will be booted with maximum performance.
		Max Battery	The Industrial PC will be booted with the most energy-efficient performance.

Table 107: US15W Power - Advanced CPU Control setting options

BIOS setting	Meaning	Setting options	Effect
Thermal Mode ¹⁾	Option for configuring the temperature monitoring. If this function is activated (TM1 and TM2, TM1, TM2), then the processor will deactivate certain threads in the core if there is overheating in order to lower the temperature.	TM1 and TM2	Intel Thermal Mode 1 and 2 enabled.
		Disabled	Temperature monitoring disabled.
		TM1	Intel Thermal Mode 1 enabled.
		TM2	Intel Thermal Mode 2 enabled.
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 107: US15W Power - Advanced CPU Control setting options

BIOS setting	Meaning	Setting options	Effect
Bi-directional PRO-CHOT#	The PROCHOT# signal (Processor Hot) provides two-way communication for enabling the Thermal Monitor. The signal can either be triggered by the CPU or the computer platform, so that the industrial PC can put the processor into a state that generates less heat. This is useful particularly if other components are at the brink of overheating and only an energy-saving mode that affects the entire system can help to prevent this from occurring.	Enabled	Enables this function.
		Disabled	Disables this function.
DTS	Option for enabling or disabling the CPU Digital Thermal Sensor function.	Enabled	Enables this function.
		Disabled	Disables this function.
DTS Calibration		Enabled	
Thermal Trip Points Setting	Configuration of the Thermal Trip Points settings.	Enter	Opens the submenu See "Thermal Trip Points Settings", on page 175

Table 107: 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*.

1.7.1.1 Thermal Trip Points Settings

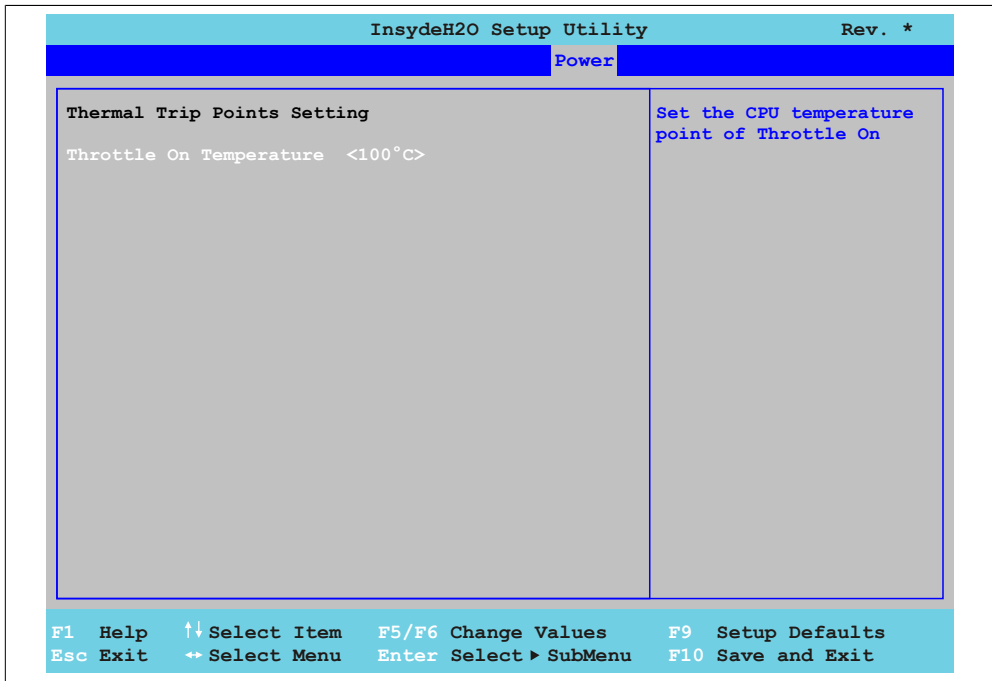


Image 62: US15W Power - Advanced - CPU Control - Thermal Trip Points Settings

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	Temperature setting for the thermal trip point. Can be set in 5 degree increments.

Table 108: US15W Power - Advanced CPU Control - Thermal Trip Points Settings options

1.7.2 Platform Power Management

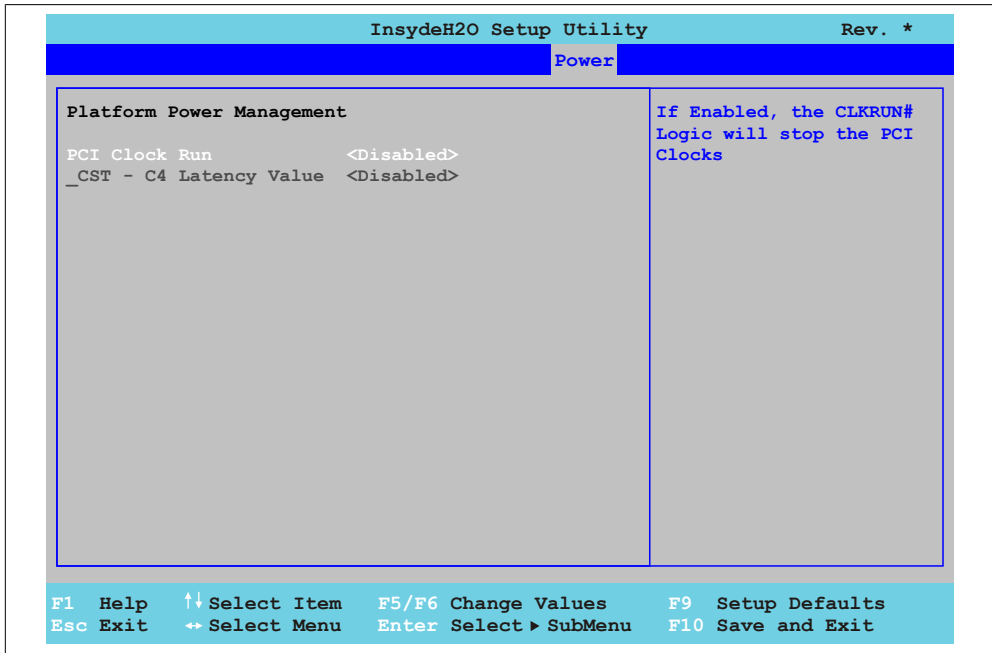


Image 63: US15W Power - Platform Power Management

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 109: 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

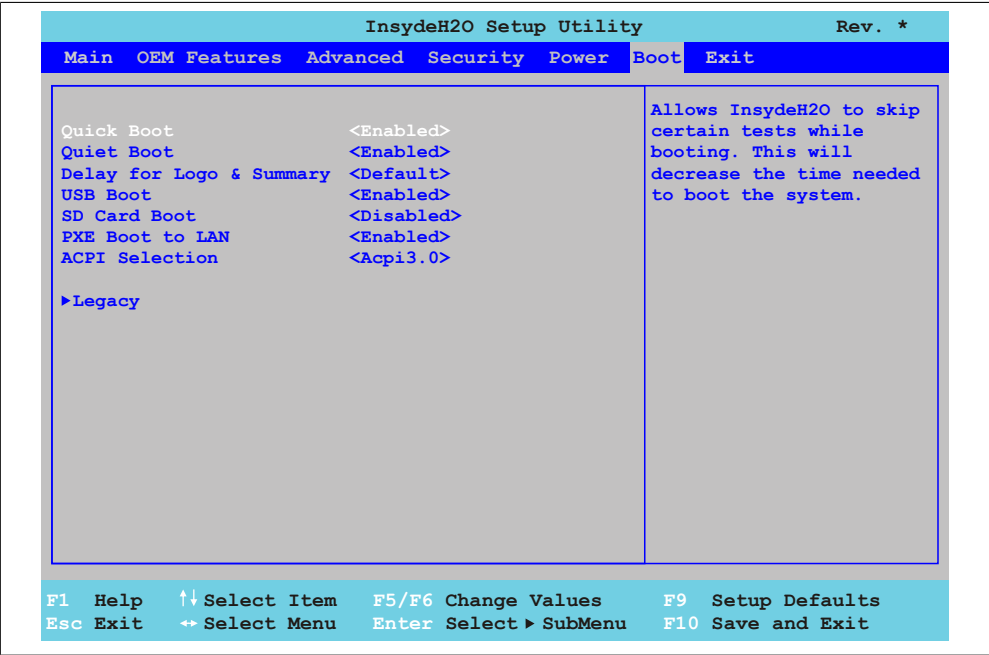


Image 64: US15W Boot - Menu

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.
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. 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.	Enabled	Enables this function.
		Disabled	Disables this function.
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.

Table 110: US15W Boot - Menu setting options

BIOS setting	Meaning	Setting options	Effect
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 179

Table 110: US15W Boot - Menu setting options

1.8.1 Legacy

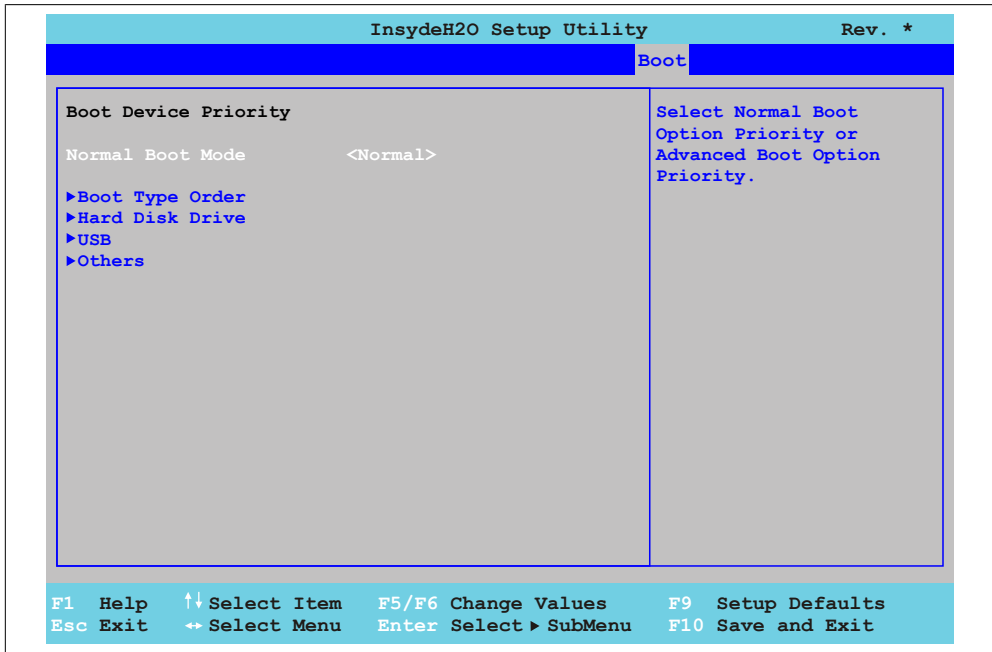


Image 65: US15W Boot - Legacy

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 180
Hard Disk Drive ⁽¹⁾⁽²⁾	Displays the inserted CompactFlash cards.	Enter	Opens the submenu See "Hard Disk Drive", on page 181

Table 111: US15W Boot - Legacy setting options

BIOS setting	Meaning	Setting options	Effect
USB ¹⁾³⁾	Displays connected USB flash drives.	Enter	Opens the submenu See "USB", on page 182
Others ¹⁾	Displays the CPU Boards / Baseboards for PXE Boot with the onboard Ethernet interfaces.	Enter	Opens the submenu See "Others", on page 183

Table 111: 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.

