Panel PC 700

User's Manual

Version: **1.93 (April 2013)**

Model number: **MAPPC700-ENG**

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Chapter 1 • General Information

Information:

B&R does its best to keep the printed versions of its user's manuals as current as possible. However, any newer versions of the User's Manual can always be downloaded in electronic form (pdf) from the B&R homepage www.br-automation.com.

1. Manual history

Version	Date	Change
1.0 Preliminary	2005-05-07	- First version
1.1 Preliminary	2005-05-31	- Technical data updated - New dimension diagrams (fan) - Cutout diagrams updated - Mounting chapter updated - Photos updated
1.2 Preliminary	2006-01-31	- Conductor cross section and AWG change for the supply plug. - More detailed definition of standard and 24-hour operation of hard disks 5AC600.HDDI-00 and 5AC600.HDDS-00. - Technical data for SDL cable updated due to new specifications from manufacturer. - Information about general tolerances according to DIN ISO 2768 medium added to dimension diagrams. - Safety guidelines revised - IP65 Protection specified in more detail. - Intel 815E CPU boards discontinued. - Additional PCI bus information added. - Voltage information on the PCI slot plug and the compatible PCI cards added. - Display contrast and viewing angle properties added. - Rear view photos of system units 5PC781.1505-00 and 5PC782.1043-00 added. - Installation diagrams and tolerance information revised for the dimensions sections - The slide-in drives can be used in system units with 1 or 2 PCI slots. - Dimensions corrected in the "Technical data" table for system unit 5PC720.1505-02.
1.30	2006-10-09	- Dimensions (depth) corrected. - Information regarding the new 512 MB and 1 GB SanDisk Cruzer Micro flash drives added. - Silicon Systems CompactFlash cards 5CFCRD.xxxx-03 added. - Power management section for 10.4", 12.1" and 15" Panel PC 700 types added. - SDL cable with 45° plug 5CASDL.0018-01, 5CASDL.0050-01, 5CASDL.0100-01, 5CASDL.0150-01 added (see section "SDL cable with 45° plug 5CASDL.0xxx-01", on page 644). - SDL cable with extender 5CASDL.0300-10 and 5CASDL.0400-10 added (see section "SDL cable with extender 5CASDL.0x00-10", on page 647).

Table 1: Manual history

Version	Date	Change
		- Technical data for the 855GME CPU boards 5PC600.E855-04 and 5PC600.E855-05 was corrected. - Typical topologies added: Selection guide for the basic system and optional components added. - HMI Drivers & Utilities DVD 5SWHMI.0000-00 added. - Legend strip templates 5AC900.104X-00, 5AC900.104X-01 and 5AC900.150X-01 added.- Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 added. - Adjustment of the 855GME BIOS description for BIOS Version 1.21. - Windows CE order numbers added. - Standards and certifications chapter added. - Service and maintenance chapter added. - Name change for CompactFlash short text. - Power management values added. - Technical data for the touch screen added (see appendix A) - New model number for the PPC700 documentation MAPPC700-ENG. - Ambient temperature specifications depending on the system unit added. - Chapter 3 "Installation" renamed to "Commissioning".
1.40	2006-12-13	- Error in the SDL cable model number overview corrected. - Texts for all SDL cables changed. - Error in the image in table 395 "Order data - Legend strip templates" corrected. - Note concerning publication of the technical data for the components placed on the title page. - USB connection description changed (back and front side) - Description of the voltage supply connection and ground (functional ground) changed. - Information about the serial number sticker added (see section "Serial number sticker", on page 105). - Font symbol assigned to the character format symbol. - 2 GB USB flash drive 5MMUSB.2048-00 added (see section "USB flash drive", on page 628). - Document now includes the chm tag "Filename". - SDL cable flex 5CASDL.0xxx-03 added (see section "SDL flex cable 5CASDL.0xxx-03", on page 650). - SDL cable flex with extender 5CASDL.0xxx-13 added (see section "SDL flex cable with extender 5CASDL.0x00-13", on page 655). - Fan kit installation and exchange added (see chapter 7 "Maintenance / Servicing", section "Fan kit installation and replacement", on page 679.) - Add-on hard disk 40 GB - 5AC600.HDDI-05 added (see section "Add-on hard disk 40 GB - 5AC600.HDDI-05", on page 208). - Slide-in hard disk 40 GB - 5AC600.HDDS-02 added (see section "Slide-in hard disk 40 GB - 5AC600.HDDS-02", on page 237). - PCI SATA RAID controller 5ACPCI.RAIC-01 added (see section "PCI SATA RAID 2 x 60 GB 24x7 - 5ACPCI.RAIC-01", on page 248). - Chapter 3 "Commissioning" updated (important information for installation, cable connection, connection examples with Automation Panel 800 and Automation Panel 900 devices) - USB Media Drive 5MD900.USB2-00 added. - 5A5003.03 front cover description added to the 5MD900.USB2-00 and 5M900.USB2-01 product descriptions. - Description of the BIOS function "Legacy USB Support" updated.
1.50	2007-02-23	- Description of SDL cable flex with extender updated (see section "SDL flex cable with extender 5CASDL.0x00-13", on page 655). - All cable specification diagrams updated. - Section "SDL flex cable - test description", on page 568 expanded (cable drag chain and torsion test). - Maximum ambient temperature specifications of system units 5PC720.1043-00, 5PC720.1043-01, 5PC720.1214-00, 5PC720.1505-02, 5PC781.1043-00 and 5PC782.1043-00, in connection with the 855GME CPU module 5PC600.E855-04 and a fan kit were lowered from 55°C to 50°C. 8 GB CompactFlash card 5CFCRD.8192-03 added. - Section "Panel PC 700 with Windows XP Embedded", on page 534 added

Table 1: Manual history

Version	Date	Change
1.60	2007-06-11	- Section "Panel PC 700 with Automation Runtime", on page 544 added - Information in section "Interface covers 5AC600.ICOV-00", on page 585 expanded. - Figure 10 "Ambient temperatures - 5PC720.1505-01 with 855GME (ETX / XTX) CPU boards", on page 58 and figure 11 "Ambient temperatures - 5PC720.1505-02 with 855GME (ETX / XTX) CPU boards", on page 60 corrected. - Section "Ethernet cable lengths for ETH1", on page 289 added - Section "USB flash drive", on page 628 updated. - Section "Exchanging the legend strips", on page 689 added - Section "Grounding concept", on page 290 added - Section "Connection examples", on page 292 in Chapter 3 "Commissioning" updated.
1.70	2008-02-01	- New model numbers for Windows CE and Windows XPe expanded. - Short description of the 5PC782.1043-00 device modified. - Section "Panel PC 700 with Windows XP Embedded", on page 534 and "Panel PC 700 with Windows CE", on page 540 updated. - Temperature/humidity diagram information expanded. - Replacement fan filters 5AC700.FA00-00, 5AC700.FA02-00 expanded (see page 666). - Section "Changing the battery", on page 675 updated. - Safety notices regarding environmental conditions - dust, humidity, aggressive gasses - updated. - New interface photos 5PC720.1043-00 and 5PC720.1214-01. - Section "Configuration of a SATA RAID array", on page 252 added - CPU boards 855GME (XTX) added (see section "CPU boards 855GME (XTX)", on page 31). - 855GME (XTX) BIOS description expanded. - Dimensions of the PCI half-size card updated. - Replacement SATA RAID HDD 5PCPCI.RAIC-02 added (see section "Replacement SATA HDD 60 GB - 5ACPCI.RAIC-02", on page 253). - Viewing angle information revised - B&R power supplies as accessories added (see section "Power Supplies", on page 581). - 815E (ETX) BIOS description adjusted to the BIOS version 1.23. - 855GME (ETX) BIOS description adjusted to the BIOS version 1.26. - 855GME (XTX) BIOS description adjusted to the BIOS version 1.16. - Vibration / shock data revised. - Temperature specifications for system units 5PC720.1214-01, 5PC720.1706-00 and 5PC720.1906-00 expanded. - New rear-view photo for the system unit 5PC720.1043-01. - DVI / SDL cable descriptions revised.
1.80	2008-11-04	- Information for determining the battery status added (possible starting with the new system unit revisions). - Section "Power management", on page 70 updated because of new system unit revisions. - Compatibility note regarding Bosch CC770 CAN controller for Intel 82527 added. - PCI SATA RAID controller 5ACPCI.RAIC-03 (see page 256) and replacement hard disk 5ACPCI.RAIC-04 (see page 260) added. - Add-on hard disk 80 GB 24x7 ET - 5AC600.HDDI-06 (see page 211) added. - Ambient temperature tables updated to include 5AC600.HDDI-06 and 5ACPCI.RAIC-03. - The Automation Device Interface (ADI) section was moved to after chapter 4 Software and expanded to include the Installation section. - Automation Device Development Kit expanded to include the Installation section. - Standards corrected (obsolete standards removed). - PCI Ethernet interface cards 5ACPIC.ETH1-01 and 5ACPCI.ETH3-01 added (see section "Ethernet PCI interface cards", on page 670). - Add-on hard disk 40 GB 24x7 5AC600.HDDI-02 added on page 199. - Add-on hard disk 60 GB 24x7 5AC600.HDDI-03 added on page 202. - Add-on hard disk 80 GB 24x7 5AC600.HDDI-04 added on page 205. - User Serial ID described in more detail. - Correction of the configuration graphics for optional components. - Spelling and grammar errors corrected. - External UPS added on page 583. - Correction of monitor diagonal dimensions for 5PC720.1706-00 and 5PC720.1906-00. - Windows XP Professional added in chapter 4 "Software" on page 532.

Table 1: Manual history

Version	Date	Change
		- Topology graphics updated (design adapted). - Correction of some BIOS settings. - Maximum USB transmission speed when connecting AP800 and AP900 devices added. - Figure 39: Dimensions for 5PC720.1043-00 changed on page 108.
1.90	2010-09-20	- Mounting orientation -45° and +45° added on page 288. - Section 2.7 "Environmentally-friendly disposal" in chapter 1 "General Information" added. - B&R CompactFlash card added. - Image of Silicon Systems CompactFlash card changed. - Technical data for Silicon Systems CFs revised. - Contents of delivery for USB flash drives removed. - 5SWWCE.0815-ENG and 5SWWCE.0816-ENG added. - Technical data and installation information for the SRAM module 5AC600.SRAM added. - Device 5PC782.1043-00 discontinued. - Model number text corrected for the CPU boards 5PC600.X855-05 and 5PC600.E855-05. - Section 3.1.1 "Installation on PCI SATA RAID controller - 5ACPCI.RAIC-03, 5ACPCI.RAIC-05", on page 533 in chapter 4 "Software" added. - Touch screen type added to the device technical data. - Description of section 2.4.19 "Slide-in slot 1 drive slot", on page 104 corrected. - Section 4.5 "Known problems" in chapter 4 "Software" removed. - Maximum graphics resolution added to the graphic card technical data. - Section 2.2 "Humidity specifications", on page 68 added - Section 7 "Membrane", on page 704 in "Appendix A" added. - Section 2.1 "Temperature monitoring - Fan control", on page 695 added - Process architecture of the CPU boards 5PC600.X855-02 and 5PC600.X855-03 corrected. - Replacement CMOS batteries 0AC201.9 replaced by 0AC201.91. - Section 2.1 "BIOS upgrade", section 2.2 "Upgrade the firmware" and section 2.3 "Creating an MS-DOS boot diskette in Windows XP" moved to section 2 "Upgrade information", on page 513. - Section 2.4 "Creating a bootable USB flash drive for B&R upgrade files", on page 528 and section 2.5 "Creating a bootable CompactFlash card for B&R upgrade files", on page 530 added. - Section 6 "Panel PC 700 with Windows CE", on page 540 updated. - The section "Creating a bootable USB flash drive" removed from chapter 6 "Accessories". - Section 2.2 "Upgrade the firmware", on page 521 updated. - Figure 10 "Ambient temperatures - 5PC720.1505-01 with 855GME (ETX / XTX) CPU boards", on page 58 and figure 11 "Ambient temperatures - 5PC720.1505-02 with 855GME (ETX / XTX) CPU boards", on page 60 corrected. - Information about mixed operation of CompactFlash cards from different manufacturers added. - Section 12 "Known problems / issues", on page 337 added - Information added in section 1 "Temperature sensor locations", on page 693. - Section 9 "User tips for increasing the display lifespan", on page 331 added - "Panel PC 700 with BIOS" changed to "BIOS options". - Section 8 "Key and LED configurations", on page 327 added - Depth dimensions corrected in the technical data for the device 5PC720.1043-00. - Section 5 "Panel PC 700 with Windows Embedded Standard 2009", on page 537 updated. - BIOS: Effect of setting options during Dark Boot corrected. - Section "Preventing after-image effect in LCD / TFT monitors" in Chapter 7 "Maintenance / Servicing" removed. - Section 18 "Cables", on page 638 in chapter 6 "Accessories" updated. - B&R USB flash drive added to the chapter 6 "Accessories" on page 631. - B&R ID codes for system units added. - 855GME (ETX) BIOS description V1.26 updated to V1.30, see page 395 - in the menu, "Exit", the items "Save Optimized Defaults" and "Load Optimized Defaults" were added. - Technical data "Remanent variables for AR (Automation Runtime) in Power Fail Mode" added for the SRAM module 5AC600.SRAM-00. - Description in Chapter 4 "Software", section "Miscellaneous", on page 370 changed.

Table 1: Manual history

Version	Date	Change
1.91	2011-06-14	- Sections "B&R Automation Device Interface (ADI) driver - Control Center", on page 545, "HMI Drivers & Utilities DVD 5SWHMI.0000-00", on page 633, "B&R Key Editor", on page 696 and "B&R Automation Device Interface (ADI) development kit", on page 698 updated. - Section "B&R Automation Device Interface (ADI) .NET SDK", on page 700 added. - Information about "Pixelerror", on page 332 added.
1.92	2011-08-02	- Sections "B&R Automation Device Interface (ADI) driver - Control Center", on page 545, "B&R Automation Device Interface (ADI) development kit", on page 698 and "B&R Automation Device Interface (ADI) .NET SDK", on page 700 updated. - „Information:“ to installation in section "Panel PC 700 with Windows XP Professional", on page 532 added. - "PCI SATA RAID 2 x 250 GB - 5ACPCI.RAIC-05", on page 263 and "Replacement SATA HDD 250 GB - 5MMHDD.0250-00", on page 267 added. - Section "Changing the CompactFlash", on page 678 added. - 5ACPCI.RAIC-05 added in: figure 6 "Ambient temperatures - 5PC720.1043-01 with 855GME (ETX / XTX) CPU boards", on page 53, figure 8 "Ambient temperatures - 5PC720.1214-01 with 855GME (ETX / XTX) CPU boards", on page 56, figure 10 "Ambient temperatures - 5PC720.1505-01 with 855GME (ETX / XTX) CPU boards", on page 58, figure 11 "Ambient temperatures - 5PC720.1505-02 with 855GME (ETX / XTX) CPU boards", on page 60, figure 3 "Configuration of optional components", on page 49, table 22 "Overview of humidity specifications for individual components", on page 68 and in headline "Installation on PCI SATA RAID controller - 5ACPCI.RAIC-03, 5ACPCI.RAIC-05", on page 533.
1.93	2013-04-24	- Replacement SSD drive "Replacement Solid State Drive 128 GB 24x7 ET - 5MMSSD.0128-00", on page 190 was added. - For "Add-on Solid State Drive 128 GB 24x7 ET - 5AC600.SSDI-00", on page 187, revision D was added. - The "CompactFlash cards 5CFCRD.xxxx-06", on page 589 were added. - Section "General instructions for performing temperature tests", on page 332 was added.

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 discharges

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

2.2.1 Packaging

- Electrical components with 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 without housing

In addition to "Electrical components with housing", the following also applies:

- 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, ounting, 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 Installation

- Installation must take place according to the documentation, using suitable equipment and tools.
- Devices must be installed without voltage applied and by qualified personnel.
- 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 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.

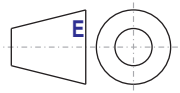
3. Organization of safety notices

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. Directives



European dimension standards apply to all dimensions (e.g. dimension diagrams, etc.).

5. Model numbers

5.1 System units

Model number	Short description	Note
5PC720.1043-00	**Panel PC 720 10.4" VGA T, 0 PCI slots** 10.4" VGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 107
5PC720.1043-01	**Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot** 10.4" VGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 113
5PC720.1214-00	**Panel PC 720 12.1" SVGA T, 0 PCI slots** 12.1" SVGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 119
5PC720.1214-01	**Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot** 12.1" SVGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 125
5PC720.1505-00	**Panel PC 720 15" XGA T, 0 PCI slots** 15" XGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 131
5PC720.1505-01	**Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot** 15" XGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 137
5PC720.1505-02	**Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot** 15" XGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 143
5PC720.1706-00	**Panel PC 720 17" SXGA T, 0 PCI slots** 17" SXGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 149 *Discontinued since 04/2009*
5PC720.1906-00	**Panel PC 720 19" SXGA T, 0 PCI slots** 19" SXGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 155

Table 4: Model numbers - system units

Model number	Short description	Note
5PC781.1043-00	**Panel PC 781 10.4" VGA FT, 0 PCI slots** 10.4" VGA color TFT display with touch screen (resistive); 10 softkeys; 28 function keys and 20 system keys; connections for 2x RS232, 3x USB 2.0, monitor, 2x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 161
5PC781.1505-00	**Panel PC 781 15" XGA FT, 0 PCI slots** 15" XGA color TFT display with touch screen (resistive); 12 softkeys; 20 function keys and 92 system keys; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 167
5PC782.1043-00	**Panel PC 782 10.4" VGA FT, 0 PCI slots** 10.4" VGA color TFT display with touch screen (resistive); 44 function keys and 20 system keys; connections for 2x RS232, 3x USB 2.0, monitor, 2x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC. Plug for power supply must be ordered separately (screw clamps: 0TB103.9; cage clamp: 0TB103.91).	See page 173 discontinued

Table 4: Model numbers - system units (Forts.)

5.2 CPU boards 815E (ETX)

Model number	Short description	Note
5PC600.E815-00	**CPU board 815E C3-400** Intel Celeron 3 CPU board, 400 MHz, 100 MHz FSB, 256 KB L2 cache, chipset 815E; 1 socket for SO-DIMM SDRAM module.	See page 179 Canceled since 10/2005 Replaced by 855GME (ETX / XTX) CPU boards
5PC600.E815-02	**CPU board 815E C3-733** Intel Celeron 3 CPU board, 733 MHz, 133 MHz FSB, 256 KB L2 cache, chipset 815E; 1 socket for SO-DIMM SDRAM module.	
5PC600.E815-03	**CPU board 815E C3-1000** Intel Celeron 3 CPU board, 1000 MHz, 133 MHz FSB, 256 KB L2 cache, chipset 815E; 1 socket for SO-DIMM SDRAM module.	

Table 5: Model numbers - 815E (ETX) CPU boards

5.3 CPU boards 855GME (ETX)

Model number	Short description	Note
5PC600.E855-00	**CPU board 855GME PM-1100** Intel Pentium M CPU board, 1100 MHz, 400 MHz FSB, 1 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 181
5PC600.E855-01	**CPU board 855GME PM-1600** Intel Pentium M CPU board, 1600 MHz, 400 MHz FSB, 1 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 181
5PC600.E855-02	**CPU board 855GME PM-1400** Intel Pentium M CPU Board, 1400 MHz, 400 MHz FSB, 2 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 181
5PC600.E855-03	**CPU board 855GME PM-1800** Intel Pentium M CPU board, 1800 MHz, 400 MHz FSB, 2 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 181
5PC600.E855-04	**CPU board 855GME CM-600** Intel Celeron M CPU Board, 600 MHz, 400 MHz FSB, 512 KB L2 cache; chipset 855GME, 1 socket for SO-DIMM DDR module.	See page 181

Table 6: Model numbers - 855GME (ETX) CPU boards

Model number	Short description	Note
5PC600.E855-05	**CPU board 855GME CM-1000** CPU board Intel Celeron M, 1000 MHz, 400 MHz FSB, 512 kB L2 cache; 855GME chipset; 1 socket for SO-DIMM DDR module.	See page 181

Table 6: Model numbers - 855GME (ETX) CPU boards (Forts.)

5.4 CPU boards 855GME (XTX)

Model number	Short description	Note
5PC600.X855-00	**CPU board 855GME PM-1100** Intel Pentium M CPU board, 1100 MHz, 400 MHz FSB, 1 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 183
5PC600.X855-01	**CPU board 855GME PM-1600** Intel Pentium M CPU board, 1600 MHz, 400 MHz FSB, 1 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 183
5PC600.X855-02	**CPU board 855GME PM-1400** Intel Pentium M CPU Board, 1400 MHz, 400 MHz FSB, 2 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 183
5PC600.X855-03	**CPU board 855GME PM-1800** Intel Pentium M CPU board, 1800 MHz, 400 MHz FSB, 2 MB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	See page 183
5PC600.X855-04	**CPU board 855GME CM-600** Intel Celeron M CPU Board, 600 MHz, 400 MHz FSB, 512 KB L2 cache; chipset 855GME, 1 socket for SO-DIMM DDR module.	See page 183
5PC600.X855-05	**CPU board 855GME CM-1000** CPU board Intel Celeron M, 1000 MHz, 400 MHz FSB, 512 kB L2 cache; 855GME chipset; 1 socket for SO-DIMM DDR module.	See page 183

Table 7: Model numbers - 855GME (XTX) CPU boards

5.5 Heat sink

Model number	Short description	Note
5AC700.HS01-00	**Panel PC 700 heat sink 815E (ETX) 12.8mm** For PPC700 systems with Intel 815E CPU Boards (ETX) with Celeron 3 400 MHz, Celeron 3 733 MHz, Celeron 3 1000 MHz.	Canceled since 10/2005 Replaced by heat sinks for 855GME boards (ETX / XTX)
5AC700.HS01-01	**Panel PC 700 heat sink 855GME (ETX / XTX) 12.8mm** For PPC700 systems with Intel 855GME CPU boards (ETX / XTX) with Celeron M 600 MHz, Celeron M 1000, Pentium M 1100 MHz, Pentium M 1400 MHz.	See page 185
5AC700.HS01-02	**Panel PC 700 heat sink 855GME (ETX / XTX) 28mm** for CPU boards with Intel 855GME CPU boards (ETX / XTX) with Pentium M 1600 MHz, Pentium M 1800 MHz.	See page 185

Table 8: Model numbers - Heat sinks

5.6 Main memory

Model number	Short description	Note
5MMSDR.0128-01	**SO-DIMM SDRAM 128 MB PC133** SO-DIMM SDRAM 128 MB PC133 for 815E CPU boards (ETX).	See page 186 Canceled since 10/2005 Replaced by main memory for 855GME boards (ETX / XTX)
5MMSDR.0256-01	**SO-DIMM SDRAM 256 MB PC133** SO-DIMM SDRAM 256 MB PC133 for 815E CPU boards (ETX).	
5MMSDR.0512-01	**SO-DIMM SDRAM 512 MB PC133** SO-DIMM SDRAM 512 MB PC133 for 815E CPU boards (ETX).	
5MMDDR.0256-00	**SO-DIMM DDR-SDRAM 256 MB PC2700** SO-DIMM DDR-SDRAM 256 MB PC2700 for 855GME CPU boards (ETX / XTX).	See page 186
5MMDDR.0512-00	**SO-DIMM DDR-SDRAM 512 MB PC2700** SO-DIMM DDR-SDRAM 512 MB PC2700 for 855GME CPU boards (ETX / XTX).	See page 186
5MMDDR.1024-00	**SO-DIMM DDR-SDRAM 1024 MB PC2700** SO-DIMM DDR-SDRAM 1024 MB PC2700 for 855GME CPU boards (ETX / XTX).	See page 186

Table 9: Model numbers - Main memory

5.7 Drives

Model number	Short description	Note
5AC600.SSDI-00	**Add-on SSD 128 GB MLC** 128 GB Solid State Drive SATA (MLC), add-on. For installation in an APC620 or PPC700.	see page 187
5MMSSD.0128-00	**Replacement SSD 128 GB MLC** 128 GB Solid State Drive SATA (MLC), replacement SSD for 5AC600.SSDI-00	see page 190
5AC600.CFSI-00	**Add-on CompactFlash slot** CompactFlash slot (add-on); for installation in an APC620 or PPC700.	See page 214
5AC600.HDDI-00	**Add-on hard disk 30 GB, 24x7** 30 GB hard disk (add-on); ideal for 24 hour operation. For installation in an APC620 or PPC700.	See page 193 Canceled since 11/2007
5AC600.HDDI-01	**Add-on hard disk 20 GB ET** 20 GB hard disk (add-on); with expanded temperature range. For installation in an APC620 or PPC700.	See page 196 Canceled since 03/2007
5AC600.HDDI-02	**Add-on hard disk 40 GB, 24x7** 40 GB hard disk (add-on); ideal for 24 hour operation (24x7). For installation in an APC620 or PPC700.	See page 199 Canceled since 07/2006
5AC600.HDDI-03	**Add-on hard disk 60 GB, 24x7** 60 GB hard disk (add-on); ideal for 24 hour operation (24x7). For installation in an APC620 or PPC700.	See page 202 Canceled since 10/2008
5AC600.HDDI-04	**Add-on hard disk 80 GB, 24x7** 80 GB hard disk (add-on); ideal for 24 hour operation (24x7). For installation in an APC620 or PPC700.	See page 205 Canceled since 03/2009
5AC600.HDDI-05	**Add-on hard disk 40 GB ET, 24x7** 40 GB hard disk (add-on); With extended temperature range and also ideal for 24 hour operation. For installation in an APC620 or PPC700.	See page 208
5AC600.HDDI-06	**Add-on hard disk 80 GB ET, 24x7** 80 GB hard disk (add-on); With extended temperature range and also ideal for 24 hour operation. For installation in an APC620 or PPC700.	See page 211

Table 10: Model numbers - Drives

Model number	Short description	Note
5AC600.CDXS-00	**Slide-in CD-ROM** CD-ROM drive (slide-in); for operation in a slide-in drive slot in an APC620 or PPC700 system.	See page 215
5AC600.CFSS-00	**Slide-in CF 2-slot** Slide-in CompactFlash adapter for 2 CompactFlash cards (via IDE and USB 2.0)	See page 226
5AC600.DVDS-00	**Slide-in DVD-ROM/CD-RW** DVD-ROM/CD-RW drive (slide-in); for operation in a slide-in drive slot in an APC620 or PPC700 system.	See page 218
5AC600.DVRS-00	**Slide-in DVD-R/RW, DVD+R/RW** DVD-RW drive (slide-in); for operation in a drive slot in an APC620 or PPC700 system.	See page 221
5AC600.FDDS-00	**Slide-in USB FDD** FDD drive (slide-in); for operation in a slide-in drive slot in an APC620 or PPC700 system.	See page 228
5AC600.HDDS-00	**Slide-in hard disk 30 GB 24x7** 30 GB hard disk (slide-in); ideal for 24-hour operation. For use in a slide-in drive slot in an APC620 or PPC700 system.	See page 231 Canceled since 06/2008
5AC600.HDDS-01	**Slide-in hard disk 20 GB ET** 20 GB hard disk (slide-in); with expanded temperature range. For use in a slide-in drive slot in an APC620 or PPC700 system.	See page 234 Canceled since 03/2007
5AC600.HDDS-02	**Slide-in hard disk 40 GB ET, 24x7** 40 GB hard disk (slide-in); With extended temperature range and also ideal for 24 hour operation. For use in a slide-in drive slot in an APC620 or PPC700 system.	See page 237
5ACPCI.RAIC-00	**PCI RAID controller ATA/100** PCI Raid controller	See page 241 Canceled since 07/2007
5ACPCI.RAIS-00	**PCI RAID storage 2 x 40 GB** PCI Raid hard disk 2 x 40 GB for the PCI RAID controller ATA/100 5ACPCI.RAIC-00.	See page 242 Canceled since 06/2006 Replacement type 5ACPCI.RAIS-00
5ACPCI.RAIS-01	**PCI RAID storage 2 x 60 GB** PCI Raid hard disk 2 x 60 GB for the PCI RAID controller ATA/100 5ACPCI.RAIC-00.	See page 245
5ACPCI.RAIC-01	**PCI SATA RAID system 2 x 60 GB 24x7** PCI Raid controller + 2 x 60 GB SATA hard disk; ideal for 24 hour operation (24x7). Requires a free PCI slot.	See page 248 Canceled since 04/2008 Replacement type 5ACPCI.RAIC-03
5ACPCI.RAIC-02	**Replacement SATA-HDD 60 GB** 1 piece Hard disk 60 GB SATA, replacement part for 5ACPCI.RAIC-01	See page 253
5ACPCI.RAIC-03	**PCI SATA RAID system 2 x 160 GB 24x7, ET** PCI Raid controller + 2 x 160 GB SATA hard disk; Suitable for 24 hour operation (24x7) as well as for operation in the extended temperature range (ET). Requires a free PCI slot.	See page 256
5ACPCI.RAIC-04	**Replacement SATA-HDD 160 GB** 1 piece Hard disk 160 GB SATA, replacement part for 5ACPCI.RAIC-03	See page 260
5ACPCI.RAIC-05	**PCI RAID system SATA 2x250GB (M5400.6)** PCI RAID controller + 2 x 250 GB SATA hard disks; requires a free PCI slot.	See page 263
5MMHDD.0250-00	**Replacement SATA-HDD 250GB (M5400.6)** Hard disk 250 GB SATA, replacement part for 5ACPCI.RAIC-03 and 5ACPCI.RAIC-05.	See page 267

Table 10: Model numbers - Drives (Forts.)

5.8 Interface options

Model number	Short description	Note
5AC600.CANI-00	**Add-on CAN interface** CAN interface for installation in an APC620 or PPC700.	See page 270
5AC600.485I-00	**Add-on RS232/422/485 interface** Add-on RS232/422/485 interface for installation in an APC620 and PPC700.	See page 274

Table 11: Model numbers - Interfaces

5.9 Fan kits

Model number	Short description	Note
5PC700.FA00-01	**Panel PC 700 fan kit** For Panel PC 700 10.4", 12.1", 15", 17" and 19" with 0 PCI slots (5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00).	See page 279
5PC700.FA02-00	**Panel PC 700 fan kit** For Panel PC 700 10.4" with 2 PCI slots (5PC720.1043-01).	See page 280
5PC700.FA02-01	**Panel PC 700 fan kit** For Panel PC 12.1" and 15" with 1 and 2 PCI slots (5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02).	See page 282

Table 12: Model numbers - Fan kits

5.10 Accessories

5.10.1 Batteries

Model number	Short description	Note
0AC201.91	**Lithium batteries, 4 pcs**. Lithium batteries, 4 pcs., 3 V / 950 mAh, button cell	See page 577
4A0006.00-000	**Lithium battery, 1 pc.** Lithium battery, 1 pc., 3 V / 950 mAh, button cell	See page 577

Table 13: Model numbers - Batteries

5.10.2 Supply voltage connectors

Model number	Short description	Note
0TB103.9	**Plug 24V 5.08 3-pin screw clamps** 24 VDC 3-pin connector, female. Screw clamp, 3.31 mm², protected against vibration by the screw flange.	See page 579
0TB103.91	**Plug 24V 5.08 3-pin cage clamps** 24 VDC 3-pin connector, female. Cage clamps, 3.31 mm², protected against vibration by the screw flange.	See page 579

Table 14: Model numbers - Supply voltage connectors

5.10.3 CompactFlash cards

Model number	Short description	Note
5CFCRD.0512-06	**CompactFlash 512 MB B&R** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.1024-06	**CompactFlash 1024 MB B&R** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.2048-06	**CompactFlash 2048 MB B&R** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.4096-06	**CompactFlash 4096 MB B&R** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.8192-06	**CompactFlash 8192 MB B&R** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.016G-06	**CompactFlash 16 GB B&R** CompactFlash card with 16 GB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.032G-06	**CompactFlash 32 GB B&R** CompactFlash card with 32 GB SLC NAND flash and IDE/ATA interface	see page 589
5CFCRD.0512-04	**CompactFlash 512 MB B&R** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	See page 594
5CFCRD.1024-04	**CompactFlash 1024 MB B&R** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	See page 594
5CFCRD.2048-04	**CompactFlash 2048 MB B&R** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	See page 594
5CFCRD.4096-04	**CompactFlash 4096 MB B&R** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	See page 594
5CFCRD.8192-04	**CompactFlash 8192 MB B&R** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	See page 594
5CFCRD.016G-04	**CompactFlash 16 GB B&R** CompactFlash card with 16 GB SLC NAND flash and IDE/ATA interface	See page 594
5CFCRD.0064-03	**CompactFlash 64 MB SSI** CompactFlash card with 64 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.0128-03	**CompactFlash 128 MB SSI** CompactFlash card with 128 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.0256-03	**CompactFlash 256 MB SSI** CompactFlash card with 256 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.0512-03	**CompactFlash 512 MB SSI** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.1024-03	**CompactFlash 1024 MB SSI** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.2048-03	**CompactFlash 2048 MB SSI** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.4096-03	**CompactFlash 4096 MB SSI** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.8192-03	**CompactFlash 8192 MB SSI** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	See page 599
5CFCRD.0032-02	**CompactFlash 32 MB SanDisk/A** CompactFlash card with 32 MB NAND flash and IDE/ATA interface.	Canceled since 12/2005 Replaced by 5CFCRD.0064-03

Table 15: Model numbers - CompactFlash cards

Model number	Short description	Note
5CFCRD.0064-02	**CompactFlash 64 MB SanDisk/A** CompactFlash card with 64 MB NAND flash and IDE/ATA interface.	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.0128-02	**CompactFlash 128 MB SanDisk/A** CompactFlash card with 128 MB NAND flash and IDE/ATA interface.	Canceled since 12/2005 Replaced by 5CFCRD.0128-03
5CFCRD.0256-02	**CompactFlash 256 MB SanDisk/A** CompactFlash card with 256 MB NAND flash and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0256-03
5CFCRD.0512-02	**CompactFlash 512 MB SanDisk/A** CompactFlash card with 512 MB NAND flash and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0512-03
5CFCRD.1024-02	**CompactFlash 1024 MB SanDisk/A** CompactFlash card with 1024 MB NAND flash and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.1024-03
5CFCRD.2048-02	**CompactFlash 2048 MB SanDisk/A** CompactFlash card with 2048 MB NAND flash and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.2048-03

Table 15: Model numbers - CompactFlash cards (Forts.)

5.10.4 USB flash drives

Model number	Short description	Note
5MMUSB.0128-00	**USB flash drive 128 MB SanDisk** USB 2.0 flash drive 128 MB	Canceled since 12/2005 Replaced by 5MMUSB.2048-00
5MMUSB.0256-00	**USB flash drive 256 MB SanDisk** USB 2.0 flash drive 256 MB	Canceled since 03/2007 Replaced by 5MMUSB.2048-00
5MMUSB.0512-00	**USB flash drive 512 MB SanDisk** USB 2.0 flash drive 512 MB	Canceled since 07/2007 Replaced by 5MMUSB.2048-00
5MMUSB.1024-00	**USB flash drive 1 GB SanDisk** USB 2.0 flash drive 1 GB	Canceled since 03/2007 Replaced by 5MMUSB.2048-00
5MMUSB.2048-00	**USB flash drive 2 GB SanDisk** USB 2.0 flash drive 2 GB	See page 628
5MMUSB.2048-01	**USB flash drive 2 GB B&R** USB 2.0 flash drive 2 GB	See page 631

Table 16: Model numbers - USB flash drives

5.10.5 Cables

Model number	Short description	Note
5CADVI.0018-00	**DVI-D cable 1.8 m** Single cable, DVI-D/m:DVI-D/m; length: 1.8 m	See page 638
5CADVI.0050-00	**DVI-D cable 5 m** Single cable, DVI-D/m:DVI-D/m; length: 5 m	See page 638
5CADVI.0100-00	**DVI-D cable 10 m** Single cable, DVI-D/m:DVI-D/m; length: 10 m	See page 638
5CASDL.0018-00	**SDL cable 1.8 m** SDL cable for a fixed type of layout; length: 1.8 m	See page 641

Table 17: Model numbers - Cables

Model number	Short description	Note
5CASDL.0018-01	**SDL cable 1.8 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 1.8 m	See page 644
5CASDL.0018-03	**SDL flex cable 1.8 m** SDL cable for fixed and flexible type of layout; length: 1.8 m	See page 650
5CASDL.0050-00	**SDL cable 5 m** SDL cable for a fixed type of layout; length: 5 m	See page 641
5CASDL.0050-01	**SDL cable 5 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 5 m	See page 644
5CASDL.0050-03	**SDL flex cable 5 m** SDL cable for fixed and flexible type of layout; length: 5 m	See page 650
5CASDL.0100-00	**SDL cable 10 m** SDL cable for a fixed type of layout; length: 10 m	See page 641
5CASDL.0100-01	**SDL cable 10 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 10 m	See page 644
5CASDL.0100-03	**SDL flex cable 10 m** SDL cable for fixed and flexible type of layout; length: 10 m	See page 650
5CASDL.0150-00	**SDL cable 15 m** SDL cable for a fixed type of layout; length: 15 m	See page 641
5CASDL.0150-01	**SDL cable 15 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 15 m	See page 644
5CASDL.0150-03	**SDL flex cable 15 m** SDL cable for fixed and flexible type of layout; length: 15 m	See page 650
5CASDL.0200-00	**SDL cable 20 m** SDL cable for a fixed type of layout; length: 20 m	See page 641
5CASDL.0200-03	**SDL flex cable 20 m** SDL cable for fixed and flexible type of layout; length: 20 m	See page 650
5CASDL.0250-00	**SDL cable 25 m** SDL cable for a fixed type of layout; length: 25 m	See page 641
5CASDL.0250-03	**SDL flex cable 25 m** SDL cable for fixed and flexible type of layout; length: 25 m	See page 650
5CASDL.0300-00	**SDL cable 30 m** SDL cable for a fixed type of layout; length: 30 m	See page 641
5CASDL.0300-03	**SDL flex cable 30 m** SDL cable for fixed and flexible type of layout; length: 30 m	See page 650
5CASDL.0300-10	**SDL cable with extender 30 m** SDL cable with extender for a fixed type of layout; length 30 m	See page 647 Canceled since 12/2006 Replaced by 5CASDL.0300-13
5CASDL.0300-13	**SDL flex cable with extender 30 m** SDL cable with extender for fixed and flexible type of layout; length: 30 m	See page 655
5CASDL.0400-10	**SDL cable with extender 40 m** SDL cable with extender for a fixed type of layout; length 40 m	See page 647 Canceled since 12/2006 Replaced by 5CASDL.0400-13
5CASDL.0400-13	**SDL flex cable with extender 40 m** SDL cable with extender for fixed and flexible type of layout; length: 40 m	See page 655
5CAUSB.0018-00	**USB 2.0 cable, A/m:B/m 1.8 m** USB 2.0 connection cable; plug type A - type B; length 1.8 m	See page 662

Table 17: Model numbers - Cables (Forts.)

Model number	Short description	Note
5CAUSB.0050-00	**USB 2.0 cable, A/m:B/m 5 m** USB 2.0 connection cable; plug type A - type B; length 5 m	See page 662
9A0014.02	**RS232 cable DB9/f:DB9/m 1.8 m** RS232 extension cable for remote operation of a display unit with touch screen; length 1.8 m.	See page 660
9A0014.05	**RS232 cable DB9/f:DB9/m 5 m** RS232 extension cable for remote operation of a display unit with touch screen; length 5 m.	See page 660
9A0014.10	**RS232 cable DB9/f:DB9/m 10 m** RS232 extension cable for remote operation of a display unit with touch screen; length 10 m.	See page 660

Table 17: Model numbers - Cables (Forts.)

5.10.6 Power Supplies

Model number	Short description	Note
0PS102.0	**Power supply, 1-phase, 2.1 A** 24 VDC power supply, 1-phase, 2.1 A, input 100-240 VAC, wide range, DIN rail mounting	See page 581
0PS104.0	**Power supply, 1-phase, 4.2 A** 24 VDC power supply, 1 phase, 4.2 A, input 115/230 VAC, auto select, DIN rail mounting	See page 581
0PS105.1	**Power supply, 1-phase, 5 A** 24 VDC power supply, 1 phase, 5 A, input 115/230 VAC, manual select, DIN rail mounting	See page 581
0PS105.2	**Power supply, 1-phase, 5 A, redundant** 24 VDC power supply, 1 phase, 5 A, redundant through parallel operation, input 115/230 VAC, manual select, DIN rail mounting	See page 581
0PS110.1	**Power supply, 1-phase, 10 A** 24 VDC power supply, 1 phase, 10 A, input 115/230 VAC, manual select, DIN rail mounting	See page 581
0PS110.2	**Power supply, 1-phase, 10 A, redundant** 24 VDC power supply, 1 phase, 10 A, redundant through parallel operation, input 115/230 VAC, manual select, DIN rail mounting	See page 581
0PS120.1	**Power supply, 1-phase, 20 A** 24 VDC power supply, 1 phase, 20 A, input 115/230 VAC, auto select, DIN rail mounting	See page 581
0PS305.1	**Power supply, 3-phase, 5 A** 24 VDC power supply, 3-phase, 5 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	See page 581
0PS310.1	**Power supply, 3-phase, 10 A** 24 VDC power supply, 3-phase, 10 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	See page 581
0PS320.1	**Power supply, 3-phase, 20 A** 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	See page 581
0PS340.1	**Power supply, 3-phase, 40 A** 24 VDC power supply, 3-phase, 40 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	See page 581

Table 18: Model numbers - Power supplies

5.10.7 External UPS

Model number	Short description	Note
9A0100.11	**UPS 24 VDC** 24 VDC input, 24 VDC output, serial interface	See page 583

Model number	Short description	Note
9A0100.14	**UPS battery unit type B** 24 V; 2.2 Ah; including battery cage	See page 583
9A0100.15	**UPS battery unit type B (replacement part)** 2 x 12 V; 2.2 Ah; for battery unit 9A0100.14	See page 583
9A0017.01	**RS232 Null Modem Cable, 0.6 m** To connect UPS and load system (9-pin DSUB socket - 9-pin DSUB socket)	See page 583
9A0017.02	**RS232 Null Modem Cable, 1.8 m** To connect UPS and load system (9-pin DSUB socket - 9-pin DSUB socket)	See page 583

5.10.8 Ethernet PCI interface cards

Model number	Short description	Note
5ACPCI.ETH1-01	**PCI Ethernet card 10/100** half size PCI Ethernet card, 1 Ethernet connection	See page 670
5ACPCI.ETH3-01	**PCI Ethernet card 10/100 3port** half size PCI Ethernet card, 3 Ethernet connections	See page 670

Table 19: Model numbers for Ethernet PCI interface cards

5.10.9 Miscellaneous

Model number	Short description	Note
5AC600.ICOV-00	**Interface covers** Interface covers for APC620 and PPC700 devices; 5 pieces	See page 585
5AC900.1000-00	**Adapter DVI-A/m to CRT DB15HD/f** Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	See page 586
5AC900.104X-00	**Legend strip template 10.4" portrait format** For Panel PC 5PC781.1043-00. For 1 device.	See page 664
5AC900.104X-01	**Legend strip template 10.4" landscape format** For Panel PC 5PC782.1043-00. For 1 device.	See page 664
5AC900.150X-01	**Legend strip template 15"** For Panel PC 5PC781.1505-00. For 4 devices.	See page 664
5AC900.1200-00	**USB port cap (attached)** Front side USB interface cover (attached) for Automation Panel 900 and Panel PC 700 devices.	See page 587 Canceled since 03/2010 Replacement types 5AC900.1200-01, 5AC900.1200-02, 5AC900.1200-03
5AC900.1200-01	**USB port cap IP65 M20 /2** Front-side USB port cap (attached) knurled, short, not slotted.	See page 588
5AC900.1200-02	**USB port cap IP65 M20 /3** Front-side USB port cap (attached) knurled, tall, not slotted.	See page 588
5AC900.1200-03	**USB port cap IP65 M20 /4** Front-side USB port cap (attached) knurled, tall, slotted.	See page 588
5MD900.USB2-00	**USB 2.0 drive DVD-ROM/CD-RW FDD CF USB** USB 2.0 drive combination, consists of DVD-ROM/CD-RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24 V DC. (Order 0TB103.9 screw clamp or 0TB103.91 cage clamps separately).	See page 612 Canceled since 10/2006 Replacement type 5MD900.USB2-01

Table 20: Model numbers - Other items

Model number	Short description	Note
5MD900.USB2-01	**USB 2.0 drive DVD-RW/CD-RW FDD CF USB** USB 2.0 drive combination; consists of DVD-R/RW DVD+R/RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24V DC; (Order 0TB103.9 screw clamp or 0TB103.91 cage clamps separately).	See page 620
5A5003.03	**Front cover** Front cover for the USB 2.0 Media Drive 5MD900.USB2-00 and 5MD900.USB-01.	See page 626
5AC600.SRAM-00	**APC620/PPC700 SRAM module 512kB** 512 KB SRAM module for APC620 and PPC700.	See page 667
5AC700.FA00-00	**PPC700 replacement fan filter 0PCI 5 piece** For Panel PC 700 10.4", 12.1", 15", 17" and 19" with 0 PCI slots (5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00).	See page 666
5AC700.FA02-00	**PPC700 replacement fan filter 1.2PCI 5 piece** For Panel PC 700 10.4" and 15" with 1 and 2 PCI slots (5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02).	See page 666
5SWHMI.0000-00	**HMI Drivers & Utilities DVD**	See page 633

Table 20: Model numbers - Other items (Forts.)

5.11 Software

Model number	Short description	Note
9S0000.01-010	**OEM MS-DOS 6.22 German (disk)** OEM MS-DOS 6.22 German disks Only delivered with a new industrial PC.	
9S0000.01-020	**OEM MS-DOS 6.22 English (disk)** OEM MS-DOS 6.22 English disks Only delivered with a new industrial PC.	
9S0000.08-010	**OEM Microsoft Windows XP Professional** CD, German; Only delivered with a new industrial PC.	See page 532 Canceled since 10/2008
9S0000.08-020	**OEM Microsoft Windows XP Professional** CD, English; Only delivered with a new industrial PC.	See page 532 Canceled since 10/2008
9S0000.09-090	**OEM Microsoft Windows XP Professional Multilanguage** CDs; Only delivered with a new industrial PC.	See page 532 Canceled since 10/2008
5SWWXP.0600-GER	**WinXP Professional with SP3, GER** Microsoft OEM Windows XP Professional Service Pack 3, CD, German. Only available with a new device.	See page 532
5SWWXP.0600-ENG	**WinXP Professional with SP3, ENG** Microsoft OEM Windows XP Professional Service Pack 3, CD, English. Only available with a new device.	See page 532
5SWWXP.0600-MUL	**WinXP Professional with SP3, MUL** Microsoft OEM Windows XP Professional Service Pack 3, CD, multi-language. Only available with a new device.	See page 532

Table 21: Model numbers - Software

Model number	Short description	Note
5SWWXP.0500-GER	**WinXP Professional with SP 2c, GER** Microsoft OEM Windows XP Professional Service Pack 2c, CD, German. Only available with a new device.	See page 532
5SWWXP.0500-ENG	**WinXP Professional with SP 2c, ENG** Microsoft OEM Windows XP Professional Service Pack 2c, CD, English. Only available with a new device.	See page 532
5SWWXP.0500-MUL	**WinXP Professional with SP 2c, MUL** Microsoft OEM Windows XP Professional Service Pack 2c, CD, multi-language. Only available with a new device.	See page 532
9S0001.19-020	**OEM Microsoft Windows XP Embedded APC620 815E w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image for APC620 systems with a 815E CPU board. Only delivered with a new industrial PC.	See page 534 Canceled since 10/2005
9S0001.20-020	**OEM Microsoft Windows XP Embedded APC620/PPC700 855GME w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image for APC620/PPC700 systems with a 855GME CPU board. Only delivered with a new industrial PC.	See page 534 Canceled since 10/2007 Replacement type 5SWWXP.0415-ENG
9S0001.27-020	**OEM Microsoft Windows XP Embedded (incl. SP2) APC620 815E w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image including SP2 for APC620 systems with a 815E CPU board. Only delivered with a new industrial PC.	See page 534 Canceled since 10/2005
9S0001.28-020	**OEM Microsoft Windows XP Embedded (incl. SP2) APC620/PPC700 855GME w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image including SP2 for APC620/PPC700 systems with a 855GME CPU board. Only delivered with a new industrial PC.	See page 534 Canceled since 10/2007 Replacement type 5SWWXP.0415-ENG
5SWWXP.0415-ENG	**WinXPe FP2007 PPC700 E855GME** Microsoft OEM Windows XP Embedded Feature Pack 2007, English; for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; order CompactFlash separately (at least 512 MB).	See page 534
5SWWXP.0416-ENG	**WinXPe FP2007 PPC700 X855GME** Microsoft OEM Windows XP Embedded Feature Pack 2007, English; for PPC700 with CPU boards 5PC600.X855-00, 5PC600.X855-01, 5PC600.X855-02, 5PC600.X855-03, 5PC600.X855-04, 5PC600.X855-05; order CompactFlash separately (at least 512 MB).	See page 534
5SWWXP.0715-ENG	**WES2009 PPC700 855GME ETX** Microsoft OEM Windows Embedded, Standard 2009, English; for PPC700 with ETX CPU board with 855GME chipset; order CompactFlash separately (at least 1 GB).	See page 537
5SWWXP.0716-ENG	**WES2009 PPC700 855GME XTX** Microsoft OEM Windows Embedded, Standard 2009, English; for PPC700 with XTX CPU board with 855GME chipset; order CompactFlash separately (at least 1 GB).	See page 537
9S0001.29-020	**WinCE5.0 Pro license** Windows CE 5.0 image, the size of the CompactFlash card must be specified in the order. Only delivered with a new industrial PC.	See page 540 Canceled since 07/2007
9S0001.32-020	**WinCE5.0 Pro APC620,PPC700** 128 MB CompactFlash with Windows CE 5.0. Only delivered with a new industrial PC.	See page 540 Canceled since 07/2007 Replacement type: 5SWWCE.0515-ENG
9S0001.34-020	**WinCE5.0 ProPlus APC620,PPC700** 128 MB CompactFlash card with Windows CE 5.0 including the following licensed viewers (PDF, Power Point, Word, Excel and CE Image Viewer). Only delivered with a new industrial PC.	See page 540 Canceled since 07/2007 Replacement type: 5SWWCE.0615-ENG
9S0001.36-020	**WinCE5.0 ProPlus license** Windows CE 5.0 image, including the following licensed viewers (PDF, Power Point, Word, Excel und CE Image Viewer), the size of the CompactFlash card must be specified in the order. Only delivered with a new industrial PC.	See page 540 Canceled since 07/2007

Table 21: Model numbers - Software (Forts.)

Model number	Short description	Note
5SWWCE.0515-ENG	**WinCE5.0 Pro PPC700 E855GME** Microsoft OEM Windows CE 5.0 Professional English; for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; order CompactFlash separately (at least 128 MB).	See page 540
5SWWCE.0516-ENG	**WinCE5.0 Pro PPC700 X855GME** Microsoft OEM Windows CE 5.0 Professional, English; for PPC700 with CPU boards 5PC600.X855-00, 5PC600.X855-01, 5PC600.X855-02, 5PC600.X855-03, 5PC600.X855-04, 5PC600.X855-05; CompactFlash separately (at least 128 MB).	See page 540
5SWWCE.0615-ENG	**WinCE5.0 ProPlus PPC700 E855GME** Microsoft OEM Windows CE 5.0 Professional plus English; for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; order CompactFlash separately (at least 128 MB).	See page 540
5SWWCE.0616-ENG	**WinCE5.0 ProPlus PPC700 X855GME** Microsoft OEM Windows CE 5.0 Professional plus English; for PPC700 with CPU boards 5PC600.X855-00, 5PC600.X855-01, 5PC600.X855-02, 5PC600.X855-03, 5PC600.X855-04, 5PC600.X855-05; CompactFlash separately (at least 128 MB).	See page 540
5SWWCE.0815-ENG	**WinCE6.0 Pro PPC700 E855GME** Microsoft OEM Windows CE 6.0 Professional, English; for PPC700 E855GME; order CompactFlash separately (at least 128 MB).	See page 540
5SWWCE.0816-ENG	**WinCE6.0 Pro PPC700 X855GME** Microsoft OEM Windows CE 6.0 Professional, English; for PPC700 X855GME; order CompactFlash separately (at least 128 MB).	See page 540

Table 21: Model numbers - Software (Forts.)

6. Typical topologies

6.1 Panel PC 700 for central control and visualization

The control program runs on the Panel PC 700. The visualization project is integrated with Visual Components. The Panel PC 700 is networked over Ethernet TCP/IP; additional Power Panel-based operator terminals can also be connected via Ethernet. Communication to I/O systems with axes is handled via fieldbus systems (CAN, Ethernet POWERLINK™).

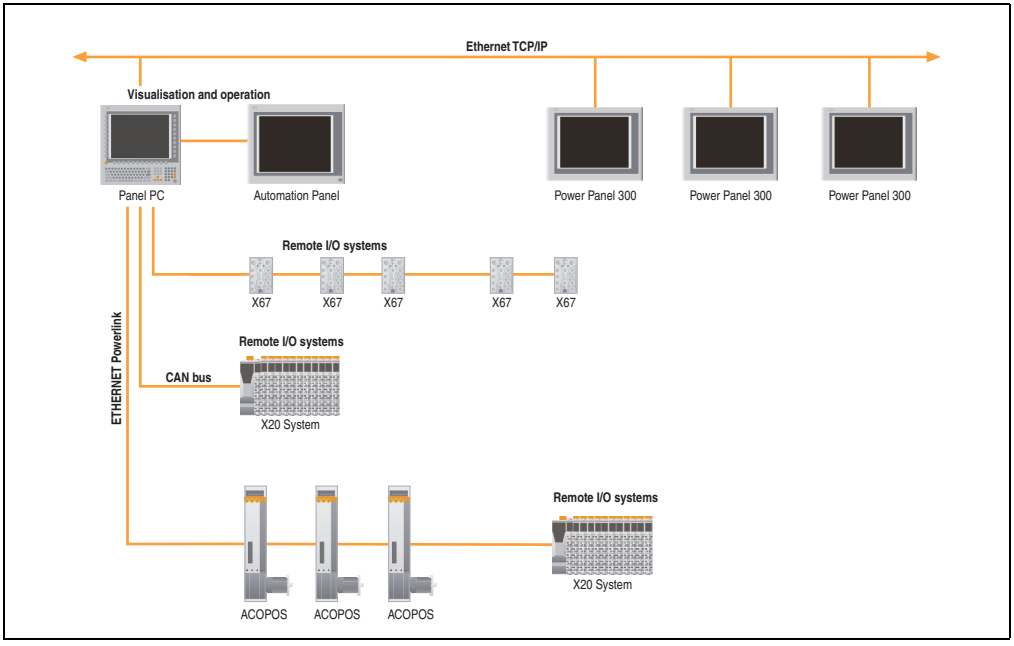


Figure 1: Typical topologies

Chapter 2 • Technical data

1. Introduction

The Panel PC 700 (PPC700) combines an industrial PC and display in one housing. This variant is the first choice anywhere a PC and display must be installed in a limited space.

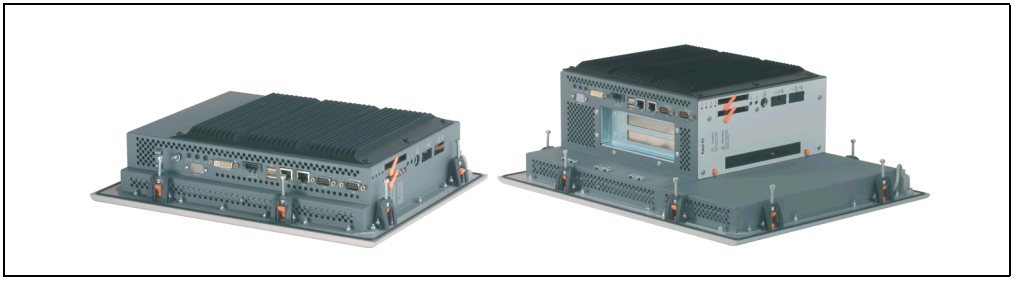
The Panel PC 700 and Automation PC 620 are based on the same platform, which means that the Panel PC also offers the full bandwidth of processors ranging from Celeron® 600 MHz to Pentium® M 1.8 GHz. Panel PCs are available as touch devices with 10.4" VGA, 12.1" SVGA, 15" XGA, 17" SXGA and 19" SXGA TFT displays. The housing is also a defining factor. From very flat devices without PCI slots to expandable devices with two PCI slots, the Panel PC can be optimized to meet the requirements of the application. Four additional Automation Panel 900s can be connected to the Panel PC 700 (dual independent display).

1.1 Features

- Diagonals up to 19"
- Processors up to Pentium M 1.8 GHz
- CompactFlash slot (type I)
- Half-size PCI slots (PCI standard 2.2, PCI bus speed 33 MHz)
- AC97 sound
- USB 2.0
- 24 VDC supply voltage
- 2x Ethernet 10/100 MBit interfaces
- 2x RS232 Interface, modem compatible
- PS/2 keyboard/mouse (combined)
- CAN add-on interface
- RS232/422/485 add-on interface
- Fan-free operation[1)]
- BIOS
- Real-time clock, RTC (battery-buffered)
- Up to 1 GB main memory
- Connection of various display devices to the "Monitor/Panel" video output (supports RGB, DVI, and SDL - Smart Display Link - signals)

1) Dependent on the device configuration and the ambient temperature.

1.2 System components / configuration



The PPC700 system can be assembled to meet individual requirements and operating conditions.

The following components are absolutely essential for operation:

- System unit
- CPU board
- Heat sink (CPU board dependent)
- Main memory (CPU board dependent)
- Drive (mass memory such as CompactFlash card or hard disk) for the operating system
- Software

1.2.1 Selection guide - basic system

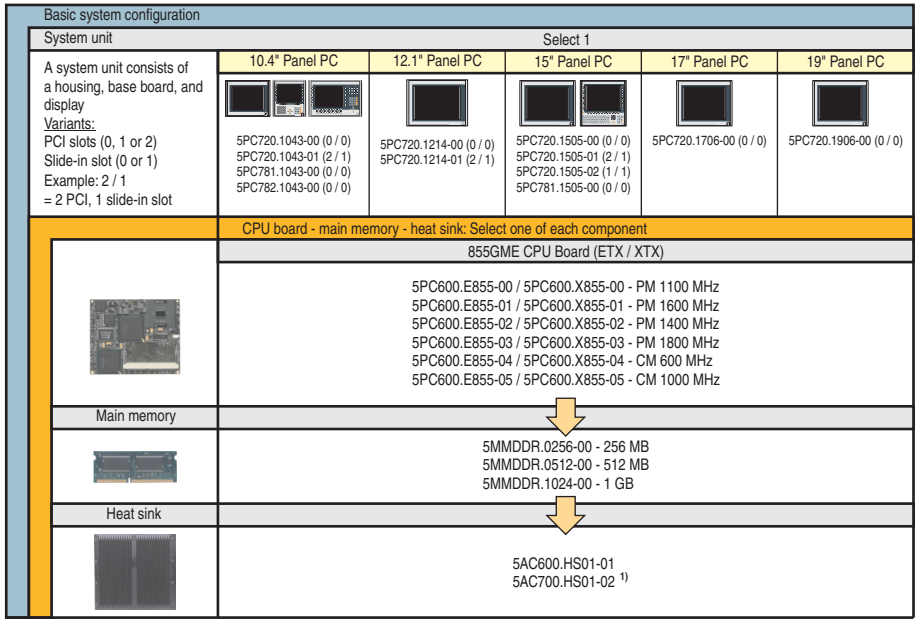


Figure 2: Configuration - Basic system

Explanation:

1) Select a system unit.
2) Choose one 855GME CPU board (ETX or XTX).
3) Select the main memory (select 1).
4) Select the heat sink for the respective CPU board (select 1).
5) Select optional components, based on selected system unit (see section 1.2.2 "Selection guide - Optional components", on page 49).

1.2.2 Selection guide - Optional components

Optional configuration			
System unit	Select 1		
	0 PCI slots	1 PCI slot	2 PCI slots
A system unit consists of a housing, base board, and display Variants: PCI slots (0, 1 or 2) Slide-in slot (0 or 1) Example: 2 / 1 = 2 PCI, 1 slide-in slot	5PC720.1043-00 (0 / 0) 5PC720.1214-00 (0 / 0) 5PC720.1505-00 (0 / 0) 5PC720.1706-00 (0 / 0) 5PC720.1906-00 (0 / 0) 5PC781.1043-00 (0 / 0) 5PC781.1505-00 (0 / 0) 5PC782.1043-00 (0 / 0)	5PC720.1505-02 (1 / 1)	5PC720.1043-01 (2 / 1) 5PC720.1214-01 (2 / 1) 5PC720.1505-01 (2 / 1)
Fan kit (select 1)			
A fan kit may be necessary for certain configurations.	5PC700.FA00-01	5PC700.FA02-01 (also for 5PC720.1505-01 and 5PC720.1214-01)	5PC700.FA02-00 (only for 5PC720.1043-01)
Add-on drive	Select 1		
	5AC600.SSDI-00 (128 GB SSD) 5AC600.HDDI-04 (80 GB Hard disk - 24-hour hard disk) 5AC600.HDDI-05 (40 GB Hard disk - 24-hour hard disk and expanded temperature range) 5AC600.CFSI-00 (CompactFlash slot)		
Slide-in drives	Not possible	Select max. 1	
		5AC600.CFSS-00 (2 CompactFlash slots) 5AC600.CDXS-00 (CD-ROM) 5AC600.DVDS-00 (DVD-ROM/CD-RW) 5AC600.DVRS-00 (DVD-R/RW DVD+R/RW) 5AC600.FDDS-00 (USB floppy) 5AC600.HDDS-02 (30 GB HDD - 24x7 hard disk)	
RAID system	Not possible	Select max. 1	
		5ACPCI.RAIC-03 (2x 160 GB) 5ACPCI.RAIC-05 (2x 250 GB)	
Interface option	Select 1		
	5AC600.CANI-00 (CAN) 5AC600.485I-00 (combined RS232/RS422/RS485)		
Voltage supply connectors	Select 1		
	0TB103.9 (screw clamps) 0TB103.91 (cage clamps)		

Figure 3: Configuration of optional components

- Depending on the system unit, a compatible fan kit can be installed in the PPC700. Required for certain system configurations and ambient temperatures (see also section 2.1 "Ambient temperature with 855GME (ETX / XTX) CPU boards", on page 50)
- Select optional drive(s) (add-on / slide-in), based on the system unit. One add-on drive can be installed in each system unit. A slide-in drive is only available in certain system units.
- An optional interface can be added using an add-on interface.
- The appropriate power supply plugs ensure simple connection to the power supply.

2. Entire device

2.1 Ambient temperature with 855GME (ETX / XTX) CPU boards

It is possible to combine CPU boards with various other components, such as drives, main memory, additional insert cards, etc. dependent on system unit and fan kit. The various configurations result in varying maximum possible ambient temperatures, which can be seen in the following graphic (see figure).

Information:

The maximum specified ambient temperatures were determined under worst-case conditions.

Experience has shown that higher ambient temperatures can be reached under typical conditions, e.g. using Microsoft Windows. The testing and evaluation is to be done on-site by the user (temperatures can be read in BIOS or using the B&R Control Center, see the chapter 4 "Software").

Worst-case conditions for systems with an 855GME CPU board

- Confidential Tool from Intel (Thermal Analysis Tool V1.4) for simulating 100% processor load.
- BurnIn testing tool (BurnIn V4.0 Pro from Passmark Software) to simulate a 100% load on the interface via loop-back adapters (serial interfaces, add-on and slide-in drives, USB interfaces, audio outputs)
- Maximum system extension and power consumption.

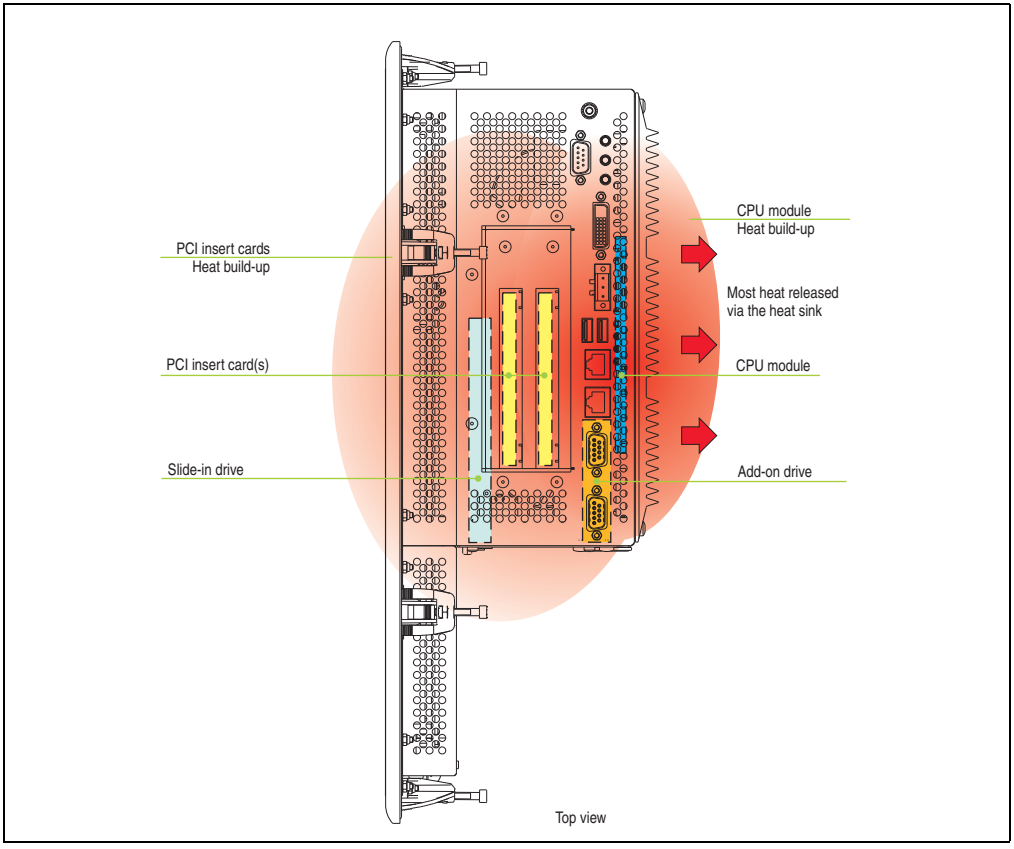


Figure 4: Example of worst-case conditions for temperature measurement

2.1.1 Ambient temperatures with system unit 5PC720.1043-00

Maximum ambient temperature

All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800			CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800				
	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	5PC600.E855-00 5PC600.X855-00	5PC600.E855-02 5PC600.X855-02	5PC600.E855-01 5PC600.X855-01	5PC600.E855-03 5PC600.X855-03			5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	5PC600.E855-00 5PC600.X855-00	5PC600.E855-02 5PC600.X855-02	5PC600.E855-01 5PC600.X855-01	5PC600.E855-03 5PC600.X855-03				
(2) Maximum ambient temperature	45	40	40	40	/	/			55	50	50	50	45	45				
(3) What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive: On-Board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
Add-on drive: 5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					25/35	25/35	25/35	25/35	-/30	-/30			45/55	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Main memory: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interface: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interface: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 5: Ambient temperatures - 5PC720.1043-00 with 855GME (ETX / XTX) CPU boards

For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.2 Ambient temperatures with system unit 5PC720.1043-01

Maximum ambient temperature

		855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02					
	All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			Temperature limits	Location of sensors
	② Maximum ambient temperature	45	40	40	40	/	/			55	50	50	50	45	45				
③	What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive	On-Board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					25/35	25/35	25/35	25/35	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Slide-in drive	5AC600.CFSS-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	Slide-in drive 1
	5AC600.CDXS-00	35	35	35	35					40	40	40	40	35	35			55	
	5AC600.DVDS-00	25	25	25	25					30	30	30	30	25	25			45	
	5AC600.DVRS-00	25	25	25	25					30	30	30	30	25	25			45	
	5AC600.FDDS-00	30	30	30	30					35	35	35	35	30	30			50	
	5AC600.HDDS-02	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5ACPCI.RAIC-03 (24 hours/standard)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5ACPCI.RAIC-05 (24 hours/standard)	✓	✓	✓	✓					50	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 6: Ambient temperatures - 5PC720.1043-01 with 855GME (ETX / XTX) CPU boards

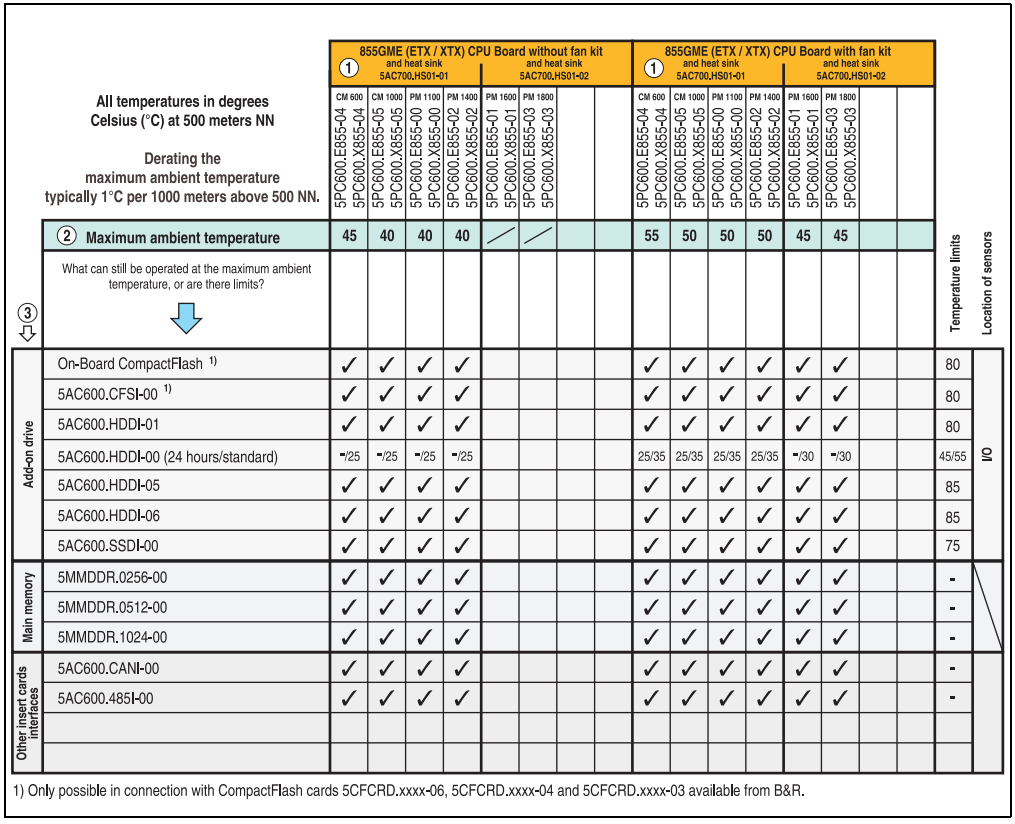
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00, 5AC600.CDXS-00, 5AC600.DVDS-00, 5AC600.DVRS-00, 5AC600.FDDS-00
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.3 Ambient temperatures with system unit 5PC720.1214-00

Maximum ambient temperature



		855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02					
All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.		CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			Temperature limits	Location of sensors
② Maximum ambient temperature		45	40	40	40					55	50	50	50	45	45				
What can still be operated at the maximum ambient temperature, or are there limits? ③																			
Add-on drive	On-Board CompactFlash 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					25/35	25/35	25/35	25/35	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 7: Ambient temperatures - 5PC720.1214-00 with 855GME (ETX / XTX) CPU boards

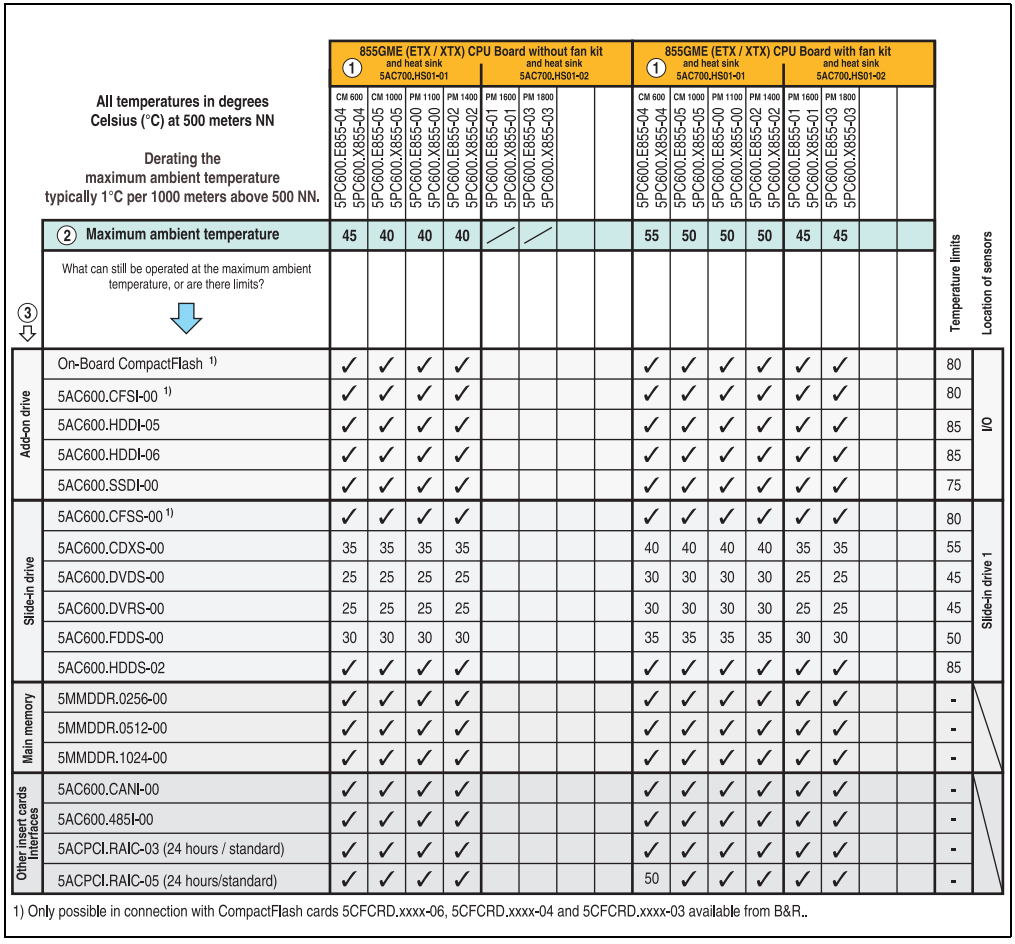
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.4 Ambient temperatures with system unit 5PC720.1214-01

Maximum ambient temperature



All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03				
② Maximum ambient temperature	45	40	40	40	/	/			55	50	50	50	45	45				
What can still be operated at the maximum ambient temperature, or are there limits? ③																		
Add-on drive: On-Board CompactFlash 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
Add-on drive: 5AC600.CFSI-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Slide-in drive: 5AC600.CFSS-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	Slide-in drive 1
Slide-in drive: 5AC600.CDXS-00	35	35	35	35					40	40	40	40	35	35			55	
Slide-in drive: 5AC600.DVDS-00	25	25	25	25					30	30	30	30	25	25			45	
Slide-in drive: 5AC600.DVRS-00	25	25	25	25					30	30	30	30	25	25			45	
Slide-in drive: 5AC600.FDDS-00	30	30	30	30					35	35	35	35	30	30			50	
Slide-in drive: 5AC600.HDDS-02	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Main memory: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards Interfaces: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards Interfaces: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards Interfaces: 5ACPCI.RAIC-03 (24 hours / standard)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards Interfaces: 5ACPCI.RAIC-05 (24 hours/standard)	✓	✓	✓	✓					50	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R..