1.8.1.1 Boot Type Order

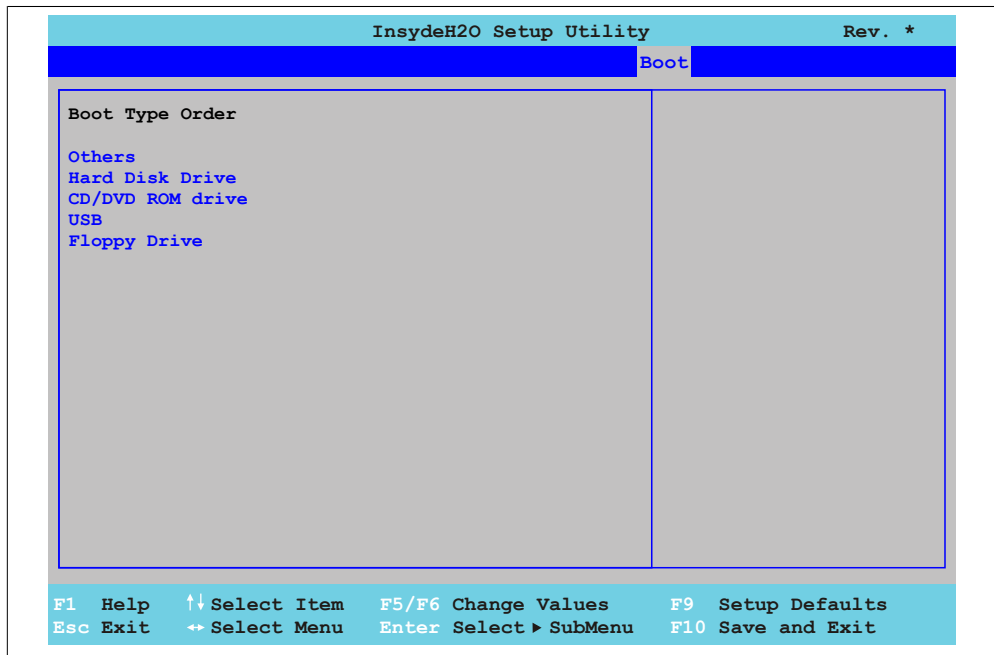


Image 66: US15W Boot - Legacy - Boot Type Order

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 112: US15W Boot - Legacy - Boot Type Order setting options

1.8.1.2 Hard Disk Drive

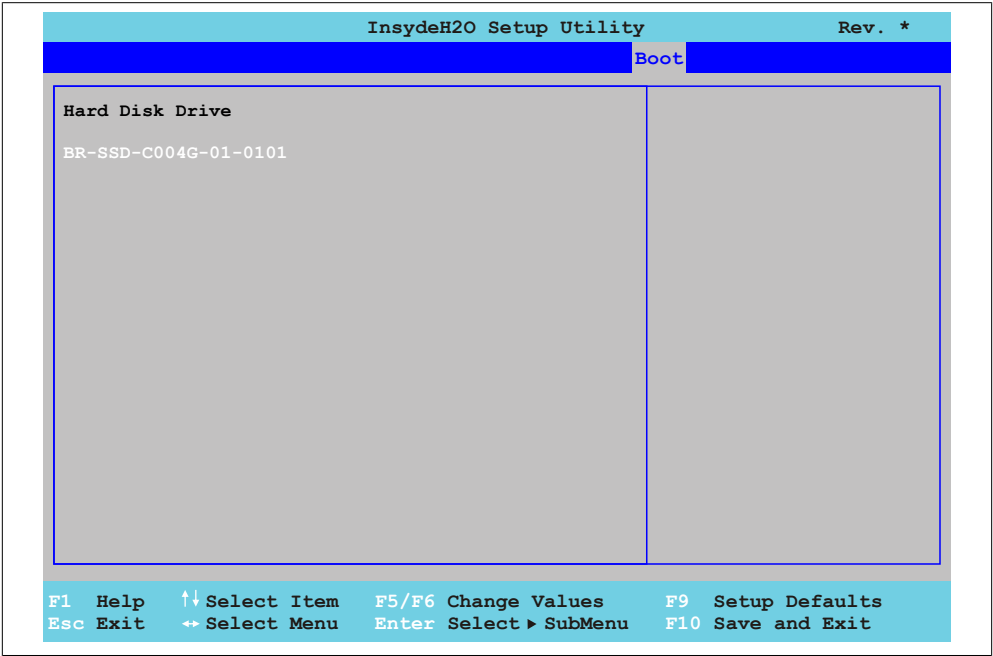


Image 67: US15W Boot - Legacy - Hard Disk Drive

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

Table 113: US15W Boot - Legacy - Hard Disk Drive setting options

1.8.1.3 USB

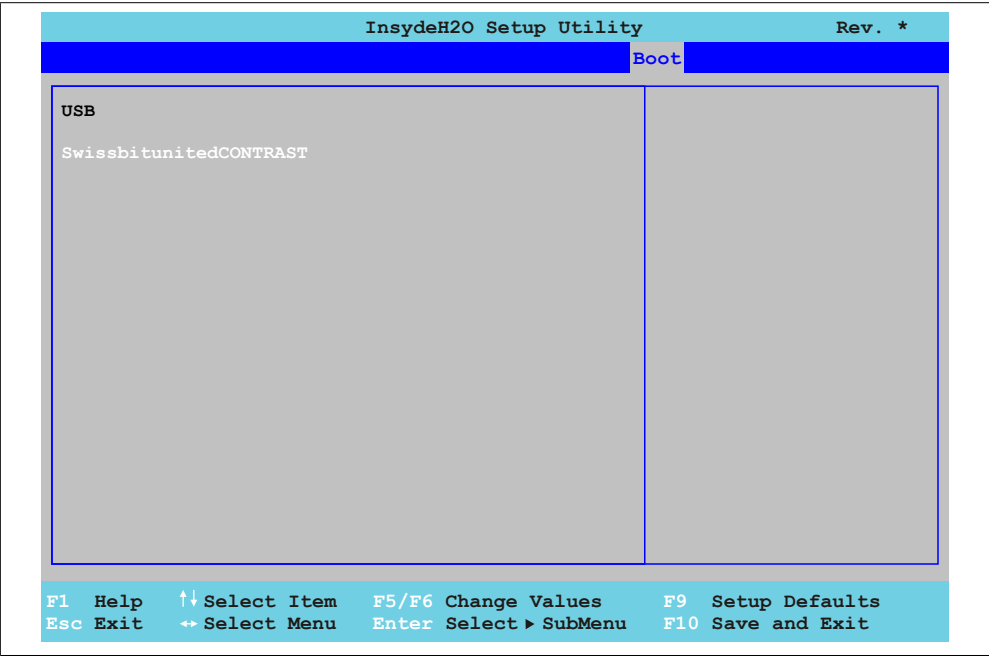


Image 68: US15W Boot - Legacy - USB

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

Table 114: US15W Boot - Legacy - USB setting options

1.8.1.4 Others

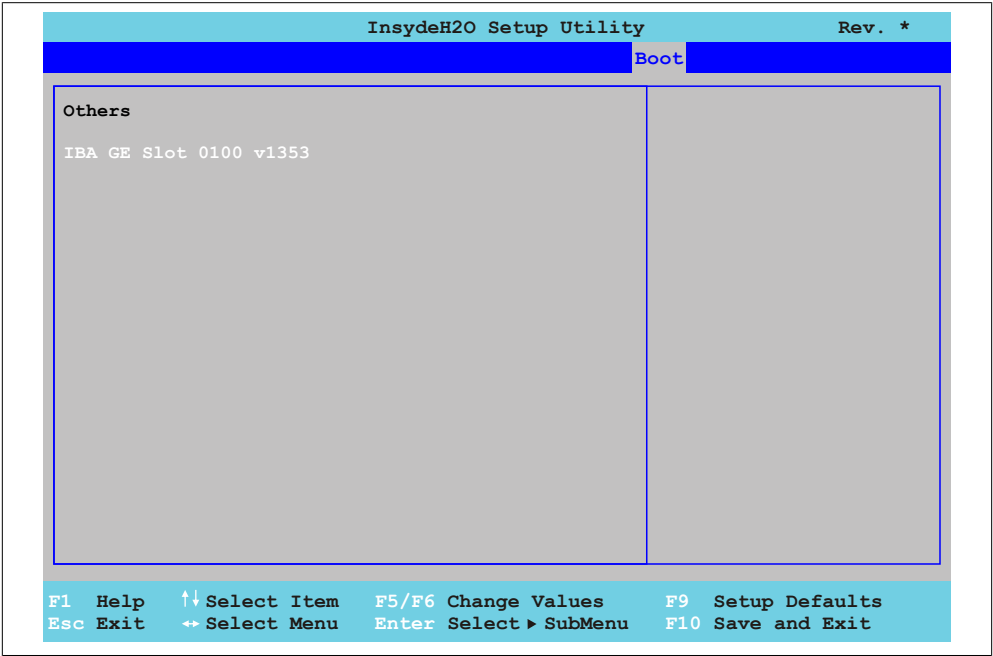


Image 69: US15W Boot - Legacy - Others

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

Table 115: US15W Boot - Legacy - Others setting options

1.9 Exit

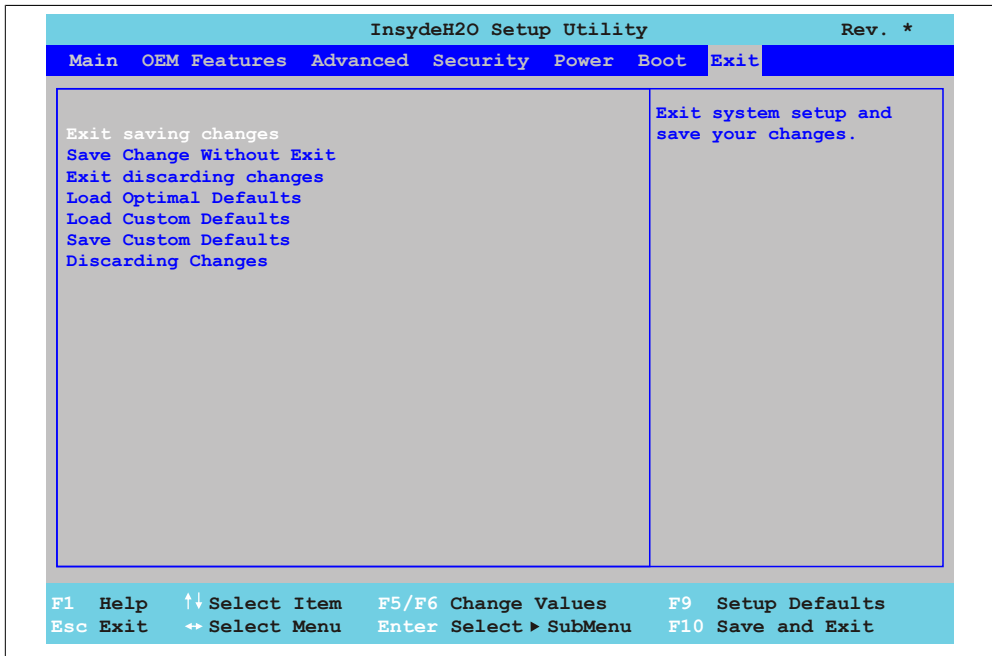


Image 70: US15W Exit - Menu

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 116: 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 117: US15W - Main profile setting overview