Figure 8: Ambient temperatures - 5PC720.1214-01 with 855GME (ETX / XTX) CPU boards

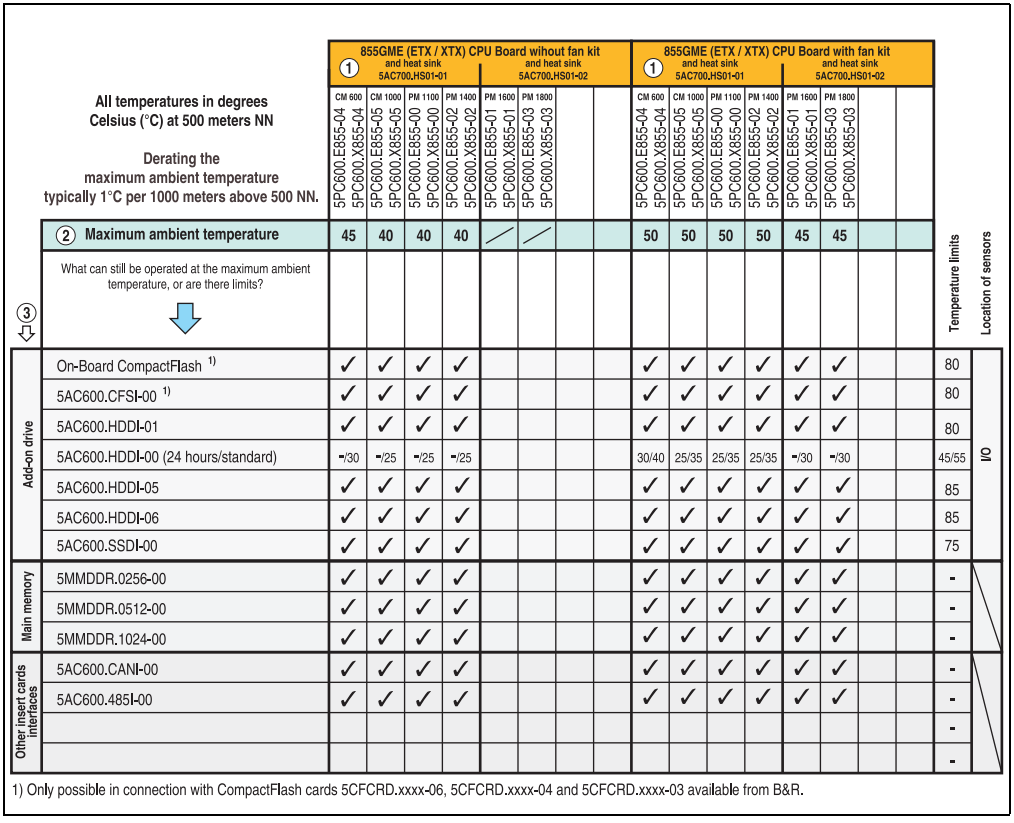
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00, 5AC600.CDXS-00, 5AC600.DVDS-00, 5AC600.DVRS-00, 5AC600.FDDS-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.5 Ambient temperatures with system unit 5PC720.1505-00

Maximum ambient temperature



		855GME (ETX / XTX) CPU Board wihout fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board wihout fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02					
	All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			Temperature limits	Location of sensors
	② Maximum ambient temperature	45	40	40	40	/	/			50	50	50	50	45	45				
③	What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive	On-Board CompactFlash 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-00 (24 hours/standard)	-/30	-/25	-/25	-/25					30/40	25/35	25/35	25/35	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
																		-	
																		-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 9: Ambient temperatures - 5PC720.1505-00 with 855GME (ETX / XTX) CPU boards

For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00, 5AC600.CDXS-00, 5AC600.DVDS-00, 5AC600.DVRS-00, 5AC600.FDDS-00, 5AC600.HDDS-00, 5ACPCI.RAIS-00, 5ACPCI.RAIS-01.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.6 Ambient temperatures with system unit 5PC720.1505-01

Maximum ambient temperature

All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03				
(2) Maximum ambient temperature	45	40	40	40	/	/			50	50	50	50	45	45				
(3) What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive: On-Board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
Add-on drive: 5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					30/40	25/35	-/30	-/30	-/30	-/30			45/55	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Slide-in drive: 5AC600.CFSS-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	Slide-in drive 1
Slide-in drive: 5AC600.CDXS-00	35	35	35	35					40	40	40	40	35	35			55	
Slide-in drive: 5AC600.DVDS-00	25	25	25	25					30	30	30	30	25	25			45	
Slide-in drive: 5AC600.DVRS-00	25	25	25	25					30	30	30	30	25	25			45	
Slide-in drive: 5AC600.FDDS-00	30	30	30	30					35	35	35	35	30	30			50	
Slide-in drive: 5AC600.HDDS-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Slide-in drive: 5AC600.HDDS-00 (24 hours/standard)	25/35	25/35	25/35	25/35					30/40	30/40	30/40	30/40	25/35	25/35			45/55	
Slide-in drive: 5AC600.HDDS-02	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Main memory: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5ACPCI.RAIC-03 (24 hours/standard)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5ACPCI.RAIC-05 (24 hours/standard)	✓	✓	✓	✓					50	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 10: Ambient temperatures - 5PC720.1505-01 with 855GME (ETX / XTX) CPU boards

For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00, 5AC600.CDXS-00, 5AC600.DVDS-00, 5AC600.DVRS-00, 5AC600.FDDS-00, 5AC600.HDDS-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.7 Ambient temperatures with system unit 5PC720.1505-02

Maximum ambient temperature

All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.		855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
		CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800			CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800				
		5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	5PC600.E855-00 5PC600.X855-00	5PC600.E855-02 5PC600.X855-02	5PC600.E855-01 5PC600.X855-01	5PC600.E855-03 5PC600.X855-03			5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	5PC600.E855-00 5PC600.X855-00	5PC600.E855-02 5PC600.X855-02	5PC600.E855-01 5PC600.X855-01	5PC600.E855-03 5PC600.X855-03				
	② Maximum ambient temperature	45	40	40	40	/	/			50	50	50	50	45	45				
③	What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive	On-board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					25/35	25/35	25/35	25/35	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Slide-in drive	5AC600.CFSS-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	Slide-in drive 1
	5AC600.CDXS-00	35	35	35	35					40	40	40	40	35	35			55	
	5AC600.DVDS-00	25	25	25	25					30	30	30	30	25	25			45	
	5AC600.DVRS-00	25	25	25	25					30	30	30	30	25	25			45	
	5AC600.FDDS-00	30	30	30	30					35	35	35	35	30	30			50	
	5AC600.HDDS-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDS-00 (24 hours/standard)	25/35	25/35	25/35	25/35					30/40	30/40	30/40	30/40	25/35	25/35			45/55	
	5AC600.HDDS-02	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interface	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5ACPCI.RAIC-03 (24 hours/standard)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5ACPCI.RAIC-05 (24 hours/standard)	✓	✓	✓	✓					50	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 11: Ambient temperatures - 5PC720.1505-02 with 855GME (ETX / XTX) CPU boards

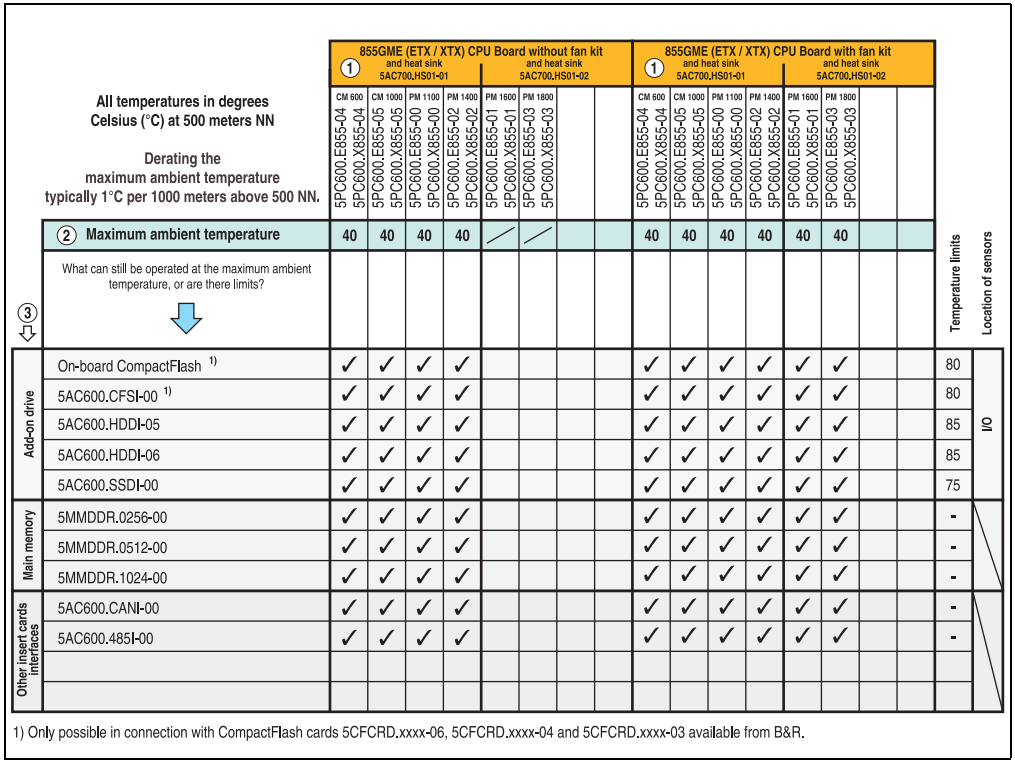
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00, 5AC600.CDXS-00, 5AC600.DVDS-00, 5AC600.DVRS-00, 5AC600.FDDS-00, 5AC600.HDDS-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.8 Ambient temperatures with system unit 5PC720.1706-00

Maximum ambient temperature



All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03				
(2) Maximum ambient temperature	40	40	40	40	/	/			40	40	40	40	40	40				
What can still be operated at the maximum ambient temperature, or are there limits? (3)																		
Add-on drive: On-board CompactFlash 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
Add-on drive: 5AC600.CFSI-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Main memory: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 12: Ambient temperatures - 5PC720.1706-00 with 855GME (ETX / XTX) CPU boards

For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.9 Ambient temperatures with system unit 5PC720.1906-00

Maximum ambient temperature

Information:

The maximum ambient temperatures specified in the following figure are valid for 5PC720.1906-00 system units with a revision F0. In revisions ≤ E0, the valid maximum ambient temperature is 5°C smaller than specified.

All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03				
② Maximum ambient temperature	45	40	40	40	/	/			45	45	45	45	45	45				
What can still be operated at the maximum ambient temperature, or are there limits? ③																		
Add-on drive: On-board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	I/O
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Main memory: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓				
Main memory: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Main memory: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 13: Ambient temperatures - 5PC720.1906-00 with 855GME (ETX / XTX) CPU boards

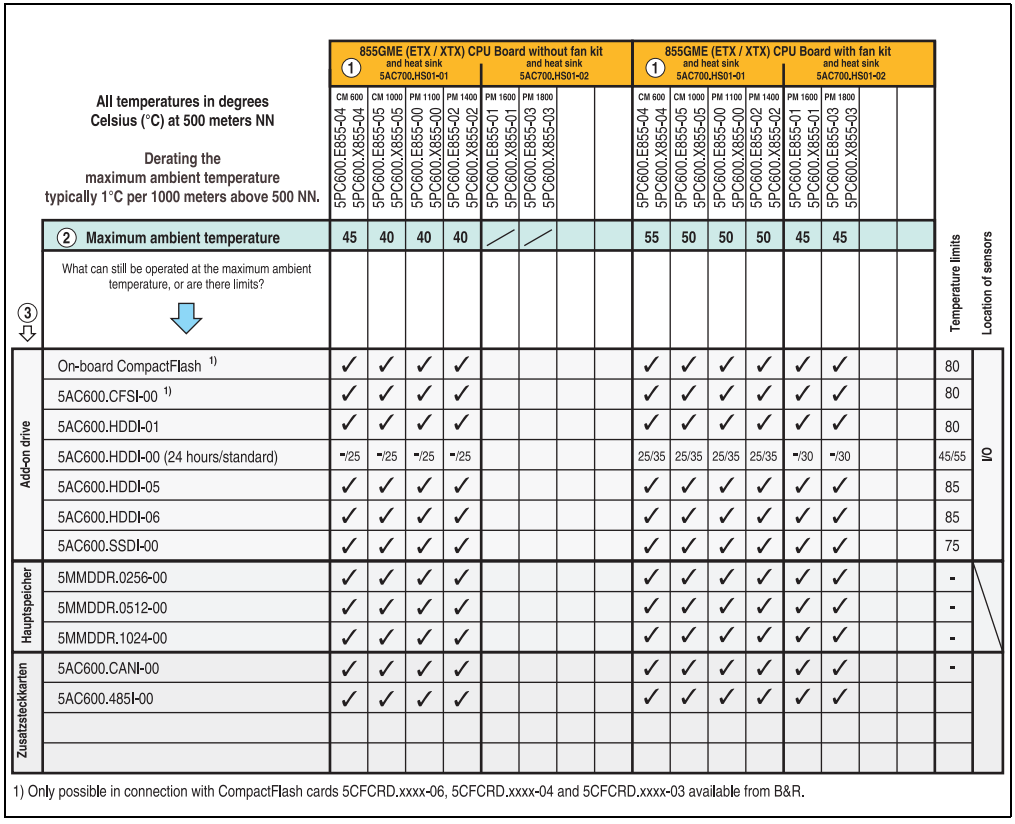
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.10 Ambient temperatures with system unit 5PC781.1043-00

Maximum ambient temperature



All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit (1) and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03				
(2) Maximum ambient temperature	45	40	40	40	/	/			55	50	50	50	45	45				
(3) What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive: On-board CompactFlash 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
Add-on drive: 5AC600.CFSI-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					25/35	25/35	25/35	25/35	-/30	-/30			45/55	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Hauptspeicher: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Hauptspeicher: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Hauptspeicher: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Zusatzsteckkarten: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Zusatzsteckkarten: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓				

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 14: Ambient temperatures - 5PC781.1043-00 with 855GME (ETX / XTX) CPU boards

For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.11 Ambient temperatures with system unit 5PC781.1505-00

Maximum ambient temperature

		855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02					
All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.		CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			Temperature limits	Location of sensors
	② Maximum ambient temperature	45	40	40	40					50	50	50	50	45	45				
③	What can still be operated at the maximum ambient temperature, or are there limits?																		
Add-on drive	On-Board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-00 (24 hours/standard)	-/30	-/25	-/25	-/25					30/40	25/35	25/35	25/35	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interfaces	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
																		-	
																		-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 15: Ambient temperatures - 5PC781.1505-00 with 855GME (ETX / XTX) CPU boards

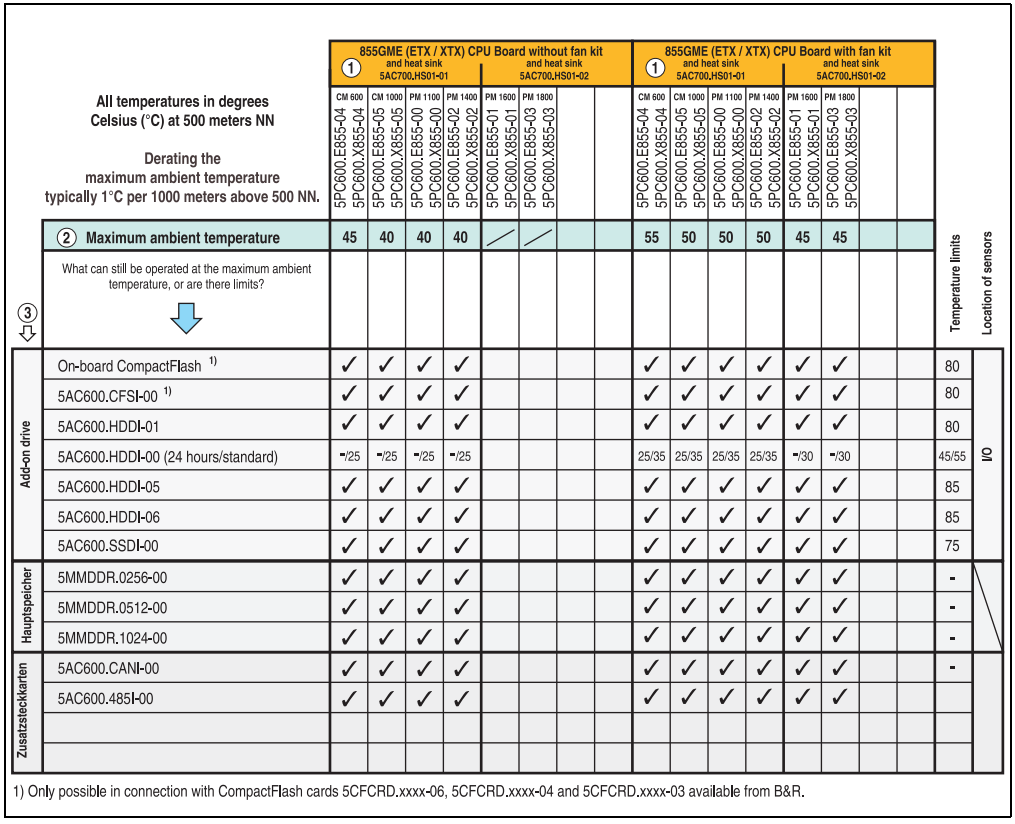
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.12 Ambient temperatures with system unit 5PC782.1043-00

Maximum ambient temperature



All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	855GME (ETX / XTX) CPU Board without fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board without fan kit and heat sink 5AC700.HS01-02				855GME (ETX / XTX) CPU Board with fan kit ① and heat sink 5AC700.HS01-01				855GME (ETX / XTX) CPU Board with fan kit and heat sink 5AC700.HS01-02				Temperature limits	Location of sensors
	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03			CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03				
② Maximum ambient temperature	45	40	40	40	/	/			55	50	50	50	45	45				
What can still be operated at the maximum ambient temperature, or are there limits? ③																		
Add-on drive: On-board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
Add-on drive: 5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
Add-on drive: 5AC600.HDDI-00 (24 hours/standard)	-/25	-/25	-/25	-/25					25/35	25/35	25/35	25/35	-/30	-/30			45/55	
Add-on drive: 5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
Add-on drive: 5AC600.SSDI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			75	
Hauptspeicher: 5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Hauptspeicher: 5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Hauptspeicher: 5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Zusatzsteckkarten: 5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Zusatzsteckkarten: 5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓				

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-06, 5CFCRD.xxxx-04 and 5CFCRD.xxxx-03 available from B&R.

Figure 16: Ambient temperatures - 5PC782.1043-00 with 855GME (ETX / XTX) CPU boards

For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

Minimum ambient temperature

For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

2.1.13 How is the the maximum ambient temperature determined?

1) Selection of the CPU board (use **with** or **without** fan kit).

2) The lines under "Maximum ambient temperature" shows the maximum ambient temperature for the entire system (= system unit + CPU board).

3) Incorporating additional drives (add-on, slide-in), main memory, additional insert cards, etc. can change the temperature limits of a Panel PC 700 system.

If there is a ✓ (checkmark) next to the component, it can be used at the maximum ambient temperature of the whole system without problems.

If there is a specific temperature, for example "35", next to the component, then the ambient temperature of the whole Panel PC 700 system cannot exceed this temperature.

Special case: 5AC600.HDDI-00, 5AC600.HDDS-00 and RAID hard disks

For these hard disks, the limits will depend on whether the system is intended for 24-hour[1)] or standard[1)] operation.

Example 1: A temperature limit of "30/35" means
30°C for 24-hour operation and 35°C for standard operation.

Example 2: A temperature limit of "-/25" means
not intended for 24-hour operation and 25°C for standard operation.

Information:

It is generally recommended to use a fan kit when using hard disks 5AC600.HDDI-00, 5AC600.HDDS-00 and the RAID hard disks.

2.1.14 Temperature monitoring

The PPC700 has temperature sensors in various places (I/O, power supply, slide-in drive 1). The locations of the temperature sensors can be found in the figure "Temperature sensor locations", on page 693. The value listed in the table represents the defined maximum temperature for this measurement point[2)] . An alarm is not triggered when this temperature is exceeded. The temperatures[2)] can be read in BIOS (menu item "Advanced" - Main board/panel features - Main board monitor) or in Microsoft Windows XP/embedded, using the B&R Control Center.
Additionally, the hard disks for PPC700 systems available from B&R are equipped with S.M.A.R.T, or Self Monitoring, Analysis, and Reporting Technology. This makes it possible to read various parameters, for example the temperature, using software (e.g. HDD thermometer - freeware) in Microsoft Windows XP/embedded.

1) 24-hour operation = 732 POH (Power On Hours) per month, standard operation = 250 POH or 333 POH (Power On Hours) per month.
2) 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 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
CPU boards 815E (ETX)		10 to 90%	5 to 95%
CPU boards 855GME (ETX / XTX)		10 to 90%	5 to 95%
Main memory for CPU boards		5 to 90%	5 to 95%
Add-on drives	5AC600.SSDI-00	0 to 95 %	0 to 95%
	5AC600.HDDI-00	8 to 90%	5 to 95%
	5AC600.HDDI-01	8 to 90%	5 to 95%
	5AC600.HDDI-02	8 to 90%	5 to 95%
	5AC600.HDDI-03	8 to 90%	5 to 95%
	5AC600.HDDI-04	8 to 90%	5 to 95%
	5AC600.HDDI-05	5 to 90%	5 to 95%
	5AC600.HDDI-06	5 to 90%	5 to 95%
Slide-in drives	5AC600.CDXS-00	8 to 80%	5 to 95%
	5AC600.DVDS-00	8 to 80%	5 to 95%
	5AC600.DVRS-00	8 to 80%	5 to 95%
	5AC600.FDDS-00	20 to 80%	10 to 95%
	5AC600.HDDS-00	8 to 90%	5 to 95%
	5AC600.HDDS-01	8 to 90%	5 to 95%
	5AC600.HDDS-02	8 to 90%	5 to 95%
Additional insert cards Interfaces AP Link	5ACPCI.RAIS-00	8 to 90%	5 to 95%
	5ACPCI.RAIS-01	8 to 90%	5 to 95%
	5ACPCI.RAIC-01	5 to 90%	5 to 95%
	5ACPCI.RAIC-02	5 to 90%	5 to 95%
	5ACPCI.RAIC-03	8 to 90%	5 to 95%
	5ACPCI.RAIC-04	8 to 90%	5 to 95%
	5ACPCI.RAIC-05	5 to 95%	5 to 95%
	5MMHDD.0250-00	5 to 95%	5 to 95%
	5AC600.CANI-00	5 to 90%	5 to 95%
	5AC600.485I-00	5 to 90%	5 to 95%
Accessories	CompactFlash cards 5CFCRD.xxxx-04	85%	85%
	CompactFlash cards - 5CFCRD.xxxx-03	8 to 95%	8 to 95%
	Flash drive 5MMUSB.xxxx-xx	10 to 90%	5 to 90%
	USB Media Drive 5MD900.USB2-00	20 to 80%	5 to 90%

Table 22: 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 Power management

The following block diagram presents the simplified structure of the PPC700 supply voltage - valid starting with the following system unit revisions:

Model number	Short text	Starting with revision
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	K0
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	I0
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	K0
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	D0
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	M0
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	L0
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	K0
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	E0
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	G0
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	H0
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	J0
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	H0

Table 23: Revision dependent block diagram

If an older system unit revision is used, its necessary to read the power management information in section 2.3.6 "Power management obsolete", on page 76.

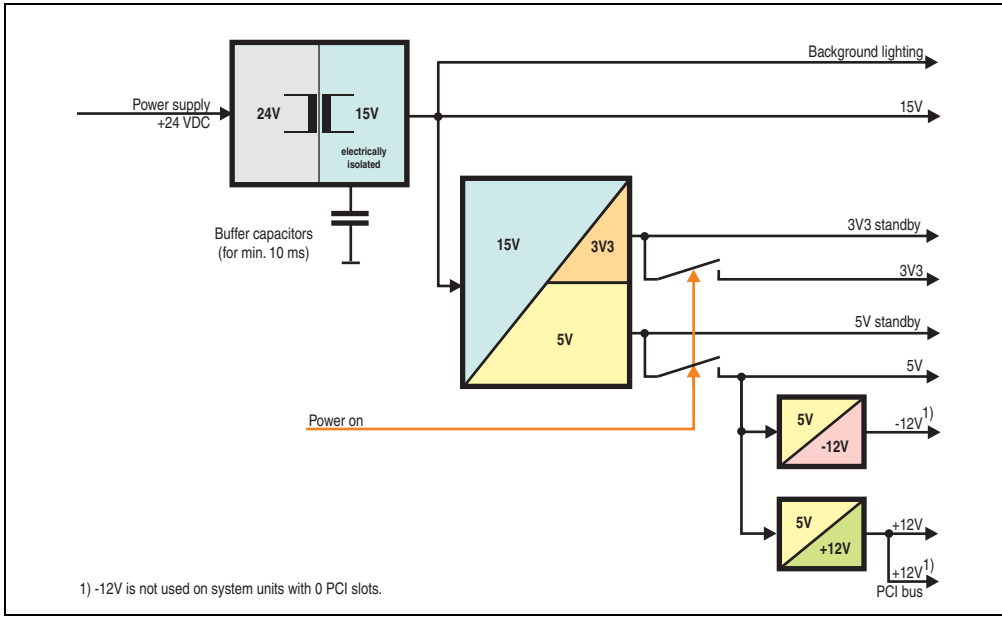


Figure 17: Block diagram - supply voltage

2.3.1 Power calculation for 10.4" Panel PC 700

Model number	Short text	Starting with revision
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	K0
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	I0
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	H0
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	H0

Table 24: Revision dependent 10.4" Panel PC 700

Information:

All values in Watts
The values for the **suppliers** are maximum values.
The values for the **consumers** are average maximum values, but not peak values.

	10,4" Panel PC 700									Current system
	C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03	CM 600 5PC600.E855-04	CM 1000 5PC600.E855-05	PM 1100 5PC600.E855-00	PM 1400 5PC600.E855-02	PM 1600 5PC600.E855-01	PM 1800 5PC600.E855-03	Enter values in this column
Total power supply power (maximum)									5PC600.X855-03	**110**
Total power supply, permanent consumers	9	9	9	9	9	9	9	9	9	
5V — Maximum possible at 5V										**70**
CPU board, permanent consumers	14	18	25	17	21	23	23	37	37	
Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	1	1	1	
Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	4	4	4	
Per drive, optional (slide-in CD, DVD CD-RW)	4	4	4	4	4	4	4	4	4	
External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1	
USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	5	5	5	
Interface option (add-on interface), optional	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	
PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
Keys/LEDs, permanent consumers (dep. on system unit)	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	
5V consumers Σ										
+12V — Maximum possible at +12V										**24**
Fan kit, optional	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	
External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
+12V consumers Σ										
-12V — Maximum possible at -12V										**1.2**
PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit) [1]										
-12V consumers Σ										
All consumers 5V Σ										
3V3 — Maximum possible at 3V3										**23**
System unit, permanent consumers	5	5	5	5	5	5	5	5	5	
Interface option (add-on interface), optional	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	
PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
3V3 consumers Σ										
All consumers Σ										

1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 18: Power calculation for 10.4" Panel PC 700 system units

2.3.2 Power calculation for 12.1" Panel PC 700

Model number	Short text	Starting with revision
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	K0
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	D0

Table 25: Revision dependent 12.1" Panel PC 700

Information:

All values in Watts
The values for the **suppliers** are maximum values.
The values for the **consumers** are average maximum values, but not peak values.

		12,1" Panel PC 700									Current system
		C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03	CM 600 5PC600.E855-04	CM 1000 5PC600.X855-04	PM 1100 5PC600.E855-05	PM 1400 5PC600.X855-05	PM 1600 5PC600.E855-01	PM 1800 5PC600.X855-01	
											Enter values in this column
	Total power supply power (maximum)										**110**
	Total power supply, permanent consumers	10	10	10	10	10	10	10	10	10	
Total power supply	**Maximum possible at 5V**										**70**
5V	CPU board, permanent consumers	14	18	25	17	21	23	23	37	37	
5V	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	1	1	1	
5V	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	4	4	4	
5V	Per drive, optional (slide-in CD, DVD CD-RW)	4	4	4	4	4	4	4	4	4	
5V	External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1	
5V	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	5	5	5	
5V	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
5V	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
5V	External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
5V	**5V consumers** Σ										
+12V	**Maximum possible at +12V**										**24**
+12V	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
+12V	External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
+12V	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
+12V	**+12V consumers** Σ										
-12V	**Maximum possible at -12V**										**1.2**
-12V	PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit) [1]										
-12V	**-12V consumers** Σ										
	All consumers 5V Σ										
3V3	**Maximum possible at 3V3**										**23**
3V3	System unit, permanent consumers	5	5	5	5	5	5	5	5	5	
3V3	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
3V3	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
3V3	**3V3 consumers** Σ										
	All consumers Σ										

1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 19: Power calculation for 12.1" Panel PC 700 system units

2.3.3 Power calculation for 15" Panel PC 700

Model number	Short text	Starting with revision
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	M0
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	L0
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	K0
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	J0

Table 26: Revision dependent 15" Panel PC 700

Information:

All values in Watts
The values for the **suppliers** are maximum values.
The values for the **consumers** are average maximum values, but not peak values.

		15" Panel PC 700									Current system
		C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03	CM 600 5PC600.E855-04	CM 1000 5PC600.X855-04	PM 1100 5PC600.E855-05	PM 1400 5PC600.X855-05	PM 1600 5PC600.E855-00	PM 1800 5PC600.X855-00	Enter values in this column
											Total power supply power (maximum) 110
	Total power supply, permanent consumers	22	22	22	22	22	22	22	22	22	
Total power supply	5V										Maximum possible at 5V 70
	CPU board, permanent consumers	14	18	25	17	21	23	23	37	37	
	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	1	1	1	
	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	4	4	4	
	Per drive, optional (slide-in CD, DVD CD-RW)	4	4	4	4	4	4	4	4	4	
	External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1	
	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
	External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
	Keys/LEDs, permanent consumers (dep. on system unit)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
											5V consumers Σ
	+12V										Maximum possible at +12V 24
	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
											+12V consumers Σ
	-12V										Maximum possible at -12V 1.2
	PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit) [1]										
											-12V consumers Σ
											All consumers 5V Σ
	3V3										Maximum possible at 3V3 23
	System unit, permanent consumers	7	7	7	7	7	7	7	7	7	
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
											3V3 consumers Σ
											All consumers Σ

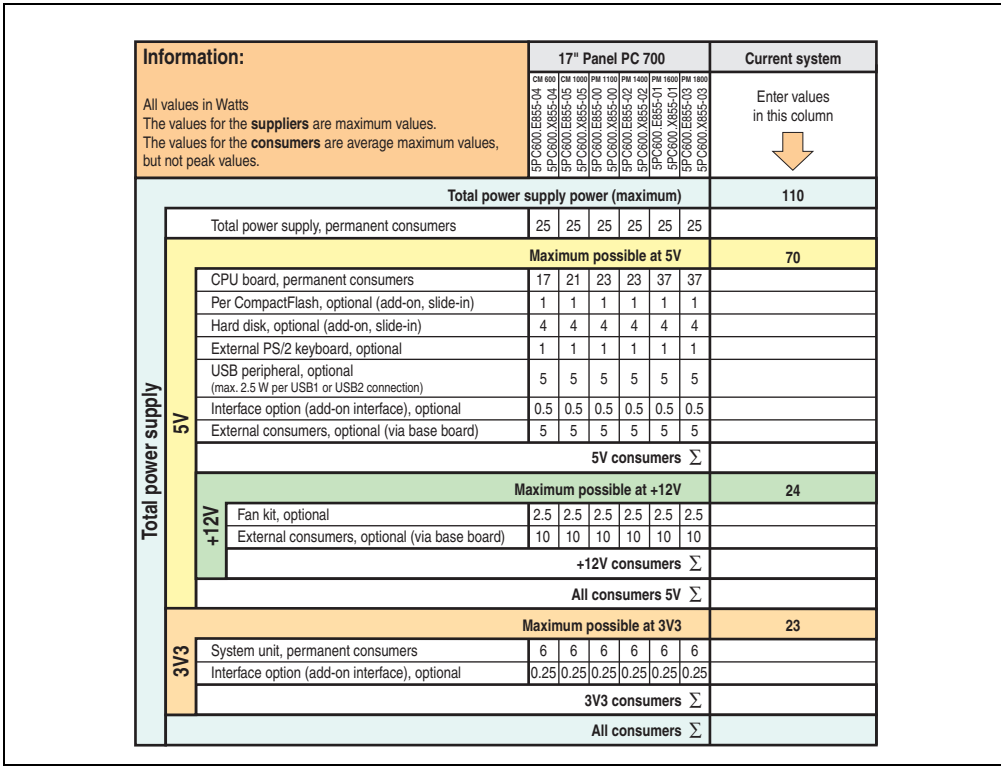
1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 20: Power calculation for 15" Panel PC 700

2.3.4 Power calculation for 17" Panel PC 700

Model number	Short text	Starting with revision
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	E0

Table 27: Revision dependent 17" Panel PC 700



Information:	17" Panel PC 700						Current system
All values in Watts The values for the **suppliers** are maximum values. The values for the **consumers** are average maximum values, but not peak values.	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	Enter values in this column
Total power supply power (maximum)							110
Total power supply, permanent consumers	25	25	25	25	25	25	
Total power supply / **5V** — **Maximum possible at 5V**							70
CPU board, permanent consumers	17	21	23	23	37	37	
Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	
Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	
External PS/2 keyboard, optional	1	1	1	1	1	1	
USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	
Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	
External consumers, optional (via base board)	5	5	5	5	5	5	
5V consumers Σ							
+12V — **Maximum possible at +12V**							24
Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	
External consumers, optional (via base board)	10	10	10	10	10	10	
+12V consumers Σ							
All consumers 5V Σ							
3V3 — **Maximum possible at 3V3**							23
System unit, permanent consumers	6	6	6	6	6	6	
Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	
3V3 consumers Σ							
All consumers Σ							

Figure 21: Power calculation for 17" Panel PC 700

2.3.5 Power calculation for 19" Panel PC 700

Model number	Short text	Starting with revision
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	G0

Table 28: Revision dependent 19" Panel PC 700

Information:

All values in Watts
The values for the **suppliers** are maximum values.
The values for the **consumers** are average maximum values, but not peak values.

		19" Panel PC 700						Current system
		CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	Enter values in this column
Total power supply	Total power supply power (maximum)							110
	Total power supply, permanent consumers	25	25	25	25	25	25	
	Maximum possible at 5V							70
5V	CPU board, permanent consumers	17	21	23	23	37	37	
5V	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	
5V	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	
5V	External PS/2 keyboard, optional	1	1	1	1	1	1	
5V	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	
5V	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	
5V	External consumers, optional (via base board)	5	5	5	5	5	5	
5V	5V consumers Σ							
+12V	Maximum possible at +12V							24
+12V	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	
+12V	External consumers, optional (via base board)	10	10	10	10	10	10	
+12V	+12V consumers Σ							
5V	All consumers 5V Σ							
3V3	Maximum possible at 3V3							23
3V3	System unit, permanent consumers	6	6	6	6	6	6	
3V3	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	
3V3	3V3 consumers Σ							
Total power supply	All consumers Σ							

Figure 22: Power calculation for 19" Panel PC 700

2.3.6 Power management obsolete

The following block diagram presents the simplified structure of the PPC700 supply voltage - valid starting with the following system unit revisions:

Model number	Short text	Lower revision
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	K0
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	I0
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	K0
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	D0
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	M0
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	L0
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	K0
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	E0
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	G0
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	H0
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	J0
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	H0

Table 29: Revision dependent block diagram

If a newer system unit revision is used, it's necessary to read the power management information in section 2.3 "Power management", on page 70.

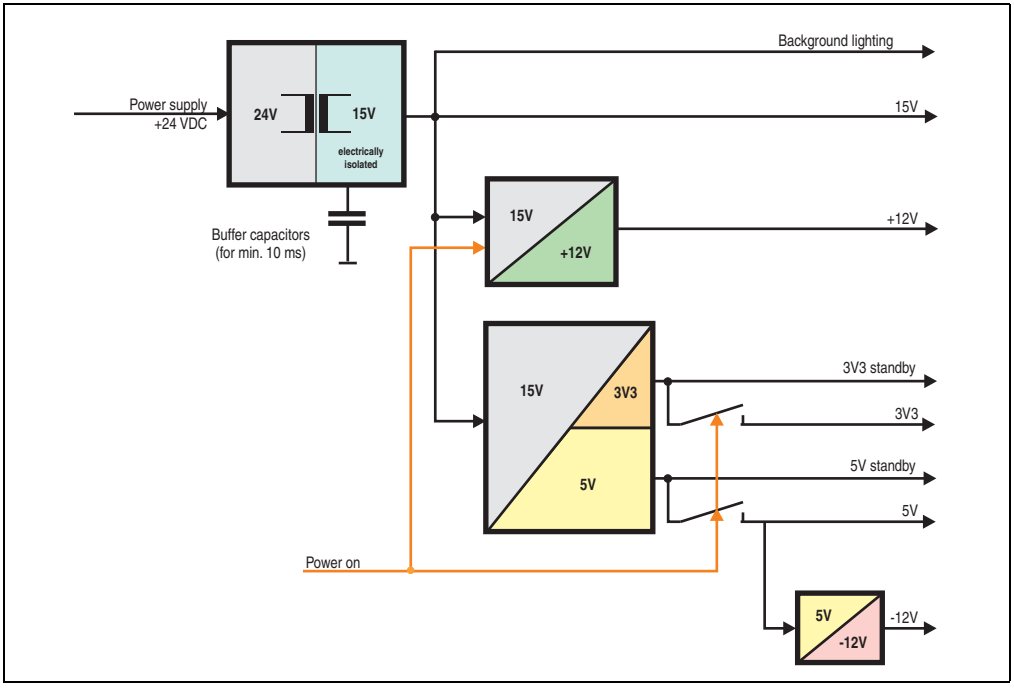


Figure 23: Block diagram - supply voltage

Explanation:

The supply voltage (+24 VDC) is converted to 15 V with a DC/DC converter. The electrically isolated 15 V is used to feed two further DC/DC converters (generation of +12 V, 3V3 and 5V standby) as well as the background lighting.

After the system is turned on (e.g. using the power button), the voltages 3V3, 5 V and +12 V are placed on the bus. At the 5 V output, another DC/DC converter generates -12 V and provides this voltage to the bus.

10.4" Panel PC 700

All values in watts

		10,4" Panel PC 700									Current system
		C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	
Total power supply		**Total power supply power (maximum)**									110
	Total power supply, permanent consumers	9	9	9	9	9	9	9	9	9	
5V		**Maximum possible at 5V**									55
	CPU board, permanent consumers	14	18	25	17	21	23	23	37	37	
	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	1	1	1	
	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	4	4	4	
	Per drive, optional (slide-in CD, DVD CD-RW)	4	4	4	4	4	4	4	4	4	
	External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1	
	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit)[1]										
	External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
	Keys/LEDs, perm. consumers (dep. on system unit)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
	5V consumers Σ										
3V3		**Maximum possible at 3V3**									23
	System unit, permanent consumers	5	5	5	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit)[1]										
	3V3 consumers Σ										
+12V		**Maximum possible at +12V**									12
	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit)[1]										
	+12V consumers Σ										
-12V		**Maximum possible at -12V**									1.2
	PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit)[1]										
	-12V consumers Σ										
	All consumers Σ										

1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 24: Power management - 10.4" Panel PC 700

12.1" Panel PC 700

All values in watts

		12,1" Panel PC 700									Current system
		C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	
Total power supply											Total power supply power (maximum) 110
	Total power supply, permanent consumers	10	10	10	10	10	10	10	10	10	
5V											Maximum possible at 5V 55
	CPU board, permanent consumers	14	18	25	17	21	23	23	37	37	
	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	1	1	1	
	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	4	4	4	
	Per drive, optional (slide-in CD, DVD CD-RW)	4	4	4	4	4	4	4	4	4	
	External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1	
	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
	Keys/LEDs, perm. consumers (dep. on system unit)	5	5	5	5	5	5	5	5	5	
											5V consumers Σ
3V3											Maximum possible at 3V3 23
	System unit, permanent consumers	5	5	5	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
											3V3 consumers Σ
+12V											Maximum possible at +12V 12
	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
											+12V consumers Σ
-12V											Maximum possible at -12V 1.2
	PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit) [1]										
											-12V consumers Σ
											All consumers Σ

1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 25: Power management - 12.1" Panel PC 700

15" Panel PC 700

All values in watts

		15" Panel PC 700									Current system
		C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03	CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	
Total power supply		Total power supply power (maximum)									110
	Total power supply, permanent consumers	22	22	22	22	22	22	22	22	22	
5V		Maximum possible at 5V									55
	CPU board, permanent consumers	14	18	25	17	21	23	23	37	37	
	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	1	1	1	
	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	4	4	4	
	Per drive, optional (slide-in CD, DVD CD-RW)	4	4	4	4	4	4	4	4	4	
	External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1	
	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 17 W with fan kit) [1]										
	External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
	Keys/LEDs, perm. consumers (dep. on system unit)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
	5V consumers Σ										
3V3		Maximum possible at 3V3									23
	System unit, permanent consumers	7	7	7	7	7	7	7	7	7	
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
	3V3 consumers Σ										
+12V		Maximum possible at +12V									12
	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
	PCI card manufacturer power specification, optional (max. 3 W without fan kit, max. 12 W with fan kit) [1]										
	+12V consumers Σ										
-12V		Maximum possible at -12V									1.2
	PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit) [1]										
	-12V consumers Σ										
	All consumers Σ										

1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 26: Power management - 15" Panel PC 700

17" Panel PC 700

All values in watts

		17" Panel PC 700						Current system
		CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	
Total power supply	Total power supply power (maximum)							110
	Total power supply, permanent consumers	25	25	25	25	25	25	
5V	Maximum possible at 5V							55
	CPU board, permanent consumers	17	21	23	23	37	37	
	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	
	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	
	External PS/2 keyboard, optional	1	1	1	1	1	1	
	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	
	External consumers, optional (via base board)	5	5	5	5	5	5	
	5V consumers Σ							
3V3	Maximum possible at 3V3							23
	System unit, permanent consumers	6	6	6	6	6	6	
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	
	3V3 consumers Σ							
+12V	Maximum possible at +12V							12
	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	
	External consumers, optional (via base board)	10	10	10	10	10	10	
	+12V consumers Σ							
	All consumers Σ							

Figure 27: Power management - 17" Panel PC 700

19" Panel PC 700

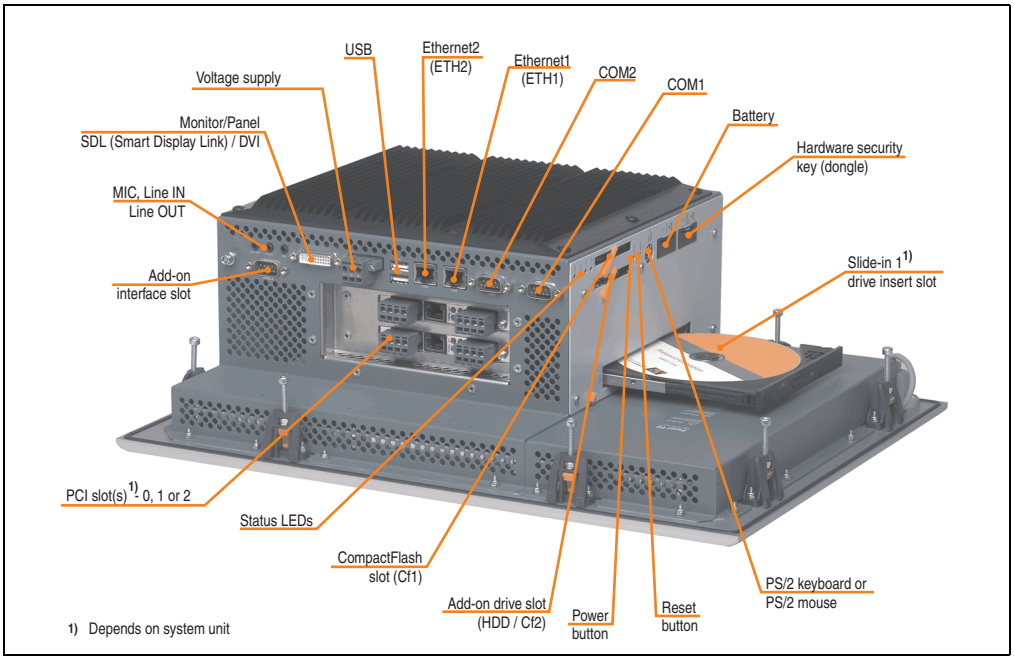
All values in watts

		19" Panel PC 700						Current system
		CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 5PC600.X855-00	PM 1400 5PC600.E855-02 5PC600.X855-02	PM 1600 5PC600.E855-01 5PC600.X855-01	PM 1800 5PC600.E855-03 5PC600.X855-03	
Total power supply	Total power supply power (maximum)							110
	Total power supply, permanent consumers	25	25	25	25	25	25	
5V	Maximum possible at 5V							55
	CPU board, permanent consumers	17	21	23	23	37	37	
	Per CompactFlash, optional (add-on, slide-in)	1	1	1	1	1	1	
	Hard disk, optional (add-on, slide-in)	4	4	4	4	4	4	
	External PS/2 keyboard, optional	1	1	1	1	1	1	
	USB peripheral, optional (max. 2.5 W per USB1 or USB2 connection)	5	5	5	5	5	5	
	Interface option (add-on interface), optional	0.5	0.5	0.5	0.5	0.5	0.5	
	External consumers, optional (via base board)	5	5	5	5	5	5	
	5V consumers Σ							
3V3	Maximum possible at 3V3							23
	System unit, permanent consumers	6	6	6	6	6	6	
	Interface option (add-on interface), optional	0.25	0..,25	0.25	0.25	0.25	0.25	
	3V3 consumers Σ							
+12V	Maximum possible at +12V							12
	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	
	External consumers, optional (via base board)	10	10	10	10	10	10	
	+12V consumers Σ							
	All consumers Σ							

Figure 28: Power management - 19" Panel PC 700

2.4 Device interfaces

The following image shows the general and optional device interfaces for an entire Panel PC 700 unit.



Depending on system unit, the device interfaces will vary only in the number of PCI slots and the presence of a slide-in drive slot.

2.4.1 Serial interface COM1

Serial interfaces COM1		
Type	RS232, modem-capable, not electrically isolated	9-pin DSUB, male
UART	16550 compatible, 16 byte FIFO	
Transfer rate	Max. 115 kBaud	
Pin	**Assignment**	
1	DCD	
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

Table 30: Pin assignments - COM1

I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	3F8	2F8, 3E8, 2E8
IRQ	IRQ4	IRQ3

Table 31: COM1 - I/O address and IRQ

The setting for the I/O address and the IRQ can be changed in the BIOS setup (under "Advanced" - submenu "I/O Device Configuration" setting "Serial port A"). Please note any potential conflicts with other resources when changing this setting.

2.4.2 Serial interface COM2

Serial interfaces COM2		
Type	RS232, modem-capable, not electrically isolated	9-pin DSUB, male
UART	16550 compatible, 16 byte FIFO	
Transfer rate	Max. 115 kBaud	
Pin	**Assignment**	
1	DCD	
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

Table 32: Pin assignments - COM2

I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	2F8	3F8, 3E8, 2E8
IRQ	IRQ3	IRQ4

Table 33: COM2 - I/O address and IRQ

The setting for the I/O address and the IRQ can be changed in the BIOS setup (under "Advanced" - submenu "I/O Device Configuration" setting "Serial port B"). Please note any potential conflicts with other resources when changing this setting.

2.4.3 Ethernet connection ETH1

This Ethernet connection is integrated in the CPU board being used.

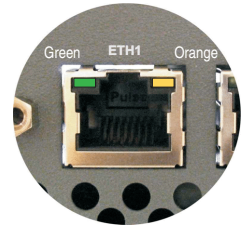
Ethernet connection (ETH1[1])			
Controller	Intel 82562		RJ45 twisted pair (10BaseT/100BaseT), female 
Cabling	S/STP (Cat5e)		
Transfer rate	10/100 Mbit/s [2]		
Cable length	See table35 "Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards (ETX)", on page 87 and table 36 "Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards", on page 87.		
LED	**On**	**Off**	
Green	100 Mbit/s	10 Mbit/s	
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)	

Table 34: Ethernet connection (ETH1)

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) Both operating modes possible. Change-over takes place automatically.

Driver support

Special drivers are necessary for operating the Intel Ethernet controller 82562. Drivers for Windows XP Professional, Windows XP Embedded, and DOS are available for download on the B&R Homepage in the download area (**www.br-automation.com**).

Information:

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

Ethernet cable length when 855GME (ETX) CPU boards are used.

The supported cable length depends on the system unit revision when using Intel 855GME CPU boards (5PC600.E855-xx (ETX)).

System unit	Cable length with CAT5e cable	
	Up to 50 meters	Up to 80 meters[1)]
5PC720.1043-00	Revision < I0	Starting with revision I0
5PC720.1043-01	Revision < H0	Starting with Revision H0
5PC720.1214-00	Revision < J0	Starting with revision J0
5PC720.1214-01	-	Starting with revision C0
5PC720.1505-00	Revision < J0	Starting with revision J0
5PC720.1505-01	Revision < I0	Starting with revision I0
5PC720.1505-02	Revision < H0	Starting with Revision H0
5PC720.1706-00	-	Starting with revision C0
5PC720.1906-00	-	Starting with revision C0
5PC781.1043-00	Revision < G0	Starting with revision G0
5PC781.1505-00	Revision < H0	Starting with Revision H0
5PC782.1043-00	Revision < G0	Starting with revision G0

Table 35: Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards (ETX)

1) When higher quality cable is used (e.g.: category CAT7), greater distances are possible.

Ethernet cable length when 855GME (XTX) CPU boards are used.

The supported cable length depends on the system unit revision when using Intel 855GME CPU boards (5PC600.E855-xx (XTX)).

System unit	Cable length with CAT5e cable	
	Up to 50 meters	Up to 100 meters
5PC720.1043-00	Revision < I0	Starting with revision I0
5PC720.1043-01	Revision < H0	Starting with Revision H0
5PC720.1214-00	Revision < J0	Starting with revision J0
5PC720.1214-01	-	Starting with revision C0
5PC720.1505-00	Revision < J0	Starting with revision J0
5PC720.1505-01	Revision < I0	Starting with revision I0
5PC720.1505-02	Revision < H0	Starting with Revision H0
5PC720.1706-00	-	Starting with revision C0
5PC720.1906-00	-	Starting with revision C0
5PC781.1043-00	Revision < G0	Starting with revision G0
5PC781.1505-00	Revision < H0	Starting with Revision H0

Table 36: Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards

System unit	Cable length with CAT5e cable	
	Up to 50 meters	Up to 100 meters
5PC782.1043-00	Revision < G0	Starting with revision G0

Table 36: Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards (Forts.)

Special features when 855GME (XTX) CPU boards are used.

The hardware supports Auto MDX, which means an integrated switch automatically determines if the connected cable is crossed or not and adjusts itself accordingly. However, Auto MDX must be supported by the Ethernet driver used by the operating system.

B&R recommends not using the Auto MDX function during cabling, and instead using it only as a diagnostics or testing feature.

2.4.4 Ethernet connection ETH2

This Ethernet connection is integrated in the system unit.

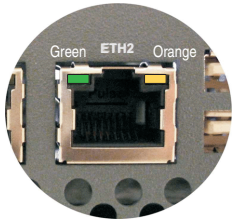
Ethernet connection (ETH1[1])			
Controller	Intel 82551ER		RJ45 twisted pair (10BaseT/100BaseT), female 
Cabling	S/STP (Cat5e)		
Transfer rate	10/100 Mbit/s [2]		
Cable length	max. 100 m (min. Cat5e)		
LED	**On**	**Off**	
Green	100 Mbit/s	10 Mbit/s	
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)	

Table 37: Ethernet connection (ETH2)

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) Both operating modes possible. Change-over takes place automatically.

Driver support

Special drivers are necessary for operating the Intel Ethernet controller 82551ER. Drivers for Windows XP Professional, Windows XP Embedded, and DOS are available for download on the B&R Homepage in the download area (**www.br-automation.com**).

Information:

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

2.4.5 USB port

All PPC700 devices have a USB 2.0 (Universal Serial Bus) Host Controller with multiple USB ports, 3 of which (2x back, 1x front) are on the outside for easy user access.

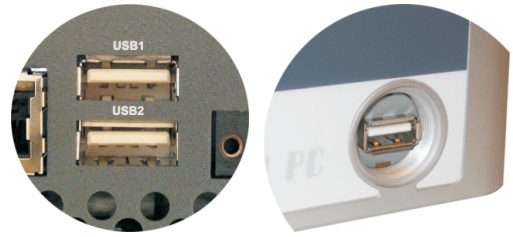
Universal Serial Bus (USB1 and UBS2)[1]		
Transfer rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)	USB type A, female  Back side Front side
Power supply	Max. 500 mA per port[2]	
Maximum Cable length	5 m (not including hub)	

Table 38: USB port - back

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)

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.

Warning!

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

Driver support

For optimal functionality of USB 2.0 (transfer speed up to 480 Mbit/s) with Windows XP, at least Service Pack 1 must be installed. Without the Service Pack, Windows XP will only support USB 1.1.
USB 2.0 comes already integrated in B&R's XP embedded operating system.

Information:

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

2.4.6 Supply voltage

The PPC700 system units have a 24 VDC ATX compatible power supply.

System unit	Max. performance at + 5 V	Max. performance at + 3V3	Max. power at + 12 V	Max. power at - 12 V	Max. total power
All types	55 W	23 W	12 W	1.2 W	110 W

Table 39: Power supply

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 Panel PC 700 housing. The supply voltage is internally protected (10A, fast-acting), so that the device cannot be damaged if there is an overload (fuse replacement necessary) or if the voltage supply is connected incorrectly (reverse polarity protection - fuse replacement not necessary).

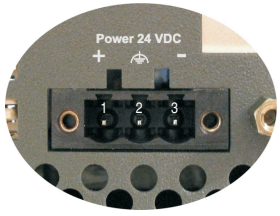
Supply voltage		
Protected against reverse polarity		3-pin, male
Pin	**Description**	
1	+	
2	Functional ground	
3	-	
Accessories		
0TB103.9	Plug 24 V 5.08 3p screw clamps	
0TB103.91	Plug 24 V 5.08 3p cage clamps	

Figure 29: Supply voltage connection

Ground

Warning!

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

PPC700 systems are equipped with a ground connection. The M4 self-locking nut can be used, for example, to fasten a copper strip that is built into the PPC700 at a central grounding point in the switching cabinet or system. The largest possible conductor cross section should be used (at least 2.5 mm²).

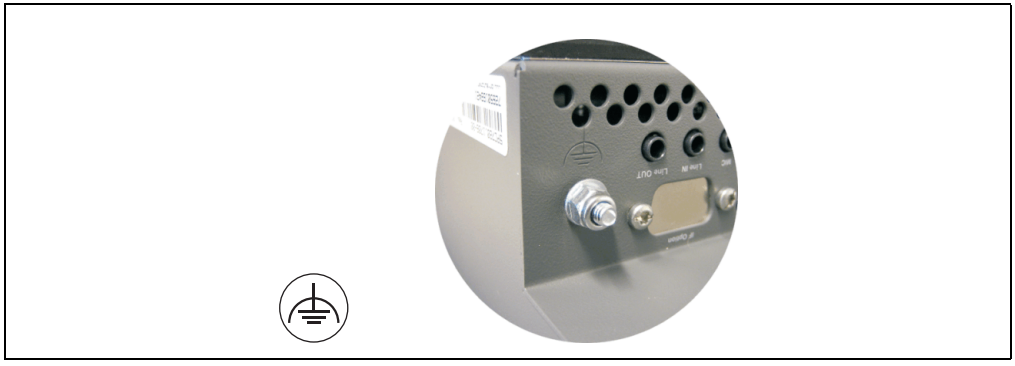


Figure 30: Ground connection

See the section "Grounding concept", on page 290.

2.4.7 Monitor / Panel connection

When using this video output, understand that the video signals that are available (RGB, DVI, and SDL - Smart Display Link) will vary depending on the system units and CPU board. DVI hotplug is not supported

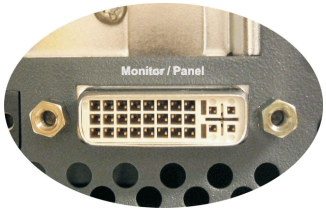
Monitor / Panel			
The following will provide an overview of the video signals available with different system units and CPU boards. For details, see technical data for the CPU board being used.			24-pin DVI-I with special functions, female 
System unit	**815E board (ETX)**	**855GME board (ETX / XTX)**	
5PC720.1043-00	RGB	RGB, DVI, SDL (GE2)	
5PC720.1043-01	RGB	RGB, DVI, SDL (GE2)	
5PC720.1214-00	RGB	RGB, DVI, SDL (GE2)	
5PC720.1214-01	RGB	RGB, DVI, SDL (GE2)	
5PC720.1505-00	RGB	RGB, DVI, SDL (GE2)	
5PC720.1505-01	RGB	RGB, DVI, SDL (GE2)	
5PC720.1505-02	RGB	RGB, DVI, SDL (GE2)	
5PC720.1706-00	RGB	RGB, DVI, SDL (GE2)	
5PC720.1906-00	RGB	RGB, DVI, SDL (GE2)	
5PC781.1043-00	RGB	RGB, DVI, SDL (GE2)	
5PC781.1505-00	RGB	RGB, DVI, SDL (GE2)	
5PC782.1043-00	RGB	RGB, DVI, SDL (GE2)	

Figure 31: Monitor / Panel connection

2.4.8 MIC, Line IN and Line OUT ports

All PPC700 systems include an AC97 (specification 2.2) compatible sound chip with access to the channels MIC, Line IN and Line OUT from the outside.

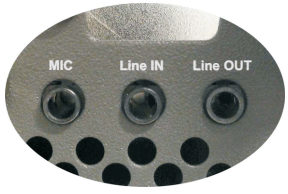
MIC, Line IN and Line OUT		
Controller	Realtek AC97	3.5 mm socket, female 
MIC	Connection of a mono microphone with a 3.5 mm stereo (headphone) jack.	
Line IN	Stereo Line IN signal supplied via 3.5 mm jack.	
Line OUT	Connection of a stereo sound device (e.g. amplifier) via a 3.5 mm jack.	

Table 40: MIC, Line IN and Line OUT ports

Driver support

Special drivers are necessary for operating the AC97 sound chip (Realtek). Drivers for Windows XP Professional and Windows XP Embedded are available for download on the B&R Homepage in the download area (www.br-automation.com).

Information:

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

2.4.9 Add-on interface slot

An optional add-on interface (e.g. CAN, RS485) can be installed here. See also section 3.8 "Interface options", on page 270.

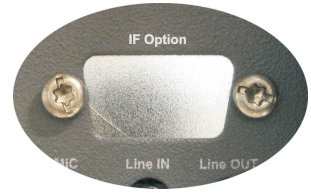
Add-on interface slot		
Available add-on interfaces		
5AC600.CANI-00	Add-on CAN interface	
5AC600.485I-00	Add-on RS232/422/485 interface	

Table 41: Add-on interface slot

Information:

An add-on interface module is only available factory-installed.

2.4.10 PCI slots

Up to 2 PCI slots are available, depending on the system unit. 5 volt cards and universal cards that comply with the PCI half-size standard 2.2 and do not exceed the following dimensions can be inserted.

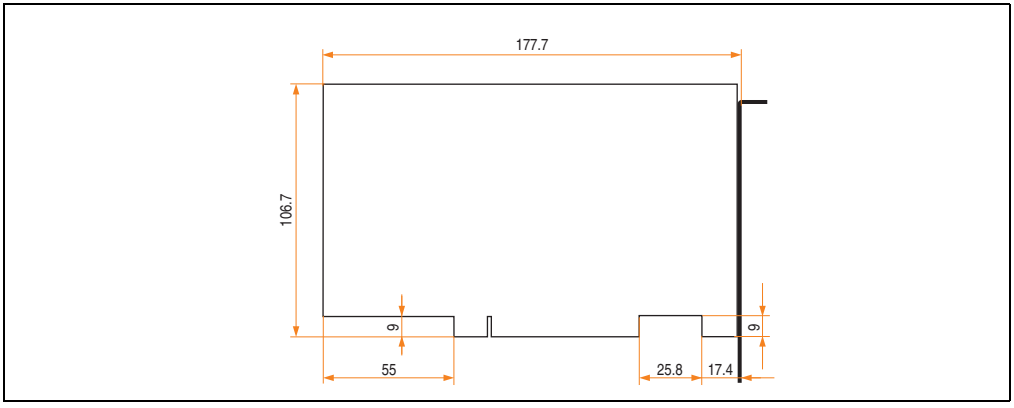


Figure 32: Dimensions - Standard half-size PCI cards

Information:

The total performance of one PCI card per PCI slot should not exceed the limit with or without a fan kit (see section 2.3 "Power management").

Technical data

Features	PCI bus properties
Default	PCI 2.2
Design	Half-size PCI
PCI bus type	32-bit
PCI bus speed	33 MHz

Table 42: Technical data - PCI bus

Voltages on the PCI slot plug

The plug design for the PCI slot is the same as the design for a 5-volt PCI plug. The supply is applied at 3.3 volts and 5 volts on the actual plug.

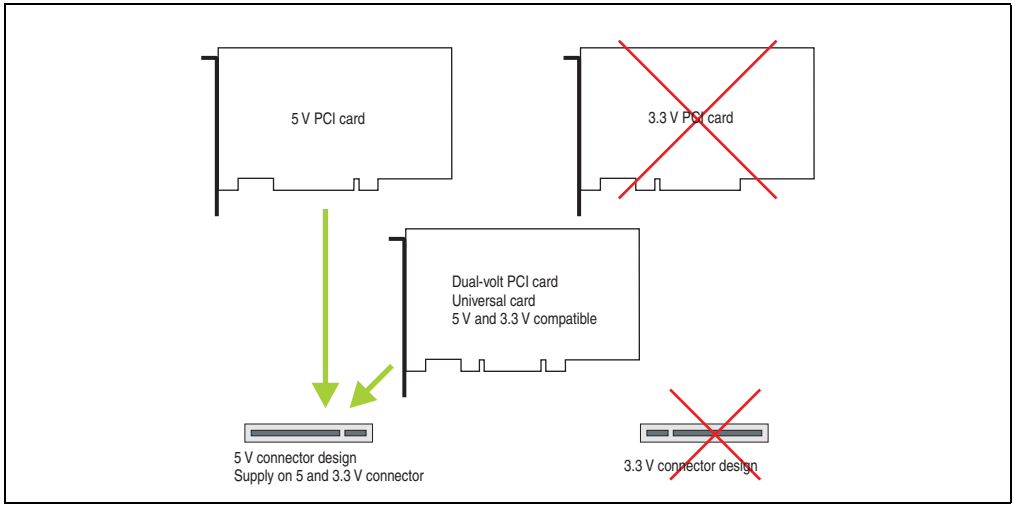


Figure 33: PCI connector type: 5 volt

2.4.11 Status LEDs

The status LEDs are integrated in the system unit.

Status LEDs				
LED	**Color**		**Meaning**	
Power	Green	On	Supply voltage OK	
	Red	On	The system is in standby mode (S5: soft-off mode or S4: Hibernate mode -Suspend-to-Disk)	
HDD	Yellow	On	Signals IDE drive access (CF, HDD, CD, etc.)	
Link 1	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.	
Link 2	-	-	No function	

Table 43: Status LEDs

2.4.12 CompactFlash slot (CF1)

This CompactFlash slot is a fixed component of an PPC700 system, and is defined in BIOS as the primary master drive. Available CompactFlash cards - see table 15 "Model numbers - CompactFlash cards", on page 35.

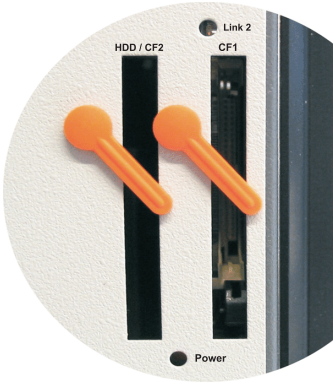
CompactFlash slot (CF1)		
Connection	Primary master IDE device	
CompactFlash Type	Type I	
Accessories	**Short description**	
5CFCRD.0512-06	CompactFlash 512 MB B&R	
5CFCRD.1024-06	CompactFlash 1024 MB B&R	
5CFCRD.2048-06	CompactFlash 2048 MB B&R	
5CFCRD.4096-06	CompactFlash 4096 MB B&R	
5CFCRD.8192-06	CompactFlash 8192 MB B&R	
5CFCRD.016G-06	CompactFlash 16 GB B&R	
5CFCRD.032G-06	CompactFlash 32 GB B&R	
5CFCRD.0064-03	CompactFlash 64 MB SSI	
5CFCRD.0128-03	CompactFlash 128 MB SSI	
5CFCRD.0256-03	CompactFlash 256 MB SSI	
5CFCRD.0512-03	CompactFlash 512 MB SSI	
5CFCRD.1024-03	CompactFlash 1024 MB SSI	
5CFCRD.2048-03	CompactFlash 2048 MB SSI	
5CFCRD.4096-03	CompactFlash 4096 MB SSI	
5CFCRD.8192-03	CompactFlash 8192 MB SSI	

Table 44: CompactFlash slot (CF1)

Warning!

Turn off power before inserting or removing the CompactFlash card!

2.4.13 Hard disk / CompactFlash slot (HDD/CF2)

This slot allows for installation of a hard disk or a second CompactFlash slot as so-called add-on drives. The add-on drive is referred to in BIOS as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

Hard disk / CompactFlash slot (HDD/CF2)	
Connection	Primary slave IDE device
Add-on hard disks 2.5" drive (internal)	
5AC600.SSDI-00	Add-on SSD 128 GB MLC
5AC600.HDDI-03	Add-on hard disk 60 GB, 24/7
5AC600.HDDI-04	Add-on hard disk 80 GB, 24/7
5AC600.HDDI-05	Add-on hard disk 40 GB ET, 24/7
5AC600.HDDI-06	Add-on hard disk 40 GB ET, 24/7
Add-on CompactFlash slot	
5AC600.CFSI-00	Add-on CompactFlash slot
CompactFlash Type	Type I
Accessories	**Short description**
5CFCRD.0512-06	CompactFlash 512 MB B&R
5CFCRD.1024-06	CompactFlash 1024 MB B&R
5CFCRD.2048-06	CompactFlash 2048 MB B&R
5CFCRD.4096-06	CompactFlash 4096 MB B&R
5CFCRD.8192-06	CompactFlash 8192 MB B&R
5CFCRD.016G-06	CompactFlash 16 GB B&R
5CFCRD.032G-06	CompactFlash 32 GB B&R
5CFCRD.0064-03	CompactFlash 64 MB SSI
5CFCRD.0128-03	CompactFlash 128 MB SSI
5CFCRD.0256-03	CompactFlash 256 MB SSI
5CFCRD.0512-03	CompactFlash 512 MB SSI
5CFCRD.1024-03	CompactFlash 1024 MB SSI
5CFCRD.2048-03	CompactFlash 2048 MB SSI
5CFCRD.4096-03	CompactFlash 4096 MB SSI
5CFCRD.8192-03	CompactFlash 8192 MB SSI

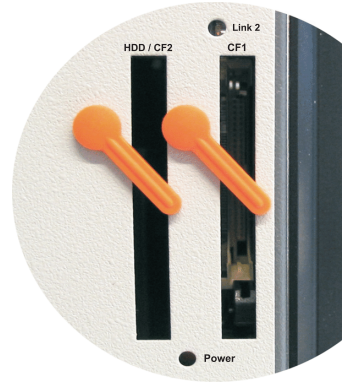


Table 45: Hard disk / CompactFlash slot (HDD/CF2)

Warning!

Turn off power before inserting or removing the CompactFlash card!

2.4.14 Power button

Due to the complete ATX power supply support, the power button serves various functions. These functions can be configured either in the BIOS setup (see BIOS function "Power button function" in section "Power", on page 379 for 815E CPU boards, or section "Power", on page 434 for 855GME CPU boards) or, for example, in the operating system Windows XP.

Power button	
The power button can be pressed with a pointed object (i.e. paper clip or tip of a pen). The power button acts like the on/off switch on a normal desktop PC with ATX power supply: **Press and release** ... Switches on PPC700 or shuts down operating system and switches off the PPC700. **Press and hold** ... ATX power supply switches off without shutting down the PPC700 (**data could be lost!**). Pressing the power button does not reset the MTCX processor.	

Table 46: Power button

2.4.15 Reset button

Reset button	
The reset button can be pressed with a pointed object (i.e. paper clip or tip of a pen). Pushing the reset button results in a hardware-reset, PCI-reset. The PPC700 is restarted (cold restart). The MTCX processor is not reset when the reset button is pressed.	

Table 47: Reset button

Warning!

A system reset can cause data to be lost!

2.4.16 PS/2 keyboard/mouse

Slot for a standard PS/2 mouse or a PS/2 AT-Enhanced keyboard. BIOS automatically determines whether a mouse or a keyboard has been connected, and transfers this information to the operating system.

With a PS/2 Y-cable, both keyboard and mouse can be operated simultaneously. They must be connected before the system is switched on.

This interface has a Hot-Plug function for PS/2 keyboards (only when no PS/2 mouse has ever been connected and used!).

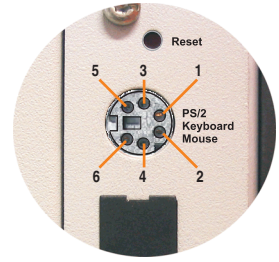
Connection for keyboard/mouse (PS/2)		
Pin	**Assignment**	PS/2 socket, female
1	DATA 0	
2	DATA 1	
3	GND	
4	+5 V[1)]	
5	CLK 0	
6	CLK 1	

Table 48: Connection for external keyboard/mouse (PS/2)

1) The PS/2 keyboard/mouse interface is protected by a multifuse (1A).