1.10.2 OEM Features

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

Table 118: 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 Compatibility ID	-	
LAN1 MAC ADDRESS	-	
LPC Devices		
COMA	-	
Base I/O Address	3F8	
Interrupt	IRQ4	
Statistical Values		
Sensor 1	-	
Sensor 2	-	
Sensor 3	-	

Table 119: 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	-	

Table 119: 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 Compatibility ID	-	
LPC Devices		
COMB	-	
Base I/O Address	2F8	
Interrupt	IRQ3	
Statistical Values		
Sensor 1	-	
Total Hours	-	
Temperature Values		
Refresh Values	-	
Sensor 1	-	

Table 120: 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	-	
Product name	-	
Hardware Number	-	
Parent Device ID	-	
Parent Compatibility ID	-	

Table 121: US15W - IF Module Features profile setting overview

Setting / View	Profile 0	My setting
LAN2 MAC ADDRESS	-	
Statistical Values		
Total Hours	-	
Power on cycles	-	

Table 121: 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 Compatibility ID	-	

Table 122: US15W - RAM Features profile setting overview

1.10.3 Advanced

1.10.3.1 Boot Configuration

Setting / View	Profile 0	My setting
NumLock	On	

Table 123: US15W - Boot Configuration profile setting overview

1.10.3.2 Peripheral Configuration

Setting / View	Profile 0	My setting
High Definition Audio	Auto	

Table 124: US15W - Peripheral Configuration profile setting overview

1.10.3.3 IDE Configuration

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

Table 125: US15W - IDE Configuration profile setting overview

1.10.3.4 Video Configuration

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

Table 126: US15W - Video Configuration profile setting overview

1.10.3.5 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 127: US15W - USB 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 128: 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 129: 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 (activated)	
FACP – C3 Latency Value	Enabled (deactivated)	
HPET - HPET support	Enabled	

Table 130: 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	
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 131: 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	
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 132: US15W - PCI Express Root Port 2 profile setting overview

1.10.4 Power

Setting / View	Profile 0	My setting
ACPI S3	Enabled	
Quickly S4 Resume	Enabled	

Table 133: 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	
Boot Performance Mode	Max Performance	
Thermal Mode	TM1 and TM2	
Use XD Capability	Enabled	
VT Support	Enabled	
SMMR 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	
Bi-directional PROCHOT#	Enabled	
DTS	Enabled	
DTS Calibration	Enabled	
Thermal Trip Point Settings		
Throttle On Temperature	85°C	

Table 134: 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 135: US15W - Platform Power Management profile setting overview

1.10.5 Boot

Setting / View	Profile 0	My setting
Quick Boot	Enabled	
Quiet Boot	Enabled	
USB Boot	Enabled	
SD Card Boot	Disabled	
PXE Boot to LAN	Enabled	
ACPI Selection	Acpi3.0	

Table 136: US15W - Boot profile setting overview

2 Windows XP Professional

2.1 Order data

Image not found for 5SWWXP.0600-ENG-5SWWXP.0600-GER-5SWWXP.0600-MUL-5SWWXP.0500-ENG-5SWWXP.0500-GER-5SWWXP.0500-MUL!	
Model number	Short description
	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.
5SWWXP.0500-ENG	Microsoft OEM Windows XP Professional Service Pack 2c, CD, English. Only available with a B&R device.
5SWWXP.0500-GER	Microsoft OEM Windows XP Professional Service Pack 2c, CD, German. Only available with a B&R device.
5SWWXP.0500-MUL	Microsoft OEM Windows XP Professional Service Pack 2c, 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 137: 5SWWXP.0600-ENG, 5SWWXP.0600-GER, 5SWWXP.0600-MUL, 5SWWXP.0500-ENG, 5SWWXP.0500-GER, 5SWWXP.0500-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

Model number	Type	Target system	CPU board	Pre-installed	Memory required on CF/HDD	Minimum amount of RAM
5SWWWXP.0500-ENG	WinXP Pro SP2c CD	APC620 APC810 APC820 PPC700 PPC725 PPC800 PP500		Optional	≤ 2.1 GB	128 MB
5SWWWXP.0500-GER	WinXP Pro SP2c CD	APC620 APC810 APC820 PPC700 PPC725 PPC800 PP500		Optional	≤ 2.1 GB	128 MB
5SWWWXP.0500-MUL	WinXP Pro SP2c CD	APC620 APC810 APC820 PPC700 PPC725 PPC800 PP500		Optional	≤ 2.1 GB	128 MB

2.3 Installation

Upon request, the required Windows XP Professional version can be pre-installed at B&R Austria on a CompactFlash card. 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 Order data

Model number	Short description	Figure
	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 138: 5SWWI7.0100-ENG, 5SWWI7.0100-GER, 5SWWI7.0300-MUL - Order data

3.2 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

3.3 Installation

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

3.4 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.

3.5 Special considerations, limitations

- Windows 7 system evaluation (system classification) is not currently supported.
- 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).

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
	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 139: 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 140: 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 141: 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	<table><tr><td>AWG wire</td><td colspan="2">26 to 12 AWG</td></tr><tr><td>Wire tip sleeves with plastic covering</td><td colspan="2">0.20 to 1.50 mm²</td></tr><tr><td>Solid wire line</td><td colspan="2">0.20 to 2.50 mm²</td></tr><tr><td>Fine wire line</td><td>0.20 to 1.50 mm²</td><td>0.20 to 2.50 mm²</td></tr><tr><td>With wire tip sleeves</td><td colspan="2">0.20 to 1.50 mm²</td></tr></table>				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	
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 142: 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

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.

3.2.4 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 208

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

Image not found for 5CFCRD.0512-04-5CFCRD.1024-04-5CFCRD.2048-04-5CFCRD.4096-04-5CFCRD.8192-04-5CFCRD.016G-04!	
Model number	Short description
	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 143: 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	No		No	Yes	
Windows XP Professional	No		Yes		Yes	
Windows XP Embedded	No	Yes		Yes		
Windows Embedded Standard 2009	Yes		Yes			
Windows CE 6.0	Yes		Yes			
Windows CE 5.0	No		No			
Software						
PVI Transfer Tool	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)					No
B&R Embedded OS Installer	≥ V3.0					No
Environmental conditions						
Temperature						
Operation	0 to 70°C					
Storage	-65 to 150°C					
Transport	-65 to 150°C					

Table 144: 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
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 144: 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.

3.3.4 Temperature humidity diagram

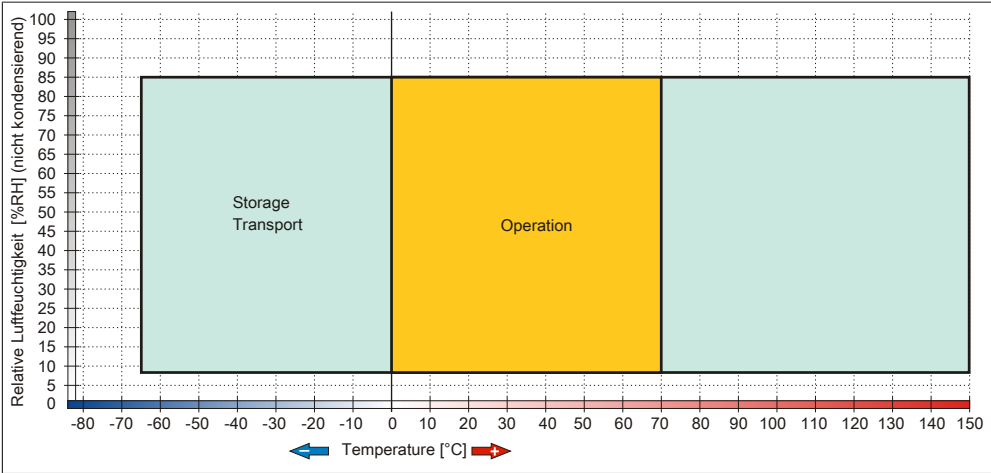
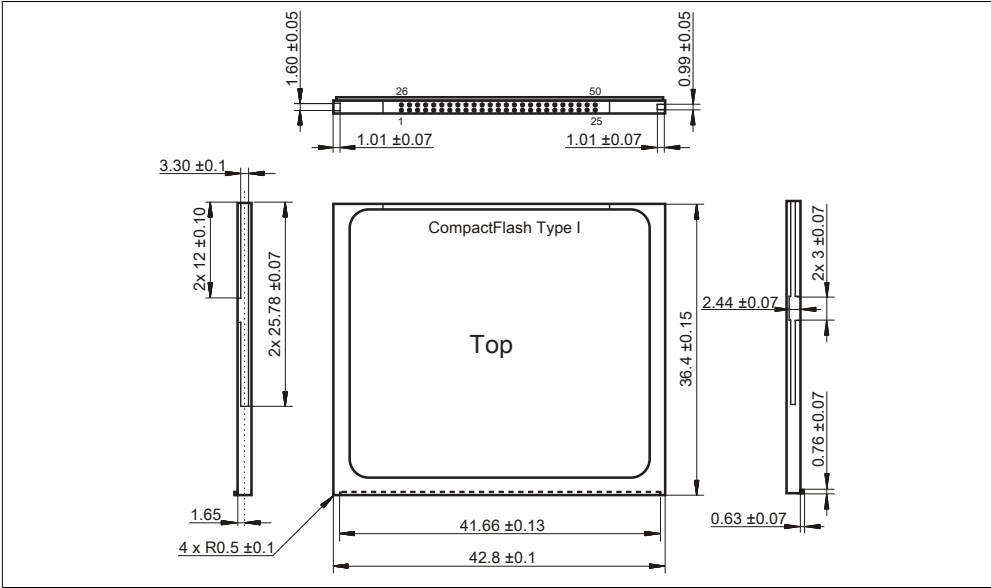
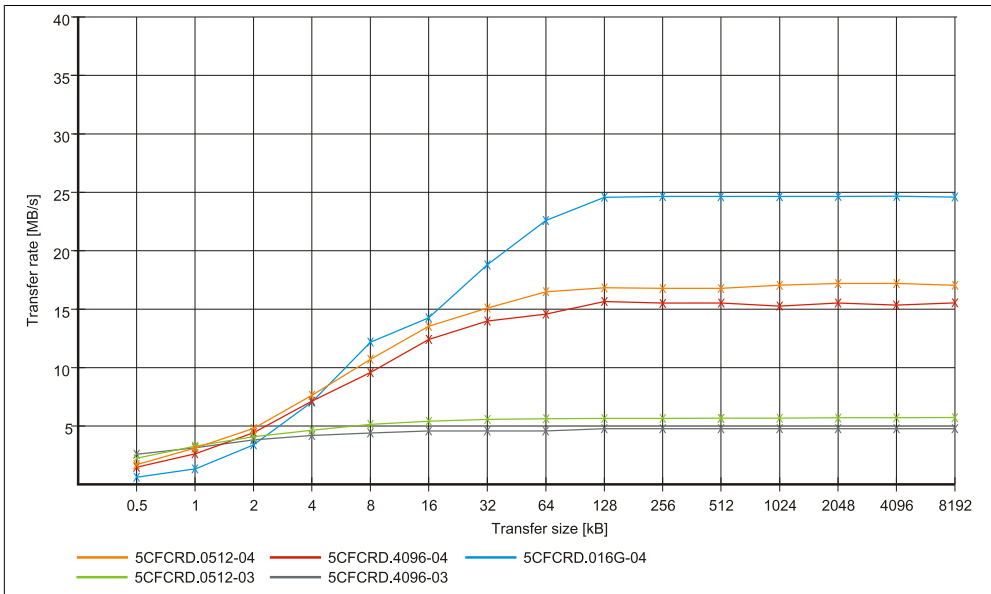
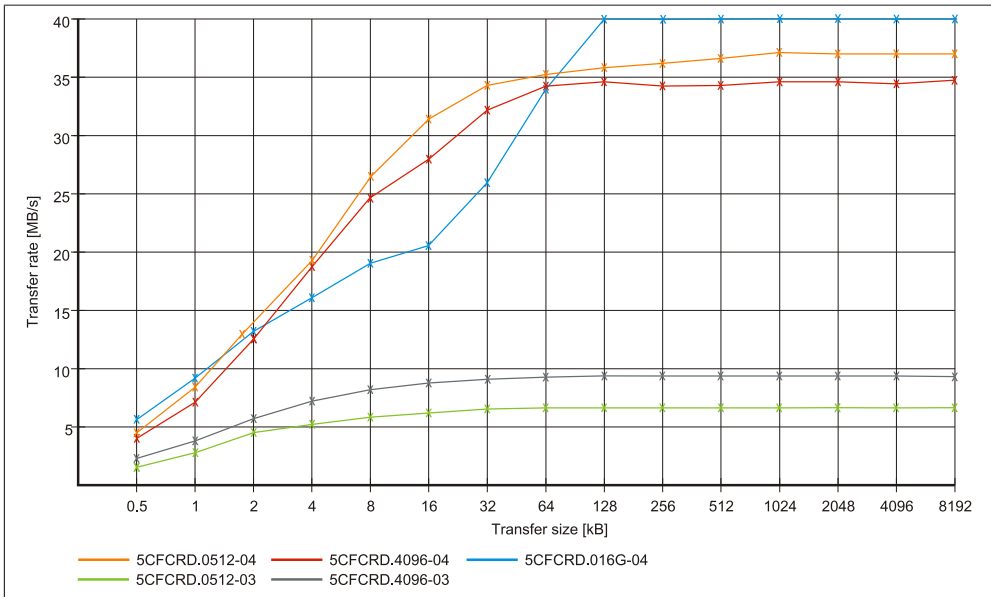


Image 71: 5CFCRD.xxxx-04 - Temperature humidity diagram CompactFlash cards

3.3.5 Dimensions



3.3.6 Benchmark



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		-		
Windows XP Embedded		No				Yes		Yes
Windows Embedded Standard 2009		No					Yes	
Windows CE 6.0				Yes				
Windows CE 5.0			Yes				No	

Table 146: 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 146: 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

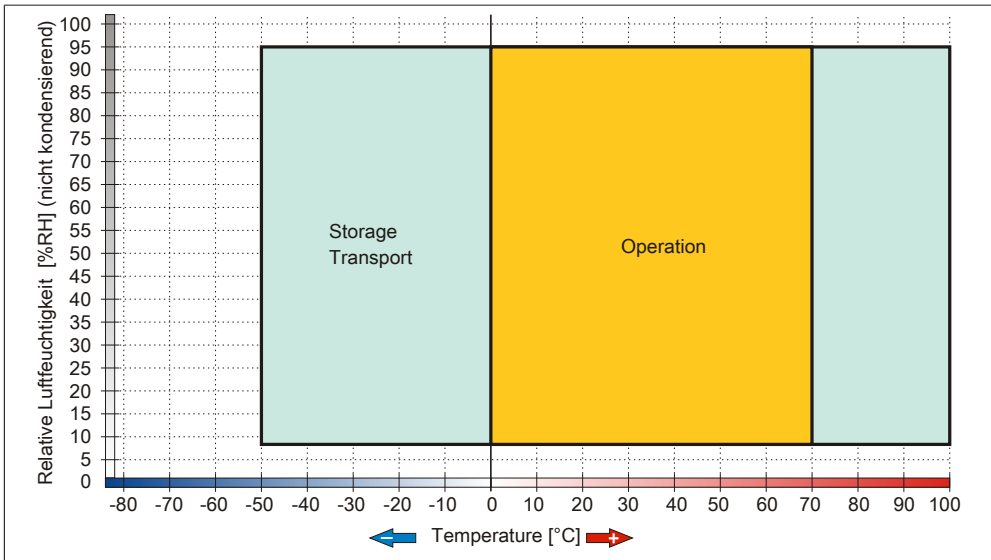
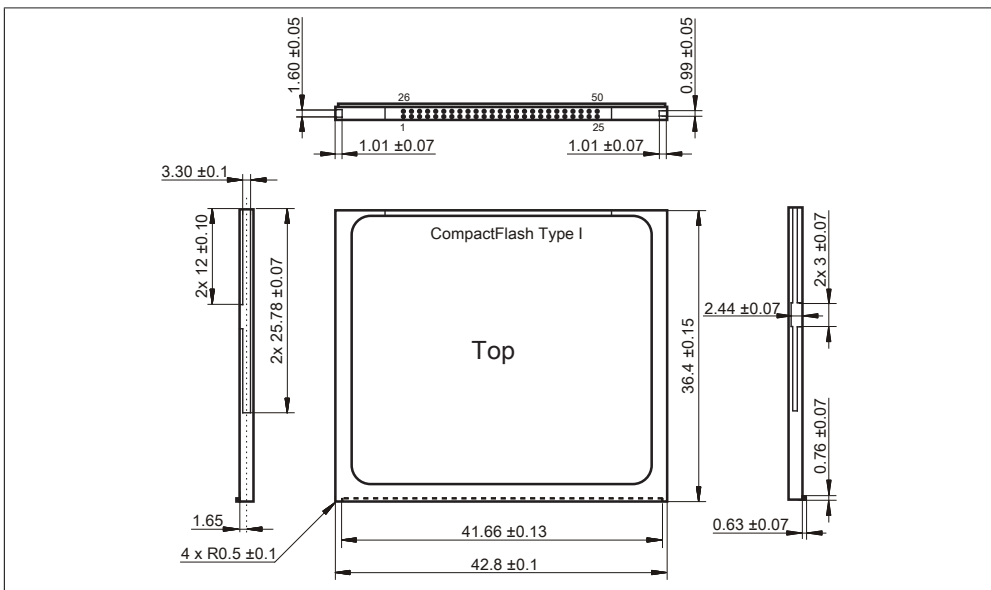


Image 72: 5CFCRD.xxxx-03 - Temperature humidity diagram CompactFlash cards

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

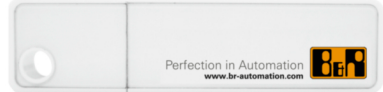
Model number	Short description	Figure
	USB accessories	
5MMUSB.2048-01	USB 2.0 flash drive 2048 MB B&R	

Table 147: 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 148: 5MMUSB.2048-01 - Technical data

1) Signals data transfer (send and receive).

4.1.4 Temperature humidity diagram

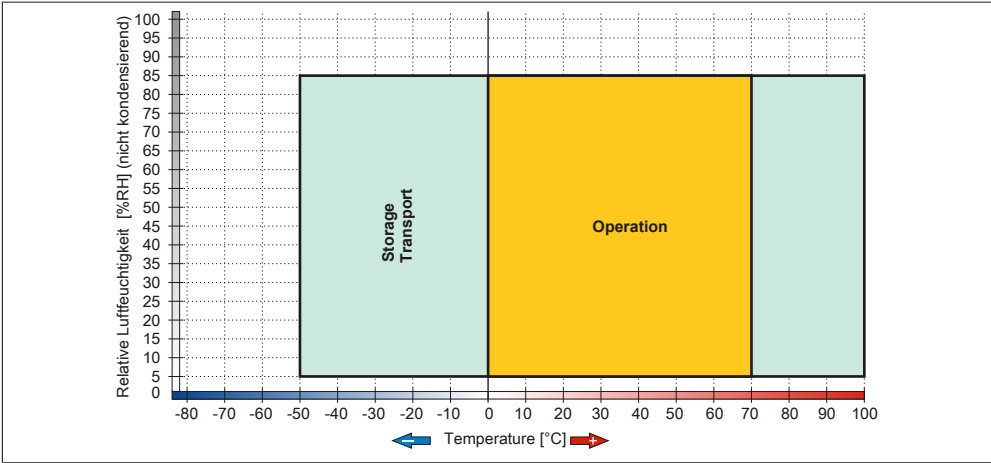


Image 73: 5MMUSB.2048-01 - Temperature humidity diagram

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 149: 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	USB Cover M20 IP65 raised	

Table 150: 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 151: 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 152: 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 153: 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 154: 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.

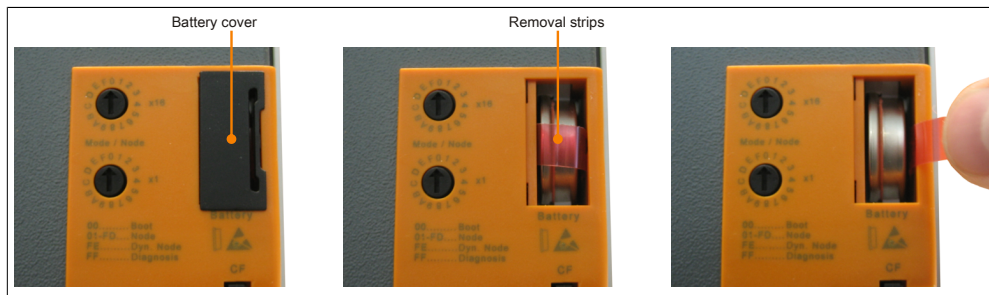


Image 74: Remove battery

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

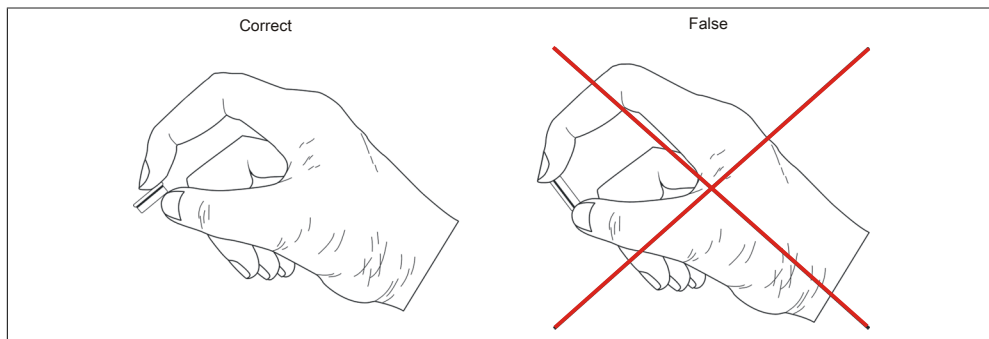


Image 75: Battery handling

- Insert the new battery with correct polarity.