Warning!

Because of general PC specifications, this interface should be used with extreme care concerning EMC, location of cables, etc.. It should therefore only be used for service!

Information:

The BIOS setup defaults only allow for the operation of a PS/2 keyboard. If a PS/2 mouse is connected, it must be activated in BIOS. In order to do this, set "PS/2 mouse" in the BIOS setup menu to "enabled" and save. (Located under Advanced - Miscellaneous - Item "PS/2 mouse").

2.4.17 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 4 years (at 50°C, 8.5 µA current requirements of the supplied components and a self discharge of 40%). The battery is subject to wear and should be replaced regularly (at least following the specified buffer duration).

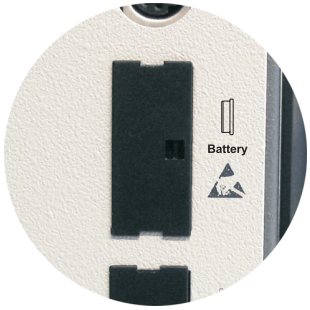
Battery		
Battery Type Removable Lifespan	 Renata 950 mAh Yes, accessible from the outside 4 years[1)]	
Accessories	**Short description**	
0AC201.91	**Lithium batteries, 4 pcs**. Lithium batteries, 4 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	**Lithium batteries, 1 pcs**. Lithium battery, 1 pc., 3 V / 950 mAh, button cell	

Table 49: Battery

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

For more on changing the lithium battery, see chapter 7 "Maintenance / Servicing", section 1 "Changing the battery", on page 675.

For technical information on the lithium battery, see chapter 6 "Accessories", section 2 "Replacement CMOS batteries", on page 577.

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 50: Meaning of battery status

Hardware requirements (system unit)

- 5PC720.1043-00 starting with Rev. K0
- 5PC720.1043-01 starting with Rev. I0
- 5PC720.1214-00 starting with Rev. K0
- 5PC720.1214-01 starting with Rev. D0
- 5PC720.1505-00 starting with Rev. M0
- 5PC720.1505-01 starting with Rev. L0
- 5PC720.1505-02 starting with Rev. K0
- 5PC720.1706-00 starting with Rev. E0
- 5PC720.1906-00 starting with Rev. G0
- 5PC781.1043-00 starting with Rev. H0
- 5PC781.1505-00 starting with Rev. J0
- 5PC782.1043-00 starting with Rev. H0

Firmware / BIOS requirements

- APC620 / Panel PC 700 Firmware Upgrade V1.19 (MTCX PX32: V1.63, MTCX FPGA V1.19)
- BIOS 855GME (ETX) V1.26, BIOS 855GME (XTX) V1.14

2.4.18 Hardware Security Key

B&R recommends a hardware security key (dongle) based on the DS1425 from MAXIM (previously Dallas Semiconductors) for software copy protection.

Hardware Security Key	
A hardware security key (dongle) can be inserted behind the black cover.	

Table 51: Hardware Security Key

Warning!

Turn off power before removing or adding the hardware security key.

I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	378	278, 3BC
IRQ	-	-

Table 52: Hardware security key - I/O address and IRQ

The setting for the I/O address and the IRQ can be changed in the BIOS setup (under "Advanced" - submenu "I/O device configuration" setting "Parallel port").

2.4.19 Slide-in slot 1 drive slot

This slide-in slot 1 drive slot exists only in PPC700 system units with 1 or 2 PCI slots. It is possible to insert a number of slide-in drives into it. See table for available slide-in drives 10 "Model numbers - Drives", on page 32.

The slide-in CD-ROM (5AC600.CDXS-00) and the slide-in DVD-ROM/CD-RW (5AC600.DVDS-00) and DVD-R/RW, DVD+R/RW (5AC600.DVRS-00) drive is referred to in BIOS as "secondary slave". The slide-in USB FDD drive (5AC600.FDDS-00) is referred to as USB.

Information:

It is possible to add, remove, or modify the slide-in drive at any time.

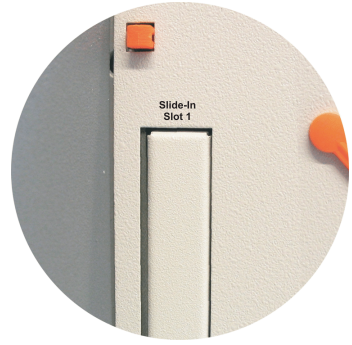
Slide-in slot 1		
Connection	Secondary slave IDE device	
Accessories	**Short description**	
5AC600.CDXS-00	Slide-in CD-ROM	
5AC600.CFSS-00	Slide-in CF 2-slot	
5AC600.DVDS-00	Slide-in DVD-ROM/CD-RW	
5AC600.FDDS-00	Slide-in USB FDD	
5AC600.HDDS-00	Slide-in hard disk 30 GB 24x7	
5AC600.HDDS-01	Slide-in hard disk 20 GB ET	
5AC600.HDDS-02	Slide-in hard disk 40 GB ET, 24x7	

Table 53: Slide-in slot 1

Caution!

Turn off power before adding or removing a slide-in drive.

2.5 Serial number sticker

Each B&R device is assigned a unique serial number label with a bar code (type 128), which allows the device to be clearly identified.

The serial number for the entire device is located on the back of the device. This serial number represents all of the components built into the system (model number, name, revision, serial number, delivery date and duration of warranty).

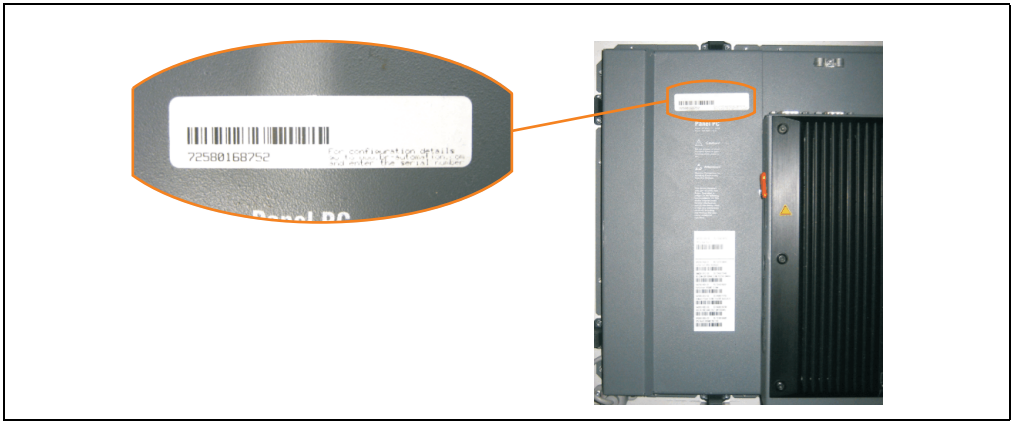


Figure 34: Serial number sticker for PPC700 assembly (back)

A sticker with detailed information about the individual components can also be found on the device.

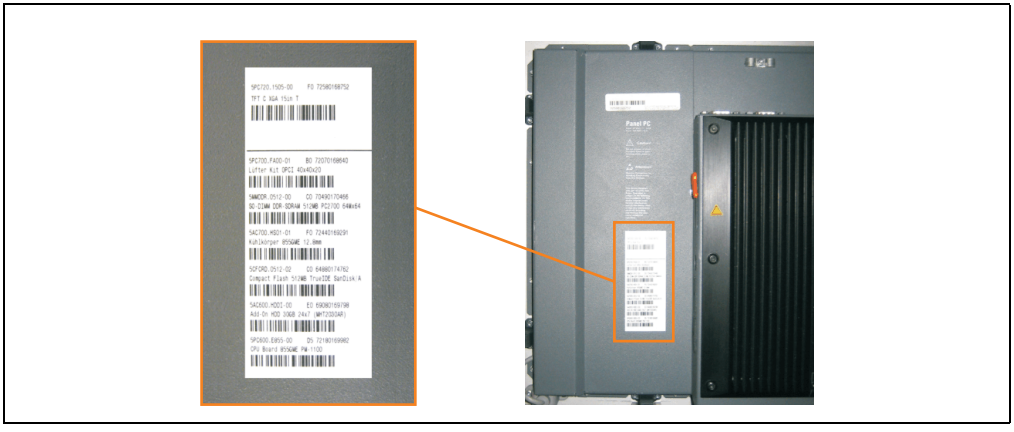


Figure 35: Serial number stickers for individual PPC700 components

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

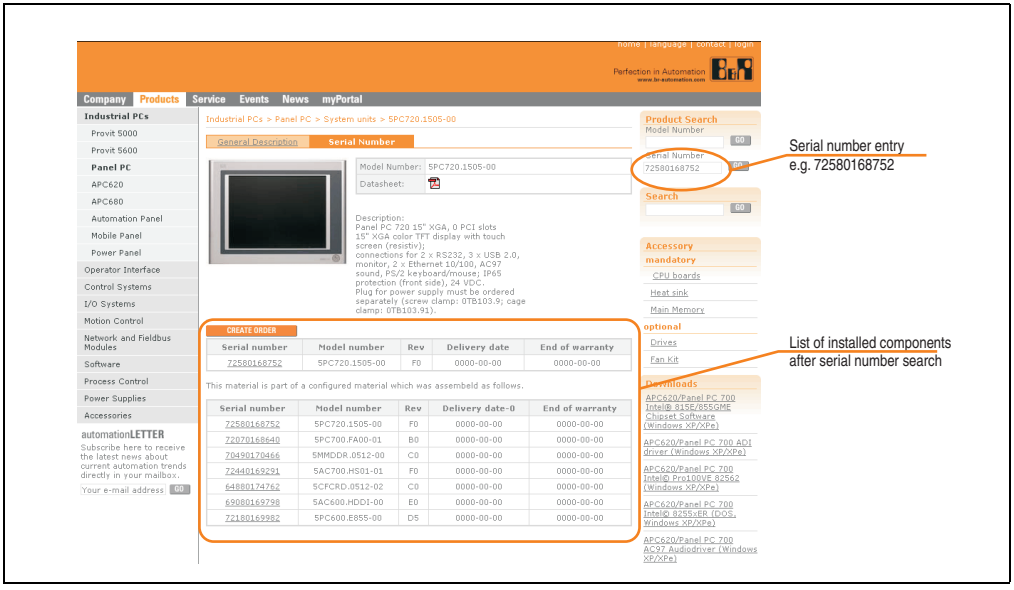


Figure 36: Example of serial number search: 72580168752

3. Individual components

3.1 System units

All components (CPU board, fan, main memory, drives) are connected together to form the system unit.

3.1.1 Panel PC 5PC720.1043-00

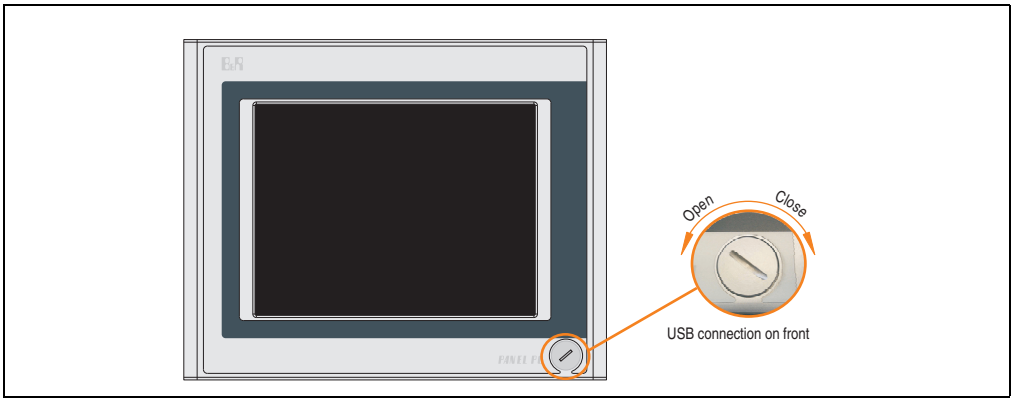


Figure 37: Front view 5PC720.1043-00

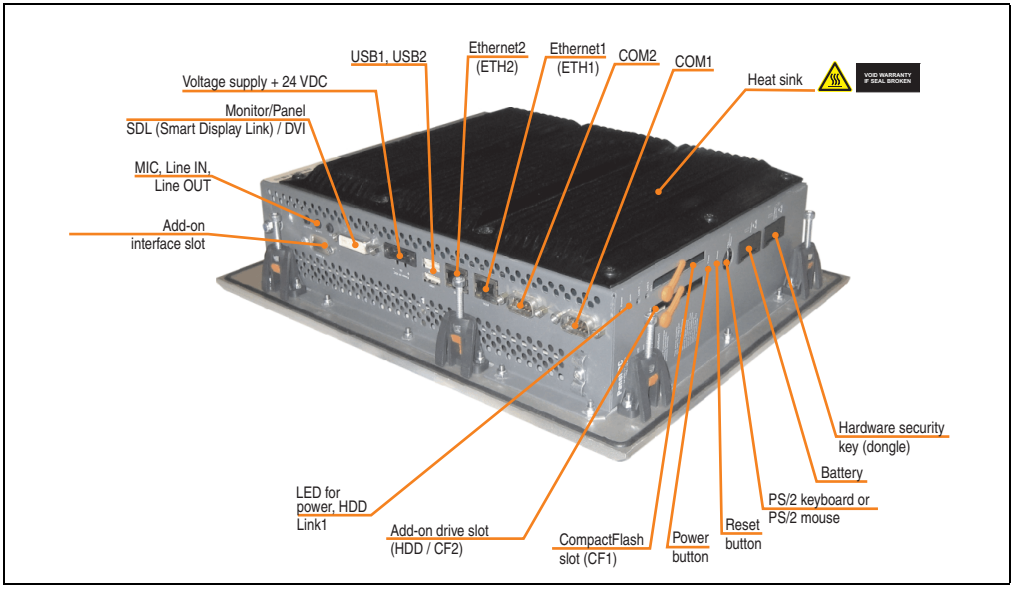


Figure 38: Rear view 5PC720.1043-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

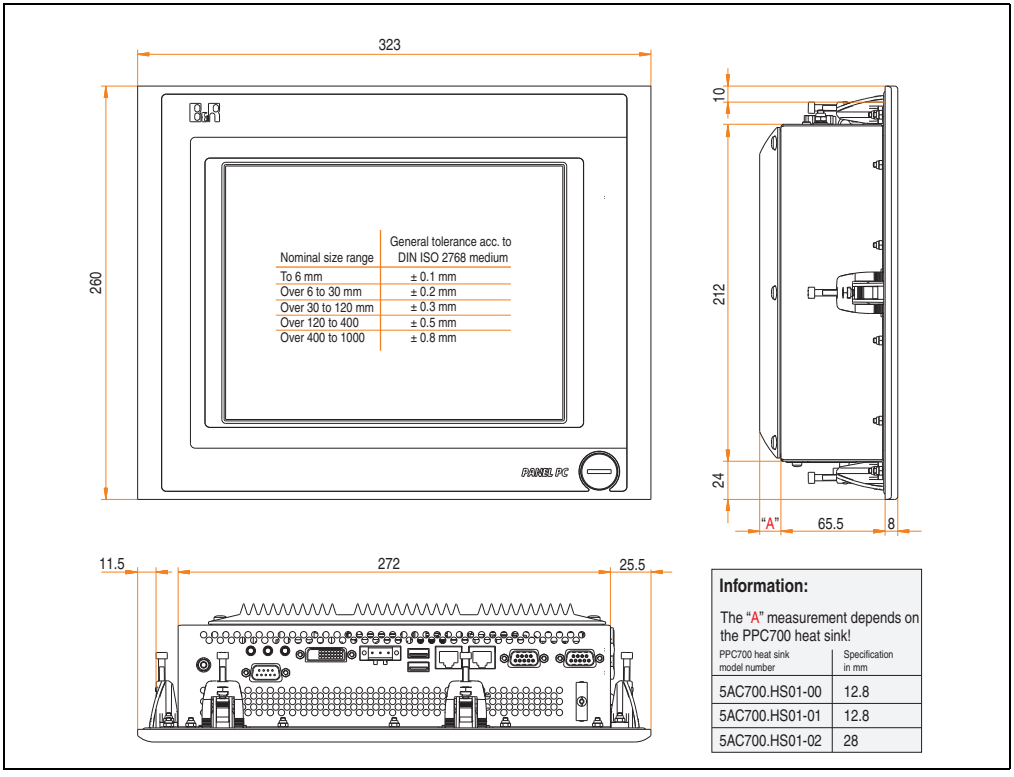


Figure 39: Dimensions - 5PC720.1043-00

Technical data

Features	5PC720.1043-00
B&R ID code	$1C5C
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot", on page 104 Secondary slave
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas

Table 54: Technical data - 5PC720.1043-00

Features	5PC720.1043-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.2 "Fan kit 5PC700.FA02-00", on page 280
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 10.4 inch (264 mm) 262,144 colors VGA, 640 x 480 pixels 300:1 Direction R / direction L = 70° Direction U / direction D = 70° 350 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 10.4" Panel PC 700", on page 71 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1043-00", on page 108 323 mm 260 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 3.6 kg

Table 54: Technical data - 5PC720.1043-00 (Forts.)

Environmental characteristics	5PC720.1043-00
Ambient temperature Operation Bearings Transport	 See 2.1.1 "Ambient temperatures with system unit 5PC720.1043-00", on page 52 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 54: Technical data - 5PC720.1043-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

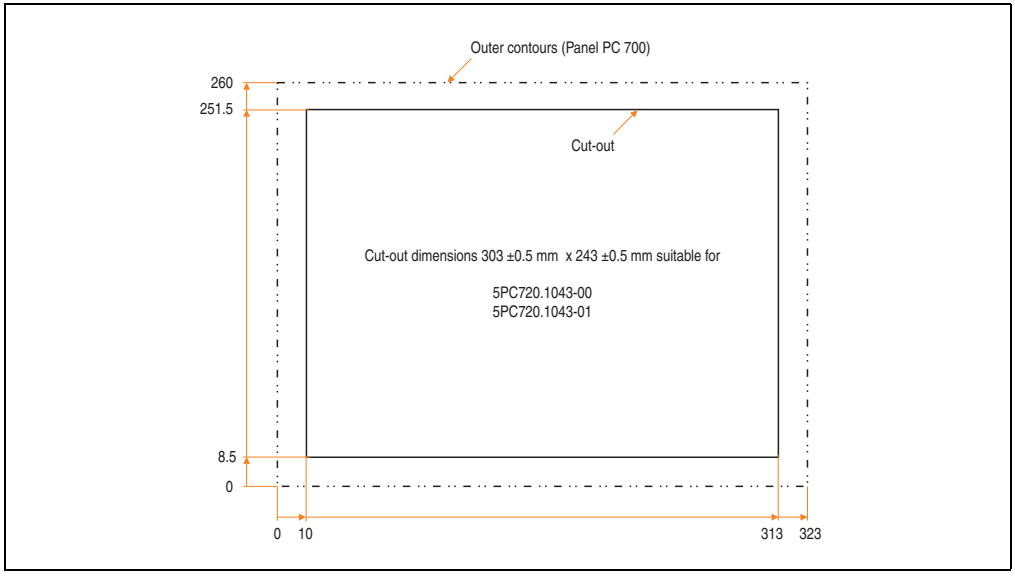


Figure 40: Cutout installation - 5PC720.1043-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.2 Panel PC 5PC720.1043-01

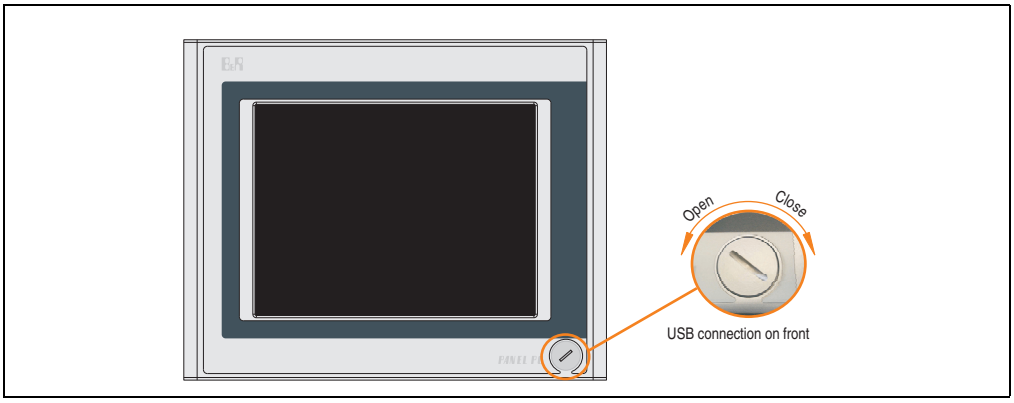


Figure 41: Front view 5PC720.1043-01

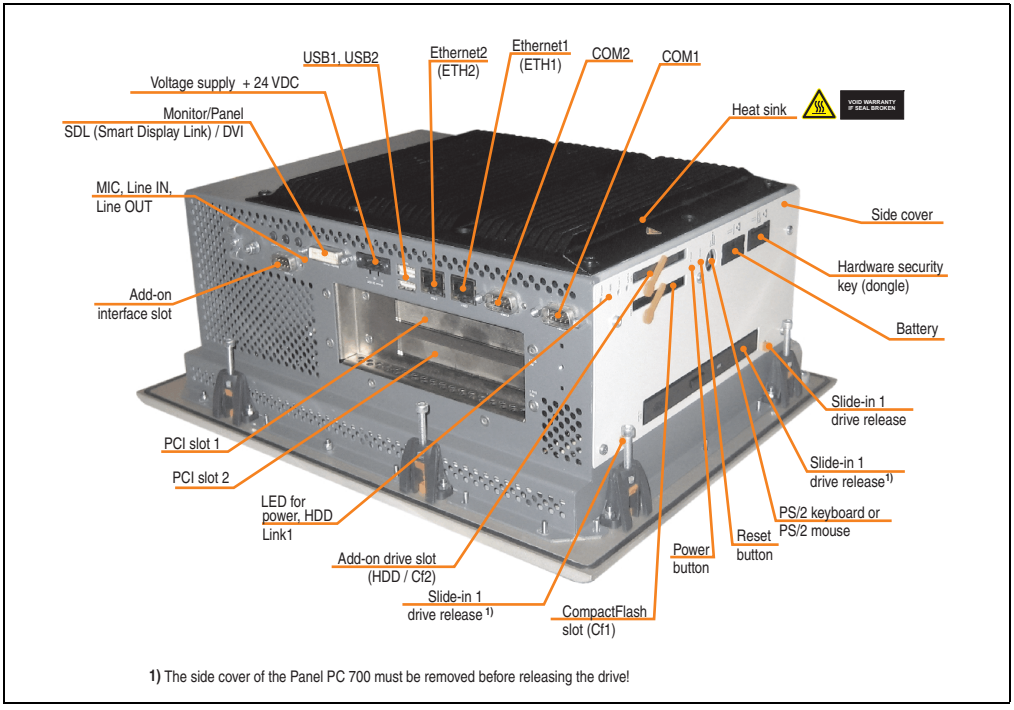


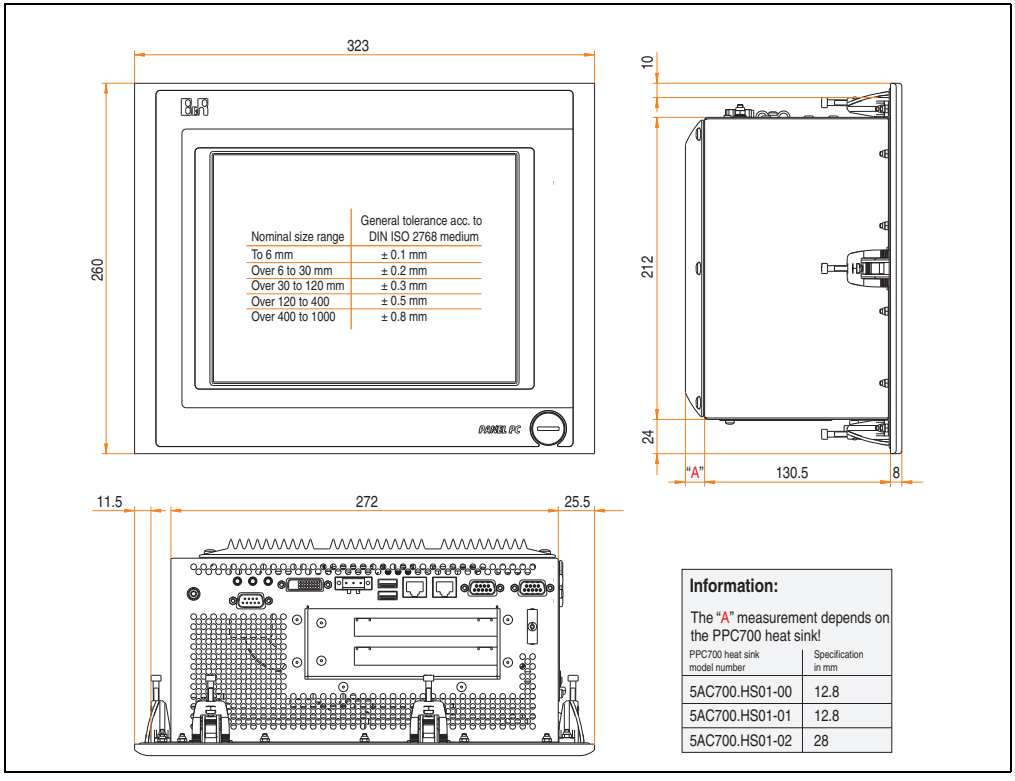
Figure 42: Rear view 5PC720.1043-01

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions



Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Information:

The "A" measurement depends on the PPC700 heat sink!

PPC700 heat sink model number	Specification in mm
5AC700.HS01-00	12.8
5AC700.HS01-01	12.8
5AC700.HS01-02	28

Figure 43: Dimensions - 5PC720.1043-01

Technical data

Features	5PC720.1043-01
B&R ID code	$1C5D
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	See also "PCI slots", on page 95 2 Half-size According to PCI half-size standard 2.2
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot", on page 104 Secondary slave
SRAM internal slot options	Yes (available starting with revision I0)
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas

Table 55: Technical data - 5PC720.1043-01

Features	5PC720.1043-01
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.2 "Fan kit 5PC700.FA02-00", on page 280
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 10.4 inch (264 mm) 262,144 colors VGA, 640 x 480 pixels 300:1 Direction R / direction L =70° Direction U / direction D = 70° 350 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 10.4" Panel PC 700", on page 71 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1043-01", on page 114 323 mm 260 mm 151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 4.5 kg

Table 55: Technical data - 5PC720.1043-01 (Forts.)

Environmental characteristics	5PC720.1043-01
Ambient temperature Operation Bearings Transport	 See 2.1.2 "Ambient temperatures with system unit 5PC720.1043-01", on page 53 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 55: Technical data - 5PC720.1043-01 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

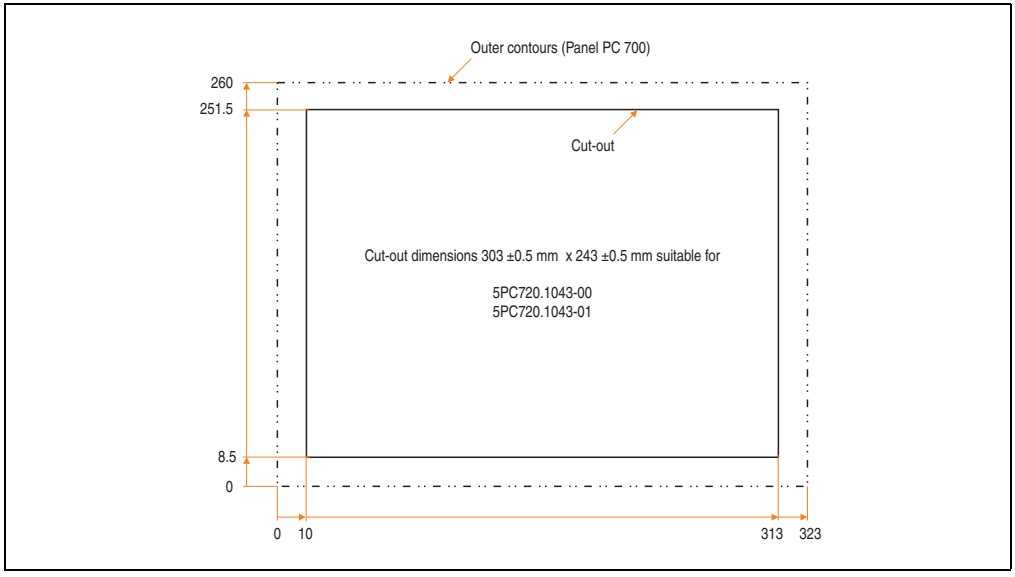


Figure 44: Cutout installation - 5PC720.1043-01

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.3 Panel PC 5PC720.1214-00

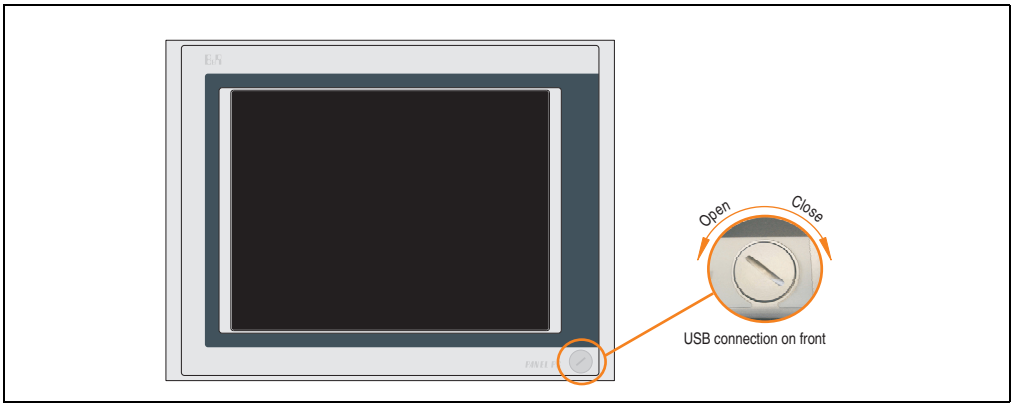


Figure 45: Front view 5PC720.1214-00

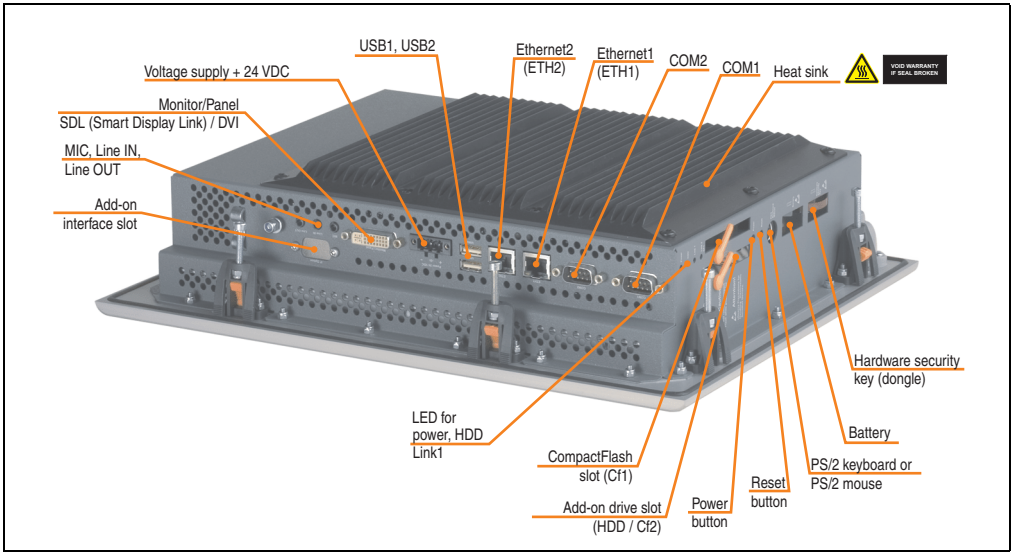


Figure 46: Rear view 5PC720.1214-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

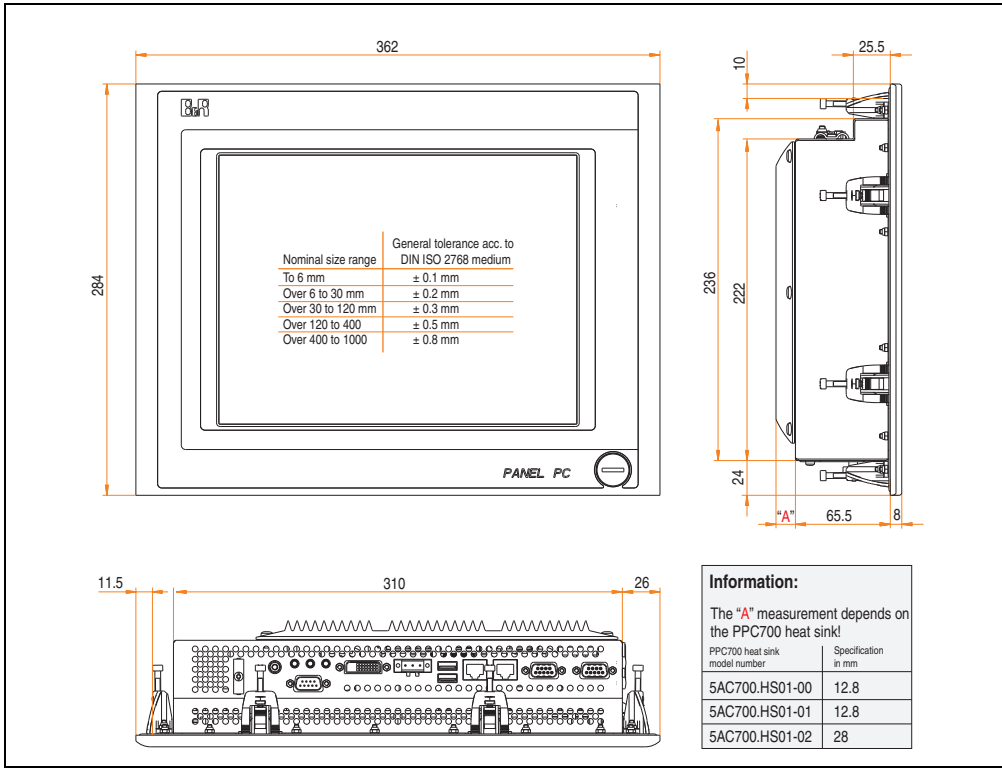


Figure 47: Dimensions - 5PC720.1214-00

Technical data

Features	5PC720.1214-00
B&R ID code	$1C5E
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 56: Technical data - 5PC720.1214-00

Features	5PC720.1214-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 12.1 inch (307 mm) 262,144 colors SVGA, 800 x 600 pixels 300:1 Direction R / direction L = 70° Direction U / direction D = 70° 350 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 12.1" Panel PC 700", on page 72 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1214-00", on page 120 362 mm 284 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 4.2 kg

Table 56: Technical data - 5PC720.1214-00 (Forts.)

Environmental characteristics	5PC720.1214-00
Ambient temperature Operation Bearings Transport	 See 2.1.3 "Ambient temperatures with system unit 5PC720.1214-00", on page 55 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 56: Technical data - 5PC720.1214-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

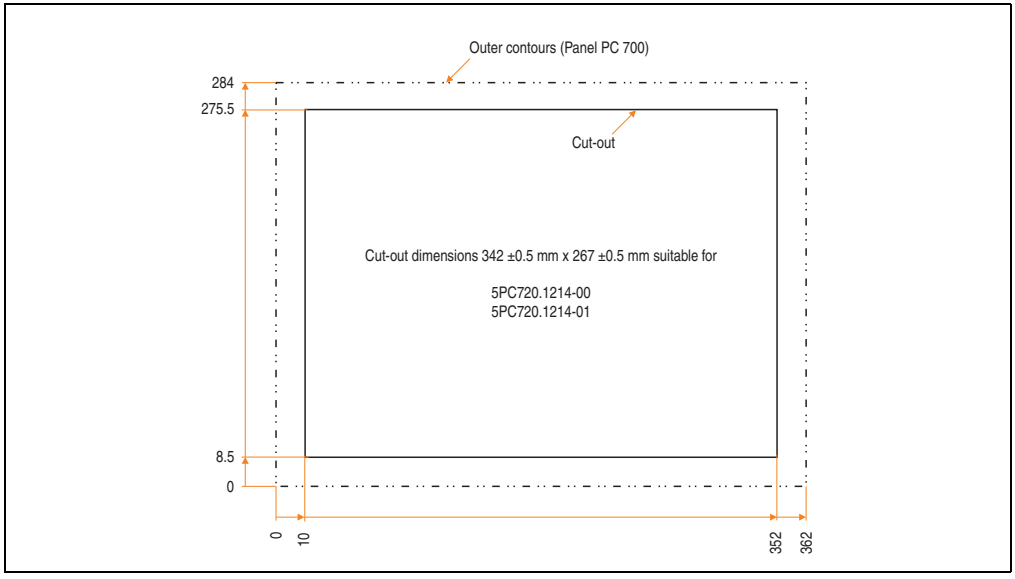


Figure 48: Cutout installation - 5PC720.1214-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.4 Panel PC 5PC720.1214-01

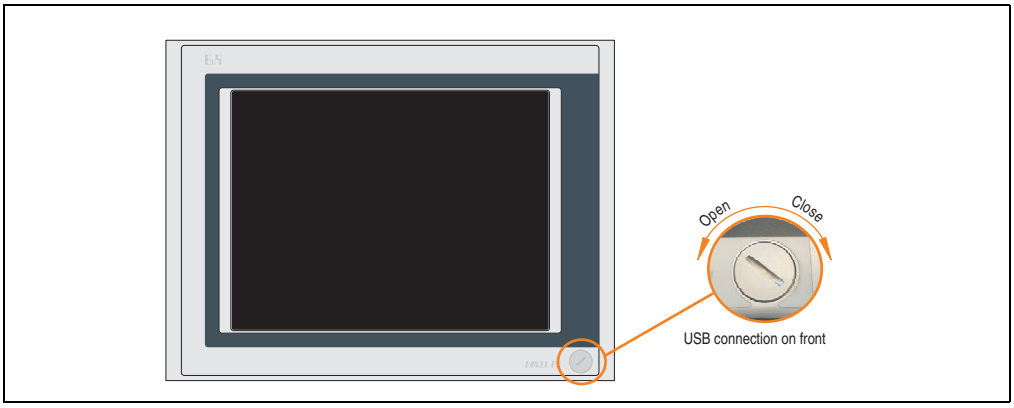


Figure 49: Front view 5PC720.1214-01

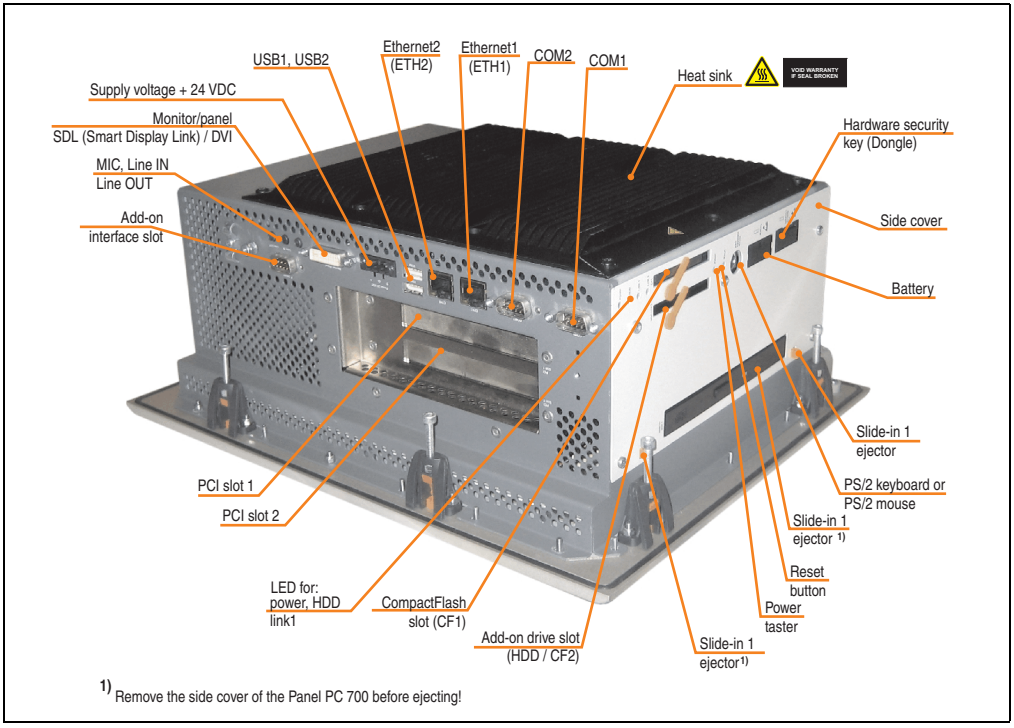


Figure 50: Rear view - 5PC720.1214-01

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

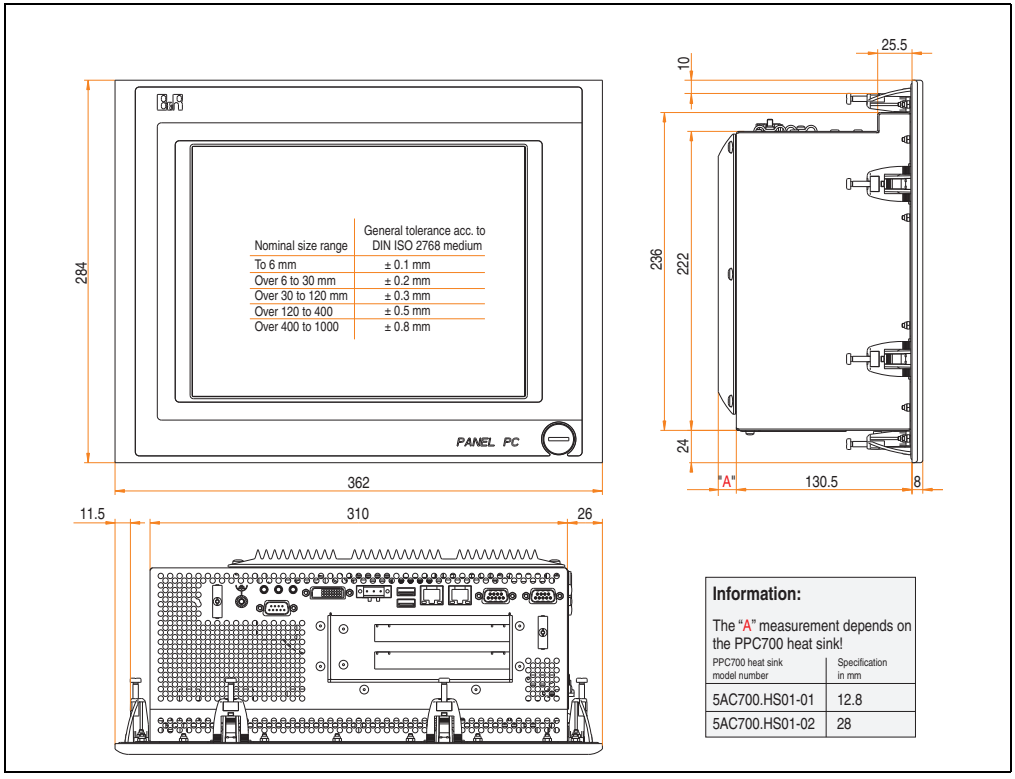


Figure 51: Dimensions - 5PC720.1214-01

Technical data

Features	5PC720.1214-01
B&R ID code	$254C
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	See also "PCI slots", on page 95 2 Half-size According to PCI half-size standard 2.2
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	Yes (available starting with revision D0)
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 57: Technical data - 5PC720.1214-01

Features	5PC720.1214-01
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 12.1 inch (307 mm) 262,144 colors SVGA, 800 x 600 pixels 300:1 Direction R / direction L = 70° Direction U / direction D = 70° 350 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 12.1" Panel PC 700", on page 72 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1214-01", on page 126 362 mm 284 mm 151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 5.3 kg

Table 57: Technical data - 5PC720.1214-01 (Forts.)

Environmental characteristics	5PC720.1214-01
Ambient temperature Operation Bearings Transport	 See 2.1.4 "Ambient temperatures with system unit 5PC720.1214-01", on page 56 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 57: Technical data - 5PC720.1214-01 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

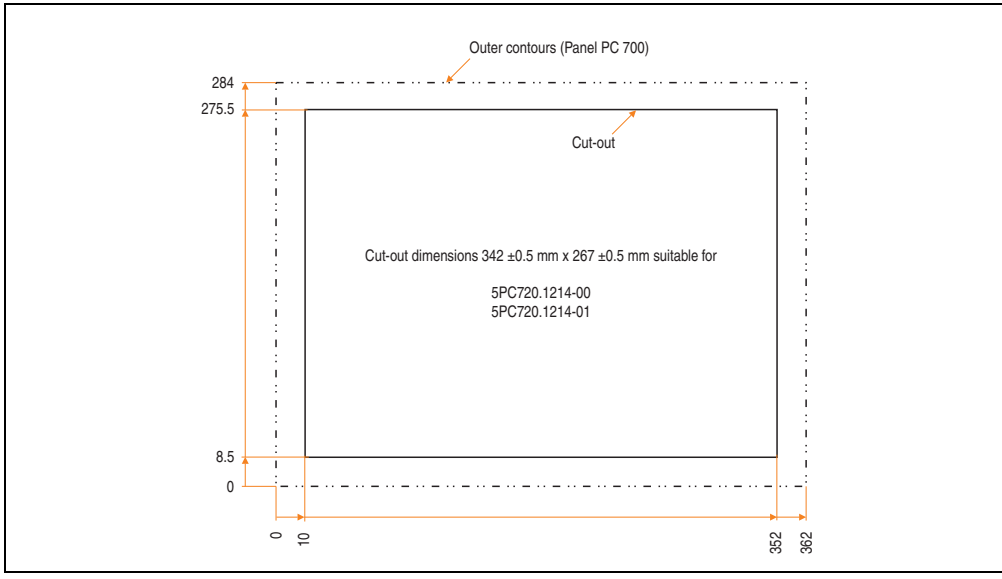


Figure 52: Cutout installation - 5PC720.1214-01

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.5 Panel PC 5PC720.1505-00

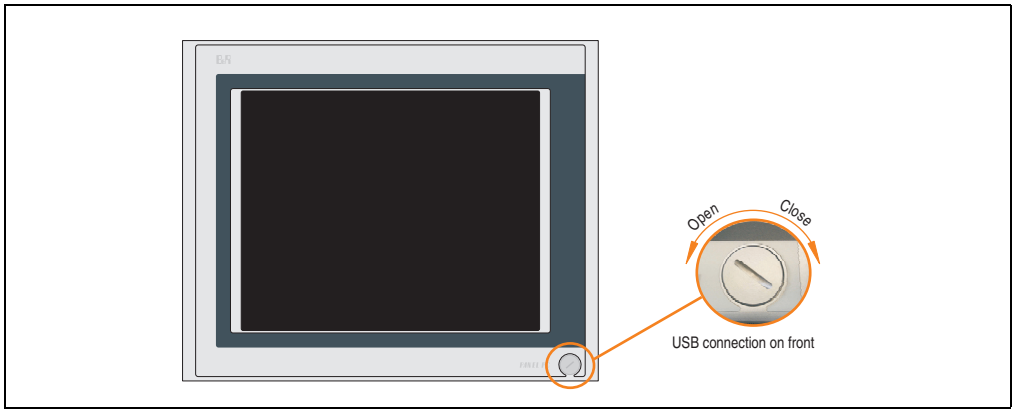


Figure 53: Front view 5PC720.1505-00

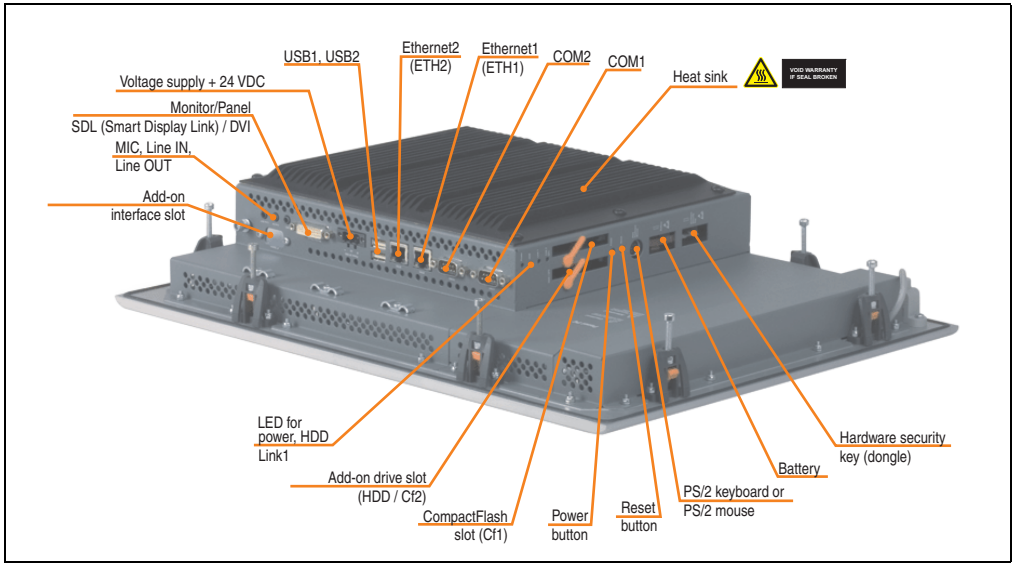


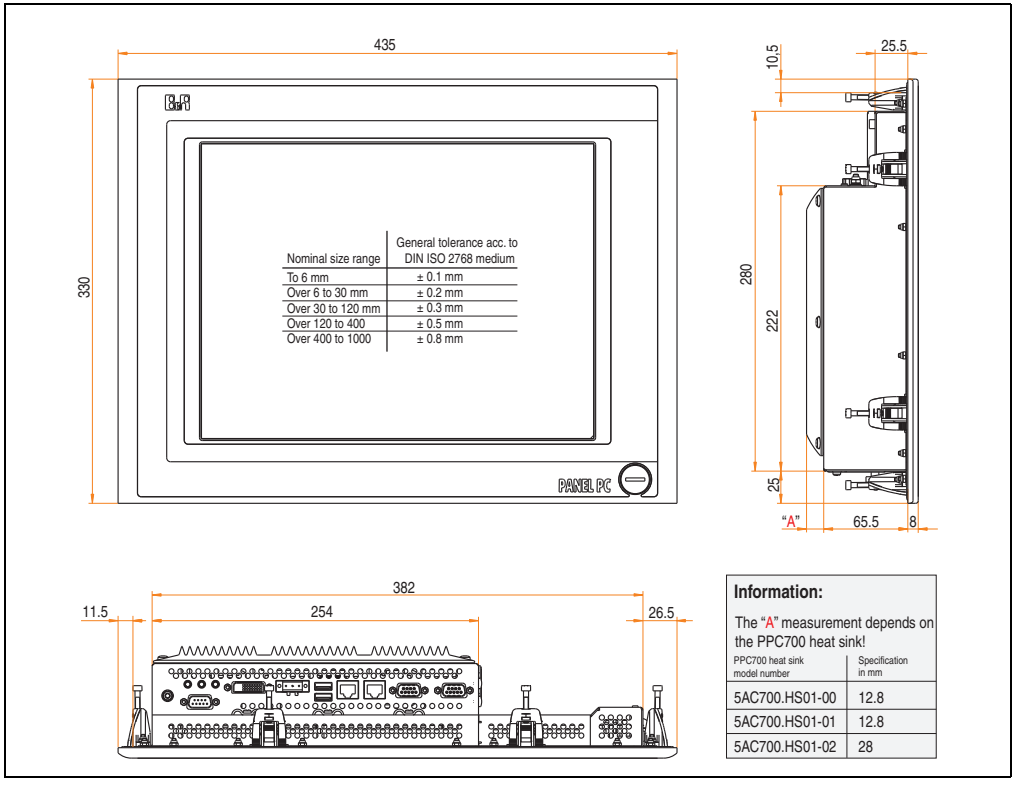
Figure 54: Rear view 5PC720.1505-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions



Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Information:

The "A" measurement depends on the PPC700 heat sink!

PPC700 heat sink model number	Specification in mm
5AC700.HS01-00	12.8
5AC700.HS01-01	12.8
5AC700.HS01-02	28

Figure 55: Dimensions - 5PC720.1505-00

Technical data

Features	5PC720.1505-00
B&R ID code	$1C5A
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 58: Technical data - 5PC720.1505-00

Features	5PC720.1505-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 15 inch (381 mm) 16 million XGA, 1024 x 768 pixels 400:1 Direction R / direction L = 85° Direction U / direction D = 85° 250 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 15" Panel PC 700", on page 73 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1505-00", on page 132 435 mm 330 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 6 kg

Table 58: Technical data - 5PC720.1505-00 (Forts.)

Environmental characteristics	5PC720.1505-00
Ambient temperature Operation Bearings Transport	 See 2.1.5 "Ambient temperatures with system unit 5PC720.1505-00", on page 57 -20 to 60°C -20 to 60°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 58: Technical data - 5PC720.1505-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

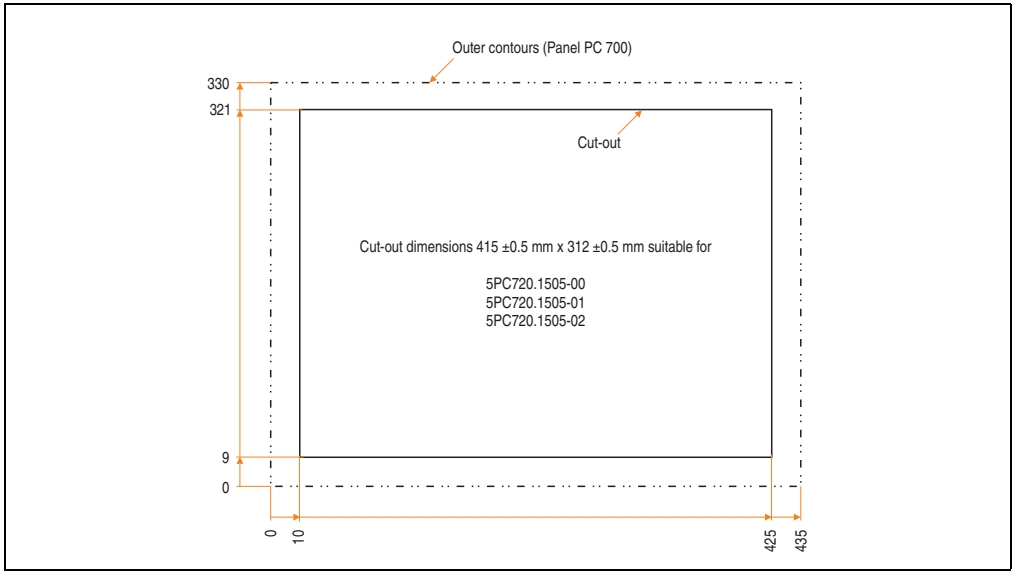


Figure 56: Cutout installation - 5PC720.1505-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.6 Panel PC 5PC720.1505-01

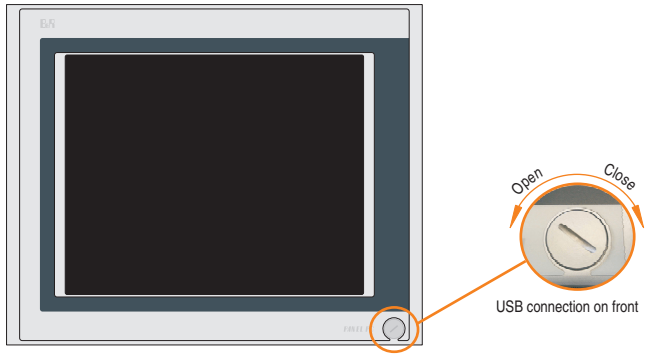


Figure 57: Front view 5PC720.1505-01

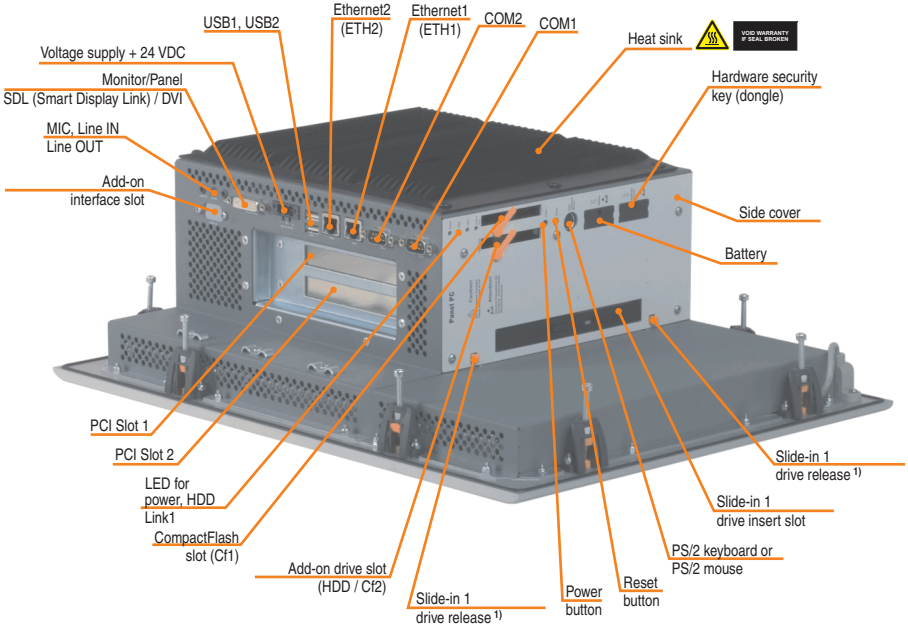


Figure 58: Rear view 5PC720.1505-01

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

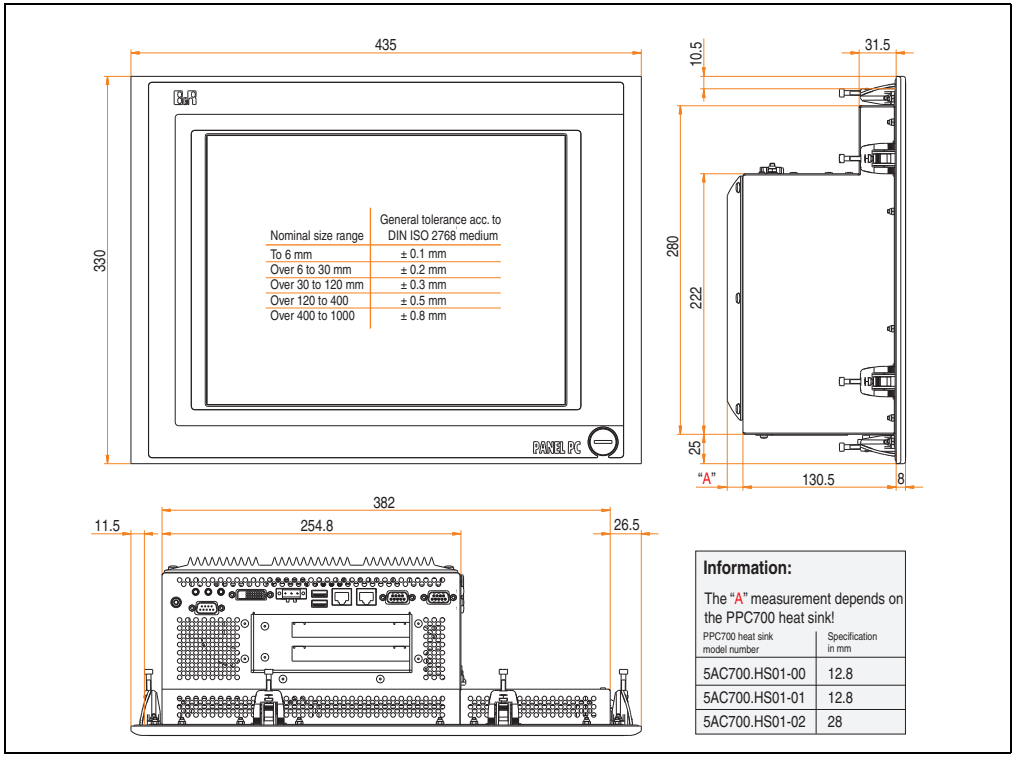


Figure 59: Dimensions - 5PC720.1505-01

Technical data

Features	5PC720.1505-01
B&R ID code	$1C5B
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	See also "PCI slots", on page 95 2 Half-size According to PCI half-size standard 2.2
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot", on page 104 Secondary slave
SRAM internal slot options	Yes (available starting with revision L0)
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years[2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas

Table 59: Technical data - 5PC720.1505-01

Features	5PC720.1505-01
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.3 "Fan kit 5PC700.FA02-01", on page 282
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 15 inch (381 mm) 16 million XGA, 1024 x 768 pixels 400:1 Direction R / direction L = 85° Direction U / direction D = 85° 250 cd/m² 50,000 hours
Keys/LED Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 15" Panel PC 700", on page 73 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone 432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1505-01", on page 138 435 mm 330 mm 151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 6.7 kg

Table 59: Technical data - 5PC720.1505-01 (Forts.)

Environmental characteristics	5PC720.1505-01
Ambient temperature Operation Bearings Transport	 See 2.1.6 "Ambient temperatures with system unit 5PC720.1505-01", on page 58 -20 to 60°C -20 to 60°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 59: Technical data - 5PC720.1505-01 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

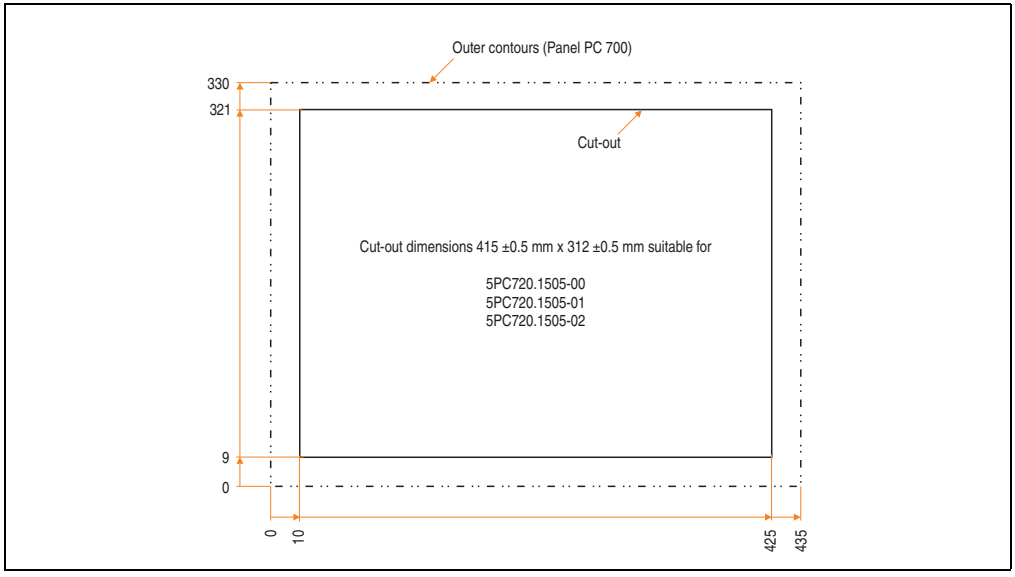


Figure 60: Cutout installation - 5PC720.1505-01

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.7 Panel PC 5PC720.1505-02

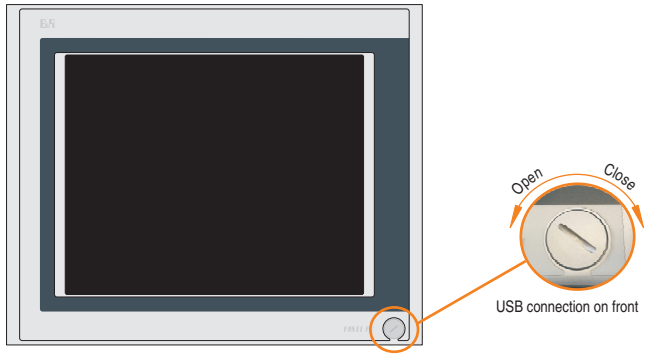


Figure 61: Front view 5PC720.1505-02

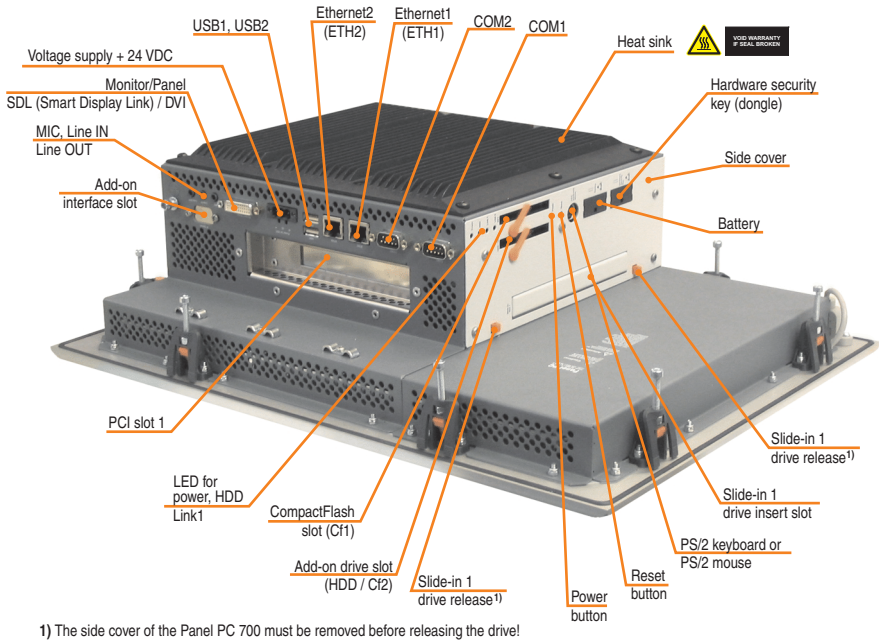


Figure 62: Rear view 5PC720.1505-02

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

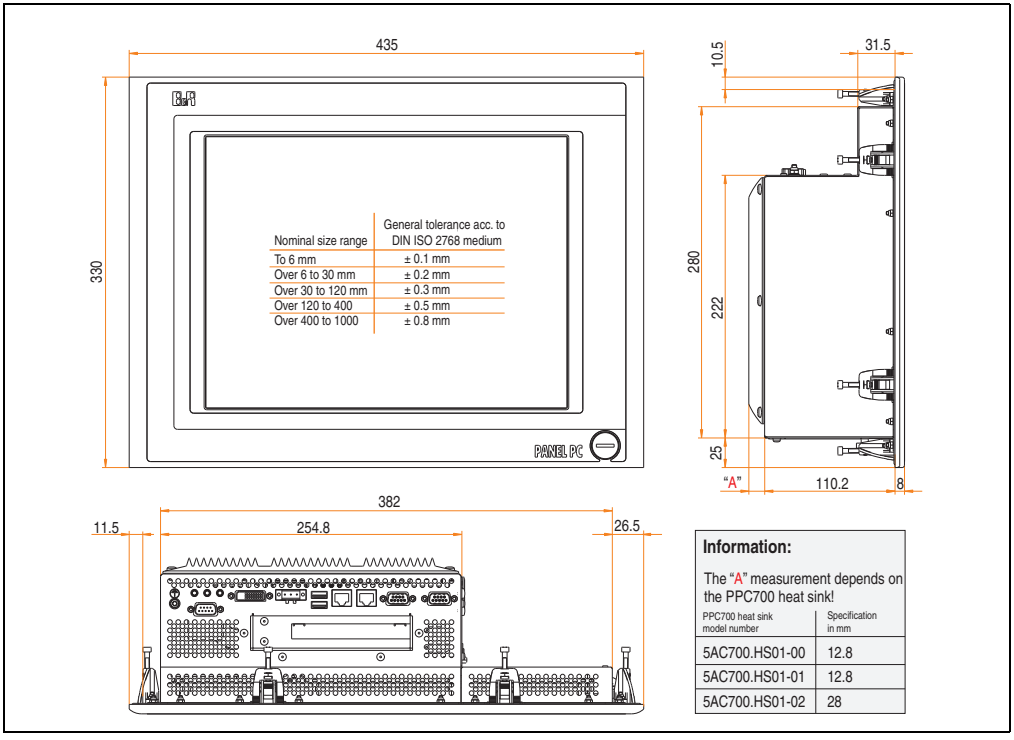


Figure 63: Dimensions - 5PC720.1505-02

Technical data

Features	5PC720.1505-02
B&R ID code	$1DA9
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	See also "PCI slots", on page 95 1 Half-size According to PCI half-size standard 2.2
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot", on page 104 Secondary slave
SRAM internal slot options	Yes (available starting with revision K0)
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years[2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 60: Technical data - 5PC720.1505-02

Features	5PC720.1505-02
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.3 "Fan kit 5PC700.FA02-01", on page 282
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 15 inch (381 mm) 16 million XGA, 1024 x 768 pixels 400:1 Direction R / direction L = 85° Direction U / direction D = 85° 250 cd/m² 50,000 hours
Keys/LED Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 15" Panel PC 700", on page 73 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone 432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1505-02", on page 144 435 mm 330 mm 131 or 146.2 mm (depending on the heat sink)
Weight	Approx. 6.5 kg

Table 60: Technical data - 5PC720.1505-02 (Forts.)

Environmental characteristics	5PC720.1505-02
Ambient temperature Operation Bearings Transport	 See 2.1.7 "Ambient temperatures with system unit 5PC720.1505-02", on page 60 -20 to 60°C -20 to 60°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 60: Technical data - 5PC720.1505-02 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

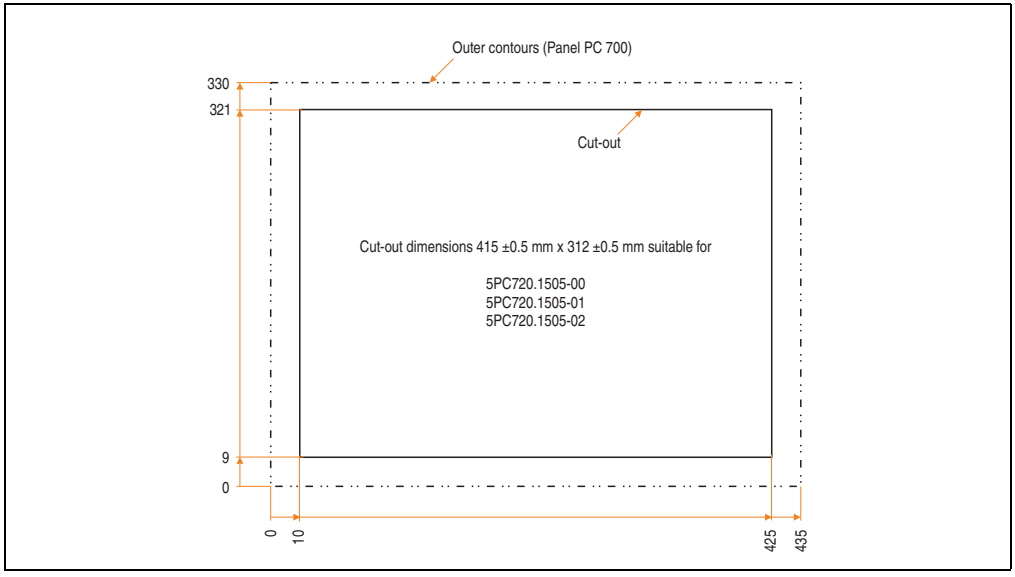


Figure 64: Cutout installation - 5PC720.1505-02

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.8 Panel PC 5PC720.1706-00

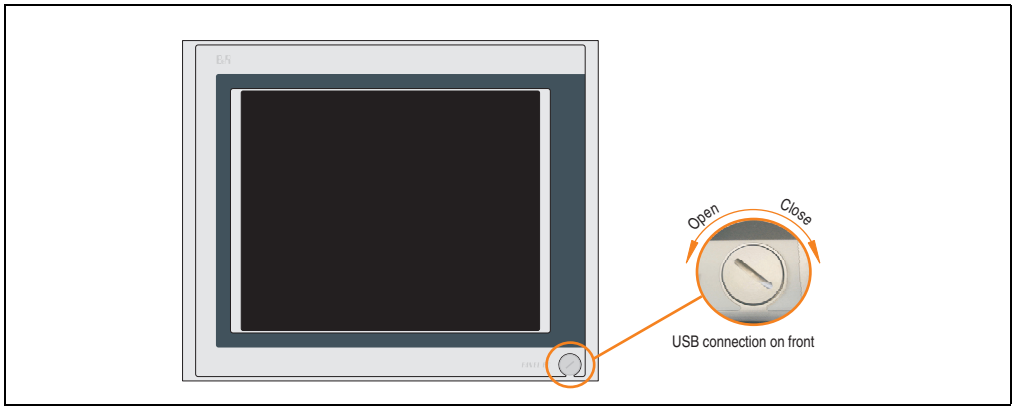


Figure 65: Front view 5PC720.1706-00

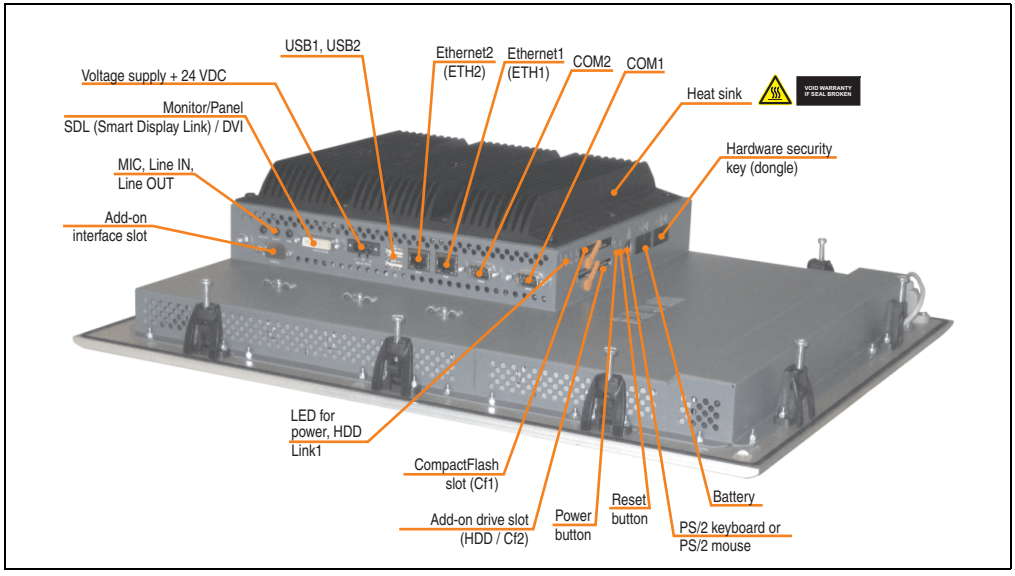


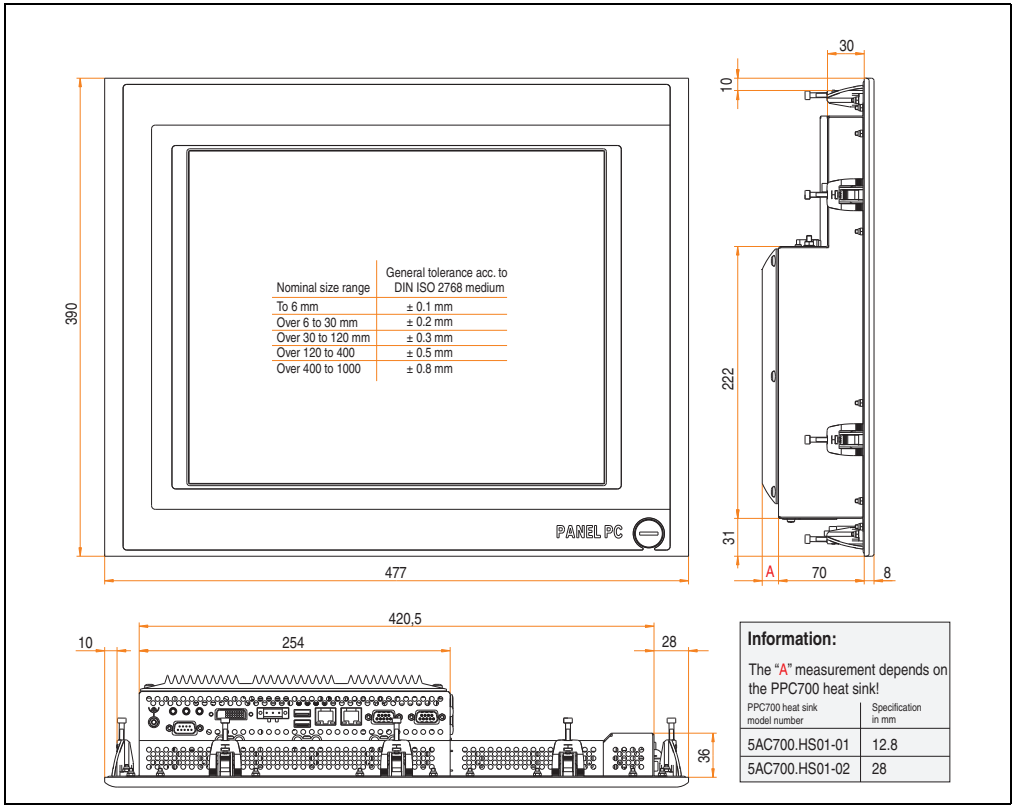
Figure 66: Rear view 5PC720.1706-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions



Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Information:

The "A" measurement depends on the PPC700 heat sink!

PPC700 heat sink model number	Specification in mm
5AC700.HS01-01	12.8
5AC700.HS01-02	28

Figure 67: Dimensions - 5PC720.1706-00

Technical data

Features	5PC720.1706-00
B&R ID code	$1C61
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 61: Technical data - 5PC720.1706-00

Features	5PC720.1706-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 17 inch (431.8 mm) 16 million SXGA, 1280 x 1024 pixels 400:1 Direction R / direction L = 85° Direction U / direction D = 85° 250 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 17" Panel PC 700", on page 74 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1706-00", on page 150 477 mm 390 mm 90.8 or 106 mm (depending on the heat sink)
Weight	Approx. 7.7 kg

Table 61: Technical data - 5PC720.1706-00 (Forts.)

Environmental characteristics	5PC720.1706-00
Ambient temperature Operation Bearings Transport	 See 2.1.8 "Ambient temperatures with system unit 5PC720.1706-00", on page 62 -20 to 60°C -20 to 60°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 61: Technical data - 5PC720.1706-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

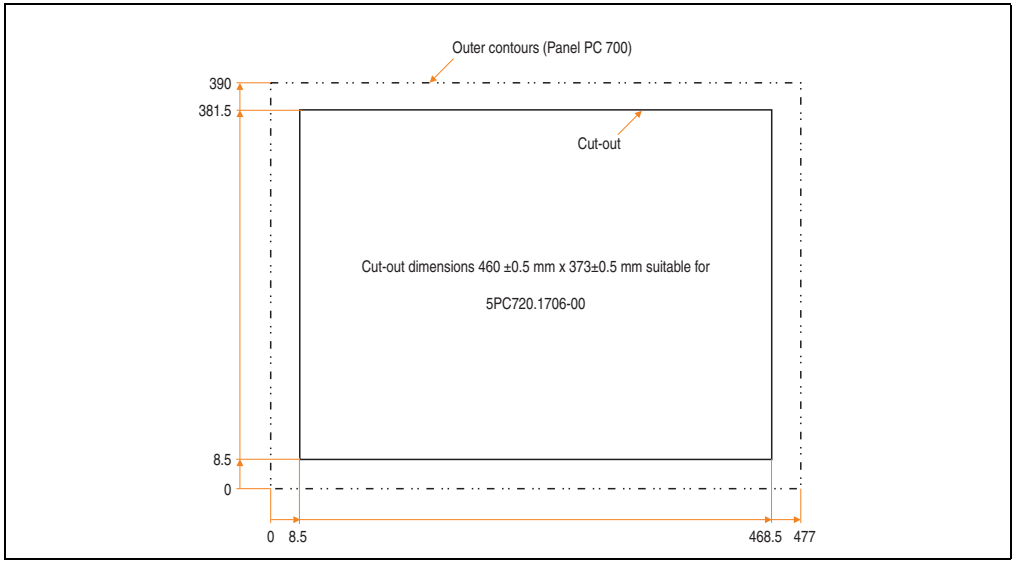


Figure 68: Cutout installation - 5PC720.1706-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.9 Panel PC 5PC720.1906-00

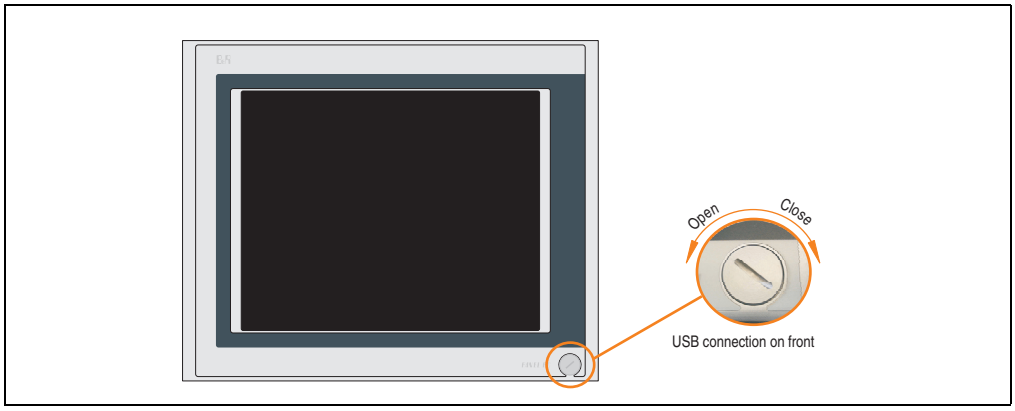


Figure 69: Front view 5PC720.1906-00

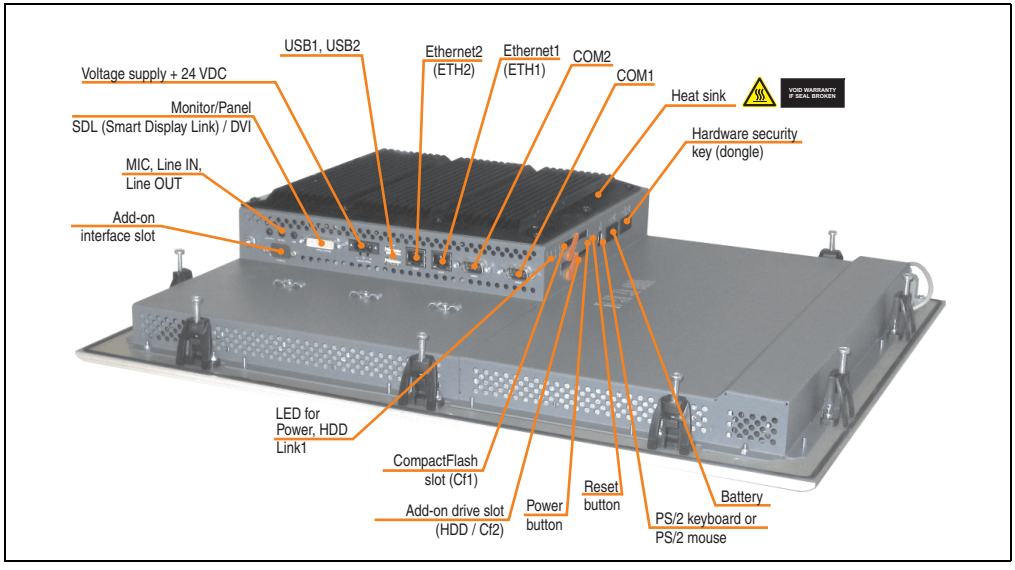


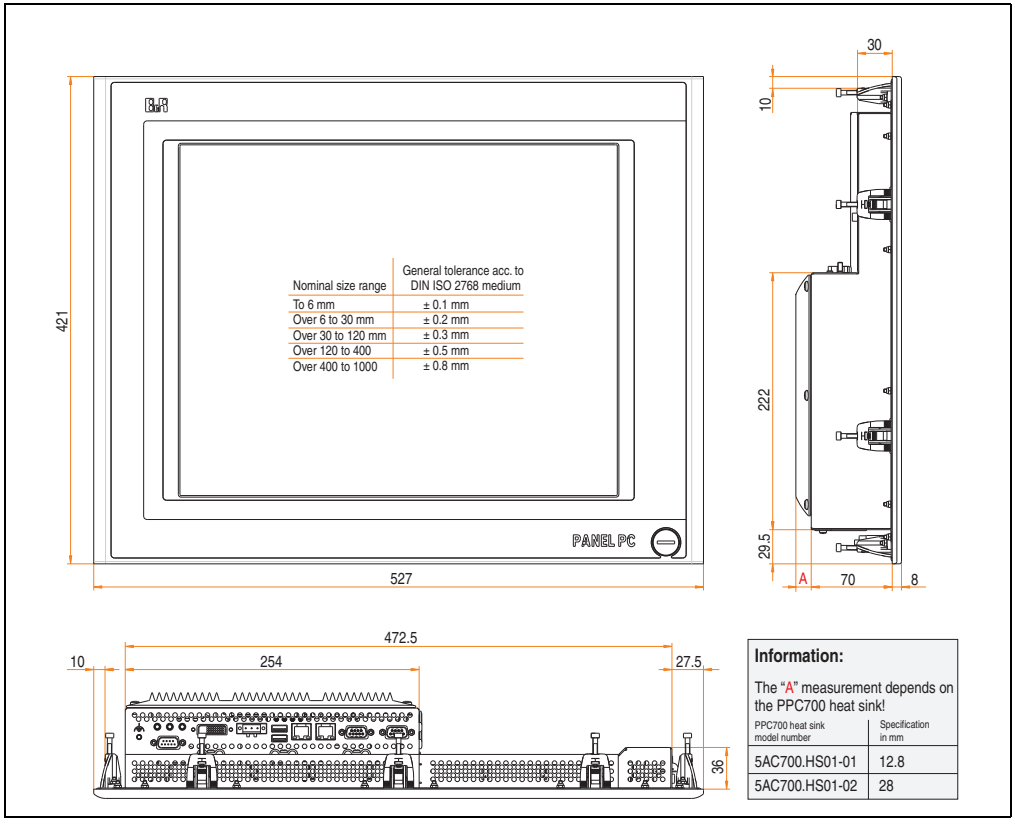
Figure 70: Rear view 5PC720.1906-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions



Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Information:

The "A" measurement depends on the PPC700 heat sink!

PPC700 heat sink model number	Specification in mm
5AC700.HS01-01	12.8
5AC700.HS01-02	28

Figure 71: Dimensions - 5PC720.1906-00

Technical data

Features	5PC720.1906-00
B&R ID code	$24E8
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 62: Technical data - 5PC720.1906-00

Features	5PC720.1906-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 19 inch (482.6 mm) 16 million SXGA, 1280 x 1024 pixels 400:1 Direction R / direction L = 85° Direction U / direction D = 85° 250 cd/m² 50,000 hours
Keys Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	-
Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 19" Panel PC 700", on page 75 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Naturally anodized aluminum[5] Gray[5] Polyester Similar to Pantone432CV[5] Similar to Pantone 427CV[5] Flat gasket around display front
Housing	Metal
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC720.1906-00", on page 156 527 mm 421 mm 90.8 or 106 mm (depending on the heat sink)
Weight	Approx. 9 kg

Table 62: Technical data - 5PC720.1906-00 (Forts.)

Environmental characteristics	5PC720.1906-00
Ambient temperature Operation Bearings Transport	 See 2.1.9 "Ambient temperatures with system unit 5PC720.1906-00", on page 63 -20 to 60°C -20 to 60°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 62: Technical data - 5PC720.1906-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

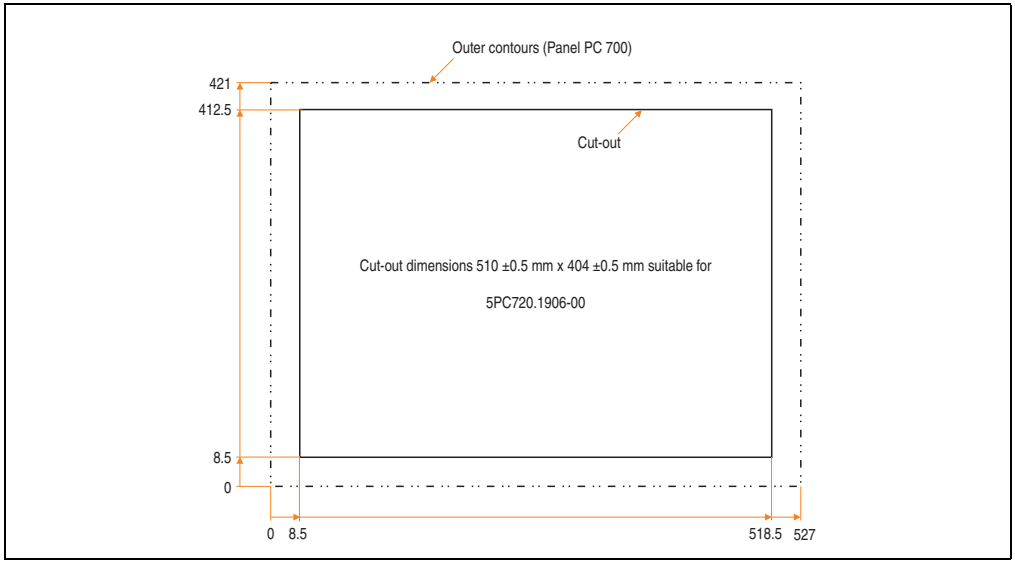


Figure 72: Cutout installation - 5PC720.1906-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.10 Panel PC 5PC781.1043-00

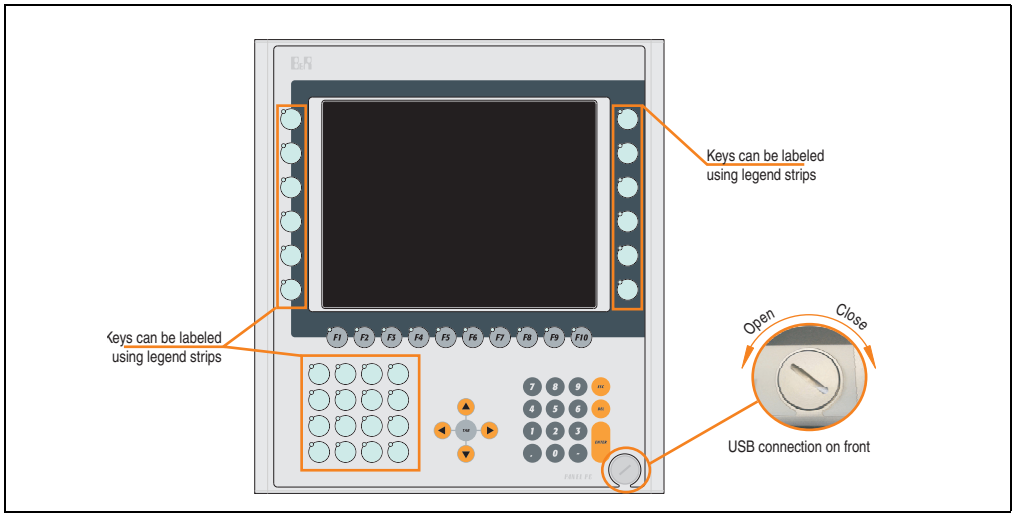


Figure 73: Front view 5PC781.1043-00

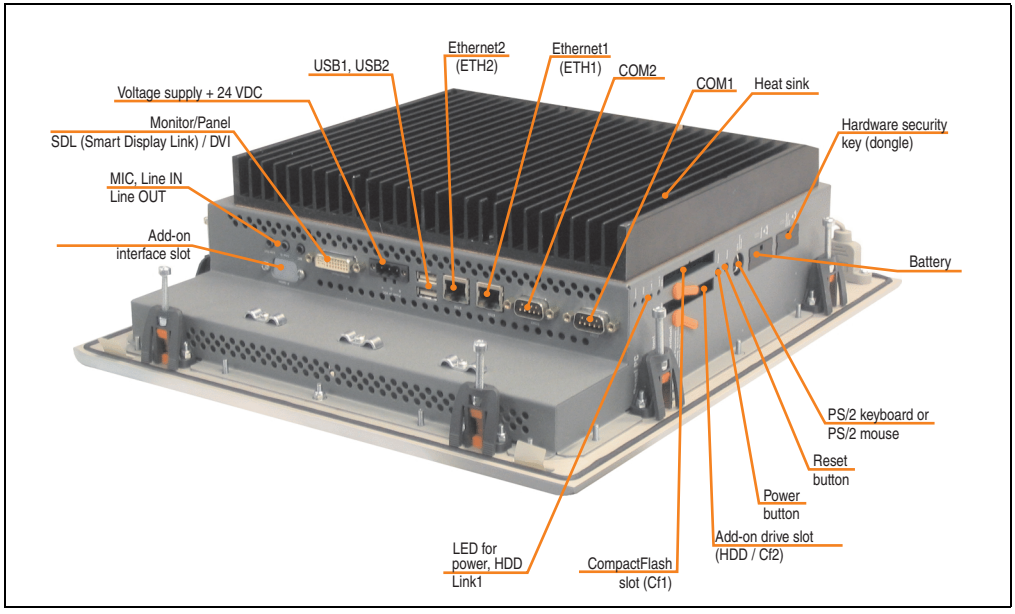


Figure 74: Rear view 5PC781.1043-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

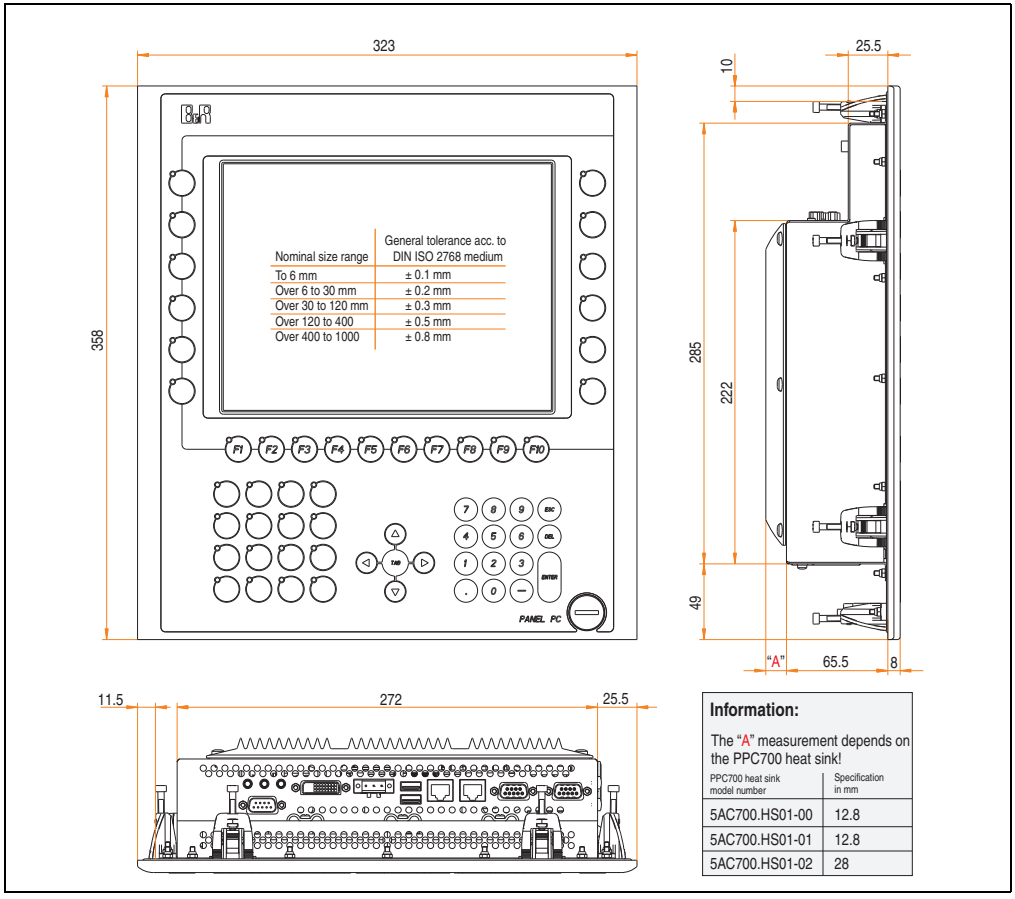


Figure 75: Dimensions - 5PC781.1043-00

Technical data

Features	5PC781.1043-00
B&R ID code	$1C60
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years[2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 63: Technical data - 5PC781.1043-00

Features	5PC781.1043-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 10.4 inch (264 mm) 262,144 colors VGA, 640 x 480 pixels 300:1 Direction R / direction L = 70° Direction U / direction D = 70° 350 cd/m² 50,000 hours
Keys/LED[5] Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	 28 with LED (yellow) 10 with LED (yellow) - 15 without LED 5 without LED > 1,000,000 actuations with 1 ±0.3 to 3 ±0.3 N operating force Typically 12 mcd (yellow)

Caution!

Pressing more than one key at a time may result in so-called phantom keys, and may trigger unintended actions.

Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 10.4" Panel PC 700", on page 71 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Orange keys Dark gray keys Color legend strips Gasket	 Naturally anodized aluminum[6] Gray[6] Polyester Similar to Pantone 432CV[6] Similar to Pantone 427CV[6] Similar to Pantone 151CV[6] Similar to Pantone 431CV[6] Similar to Pantone 429CV[6] Flat gasket around display front
Housing	Metal

Table 63: Technical data - 5PC781.1043-00 (Forts.)

Mechanical characteristics	5PC781.1043-00
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC781.1043-00", on page 162 323 mm 358 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 4.5 kg
Environmental characteristics	
Ambient temperature Operation Bearings Transport	See section 2.1.10 "Ambient temperatures with system unit 5PC781.1043-00", on page 64 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 63: Technical data - 5PC781.1043-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) The key and LED functions can be freely configured with the B&R Key Editor, which can be found in the download area of the B&R homepage (**www.br-automation.com**) or on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

6) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

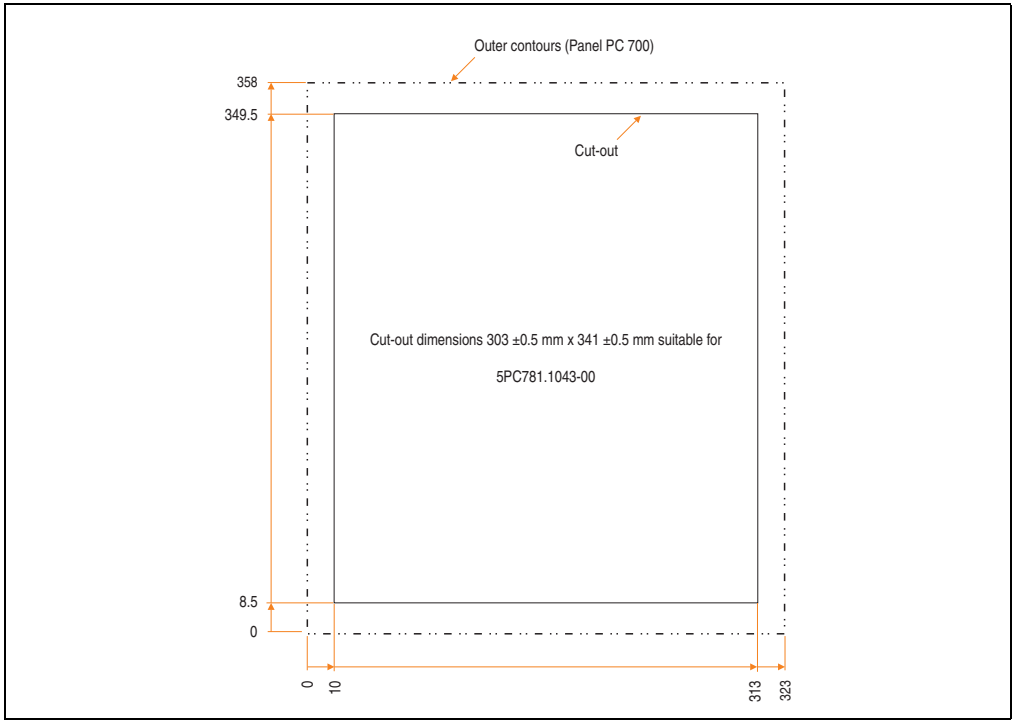


Figure 76: Cutout installation - 5PC781.1043-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.11 Panel PC 5PC781.1505-00

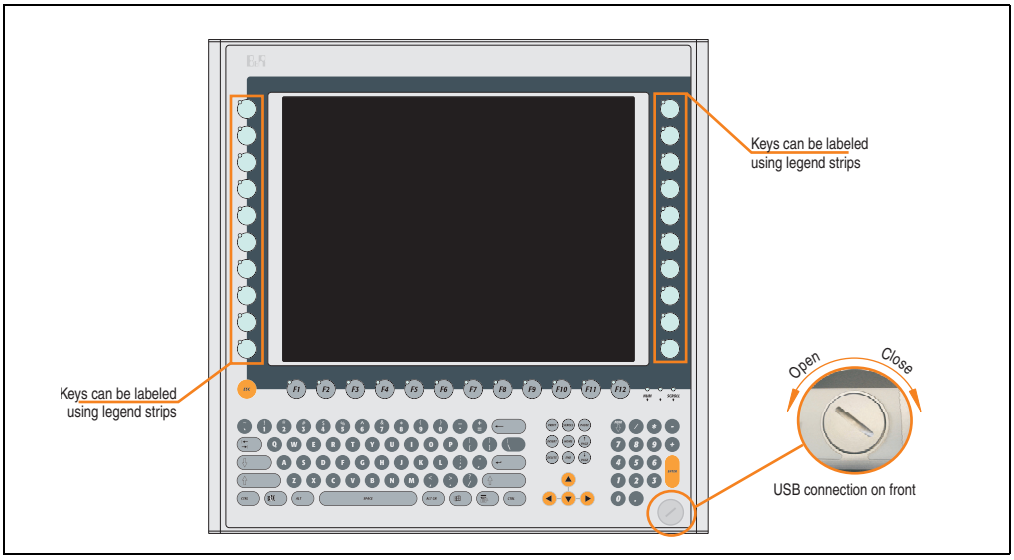


Figure 77: Front view 5PC781.1505-00

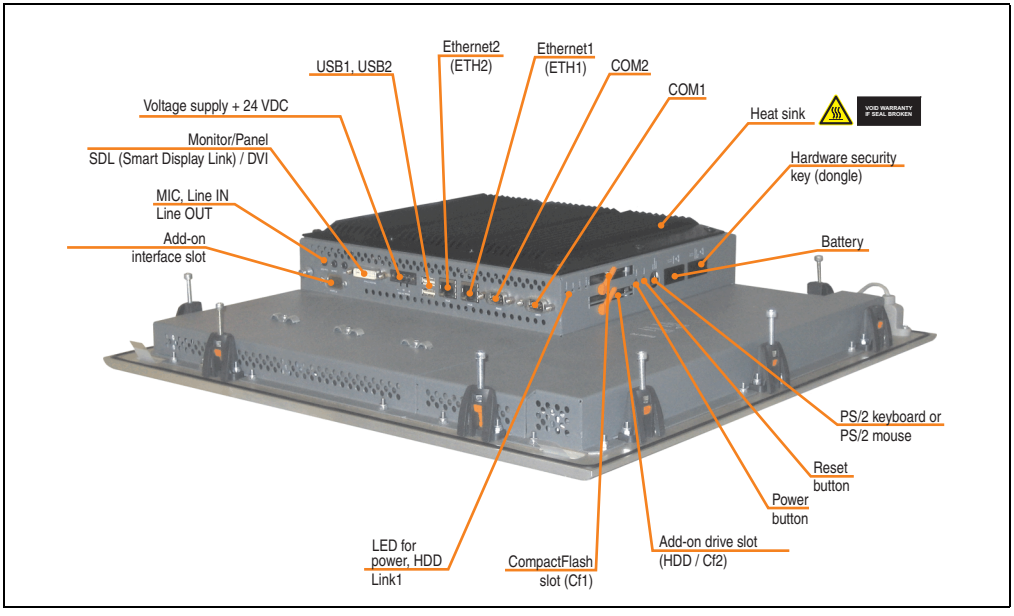


Figure 78: Rear view 5PC781.1505-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions

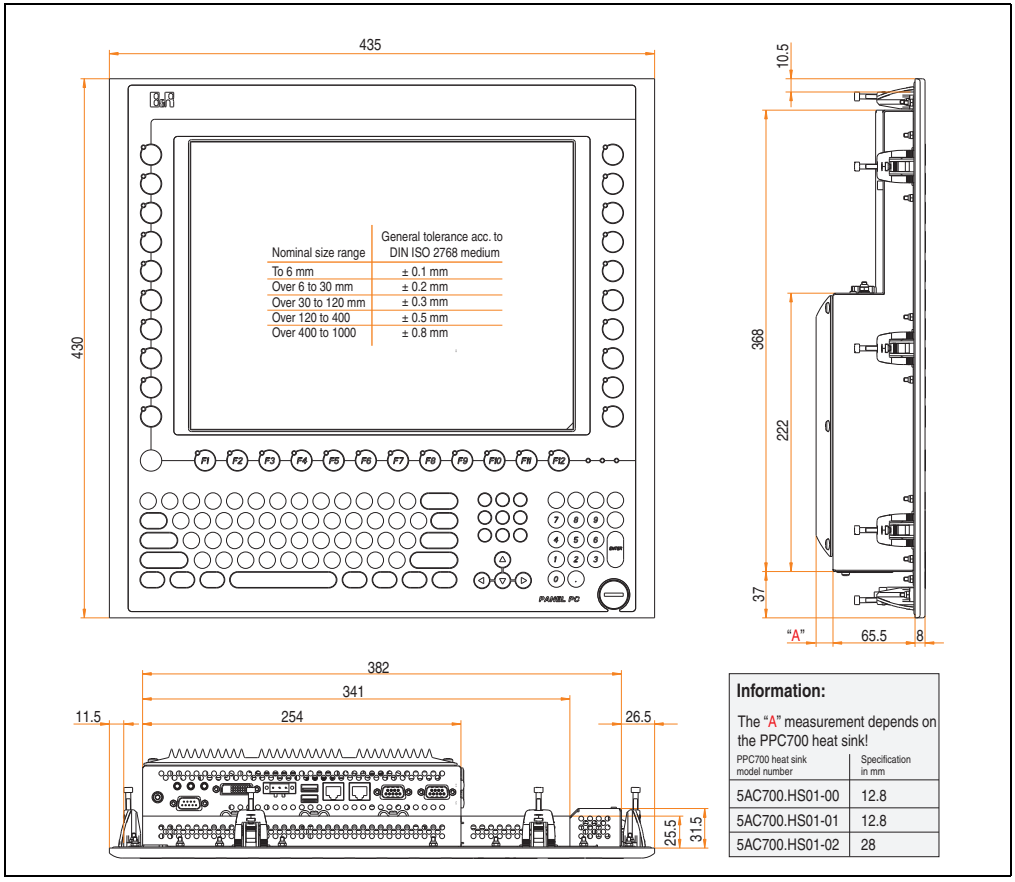


Figure 79: Dimensions - 5PC781.1505-00

Technical data

Features	5PC781.1505-00
B&R ID code	$1C5F
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years[2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 64: Technical data - 5PC781.1505-00

Features	5PC781.1505-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 15 inch (381 mm) 16 million XGA, 1024 x 768 pixels 400:1 Direction R / direction L = 85° Direction U / direction D = 85° 250 cd/m² 50,000 hours
Keys/LED[5] Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	 20 with LED (yellow) 12 with LED (yellow) - 15 without LED 77 without LED > 1,000,000 actuations with 1 ±0.3 to 3 ±0.3 N operating force Typically 12 mcd (yellow)

Caution!

Pressing more than one key at a time may result in so-called phantom keys, and may trigger unintended actions.

Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 15" Panel PC 700", on page 73 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Orange keys Dark gray keys Color legend strips Gasket	 Naturally anodized aluminum[6] Gray[6] Polyester Similar to Pantone 432CV[6] Similar to Pantone 427CV[6] Similar to Pantone 151CV[6] Similar to Pantone 431CV[6] Similar to Pantone 429CV[6] Flat gasket around display front
Housing	Metal

Table 64: Technical data - 5PC781.1505-00 (Forts.)

Mechanical characteristics	5PC781.1505-00
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC781.1505-00", on page 168 435 mm 430 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 7.5 kg
Environmental characteristics	
Ambient temperature Operation Bearings Transport	 See 2.1.11 "Ambient temperatures with system unit 5PC781.1505-00", on page 65 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	 T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	 2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	 15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 64: Technical data - 5PC781.1505-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) The key and LED functions can be freely configured with the B&R Key Editor, which can be found in the download area of the B&R homepage (**www.br-automation.com**) or on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

6) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

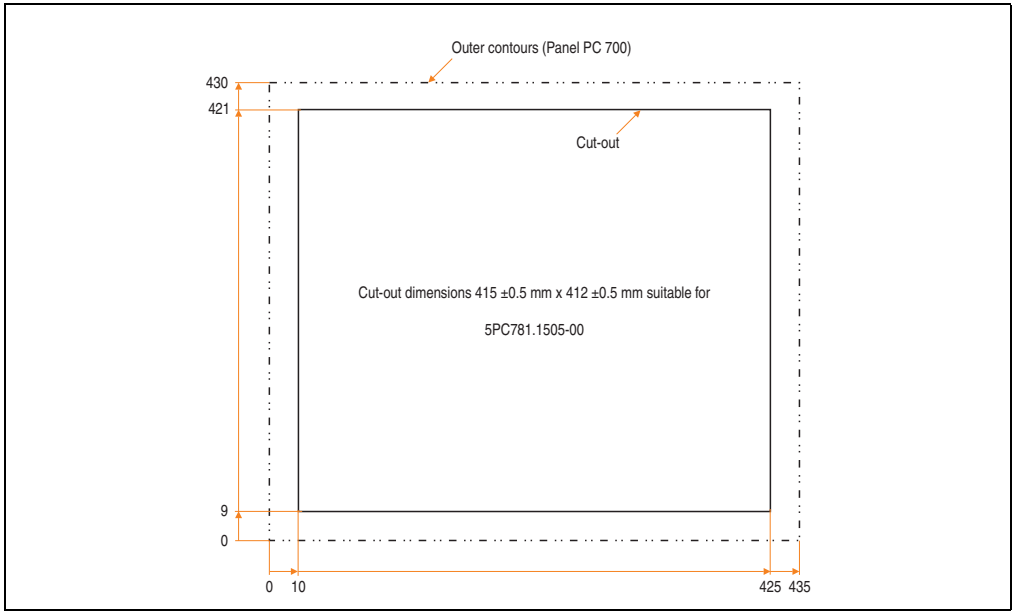


Figure 80: Cutout installation - 5PC781.1505-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.1.12 Panel PC 5PC782.1043-00

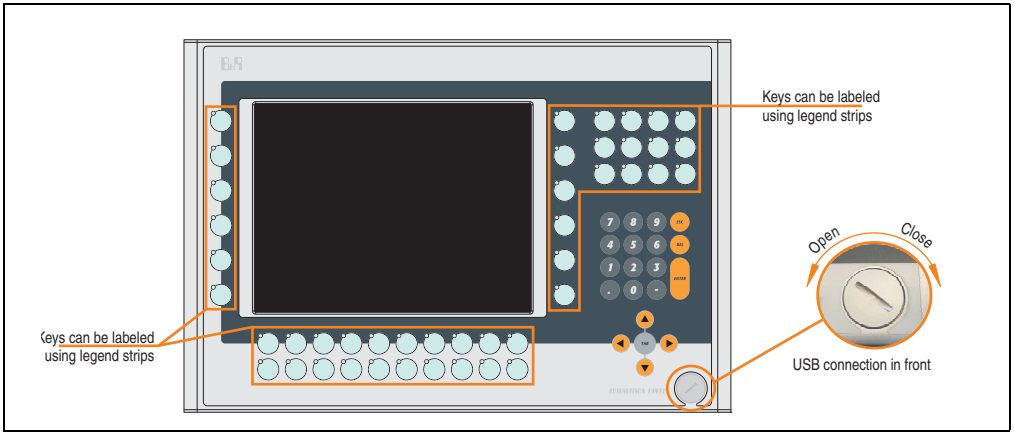


Figure 81: Front view 5PC782.1043-00

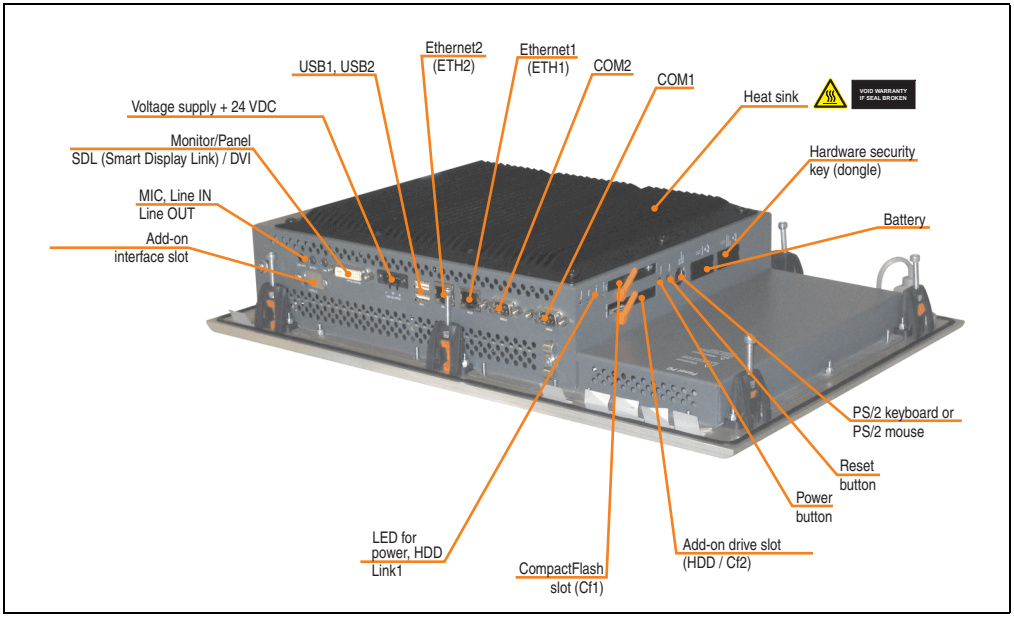


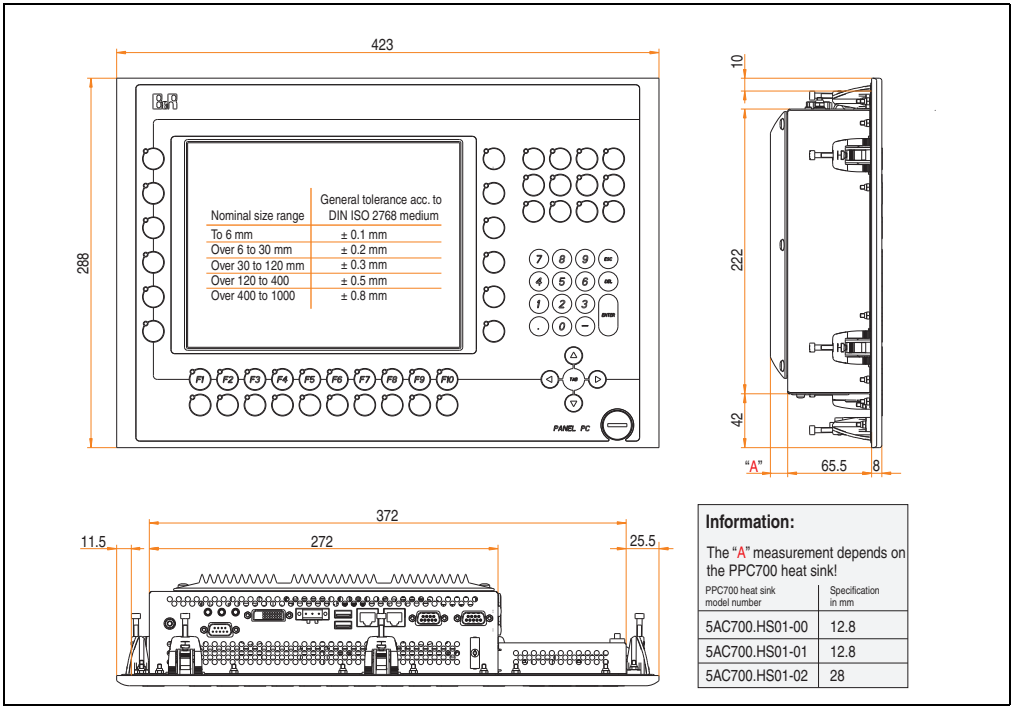
Figure 82: Rear view 5PC782.1043-00

Warning!

Do not remove the mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. If this connection is broken, the PPC700 must be sent for repair. Removal of the mounting screws, which can be determined by a broken seal, voids all warranty.

During operation, surface temperatures of the heat sink may reach 70°C (warning "hot surface").

Dimensions



Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Information:

The "A" measurement depends on the PPC700 heat sink!

PPC700 heat sink model number	Specification in mm
5AC700.HS01-00	12.8
5AC700.HS01-01	12.8
5AC700.HS01-02	28

Figure 83: Dimensions - 5PC782.1043-00

Technical data

Features	5PC782.1043-00
B&R ID code	$1C62
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interface COM1", on page 84 and "Serial interface COM2", on page 85 RS232, modem capable 2 16550 compatible, 16 byte FIFO Max. 115 kBaud 9-pin DSUB, male
Ethernet Controller Transfer rate Connection	See "Ethernet connection ETH1", on page 86 and "Ethernet connection ETH2", on page 89 10/100 Mbit/s RJ45 twisted pair (10 Base T / 100 Base T)
USB interfaces Type Amount Transfer rate Connection	See also "USB port", on page 90 USB 2.0 3 (2x back side, 1x front side) Up to 480 MBit [1] (high speed) Type A
Monitor / Panel Type	See also "Monitor / Panel connection", on page 93 DVI-I, female
AC97 sound Entrances Outputs	See also "MIC, Line IN and Line OUT ports", on page 93 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot", on page 94 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)", on page 97 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)", on page 98 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
SRAM internal slot options	No
Reset button	Yes, see also "Power button", on page 99
Power button	Yes, see also "Reset button", on page 99
PS/2 keyboard / mouse Type	Yes, see also "PS/2 keyboard/mouse", on page 100 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery", on page 101 Renata 950 mAh Yes, accessible from the outside 4 years [2]
Hardware security key compartment Optimized for	Yes, see also "Hardware Security Key", on page 103 DS1425 from MAXIM/Dallas)

Table 65: Technical data - 5PC782.1043-00

Features	5PC782.1043-00
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01", on page 279
LED Amount	See also "Status LEDs", on page 96 3 (Power, HDD, Link 1)
Touch screen[3] Touch screen type Technology Controller Degree of transmission	 Elo Accu Touch Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 705) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 10.4 inch (264 mm) 262,144 colors VGA, 640 x 480 pixels 300:1 Direction R / direction L = 70° Direction U / direction D = 70° 350 cd/m² 50,000 hours
Keys/LED[5] Function keys Soft keys Cursor keys Number block Other keys Key lifespan LED brightness	 44 with LED (yellow) - - 15 without LED 5 without LED > 1,000,000 actuations with 1 ±0.3 to 3 ±0.3 N operating force Typically 12 mcd (yellow)

Caution!

Pressing more than one key at a time may result in so-called phantom keys, and may trigger unintended actions.

Electrical characteristics	
Power supply Rated voltage Rated current Starting current Power consumption Electrical isolation	See also "Supply voltage", on page 91 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "Power calculation for 10.4" Panel PC 700", on page 71 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Orange keys Dark gray keys Color legend strips Gasket	 Naturally anodized aluminum[6] Gray[6] Polyester Similar to Pantone 432CV[6] Similar to Pantone 427CV[6] Similar to Pantone 151CV[6] Similar to Pantone 431CV[6] Similar to Pantone 429CV[6] Flat gasket around display front
Housing	Metal

Table 65: Technical data - 5PC782.1043-00 (Forts.)

Mechanical characteristics	5PC782.1043-00
Outer dimensions Width Height Depth	Also see diagram "Dimensions - 5PC782.1043-00", on page 174 423 mm 288 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 7.5 kg
Environmental characteristics	
Ambient temperature Operation Bearings Transport	See 2.1.12 "Ambient temperatures with system unit 5PC782.1043-00", on page 66 -30 to 70°C -30 to 70°C
Relative humidity Operation / Storage / Transport	T <= 40°C: 5 to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Bearings Transport	2 - 9 Hz: 1.75 mm amplitude / 9 - 200 Hz: 0.5 g 2 - 9 Hz: 3.5 mm amplitude / 9 - 200 Hz: 1 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g 2 - 8 Hz: 7.5 mm amplitude / 8 - 200 Hz: 2 g / 200 - 500 Hz: 4 g
Shock Operation Bearings Transport	15 g, 11 ms 30 g, 15 ms 30 g, 15 ms
Protection type	IP20 back side (only with installed CompactFlash card) IP65 / NEMA 250 type 4X, dust and sprayed water protection (front side)
Altitude	Max. 3,000 m

Table 65: Technical data - 5PC782.1043-00 (Forts.)

1) Software must support USB 2.0 (e.g. Windows XP with at least Service Pack 1).

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

3) Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4) At 25°C ambient temperature. Reducing the brightness by 50% can result in an approximate 50% increase of the half-brightness time.

5) The key and LED functions can be freely configured with the B&R Key Editor, which can be found in the download area of the B&R homepage (**www.br-automation.com**) or on the B&R HMI Driver & Utilities DVD (model number 5SWHMI.0000-00).

6) Depending on the process or batch, there may be visible deviations in the color and surface structure.

Cutout installation

The Panel PC 700 with preassembled mounting blocks is installed e.g. in a housing cutout. A cutout that corresponds to the following drawing must be made.

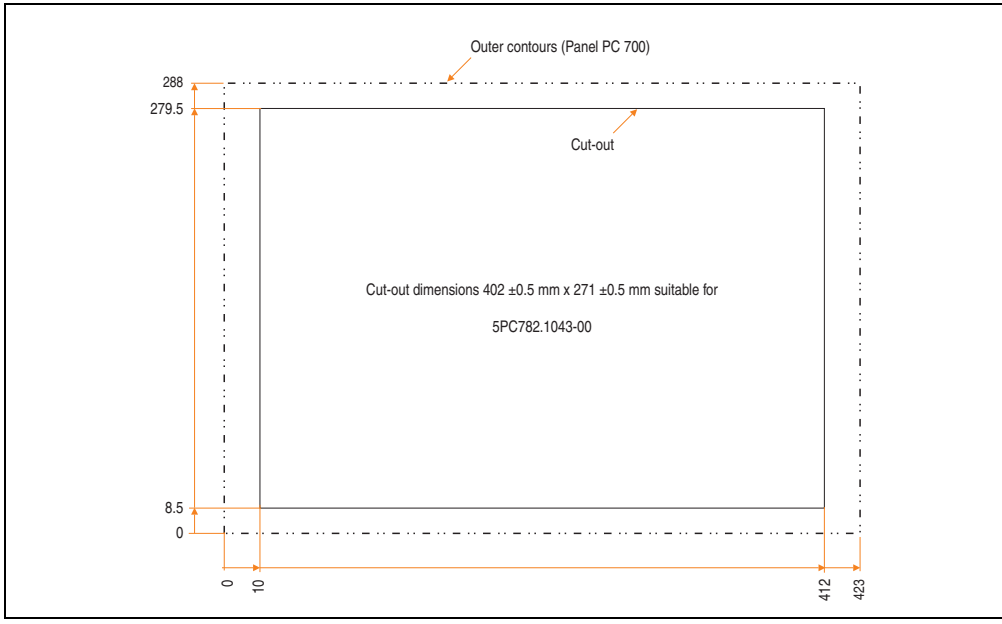


Figure 84: Cutout installation - 5PC782.1043-00

For further information regarding mounting and installation position, see chapter 3 "Commissioning", on page 285.

3.2 CPU boards 815E (ETX)

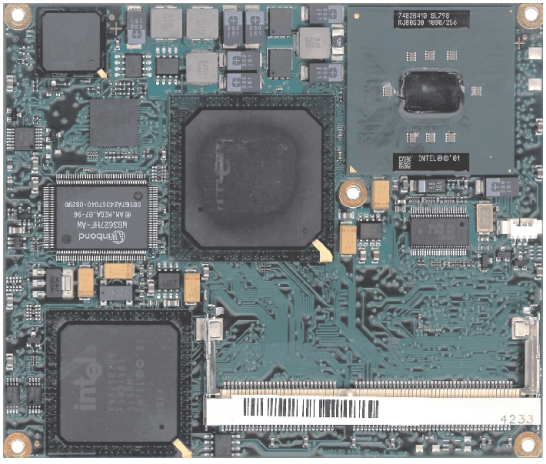


Figure 85: CPU boards 815E (ETX)

Information:

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

3.2.1 Technical data

Features	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03
Boot loader / Operating system	BIOS Phoenix (see section "815E (ETX) BIOS description", on page 339)		
Processor Architectures Type Clock frequency Expanded command set L1 cache L2 cache Floating point unit (FPU)	 0.13 µm Intel Celeron 3 400 MHz MMX technology, streaming SIMD extension 16 kB 256 kB Yes	 0.13 µm Intel Celeron 3 733 MHz MMX technology, streaming SIMD extension 16 kB 256 kB Yes	 0.13 µm Intel Celeron 1 GHz MMX technology, streaming SIMD extension 16 kB 256 kB Yes
Chipset	Intel 82815E (GMCH) Intel 82801DB (ICH4)		

Table 66: Technical data - 815E CPU boards (ETX)

Features	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03
Real-time clock (RTC) Battery-buffered Accuracy	Yes at 25°C typ. 24 ppm (2 seconds) 1) per day		
Front side bus	100 Mhz	133 Mhz	133 MHz
IDE ports	2 IDE ports, UDMA 100		
Memory Type Quantity Socket	SDRAM Max. 512 MB SO-DIMM 144-pin		
Graphics Controller Memory Color depth Resolution RGB GE1 2)	Support up to SXGA display units Intel 82815 (integrated in the Chipset) 32 MB shared memory (reserved in the main memory) Max. 24 bit up to 1280 x 1024 @ 85 Hz 24 bit, up to 1600 x 1200 @ 75 Hz 8 bit up to 1280 x 1024 @ 85 Hz 24 bit		

Table 66: Technical data - 815E CPU boards (ETX) (Forts.)

1) At max. specified ambient temperature: typically 70 ppm (6 seconds) - worst-case 220 ppm (19 seconds).

2) GE = Graphics Engine

Driver support

In order for the CPU board with the Intel 82815E chipset to work properly, it is necessary to install the Intel chipset driver (e.g. special USB driver) and the graphics chip. The necessary software can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

Information:

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

3.3 CPU boards 855GME (ETX)

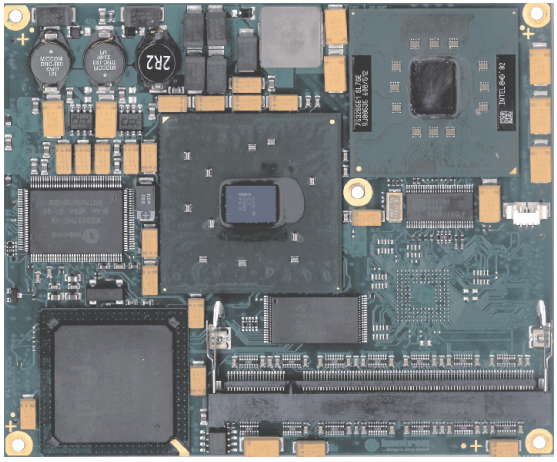


Figure 86: CPU boards 855GME

Information:

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

3.3.1 Technical data

Features	5PC600.E855-00	5PC600.E855-01	5PC600.E855-02	5PC600.E855-03	5PC600.E855-04	5PC600.E855-05
Boot loader / Operating system	BIOS Phoenix (see section "855GME (ETX) BIOS description", on page 395)					
Processor						
Architectures	0.13 µm	0.13 µm	0.90 nm	0.90 nm	0.13 µm	0.13 µm
Type	Intel Pentium M	Intel Pentium M	Intel Pentium M	Intel Pentium M	Intel Celeron M	Intel Celeron M
Clock frequency	1.1 GHz	1.6 GHz	1.4 GHz	1.8 GHz	600 MHz	1000 MHz
Expanded command set	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension
L1 cache	2	2	2	2	2	2
L2 cache	32 kB	32 kB	32 kB	32 kB	32 kB	32 kB
Floating point unit (FPU)	1 MB	1 MB	2 MB	2 MB	512 kB	512 kB
	Yes	Yes	Yes	Yes	Yes	Yes

Table 67: Technical data - CPU boards 855GME (ETX)

Features	5PC600.E855-00	5PC600.E855-01	5PC600.E855-02	5PC600.E855-03	5PC600.E855-04	5PC600.E855-05
Chipset	Intel 82855GME (GMHC) Intel 82801DB (ICH4)					
Real-time clock (RTC) Battery-buffered Accuracy	Yes At 25°C typ. 12 ppm (1 second)[1] per day					
Front side bus	400 Mhz					
IDE ports	2 IDE ports, UDMA 100					
Memory Type Quantity Socket	DDRAM Max. 1 GB SO-DIMM 200-pin					
Graphics Controller Memory Color depth Resolution RGB GE1 [2] = LVDS GE2[2] = DVO	Intel Extreme Graphics 2 (integrated in the chipset) 64 MB shared memory (reserved in the main memory) Max. 32 bit 350 MHz RAMDAC, up to 2048 x 1536 @ 60 Hz (QXGA) including 1920 x 1080 @ 85 Hz (HDTV) 2x 112 MHz LVDS transmitter, from 640 x 480 up to 1600 x 1200 (Embedded Panel interface based on VESA EDID™ 1.3) Intel compliant DVO 2.0 port (12-bit DDR) supports external DVI transmitters with a bandwidth up to 165 MHz, 1600 x 1200 (UXGA)					

Table 67: Technical data - CPU boards 855GME (ETX) (Forts.)

1) At max. specified ambient temperature: typically 58 ppm (5 seconds) - worst-case 220 ppm (19 seconds).

2) GE = Graphics Engine

Driver support

In order for the CPU board with the Intel 82855GME chipset to work properly, it is necessary to install the Intel chipset driver (e.g. special USB driver) and the graphics chip. The necessary software can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

Information:

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

3.4 CPU boards 855GME (XTX)

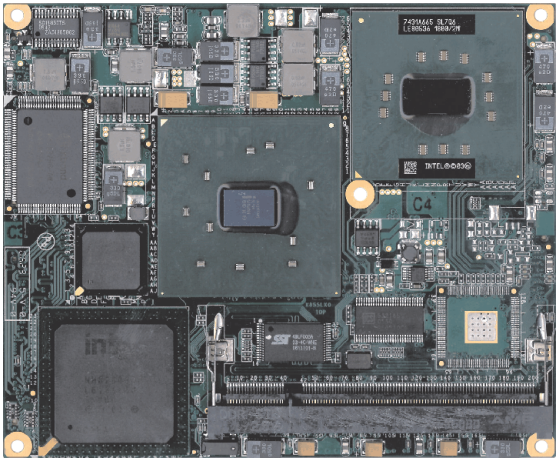


Figure 87: CPU boards 855GME (XTX)

Information:

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

3.4.1 Technical data

Features	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
Boot loader / Operating system	BIOS AMI (see Section "855GME (XTX) BIOS description", on page 450)					
Processor						
Architectures	0.13 µm	0.13 µm	90 nm	90 nm	0.13 µm	0.13 µm
Type	Intel Pentium M	Intel Pentium M	Intel Pentium M	Intel Pentium M	Intel Celeron M	Intel Celeron M
Clock frequency	1.1 GHz	1.6 GHz	1.4 GHz	1.8 GHz	600 MHz	1000 MHz
Expanded command set	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension
L1 cache	2	2	2	2	2	2
L2 cache	32 kB	32 kB	32 kB	32 kB	32 kB	32 kB
Floating point unit (FPU)	1 MB	1 MB	2 MB	2 MB	512 kB	512 kB
	Yes	Yes	Yes	Yes	Yes	Yes

Table 68: Technical data - CPU boards 855GME (XTX)

Features	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
Chipset	Intel 82855GME (GMHC) Intel 82801DB (ICH4)					
Real-time clock (RTC) Battery-buffered Accuracy	Yes At 25°C typ. 12 ppm (1 second)[1] per day					
Front side bus	400 Mhz					
IDE ports	2 IDE ports, UDMA 100					
Memory Type Quantity Socket	DDRAM Max. 1 GB SO-DIMM 200-pin					
Graphics Controller Memory Color depth Resolution RGB GE1[2] = LVDS GE2[2] = DVO	Intel Extreme Graphics 2 (integrated in the chipset) 64 MB shared memory (reserved in the main memory) Max. 32 bit 350 MHz RAMDAC, up to 2048 x 1536 @ 60 Hz (QXGA) including 1920 x 1080 @ 85 Hz (HDTV) 2x 112 MHz LVDS transmitter, from 640 x 480 up to 1600 x 1200 (Embedded Panel interface based on VESA EDID™ 1.3) Intel compliant DVO 2.0 port (12-bit DDR) supports external DVI transmitters with a bandwidth up to 165 MHz, 1600 x 1200 (UXGA)					

Table 68: Technical data - CPU boards 855GME (XTX) (Forts.)

1) At max. specified ambient temperature: typically 58 ppm (5 seconds) - worst-case 220 ppm (19 seconds).

2) GE = Graphics Engine

Driver support

In order for the CPU board with the Intel 82855GME chipset to work properly, it is necessary to install the Intel chipset driver (e.g. special USB driver) and the graphics chip. The necessary software can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

Information:

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

3.5 Heat sink

There are a number of heat sink variants available to be used in different CPU boards.

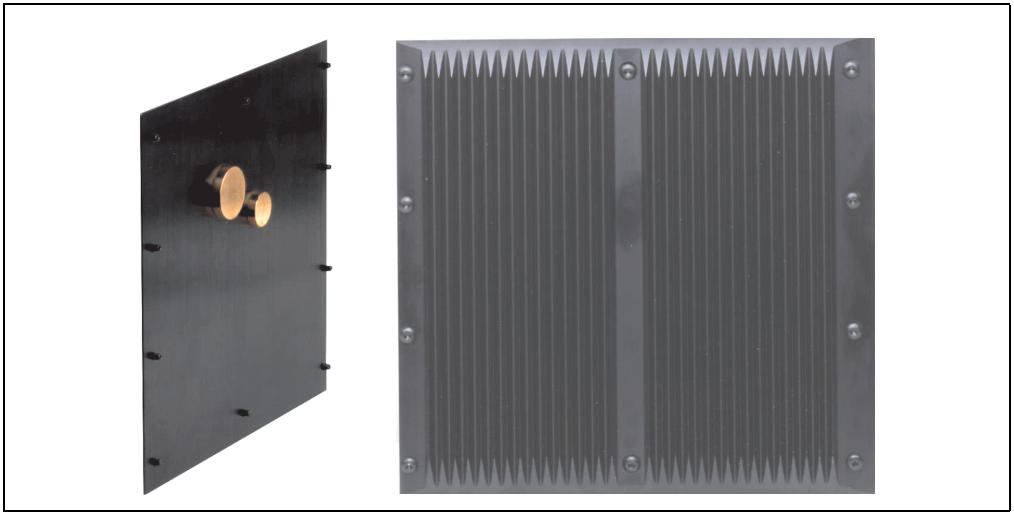


Figure 88: Heat sink

Information:

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

A heat sink can only be replaced at the B&R plant.

Mechanical characteristics	5AC700.HS01-00	5AC700.HS01-01	5AC700.HS01-02
Ideal for CPU boards	5PC600.E815-00 5PC600.E815-02 5PC600.E815-03	5PC600.E855-00 5PC600.E855-02 5PC600.E855-04 5PC600.E855-05 5PC600.X855-00 5PC600.X855-02 5PC600.X855-04 5PC600.X855-05	5PC600.E855-01 5PC600.E855-03 5PC600.X855-01 5PC600.X855-03
Item	Black-coated aluminum		
Outer dimensions Width Height Depth	250 mm 208 mm 12.8 mm		250 mm 208 mm 30 mm
Weight	1450 g		1900 g

Table 69: Technical data - Heat sink

3.6 Main memory

The CPU boards (815E, 855GME) are each equipped with a socket for memory modules. When choosing a main memory, it is important to consider both the maximum memory capacity (for 815E (ETX) CPU Boards 512 MB, and for 855GME (ETX or XTX) CPU Boards 1 GB) and the correct type.

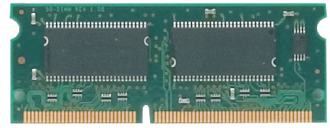


Figure 89: Main memory module

Information:

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

3.6.1 Technical data

Features	5MMSDR.0128-01	5MMSDR.0256-01	5MMSDR.0512-01	5MMDDR.0256-00	5MMDDR.0512-00	5MMDDR.1024-00
Ideal for CPU boards	815E (ETX)			855GME (ETX / XTX)		
Quantity Construction Type	128 MB 144-pin SO-DIMM SDRAM	256 MB 144-pin SO-DIMM SDRAM	512 MB 144-pin SO-DIMM SDRAM	256 MB 200-pin SO-DIMM DDR-SDRAM	512 MB 200-pin SO-DIMM DDR-SDRAM	1 GB 200-pin SO-DIMM DDR-SDRAM
Organization	16Mx64	32Mx64	64Mx64	32Mx64	64Mx64	128Mx64

Table 70: Technical data - Main memory

Information:

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

3.7 Drives

3.7.1 Add-on Solid State Drive 128 GB 24x7 ET - 5AC600.SSDI-00

This 128 GB add-on SSD (Solid State Drive) is based on Multi Level Cell (MLC) technology and is ATA/ATAPI compatible. The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

Figure 90: Add-on SSD 128 GB - 5AC600.SSDI-00

Technical data

Information:

A sudden loss of power may result in data loss! In very rare cases, mass memory may also be damaged.

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

Information:

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

Features	5AC600.SSDI-00 Revision ≤ C0	5AC600.SSDI-00 Revision ≥ D0
Manufacturer	Transcend	
Manufacturer's product ID	TS128GPSD320	TS128GPSD330
Formatted capacity	128 GB	
Data reliability	< 1 unrecoverable error in 10^{16} bit read accesses	

Table 71: Technical data - Add-on SSD - 5AC600.SSDI-00

Features	5AC600.SSDI-00 Revision ≤ C0	5AC600.SSDI-00 Revision ≥ D0
Interface	PATA	
S.M.A.R.T. Support	Yes	
MTBF	1,000,000 hours	
Continuous reading	Max. 103.7 MB/s	Max. 118.4 MB/s
Continuous writing	Max. 93.15 MB/s	Max. 92.75 MB/s
IOPS[1)] 4k read 4k write	 7.733 MB/s 0.722 MB/s	 13.09 MB/s 1.225 MB/s
Mechanical characteristics		
MLC flash	Yes	
Compatibility	PATA (ATA/ATAPI 8) SSD Enhanced SMART ATA feature set Ultra DMA Mode 0-6 Multi-Word DMA Mode 0-2 PIO Mode 0-4	
Mechanical characteristics		
Add-on mounting	Fixed	
Outer dimensions[2)] Width Height Depth	 69.85 mm 7.40 mm 100.3 mm	
Weight[3)]	55 g	
Environmental characteristics		
Ambient temperature Operation Storage Transport	 0 to 70°C -40 to 85°C -40 to 85°C	
Relative humidity Operation Storage Transport	 0 to 95%, non-condensing 0 to 95%, non-condensing 0 to 95%, non-condensing	
Vibration Operation Storage Transport	 20 to 2000 Hz: 20 g 20 to 2000 Hz: 20 g 20 to 2000 Hz: 20 g	
Shock (pulse with a sine half-wave) Operation Storage Transport	 1500 g, 0.5 ms 1500 g, 0.5 ms 1500 g, 0.5 ms	
Altitude Operation Storage Transport	 - 300 to 12192 meters - 300 to 12192 meters - 300 to 12192 meters	

Table 71: Technical data - Add-on SSD - 5AC600.SSDI-00 (Forts.)

1) IOPS: Random read and write input/output operations per second.

2) Dimensions without add-on

3) Weight without add-on

Temperature humidity diagram

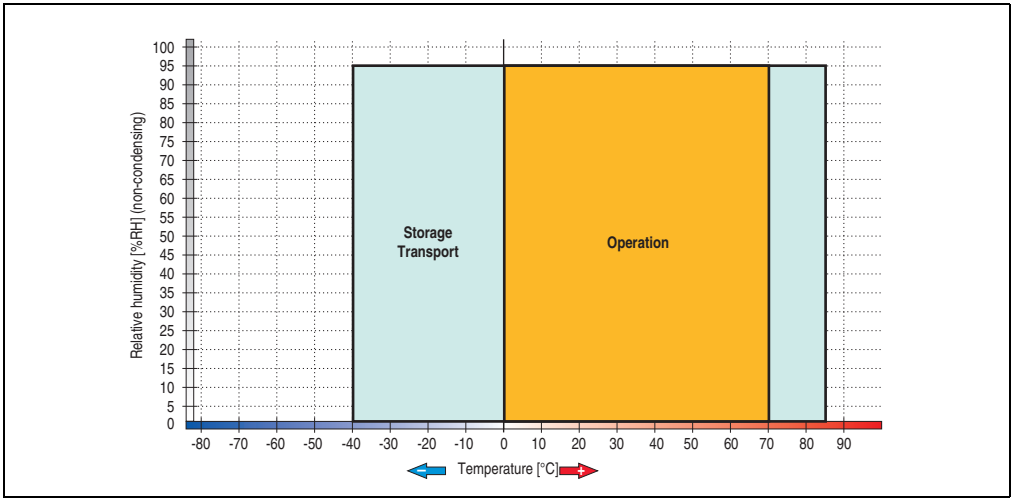


Figure 91: Temperature humidity diagram - Add-on SSD 128 GB - 5AC600.SSDI-00

3.7.2 Replacement Solid State Drive 128 GB 24x7 ET - 5MMSSD.0128-00

This 128 GB Solid State Drive can be used as a replacement part for the 5AC600.SSDI-00 SSD.

Figure 92: Replacement SSD 128 GB - 5MMSSD.0128-00

Technical data

Information:

A sudden loss of power may result in data loss! In very rare cases, mass memory may also be damaged.

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

Information:

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

Features	5MMSSD.0128-00 Revision ≤ C0	5MMSSD.0128-00 Revision ≥ D0
Manufacturer	Transcend	
Manufacturer's product ID	TS128GPSD320	TS128GPSD330
Formatted capacity	128 GB	
Data reliability	< 1 unrecoverable error in 10^{16} bit read accesses	
Interface	PATA	
S.M.A.R.T. Support	Yes	
MTBF	1,000,000 hours	
Continuous reading	Max. 103.7 MB/s	Max. 118.4 MB/s
Continuous writing	Max. 93.15 MB/s	Max. 92.75 MB/s

Table 72: Technical data - Replacement SSD - 5MMSSD.0128-00

Features	5MMSSD.0128-00 Revision ≤ C0	5MMSSD.0128-00 Revision ≥ D0
IOPS[1)] 4k read 4k write	 7.733 MB/s 0.722 MB/s	 13.09 MB/s 1.225 MB/s
Mechanical characteristics		
MLC flash	Yes	
Compatibility	PATA (ATA/ATAPI 8) SSD Enhanced SMART ATA feature set Ultra DMA Mode 0-6 Multi-Word DMA Mode 0-2 PIO Mode 0-4	
Mechanical characteristics		
Outer dimensions Width Height Depth	 69.85 mm 7.40 mm 100.3 mm	
Weight	55 g	
Environmental characteristics		
Ambient temperature Operation Storage Transport	 0 to 70°C -40 to 85°C -40 to 85°C	
Relative humidity Operation Storage Transport	 0 to 95%, non-condensing 0 to 95%, non-condensing 0 to 95%, non-condensing	
Vibration Operation Storage Transport	 20 to 2000 Hz: 20 g 20 to 2000 Hz: 20 g 20 to 2000 Hz: 20 g	
Shock (pulse with a sine half-wave) Operation Storage Transport	 1500 g, 0.5 ms 1500 g, 0.5 ms 1500 g, 0.5 ms	
Altitude Operation Storage Transport	 - 300 to 12192 meters - 300 to 12192 meters - 300 to 12192 meters	

Table 72: Technical data - Replacement SSD - 5MMSSD.0128-00 (Forts.)

1) IOPS: Random read and write input/output operations per second.