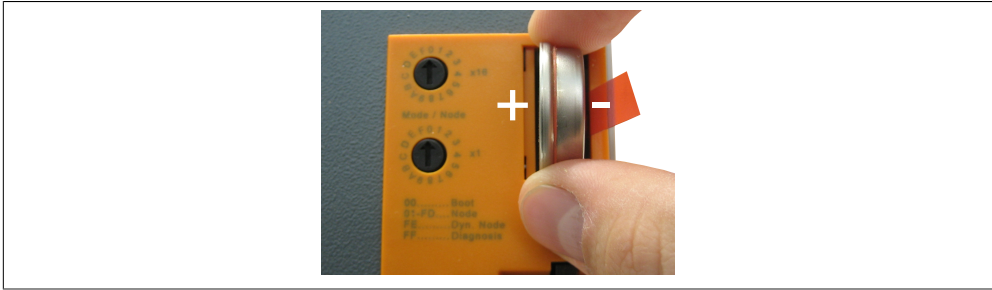


Image 76: Insert battery

- 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.

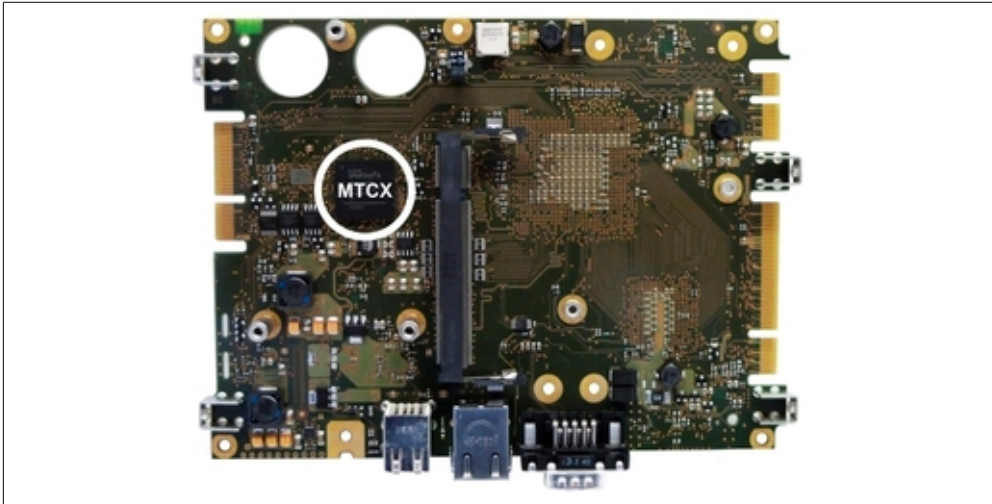


Image 77: MTCX controller location

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 (matrix keyboard on B&R display units)
- 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 a connected B&R 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 140) 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).

2 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.

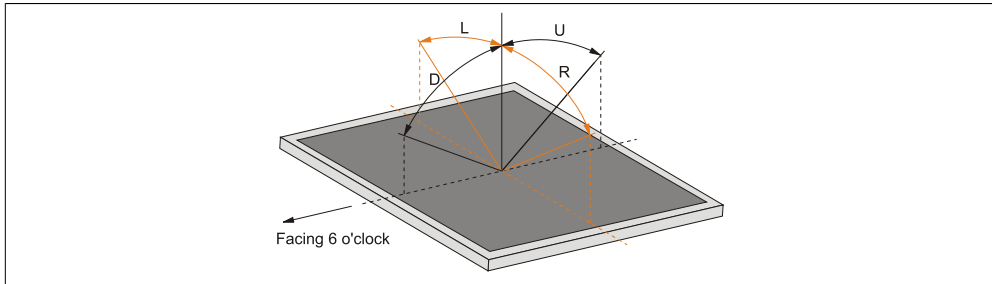
Ethanol Cyclohexanol Diacetone alcohol Glycol Isopropanol Glycerine Methanol Triacetin Dowanol DRM/PM	Formaldehyde 37 to 42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene White spirits	Trichloroethane Ethyl acetate Diethyl ether N-Butyl acetate Amyl acetate Butylcellosolve Ether
Acetone Methyl ethyl 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 155: 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.

3 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.



4 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 156: Product abbreviations

4.1 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 4.2 "Compatibility details", on page 226 .

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

Size	Format	Image	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	●	●	●	▲	▲	-
			Outer dimensions						
			Installation dimensions						

Table 157: Device compatibility overview

Size	Format	Image	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	●	●	▲	●	●	-

Table 157: Device compatibility overview

4.2 Compatibility details

4.2.1 Example

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

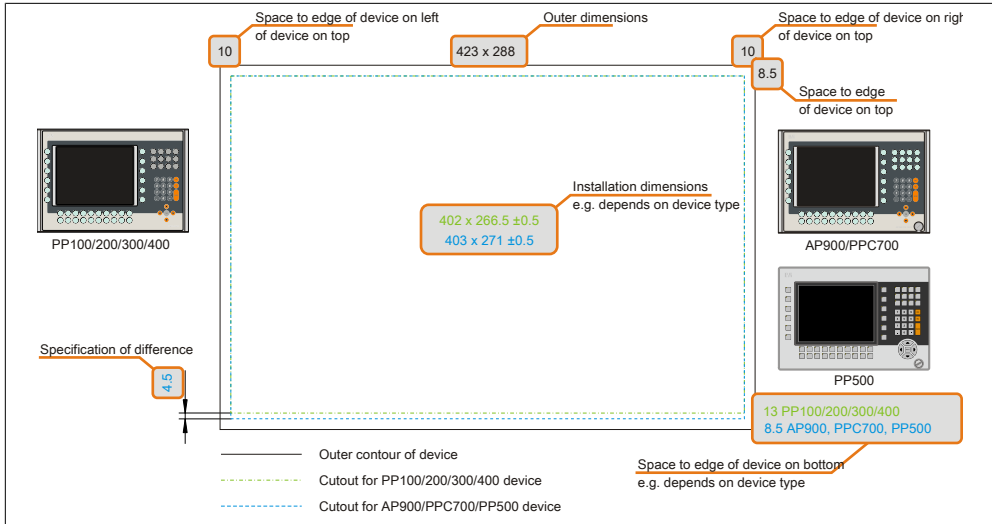


Image 78: Compatibility details - figure structure

4.2.2 5.7" devices

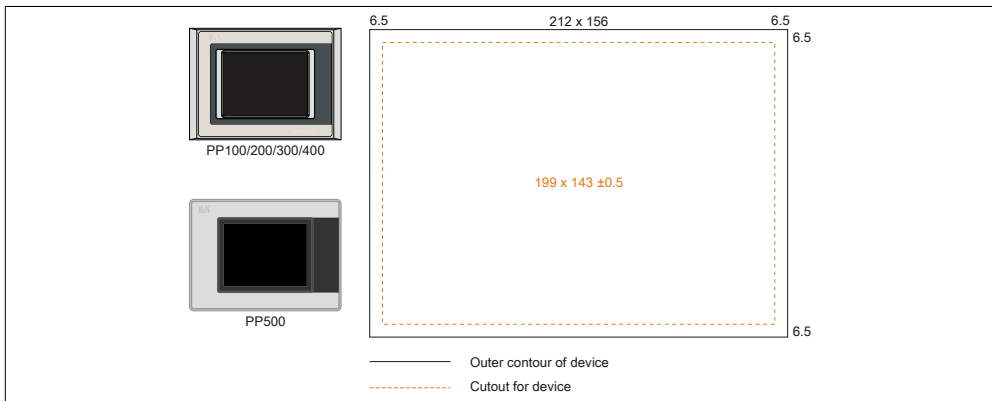


Image 79: Mounting compatibility - 5.7" device format - Horizontal1

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

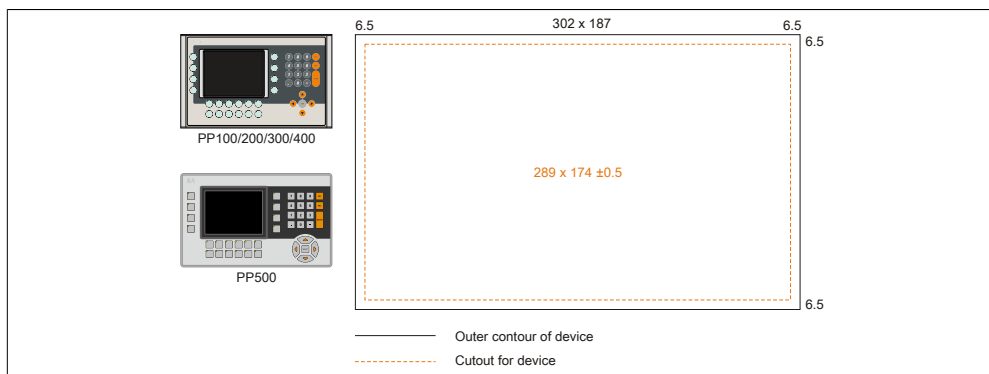


Image 80: Mounting compatibility - 5.7" device format - Horizontal2

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

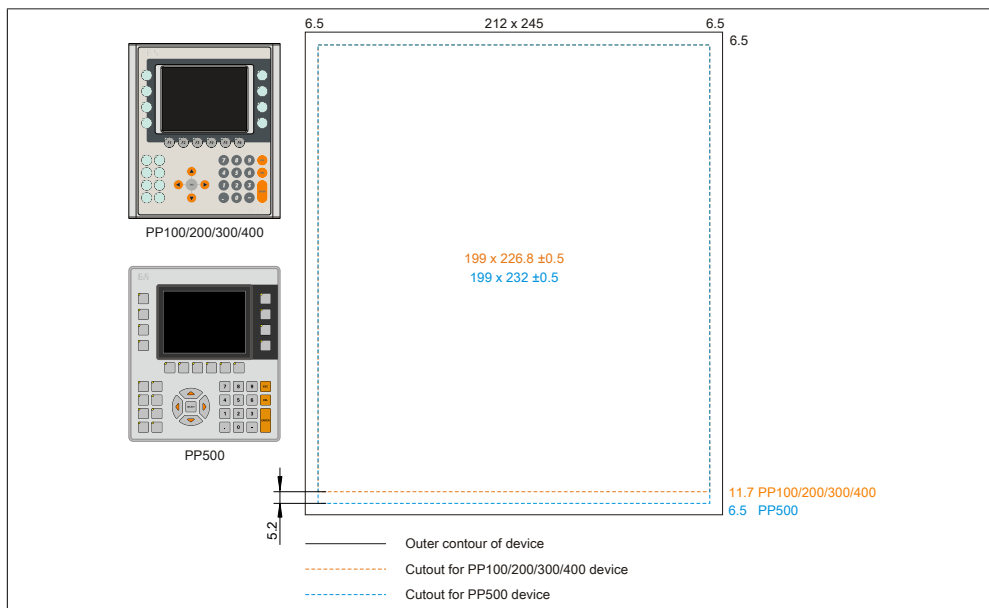


Image 81: Mounting compatibility - 5.7" device format - Vertical1

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).