Temperature humidity diagram

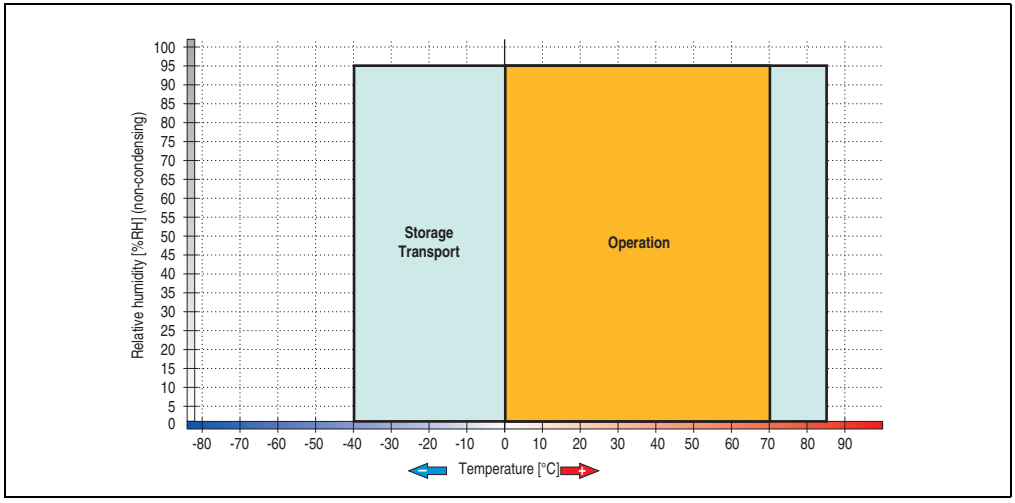


Figure 93: Temperature humidity diagram - Replacement SSD 128 GB - 5MMSSD.0128-00

3.7.3 Add-on hard disk 30 GB 24x7 - 5AC600.HDDI-00

This hard disk is specified for 24-hour operation. The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

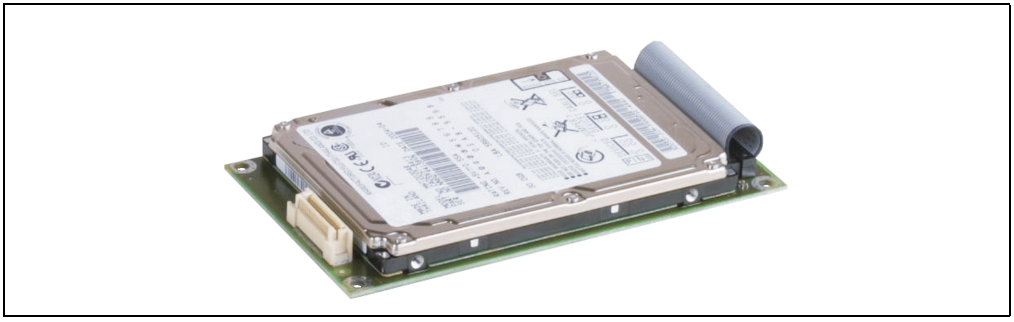


Figure 94: Add-on hard disk 30 GB 24/7 - 5AC600.HDDI-00

Technical data

Information:

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

Features	5AC600.HDDI-00
Manufacturer's product ID	Fujitsu MHT2030AR
Formatted capacity	30 GB
Number of heads	2
Number of sectors (user)	58,605,120
Bytes per sector	512
Revolution speed	4200 rpm ±1%
Access time (average)	7.14 ms

Table 73: Technical data - Add-on hard disk 5AC600.HDDI-00

Features	5AC600.HDDI-00
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum	 1.5 ms 12 ms 22 ms
Starting time (0 rpm to read access)	5 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 26.1 to 36.2 MB/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 24 dBA at 30 cm
Electrical characteristics	
Lifespan	5 years or 20,000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[1)] Operation - standard[2)] Operation - 24-hour[3)] Bearings Transport	 5 to 55°C 5 to 44°C -40 to 65°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 5 - 500 Hz: 1 g (9.8 m/s^2 0-peak) no non-recovered errors 5 - 500 Hz: 5 g (49 m/s^2 0-peak) no damage
Shock Operation Bearings	 No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3000 meters - 300 to 12000 meters

Table 73: Technical data - Add-on hard disk 5AC600.HDDI-00 (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Standard operation means 250 POH (power-on hours) per month.

3) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

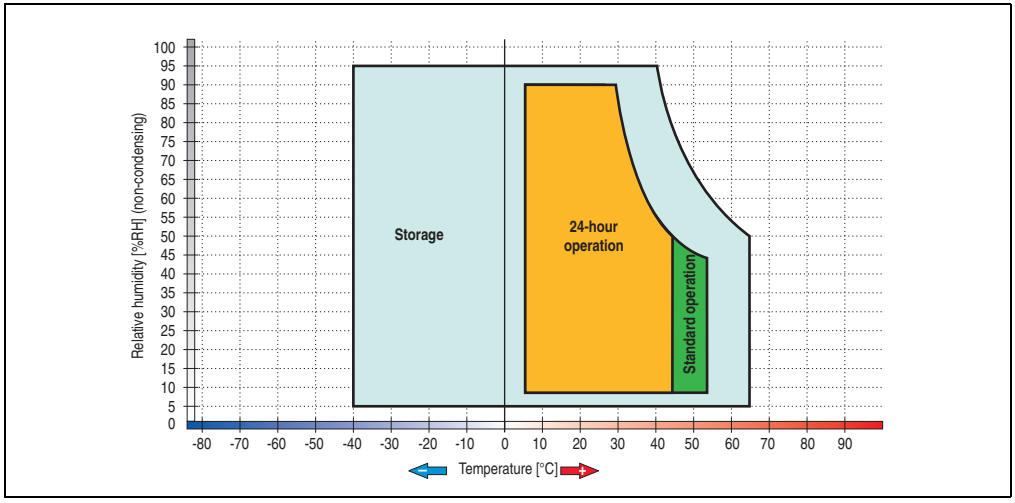


Figure 95: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.4 Add-on hard disk 20 GB ET - 5AC600.HDDI-01

This hard disk has an extended temperature specification, but is not permitted for 24 hour operation. The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

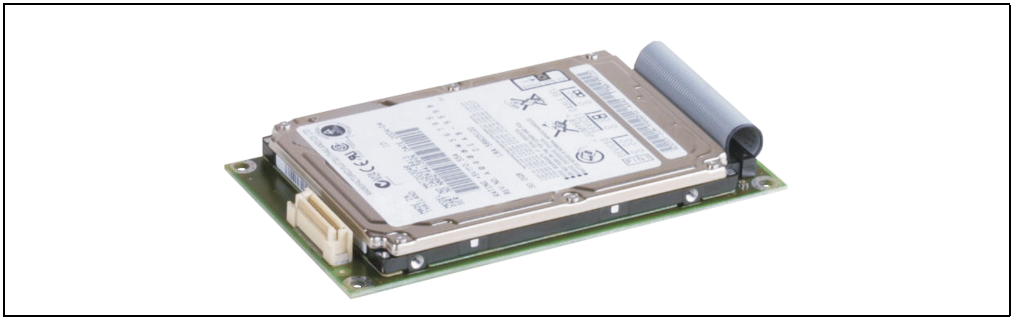


Figure 96: Add-on hard disk 20 GB ET - 5AC600.HDDI-01

Technical data

Information:

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

Features	5AC600.HDDI-01
Manufacturer's product ID	Fujitsu MHT2020AC
Formatted capacity	20 GB
Number of heads	2
Number of sectors (user)	39,070,080
Bytes per sector	512
Revolution speed	4200 rpm ±1%
Access time (average)	7.14 ms

Table 74: Technical data - Add-on hard disk 5AC600.HDDI-01

Features	5AC600.HDDI-01
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum	 1.5 ms 12 ms 22 ms
Starting time (0 rpm to read access)	5 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 Up to 28.9 MB/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 22 dBA at 30 cm
Electrical characteristics	
Lifespan	5 years or 20,000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[1)] Operation[2)] Bearings Transport	 -20 to 80°C -40 to 85°C -40 to 85°C
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 5 - 500 Hz: 1 g (9.8 m/s^2 0-peak) no non-recovered errors 5 - 500 Hz: 5 g (49 m/s^2 0-peak) no damage
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3000 meters - 300 to 12000 meters

Table 74: Technical data - Add-on hard disk 5AC600.HDDI-01 (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Standard operation means 250 POH (power-on hours) per month.

Temperature humidity diagram

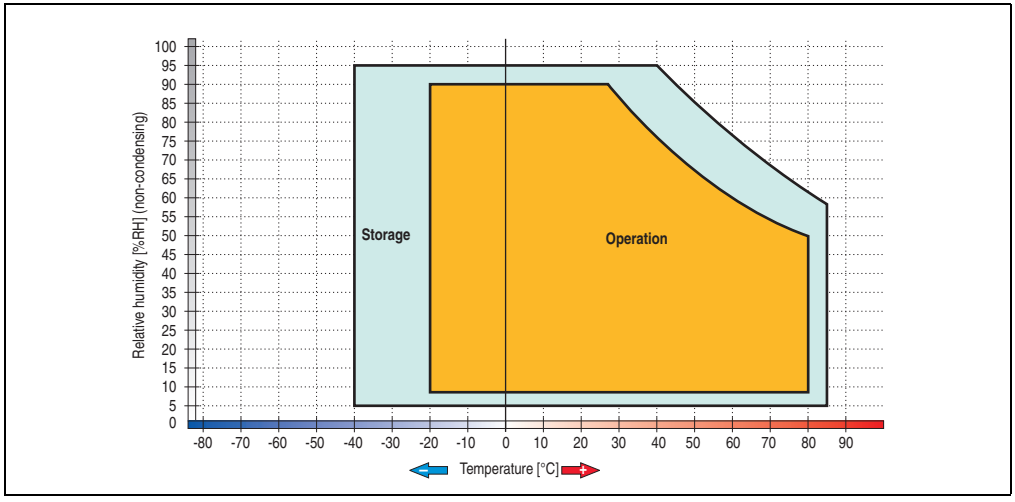


Figure 97: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-01

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.5 Add-on hard disk 40 GB 24x7 - 5AC600.HDDI-02

This hard disk is specified for 24-hour operation (24x7). The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

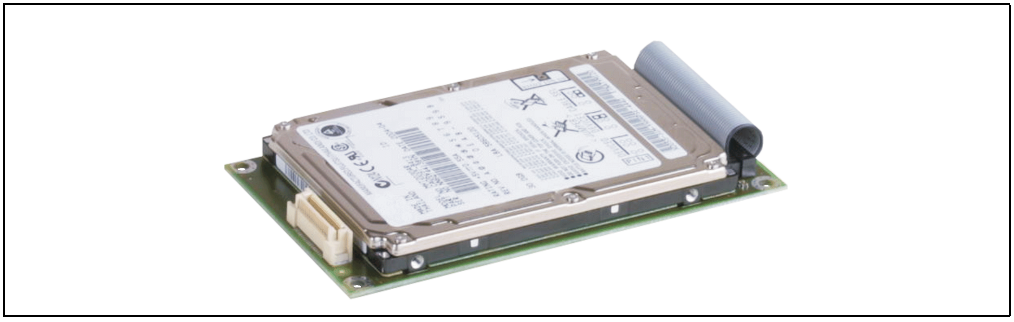


Figure 98: Add-on hard disk 40 GB - 5AC600.HDDI-02

Technical data

Information:

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

Features	5AC600.HDDI-02
Manufacturer's product ID	Hitachi HTE726040M9AT00
Formatted capacity	40 GB
Number of heads	4
Number of sectors (user)	78,140,160
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	10 ms

Table 75: Technical data - add-on hard disk - 5AC600.HDDI-02

Features	5AC600.HDDI-02
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 10 ms 16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 236 to 507 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30,000 POH (Power-On Hours)
MTBF	477,000 hours[1)]
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[2)] Operation - standard [3)] Operation - 24-hour[4)] Bearings Transport	 5 to 55°C 5 to 40°C -40 to 65°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 5 - 500 Hz: 1 g (9.8 m/s^2 0-peak) duration 2 octaves per minute; no non-recovered errors 5 - 500 Hz: 5 g (49 m/s^2 0-peak) duration 0.5 oct./min.; no damage
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 200 g (1960 m/s^2 0-peak) and 2 ms duration No non-recovered errors at max. 15 g (147 m/s^2 0-peak) and 11 ms duration No damage at max. 980 g (9800 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 75: Technical data - add-on hard disk - 5AC600.HDDI-02 (Forts.)

1) Manufacturer specification at +40°C ambient temperature.

2) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3) Standard operation means 333 POH (power-on hours) per month.

4) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

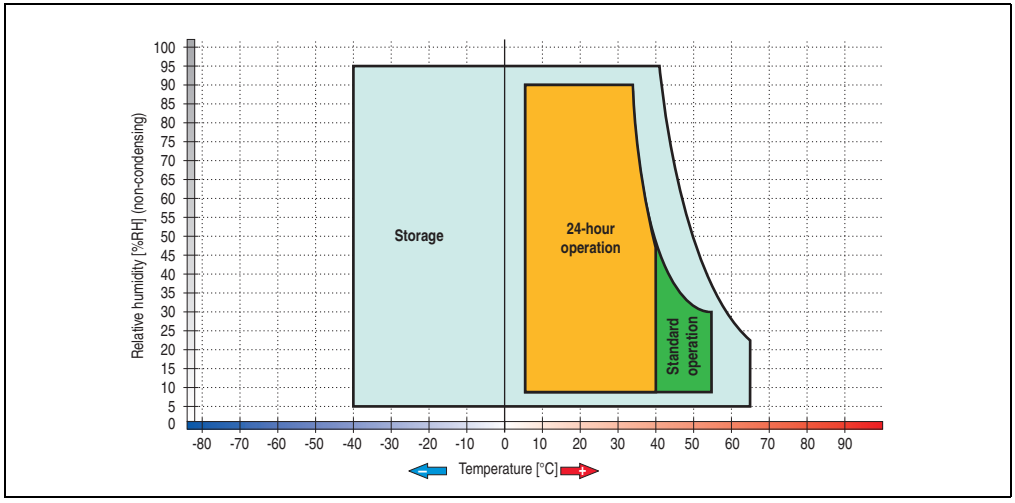


Figure 99: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-02

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.6 Add-on hard disk 60 GB 24x7 - 5AC600.HDDI-03

This hard disk is specified for 24-hour operation (24x7). The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

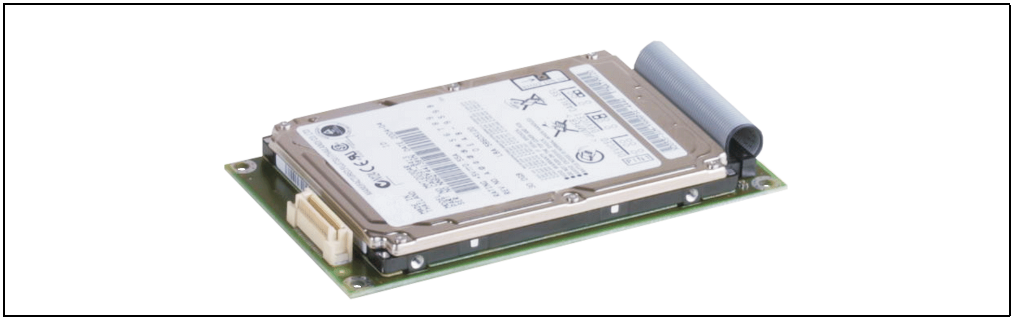


Figure 100: Add-on hard disk 60 GB - 5AC600.HDDI-03

Technical data

Information:

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

Features	5AC600.HDDI-03
Manufacturer's product ID	Hitachi HTE721060G9AT00
Formatted capacity	60 GB
Number of heads	3
Number of sectors (user)	117,210,240
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	10 ms

Table 76: Technical data - add-on hard disk - 5AC600.HDDI-03

Features	5AC600.HDDI-03
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 10 ms 16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 267 to 629 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30,000 POH (Power-On Hours)
MTBF	550,000 hours[1)]
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[2)] Operation - standard [3)] Operation - 24-hour[4)] Bearings Transport	 5 to 55°C 5 to 40°C -40 to 65°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 5 - 500 Hz: 1 g (9.8 m/s^2 0-peak) duration 1 octave per minute; no non-recovered errors 10 - 500 Hz: 5 g (49 m/s^2 0-peak) duration 0.5 oct./min.; no damage
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 160 g (1568 m/s^2 0-peak) and 1 ms duration No non-recovered errors at max. 300 g (2900 m/s^2 0-peak) and 2 ms duration No non-recovered errors at max. 15 g (147 m/s^2 0-peak) and 11 ms duration No damage at max. 1000 g (9800 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 76: Technical data - add-on hard disk - 5AC600.HDDI-03 (Forts.)

1) Manufacturer specification at +40°C ambient temperature.

2) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3) Standard operation means 333 POH (power-on hours) per month.

4) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

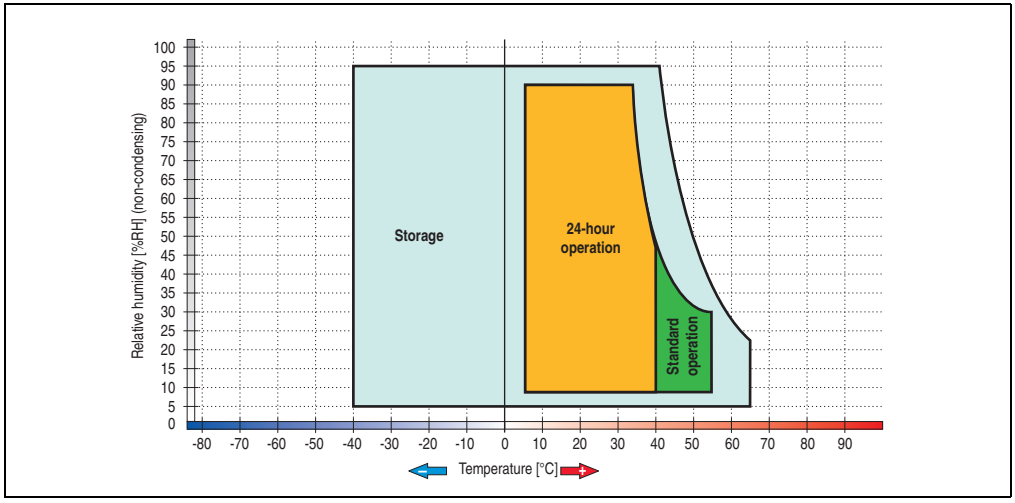


Figure 101: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-03

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.7 Add-on hard disk 80 GB 24x7 - 5AC600.HDDI-04

This hard disk is specified for 24-hour operation (24x7). The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

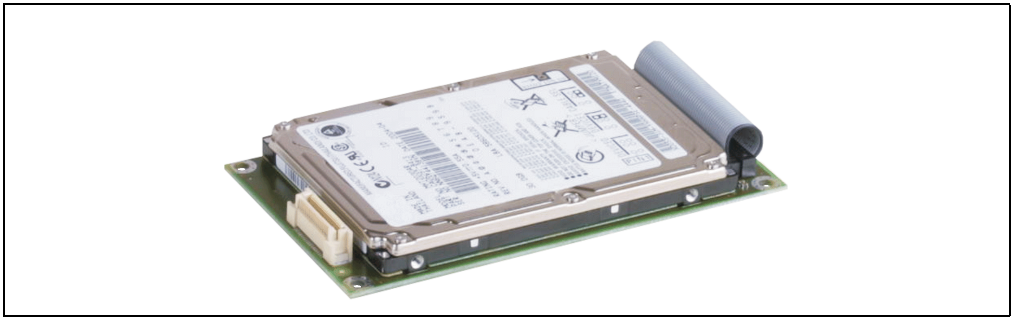


Figure 102: Add-on hard disk 80 GB - 5AC600.HDDI-04

Technical data

Information:

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

Features	5AC600.HDDI-04
Manufacturer's product ID	Hitachi HTE721080G9AT00
Formatted capacity	80 GB
Number of heads	4
Number of sectors (user)	156,301,488
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	10 ms

Table 77: Technical data - add-on hard disk - 5AC600.HDDI-04

Features	5AC600.HDDI-04
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 10 ms 16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 267 to 629 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30,000 POH (Power-On Hours)
MTBF	550,000 hours[1)]
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[2)] Operation - standard [3)] Operation - 24-hour[4)] Bearings Transport	 5 to 55°C 5 to 40°C -40 to 65°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 5 - 500 Hz: 1 g (9.8 m/s^2 0-peak) duration 1 octave per minute; no non-recovered errors 10 - 500 Hz: 5 g (49 m/s^2 0-peak) duration 0.5 oct./min.; no damage
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 160 g (1568 m/s^2 0-peak) and 1 ms duration No non-recovered errors at max. 300 g (2900 m/s^2 0-peak) and 2 ms duration No non-recovered errors at max. 15 g (147 m/s^2 0-peak) and 11 ms duration No damage at max. 1000 g (9800 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 77: Technical data - add-on hard disk - 5AC600.HDDI-04 (Forts.)

1) Manufacturer specification at +40°C ambient temperature.

2) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3) Standard operation means 333 POH (power-on hours) per month.

4) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

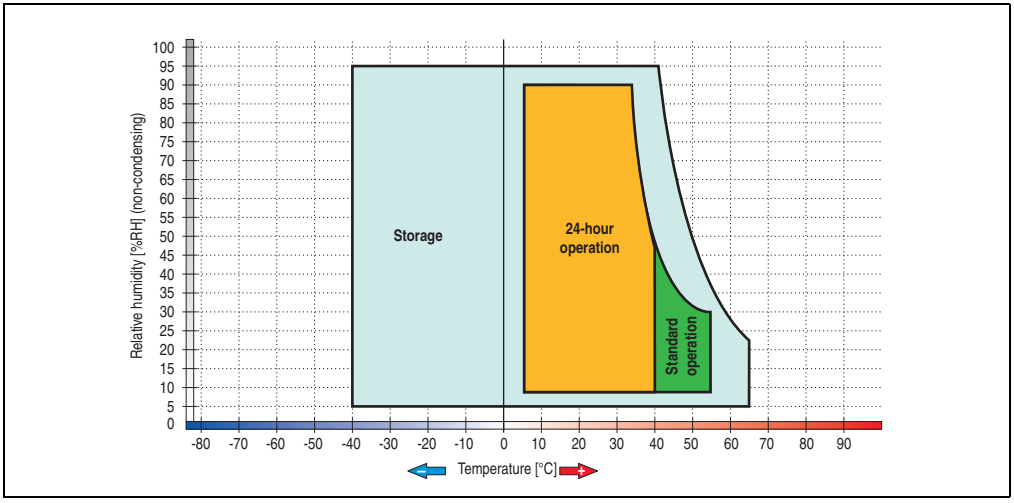


Figure 103: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-04

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.8 Add-on hard disk 40 GB - 5AC600.HDDI-05

This hard disk is specified for 24-hour operation and also provides an extended temperature specification. The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

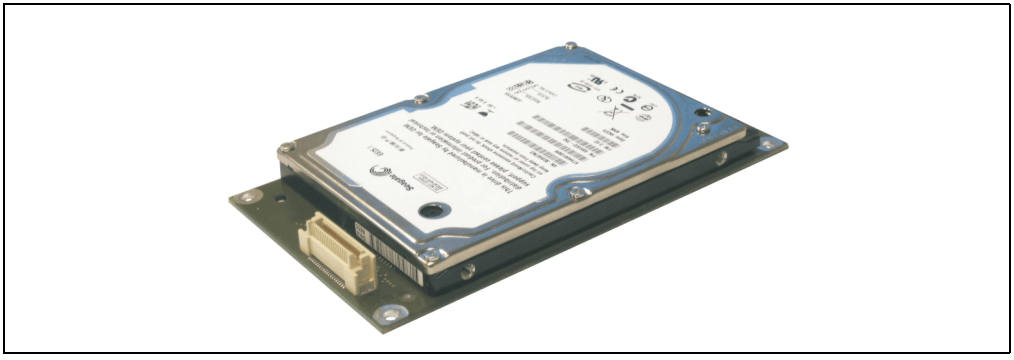


Figure 104: Add-on hard disk 40 GB - 5AC600.HDDI-05

Technical data

Information:

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

Features	5AC600.HDDI-05
Manufacturer's product ID	Seagate ST940813AM
Formatted capacity	40 GB
Number of heads	2
Number of sectors (user)	78,140,160
Bytes per sector	512
Revolution speed	5400 rpm ±1%
Access time (average)	12.5 ms

Table 78: Technical data - Add-on hard disk 5AC600.HDDI-05

Features	5AC600.HDDI-05
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 12.5 ms 22 ms
Starting time (0 rpm to read access)	3 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 max. 321 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
S.M.A.R.T. Support	Yes
MTBF	550,000 hours[1)]
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions Width Length Height	 70 mm 100 mm 9.5 mm
Weight	100 g
Environmental characteristics	
Ambient temperature[2)] Operation - Standard / 24-hour Bearings Transport	 -30 to 85°C -40 to 95°C -40 to 95°C
Relative humidity Operation Bearings Transport	 5 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 10 - 500 Hz: 1 g (9.8 m/s^2 0-peak) no non-recovered errors 5 - 500 Hz: 5 g (49 m/s^2 0-peak) no non-recovered errors
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 200 g (1962 m/s^2 0-peak) and 2 ms duration No non-recovered errors at max. 110 g (1079 m/s^2 0-peak) and 11 ms duration No damage at max. 800 g (7848 m/s^2 0-peak) and 2 ms duration No damage at max. 400 g (3924 m/s^2 0-peak) and 0.5 ms duration
Altitude Operation Bearings	 - 300 to 4419 meters - 300 to 12192 meters

Table 78: Technical data - Add-on hard disk 5AC600.HDDI-05 (Forts.)

1) With 8760 POH (Power On Hours) per year and 70°C surface temperature.

2) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

Temperature humidity diagram

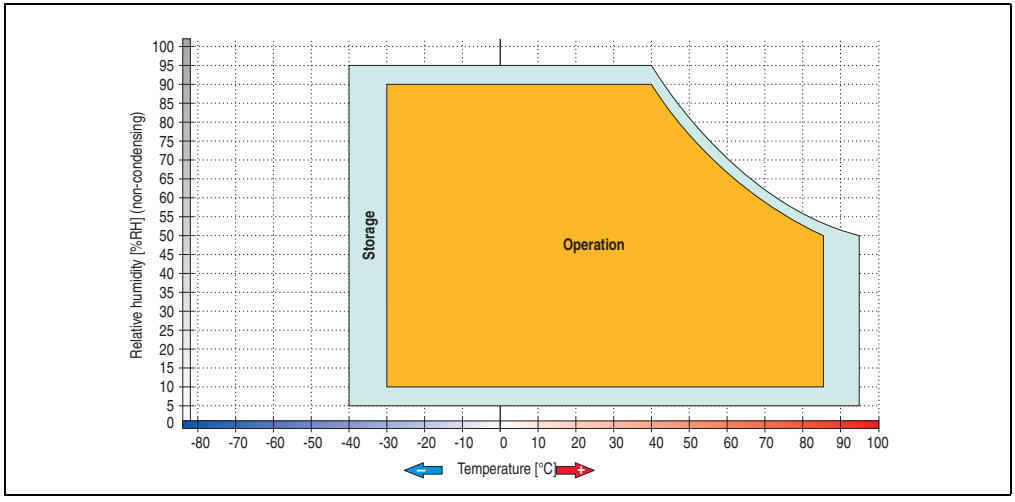


Figure 105: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-05

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.9 Add-on hard disk 80 GB 24x7 ET - 5AC600.HDDI-06

This hard disk is specified for 24-hour operation (24x7) and also provides an extended temperature specification (ET). The add-on drive is referred to internally as the primary slave drive.

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

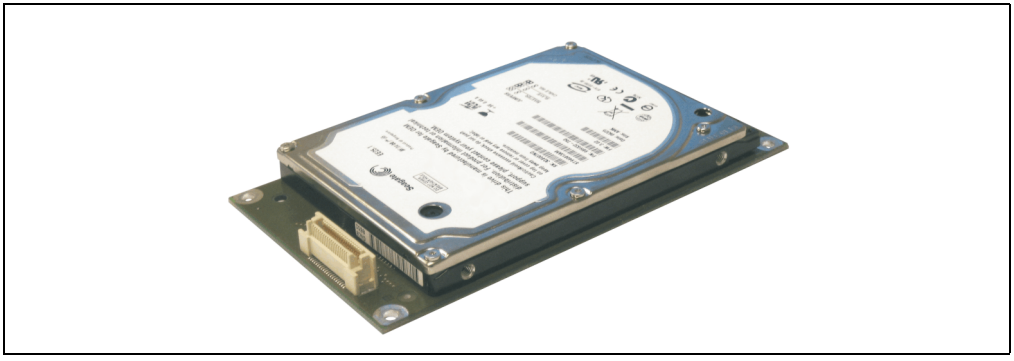


Figure 106: Add-on hard disk 80 GB - 5AC600.HDDI-06

Technical data

Information:

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

Features	5AC600.HDDI-06
Manufacturer's product ID	Seagate ST980817AM
Formatted capacity	80 GB
Number of heads	2
Number of sectors (user)	156,301,488
Bytes per sector	512
Revolution speed	5400 rpm ±1%
Access time (average)	10 ms

Table 79: Technical data - add-on hard disk - 5AC600.HDDI-06

Features	5AC600.HDDI-06
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 12.5 ms 22 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 Max. 450 MBit/s Max. 100 MB/s (Ultra-DMA Mode 5)
S.M.A.R.T. Support	Yes
Cache	8 MB
MTBF	750,000 hours[1)]
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[2)] Operation - Standard / 24-hour Bearings Transport	 -30 to 85°C -40 to 95°C -40 to 95°C
Relative humidity Operation Bearings Transport	 5 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 5 - 500 Hz: 2 g; no non-recovered errors 5 - 500 Hz: 5 g; no non-recovered errors
Shock (pulse with a sine half-wave) Operation Bearings	 Max. 300 g, 2 ms; no non-recovered errors Max. 150 g, 11 ms; no non-recovered errors Max. 800 g, 2 ms; no damage Max. 400 g, 0.5 ms; no damage
Altitude Operation Bearings	 - 300 to 5000 meters - 300 to 12192 meters

Table 79: Technical data - add-on hard disk - 5AC600.HDDI-06 (Forts.)

1) With 8760 POH (Power On Hours) per year and 70°C surface temperature.

2) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

Temperature humidity diagram

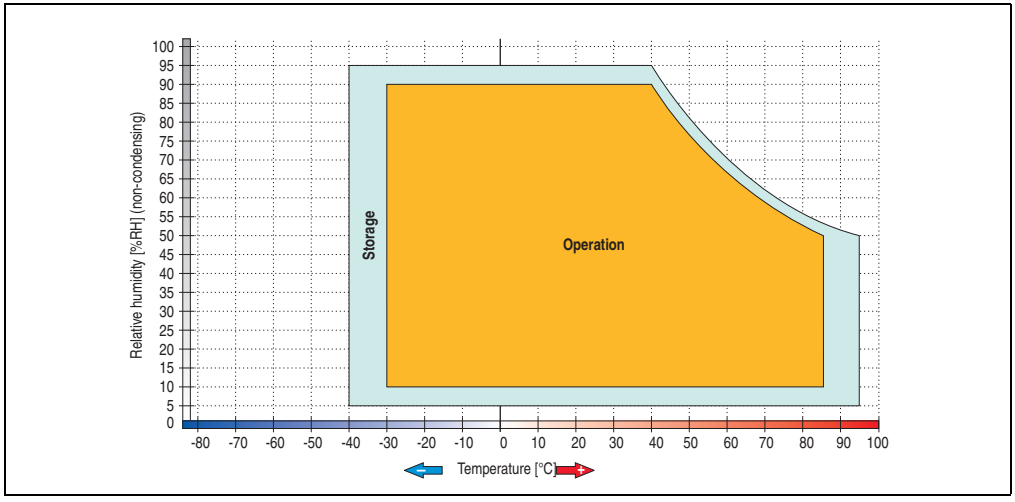


Figure 107: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-06

Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

3.7.10 Add-on CompactFlash slot - 5AC600.CFSI-00

A CompactFlash card inserted in the add-on drive is referred to internally as the "primary slave drive."

Information:

Add-on drives are only available factory-installed. Therefore, they need to be requested when placing an order.

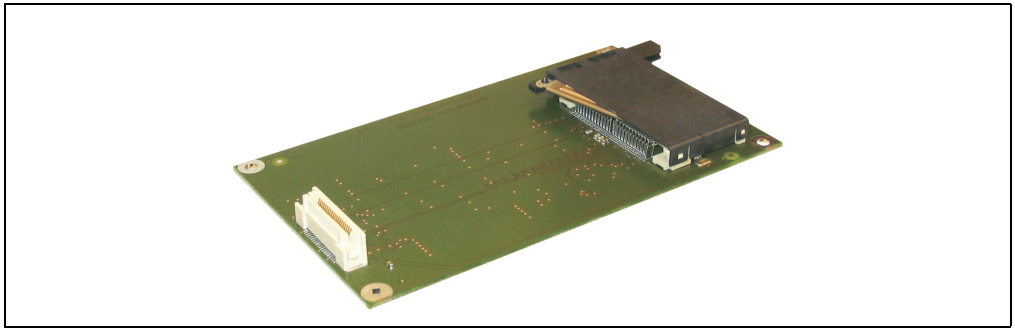


Figure 108: Add-on CompactFlash slot - 5AC600.CFSI-00

Technical data

Features	5AC600.CFSI-00
CompactFlash Type Amount Connection	 Type I 1 slot Primary slave
Weight	100 g

Table 80: Technical data - Add-on CompactFlash slot 5AC600.CFSI-00

Warning!

Turn off power before inserting or removing the CompactFlash card!

3.7.11 Slide-in CD-ROM - 5AC600.CDXS-00

The slide-in drive can be used in system units with 1 or 2 PCI slots. When inserted in slide-in slot 1, it is referred to internally as "secondary slave".

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

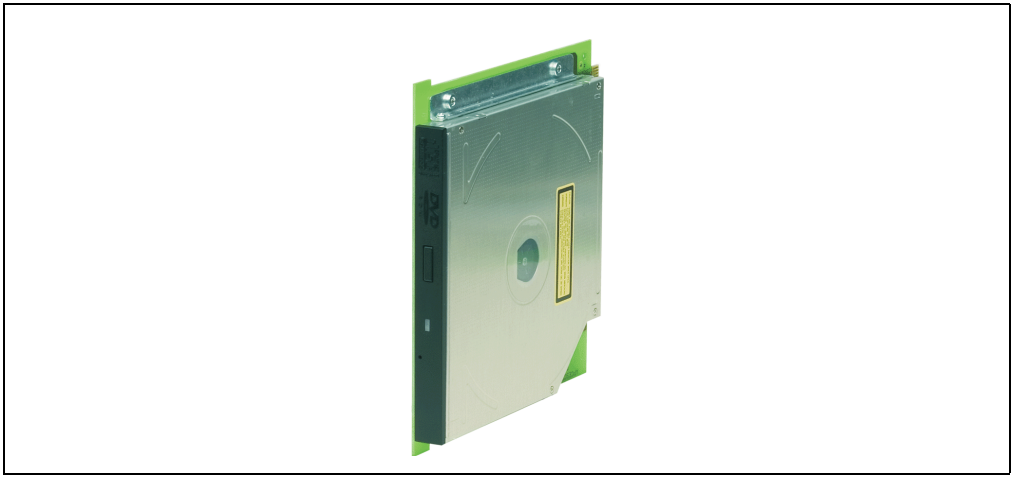


Figure 109: Slide-in CD-ROM - 5AC600.CDXS-00

Technical data

Information:

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

Features	5AC600.CDXS-00
Reading rate	24x
Data transfer rate	Max. 33.3 MB/s
Access time (average)	115 ms
Revolution speed	Max. 5136 rpm ±1%
Starting time (0 rpm to read access)	10 seconds (maximum)
Host interface	IDE (ATAPI)
Readable CD media	CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW
Compatible formats	CD-DA, CD-ROM mode 1/mode 2 CD-ROM XA mode 2 (form 1, form 2) Photo CD (single/multi-session) Enhanced CD
Cache	128 kB
Noise level (complete read access)	Approx. 45 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
Environmental characteristics	
Ambient temperature[1)] Operation Bearings Transport	 -5 to 60°C[2)] -20 to 60°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 80%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings Transport	 5 - 500 Hz: 0.3 g (2.9 m/s^2 0-peak) 5 - 500 Hz: 2 g (19.6 m/s^2 0-peak) 5 - 500 Hz: 5 g (49 m/s^2 0-peak)
Shock Operation Bearings Transport	 Max. 7 g (68 m/s^2 0-peak) at 11 ms duration Max. 60 g (588 m/s^2 0-peak) at 11 ms duration Max. 200 g (1962 m/s^2 0-peak) at 2 ms duration Max. 60 g (588 m/s^2 0-peak) at 11 ms duration Max. 200 g (1962 m/s^2 0-peak) at 2 ms duration

Table 81: Technical data - Slide-in CD-ROM 5AC600.CDXS-00

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Drive surface temperature

Temperature humidity diagram

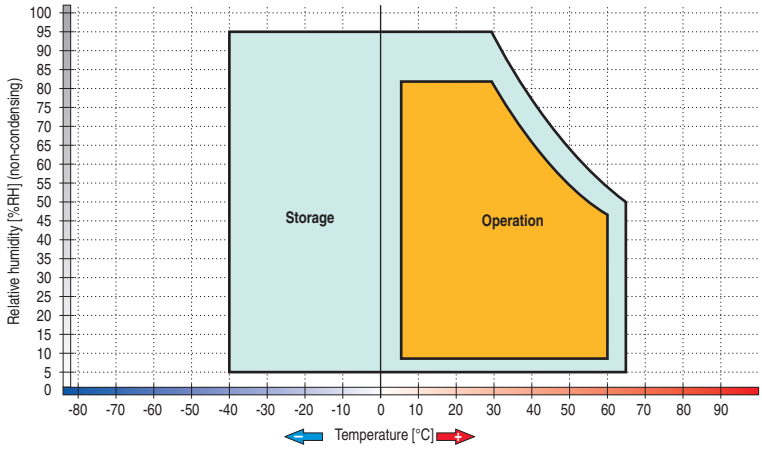


Figure 110: Temperature humidity diagram - Slide-in CD-ROM 5AC600.CDXS-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.12 Slide-in DVD-ROM/CD-RW - 5AC600.DVDS-00

The slide-in drive can be used in system units with 1 or 2 PCI slots. When inserted in slide-in slot 1, it is referred to internally as "secondary slave".

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

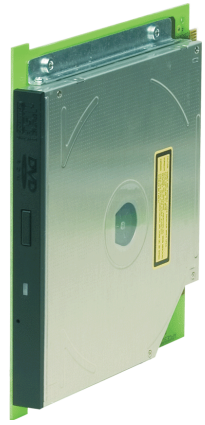


Figure 111: Slide-in DVD-ROM/CD-RW - 5AC600.DVDS-00

Technical data

Information:

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

Features	5AC600.DVDS-00
Write speed CD-R CD-RW	 24x, 16x, 10x and 4x 10x and 4x
Reading rate CD DVD	 24x 8x
Data transfer rate	Max. 33.3 MB/s
Access time (average) CD DVD	 85 ms 110 ms
Revolution speed	Max. 5136 rpm ±1%
Starting time (0 rpm to read access)	19 seconds (maximum)
Host interface	IDE (ATAPI)
Readable media CD DVD	 CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW DVD-ROM, DVD-R, DVD-RW, DVD-RAM
Non-write protected media CD	 CD-R, CD-RW
Compatible formats	CD-DA, CD-ROM mode 1/mode 2 CD-ROM XA mode 2 (form 1, form 2) Photo CD (single/multi-session) Enhanced CD, CD text DVD-ROM, DVD-R, DVD-Video (double layer) DVD-RAM (4.7 GB, 2.6 GB)
Write-methods	Disk at once, session at once, packet write, track at once
Laser class	Class 1 laser
Data buffer capacity	2 MB
Noise level (complete read access)	Approx. 45 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
Environmental characteristics	
Ambient temperature[1)] Operation Bearings Transport	 5 to 50°C[2)] -20 to 60°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 80%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings Transport	 5 - 500 Hz: 0.2 g (1.9 m/s^2 0-peak) 5 - 500 Hz: 2 g (19.6 m/s^2 0-peak) 5 - 500 Hz: 2 g (19.6 m/s^2 0-peak)

Table 82: Technical data - slide-in DVD-ROM/CD-RW 5AC600.DVDS-00

Features	5AC600.DVDS-00
Shock	
Operation	Max. 5 g (49 m/s^2 0-peak) and 11 ms duration
Bearings	Max. 60 g (588 m/s^2 0-peak) and 11 ms duration Max. 200 g (1962 m/s^2 0-peak) and 2 ms duration
Transport	Max. 60 g (588 m/s^2 0-peak) and 11 ms duration Max. 200 g (1962 m/s^2 0-peak) and 2 ms duration

Table 82: Technical data - slide-in DVD-ROM/CD-RW 5AC600.DVDS-00 (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Drive surface temperature

Temperature humidity diagram

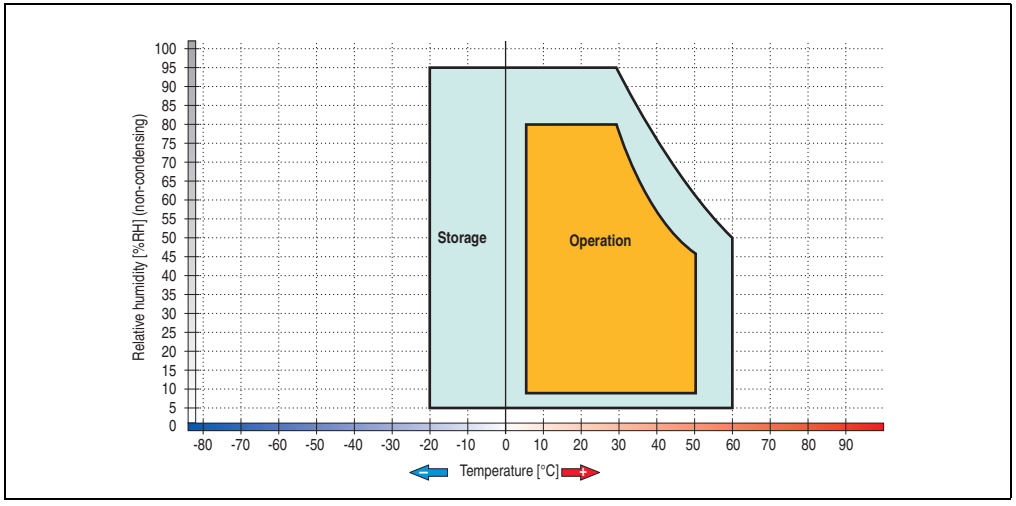


Figure 112: Temperature humidity diagram - Slide-in DVD-ROM/CD-RW 5AC600.DVDS-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.13 Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00

The slide-in drive can be used in system units with 1 or 2 PCI slots. When inserted in slide-in slot 1, it is referred to internally as "secondary slave".

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

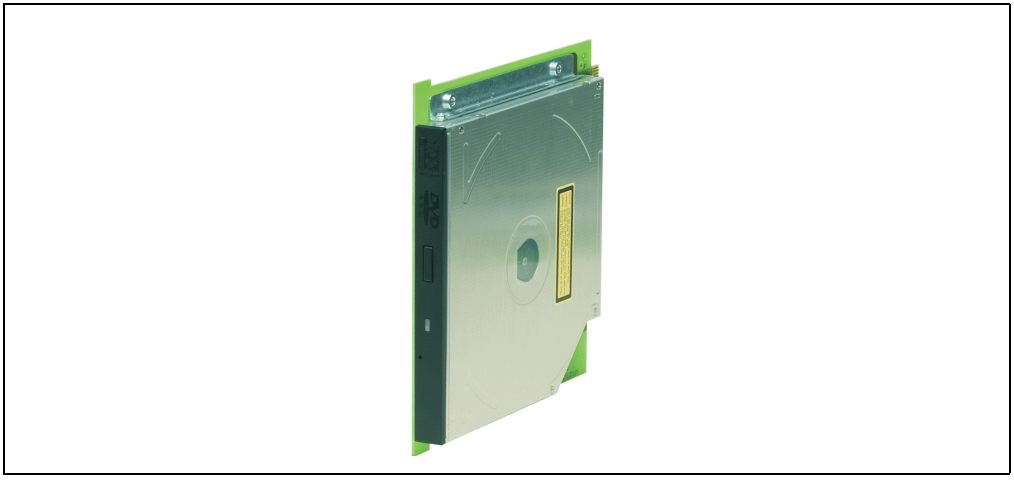


Figure 113: Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00

Technical data - Revision D0 and higher

Information:

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

Features	5AC600.DVRS-00 revision D0 and higher
Write speed CD-R CD-RW DVD-R DVD-RW DVD-RAM DVD+R DVD+R (double layer) DVD+RW	 24x, 16x, 10x and 4x 10x and 4x 8x, 4x and 2x 4x and 2x 3x and 2x 8x, 4x and 2x 2x,4x 4x and 2x
Reading rate CD DVD	 24x 8x
Data transfer rate	Max. 33.3 MB/s
Access time (average) CD DVD	 130 ms (24x) 130 ms (8x)
Revolution speed	Max. 5090 rpm ±1%
Starting time (0 rpm to read access) CD DVD	 14 seconds (maximum) 15 seconds (maximum)
Host interface	IDE (ATAPI)
Readable media CD DVD	 CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW DVD-ROM, DVD-R, DVD-RW. DVD-RAM, DVD+R, DVD+R (double layer), DVD+RW
Non-write protected media CD DVD	 CD-R, CD-RW DVD-R/RW, DVD-RAM (4.7 GB), DVD+R/RW, DVD+R (double layer)
Compatible formats	CD-DA, CD-ROM mode 1/mode 2 CD-ROM XA mode 2 (form 1, form 2) Photo CD (single/multi-session), Enhanced CD, CD text DVD-ROM, DVD-R, DVD-RW, DVD-Video DVD-RAM (4.7 GB, 2.6 GB) DVD+R, DVD+R (double layer), DVD+RW
Write-methods CD DVD	 Disk at once, session at once, packet write, track at once Disk at once, incremental, over-write, sequential, multi-session
Laser class	Class 1 laser
Data buffer capacity	8 MB
Noise level (complete read access)	Approx. 48 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
Environmental characteristics	
Ambient temperature[1)] Operation Bearings Transport	 5 to 55°C[2)] -20 to 60°C -40 to 65°C

Table 83: Technical data - slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 revision D0 and higher

Features	5AC600.DVRS-00 revision D0 and higher
Relative humidity	
Operation	8 to 80%, non-condensing
Bearings	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Vibration	
Operation	At max. 5 - 500 Hz and 0.2 g
Bearings	At max. 5 - 500 Hz and 2 g
Transport	At max. 5 - 500 Hz and 2 g
Shock (pulse with a sine half-wave)	
Operation	At max. 5 g for 11 ms
Bearings	At max. 60 g for 11 ms At max. 200 g for 2 ms
Transport	At max. 60 g for 11 ms At max. 200 g for 2 ms

Table 83: Technical data - slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 revision D0 and higher (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Drive surface temperature

Technical data - revision D0 or lower

Features	5AC600.DVRS-00 revision D0 and lower
Write speed	
CD-R	24x, 16x, 10x and 4x
CD-RW	10x and 4x
DVD-R	8x, 4x and 2x
DVD-RW	4x and 2x
DVD+R	8x, 4x and 2x
DVD+RW	4x and 2x
Reading rate	
CD	24x
DVD	8x
Data transfer rate	Max. 33.3 MB/s
Access time (average)	
CD	130 ms (24x)
DVD	130 ms (8x)
Revolution speed	Max. 5090 rpm ±1%
Starting time (0 rpm to read access)	
CD	14 seconds (maximum)
DVD	15 seconds (maximum)
Host interface	IDE (ATAPI)
Readable media	
CD	CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW
DVD	DVD-ROM, DVD-R, DVD-RW
Non-write protected media	
CD	CD-R, CD-RW
DVD	DVD-R/RW, DVD+R/RW

Table 84: Technical data - slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 revision D0 and lower

Features	5AC600.DVRS-00 revision D0 and lower
Compatible formats	CD-DA, CD-ROM mode 1/mode 2 CD-ROM XA mode 2 (form 1, form 2) Photo CD (single/multi-session) Enhanced CD, CD text DVD-ROM, DVD-R, DVD-Video (double layer), DVD-RW DVD+R, DVD+R (double layer), DVD+RW
Write-methods CD DVD	 Disk at once, session at once, packet write, track at once Disk at once, incremental, over-write, sequential, multi-session
Laser class	Class 1 laser
Data buffer capacity	8 MB
Noise level (complete read access)	Approx. 48 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
Environmental characteristics	
Ambient temperature[1)] Operation Bearings Transport	 5 to 55°C[2)] -20 to 60°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 80%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings Transport	 At max. 5 - 500 Hz and 0.2 g At max. 5 - 500 Hz and 2 g At max. 5 - 500 Hz and 2 g
Shock (pulse with a sine half-wave) Operation Bearings Transport	 At max. 5 g for 11 ms At max. 60 g for 11 ms At max. 200 g for 2 ms At max. 60 g for 11 ms At max. 200 g for 2 ms

Table 84: Technical data - slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 revision D0 and lower (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Drive surface temperature

Temperature humidity diagram

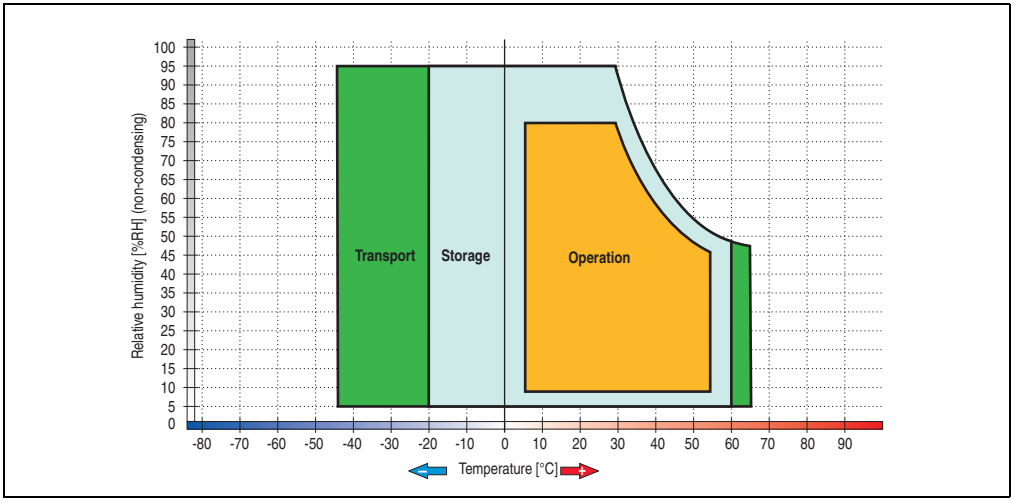


Figure 114: Temperature humidity diagram - Slide-in DVD-R/RW, DVD+R/RW 5AC600.DVRS-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.14 Slide-in CF 2 slot - 5AC600.CFSS-00

The slide-in drive can be used in system units with 1 or 2 PCI slots. When inserted in slide-in slot 1, CompactFlash slot CF3 is referred to internally as "secondary slave". CompactFlash slot CF4 is always accessed via USB.

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

Warning!

The CompactFlash card can only be inserted in and removed from the CF3 IDE CompactFlash slot can only take place without power applied to the PPC700!

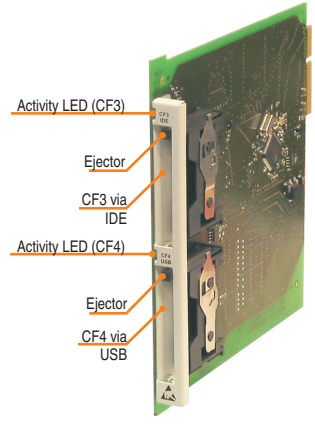


Figure 115: Slide-in CF 2-slot - 5AC600.CFSS-00

Technical data

Features	5AC600.CFSS-00
CompactFlash (CF3)	
Type	Type I and II
Amount	1 slot
Connection	IDE - Secondary slave in slide-in slot 1 IDE - Secondary master in slide-in slot 2
Activity LED	Yes
CompactFlash (CF4)	
Type	Type I and II
Amount	1 slot
Connection	Via USB 2.0
Activity LED	Yes

Table 85: Technical data - Slide-in CF slot 2 - 5AC600.CFSS-00

3.7.15 Slide-in USB FDD - 5AC600.FDDS-00

The slide-in drive can be used in system units with 1 or 2 PCI slots. In these units it is connected to the system via USB.

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

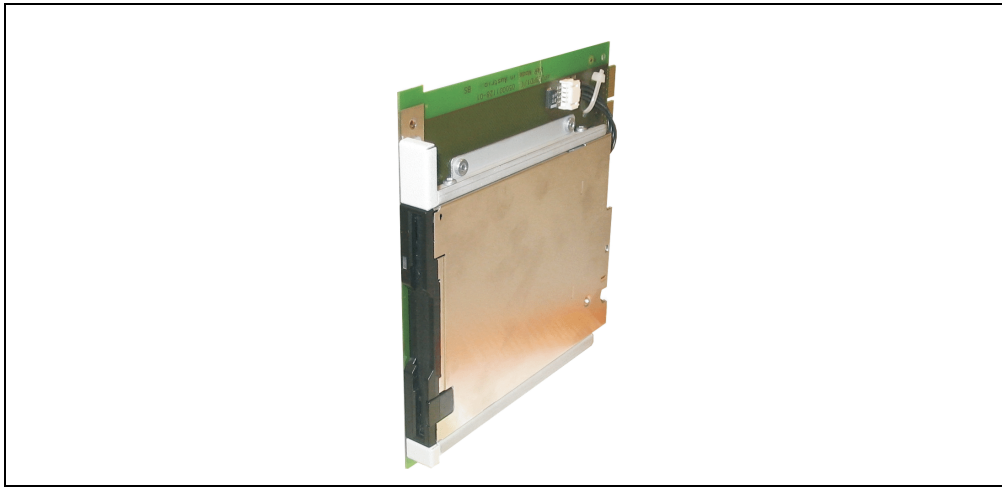


Figure 116: Slide-in USB FDD - 5AC600.FDDS-00

Technical data

Information:

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

Features	5AC600.FDDS-00
Data capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
USB transfer rate	Full speed (12 Mbps)
Data transfer rate	250 kbits (720 KB) or 500 kbits (1.25 MB and 1.44 MB)
Rotation speed	Up to 360 rpm
Diskette media	High density (2HD) or normal density (2DD) 3.5" diskettes
MTBF	30,000 POH (Power-On Hours)
Environmental characteristics	
Ambient temperature[1)] Operation Bearings Transport	 4 to 50°C -20 to 60°C -20 to 60°C
Relative humidity Operation Bearings Transport	 20 to 80%, non-condensing 5 to 90%, non-condensing 5 to 90%, non-condensing
Vibration Operation Bearings Transport	 At max. 5 - 500 Hz and 0.3 g At max. 10 - 100 Hz and 2 g At max. 10 - 100 Hz and 2 g
Shock (pulse with a sine half-wave) Operation Bearings Transport	 At max. 5 g for 11 ms At max. 60 g for 11 ms At max. 60 g for 11 ms
Altitude	Max. 3000 meters

Table 86: Technical data - Slide-in USB diskette drive - 5AC600.FDDS-00

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

Temperature humidity diagram

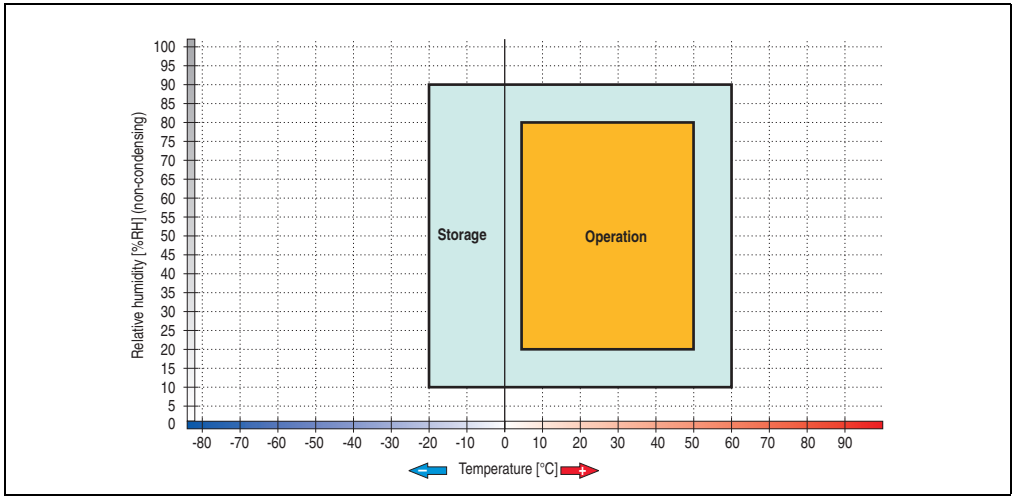


Figure 117: Temperature humidity diagram - Slide-in USB diskette drive 5AC600.FDDS-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.16 Slide-in hard disk 30 GB 24x7 - 5AC600.HDDS-00

This hard disk is specified for 24-hour operation. The slide-in drive can be used in system units with 1 or 2 PCI slots. When inserted in slide-in slot 1, it is referred to internally as "secondary slave".

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

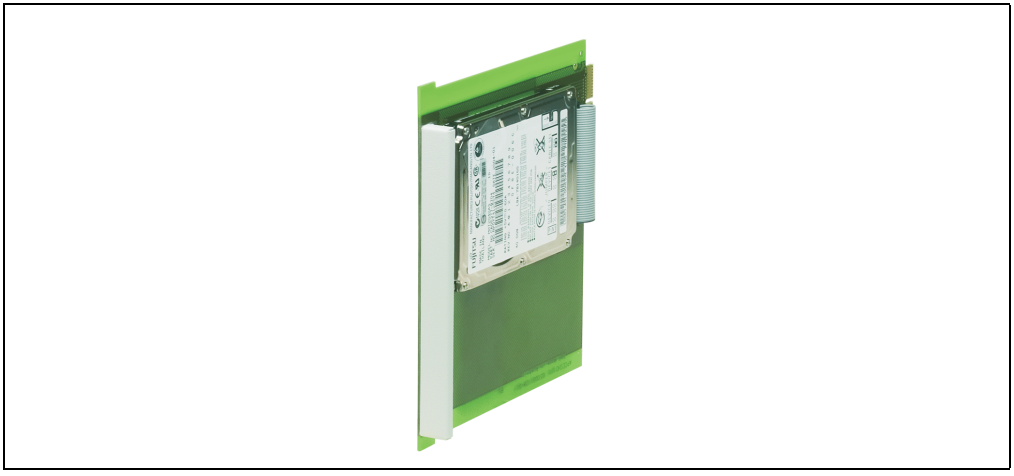


Figure 118: Slide-in hard disk 30 GB - 5AC600.HDDS-00

Technical data

Information:

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

Features	5AC600.HDDS-00
Manufacturer's product ID	Fujitsu MHT2030AR
Formatted capacity	30 GB
Number of heads	2
Number of sectors (user)	58,605,120
Bytes per sector	512
Revolution speed	4200 rpm ±1%
Access time (average)	7.14 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum	 1.5 ms 12 ms 22 ms
Starting time (0 rpm to read access)	5 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 26.1 to 36.2 MB/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 24 dBA at 30 cm
Electrical characteristics	
Lifespan	5 years or 20,000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical characteristics	
Slide-in mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g

Table 87: Technical data - Slide-in hard disk - 5AC600.HDDS-00

Environmental characteristics	5AC600.HDDS-00
Ambient temperature[1)]	
Operation - standard[2)]	5 to 55°C
Operation - 24-hour[3)]	5 to 44°C
Bearings	-40 to 65°C
Transport	-40 to 65°C
Relative humidity	
Operation	8 to 90%, non-condensing
Bearings	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Vibration	
Operation	No non-recovered errors at max. 5 - 500 Hz and 1 g (9.8 m/s^2 0-peak)
Bearings	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)
Shock (pulse with a sine half-wave)	
Operation	No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration
Bearings	No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration
	No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude	
Operation	- 300 to 3000 meters
Bearings	- 300 to 12000 meters

Table 87: Technical data - Slide-in hard disk - 5AC600.HDDS-00 (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Standard operation means 250 POH (power-on hours) per month.

3) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

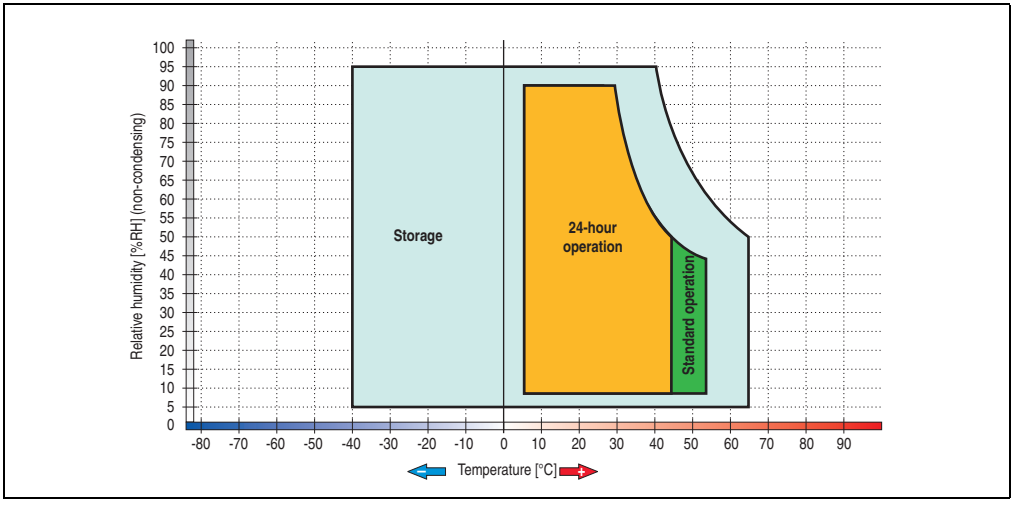


Figure 119: Temperature humidity diagram - Slide-in hard disk 5AC600.HDDS-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.17 Slide-in hard disk ET 20 GB - 5AC600.HDDS-01

This hard disk has an extended temperature specification (ET), but is not permitted for 24 hour operation. The slide-in drive can be used in system units with 1 or 2 PCI slots. When inserted in slide-in slot 1 it is referred to internally as "secondary slave" and when in slide-in slot 2 as "secondary master."

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

Figure 120: Slide-in hard disk 20 GB - 5AC600.HDDS-01

Technical data

Information:

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

Features	5AC600.HDDS-01
Manufacturer's product ID	Fujitsu MHT2020AC
Formatted capacity	20 GB
Number of heads	2
Number of sectors (user)	39,070,080
Bytes per sector	512
Revolution speed	4200 rpm ±1%
Access time (average)	7.14 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum	 1.5 ms 12 ms 22 ms
Starting time (0 rpm to read access)	5 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 Up to 28.9 MB/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 22 dBA at 30 cm
Electrical characteristics	
Lifespan	5 years or 20,000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical characteristics	
Slide-in mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[1)] Operation[2)] Bearings Transport	 -20 to 80°C -40 to 85°C -40 to 85°C

Table 88: Technical data - Slide-in hard disk - 5AC600.HDDS-01

Environmental characteristics	5AC600.HDDS-01
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 No non-recovered errors at max. 5 - 500 Hz and 1 g (9.8 m/s^2 0-peak) No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3000 meters - 300 to 12000 meters

Table 88: Technical data - Slide-in hard disk - 5AC600.HDDS-01 (Forts.)

1) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

2) Standard operation means 250 POH (power-on hours) per month.

Temperature humidity diagram

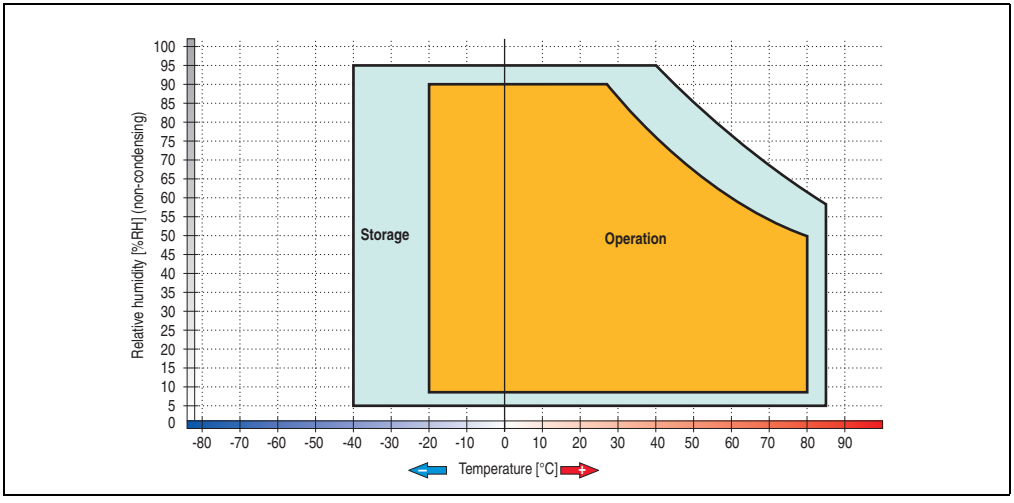


Figure 121: Temperature humidity diagram - Slide-in hard disk 5AC600.HDDS-01

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.18 Slide-in hard disk 40 GB - 5AC600.HDDS-02

This hard disk is specified for 24-hour operation and also provides an extended temperature specification. The slide-in drive can be used in system units with 2 or 5 PCI slots. When inserted in slide-in slot 1 it is referred to internally as "secondary slave" and when in slide-in slot 2 as "secondary master."

Information:

It is possible to add or remove a slide-in drive at any time.

Caution!

Turn off power before adding or removing a slide-in drive.

Figure 122: Slide-in hard disk 40 GB - 5AC600.HDDS-02

Technical data

Information:

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

Features	5AC600.HDDS-02
Manufacturer's product ID	Seagate ST940813AM
Formatted capacity	40 GB
Number of heads	2
Number of sectors (user)	78,140,160
Bytes per sector	512
Revolution speed	5400 rpm ±1%
Access time (average)	12.5 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 12.5 ms 22 ms
Starting time (0 rpm to read access)	3 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 max. 321 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
S.M.A.R.T. Support	Yes
MTBF	550,000 hours[1)]
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	100 g
Environmental characteristics	
Ambient temperature[2)] Operation - Standard / 24-hour Bearings Transport	 -30 to 85°C -40 to 95°C -40 to 95°C

Table 89: Technical data - Slide-in hard disk - 5AC600.HDDS-02

Environmental characteristics	5AC600.HDDS-02
Relative humidity	
Operation	5 to 90%, non-condensing
Bearings	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Vibration	
Operation	10 - 500 Hz: 1 g (9.8 m/s^2 0-peak) no non-recovered errors
Bearings	5 - 500 Hz: 5 g (49 m/s^2 0-peak) no non-recovered errors
Shock (pulse with a sine half-wave)	
Operation	No non-recovered errors at max. 200 g (1962 m/s^2 0-peak) and 2 ms duration No non-recovered errors at max. 110 g (1079 m/s^2 0-peak) and 11 ms duration
Bearings	No damage at max. 800 g (7848 m/s^2 0-peak) and 2 ms duration No damage at max. 400 g (3924 m/s^2 0-peak) and 0.5 ms duration
Altitude	
Operation	- 300 to 4419 meters
Bearings	- 300 to 12192 meters

Table 89: Technical data - Slide-in hard disk - 5AC600.HDDS-02 (Forts.)

1) With 8760 POH (Power On Hours) per year and 70°C surface temperature.

2) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

Temperature humidity diagram

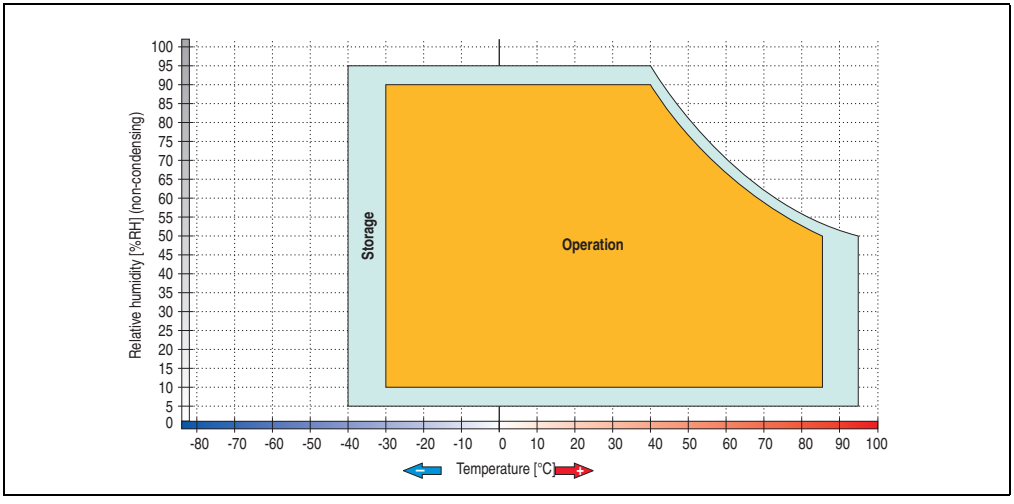


Figure 123: Temperature humidity diagram - Slide-in hard disk 5AC600.HDDS-02

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3.7.19 RAID system

Sometimes it is simply not possible to avoid using hard disks due to the amount of data that needs to be saved. In this case, a RAID provides high system availability. All data is simultaneously and automatically stored on two hard drives. This double data storage means that when one hard disk fails, the system will continue to run on the second hard disk.

Advantages for the user:

- No data loss when hard drive fails.
- The system continues to run with a hard disk.
- Data redundancy is automatically restored by the system when the faulty hard disk has been replaced.

Depending on the type, the RAID 1 system is designed in the form of 1 or 2 PCI cards.

1 PCI slot: PCI SATA RAID controller 5ACPCI.RAIC-01 (2x60GB) or 5ACPCI.RAIC-03 (2x160GB)

2 PCI slot: PCI RAID controller (5ACPCI.RAIC-00) and PCI card with two hard disks (5ACPCI.RAIS-00 or 5ACPCI.RAIS-01)

The system can be flexibly implemented in all APC620 und PPC700s with 1 free PCI slot (depending on the RAID system design). The system also supports RAID 0 applications. As a result, parallel access to two hard drives with a relatively high data throughput is the main focus, in addition to the high availability.

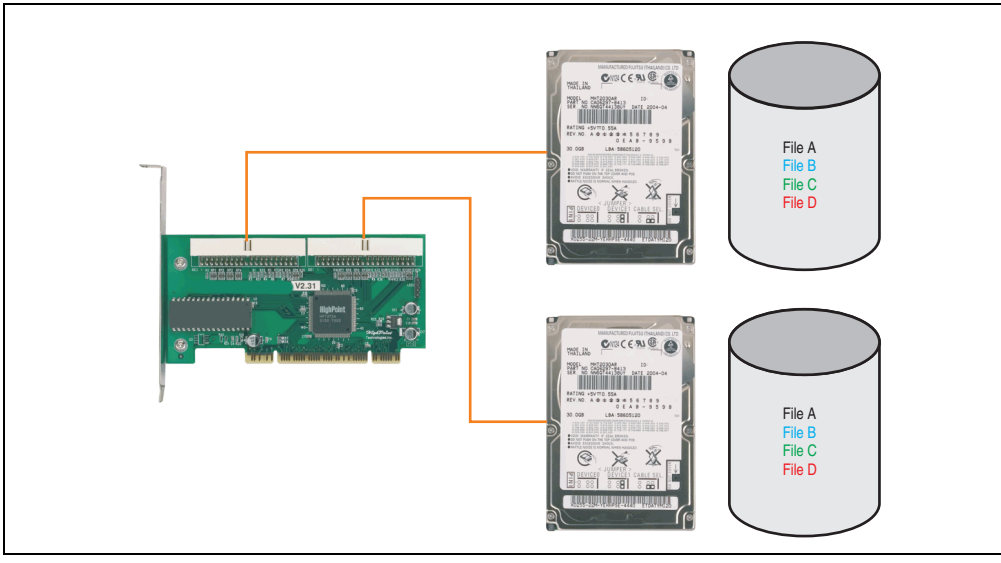


Figure 124: RAID 1 system schematic

PCI RAID Controller ATA/100 5ACPCI.RAIC-00

Information:

PCI RAID controllers are only available factory-installed. Therefore, this needs to be requested when placing the order.

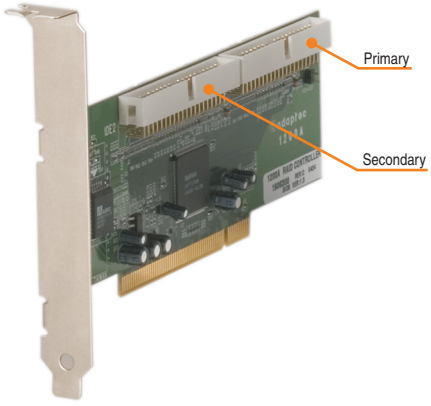


Figure 125: RAID controller 5ACPCI.RAIC-00

Technical data

Features	5ACPCI.RAIC-00
Manufacturer's product ID	Adaptec ATA RAID 1200A
Data transfer rate	up to 100 MB/s per channel
RAID level	Supports RAID 0, 1, 0/1 and JBOD
Internal connections	Two 40-pin connections
Electrical characteristics	
Power consumption	0.15 A at 5 V (PCI bus)
Mechanical characteristics	
Outer dimensions Length Height	 168 mm 64 mm
Environmental characteristics	
Ambient temperature Operation Bearings Transport	 0 to 55°C -20 to 60°C -20 to 60°C

Table 90: Technical data - RAID controller - 5ACPCI.RAIC-00

Contents of delivery

Amount	Component
1	Adaptec ATA RAID 1200A controller
2	ATA RAID connection cable (length 130 mm)

Table 91: Contents of delivery - 5ACPCI.RAIC-00

PCI RAID storage 2 x 40 GB 5ACPCI.RAIS-00

Information:

PCI RAID storage drives are only available factory-installed. Therefore, this needs to be requested when placing the order.

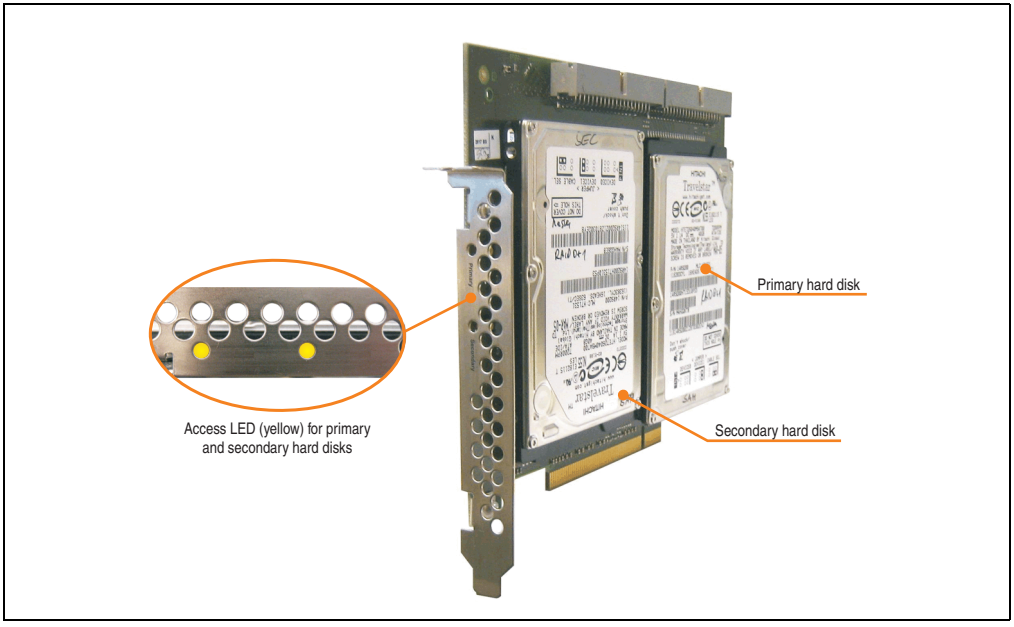


Figure 126: PCI RAID storage 5ACPCI.RAIS-00

Technical data

Information:

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

Features	5ACPCI.RAIS-00
Manufacturer's product ID	Hitachi Travelstar HTE726040M9AT00
Formatted capacity	40 GB
Number of heads	4
Number of sectors (user)	78,140,160
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	4.2 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 10 ms 16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 236 to 507 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30,000 POH (Power-On Hours)
MTBF	477,000 hours[1)]
Mechanical characteristics	
Mounted on PCI insert	Fixed
Outer dimensions (without PCI card) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	350 g
Environmental characteristics	
Ambient temperature[2)] Operation - standard [3)] Operation - 24-hour[4)] Bearings Transport	 5 to 55°C 5 to 40°C -40 to 65°C -40 to 65°C

Table 92: Technical data - RAID hard disk - 5ACPCI.RAIS-00

Environmental characteristics	5ACPCI.RAIS-00
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 No non-recovered errors at max. 5 - 500 Hz and 1 g (9.8 m/s^2 0-peak) No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 200 g (1960 m/s^2 0-peak) and 2 ms duration No damage at max. 980 g (9800 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 92: Technical data - RAID hard disk - 5ACPCI.RAIS-00 (Forts.)

1) Manufacturer specification at +40°C ambient temperature.

2) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3) Standard operation means 333 POH (power-on hours) per month.

4) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

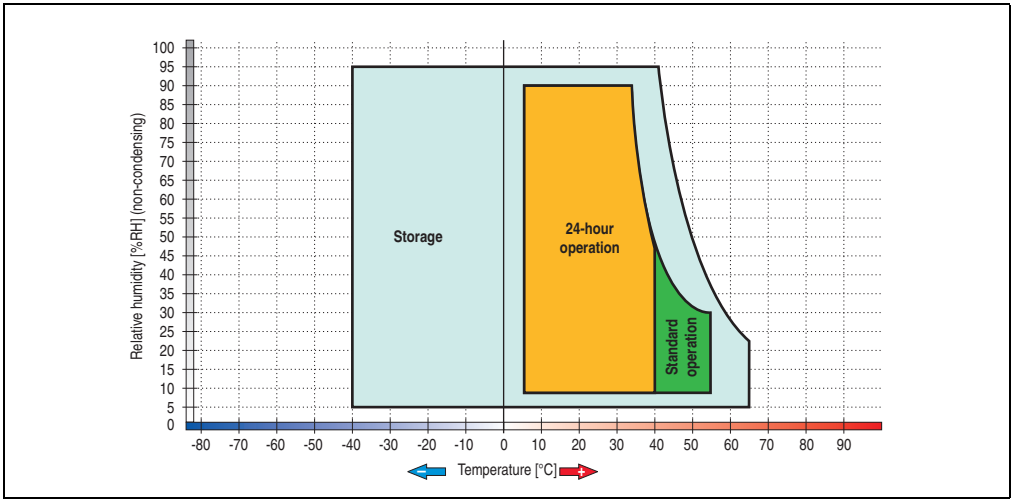


Figure 127: Temperature humidity diagram - RAID hard disk 5ACPCI.RAIS-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

PCI RAID storage 2 x 60 GB - 5ACPCI.RAIS-01

Information:

PCI RAID storage drives are only available factory-installed. Therefore, this needs to be requested when placing the order.

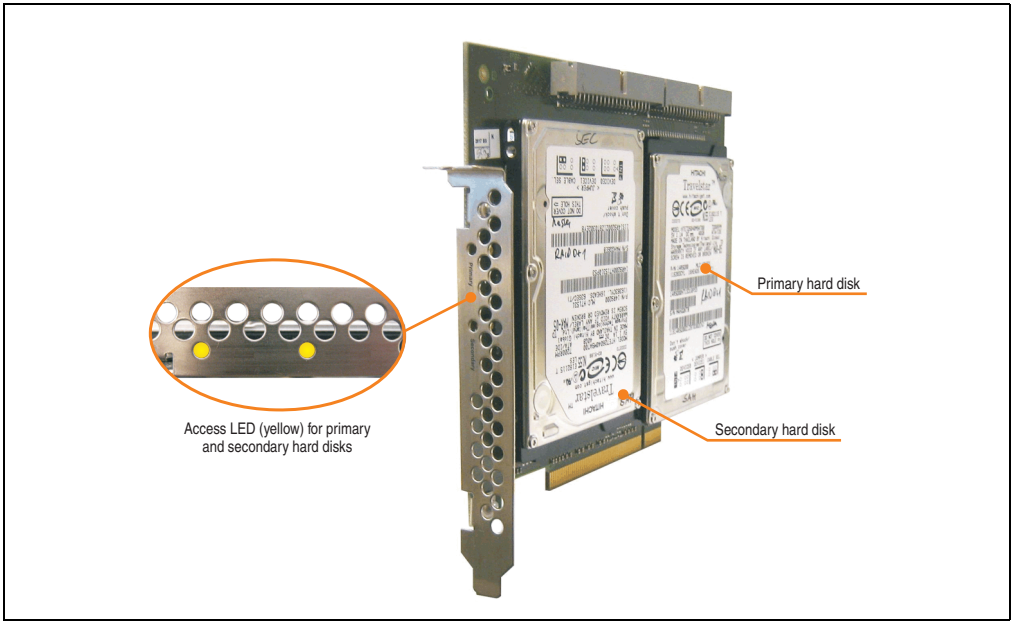


Figure 128: PCI RAID storage - 5ACPCI.RAIS-01

Technical data

Information:

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

Features	5ACPCI.RAIS-01
Manufacturer's product ID	Hitachi HTE721060G9AT00
Formatted capacity	60 GB

Table 93: Technical data - RAID hard disk - 5ACPCI.RAIS-01

Features	5ACPCI.RAIS-01
Number of heads	3
Number of sectors (user)	117,210,240
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	10 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 10 ms 16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate On the medium To/from host	 267 to 629 MBit/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30,000 POH (Power-On Hours)
MTBF	550,000 hours[1)]
Mechanical characteristics	
Mounted on PCI insert	Fixed
Outer dimensions (without PCI card) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature[2)] Operation - standard [3)] Operation - 24-hour[4)] Bearings Transport	 5 to 55°C 5 to 40°C -40 to 65°C -40 to 65°C
Relative humidity Operation Bearings Transport	 8 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings	 Max. 5 - 500 Hz and 1 g (9.8 m/s^2 0-peak) 1 oct/min duration, no non-recovered errors No damage at max. 10 - 500 Hz and 5 g (49 m/s^2 0-peak) duration 0.5 oct/min
Shock (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 160 g (1568 m/s^2 0-peak) and 1 ms duration No non-recovered errors at max. 300 g (2900 m/s^2 0-peak) and 2 ms duration No non-recovered errors at max. 15 g (147 m/s^2 0-peak) and 11 ms duration No damage at max. 1000 g (9800 m/s^2 0-peak) and 1 ms duration No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration

Table 93: Technical data - RAID hard disk - 5ACPCI.RAIS-01 (Forts.)

Features	5ACPCI.RAIS-01
Altitude	
Operation	- 300 to 3048 meters
Bearings	- 300 to 12192 meters

Table 93: Technical data - RAID hard disk - 5ACPCI.RAIS-01 (Forts.)

1) Manufacturer specification at +40°C ambient temperature.

2) Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

3) Standard operation means 333 POH (power-on hours) per month.

4) 24-hour operation means 732 POH (power-on hours) per month.

Temperature humidity diagram

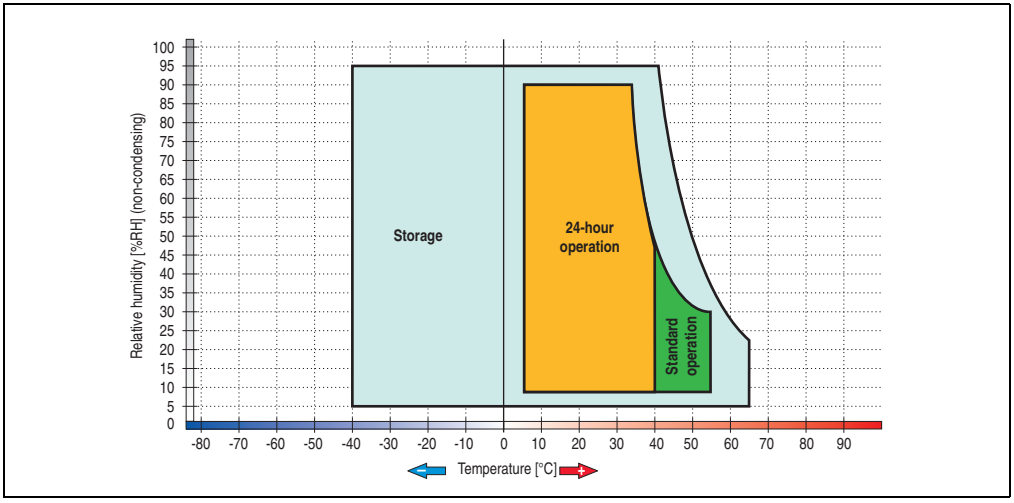


Figure 129: Temperature humidity diagram - RAID hard disk 5ACPCI.RAIS-01

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

PCI SATA RAID 2 x 60 GB 24x7 - 5ACPCI.RAIC-01

The hard disks that are used are specified for 24-hour operation (24x7).

Features

- SATA RAID controller
- RAID Level 0 (striped) and 1 (mirrored)
- 2 SATA hard disk drives (suitable for 24 hour operation)
- Only requires 1 PCI slot
- Transfer rates up to 150 MB/s

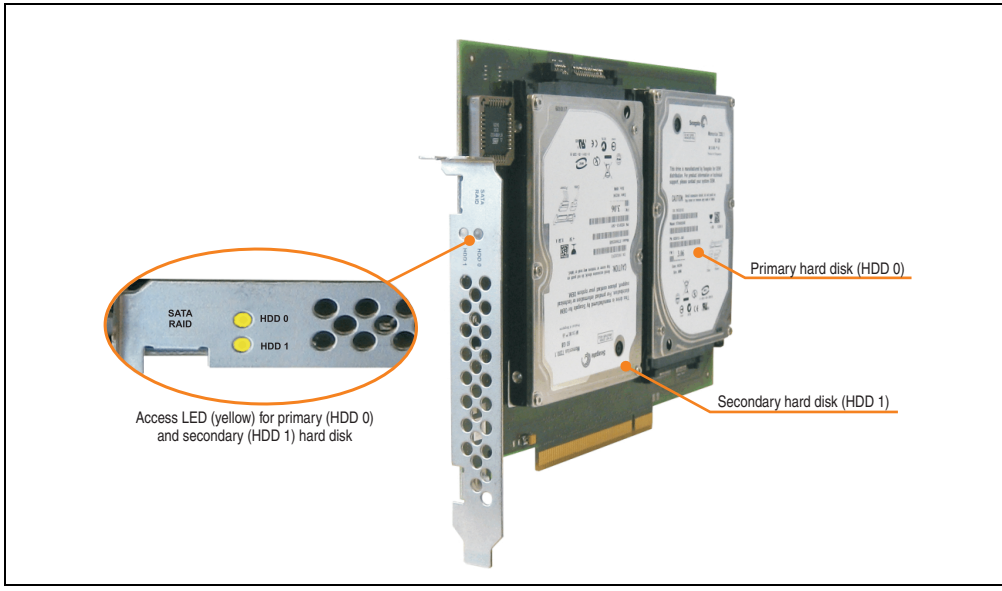


Figure 130: PCI SATA RAID controller - 5ACPCI.RAIC-01

Information:

The PCI SATA RAID controller can not be used in place of a Universal Power Supply (UPS). If the operating system is shut down improperly, the next time it is started it is detected as an error by the RAID 1, and a complete rebuild is executed. This generally takes at least 50 minutes (configurable) to complete.

PCI SATA RAID controllers are only available factory-installed. Therefore, this needs to be requested when placing the order.

Technical data

Information:

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

Features	5ACPCI.RAIC-01
SATA RAID controller Type Specifications Data transfer rate RAID level BIOS Extension ROM - requirements	 Sil 3512 SATA link Serial ATA 1.0 Max. 1.5 GB/s (150 MB/s) Supports RAID 0, 1 ca. 32 KB
Hard disks Amount	Seagate Momentus 7200.1 ST96023AS 2
Formatted capacity (512 bytes/sector)	60 GB
Number of heads	3
Number of sectors (user)	117,210,240
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	4.2 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1.5 ms 10.5 ms 22 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Supported transfer mode	SATA 1.0, PIO mode 0-4, multiword DMA mode 0-2, UDMA 0-5
Data transfer rate On the medium To/from host	 max. 539 MBit/s Max. 150 MB/s
Cache	8 MB
S.M.A.R.T. Support	Yes
Lifespan	5 years
Electrical characteristics	
Power consumption	0.3 A at 3.3 V (PCI bus) 1 A at 5 V (PCI bus)
Mechanical characteristics	
Mounted on PCI insert	Fixed
Weight	350 g

Table 94: Technical data - RAID hard disk - 5ACPCI.RAIC-01

Environmental characteristics	5ACPCI.RAIC-01
Ambient temperature[1]	
Operation - standard [2]	5 to 55°C
Operation - 24-hour[3]	5 to 40°C
Bearings	-40 to 70°C
Transport	-40 to 70°C
Relative humidity	
Operation	5 to 90%, non-condensing
Bearings	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Vibration[4]	
Operation (continuous)	No damage at max. 5 - 500 Hz and 0.125 g (1.225 m/s^2 0-peak) duration 1 oct/min
Operation (occasional)	No damage at max. 5 - 500 Hz and 0.25 g (2.45 m/s^2 0-peak) duration 1 oct/min
Bearings	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) duration 0.5 oct/min
Transport	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) duration 0.5 oct/min
Shock [4] (pulse with a sine half-wave)	
Operation	No non-recovered errors at max. 125 g (1226 m/s^2 0-peak) and 2 ms duration
Bearings	No damage at max. 400 g (3924 m/s^2 0-peak) and 2 ms duration
	No damage at max. 450 g (4424 m/s^2 0-peak) and 1 ms duration
	No damage at max. 200 g (1962 m/s^2 0-peak) and 0.5 ms duration
Altitude	
Operation	- 300 to 3048 meters
Bearings	- 300 to 12192 meters

Table 94: Technical data - RAID hard disk - 5ACPCI.RAIC-01 (Forts.)

1) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

2) Standard operation means 333 POH (power-on hours) per month.

3) 24-hour operation means 732 POH (power-on hours) per month.

4) Operation in areas prone to vibration and shock can affect performance negatively (reduction of transfer rate).

Temperature humidity diagram

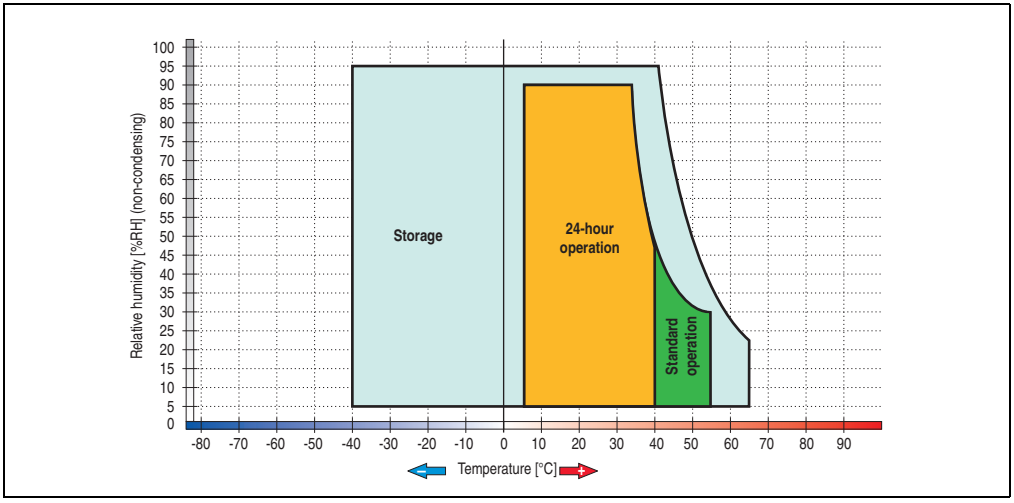


Figure 131: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-01

Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

Driver support

Special drivers are necessary for operating the PCI SATA RAID controller. Drivers for Windows XP Professional and Windows XP Embedded are available on the B&R Homepage in the download area (**www.br-automation.com**).

The .Net based SATA RAID Installation Utility is also on the B&R homepage. This software detects all error states (also during operation) and signals this to the user using pop-up messages.

Information:

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

Behavior if an error occurs in a RAID1 configuration

If one of the two hard disks is physically damaged, when the system is booted the SATA RAID BIOS displays the following error message for approx. 5 seconds: "RAID1 set is in critical status". After this time the operating system is automatically started on the functioning hard disk.

The installed SATA RAID management software detects this error status. After repairing the cause of the error (e.g. replacing the hard disk - see section "Exchanging a PCI SATA hard disk", on page 255 or section "Rebuild mirrored set", on page 324) the SATA RAID management software automatically executes a rebuild (mirroring of the hard disk). This process takes approximately 50 minutes to complete, regardless of the amount of data and with the highest possible setting for "Rebuild rate".

Important notes / BIOS Extension ROM

For PCI cards with BIOS Extension ROM, there is a limited area of 64 KB available in the Phoenix BIOS. A B&R PCI SATA RAID controller requires a free area of approx. 32 KB. The remaining area can be used as desired.

Configuration of a SATA RAID array

Instructions for configuration of a PCI SATA RAID array using RAID BIOS can be found in chapter 3 "Commissioning", section "Configuration of a SATA RAID array", on page 319.

Replacement SATA HDD 60 GB - 5ACPCI.RAIC-02

The hard disk can be used as a replacement part for 5ACPCI.RAIC-01.

Figure 132: Replacement SATA HDD 60 GB - 5ACPCI.RAIC-02

Technical data

Information:

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

Features	5ACPCI.RAIC-02
Hard disks Amount	Seagate Momentus 7200.1 ST96023AS 1
Formatted capacity (512 bytes/sector)	60 GB
Number of heads	3
Number of sectors (user)	117,210,240
Bytes per sector	512
Revolution speed	7200 rpm ±1%
Access time (average)	4.2 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1.5 ms 10.5 ms 22 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Supported transfer mode	SATA 1.0, PIO mode 0-4, multiword DMA mode 0-2, UDMA 0-5
Data transfer rate On the medium To/from host	 max. 539 MBit/s Max. 150 MB/s

Table 95: Technical data - RAID hard disk - 5ACPCI.RAIC-02

Features	5ACPCI.RAIC-02
Cache	8 MB
S.M.A.R.T. Support	Yes
Lifespan	5 years
Environmental characteristics	
Ambient temperature[1)] Operation - standard [2)] Operation - 24-hour[3)] Bearings Transport	 5 to 55°C 5 to 40°C -40 to 70°C -40 to 70°C
Relative humidity Operation Bearings Transport	 5 to 90%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration[4)] Operation (continuous) Operation (occasional) Bearings Transport	 No damage at max. 5 - 500 Hz and 0.125 g (1.225 m/s^2 0-peak) duration 1 oct/min No damage at max. 5 - 500 Hz and 0.25 g (2.45 m/s^2 0-peak) duration 1 oct/min No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) duration 0.5 oct/min No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) duration 0.5 oct/min
Shock [4)] (pulse with a sine half-wave) Operation Bearings	 No non-recovered errors at max. 125 g (1226 m/s^2 0-peak) and 2 ms duration No damage at max. 400 g (3924 m/s^2 0-peak) and 2 ms duration No damage at max. 450 g (4424 m/s^2 0-peak) and 1 ms duration No damage at max. 200 g (1962 m/s^2 0-peak) and 0.5 ms duration
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 95: Technical data - RAID hard disk - 5ACPCI.RAIC-02 (Forts.)

1) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

2) Standard operation means 333 POH (power-on hours) per month.

3) 24-hour operation means 732 POH (power-on hours) per month.

4) Operation in areas prone to vibration and shock can affect performance negatively (reduction of transfer rate).

Temperature humidity diagram

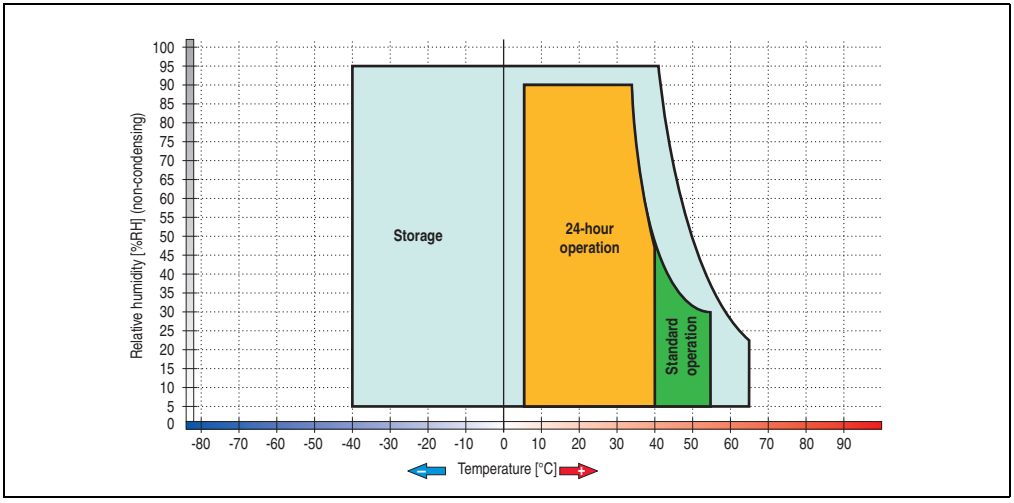


Figure 133: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-02

Exchanging a PCI SATA hard disk

Instructions for exchanging a SATA hard disk can be found in chapter 7 "Maintenance / Servicing", section "Exchanging a PCI SATA RAID hard disk", on page 690.

PCI SATA RAID 2 x 160 GB 24x7 ET - 5ACPCI.RAIC-03

The hard disks being used are specified for 24-hour operation (24x7) and also provides an extended temperature specification (ET).

Features

- SATA RAID controller
- RAID Level 0 (striped) and 1 (mirrored)
- 2 SATA hard disk drives (suitable for 24 hour operation)
- Only requires 1 PCI slot
- Transfer rates up to 150 MB/s

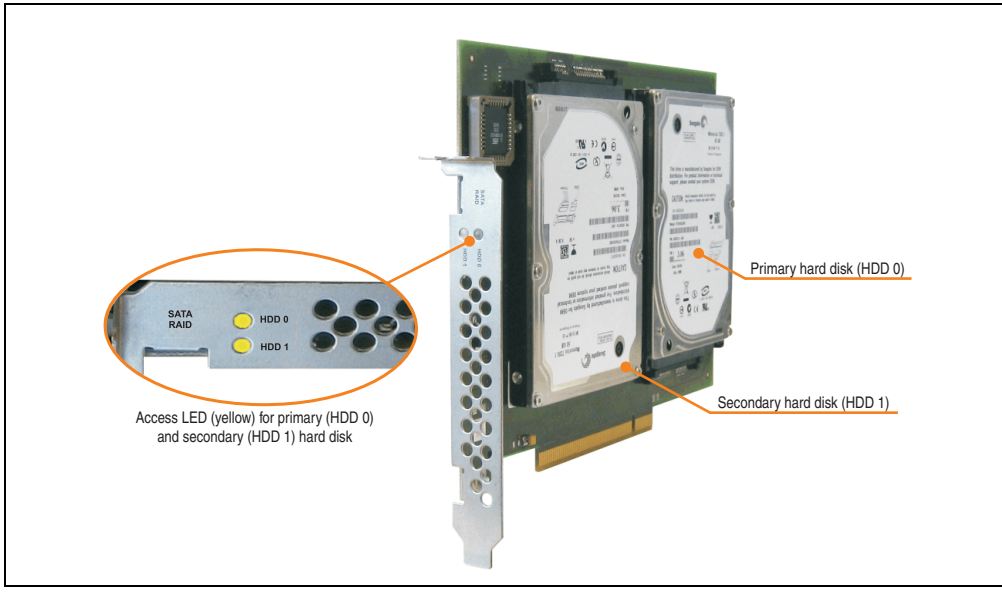


Figure 134: PCI SATA RAID controller - 5ACPCI.RAIC-03

Information:

The PCI SATA RAID controller can not be used in place of a Universal Power Supply (UPS). If the operating system is shut down improperly, the next time it is started it is detected as an error by the RAID 1, and a complete rebuild is executed. This generally takes at least 120 minutes (configurable) to complete.

PCI SATA RAID controllers are only available factory-installed. Therefore, this needs to be requested when placing the order.

Technical data

Information:

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

Features	5ACPCI.RAIC-03
SATA RAID controller Type Specifications Data transfer rate RAID level BIOS Extension ROM - requirements	 Sil 3512 SATA link Serial ATA 1.0 Max. 1.5 GB/s (150 MB/s) Supports RAID 0, 1 Approx. 32 KB
Hard disks Amount	Fujitsu M120-ESW MHY2160BH-ESW 2
Formatted capacity (512 bytes/sector)	160 GB
Number of heads	3
Number of sectors (user)	312,581,808
Bytes per sector	512
Revolution speed	5400 rpm ±1%
Access time (average)	5.56 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1.5 ms 12 ms 22 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Supported transfer mode	SATA 1.0, PIO mode 0-4, multiword DMA mode 0-2, UDMA 0-5
Data transfer rate On the medium To/from host	 Max. 84.6 MBit/s Max. 150 MB/s
Cache	8 MB
S.M.A.R.T. Support	Yes
Lifespan	5 years
Electrical characteristics	
Power consumption	0.3 A at 3.3 V (PCI bus) 1 A at 5 V (PCI bus)
Mechanical characteristics	
Mounted on PCI insert	Fixed
Weight	350 g

Table 96: Technical data - RAID hard disk - 5ACPCI.RAIC-03

Environmental characteristics	5ACPCI.RAIC-03
Ambient temperature[1)] Operation - Standard / 24-hour[2)] Bearings Transport	 -15 to 80°C -40 to 95°C -40 to 95°C
Relative humidity Operation Bearings Transport	 8 to 90% non-condensing (maximum humidity at 29°C) 5 to 95% non-condensing (maximum humidity at 40°C) 5 to 95% non-condensing (maximum humidity at 40°C)
Vibration[3)] Operation (continuous) Operation (occasional) Bearings Transport	 5 - 500 Hz: max. 0.125 g; duration 1 octave per minute; no unrecoverable errors 5 - 500 Hz: max. 0.25 g; duration 1 octave per minute; no unrecoverable errors 5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage 5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage
Shock [4)] (pulse with a sine half-wave) Operation Bearings	 Max. 125 g, 2 ms; no unrecoverable errors Max. 400 g, 2 ms; no damage Max. 450 g, 1 ms; no damage Max. 200 g, 0.5 ms; no damage
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 96: Technical data - RAID hard disk - 5ACPCI.RAIC-03 (Forts.)

1) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

2) 24-hour operation means 732 POH (power-on hours) per month.

3) Operation in areas prone to vibration and shock can affect performance negatively (reduction of transfer rate).

Temperature humidity diagram

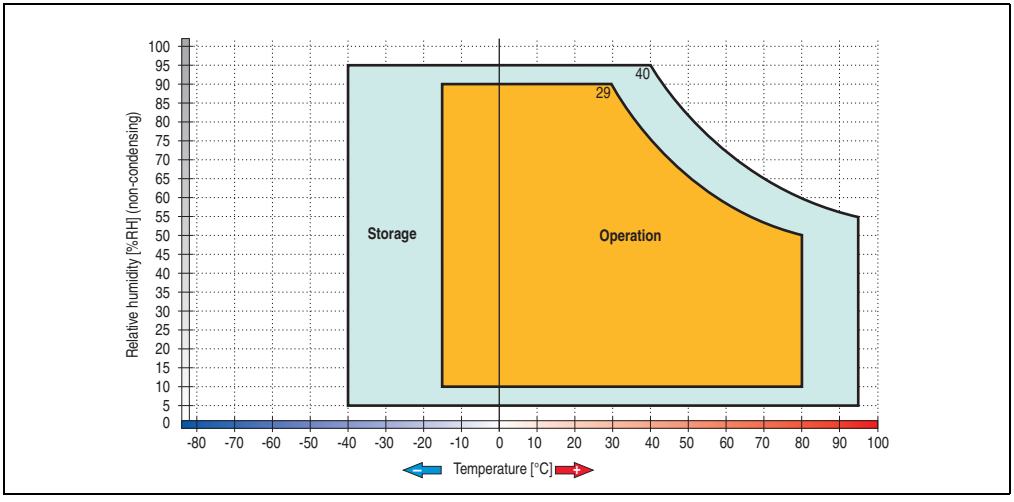


Figure 135: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-03

Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

Driver support

Special drivers are necessary for operating the PCI SATA RAID controller. Drivers for Windows XP Professional and Windows XP Embedded are available on the B&R Homepage in the download area (**www.br-automation.com**).

The .NET based SATA RAID Installation Utility is also on the B&R homepage. This software detects all error states (also during operation) and signals this to the user using pop-up messages.

Information:

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

Behavior if an error occurs in a RAID1 configuration

If one of the two hard disks is physically damaged, when the system is booted the SATA RAID BIOS displays the following error message for approx. 5 seconds: "RAID1 set is in critical status". After this time the operating system is automatically started on the functioning hard disk.

The installed SATA RAID management software detects this error status. After repairing the cause of the error (e.g. replacing the hard disk - see section "Exchanging a PCI SATA hard disk", on page 255 or section "Rebuild mirrored set", on page 324) the SATA RAID management software automatically executes a rebuild (mirroring of the hard disk). This process takes approximately 50 minutes to complete, regardless of the amount of data and with the highest possible setting for "Rebuild rate".

Important notes / BIOS Extension ROM

For PCI cards with BIOS Extension ROM, there is a limited area of 64 KB available in the Phoenix BIOS. A B&R PCI SATA RAID controller requires a free area of approx. 32 KB. The remaining area can be used as desired.

Configuration of a SATA RAID array

Instructions for configuration of a PCI SATA RAID array using RAID BIOS can be found in chapter 3 "Commissioning", section "Configuration of a SATA RAID array", on page 319.

Replacement SATA HDD 160 GB - 5ACPCI.RAIC-04

The hard disk can be used as a replacement part for 5ACPCI.RAIC-03.

Figure 136: Replacement SATA HDD 160 GB - 5ACPCI.RAIC-04

Technical data

Information:

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

Features	5ACPCI.RAIC-04
Hard disks Amount	Fujitsu M120-ESW MHY2160BH-ESW 1
Formatted capacity (512 bytes/sector)	160 GB
Number of heads	3
Number of sectors (user)	312,581,808
Bytes per sector	512
Revolution speed	5400 rpm ±1%
Access time (average)	5.56 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1.5 ms 12 ms 22 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Supported transfer mode	SATA 1.0, PIO mode 0-4, multiword DMA mode 0-2, UDMA 0-5
Data transfer rate On the medium To/from host	 Max. 84.6 MBit/s Max. 150 MB/s

Table 97: Technical data - RAID hard disk - 5ACPCI.RAIC-04

Features	5ACPCI.RAIC-04
Cache	8 MB
S.M.A.R.T. Support	Yes
Lifespan	5 years
Environmental characteristics	
Ambient temperature[1)] Operation - Standard / 24-hour[2)] Bearings Transport	 -15 to 80°C -40 to 95°C -40 to 95°C
Relative humidity Operation Bearings Transport	 8 to 90% non-condensing (maximum humidity at 29°C) 5 to 95% non-condensing (maximum humidity at 40°C) 5 to 95% non-condensing (maximum humidity at 40°C)
Vibration[3)] Operation (continuous) Operation (occasional) Bearings Transport	 5 - 500 Hz: max. 0.125 g; duration 1 octave per minute; no unrecoverable errors 5 - 500 Hz: max. 0.25 g; duration 1 octave per minute; no unrecoverable errors 5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage 5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage
Shock [4)] (pulse with a sine half-wave) Operation Bearings	 Max. 125 g, 2 ms; no unrecoverable errors Max. 400 g, 2 ms; no damage Max. 450 g, 1 ms; no damage Max. 200 g, 0.5 ms; no damage
Altitude Operation Bearings	 - 300 to 3048 meters - 300 to 12192 meters

Table 97: Technical data - RAID hard disk - 5ACPCI.RAIC-04 (Forts.)

1) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 3°C per minute.

2) 24-hour operation means 732 POH (power-on hours) per month.

3) Operation in areas prone to vibration and shock can affect performance negatively (reduction of transfer rate).

Temperature humidity diagram

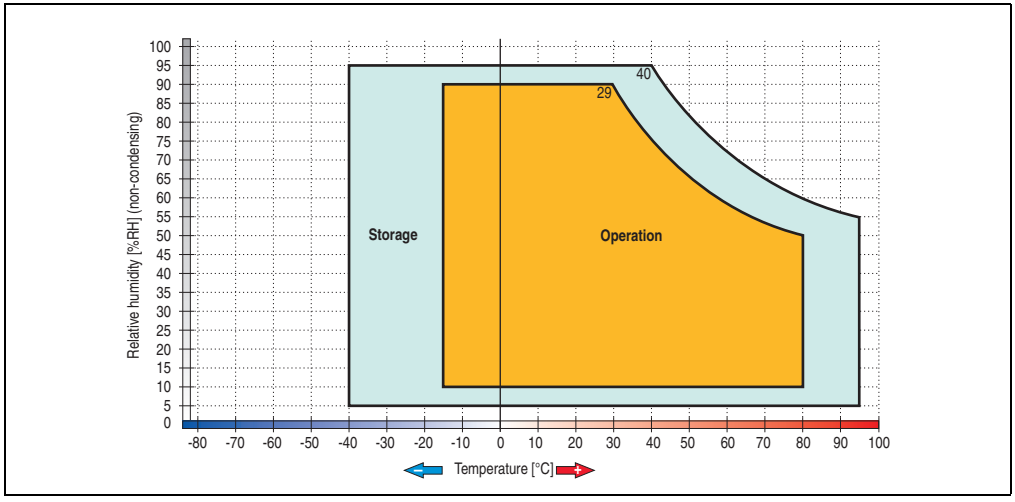


Figure 137: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-04

Exchanging a PCI SATA hard disk

Instructions for exchanging a SATA hard disk can be found in chapter 7 "Maintenance / Servicing", section "Exchanging a PCI SATA RAID hard disk", on page 690.

PCI SATA RAID 2 x 250 GB - 5ACPCI.RAIC-05

The hard disks that are used are specified for 24-hour operation (24x7).

Features

- SATA RAID controller
- RAID Level 0 (striped) and 1 (mirrored)
- 2 SATA hard disk drives (suitable for 24 hour operation)
- Only requires 1 PCI slot
- Transfer rates up to 150 MB/s

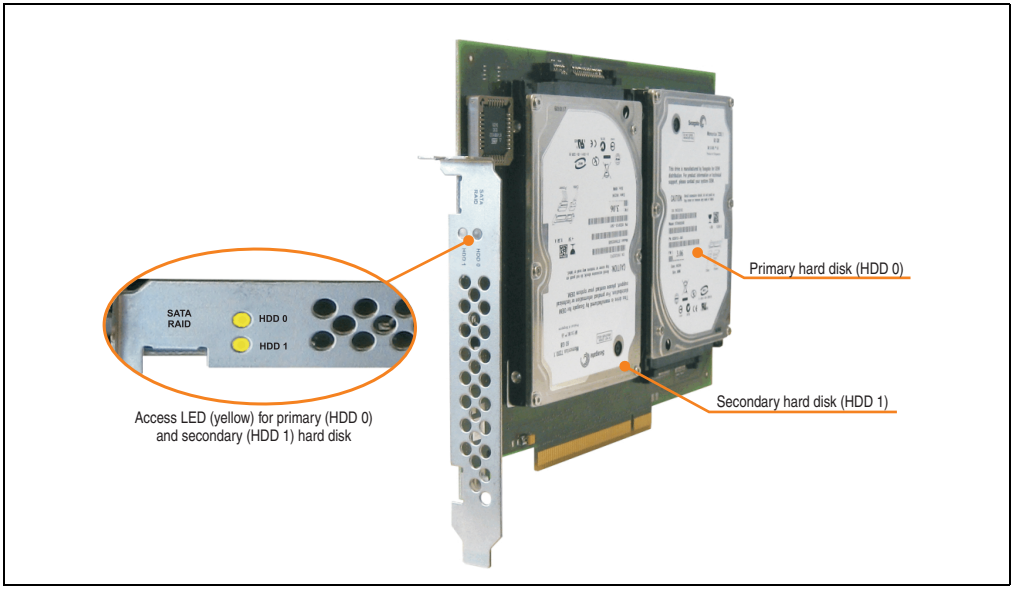


Figure 138: PCI SATA RAID controller - 5ACPCI.RAIC-05

Information:

The PCI SATA RAID controller can not be used in place of a Universal Power Supply (UPS). If the operating system is shut down improperly, the next time it is started it is detected as an error by the RAID 1, and a complete rebuild is executed. This generally takes at least 120 minutes (configurable) to complete.

Technical data

Information:

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

Features	5ACPCI.RAIC-05
SATA RAID controller Type Specifications Data transfer rate RAID level BIOS Extension ROM - requirements	 Sil 3512 SATA link Serial ATA 1.0 Max. 1.5 GB/s (150 MB/s) Supports RAID 0, 1 Approx. 32 KB
Hard disks Amount	Seagate ST9250315AS 2
Formatted capacity (512 bytes/sector)	250 GB
Number of heads	1
Number of sectors (user)	488,397,168
Bytes per sector	512
Revolution speed	5400 rpm ±0.2%
Access time (average)	5.56 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 14 ms 30 ms
Starting time (0 rpm to read access)	3.6 seconds (typically)
Supported transfer modes	SATA 1.0, Serial ATA Revision 2.6 PIO mode 0-4, multiword DMA mode 0-2, UDMA mode 0-6
Data transfer rate On the medium To/from host	 Max. 1175 Mbits/s Max. 150 MB/s
Cache	8 MB
S.M.A.R.T. Support	Yes
Electrical characteristics	
Power consumption	0.3 A at 3.3 V (PCI bus) 1 A at 5 V (PCI bus)
Mechanical characteristics	
Mounted on PCI insert	Fixed
Weight	350 g

Table 98: Technical data - RAID Hard Disk - 5ACPCI.RAIC-05

Environmental characteristics	5ACPCI.RAIC-05
Ambient temperature[1)] Operation - Standard / 24-hour[2)] Storage Transport	 0 to 60°C -40 to 70°C -40 to 70°C
Relative humidity[3)] Operation Storage Transport	 5 to 95%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration[4)] Operation (continuous) Operation (occasional) Storage Transport	 5 - 500 Hz: max. 0.125 g; duration 1 octave per minute; no unrecoverable errors 5 - 500 Hz: max. 0.25 g; duration 1 octave per minute; no unrecoverable errors 5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage 5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage
Shock[4)] (pulse with a sine half-wave) Operation Storage	 Max. 125 g, 2 ms; no unrecoverable errors Max. 400 g, 2 ms; no damage Max. 500 g, 1 ms; no damage Max. 300 g, 0.5 ms; no damage
Altitude Operation Storage	 - 300 to 3048 m - 300 to 12,192 m

Table 98: Technical data - RAID Hard Disk - 5ACPCI.RAIC-05 (Forts.)

1) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 20°C per hour.

2) 24-hour operation means 732 POH (power-on hours) per month.

3) Humidity gradient: Maximum 30% per hour.

4) Operation in areas prone to vibration and shock can affect performance negatively (reduction of transfer rate).

Temperature humidity diagram

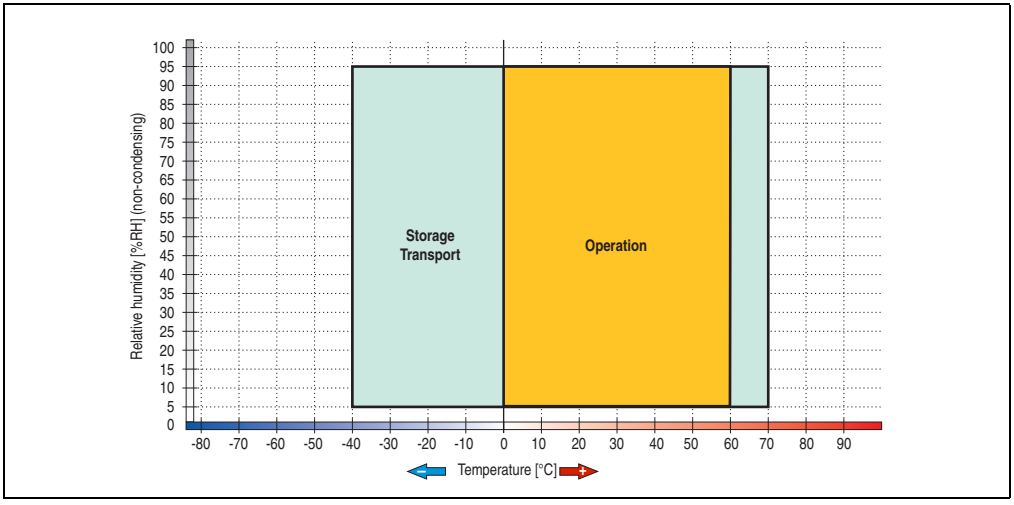


Figure 139: Temperature humidity diagram - SATA RAID Hard Disk - 5ACPCI.RAIC-05

Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 20°C per hour.

Driver support

Special drivers are necessary for operating the PCI SATA RAID controller. Drivers for Windows XP Professional and Windows XP Embedded are available for download on the B&R Homepage in the download area (**www.br-automation.com**).

The .NET-based SATARaid™ serial ATA RAID management software can also be found on the B&R homepage.

Information:

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

Configuration

For configuration of a SATA RAID network, see Chapter 3 "Commissioning", section "Configuration of a SATA RAID array", on page 319.

Exchanging a HDD

A hard drive can be easily exchanged in the event of an error when using the RAID1 (mirroring) configuration without having to re-install the system. The replacement SATA HDD 250GB 5MMHDD.0250-00 is available as a replacement part for a HDD.

For instructions on exchanging the drive, see Chapter 7 "Maintenance / Servicing", section "Exchanging a PCI SATA RAID hard disk", on page 690.

Replacement SATA HDD 250 GB - 5MMHDD.0250-00

The hard disk can be used as a replacement part for 5ACPCI.RAIC-05.

Figure 140: Replacement SATA HDD 250 GB - 5MMHDD.0250-00

Technical data

Information:

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

Features	5MMHDD.0250-00
Hard disks Amount	Seagate ST9250315AS 1
Formatted capacity (512 bytes/sector)	250 GB
Number of heads	1
Number of sectors (user)	488,397,168
Bytes per sector	512
Revolution speed	5400 rpm ±0.2%
Access time (average)	5.56 ms
Positioning time (seek, typical values) Minimum (track to track) Average (read access) Maximum (read access)	 1 ms 14 ms 30 ms
Starting time (0 rpm to read access)	3.6 seconds (typically)
Supported transfer modes	SATA 1.0, Serial ATA Revision 2.6 PIO mode 0-4, multiword DMA mode 0-2, UDMA mode 0-6
Interface	SATA

Table 99: Technical data - RAID hard disk - 5MMHDD.0250-00

Features	5MMHDD.0250-00
Data transfer rate On the medium To/from host	 Max. 1175 Mbits/s Max. 150 MB/s (SATA I), max. 300 MB/s (SATA II)
Cache	8 MB
S.M.A.R.T. Support	Yes
MTBF	550,000 Power On Hours[1]
Environmental characteristics	
Ambient temperature[2] Operation - Standard / 24-hour[3] Storage Transport	 0 to 60°C -40 to 70°C -40 to 70°C
Relative humidity[4] Operation Storage Transport	 5 to 95%, non-condensing 5 to 95%, non-condensing 5 to 95%, non-condensing
Vibration Operation Storage	 0.5 g at 5 - 500 Hz, no non-recovered errors 5 g at 5 - 500 Hz, no non-recovered errors
Shock (pulse with a sine half-wave) Operation Storage	 350 g and 2 ms duration, no non-recovered errors 800 g and 2 ms duration, no non-recovered errors 1000 g and 1 ms duration, no non-recovered errors 600 g and 0.5 ms duration, no non-recovered errors
Altitude Operation Storage	 - 300 to 3048 m - 300 to 12,192 m

Table 99: Technical data - RAID hard disk - 5MMHDD.0250-00 (Forts.)

1) With 8760 POH (Power On Hours) per year and 25°C surface temperature.

2) Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 20°C per hour.

3) 24-hour operation means 732 POH (power-on hours) per month.

4) Humidity gradient: Maximum 30% per hour.

Temperature humidity diagram

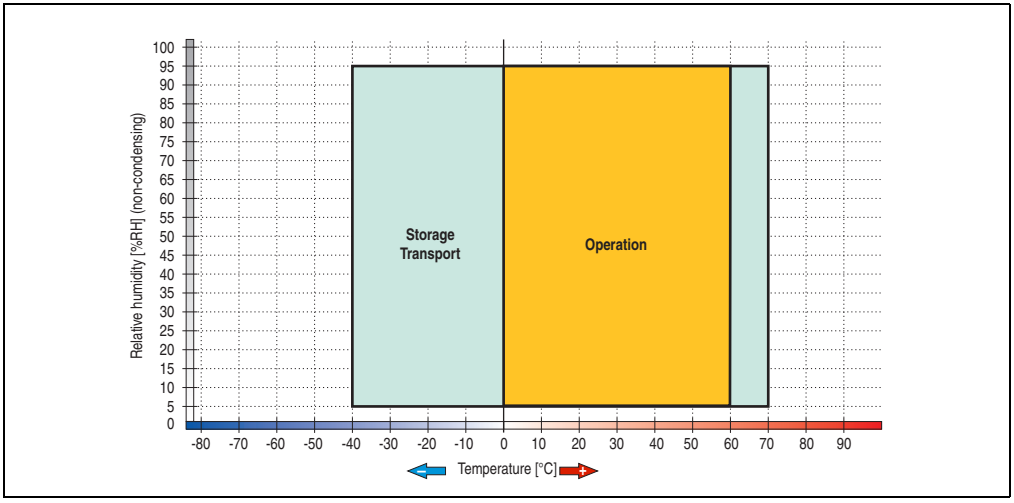


Figure 141: Temperature humidity diagram - SATA RAID hard disk - 5MMHDD.0250-00

Temperature values for 305 meter altitude. The temperature specification must be reduced linearly by 1°C every 305 meters. The temperature increase and decrease can be a maximum of 20°C per hour.

3.8 Interface options

An add-on interface (CAN or combined RS232/422/485) can be inserted.

Information:

It is possible to add or remove an add-on interface at any time.

Caution!

Turn off power before adding or removing an add-on interface.

3.8.1 Add-on CAN interface - 5AC600.CANI-00

The add-on CAN interface is equipped with a Bosch CC770 CAN controller (compatible with an Intel 82527 CAN controller), which conforms to CAN specifications 2.0 part A/B. The CAN controller can trigger an NMI (non-maskable interrupt).

Order data

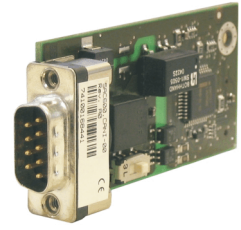
Model number	Description	Figure
5AC600.CANI-00	**Add-on CAN interface** CAN interface for installation in an APC620 or PPC700.	

Table 100: Add-on CAN interface - 5AC600.CANI-00

Technical data

Features	5AC600.CANI-00
CAN interface Controller Amount Connection	 Bosch CC770 (compatible with Intel 82527 CAN controller) 1 9-pin DSUB, male
Terminating resistor Default setting	Can be activated and deactivated using a sliding switch Disabled

Table 101: Technical data - Add-on CAN interface - 5AC600.CANI-00

Pin assignments

Add-on CAN		
Type	Electrically isolated	
Transfer rate	Max. 500 kBit/s	
Bus length	Max. 1000 Meter	
Pin	**Assignment**	
1	n.c.	
2	CAN low	
3	GND	
4	n.c.	
5	n.c.	
6	Reserved	
7	CAN high	
8	n.c.	
9	n.c.	

9-pin DSUB connector

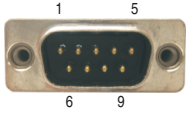


Table 102: Pin assignments - CAN

I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	384h / 385h	-
IRQ	IRQ10	NMI [1)]

Table 103: Add-on CAN - I/O Adresse und IRQ

1) NMI = Non Maskable Interrupt.

The setting for the IRQ can be changed in the BIOS setup (under "Advanced" - submenu "Baseboard/Panel Features" - submenu "Legacy Devices", setting "CAN"). Please note any potential conflicts with other resources when changing this setting.

I/O address	Register	Function
384h	Address register	Defines the register number to access.
385h	Data register	Access to the register defined in the address register.

Table 104: CAN address register

Bus length and cable type

The type of cable used depends largely on the required bus length and the number of nodes. The bus length is mainly determined by the bit rate. In accordance with CiA (CAN in Automation) the maximum bus length is 1000 meters.

The following bus lengths are permitted with a maximum oscillator tolerance of 0.121%:

Distance [m]	Transfer rate [kBit/s]
≤ 1000	Typ. 50
≤ 200	Typ. 250
≤ 60	Typ. 500

Table 105: Bus length and transfer rate - CAN

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

CAN cable	Property
Signal lines	
Cable cross section	2 x 0.25 mm² (24AWG/19), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 82 Ω / km
Stranding	Wires stranded in pairs
Shield	Paired shield with aluminum foil
Grounding line	
Cable cross section	1 x 0.34 mm² (22AWG/19), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 59 Ω / km
Outer sheathing	
Item	PUR mixture
Characteristics	Halogen free
Entire shielding	From tinned cu wires

Table 106: CAN cable requirements

Terminating resistor

CAN networks are cabled using a bus structure where both ends of the bus are equipped with terminating resistors. The add-on CAN interface has an integrated terminating resistor (delivery state: disabled with the setting "Off").

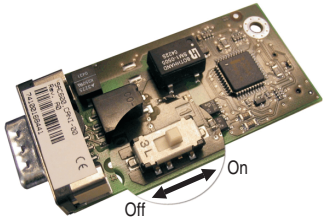


Figure 142: Terminating resistor - Add-on CAN interface 5AC600.CANI-00

Contents of the delivery / mounting material

The screws included in the mounting kit are to be used for installation.

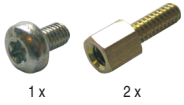


Figure 143: Contents of the delivery / mounting material - 5AC600.CANI-00

3.8.2 Add-on RS232/422/485 interface - 5AC600.485I-00

The serial interface is a combined RS232/RS422/RS485 interface. The operating mode (RS232/RS422/RS485) is selected automatically, depending on the electrical connection.

Order data

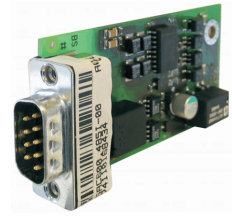
Model number	Description	Figure
5AC600.485I-00	**Add-on RS232/422/485 interface** Add-on RS232/422/485 interface for installation in an APC620 and PPC700.	

Table 107: Add-on RS232/422/485 interface - 5AC600.485I-00

Pin assignments

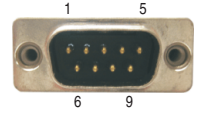
Add-on RS232/422/485			
	RS232	**RS422/485**	
Type	RS232 not modem compatible; Electrically isolated		
UART	16550 compatible, 16 byte FIFO		
Transfer rate	Max. 115 kBit/s		
Bus length	Max. 15 meters	Max. 1200 meters	
Pin	**Assignments (RS232)**	**Assignments (RS422)**	9-pin DSUB connector 
1	n.c.	TXD\	
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	

Table 108: Pin assignments - RS232/RS422

I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	2E8	238, 2F8, 338, 3E8, 3F8
IRQ	IRQ10	IRQ 3, 4, 5, 7, 11, 12

Table 109: Add-on RS232/422/485 - I/O address and IRQ

The setting for the I/O address and the IRQ can be changed in the BIOS setup (under "Advanced" - submenu "Main board/Panel Features" - submenu "Legacy Devices", setting "COM E"). Please note any potential conflicts with other resources when changing this setting.

Bus length and cable type RS232

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

Distance [m]	Transfer rate [kBit/s]
≤ 15	Typ. 64
≤ 10	Typ. 115
≤ 5	Typ. 115

Table 110: 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 Wire insulation Conductor resistance Stranding Shield	 4 x 0.16 mm² (26AWG), 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	 1 x 0.34 mm² (22AWG/19), tinned Cu wire PE ≤ 59 Ω / km
Outer sheathing Item Characteristics Entire shielding	 PUR mixture Halogen free From tinned cu wires

Table 111: RS232 - Cable requirements

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.

Distance [m]	Transfer rate [kBit/s]
1200	Typ. 115

Table 112: 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 Shield	 4 x 0.25 mm² (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	 1 x 0.34 mm² (22AWG/19), tinned Cu wire PE ≤ 59 Ω / km
Outer sheathing Item Characteristics Entire shielding	 PUR mixture Halogen free From tinned cu wires

Table 113: RS422 - Cable requirements

RS485 interface operation

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

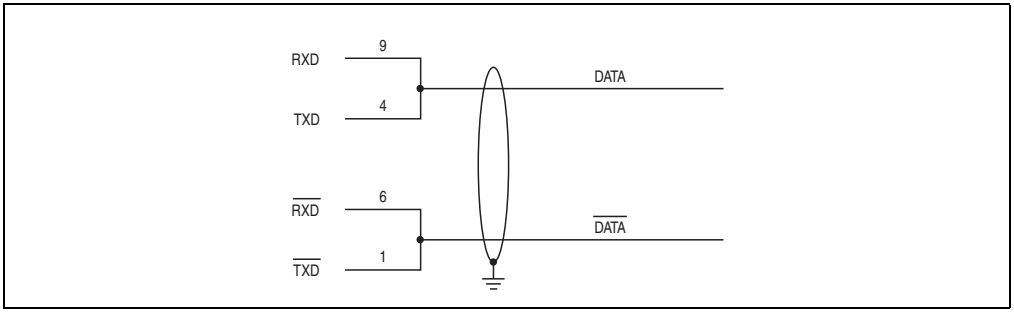


Figure 144: Add-on RS232/422/485 interface - operated in RS485 mode

The RTS line must be switched each time the driver is sent and received, and there is also 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 resistance.

RS485 - Bus length and cable type

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

Distance [m]	Transfer rate [kBit/s]
1200	Typ. 115

Table 114: 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	4 x 0.25 mm² (24AWG/19), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 82 Ω / km
Stranding	Wires stranded in pairs
Shield	Paired shield with aluminum foil
Grounding line	
Cable cross section	1 x 0.34 mm² (22AWG/19), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 59 Ω / km
Outer sheathing	
Item	PUR mixture
Characteristics	Halogen free
Entire shielding	From tinned cu wires

Table 115: RS485 - Cable requirements

Contents of the delivery / mounting material

The screws included in the mounting kit are to be used for installation.

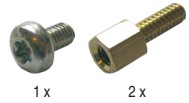


Figure 145: Contents of the delivery / mounting material 5AC600.485I-00

3.9 Fan kits

Information:

Fans are necessary when using components which must work within certain temperature limits, e.g. hard disks, DVD combos, PCI cards, etc.

The fan kits are subject to wear and must be checked with appropriate frequency and cleaned or replaced when not functioning properly (e.g. due to dirt and grime).

3.9.1 Fan kit 5PC700.FA00-01

This fan kit can be used as an option for 10.4", 12.1", 15", 17" and 19" Panel PC 700 system units with 0 PCI slots (5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00).

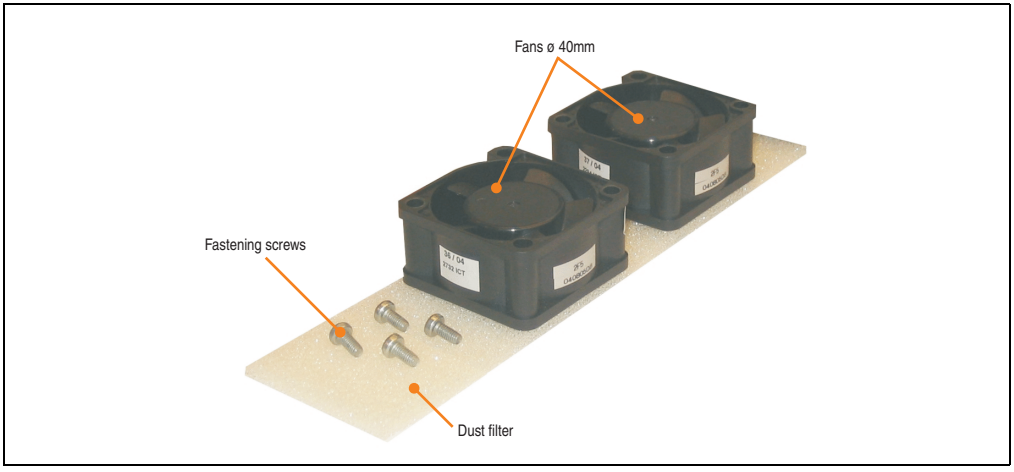


Figure 146: Fan kit 5PC700.FA00-01

Technical data

Features	5PC700.FA00-01
Fan type Width Length Height	Double ball bearings 40 mm 40 mm 20 mm
Revolution speed	5600 rpm ±10%
Noise level	24 dB
Lifespan	80,000 hours at 30°C

Table 116: Technical data - 5PC700.FA00-01

Features	5PC700.FA00-01
Maintenance interval	Depending on the work environment, the dust filter should be checked with appropriate frequency to determine whether the air flow provides sufficient cooling. An exchange or cleaning of the filter kit is appropriate at that time.
Installation	See "Procedure - PPC700 without PCI slots", on page 679

Table 116: Technical data - 5PC700.FA00-01 (Forts.)

Contents of delivery

- 2 fans with 40 mm diameter
- 1 dust filter
- Installation material - Mounting screws

Installation

For a description of how to install the fan kit, see chapter 7 "Maintenance / Servicing", section 3 "Fan kit installation and replacement", starting on page 679.

3.9.2 Fan kit 5PC700.FA02-00

This fan kit can be used as an option for 10.4" Panel PC 700 system units with 2 PCI slots (5PC720.1043-01).

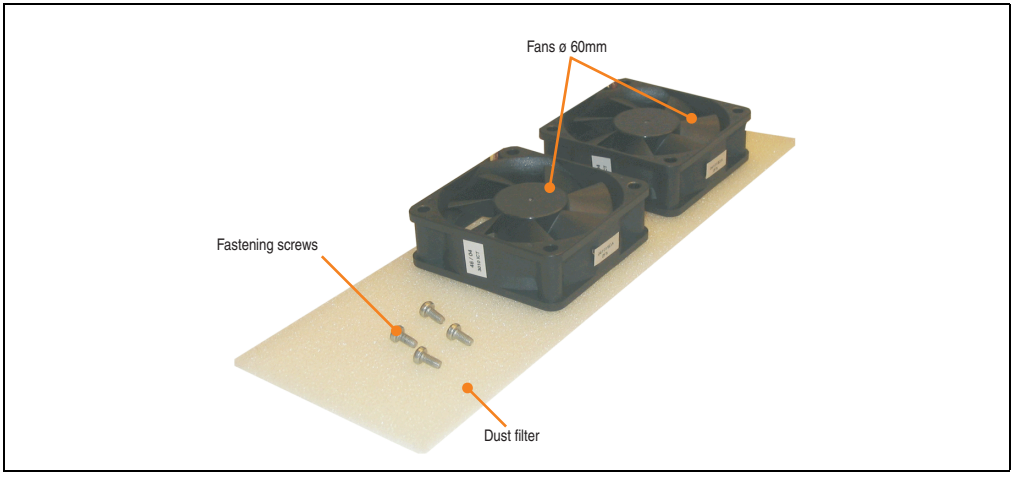


Figure 147: Fan kit 5PC700.FA02-00

Technical data

Features	5PC700.FA02-00
Fan type Width Length Height	Double ball bearings 60 mm 60 mm 10 mm
Revolution speed	3600 rpm ±10%
Noise level	30.5 dB
Lifespan	80,000 hours at 30°C
Maintenance interval	Depending on the work environment, the dust filter should be checked with appropriate frequency to determine whether the air flow provides sufficient cooling. An exchange or cleaning of the filter kit is appropriate at that time.
Installation	See "Procedure - PPC700 with 1 and 2 PCI slots", on page 682

Table 117: Technical data - 5PC700.FA02-00

Contents of delivery

- 2 fans with 60 mm diameter
- 1 dust filter
- Installation material - Mounting screws

Installation

For a description of how to install the fan kit, see chapter 7 "Maintenance / Servicing", section 3 "Fan kit installation and replacement", starting on page 682.

3.9.3 Fan kit 5PC700.FA02-01

This fan kit can be used as an option for 12.1" and 15" Panel PC 700 system units with 1 and 2 PCI slots (5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02).

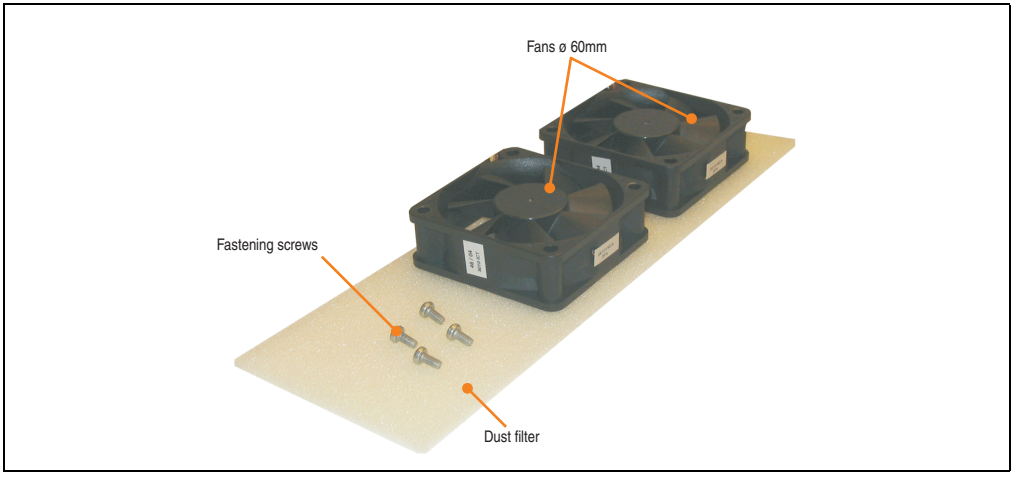


Figure 148: Fan kit 5PC700.FA02-01

Technical data

Features	5PC700.FA02-01
Fan type Width Length Height	Double ball bearings 60 mm 60 mm 20 mm
Revolution speed	3600 rpm ±10%
Noise level	30.5 dB
Lifespan	80,000 hours at 30°C
Maintenance interval	Depending on the work environment, the dust filter should be checked with appropriate frequency to determine whether the air flow provides sufficient cooling. An exchange or cleaning of the filter kit is appropriate at that time.
Installation	See "Procedure - PPC700 with 1 and 2 PCI slots", on page 682

Table 118: Technical data - 5PC700.FA02-01

Contents of delivery

- 2 fans with 60 mm diameter
- 1 dust filter
- Installation material - Mounting screws

Installation

For a description of how to install the fan kit, see chapter 7 "Maintenance / Servicing", section 3 "Fan kit installation and replacement", starting on page 682.

Chapter 3 • Commissioning

1. Installation

Panel PC 700 devices are best mounted in a housing cutout using the clamps found on the housing (different designs possible). The cutout dimensions for the respective Panel PC 700 device can be found in the technical data for the system units (see chapter 2 "Technical data" starting on page 45).

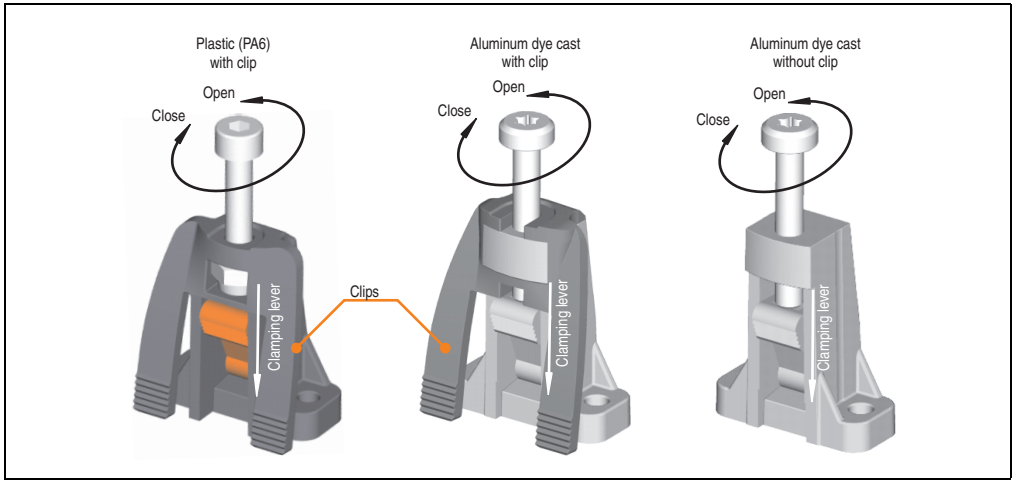


Figure 149: Terminal block

The mounting clamps are designed for a max. thickness of 10 mm for the material where the device is being clamped. The minimum thickness is 2 mm.

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 Panel PC 700 unit must be mounted to a flat surface. Uneven areas can cause damage to the display when the screws are tightened.

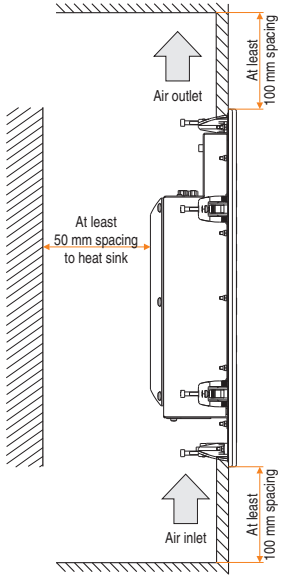
1.1 Important mounting information

- The environmental conditions must be taken into consideration (see chapter 2 "Technical data", section "Ambient temperature with 855GME (ETX / XTX) CPU boards", on page 50).
- The PPC700 must be mounted to a planar surface.
- The PPC700 is only for operation in closed rooms.
- The PPC700 cannot be situated in direct sunlight.
- The vent holes may not be covered.
- When mounting the device, be sure to adhere to the allowable mounting orientations (see Section "Mounting orientation", on page 288).
- Be sure the wall or switching cabinet can withstand four times the total weight of the the PPC700.
- When connecting certain cable types (DVI, SDL, USB, etc.), keep the flex radius in mind.

1.2 Air circulation

In order to guarantee proper air circulation, allow the specified amount of space above, below, to the side and behind the Panel PC 700. The minimum specified free space can be found in the diagram below.

Side view



Rear view

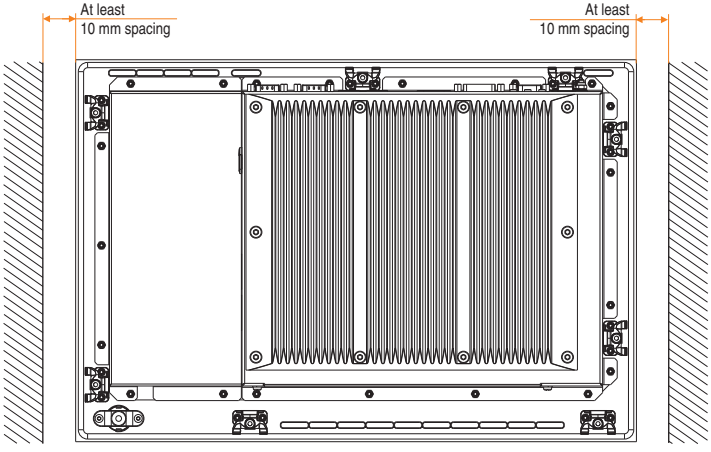


Figure 150: Spaces for air circulation

1.3 Mounting orientation

The following diagram displays the specified mounting orientation for the Panel PC 700 device.

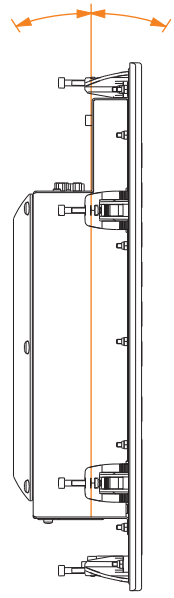
Mounting orientation


Table 119: Mounting orientation

2. Cable connections

When making cable connections and installing cables, it is not permitted to have a flex radius smaller than the minimum value specified.

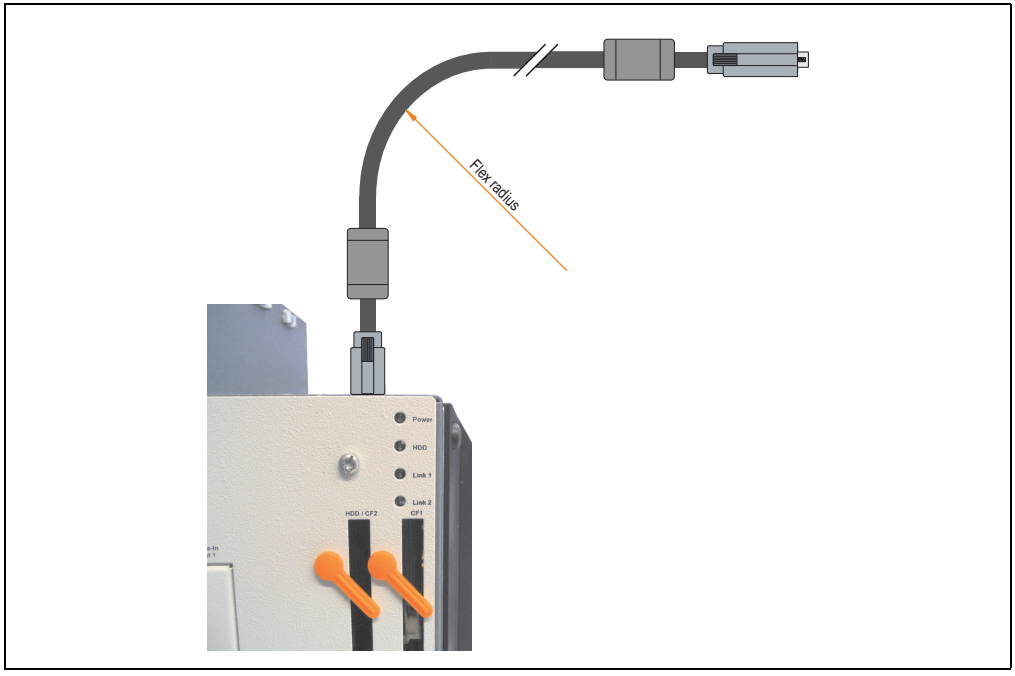


Figure 151: Flex radius - Cable connection

Information:

The value specified for the minimum flex radius can be found in the technical data for the cable that is being used.