4.2.3 10.4" devices

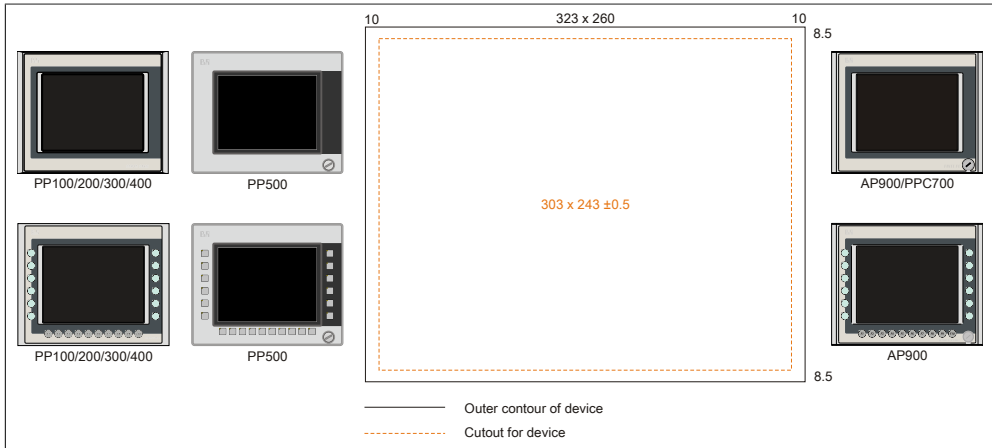


Image 82: Mounting compatibility - 10.4" device format - Horizontal1

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

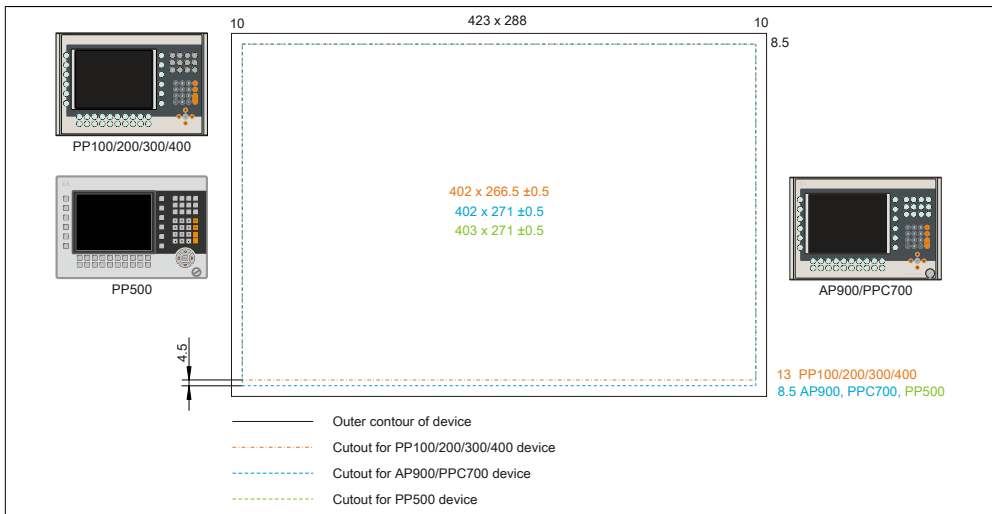


Image 83: Mounting compatibility - 10.4" device format - Horizontal2

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).

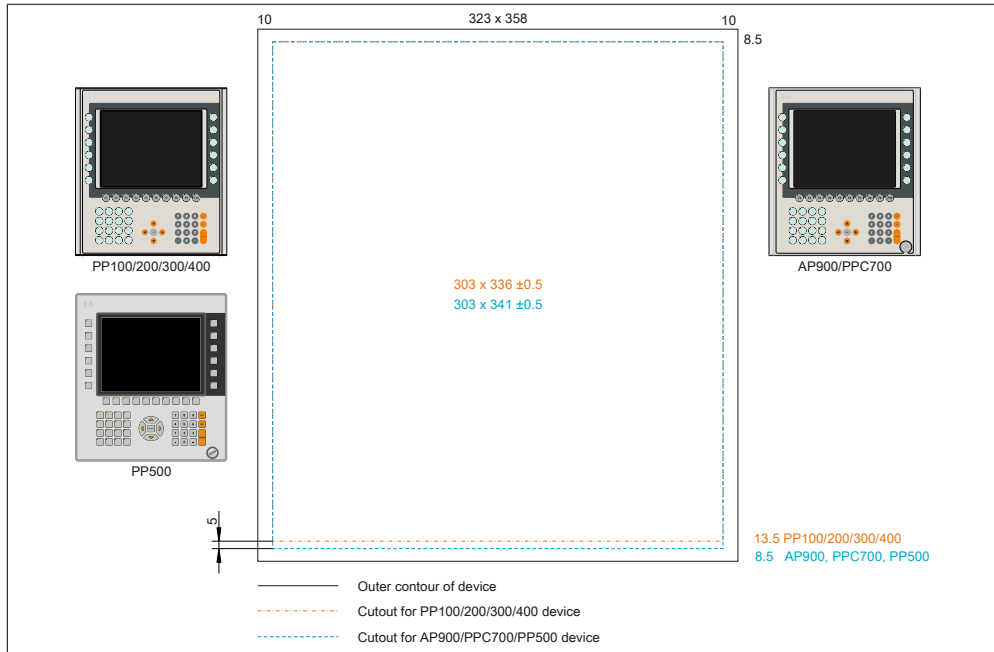


Image 84: Mounting compatibility - 10.4" device format - Vertical1

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).

4.2.4 12.1" devices

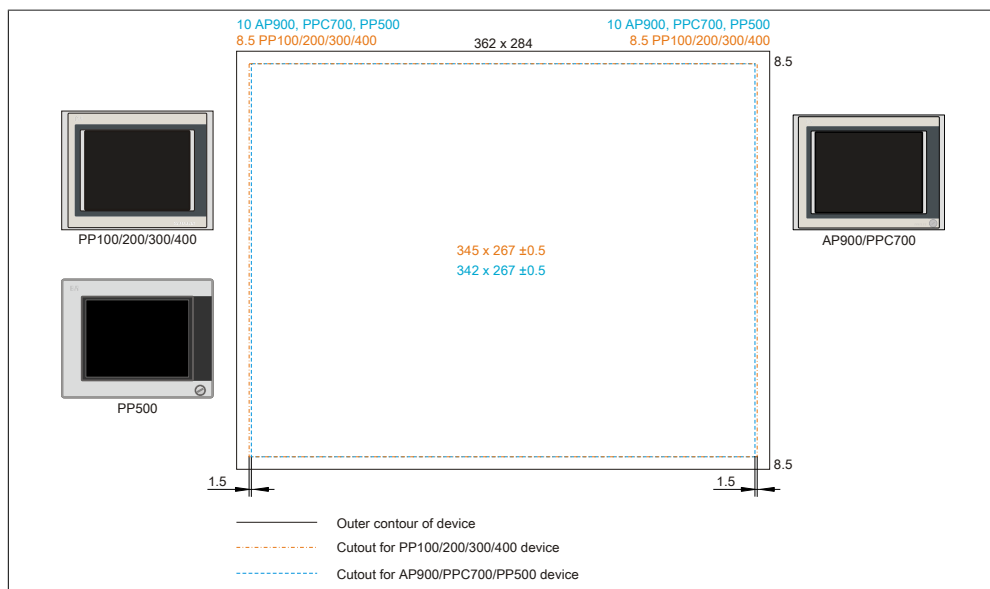


Image 85: Mounting compatibility - 12.1" device format - Horizontal1

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.

4.2.5 15" devices

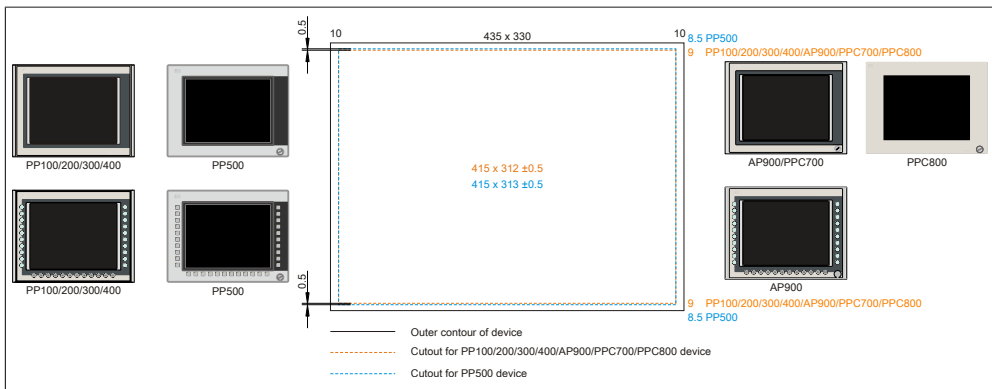


Image 86: Mounting compatibility - 15" device format - Horizontal1

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).

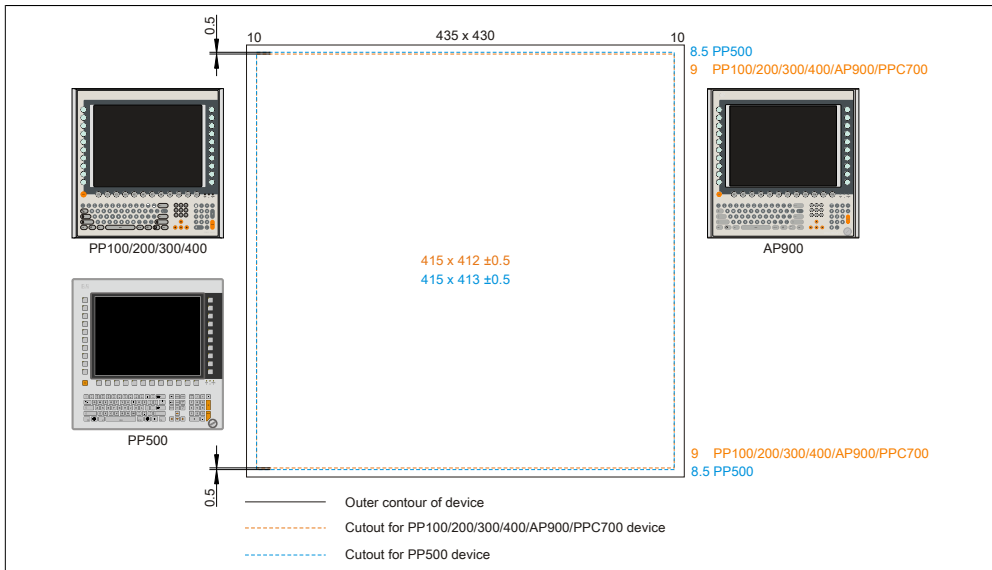


Image 87: Mounting compatibility - 15" device format - Vertical1

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 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 158: Abbreviations used in this User's Manual

6 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.].
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.

0AC201.91.....	194	5SWWI7.0100-GER.....	193
0TB103.9.....	196	5SWWI7.0300-MUL.....	193
0TB103.91.....	196	5SWWXP.0500-ENG.....	191
4A0006.00-000.....	194	5SWWXP.0500-GER.....	191
5AC900.1201-00.....	212	5SWWXP.0500-MUL.....	191
5AC900.1201-01.....	212	5SWWXP.0600-ENG.....	191
5AC900.BLOC-00.....	213	5SWWXP.0600-GER.....	191
5AC900.BLOC-01.....	214	5SWWXP.0600-MUL.....	191
5AC900.CLIP-01.....	215		
5CFCRD.0064-03.....	204		
5CFCRD.0128-03.....	204		
5CFCRD.016G-04.....	199		
5CFCRD.0256-03.....	204		
5CFCRD.0512-03.....	204		
5CFCRD.0512-04.....	199		
5CFCRD.1024-03.....	204		
5CFCRD.1024-04.....	199		
5CFCRD.2048-03.....	204		
5CFCRD.2048-04.....	199		
5CFCRD.4096-03.....	204		
5CFCRD.4096-04.....	199		
5CFCRD.8192-03.....	204		
5CFCRD.8192-04.....	199		
5MMDDR.0512-01.....	117		
5MMDDR.1024-01.....	117		
5MMDDR.2048-01.....	117		
5MMUSB.2048-01.....	209		
5PP520.0573-00.....	44		
5PP520.0573-01.....	50		
5PP520.0702-00.....	67		
5PP520.1043-00.....	73		
5PP520.1214-00.....	94		
5PP520.1505-00.....	99		
5PP551.0573-00.....	56		
5PP552.0573-00.....	62		
5PP580.1043-00.....	79		
5PP580.1505-00.....	105		
5PP581.1043-00.....	84		
5PP581.1505-00.....	110		
5PP582.1043-00.....	89		
5PP5CP.US15-00.....	115		
5PP5CP.US15-01.....	115		
5PP5CP.US15-02.....	115		
5PP5IF.CETH-00.....	118		
5PP5IF.CHDA-00.....	120		
5PP5IF.FPLM-00.....	122		
5PP5IO.GNAC-00.....	125		
5SWWI7.0100-ENG.....	193		

Image 1:	Configuration - Basic system.....	22
Image 2:	Configuration - Software, accessories.....	23
Image 3:	Temperature sensor locations.....	25
Image 4:	Serial number sticker.....	28
Image 5:	Serial number search.....	29
Image 6:	Interfaces - PP500 with interface board.....	30
Image 7:	PP500 - Back cover.....	31
Image 8:	Ground connection.....	32
Image 9:	5PP520.0573-00 - Dimensions.....	48
Image 10:	5PP520.0573-00 - Cutout installation.....	49
Image 11:	5PP520.0573-01 - Dimensions.....	54
Image 12:	5PP520.0573-01 - Cutout installation.....	55
Image 13:	5PP551.0573-00 - Dimensions.....	60
Image 14:	5PP551.0573-00 - Cutout installation.....	61
Image 15:	5PP552.0573-00 - Cutout installation.....	66
Image 16:	5PP520.0702-00 - Dimensions.....	71
Image 17:	5PP520.0702-00 - Cutout installation.....	72
Image 18:	5PP520.1043-00 - Dimensions.....	77
Image 19:	5PP520.1043-00 - Cutout installation.....	78
Image 20:	5PP580.1043-00 - Cutout installation.....	83
Image 21:	5PP581.1043-00 - Cutout installation.....	88
Image 22:	5PP582.1043-00 - Cutout installation.....	93
Image 23:	5PP520.1214-00 - Cutout installation.....	98
Image 24:	5PP520.1505-00 - Dimensions.....	103
Image 25:	5PP520.1505-00 - Cutout installation.....	104
Image 26:	5PP580.1505-00 - Cutout installation.....	109
Image 27:	5PP581.1505-00 - Cutout installation.....	114
Image 28:	RS232/422/485 interface - operated in RS485 mode.....	128
Image 29:	Retaining clips.....	131
Image 30:	Terminal block for the Power Panel 500.....	132
Image 31:	Bootscreen.....	137
Image 32:	US15W Main - Menu.....	139
Image 33:	US15W OEM Features - Menu.....	140
Image 34:	US15W OEM Features - Baseboard Features.....	141
Image 35:	US15W OEM Features - Baseboard Features - LPC Devices.....	142
Image 36:	US15W OEM Features - Baseboard Features - Statistical Values.....	143
Image 37:	US15W OEM Features - Baseboard Features - Temperature Values.....	144
Image 38:	US15W OEM Features - Display Features.....	145
Image 39:	US15W OEM Features - Display Features - LPC Devices.....	146
Image 40:	US15W OEM Features - Display Features - Statistical Values.....	147
Image 41:	US15W OEM Features - Display Features - Temperature Values.....	148
Image 42:	US15W OEM Features - IO Module Features.....	149
Image 43:	US15W OEM Features - IO Module Features - Statistical Values.....	150
Image 44:	US15W OEM Features - IF Module Features.....	151
Image 45:	US15W OEM Features - IF Module Features - Statistical Values.....	152
Image 46:	US15W OEM Features - RAM Features.....	153
Image 47:	US15W Advanced - Menu.....	154
Image 48:	US15W Advanced - Boot Configuration.....	155
Image 49:	US15W Advanced - Peripheral Configuration.....	156
Image 50:	US15W Advanced - IDE Configuration.....	157
Image 51:	US15W Advanced - IDE Configuration - Channel 1 Master.....	158
Image 52:	US15W Advanced - IDE Configuration - Channel 1 Slave.....	159
Image 53:	US15W Advanced - Video Configuration.....	160
Image 54:	US15W Advanced - USB Configuration.....	161
Image 55:	US15W Advanced - SDIO Configuration.....	163
Image 56:	US15W Advanced - ACPI Table/Features Control.....	164
Image 57:	US15W Advanced - PCI Express Root Port 1.....	165
Image 58:	US15W Advanced - PCI Express Root Port 2.....	168
Image 59:	US15W Security - Menu.....	171
Image 60:	US15W Power - Menu.....	172
Image 61:	US15W Power - Advanced - CPU Control.....	173
Image 62:	US15W Power - Advanced - CPU Control - Thermal Trip Points Settings.....	175
Image 63:	US15W Power - Platform Power Management.....	176
Image 64:	US15W Boot - Menu.....	178
Image 65:	US15W Boot - Legacy.....	179

Image 66:	US15W Boot - Legacy - Boot Type Order.....	180
Image 67:	US15W Boot - Legacy - Hard Disk Drive.....	181
Image 68:	US15W Boot - Legacy - USB.....	182
Image 69:	US15W Boot - Legacy - Others.....	183
Image 70:	US15W Exit - Menu.....	184
Image 71:	5CFCRD.xxxx-04 - Temperature humidity diagram CompactFlash cards.....	202
Image 72:	5CFCRD.xxxx-03 - Temperature humidity diagram CompactFlash cards.....	207
Image 73:	5MMUSB.2048-01 - Temperature humidity diagram.....	211
Image 74:	Remove battery.....	218
Image 75:	Battery handling.....	218
Image 76:	Insert battery.....	219
Image 77:	MTCX controller location.....	220
Image 78:	Compatibility details - figure structure.....	226
Image 79:	Mounting compatibility - 5.7" device format - Horizontal1.....	226
Image 80:	Mounting compatibility - 5.7" device format - Horizontal2.....	227
Image 81:	Mounting compatibility - 5.7" device format - Vertical1.....	227
Image 82:	Mounting compatibility - 10.4" device format - Horizontal1.....	228
Image 83:	Mounting compatibility - 10.4" device format - Horizontal2.....	228
Image 84:	Mounting compatibility - 10.4" device format - Vertical1.....	229
Image 85:	Mounting compatibility - 12.1" device format - Horizontal1.....	230
Image 86:	Mounting compatibility - 15" device format - Horizontal1.....	231
Image 87:	Mounting compatibility - 15" device format - Vertical1.....	232

Table 1:	Manual history.....	11
Table 2:	Environmentally-friendly separation of materials.....	15
Table 3:	Organization of safety notices.....	16
Table 4:	Nominal measurement areas.....	16
Table 5:	Temperature sensor locations.....	25
Table 6:	Overview of humidity specifications for individual components.....	27
Table 7:	Supply voltage connection + 24VDC.....	32
Table 8:	Pin assignments - COM.....	33
Table 9:	Ethernet connection (ETH).....	34
Table 10:	USB1, USB2 port.....	35
Table 11:	USB3 port.....	36
Table 12:	Battery.....	37
Table 13:	Meaning of battery status.....	37
Table 14:	CompactFlash slot.....	38
Table 15:	SD Memory Card Slot.....	39
Table 16:	Power button.....	40
Table 17:	Reset button.....	40
Table 18:	Mode/Node switches.....	41
Table 19:	Data - status LEDs.....	42
Table 20:	Interface board insert.....	43
Table 21:	I/O board insert.....	43
Table 22:	5PP520.0573-00 - Order data.....	44
Table 23:	5PP520.0573-00 - Technical data.....	45
Table 24:	5PP520.0573-01 - Order data.....	50
Table 25:	5PP520.0573-01 - Technical data.....	51
Table 26:	5PP551.0573-00 - Order data.....	56
Table 27:	5PP551.0573-00 - Technical data.....	57
Table 28:	5PP552.0573-00 - Order data.....	62
Table 29:	5PP552.0573-00 - Technical data.....	63
Table 30:	5PP520.0702-00 - Order data.....	67
Table 31:	5PP520.0702-00 - Technical data.....	68
Table 32:	5PP520.1043-00 - Order data.....	73
Table 33:	5PP520.1043-00 - Technical data.....	74
Table 34:	5PP580.1043-00 - Order data.....	79
Table 35:	5PP580.1043-00 - Technical data.....	80
Table 36:	5PP581.1043-00 - Order data.....	84
Table 37:	5PP581.1043-00 - Technical data.....	85
Table 38:	5PP582.1043-00 - Order data.....	89
Table 39:	5PP582.1043-00 - Technical data.....	90
Table 40:	5PP520.1214-00 - Order data.....	94
Table 41:	5PP520.1214-00 - Technical data.....	95
Table 42:	5PP520.1505-00 - Order data.....	99
Table 43:	5PP520.1505-00 - Technical data.....	100
Table 44:	5PP580.1505-00 - Order data.....	105
Table 45:	5PP580.1505-00 - Technical data.....	106
Table 46:	5PP581.1505-00 - Order data.....	110
Table 47:	5PP581.1505-00 - Technical data.....	111
Table 48:	5PP5CP.US15-00, 5PP5CP.US15-01, 5PP5CP.US15-02 - Order data.....	115
Table 49:	5PP5CP.US15-00, 5PP5CP.US15-01, 5PP5CP.US15-02 - Technical data.....	116
Table 50:	5MMDDR.0512-01, 5MMDDR.1024-01, 5MMDDR.2048-01 - Order data.....	117
Table 51:	5MMDDR.0512-01, 5MMDDR.1024-01, 5MMDDR.2048-01 - Technical data.....	117
Table 52:	5PP5IF.CETH-00 - Order data.....	118
Table 53:	5PP5IF.CETH-00 - Technical data.....	118
Table 54:	5PP5IF.CETH-00 - Ethernet connection.....	119
Table 55:	5PP5IF.CHDA-00 - Order data.....	120
Table 56:	5PP5IF.CHDA-00 - Technical data.....	120
Table 57:	MIC, Line IN, Line OUT.....	121
Table 58:	5PP5IF.FPLM-00 - Order data.....	122
Table 59:	5PP5IF.FPLM-00 - Technical data.....	122
Table 60:	POWERLINK Interface Board 2port connection.....	123
Table 61:	Status / Error LED as error LED - POWERLINK operating mode.....	123
Table 62:	Status/Error LED as status LED - POWERLINK operating mode.....	123
Table 63:	5PP5IO.GNAC-00 - Order data.....	125
Table 64:	5PP5IO.GNAC-00 - Technical data.....	125
Table 65:	Panel connection - DVI, SDL.....	126