2.1 Ethernet cable lengths for ETH1

More information can be found in section "Ethernet connection ETH1", on page 86.

3. Grounding concept

The functional ground is a current path with low impedance between isolated circuits and ground, which is not a protective measure, but rather provides e.g. increased immunity to disturbances. It serves only as disturbance dissipation and not as contact protection for persons.

The PPC700 functional ground has 2 connections:

- Supply voltage
- Ground connection

To guarantee secure dissipation of electric disturbances, the following points should be observed:

- The device should be connected to the ground using the shortest route possible.
- Use cable with a minimum cross section of 2.5 mm^2 per connection.

Note the line shielding concept. All data cables connected to the device must use shielded lines.

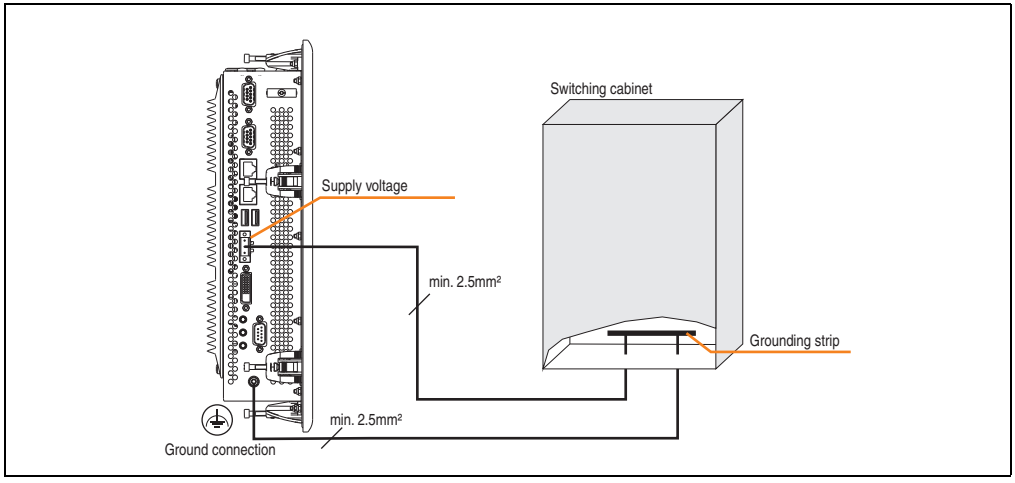


Figure 152: Grounding concept

4. Touch screen calibration

B&R touch screen devices are equipped with a touch controller, which supports hardware calibration. This means that the devices are pre-calibrated from stock (pre-calibration). 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.

4.1 Windows XP Professional

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

4.2 Windows CE

Windows CE starts the touch screen calibration sequence during its first boot in the default configuration / delivered state.

4.3 Windows XP Embedded

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

4.4 Windows Embedded Standard 2009

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

4.5 Automation Runtime / Visual Components

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

5. Connection examples

The following examples provide an overview of the configuration options for connecting Automation Panel 800 and Automation Panel 900 devices with the PPC700. The following questions will be answered:

- How are Automation Panel 800 devices connected to the monitor / panel output of the PPC700, and what needs to be considered?
- How are Automation Panel 900 devices connected to the monitor / panel output of the PPC700, and what needs to be considered?
- How are Automation Panel 800 and Automation Panel 900 devices connected in a line to the monitor / panel output of the PPC700, and what needs to be considered?
- What are "Display Clone" and "Extended Desktop" modes?
- How many Automation Panel 900 devices and an Automation Panel 800 device can be connected on one line?
- How are the connected Automation Panel 800 and Automation Panel 900 devices numbered internally?
- Are there limitations to the segment length and if so, what are they?
- Up to what segment length or for which Automation Panel is USB supported?
- Which cables are required?
- Do BIOS settings have to be changed for a specific configuration?

5.1 Selecting the display units

If an Automation Panel 800 and an Automation Panel 900 should be connected on the same line, the devices must have the same display type.
The following table lists the AP900 devices that can be connected on the same line with an AP800 device.

Automation Panel 800	Automation Panel 800
5AP820.1505-00	5AP920.1505-01 5AP951.1505-01 5AP980.1505-01 5AP981.1505-01
5AP880.1505-00	5AP920.1505-01 5AP951.1505-01 5AP980.1505-01 5AP981.1505-01

Table 120: Selecting the display units

5.2 One Automation Panel via DVI (onboard)

An Automation Panel 900 with max. SXGA resolution is connected to the integrated DVI interface (onboard). As an alternative, an office TFT with DVI interface or an analog monitor (using adapter with model no. 5AC900.1000-00) can also be operated. A separate cable is used for touch screen and USB. If USB devices are to be operated on the Automation Panel 900, the maximum distance is 5 meters. USB devices can only be connected directly to the Automation Panel (without a hub). With the Automation Panel 800, a transmission speed of max. USB 1.1 is possible; with the Automation Panel 900 and a segment length of max. 5 m, USB 2.0 is possible. If the segment length for the Automation Panel 900 is larger than 5 m, then USB 1.1 is available.

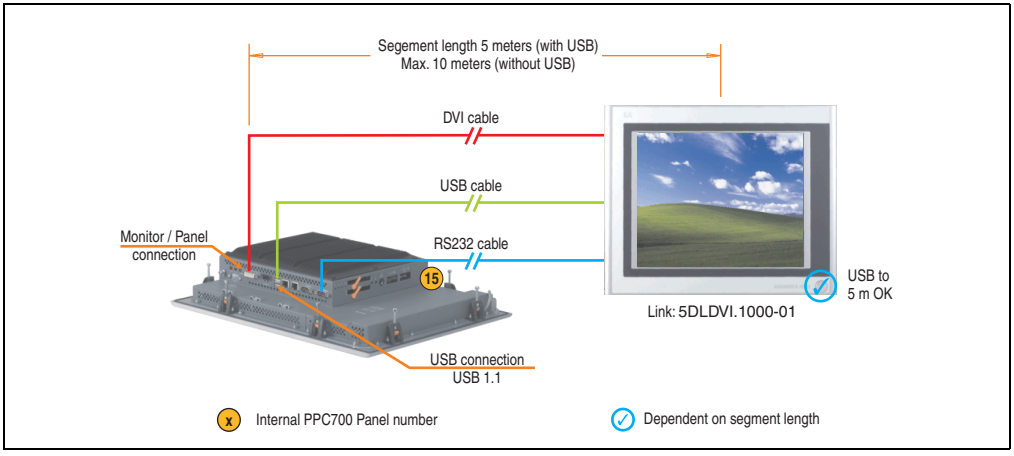


Figure 153: Configuration - One Automation Panel via DVI (onboard)

5.2.1 Basic system requirements

The following table displays the possible combinations for the PPC700 system unit with CPU board to implement the configuration shown in the figure above. If the maximum resolution is limited when making the combination then it is also shown in this table (e.g. for connecting a non-B&R Automation Panel 900 device).

System unit	CPU board						Limitation
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	Resolution
5PC720.1043-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1043-01	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1214-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1214-01	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1505-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1505-01	✓	✓	✓	✓	✓	✓	Max. SXGA

Table 121: Possible combinations of system unit and CPU board

System unit	CPU board						Limitation Resolution
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	
5PC720.1505-02	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. SXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. SXGA

Table 121: Possible combinations of system unit and CPU board

5.2.2 Link modules

Model number	Description	Note
5DLDVI.1000-01	**Automation Panel Link DVI receiver**	For Automation Panel 900

Table 122: Link module for configuration - One Automation Panel via DVI

5.2.3 Cables

Select one cable each from the 3 required types.

Model number	Type	Length
5CADVI.0018-00	DVI	1.8 m
5CADVI.0050-00	DVI	5 m
5CADVI.0100-00	DVI	10 m[1)]
9A0014.02	Touch screen	1.8 m
9A0014.05	Touch screen	5 m
9A0014.10	Touch screen	10 m[1)]
5CAUSB.0018-00	USB	1.8 m
5CAUSB.0050-00	USB	5 m

Table 123: Cables for DVI configurations

1) USB support is not possible on the Automation Panel 900 because USB is limited to 5 m.

5.2.4 Possible Automation Panel units, resolutions und segment lengths

The following Automation Panel 900 units can be used. In rare cases, the segment length is limited according to the resolution.

Model number	Diagonal	Resolution	Touch screen	Keys	Max. segment length
5AP920.1043-01	10.4“	VGA	✓	-	5 m / 10 m[1)]

Table 124: Possible Automation Panel units, resolutions und segment lengths

Model number	Diagonal	Resolution	Touch screen	Keys	Max. segment length
5AP920.1214-01	12.1“	SVGA	✓	-	5 m / 10 m[1)]
5AP920.1505-01	15.0“	XGA	✓	-	5 m / 10 m[1)]
5AP920.1706-01	17.0“	SXGA	✓	-	5 m / 10 m[1)]
5AP920.1906-01	19.0“	SXGA	✓	-	5 m / 10 m[1)]

Table 124: Possible Automation Panel units, resolutions und segment lengths

1) USB support is not possible on the Automation Panel 900 because USB is limited to 5 m.

Information:

The DVI transfer mode does not allow reading statistical values on Automation Panel 900 units.

5.2.5 BIOS settings

No special BIOS settings are necessary for operation.

5.3 An Automation Panel 900 via SDL (onboard)

An Automation Panel 900 is connected to the integrated SDL interface (onboard) via an SDL cable. USB devices can only be connected directly to the Automation Panel (without a hub). A transmission speed of max. USB 1.1 is possible.

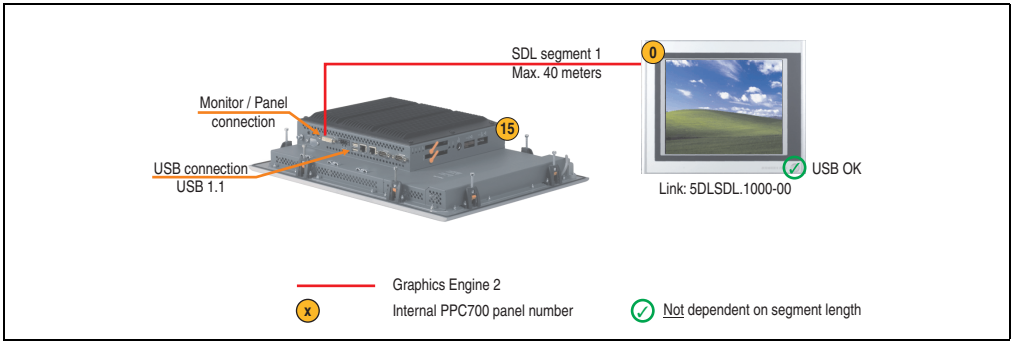


Figure 154: Configuration - An Automation Panel 900 via SDL (onboard)

5.3.1 Basic system requirements

The following table displays the possible combinations for the PPC700 system unit with CPU board to implement the configuration shown in the figure above. If the maximum resolution is limited when making the combination then it is also shown in this table.

System unit	CPU board						Limitation Resolution
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	
5PC720.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1043-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-02	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 125: Possible combinations of system unit and CPU board

5.3.2 Link modules

Model number	Description	Note
5DLSDL.1000-00	**Automation Panel Link SDL receiver**	For Automation Panel 900

Table 126: Link module for configuration - One Automation Panel via DVI

5.3.3 Cables

Selection of an SDL cable from the subsequent table for connecting an AP900 display.

Model number	Type	Length
5CASDL.0018-01	SDL with single-sided 45° plug	1.8 m
5CASDL.0018-03	SDL flex without extender	1.8 m
5CASDL.0050-01	SDL with single-sided 45° plug	5 m
5CASDL.0050-03	SDL flex without extender	5 m
5CASDL.0100-01	SDL with single-sided 45° plug	10 m
5CASDL.0100-03	SDL flex without extender	10 m
5CASDL.0150-01	SDL with single-sided 45° plug	15 m
5CASDL.0150-03	SDL flex without extender	15 m
5CASDL.0200-03	SDL flex without extender	20 m
5CASDL.0250-03	SDL flex without extender	25 m
5CASDL.0300-03	SDL flex without extender	30 m
5CASDL.0300-13	SDL flex with extender	30 m
5CASDL.0400-13	SDL flex with extender	40 m

Table 127: Cables for SDL configurations

Cable lengths and resolutions for SDL transfer

The following table shows the relationship between segment lengths and the maximum resolution according to the SDL cable used:

Cables Segment length [m]	Resolution				
	VGA 640 x 480	SVGA 800 x 600	XGA 1024 x 768	SXGA 1280 x 1024	UXGA 1600 x 1200
1.8	5CASDL.0018-01 5CASDL.0018-03	5CASDL.0018-01 5CASDL.0018-03	5CASDL.0018-01 5CASDL.0018-03	5CASDL.0018-01 5CASDL.0018-03	5CASDL.0018-01 5CASDL.0018-03
5	5CASDL.0050-01 5CASDL.0050-03	5CASDL.0050-01 5CASDL.0050-03	5CASDL.0050-01 5CASDL.0050-03	5CASDL.0050-01 5CASDL.0050-03	5CASDL.0050-01 5CASDL.0050-03
10	5CASDL.0100-01 5CASDL.0100-03	5CASDL.0100-01 5CASDL.0100-03	5CASDL.0100-01 5CASDL.0100-03	5CASDL.0100-01 5CASDL.0100-03	5CASDL.0100-01[1)] 5CASDL.0100-03[1)]
15	5CASDL.0150-01 5CASDL.0150-03	5CASDL.0150-01 5CASDL.0150-03	5CASDL.0150-01 5CASDL.0150-03	5CASDL.0150-01[1)] 5CASDL.0150-03[1)]	- -
20	5CASDL.0200-03[1)]	5CASDL.0200-03[1)]	5CASDL.0200-03[1)]	5CASDL.0200-03[1)]	-
25	5CASDL.0250-03[1)]	5CASDL.0250-03[1)]	5CASDL.0250-03[1)]	-	-
30	5CASDL.0300-03[1)] 5CASDL.0300-13[2)]	5CASDL.0300-03[1)] 5CASDL.0300-13[2)]	5CASDL.0300-13[2)] -	5CASDL.0300-13[2)] -	- -
40	5CASDL.0400-13[2)]	5CASDL.0400-13[2)]	5CASDL.0400-13[2)]	5CASDL.0400-13[2)]	-

Table 128: Segment lengths, resolutions and SDL cables

1) See table 129 "Requirements for SDL cable with automatic cable adjustment (equalizer)"

2) See table 130 "Requirements for SDL cable with extender and automatic cable adjustment (equalizer)"

The cable types and resolutions shown with a footnote 1) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 129: Requirements for SDL cable with automatic cable adjustment (equalizer)

The cable types and resolutions shown with a footnote 2) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	-
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	-
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	Rev. J0	-
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	Rev. H0	-
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	Rev. J0	-
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	Rev. A0	-
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	Rev. J0	-
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	Rev. I0	-
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	Rev. H0	-
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	Rev. A0	-
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	Rev. A0	-
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	Rev. G0	-
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	Rev. G0	-
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	Rev. G0	-

Table 130: Requirements for SDL cable with extender and automatic cable adjustment (equalizer)

5.3.4 BIOS settings

No special BIOS settings are necessary for operation.

5.4 An Automation Panel 800 via SDL (onboard)

An Automation Panel 800 is connected to the integrated SDL interface (onboard) via an SDL cable. USB devices can only be connected directly to the extension keyboard (without a hub). A transmission speed of max. USB 1.1 is possible.

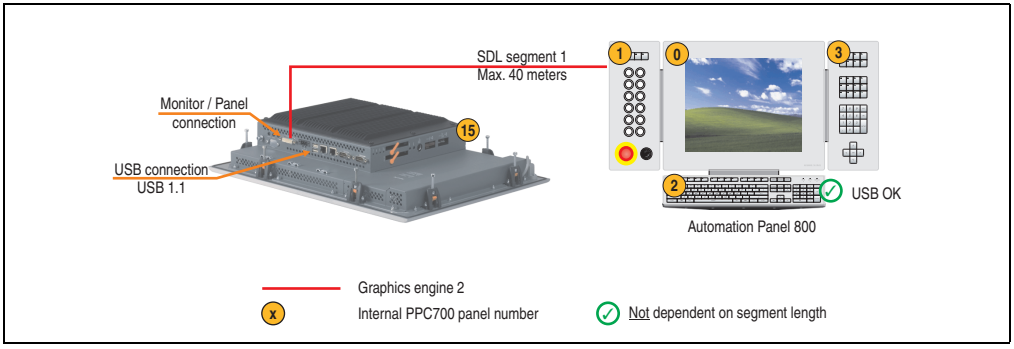


Figure 155: Configuration - An Automation Panel 800 via SDL (onboard)

5.4.1 Basic system requirements

The following table displays the possible combinations for the PPC700 system unit with CPU board to implement the configuration shown in the figure above. If the maximum resolution is limited when making the combination then it is also shown in this table.

System unit	CPU board						Limitation Resolution
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	
5PC720.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1043-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-02	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 131: Possible combinations of system unit and CPU board

5.4.2 Cables

Select an SDL cable from the following table.

Model number	Type	Length
5CASDL.0018-20	SDL w/o extender	1.8 m
5CASDL.0050-20	SDL w/o extender	5 m
5CASDL.0100-20	SDL w/o extender	10 m
5CASDL.0150-20	SDL w/o extender	15 m
5CASDL.0200-20	SDL w/o extender	20 m
5CASDL.0250-20	SDL w/o extender	25 m
5CASDL.0300-30	SDL w/ extender	30 m
5CASDL.0400-30	SDL w/ extender	40 m

Table 132: Cables for SDL configurations

Cable lengths and resolutions for SDL transfer

The following table shows the relationship between segment lengths and the maximum resolution according to the SDL cable used:

Cables Segment length [m]	Resolution XGA 1024 x 768
1.8	5CASDL.0018-20
5	5CASDL.0050-20
10	5CASDL.0100-20
15	5CASDL.0150-20
20	5CASDL.0200-20[1)]
25	5CASDL.0250-20[1)]
30	5CASDL.0300-30[2)]
40	5CASDL.0400-30[2)]

Table 133: Segment lengths, resolutions and SDL cables

1) See table 134 "Requirements for SDL cable with automatic cable adjustment (equalizer)"
2) See table 135 "Requirements for SDL cable with extender and automatic cable adjustment (equalizer)"

The cable types and resolutions shown with a footnote 1) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 134: Requirements for SDL cable with automatic cable adjustment (equalizer)

The cable types and resolutions shown with a footnote 2) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	-
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	-
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	Rev. J0	-
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	Rev. H0	-
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	Rev. J0	-
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	Rev. A0	-
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	Rev. J0	-
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	Rev. I0	-
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	Rev. H0	-
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	Rev. A0	-
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	Rev. A0	-
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	Rev. G0	-
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	Rev. G0	-
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	Rev. G0	-

Table 135: Requirements for SDL cable with extender and automatic cable adjustment (equalizer)

5.4.3 BIOS settings

No special BIOS settings are necessary for operation.

5.5 An AP900 and an AP800 via SDL (onboard)

An Automation Panel 900 and an Automation Panel 800 are connected to the integrated SDL interface (onboard) via SDL.

USB is supported up to a maximum distance (segment 1 + segment 2) of 30 m on the two displays. Starting at a distance of 30 m, USB is only available on the first display (front and back) up to a maximum of 40 m. USB devices can only be connected directly to the Automation Panel 900 or extension keyboard (without a hub). A transmission speed of max. USB 1.1 is possible.

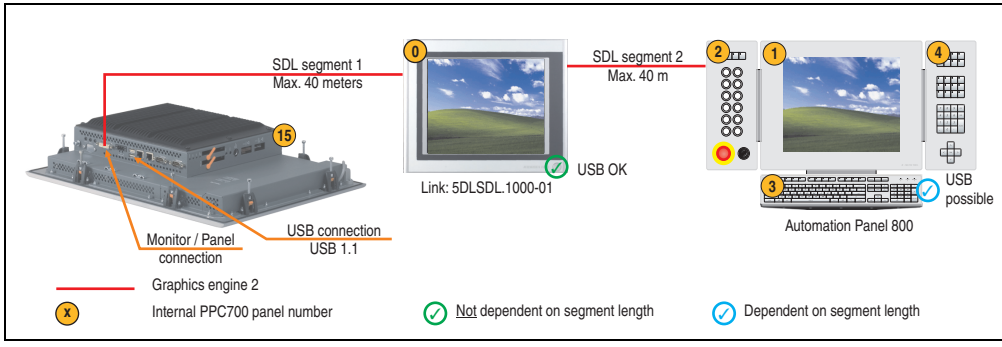


Figure 156: Configuration - One AP900 and an AP800 via SDL (onboard)

5.5.1 Basic system requirements

The following table displays the possible combinations for the PPC700 system unit with CPU board to implement the configuration shown in the figure above. If the maximum resolution is limited when making the combination then it is also shown in this table.

System unit	CPU board						Limitation
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	Resolution
5PC720.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1043-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-02	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 136: Possible combinations of system unit and CPU board

5.5.2 Cables

How to select an SDL cable for connecting the AP900 display to the AP900 display 5.3 "An Automation Panel 900 via SDL (onboard)", on page 296.

How to select an SDL cable for connecting the AP800 display to the AP900 display5.4 "An Automation Panel 800 via SDL (onboard)", on page 300.

Cable lengths and resolutions for SDL transfer

The following table shows the relationship between segment lengths and the maximum resolution according to the SDL cable used:

Cables Segment length [m]	Resolution XGA 1024 x 768
1.8	5CASDL.0018-20
5	5CASDL.0050-20
10	5CASDL.0100-20
15	5CASDL.0150-20
20	5CASDL.0200-20[1)]
25	5CASDL.0250-20[1)]
30	5CASDL.0300-30[2)]
40	5CASDL.0400-30[2)]

Table 137: Segment lengths, resolutions and SDL cables

1) See table 138 "Requirements for SDL cable with automatic cable adjustment (equalizer)"

2) See table 139 "Requirements for SDL cable with extender and automatic cable adjustment (equalizer)"

The cable types and resolutions shown with a footnote 1) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 138: Requirements for SDL cable with automatic cable adjustment (equalizer)

The cable types and resolutions shown with a footnote 2) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	-
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	-
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	Rev. J0	-
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	Rev. H0	-
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	Rev. J0	-
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	Rev. A0	-
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	Rev. J0	-
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	Rev. I0	-
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	Rev. H0	-
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	Rev. A0	-
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	Rev. A0	-
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	Rev. G0	-
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	Rev. G0	-
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	Rev. G0	-

Table 139: Requirements for SDL cable with extender and automatic cable adjustment (equalizer)

5.5.3 BIOS settings

No special BIOS settings are necessary for operation.

5.6 Four Automation Panel 900 units via SDL (onboard)

An Automation Panel 900 is connected to the integrated SDL interface (onboard) via an SDL cable. Up to three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All four panels show the same content (Display Clone).

USB is supported up to a maximum distance (SDL segment 1 + SDL segment 2) of 30 m on the first two panels (front and back side). From a distance of 30 m and longer, USB is only available for the first panel (front and back side). USB devices can only be connected directly to the Automation Panel (without a hub). A transmission speed of max. USB 1.1 is possible.

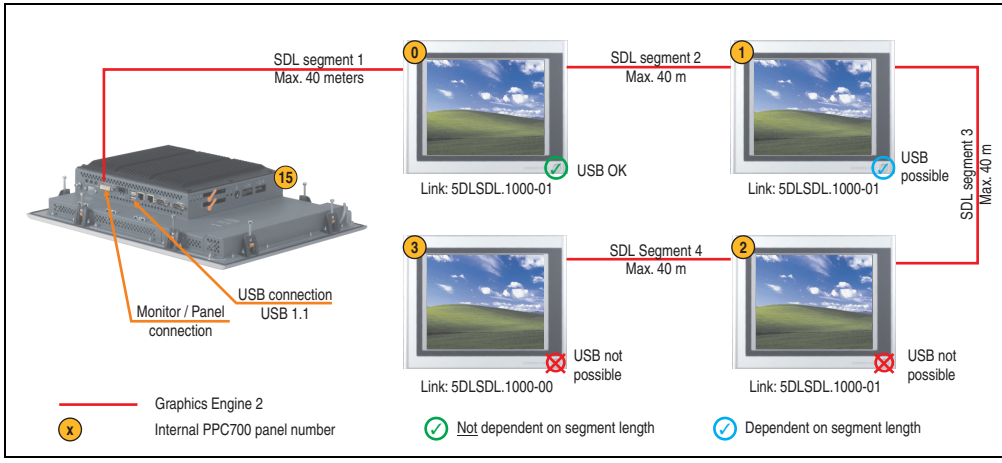


Figure 157: Configuration - Four Automation Panel 900 units via SDL (onboard)

5.6.1 Basic system requirements

The following table displays the possible combinations for the PPC700 system unit with CPU board to implement the configuration shown in the figure above. If the maximum resolution is limited when making the combination then it is also shown in this table.

System unit	CPU board						Limitation Resolution
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	
5PC720.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1043-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-02	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 140: Possible combinations of system unit and CPU board

System unit	CPU board						Limitation Resolution
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 140: Possible combinations of system unit and CPU board

5.6.2 Link modules

Model number	Description	Note
5DLSDL.1000-00	**Automation Panel Link SDL receiver**	For Automation Panel 900
5DLSDL.1000-01	**Automation Panel Link SDL transceiver**	For Automation Panel 900 3 pieces required

Table 141: Link modules for the configuration: 4 Automation Panel 900 via SDL on 1 line

5.6.3 Cables

Selection of 4 cables from the following tables.

Model number	Type	Length
5CASDL.0018-00	SDL w/o extender	1.8 m
5CASDL.0018-01	SDL without extender with 45° plug	1.8 m
5CASDL.0050-00	SDL w/o extender	5 m
5CASDL.0050-01	SDL without extender with 45° plug	5 m
5CASDL.0100-00	SDL w/o extender	10 m
5CASDL.0100-01	SDL without extender with 45° plug	10 m
5CASDL.0150-00	SDL w/o extender	15 m
5CASDL.0150-01	SDL without extender with 45° plug	15 m
5CASDL.0200-00	SDL w/o extender	20 m
5CASDL.0250-00	SDL w/o extender	25 m
5CASDL.0300-00	SDL w/o extender	30 m
5CASDL.0300-10	SDL w/ extender	30 m
5CASDL.0400-10	SDL w/ extender	40 m

Table 142: Cables for SDL configurations

Cable lengths and resolutions for SDL transfer

The following table shows the relationship between segment lengths and the maximum resolution according to the SDL cable used:

Cables Segment length [m]	Resolution				
	VGA 640 x 480	SVGA 800 x 600	XGA 1024 x 768	SXGA 1280 x 1024	UXGA 1600 x 1200
1.8	5CASDL.0018-00 5CASDL.0018-01	5CASDL.0018-00 5CASDL.0018-01	5CASDL.0018-00 5CASDL.0018-01	5CASDL.0018-00 5CASDL.0018-01	5CASDL.0018-00 5CASDL.0018-01
5	5CASDL.0050-00 5CASDL.0050-01	5CASDL.0050-00 5CASDL.0050-01	5CASDL.0050-00 5CASDL.0050-01	5CASDL.0050-00 5CASDL.0050-01	5CASDL.0050-00 5CASDL.0050-01
10	5CASDL.0100-00 5CASDL.0100-01	5CASDL.0100-00 5CASDL.0100-01	5CASDL.0100-00 5CASDL.0100-01	5CASDL.0100-00 5CASDL.0100-01	5CASDL.0100-00[1)] 5CASDL.0100-01[1)]
15	5CASDL.0150-00 5CASDL.0150-01	5CASDL.0150-00 5CASDL.0150-01	5CASDL.0150-00 5CASDL.0150-01	5CASDL.0150-00[1)] 5CASDL.0150-01[1)]	- -
20	5CASDL.0200-00[1)]	5CASDL.0200-00[1)]	5CASDL.0200-00[1)]	5CASDL.0200-00[1)]	-
25	5CASDL.0250-00[1)]	5CASDL.0250-00[1)]	5CASDL.0250-00[1)]	-	-
30	5CASDL.0300-00[1)]	5CASDL.0300-00[1)]	5CASDL.0300-10[2)]	5CASDL.0300-10[2)]	-
40	5CASDL.0400-10[2)]	5CASDL.0400-10[2)]	5CASDL.0400-10[2)]	5CASDL.0400-10[2)]	-

Table 143: Segment lengths, resolutions and SDL cables

1) See table 144 "Requirements for SDL cable with automatic cable adjustment (equalizer)", on page 310

2) See table 145 "Requirements for SDL cable with extender and automatic cable adjustment (equalizer)", on page 311

The cable types and resolutions shown with a footnote 1) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 144: Requirements for SDL cable with automatic cable adjustment (equalizer)

The cable types and resolutions shown with a footnote 2) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	-
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	-
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	Rev. J0	-
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	Rev. H0	-
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	Rev. J0	-
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	Rev. A0	-
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	Rev. J0	-
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	Rev. I0	-
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	Rev. H0	-
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	Rev. A0	-
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	Rev. A0	-
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	Rev. G0	-
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	Rev. G0	-
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	Rev. G0	-

Table 145: Requirements for SDL cable with extender and automatic cable adjustment (equalizer)

5.6.4 BIOS settings

No special BIOS settings are necessary for operation.

5.7 Three Automation Panel 900 devices and an AP800 via SDL (onboard)

Up to four Automation Panels can be connected to the integrated SDL interface (onboard). At the fourth location, an Automation Panel 800 can be operated via SDL. All four displays show the same content (Display Clone).

USB is supported up to a maximum distance (segment 1 + segment 2) of 30 m on the first two displays. Starting at a distance of 30 m, USB is only available on the first display (front and back) up to a maximum of 40 m. USB devices can only be connected directly to Automation Panel 900 devices (without a hub). A transmission speed of max. USB 1.1 is possible.

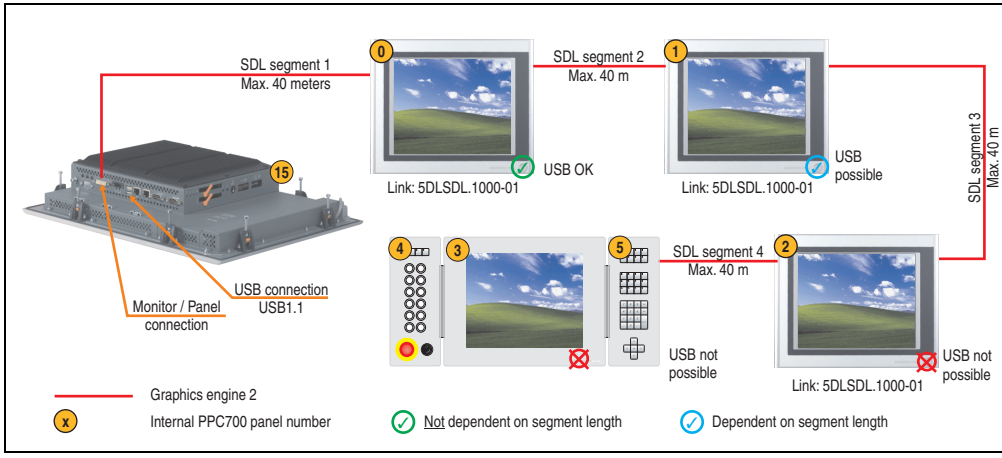


Figure 158: Three Automation Panel 900 devices and an Automation Panel 800 via SDL (onboard)

5.7.1 Basic system requirements

The following table displays the possible combinations for the PPC700 system unit with CPU board to implement the configuration shown in the figure above. If the maximum resolution is limited when making the combination then it is also shown in this table.

System unit	CPU board						Limitation Resolution
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	
5PC720.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1043-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1214-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-01	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1505-02	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 146: Possible combinations of system unit and CPU board

System unit	CPU board						Limitation
	5PC600.E855-00 5PC600.X855-00	5PC600.E855-01 5PC600.X855-01	5PC600.E855-02 5PC600.X855-02	5PC600.E855-03 5PC600.X855-03	5PC600.E855-04 5PC600.X855-04	5PC600.E855-05 5PC600.X855-05	Resolution
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 146: Possible combinations of system unit and CPU board

5.7.2 Link modules

Model number	Description	Note
5DLSDL.1000-00	**Automation Panel Link SDL receiver**	For Automation Panel 900
5DLSDL.1000-01	**Automation Panel Link SDL transceiver**	For Automation Panel 900 3 pieces required

Table 147: Link modules for the configuration: 4 Automation Panel 900 via SDL on 1 line

5.7.3 Cables

How to select an SDL cable for connecting the AP900 display to the AP900 display 5.3 "An Automation Panel 900 via SDL (onboard)", on page 296.

How to select an SDL cable for connecting the AP800 display to the AP900 display5.4 "An Automation Panel 800 via SDL (onboard)", on page 300.

Cable lengths and resolutions for SDL transfer

The following table shows the relationship between segment lengths and the maximum resolution according to the SDL cable used:

Cables Segment length [m]	Resolution XGA 1024 x 768
1.8	5CASDL.0018-20
5	5CASDL.0050-20
10	5CASDL.0100-20
15	5CASDL.0150-20
20	5CASDL.0200-20[1)]
25	5CASDL.0250-20[1)]
30	5CASDL.0300-30[2)]
40	5CASDL.0400-30[2)]

Table 148: Segment lengths, resolutions and SDL cables

1) See table 149 "Requirements for SDL cable with automatic cable adjustment (equalizer)"

2) See table 150 "Requirements for SDL cable with extender and automatic cable adjustment (equalizer)"

The cable types and resolutions shown with a footnote 1) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	Note
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 149: Requirements for SDL cable with automatic cable adjustment (equalizer)

The cable types and resolutions shown with a footnote 2) in the previous table can only be implemented starting with the following firmware and hardware versions:

Firmware	Name	Version	
MTCX FPGA	Firmware on PPC700	v 01.19	The version is read from BIOS - see the BIOS description. Supported starting with the APC620 / PPC 700 Firmware upgrade (MTCX, SDLR) **V01.10**, available in the download area of the B&R homepage.
MTCX PX32	Firmware on PPC700	v 01.06	
SDLR FPGA	Firmware on the AP Link SDL receiver	v 00.03	
Hardware	**Name**	**Revision**	**Note**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	-
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	-
5PC720.1043-00	Panel PC 720 10.4" VGA T, 0 PCI slots	Rev. J0	-
5PC720.1043-01	Panel PC 720 10.4" VGA T, 2 PCI slots, 1 disk drive slot	Rev. H0	-
5PC720.1214-00	Panel PC 720 12.1" SVGA T, 0 PCI slots	Rev. J0	-
5PC720.1214-01	Panel PC 720 12.1" SVGA T, 2 PCI slots, 1 disk drive slot	Rev. A0	-
5PC720.1505-00	Panel PC 720 15" XGA T, 0 PCI slots	Rev. J0	-
5PC720.1505-01	Panel PC 720 15" XGA T, 2 PCI slots, 1 disk drive slot	Rev. I0	-
5PC720.1505-02	Panel PC 720 15" XGA T, 1 PCI slot, 1 disk drive slot	Rev. H0	-
5PC720.1706-00	Panel PC 720 17" SXGA T, 0 PCI slots	Rev. A0	-
5PC720.1906-00	Panel PC 720 19" SXGA T, 0 PCI slots	Rev. A0	-
5PC781.1043-00	Panel PC 781 10.4" VGA FT, 0 PCI slots	Rev. G0	-

Table 150: Requirements for SDL cable with extender and automatic cable adjustment (equalizer)

Hardware	Name	Revision	Note
5PC781.1505-00	Panel PC 781 15" XGA FT, 0 PCI slots	Rev. G0	-
5PC782.1043-00	Panel PC 782 10.4" VGA FT, 0 PCI slots	Rev. G0	-

Table 150: Requirements for SDL cable with extender and automatic cable adjustment (equalizer) (Forts.)

5.7.4 BIOS settings

No special BIOS settings are necessary for operation.

6. Connection of USB peripheral devices

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.

6.1 Locally on the PPC700

Many different peripheral USB devices can be connected to the 2 or 3 USB interfaces on the Panel PC 700. These can each handle a load of 1A. The maximum transfer rate is USB 2.0.

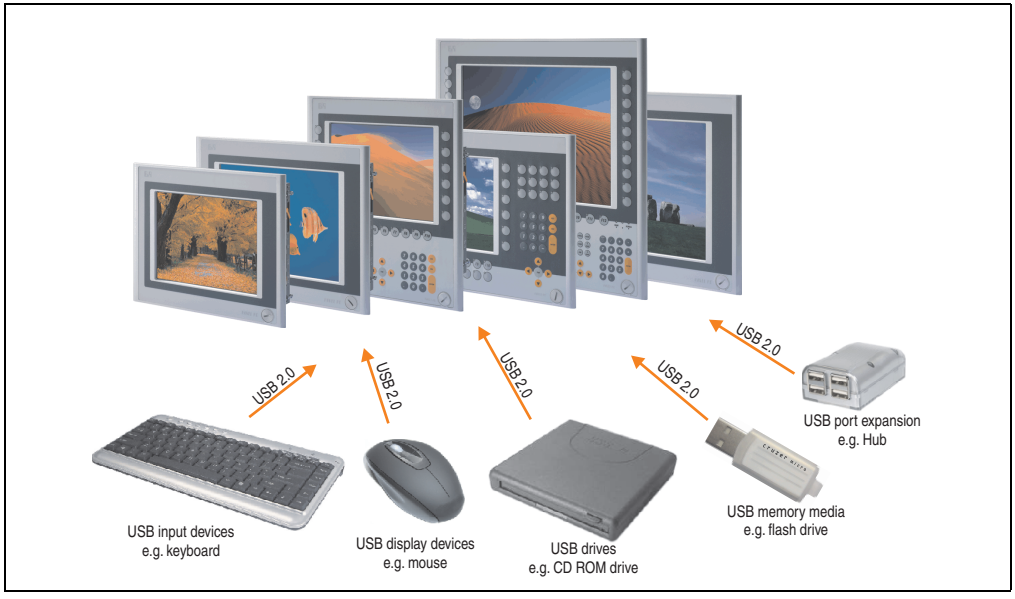


Figure 159: Local connection of USB peripheral devices on the PPC 700

6.2 Remote connection to Automation Panel 900 via DVI

Many different peripheral USB devices can be connected to the 2 or 3 USB interfaces on the Automation Panel 900. These can each handle a load of 500 mA. The maximum transfer rate is USB 2.0.

Information:

Only end devices (no hubs) can be connected to the Automation Panel 900.

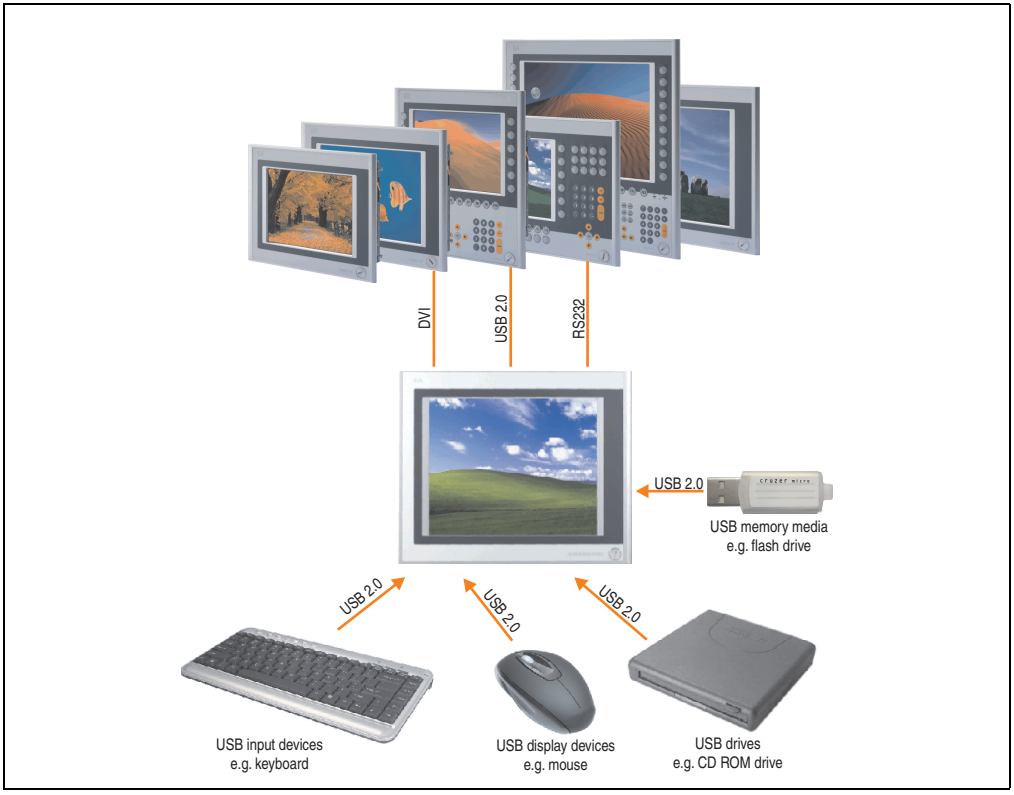


Figure 160: Remote connection of USB peripheral devices to the APC900 via DVI

6.3 Remote connection to Automation Panel 800/900 via SDL

Many different peripheral USB devices can be connected to the 2 or 3 USB interfaces on Automation Panel 900 and/or USB connections on the Automation Panel 800 devices. These can each handle a load of 500 mA. The maximum transfer rate is USB 1.1.

Information:

Only end devices (no hubs) can be connected to the Automation Panel 800/900.

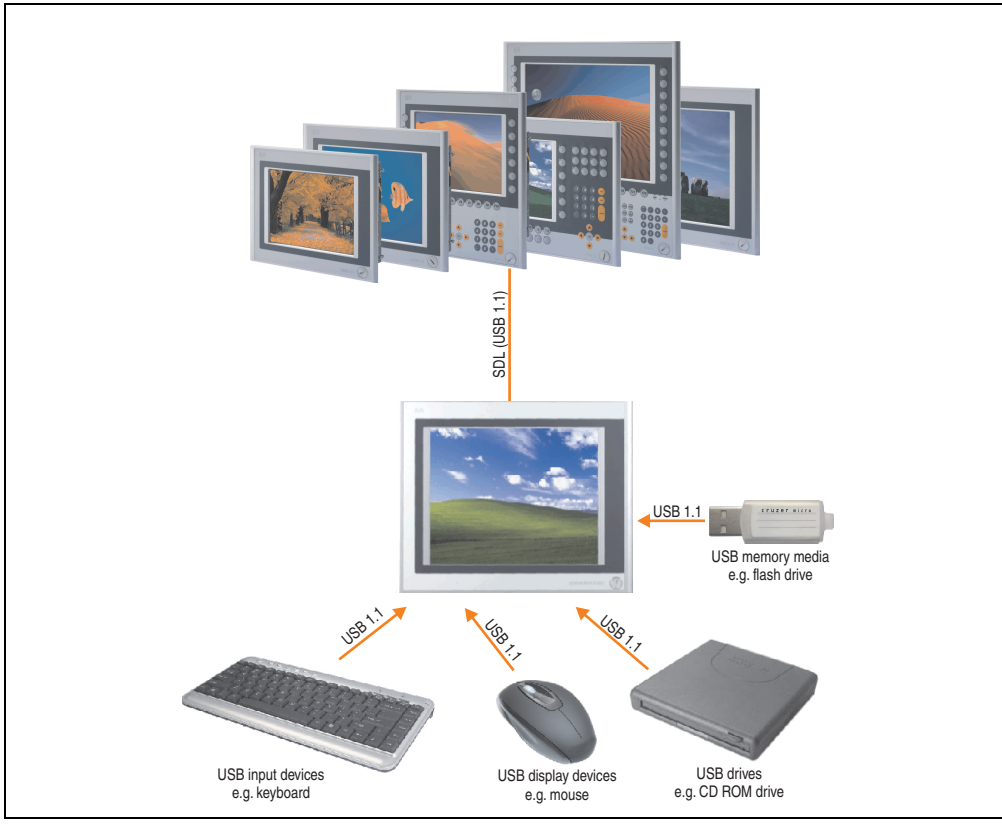


Figure 161: Remote connection of USB peripheral devices to the APC800/900 via SDL

7. Configuration of a SATA RAID array

You must enter the BIOS "RAID Configuration Utility" in order to make the necessary settings. After the POST, enter <Ctrl+S> or <F4> to open RAID BIOS.

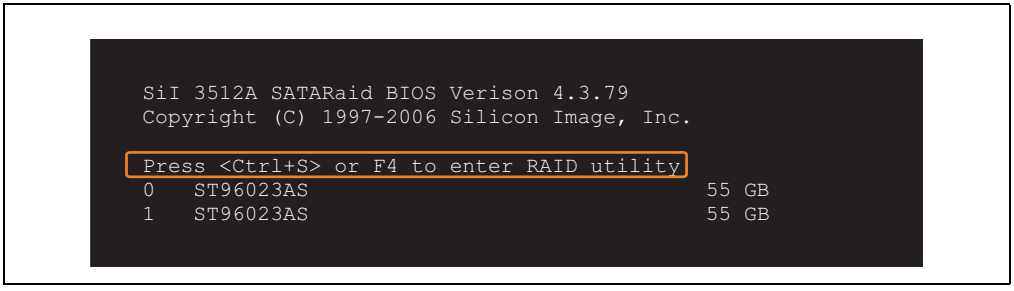


Figure 162: Open the RAID Configuration Utility

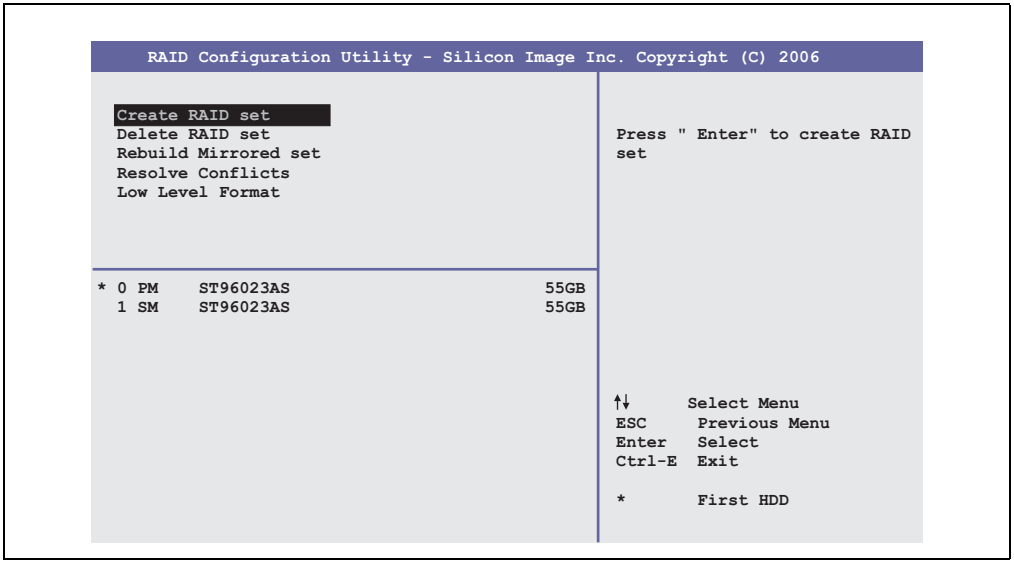


Figure 163: RAID Configuration Utility - Menu

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

Key	Function
Cursor ↑	Go to previous item.
Cursor ↓	Go to the next item.
Enter	Select an item or open a submenu.
ESC	Go back to previous menu.

Table 151: BIOS-relevant keys in the RAID Configuration Utility

Key	Function
Ctrl+E	Exit setup and save the changed settings.

Table 151: BIOS-relevant keys in the RAID Configuration Utility

7.1 Create RAID set

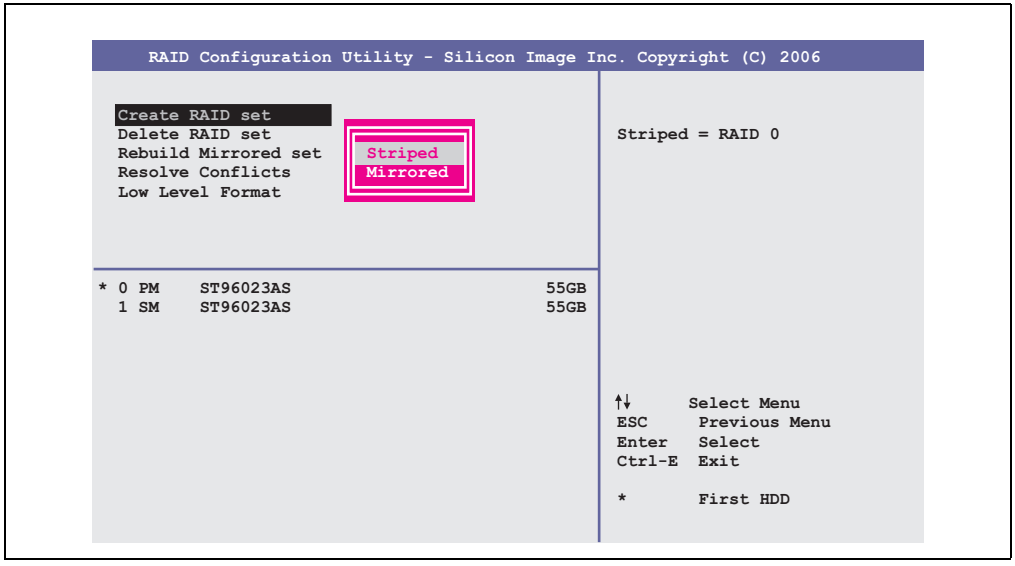


Figure 164: RAID Configuration Utility - Menu

The RAID system can be recreated as "Striped" = RAID0 or "Mirrored" = RAID1 using the menu "Create RAID set".

7.2 Create RAID set - Striped

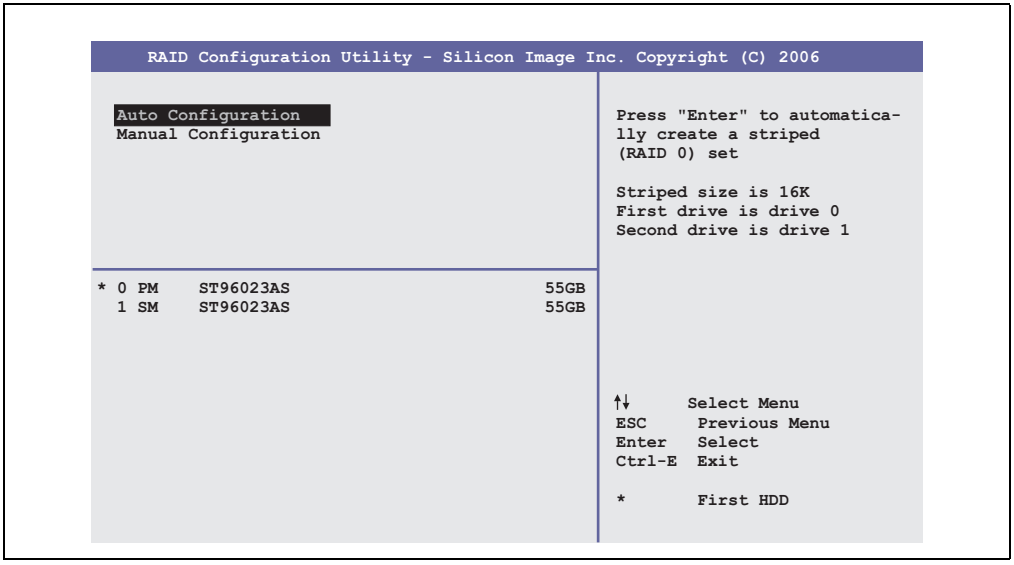


Figure 165: RAID Configuration Utility - Create RAID set - Striped

Auto Configuration

Auto Configuration optimizes all settings.

Manual Configuration

It is possible to specify the first and second HDD as well as the "Chunk Size" (= block size, application-dependent).

7.3 Create RAID set - Mirrored

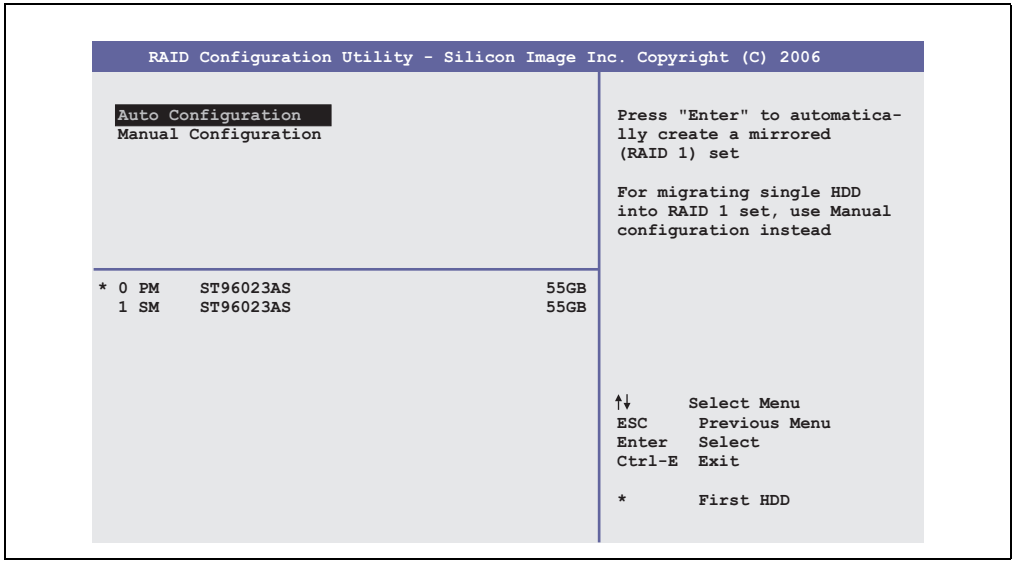


Figure 166: RAID Configuration Utility - Create RAID set - Mirrored

Auto Configuration

Auto Configuration optimizes all settings.

Manual Configuration

It is possible to specify the "Source" and "Target" HDD, and also to specify whether a rebuild (mirror) should be performed immediately (approx. 50 minutes).

7.4 Delete RAID set

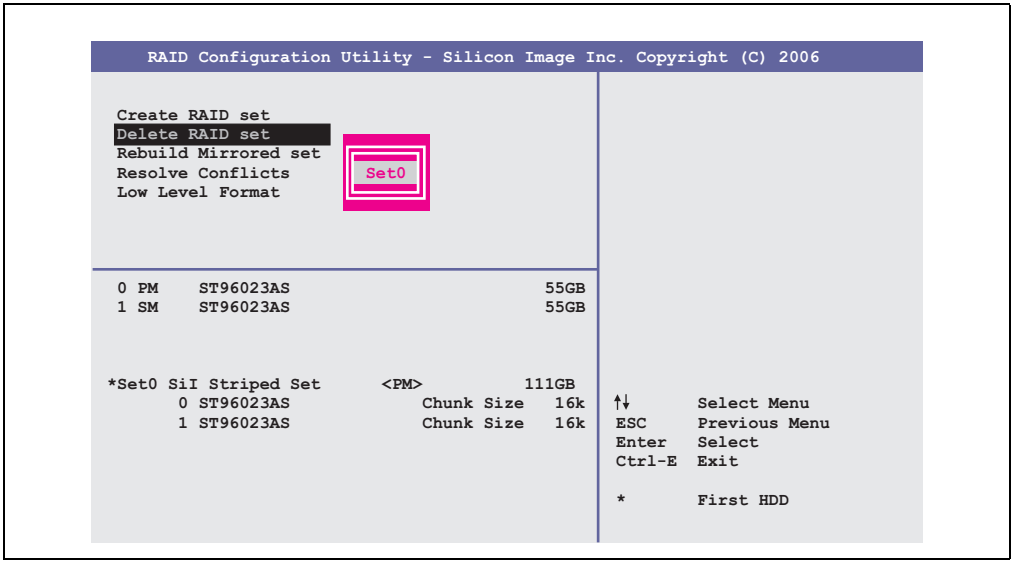


Figure 167: RAID Configuration Utility - Delete RAID set

An existing RAID set can be deleted using the menu "Delete RAID set".

7.5 Rebuild mirrored set

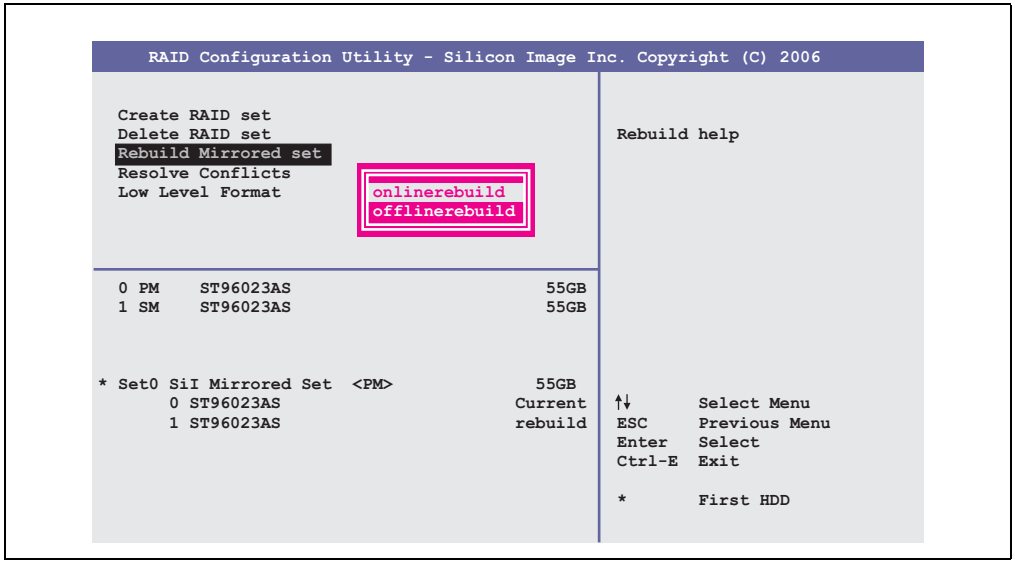


Figure 168: RAID Configuration Utility - Rebuild mirrored set

The "Rebuild mirrored set" menu can be used to restart a rebuild procedure in a RAID 1 network if an error occurs, after first interrupting the rebuild procedure or when exchanging a hard disk.

If "onlinerebuild" is selected, then the rebuild is executed during operation after the system is booted. E.g. an event pop-up is displayed by the installed SATA RAID configuration program: `SATARaid detected a new event` and the rebuild is started. The entire rebuild lasts approximately 50 minutes.

If "offlinerebuild" is selected, then a rebuild is performed immediately before starting the operating system (lasts approximately 30 minutes).

7.6 Resolve conflicts

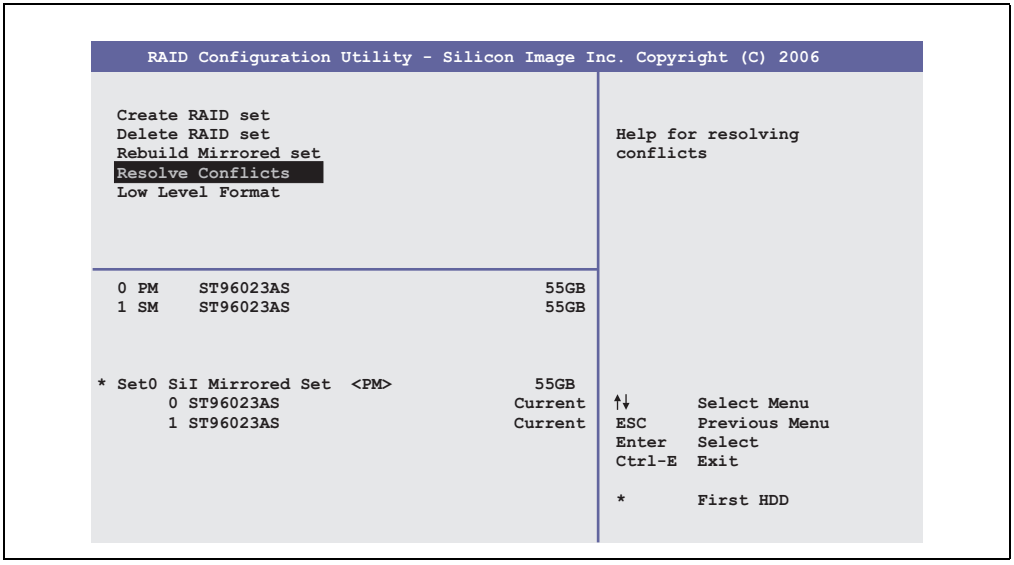


Figure 169: RAID Configuration Utility - Resolve conflicts

Conflicts in a RAID set can be resolved using the "Resolve conflicts" menu. This function is only available if the status of the hard disk is "conflict".

7.7 Low level format

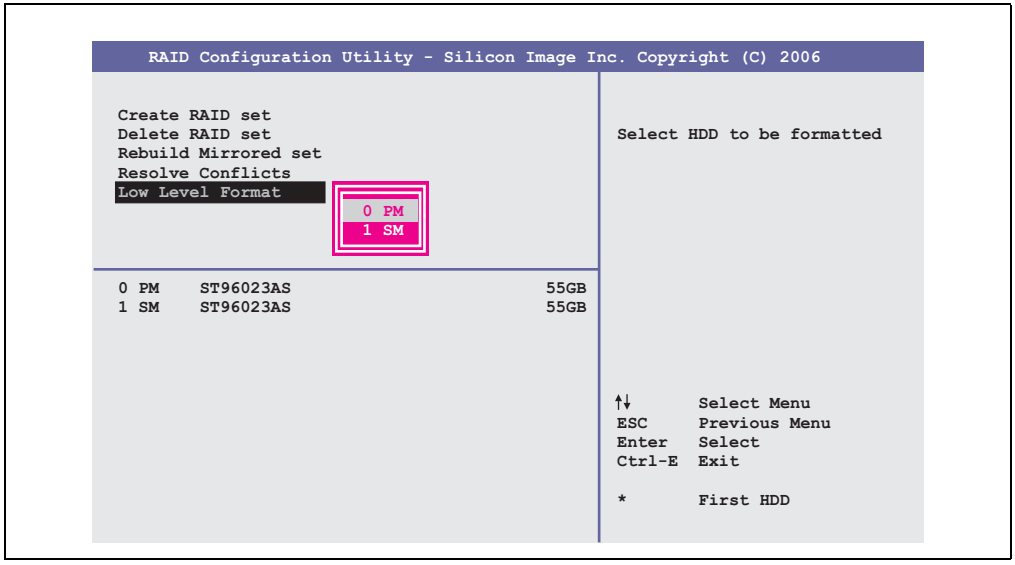


Figure 170: RAID Configuration Utility - Low level format

Individual hard disks can be configured using the "Low Level Format" menu. This can only be done if a RAID set is not configured. A low level format of a hard disk takes approx. 40 minutes.

8. Key and LED configurations

Each key or LED can be configured individually and adjusted to suit the application. Various B&R tools are available for this purpose:

- B&R Key Editor for Windows operating systems
- Visual Components for Automation Runtime

Keys and LEDs from each device are processed by the matrix controller in a bit sequence of 128 bits each.

The positions of the keys and LEDs in the matrix are shown as hardware numbers. The hardware numbers can be read directly on the target system, for example with the B&R Key Editor and the B&R Control Center.

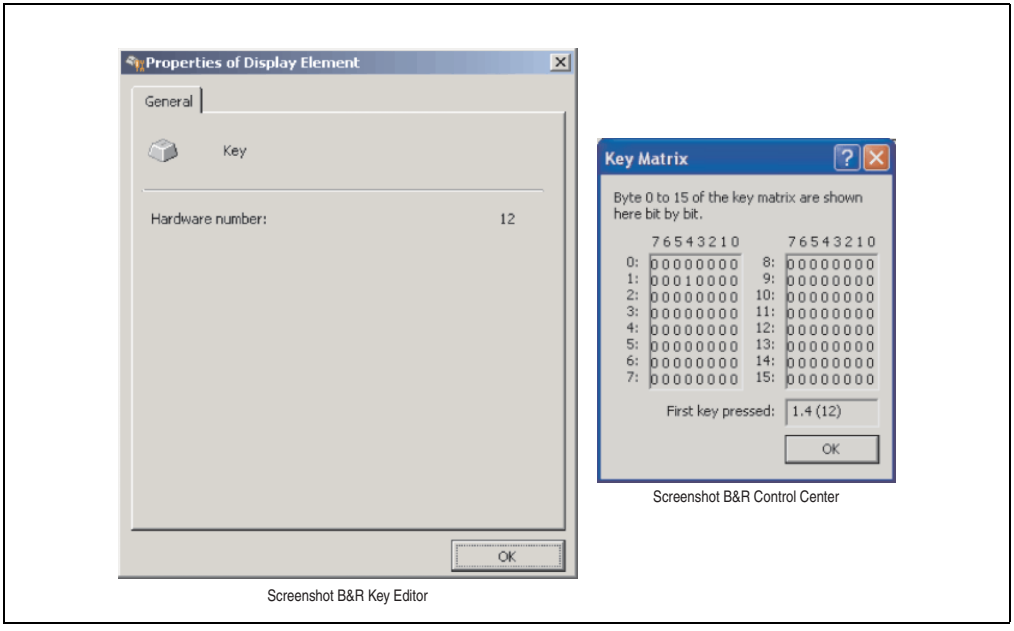


Figure 171: Example - Hardware number in the B&R Key Editor or in the B&R Control Center

The following graphics show the positions of the keys and LEDs in the matrix. They are shown as follows.

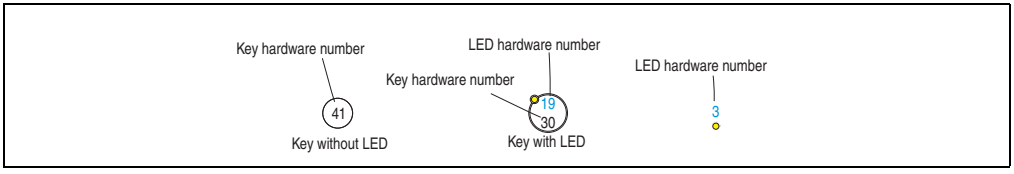


Figure 172: Display - Keys and LEDs in the matrix

8.1 Panel PC 10.4" TFT

8.1.1 Panel PC 5PC781.1043-00

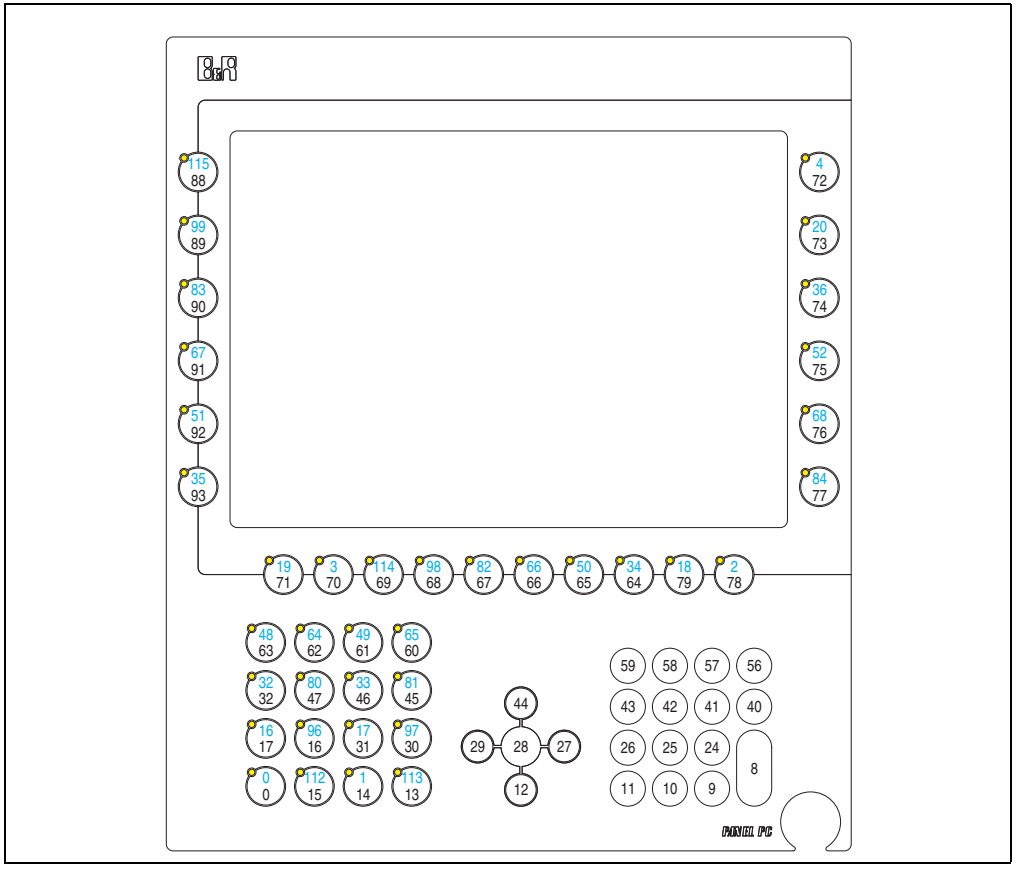


Figure 173: Hardware numbers - 5PC781.1043-00

8.1.2 Panel PC 5PC782.1043-00

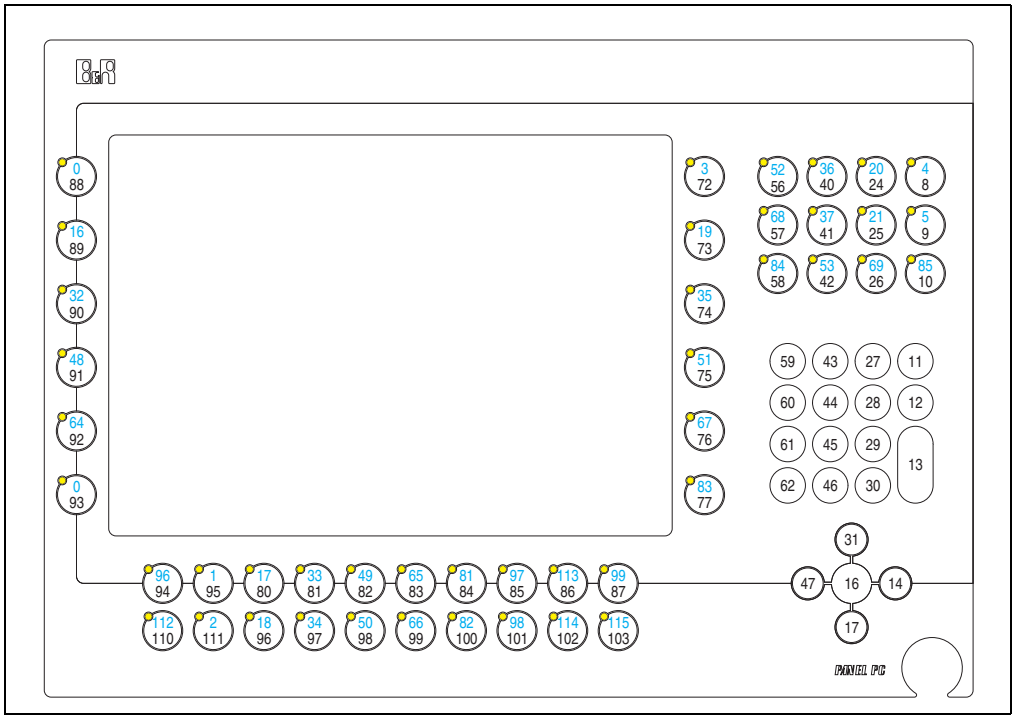


Figure 174: Hardware numbers - 5PC782.1043-00

8.2 Panel PC 15" TFT

8.2.1 Panel PC 5PC781.1505-00

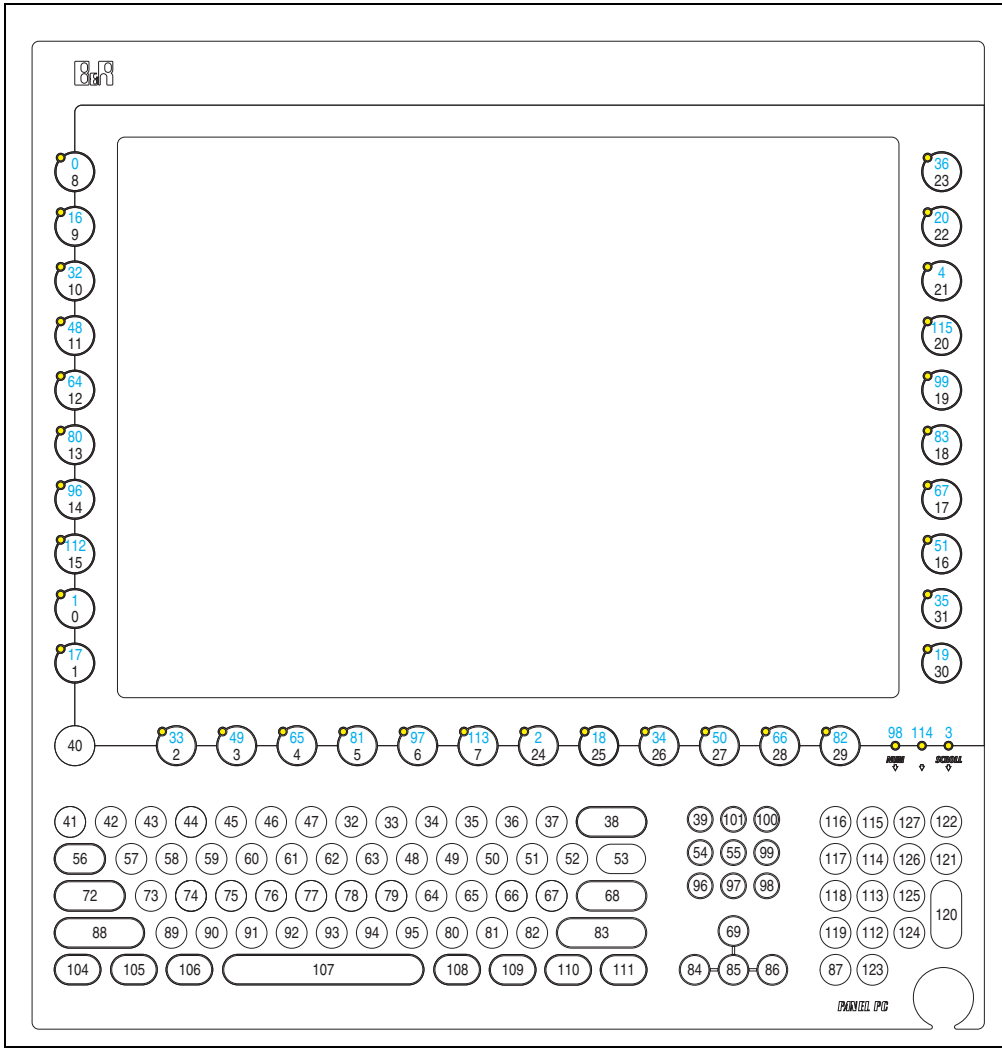


Figure 175: Hardware numbers - 5PC781.1505-00

9. User tips for increasing the display lifespan

9.1 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.