Table 66:	Pin assignments - COM.....	126
Table 67:	RS232/422/485 - I/O address and IRQ.....	127
Table 68:	RS232 - Bus length and transfer rate.....	127
Table 69:	RS232 - Cable requirements.....	127
Table 70:	RS422 - Bus length and transfer rate.....	127
Table 71:	RS422 - Cable requirements.....	128
Table 72:	RS485 - Bus length and transfer rate.....	129
Table 73:	RS485 - Cable requirements.....	129
Table 74:	USB1 connection.....	129
Table 75:	MIC, Line IN, Line OUT.....	130
Table 76:	BIOS-relevant keys for POST.....	138
Table 77:	BIOS-relevant keys in the BIOS menu.....	138
Table 78:	US15W Main - Menu setting options.....	139
Table 79:	US15W OEM Features - Menu setting options.....	140
Table 80:	US15W OEM Features - Baseboard Features setting options.....	141
Table 81:	US15W OEM Features - Baseboard Features - LPC Devices setting options.....	143
Table 82:	US15W OEM Features - Baseboard Features - Statistical Values setting options.....	144
Table 83:	US15W OEM Features - Baseboard Features - Temperature Values setting options.....	144
Table 84:	US15W OEM Features - Display Features setting options.....	145
Table 85:	US15W OEM Features - Display Features - LPC Devices setting options.....	146
Table 86:	US15W OEM Features - Display Features - Statistical Values setting options.....	147
Table 87:	US15W OEM Features - Display Features - Temperature Values setting options.....	148
Table 88:	US15W OEM Features - IO Module Features setting options.....	149
Table 89:	US15W OEM Features - IO Module Features - Statistical Values setting options.....	150
Table 90:	US15W OEM Features - IF Module Features setting options.....	151
Table 91:	US15W OEM Features - IF Module Features - Statistical Values setting options.....	152
Table 92:	US15W OEM Features - RAM Features setting options.....	153
Table 93:	US15W Advanced - Menu setting options.....	154
Table 94:	US15W Advanced - Boot Configuration setting options.....	156
Table 95:	US15W Advanced - Peripheral Configuration setting options.....	156
Table 96:	US15W Advanced - IDE Configuration setting options.....	157
Table 97:	US15W Advanced - IDE Configuration - Channel 1 Master setting options.....	158
Table 98:	US15W Advanced - IDE Configuration - Channel 1 Slave setting options.....	159
Table 99:	US15W Advanced - Video Configuration setting options.....	160
Table 100:	US15W Advanced - USB Configuration setting options.....	162
Table 101:	US15W Advanced - SDIO Configuration setting options.....	163
Table 102:	US15W Advanced - ACPI Table/Features Control setting options.....	164
Table 103:	US15W Advanced - PCI Express Root Port 1 setting options.....	165
Table 104:	US15W Advanced - PCI Express Root Port 2 setting options.....	168
Table 105:	US15W Security - Menu setting options.....	171
Table 106:	US15W Power - Menu setting options.....	172
Table 107:	US15W Power - Advanced CPU Control setting options.....	173
Table 108:	US15W Power - Advanced CPU Control - Thermal Trip Points Settings options.....	176
Table 109:	US15W Power - Platform Power Management setting options.....	176
Table 110:	US15W Boot - Menu setting options.....	178
Table 111:	US15W Boot - Legacy setting options.....	179
Table 112:	US15W Boot - Legacy - Boot Type Order setting options.....	180
Table 113:	US15W Boot - Legacy - Hard Disk Drive setting options.....	181
Table 114:	US15W Boot - Legacy - USB setting options.....	182
Table 115:	US15W Boot - Legacy - Others setting options.....	183
Table 116:	US15W Exit - Menu setting options.....	184
Table 117:	US15W - Main profile setting overview.....	185
Table 118:	US15W - OEM Features profile setting overview.....	185
Table 119:	US15W - Baseboard Features profile setting overview.....	185
Table 120:	US15W - Display Features profile setting overview.....	186
Table 121:	US15W - IF Module Features profile setting overview.....	186
Table 122:	US15W - RAM Features profile setting overview.....	187
Table 123:	US15W - Boot Configuration profile setting overview.....	187
Table 124:	US15W - Peripheral Configuration profile setting overview.....	187
Table 125:	US15W - IDE Configuration profile setting overview.....	187
Table 126:	US15W - Video Configuration profile setting overview.....	188
Table 127:	US15W - USB Configuration profile setting overview.....	188
Table 128:	US15W - USB Configuration profile setting overview.....	188
Table 129:	US15W - SDIO Configuration profile setting overview.....	188
Table 130:	US15W - ACPI Table/Features Control profile setting overview.....	188

Table index

Table 131:	US15W - PCI Express Root Port 1 profile setting overview.....	189
Table 132:	US15W - PCI Express Root Port 2 profile setting overview.....	189
Table 133:	US15W - Power profile setting overview.....	190
Table 134:	US15W - Advanced CPU Control profile setting overview.....	190
Table 135:	US15W - Platform Power Management profile setting overview.....	190
Table 136:	US15W - Boot profile setting overview.....	190
Table 137:	5SWWXP.0600-ENG, 5SWWXP.0600-GER, 5SWWXP.0600-MUL, 5SWWXP.0500-ENG, 5SWWXP.0500-GER, 5SWWXP.0500-MUL - Order data.....	191
Table 138:	5SWWI7.0100-ENG, 5SWWI7.0100-GER, 5SWWI7.0300-MUL - Order data.....	193
Table 139:	0AC201.91, 4A0006.00-000 - Order data.....	194
Table 140:	0AC201.91, 4A0006.00-000 - Technical data.....	195
Table 141:	0TB103.9, 0TB103.91 - Order data.....	196
Table 142:	0TB103.9, 0TB103.91 - Technical data.....	196
Table 143:	5CFCRD.0512-04, 5CFCRD.1024-04, 5CFCRD.2048-04, 5CFCRD.4096-04, 5CFCRD.8192-04, 5CFCRD.016G-04 - Order data.....	199
Table 144:	5CFCRD.0512-04, 5CFCRD.1024-04, 5CFCRD.2048-04, 5CFCRD.4096-04, 5CFCRD.- 8192-04, 5CFCRD.016G-04 - Technical data.....	200
Table 145:	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 da- ta.....	204
Table 146:	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.....	205
Table 147:	5MMUSB.2048-01 - Order data.....	209
Table 148:	5MMUSB.2048-01 - Technical data.....	210
Table 149:	5AC900.1201-00 - Order data.....	212
Table 150:	5AC900.1201-01 - Order data.....	212
Table 151:	5AC900.BLOC-00 - Order data.....	213
Table 152:	5AC900.BLOC-01 - Order data.....	214
Table 153:	5AC900.CLIP-01 - Order data.....	215
Table 154:	Meaning of battery status.....	217
Table 155:	Chemical resistance of the décor foil.....	222
Table 156:	Product abbreviations.....	224
Table 157:	Device compatibility overview.....	224
Table 158:	Abbreviations used in this User's Manual.....	233

A

Abbreviation.....	224
Accessories.....	194
ARwin, CMP support.....	173

B

B&R CompactFlash.....	199
Backlight.....	134
Backup BIOS.....	140, 161
Battery.....	37
Battery status evaluation.....	217
Battery status evaluation.....	37

BIOS

ACPI Table/Features Control.....	164
Advanced.....	154
Advanced CPU Control.....	173
Baseboard Features.....	141
Boot.....	178
Boot Configuration.....	155
Boot Type Order.....	180
Channel 1 Master.....	158
Channel 1 slave.....	159
Display Features.....	145
Exit.....	184
Hard Disk Drive.....	181
IDE Configuration.....	157
IF Module Features.....	151
IO Module Features.....	149
Legacy.....	179
LPC Devices.....	142, 146
Main.....	139
OEM Features.....	140
Others.....	183
PCI Express Root Port 1.....	165
PCI Express Root Port 2.....	168
Peripheral Configuration.....	156
Platform Power Management.....	176
Power.....	172
RAM Features.....	153

SDIO Configuration.....	163
Security.....	171
Statistical Values.....	143, 147, 150, 152
Temperature Values.....	144, 148
Thermal Trip Points Settings.....	175
USB.....	182
USB Configuration.....	161
Video Configuration.....	160

BIOS default settings.....	185
BIOS setup.....	136
BIOS setup keys.....	137
BIOS update.....	40, 140
BIOS update procedure.....	40, 140
Boot sequence.....	178
Burn-in effect.....	134

C

caused during.....	135
--------------------	-----

C

CF LED.....	42
Changing the battery.....	217
Chemical resistance.....	222
Cleaning.....	216
Clip.....	215
COM.....	33, 126
CompactFlash	
Benchmark.....	203
CompactFlash.....	38
CompactFlash cards.....	197
Configuration	
- Basic system.....	22
software, accessories.....	23
Configuration - PP500.....	22
Device interfaces.....	30

Dimension standards..... 16

D

display lifespan..... 134

Disposal..... 15, 15

D

DVI..... 126

Dynamic Wear Leveling..... 197

Entire device..... 25

E

ESD..... 12

Electrical components with hous-
ing..... 12, 12

handling..... 12

Individual components..... 12

Packaging..... 12

ETH..... 34

Ethernet..... 34, 119

F

front USB..... 35

General tolerance..... 16

Ground..... 32

Guidelines..... 16

H

HDA..... 120

HDA sound..... 125

hex selection..... 41

I/O board..... 43

Image sticking..... 134

Installation..... 131

Interface board..... 43

Interfaces..... 30

L

LED..... 42

Link LED..... 42

Main memory..... 117

Manual history..... 11

Membrane..... 222

MIC, Line IN, Line OUT..... 121, 130

Mode/Node switches..... 41

Mounting compatibilities..... 224

Mounting with retaining clips..... 131

Mounting with terminal blocks..... 131

M

MTCX upgrade..... 42

Panel connection..... 126

P

Pixel error..... 135

Power button..... 40

Power failure logic..... 220

Power LED..... 42

POWERLINK..... 122

Link LED..... 123

Speed LED..... 123

Status / Error LED..... 123

Product abbreviations..... 224

R

Relative humidity..... 27

Reset button..... 40

Retaining clip.....	131	Status LEDs.....	42
RS232		Supply voltage.....	32
bus length.....	127	Supply voltage connectors.....	196
cable type.....	127	Temperature monitoring.....	26
RS422		Temperature monitoring.....	220
bus length.....	127	Temperature specifications.....	25
cable type.....	127	Terminal block.....	131, 213
RS485		Touch screen calibration.....	133
- Bus length.....	128	USB.....	35, 129
- Cable type.....	128	USB flash drive.....	209
RS485 Interface.....	128	Viewing angles.....	223
Run LED.....	42	Windows 7.....	193
S		Windows XP Professional.....	191
Safety notices			
Environmental conditions.....	14		
Intended use.....	12		
Mounting.....	13		
Operation.....	14		
Organization.....	16		
Policy and procedures.....	13		
Protection against electrostatic discharge.....	12		
Seperation of materials.....	15		
Transport and storage.....	13		
Safety notices.....	12		
Safety notices			
Environmentally-friendly disposal.....	15		
SDL.....	126		
SD memory card.....	39		
SD Memory Card Slot.....	39		
Serial interface.....	33, 126		
Serial number sticker.....	28		
Service function.....	42		
Smart Display Link.....	126		
Smart Display Link/DVI socket.....	125		
Static wear leveling.....	198		