9.1.1 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.

9.2 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.

9.2.1 What causes image sticking?

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

9.2.2 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

10. Pixelerror

Information:

Displays can contain dead pixels that result from the manufacturing process. These flaws are not grounds claiming reclamation or warranty.

11. General instructions for performing temperature tests

The purpose of these instructions is to explain general procedures for performing application-specific temperature tests with B&R industrial PCs or Power Panels. However, these instructions are meant to serve only as a guideline.

11.1 Procedure

In order to obtain accurate results, the testing conditions should match the conditions in the field. This means that for the duration of the temperature tests, the target application should be running, the PC should be installed in the control cabinet that will be used, etc.

Additionally, a temperature sensor should be installed for the device being tested to provide live monitoring of the ambient temperature. In order to obtain accurate measurements, this sensor should be mounted at a distance of 5 to 10 cm from the B&R industrial PC, near the air intake (not near the exhaust).

All B&R industrial PCs and Power Panels are equipped with internal temperature sensors. These are installed in different locations for each series. The number of sensors and the temperature limits also vary from series to series.

Information about the locations of temperature sensors and the maximum specified values can be found in section "Temperature sensor locations", on page 693.

To ensure a reliable evaluation of the temperature situation, a minimum of 8 hours are recommended for testing.

11.2 Evaluating the temperatures in Windows operating systems

11.2.1 Evaluation using B&R Control Center

The B&R Control Center can be used to evaluate the temperatures. The temperatures can be viewed on the "Temperatures" tab. The B&R Control Center can be downloaded at no cost from the Downloads section of the B&R website (www.br-automation.com). The B&R Control Center uses the B&R Automation Device Interface (ADI).

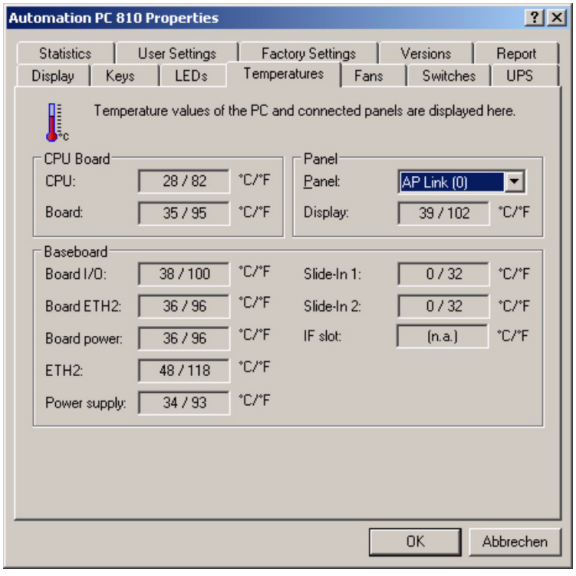


Figure 176: B&R Control Center

A new application can be created if a historic recording of the data is required.

Information:

There are SDK's (e.g. the ADI .NET SDK) available on the B&R website (www.br-automation.com) that can be helpful in creating a new application.

11.2.2 Evaluation using the BurnIn tool from Passmark

If a new application is not created for evaluating the temperatures, B&R recommends using the BurnIn Test software tool from the company Passmark.

Standard and Professional versions of the BurnIn tool are available. In addition to the software package, there are also various loopback adapters (serial, parallel, USB, etc.) and test CDs/DVDs available. The exact software and loopback adapters used will determine the corresponding load that can be generated on the system and peripheral devices.

Information:

Loopback adapters are also available from Passmark. More information can be found at www.passmark.com.

The following screenshots are based on Passmark BurnIn Pro Version V4 and an APC810 2-slot with DVD.

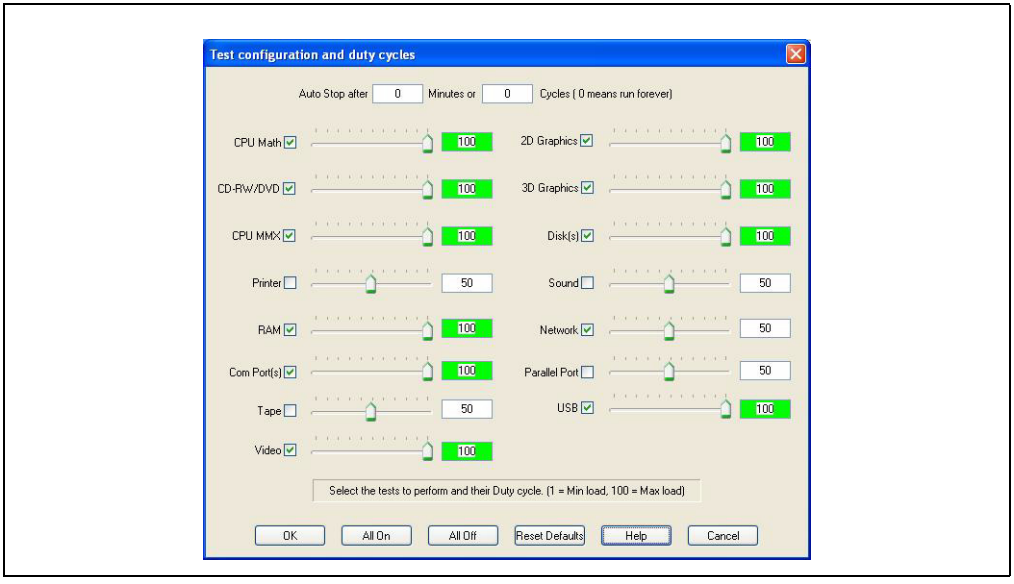


Figure 177: Settings for Passmark BurnIn Pro V4 with an APC810 2-slot with DVD

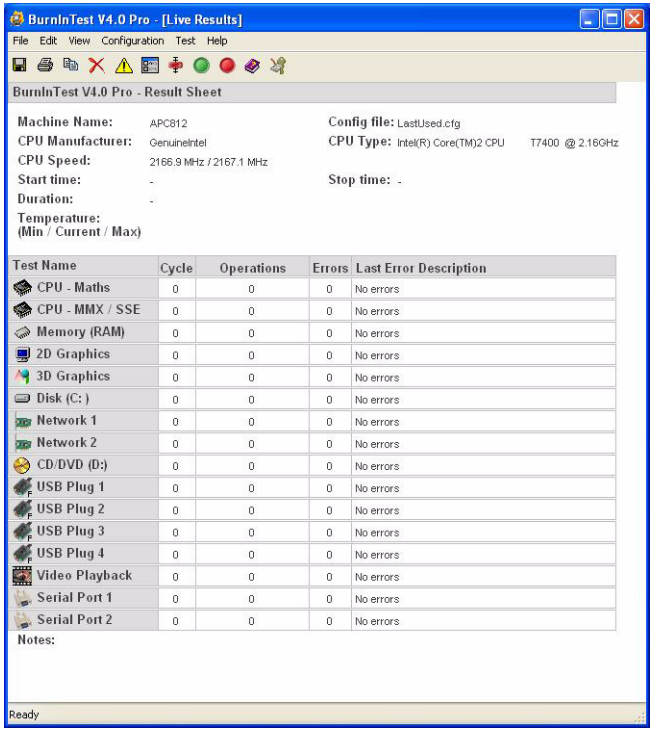


Figure 178: Test overview of an APC810 2-slot with DVD

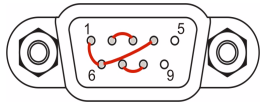
The respective test properties may need to be fine tuned depending on the availability of a loopback adapter and DVDs.

Information:

If there is no USB loopback adapter available, USB flash drives can also be used. The USB flash drives must be available in Windows as formatted drives. The test USB must then be deselected and the USB flash drives must be configured in the disk properties.

Information:

Serial loopback adapters are relatively easy to create yourself. Simple connect several pins on the serial interface with wires.



11.3 Evaluating the temperatures in an operating system other than Windows

For applications that don't use Windows, the temperatures can be evaluated using the B&R implementation guide. In addition to the implementation guide, there are also programs available in MS-DOS.

The implementation guide only describes the device-specific functions and not the main functions of the sample programs.

If code from the sample programs is used, please observe the notes in the implementation guide regarding the TODO statements, I/O access functions, etc.

Information:

Sample programs and implementation guides for any B&R industrial PC or Power Panel can be downloaded free of charge from the B&R website (www.br-automation.com).

11.4 Evaluating the measurement results

The maximum temperature value recorded by each sensor must not exceed the temperature limits specified in the user's manuals.

If the temperature tests cannot be performed in a climate controlled chamber, they can also be performed in an office environment. In this case, however, it is necessary to measure the ambient temperature. Experience at B&R has shown that values measured on passive systems (systems without a fan kit) can be projected linearly based on the ambient temperature. In order to be able to project the temperature values for systems with a fan kit, the fans must be running. It is also important to consider the speed, etc.

If the temperature tests are performed in a climate controlled chamber with fans, the devices will be cooled by these fans, and the results will be skewed. The measurement results for passive devices would therefore be unusable. In order to obtain accurate results in climate controlled chambers with fans, the chamber fans must be turned off and the device must be allowed to run for a sufficient amount of time (several hours) before beginning the test.

11.4.1 Example using an APC810 2-slot

The following example is only valid as long as the instructions for installation and mounting orientation provided in the user's manual are followed.

Temperature sensor	Measured temperature	Projected temperature	
Ambient temperature	20°C	35°C	45°C
CPU	48°C	63°C	73°C
CPU board	51°C	66°C	76°C
Board I/O	51°C	66°C	76°C
Board ETH2	52°C	67°C	77°C
Board power supply	51°C	66°C	76°C
ETH2	65°C	80°C	90°C
Power supply	51°C	66°C	76°C

Table 152: Evaluation example using an APC810 2-slot

12. Known problems / issues

The following issues for the PPC700 devices are 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 startup 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.
- During daisy chain operation of multiple AP800/AP900 devices via SDL, it's possible that the touch controller status shows a red "X" in the Control Center applet for the touch screen driver when the touch controller is detected. The functionality of the touch system is not affected by this. This can be avoided by setting a panel locking time of 50 ms. The panel locking time can be configured with the B&R Key Editor.

Chapter 4 • Software

1. BIOS options

The available BIOS settings in various CPU boards 815E (ETX), 855GME (ETX) and 855GME (XTX) are described in the following sections.

1.1 815E (ETX) BIOS description

Information:

- **The following diagrams and BIOS menu items including descriptions refer to BIOS version 1.23. It is therefore possible that these diagrams and BIOS descriptions do not correspond with the installed BIOS version.**
- **The setup defaults are the settings recommended by B&R. The setup defaults are dependant on the DIP switch configuration on the baseboard (see section 1.1.10 "Profile overview - BIOS default settings - 815E (ETX)", on page 386).**

1.1.1 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 on the Panel PC 700 systems is produced by Phoenix.

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 is buffered by a battery, and the data remains in the PPC700 even when the power is turned off.

1.1.2 BIOS setup

BIOS is immediately activated when the Panel PC 700 system power supply is switched on. 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 as soon as the following message appears on the lower margin of the display (during POST):

"Press <F2> to enter SETUP"

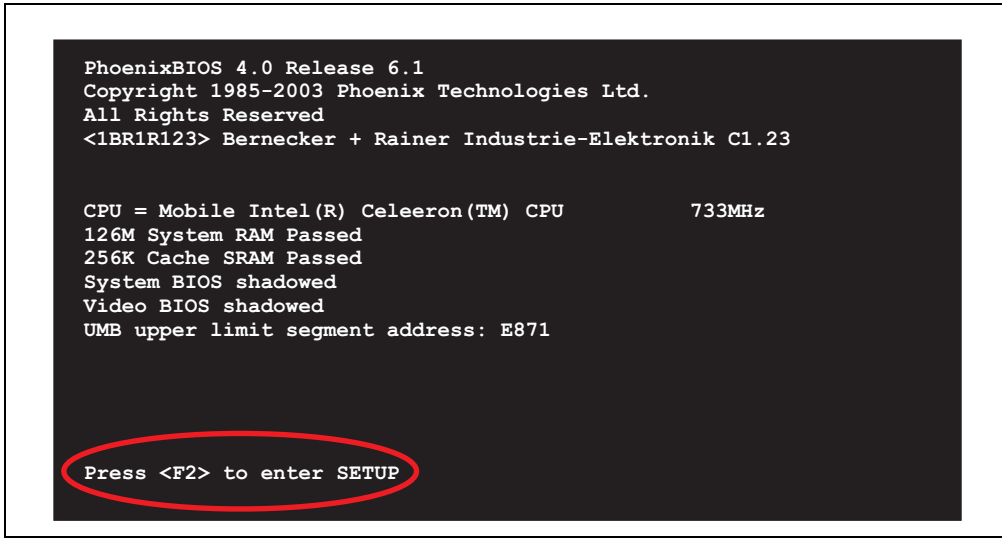


Figure 179: 815E (ETX) BIOS diagnostic screen

Summary screen

After the POST, the summary screen displays the most important system characteristics.

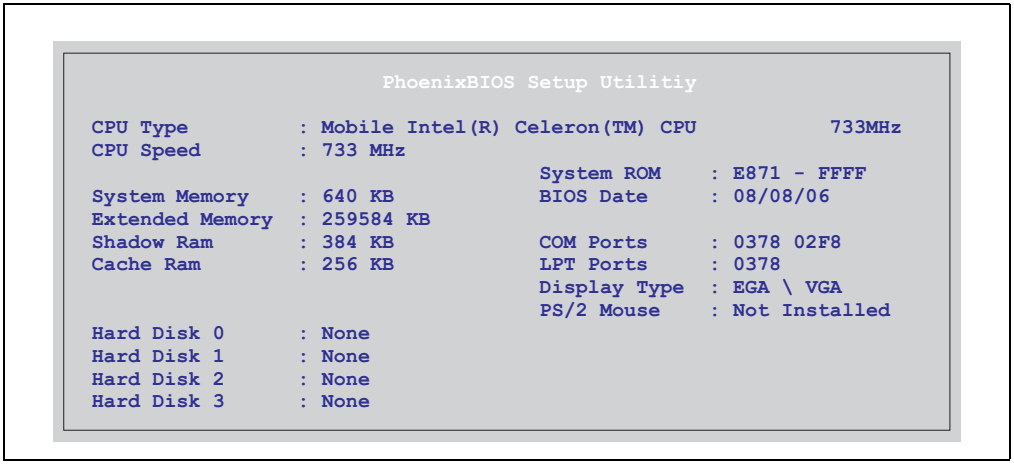


Figure 180: 815E (ETX) BIOS Summary screen

1.1.3 BIOS setup keys

The following keys are active during the POST:

Key	Function
F2	Enters the BIOS setup menu.
ESC	Cues the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER>, select the device from which will be booted.
<Spacebar>	Pressing the spacebar skips the system RAM check.
<Pause>	Pressing the <pause> key stops the POST. Press any other key to resume the POST.

Table 153: Keys relevant to 815E (ETX) BIOS during POST

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

Key	Function
Cursor ↑	Moves to the previous item.
Cursor ↓	Go to the next item.
Cursor ←	Move to the item on the left.
Cursor →	Move to the item on the right.
<ESC>	Exits the submenu.
PageUp ↑	Moves the cursor to the top of the current BIOS setup page.
PageDown ↓	Moves the cursor to the bottom of the current BIOS setup page.

Table 154: Keys relevant to BIOS 815E (ETX)

Key	Function
<F1> or <Alt+H>	Opens a help window showing the key assignments.
<F5> or <->	Scrolls to the previous option for the selected BIOS setting.
<F6> or <+> or <spacebar>	Scrolls to the next option for the selected BIOS setting.
<F9>	Loads setup defaults for the current BIOS setup screen.
<F10>	Saves settings and closes BIOS setup.
<Enter>	Opens submenu for a BIOS setup menu item, or displays the configurable values of a BIOS setup item.

Table 154: Keys relevant to BIOS 815E (ETX)

The following sections explain the individual BIOS setup menu items in detail.

BIOS setup menu item	Function	From page
Main	The basic system configurations (e.g. time, date, hard disk parameters) can be set in this menu.	343
Advanced	Advanced BIOS options such as cache areas, PnP, keyboard repeat rate, as well as settings specific to B&R integrated hardware, can be configured here.	352
Security	For setting up the system's security functions.	377
Power	Setup of various APM (Advanced Power Management) options.	379
Boot	The boot order can be set here.	383
Exit	To end the BIOS setup.	384

Table 155: BIOS 815E (ETX) - Overview of BIOS menu items

1.1.4 Main

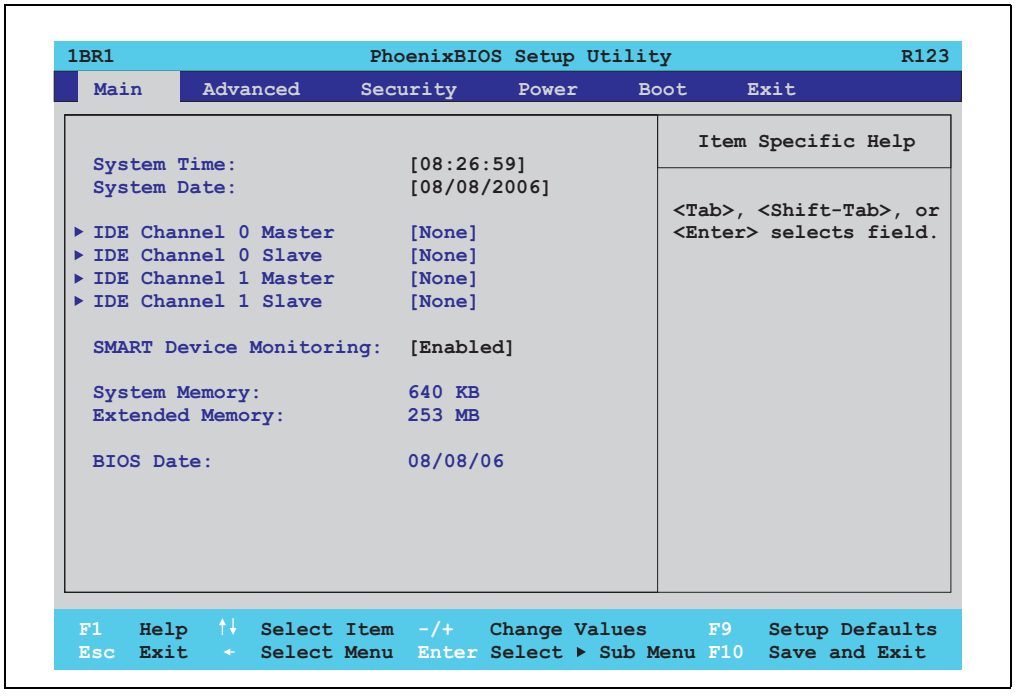


Figure 181: 815E (ETX) Main Menu

BIOS setting	Meaning	Setting options	Effect
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.	Changes the System time	Set the system time in the format (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 the system date	Set the system date in the format (mm:dd:yyyy).
IDE channel 0 master	The drive in the system that is connected to the IDE primary master port is configured here.	Enter	Opens the submenu See "IDE channel 0 master", on page 344.
IDE channel 0 slave	The drive in the system that is connected to the IDE primary slave port is configured here.	Enter	Opens the submenu See "IDE Channel 0 Slave", on page 346.
IDE channel 1 master	The drive in the system that is connected to the IDE secondary master port is configured here.	Enter	Opens the submenu See "IDE channel 1 master", on page 348.
IDE channel 1 slave	The drive in the system that is connected to the IDE secondary slave port is configured here.	Enter	Opens the submenu See "IDE channel 1 slave", on page 350.

Table 156: 815E (ETX) Main setting options

BIOS setting	Meaning	Setting options	Effect
SMART device monitoring	S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) is implemented in the today's hard drives. This technology allows you to detect reading or rotational problems with the hard drive, and much more.	Enabled	Activates this function. In the future, a message regarding impending errors is produced.
		Disabled	Deactivates this function.
System Memory	Displays the amount of main memory installed. Between 0 and 640 KB.	None	-
Extended memory	Displays the available main memory from the first MB to the maximum memory capacity.	None	-
BIOS Date	The creation date of the software stored in BIOS is displayed here.	None	-

Table 156: 815E (ETX) Main setting options (Forts.)

IDE channel 0 master

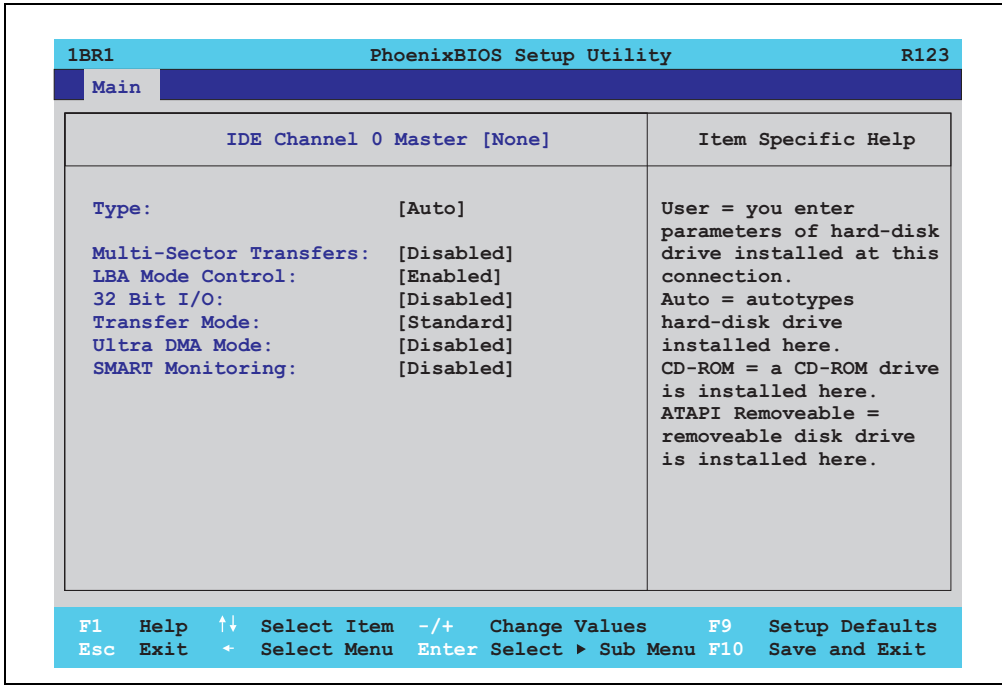


Figure 182: 815E (ETX) IDE Channel 0 Master setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the primary master is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the primary master drive and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the primary master drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the primary master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 157: 815E (ETX) IDE Channel 0 Master setting options

IDE Channel 0 Slave

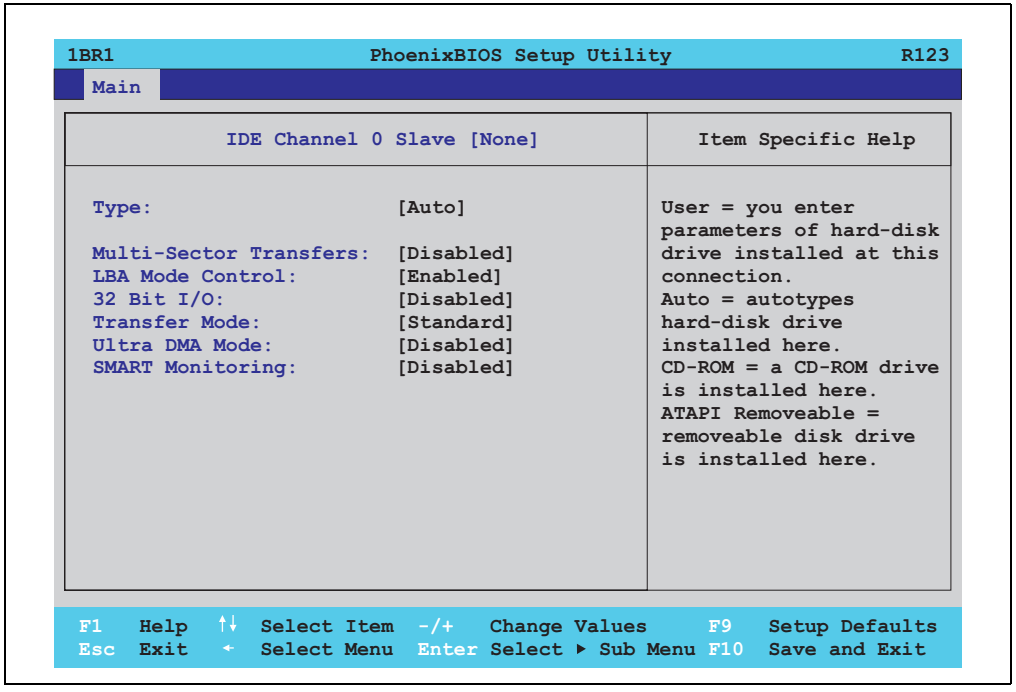


Figure 183: 815E (ETX) IDE Channel 0 Slave setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the primary slave is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 158: 815E (ETX) IDE Channel 0 Slave setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the primary slave drive and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the primary slave drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the primary slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 158: 815E (ETX) IDE Channel 0 Slave setting options (Forts.)

IDE channel 1 master

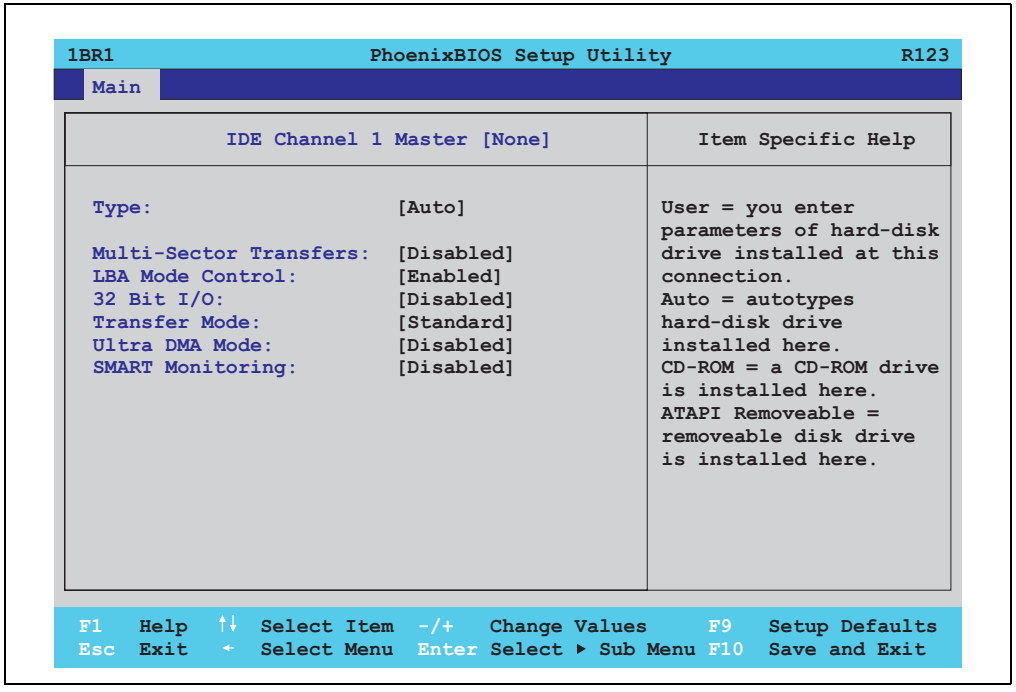


Figure 184: 815E (ETX) IDE Channel 1 Master setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the secondary master is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 159: 815E (ETX) IDE Channel 1 Master setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the secondary master drive and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the secondary master drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the secondary master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 159: 815E (ETX) IDE Channel 1 Master setting options (Forts.)

IDE channel 1 slave

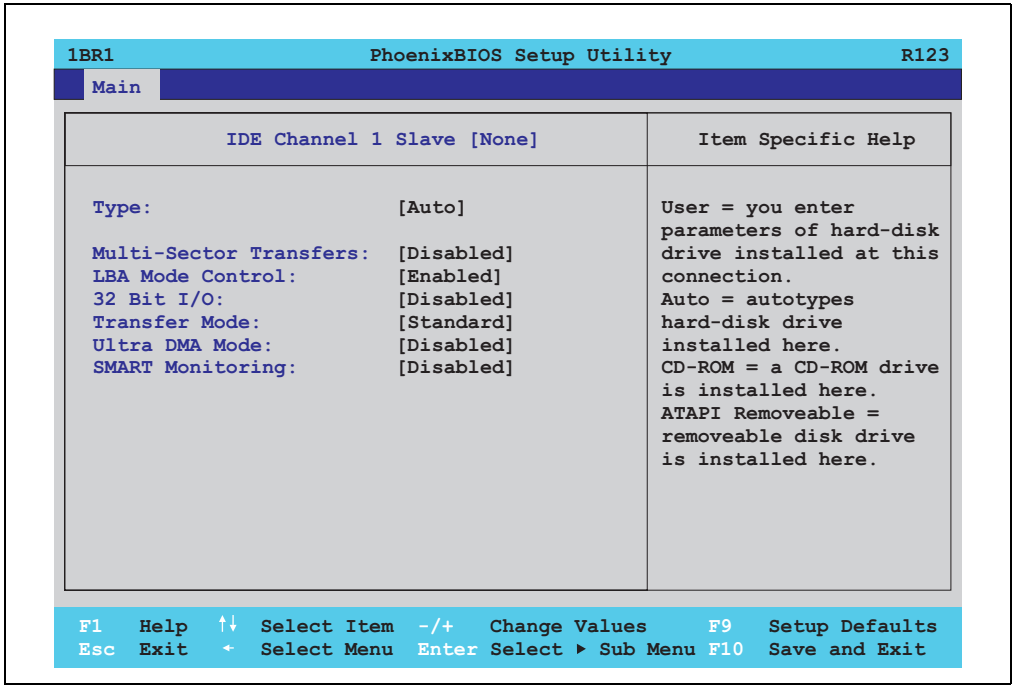


Figure 185: 815E (ETX) IDE Channel 1 Slave setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the secondary slave is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 160: 815E (ETX) IDE Channel 1 Slave setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the secondary slave drive and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the secondary slave is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the secondary slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 160: 815E (ETX) IDE Channel 1 Slave setting options (Forts.)

1.1.5 Advanced

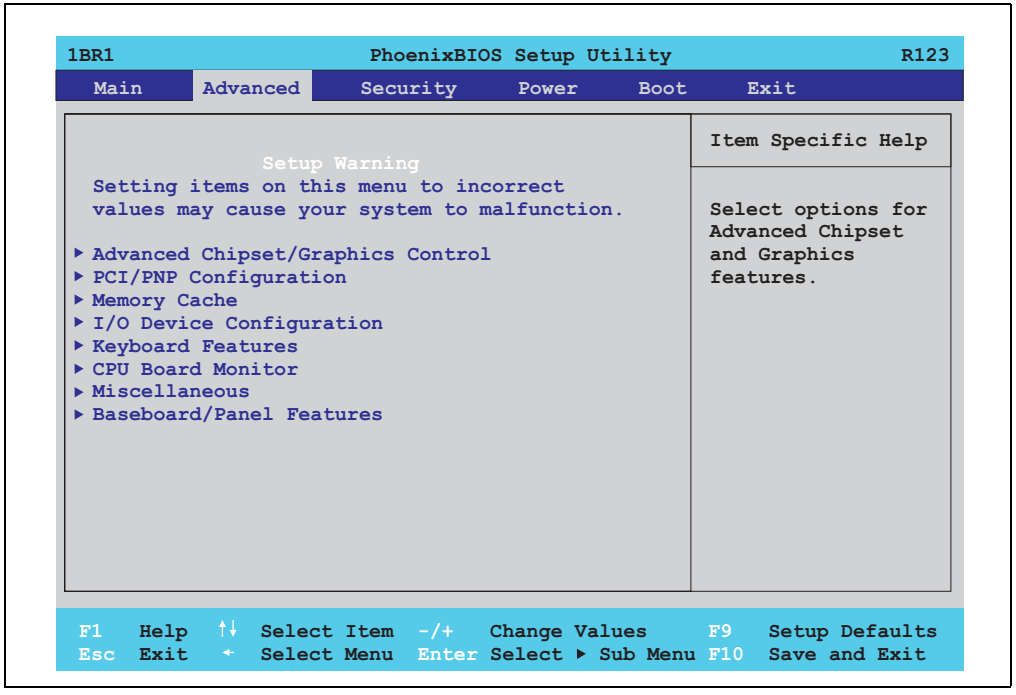


Figure 186: 815E (ETX) Advanced Menu

BIOS setup menu	Meaning	Setting options	Effect
Advanced chipset/graphics control	Setup of advanced chipset and graphics functions.	Enter	Opens the submenu See "Advanced chipset/graphics control", on page 354.
PCI/PNP Configuration	Configures PCI devices.	Enter	Opens the submenu See "PCI/PNP Configuration", on page 356.
Memory cache	Configuration of the memory cache resources.	Enter	Opens the submenu See "Memory cache", on page 363.
I/O Device Configuration	Configures the I/O devices.	Enter	Opens the submenu See "I/O Device Configuration", on page 365.
Keyboard Features	Configuration of the keyboard options.	Enter	Opens the submenu See "Keyboard Features", on page 368.
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens the submenu See "CPU board monitor", on page 369.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc.).	Enter	Opens the submenu See "Miscellaneous", on page 370.

Table 161: 815E (ETX) Advanced Menu setting options

BIOS setup menu	Meaning	Setting options	Effect
Main Board/Panel Features	Displays device specific information and setup of device specific values.	Enter	Opens the submenu See "Main Board/Panel Features", on page 371.

Table 161: 815E (ETX) Advanced Menu setting options (Forts.)

Advanced chipset/graphics control

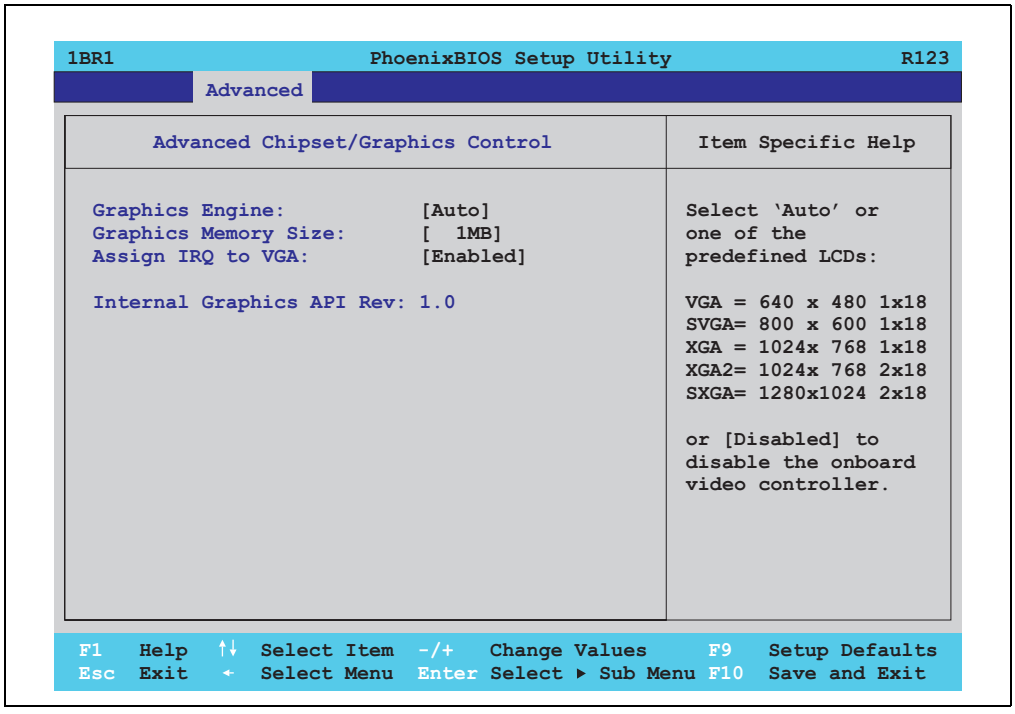


Figure 187: 815E (ETX) Advanced Chipset/Graphics Control

BIOS setting	Meaning	Setting options	Effect
Graphics engine	Settings can be made for the onboard video controller.	Auto	Automatic setting of the resolution (using a read-out of the connected panel's EDID data).
		VGA, SVGA, XGA, XGA2, SXGA	VGA = 640 x 480 resolution SVGA = 800 x 600 resolution XGA = 1024 x 768 resolution XGA2 = 1024 x 768 resolution SXGA = 1280 x 1024 resolution
		Disabled	**Information:** **The onboard video must be activated to make video output possible. Deactivate only for use of an external PCI graphics card.**
Graphics memory size	Reserves a memory location in the RAM for the onboard graphics controller, into which the memory access will be directed.	1 MB	1 MB main memory is reserved for the onboard video controller.
		512kB	512 k main memory is reserved for the onboard video controller.
Assign IRQ to VGA	This is where an IRQ is reserved and automatically assigned for the CPU board's onboard graphics.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 162: 815E (ETX) Advanced Chipset/Graphics Control setting options

BIOS setting	Meaning	Setting options	Effect
Internal graphics API Rev	Displays the internal graphics API version number.	None	-

Table 162: 815E (ETX) Advanced Chipset/Graphics Control setting options

PCI/PNP Configuration

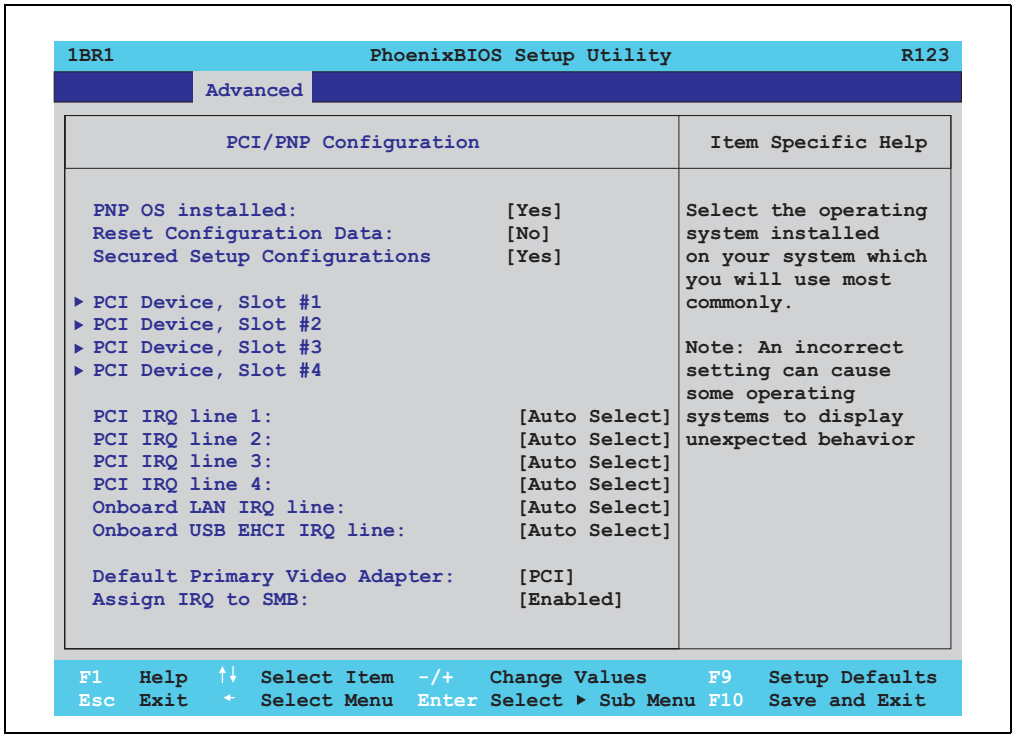


Figure 188: 815E (ETX) PCI/PNP Configuration

BIOS setting	Meaning	Setting options	Effect
PNP OS installed	If the operating system is plug & play capable, then this option informs BIOS that the operating system will handle the distribution of resources in the future.	Yes	The ISA PnP resources are not assigned. The resource assignment sequence is as follows: 1. Motherboard devices 2. PCI devices
		No	The resource assignment sequence is as follows: 1. Motherboard devices 2. ISA PnP devices 3. PCI devices
Reset configuration data	During booting, the assigned resources are stored in the Flash (ESCD).	Yes	When the system is reset after leaving the BIOS setup, all ECSD entries (extended system configuration data) are deleted.
		No	Disables this function. Resources are not reset.
Secured setup configuration	This option protects the setup configuration from interference from a PnP operating system.	Yes	Prevents a PnP operating system from changing system settings.
		No	Disables this function. Changes are allowed.
PCI device, slot #1	Advanced configuration of the PCI slot number 1.	Enter	Opens the submenu See "PCI device, slot #1", on page 358

Table 163: 815E (ETX) PCI/PNP Configuration setting options

BIOS setting	Meaning	Setting options	Effect
PCI device, slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens the submenu See "PCI device, slot #2", on page 359
PCI device, slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens the submenu See "PCI device, slot #3", on page 360
PCI device, slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens the submenu See "PCI device, slot #4", on page 361
PCI IRQ line 1	Under this option, the external PCI interrupt 1 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the Plug & Play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI IRQ line 2	Under this option, the external PCI interrupt 2 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the Plug & Play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI IRQ line 3	Under this option, the external PCI interrupt 3 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the Plug & Play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI IRQ line 4	Under this option, the external PCI interrupt 4 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the Plug & Play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
Onboard LAN IRQ line	Under this option, the onboard LAN interrupt is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the Plug & Play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
Onboard USB EHCI IRQ line	Under this option, the USB EHCI interrupt is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the Plug & Play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
Default primary video adapter	This option sets the default graphics card (either an existing AGP or the PCI graphics card).	PCI	A PCI graphics card is set as the default display device.
		AGP	An AGP graphics card is set as the default display device.
Assign IRQ to SMB	Use this function to set whether or not the SM (System Management) bus controller is assigned a PCI interrupt.	Enabled	Automatic assignment of a PCI interrupt.
		Disabled	No assignment of an interrupt.

Table 163: 815E (ETX) PCI/PNP Configuration setting options (Forts.)

PCI device, slot #1

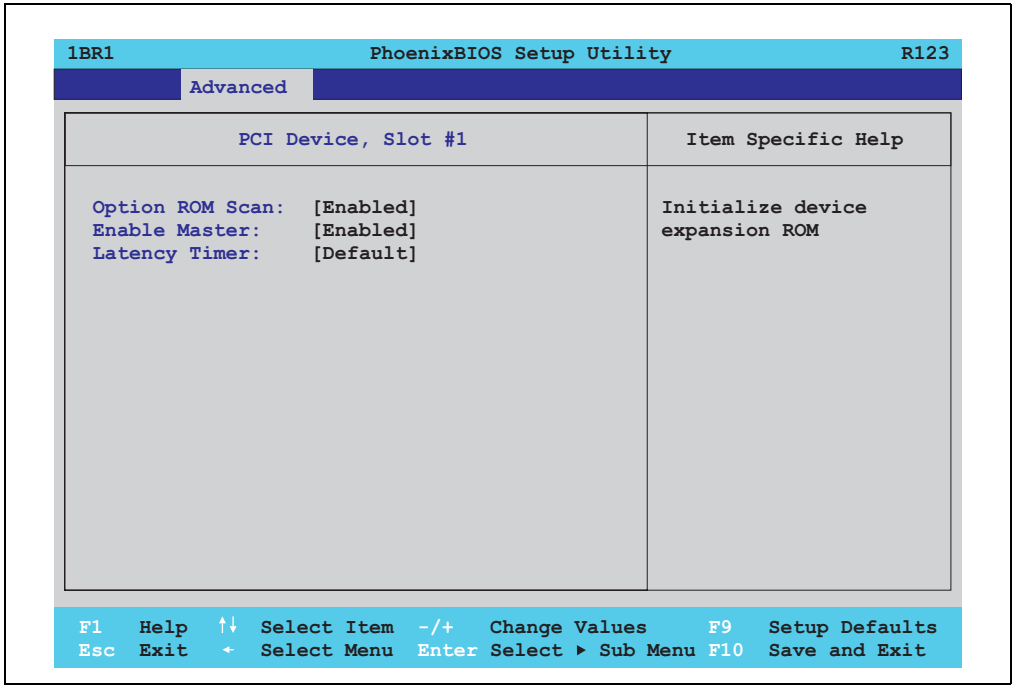


Figure 189: 815E (ETX) PCI device, slot #1

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 164: 815E (ETX) PCI device, slot #1 setting options

PCI device, slot #2

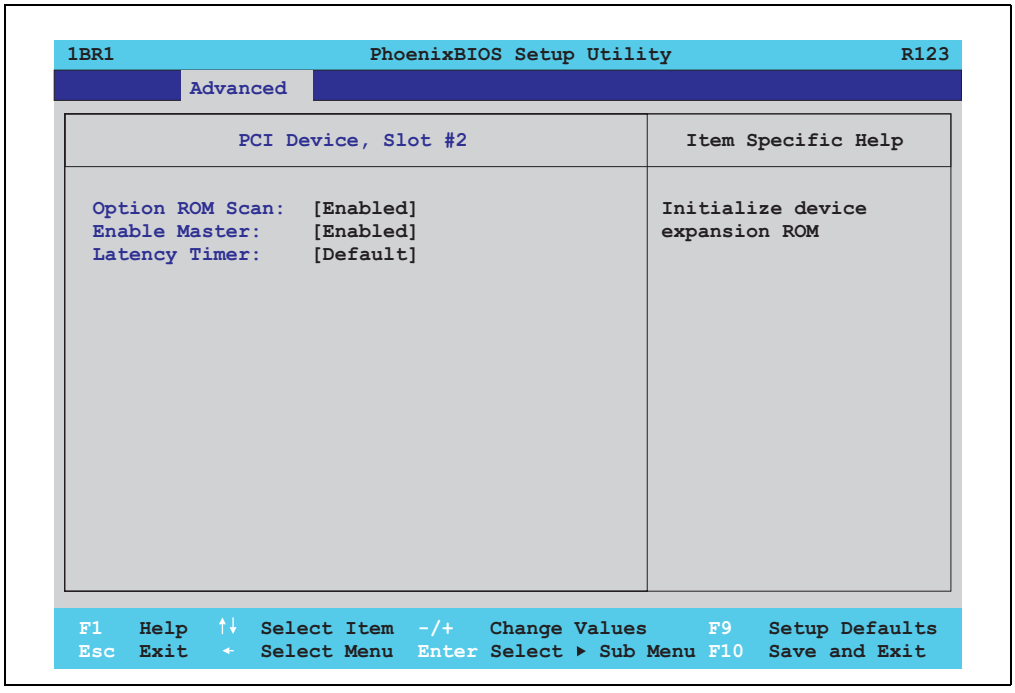


Figure 190: 815E (ETX) PCI device, slot #2

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 165: 815E (ETX) PCI device, slot #2 setting options

PCI device, slot #3

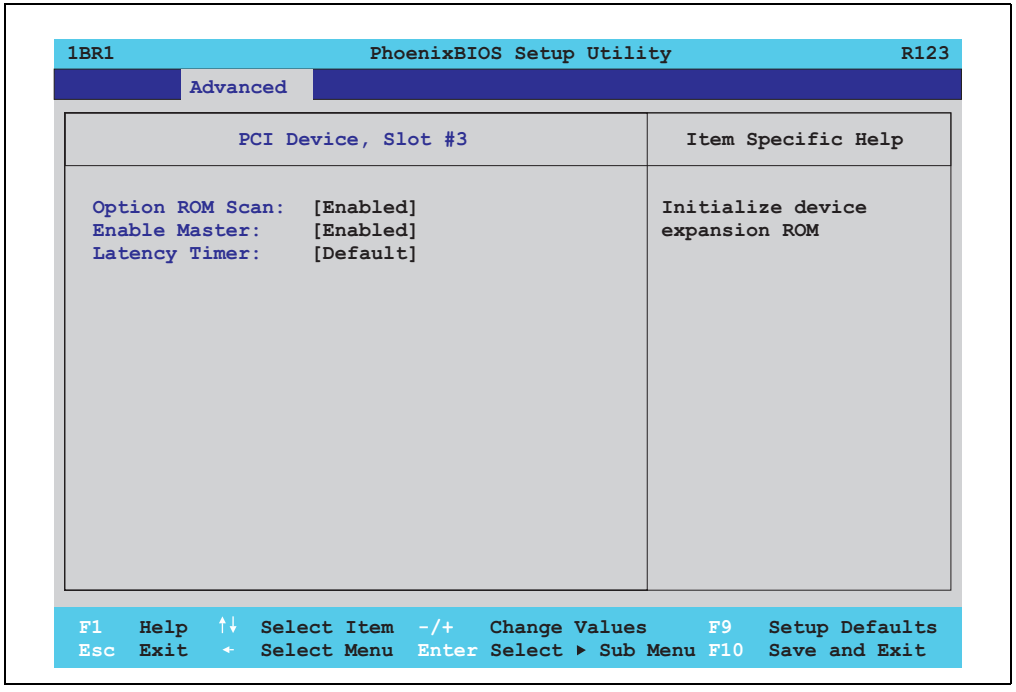


Figure 191: 815E (ETX) PCI device, slot #3

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 166: 815E (ETX) PCI device, slot #3 setting options

PCI device, slot #4

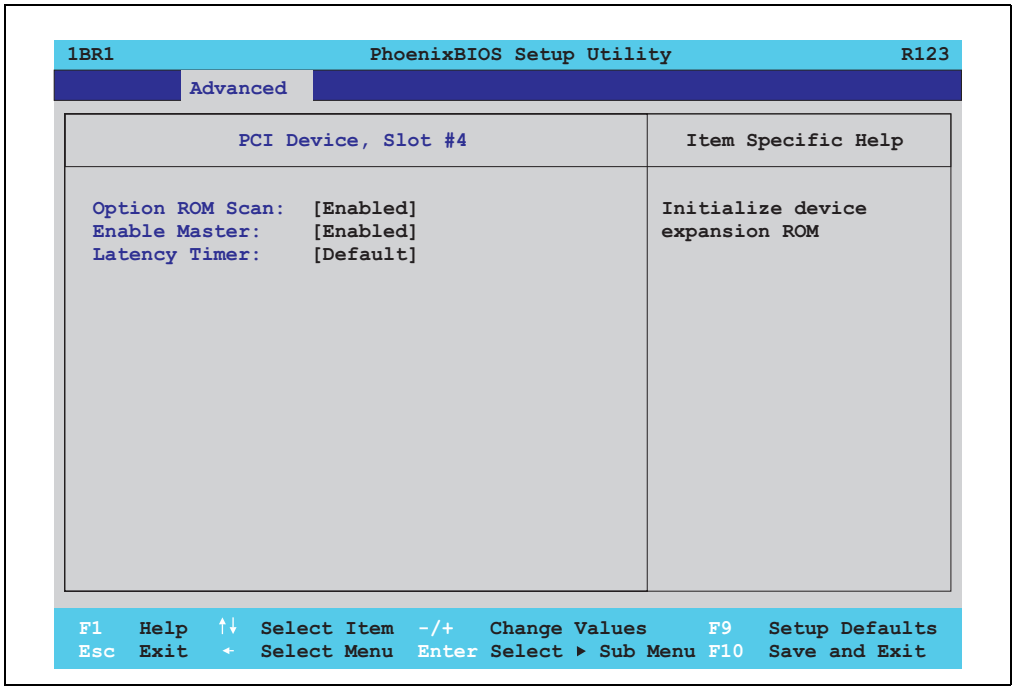


Figure 192: 815E (ETX) PCI device, slot #4

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 167: 815E (ETX) PCI device, slot #4 setting options

PCI/PNP ISA IRQ Resource Exclusion

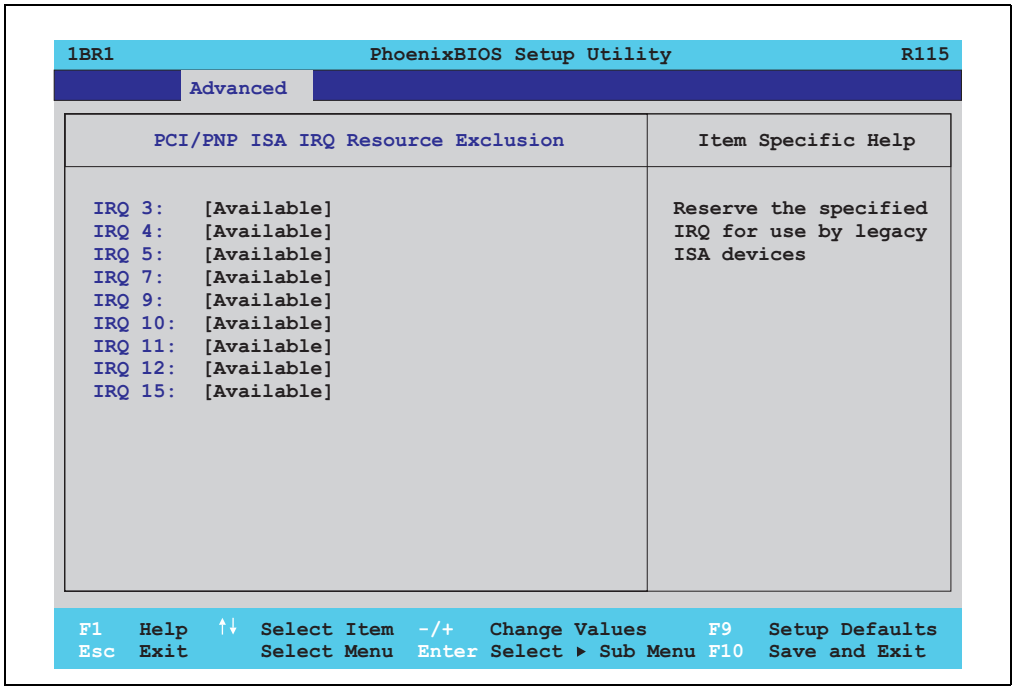


Figure 193: 815E (ETX) - PCI/PNP ISA IRQ Resource Exclusion

BIOS setting	Meaning	Setting options	Effect
IRQ 3	This setting determines whether the IRQ 3 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 4	This setting determines whether the IRQ 4 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 5	This setting determines whether the IRQ 5 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 7	This setting determines whether the IRQ 7 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 9	This setting determines whether the IRQ 9 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 10	This setting determines whether the IRQ 10 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 11	This setting determines whether the IRQ 11 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.

Table 168: 815E (ETX) - PCI/PNP ISA IRQ Resource Exclusion setting options

BIOS setting	Meaning	Setting options	Effect
IRQ 12	This setting determines whether the IRQ 12 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 15	This setting determines whether the IRQ 15 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.

Table 168: 815E (ETX) - PCI/PNP ISA IRQ Resource Exclusion setting options (Forts.)

Memory cache

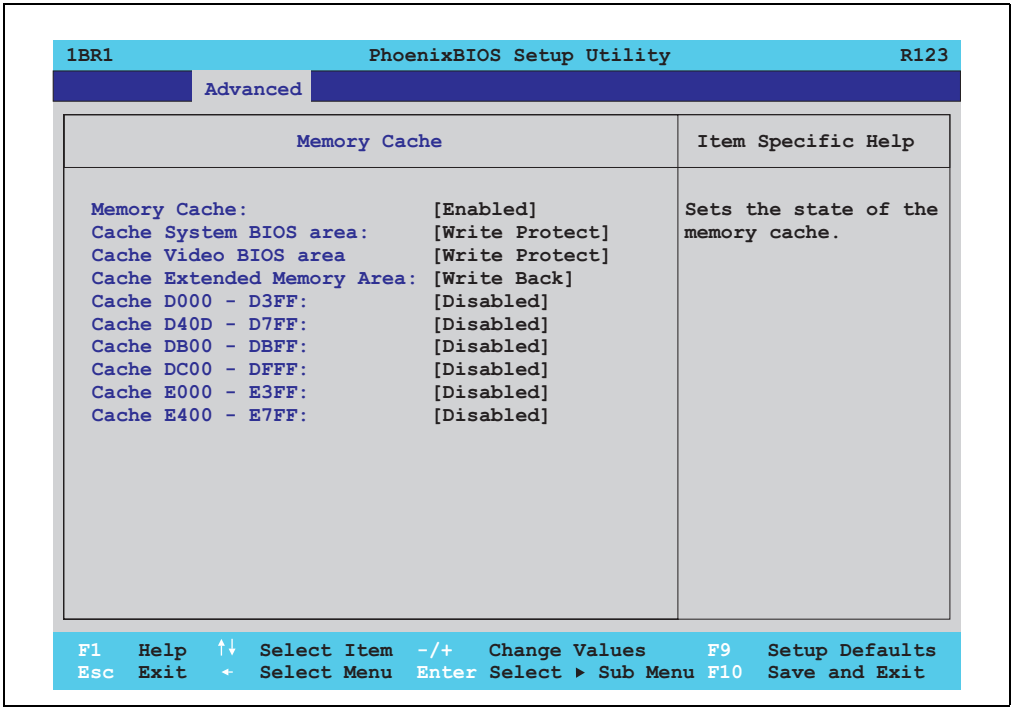


Figure 194: 815E (ETX) Memory Cache

BIOS setting	Meaning	Setting options	Effect
Memory cache	Enable/ disable utilization of the L2 cache.	Enabled	Enables this function.
		Disabled	Disables this function.
Cache system BIOS area	Set whether or not the system BIOS should be buffered.	Write protect	System BIOS is mapped in the cache.
		Uncached	System BIOS is not mapped in the cache.
Cache video BIOS area	Set whether or not the video BIOS should be buffered.	Write protect	Video BIOS is mapped in the cache.
		Uncached	Video BIOS is not mapped in the cache.
Cache extended memory area	Configure how the memory content of the system memory above 1MB should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache D000 - D3FF	Configure how the memory content of D000-D3FF should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache D400 - D7FF	Configure how the memory content of D400-D7FF should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache DB00 - DBFF	Configure how the memory content of D800-DBFF should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache DC00 - DFFF	Configure how the memory content of DC00-DFFF should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache E000 - E3FF	Configure how the memory content of D800-DBFF should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.

Table 169: 815E (ETX) Memory Cache setting options

BIOS setting	Meaning	Setting options	Effect
Cache E400 - E7FF	Configure how the memory content of DC00-DFFF should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.

Table 169: 815E (ETX) Memory Cache setting options (Forts.)

I/O Device Configuration

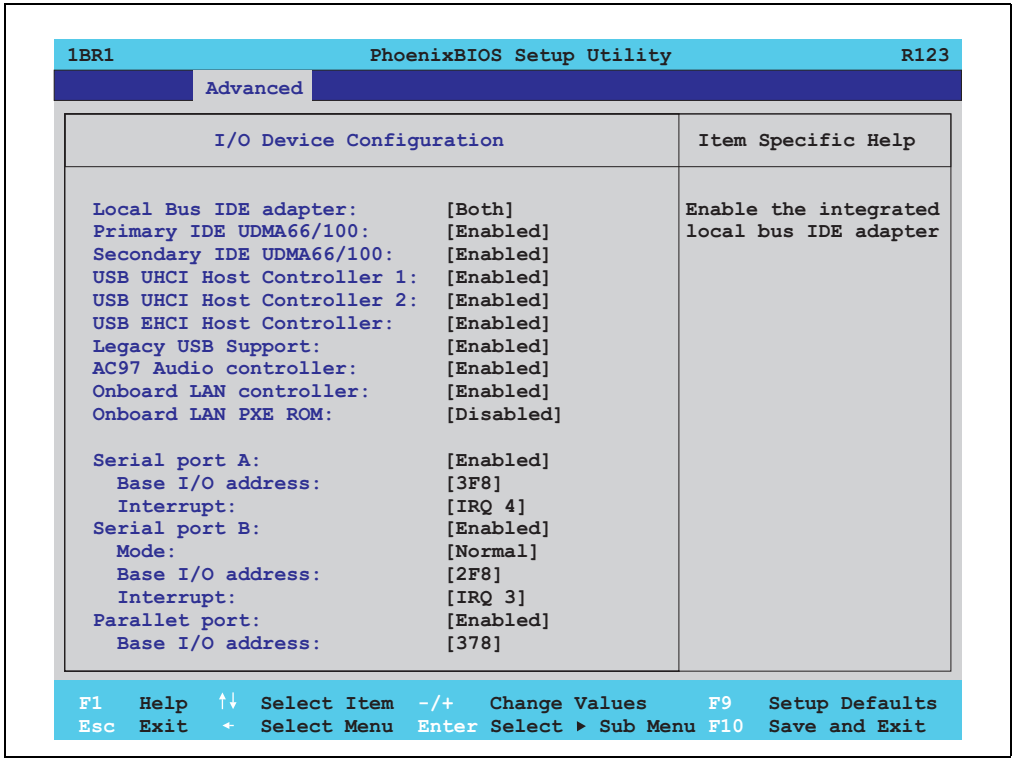


Figure 195: 815E (ETX) I/O Device Configuration

BIOS setting	Meaning	Setting options	Effect
Local bus IDE adapter	Function for enabling/disabling the PCI IDE controllers (primary and secondary).	Disabled	Deactivates both PCI IDE controllers (primary and secondary).
		Primary	Activates the primary IDE controller only.
		Secondary	Activates the secondary IDE controller only.
		Both	Activates both PCI IDE controllers (primary and secondary).
Primary IDE UDMA66/100	Setup the data transfer rate for a device connected to the primary IDE channel. This option is only available when a primary IDE drive is connected.	Disabled	The maximum data transfer rate is UDMA33.
		Enabled	The maximum data transfer rate is UDMA66 or higher.
Secondary IDE UDMA66/100	Setup the data transfer rate for a device connected to the secondary IDE channel. This option is only available when a secondary IDE drive is connected.	Disabled	The maximum data transfer rate is UDMA33.
		Enabled	The maximum data transfer rate is UDMA66.
USB UHCI host controller 1	Configuration of the USB UHCI controller 1 for USB port 0 and 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller 2	Configuration of the USB UHCI controller 2 for USB port 2 and 3. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller	Configuration of the USB EHCI controller. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	When enabled, the USB 2.0 support is activated as soon as a USB 2.0 device is connected to the interface.
Legacy USB Support	Here IRQs are assigned to the USB connections.	Disabled	No IRQ assigned. It is not possible to boot from a USB device (USB stick, USB floppy, USB CD ROM, etc.)! However, a connected USB keyboard can be used to access and configure the BIOS setup, boot menu or optional RAID boot menu. USB devices will not function after completing the BIOS POST routine. USB devices only work after starting the operating system with USB support (e.g. Windows XP). MS-DOS does not support the use of USB devices.
		Enabled	IRQ assigned. Booting from USB devices is now possible. Supported USB devices work with MS-DOS (e.g. USB keyboard, etc).
AC97 audio controller	For turning the AC97 audio controller on and off.	Disabled	AC97 sound is deactivated.
		Enabled	AC97 sound is activated.
Onboard LAN controller	For turning the ICH4 on-board LAN controller (for ETH1) on and off.	Disabled	Deactivates the LAN controller or the ETH1 interface.
		Enabled	Activates the LAN controller or the ETH1 interface.

Table 170: 815E (ETX) I/O Device Configuration setting options

BIOS setting	Meaning	Setting options	Effect
Onboard LAN PXE ROM	For turning the remote boot BIOS extension for the onboard LAN controller (ETH1) on and off.	Disabled	Disables this function.
		Enabled	Enables this function.
Serial port A	For the configuration of serial port A (COM1).	Disabled	Port A deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Base I/O address	Selection of the base I/O address for port A. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Base I/O address is manually assigned.
Interrupt	Selection of the interrupt for port A. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Manual assignment of the interrupt.
Serial port B	For the configuration of serial port B (COM2).	Disabled	Port B deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Mode	This option is for setting the serial port B as either a standard interface or as an infrared interface.	Normal	Serial port B is used as a standard interface.
		IR	The serial interface is used as an infrared interface, and allows data transfers up to 115 kBit/s.
Base I/O address	Selection of the base I/O address for port B. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Selected base I/O address is manually assigned.
Interrupt	Selection of the interrupt for port B. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Selected interrupt is manually assigned.
Parallel port	For configuring the hardware security key (dongle), which accessed internally through the parallel interface.	Disabled	Deactivates the port.
		Enabled	Activates the port. The base I/O address must then be set.
		Auto	First BIOS and then the operating system configure the port automatically.
Base I/O address	Selection of the base I/O address for the parallel port.	378, 278, 3BC	Base I/O address is manually assigned.

Table 170: 815E (ETX) I/O Device Configuration setting options (Forts.)

Keyboard Features

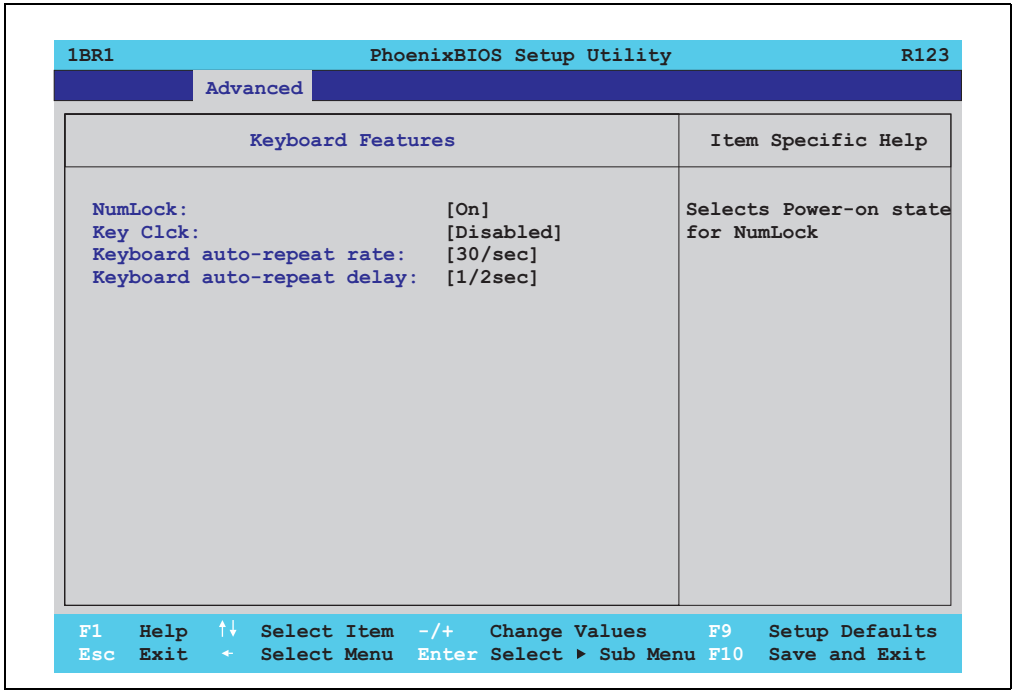


Figure 196: 815E (ETX) Keyboard Features

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.
		Auto	Numeric keypad is activated, if present.
Key click	Using this option, the clicking of the keys can be turned on or off.	Disabled	Disables this function.
		Enabled	Enables this function.
Keyboard auto-repeat rate	For setting the speed of repetition when a key is held down.	30/sec, 26.7/sec, 21.8/sec, 18.5/sec, 13.3/sec, 10/sec, 6/sec, 2/sec	Settings from 2 to 30 characters per second.
Keyboard auto-repeat delay	For setting the amount of delay after the key is pressed before the auto-repeat begins.	1/4 sec, 1/2 sec, 3/4 sec, 1 sec	Setting of the desired delay.

Table 171: 815E (ETX) Keyboard Features setting options

CPU board monitor

Information:

The displayed voltage values (e.g. core voltage, battery voltage) on this BIOS Setup page represent uncalibrated information values. These cannot be used to draw any conclusions about any hardware alarms or error conditions. The hardware components used have automatic diagnostics functions that can be applied in the event of error.

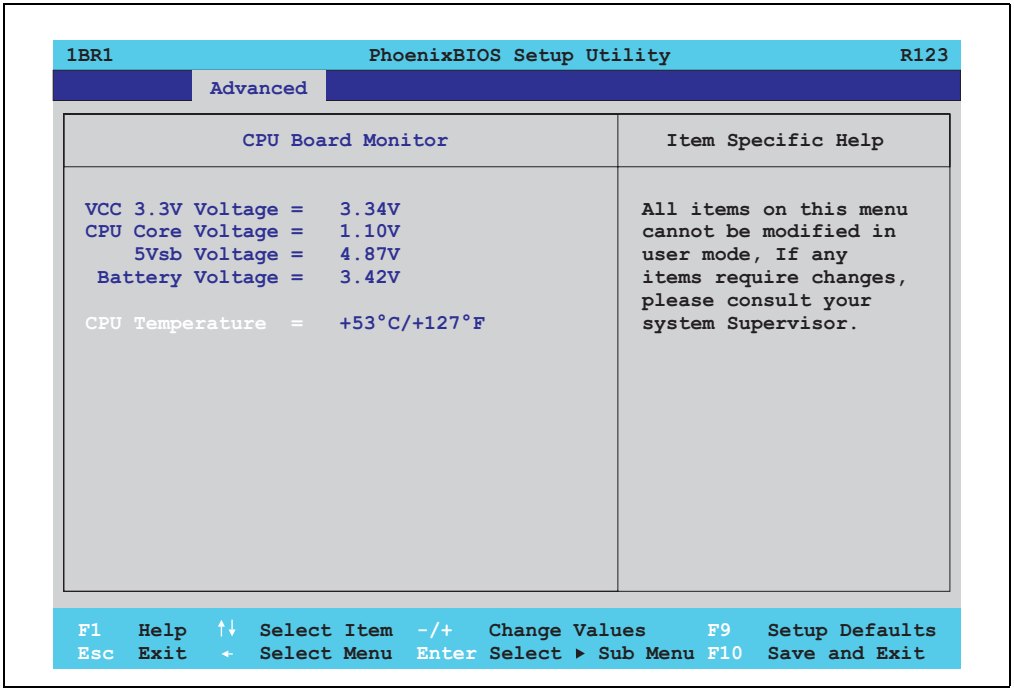


Figure 197: 815E (ETX) CPU Board Monitor

BIOS setting	Meaning	Setting options	Effect
VCC 3.3V voltage	Displays the current voltage of the 3.3 volt supply (in volts).	None	-
CPU core voltage	Displays the processor's core voltage (in volts).	None	-
5Vsb voltage	Displays the 5 V standby voltage (in volts).	None	-
Battery voltage	Displays the battery voltage (in volts).	None	-
CPU temperature	Displays the processor's temperature (in degrees Celsius and Fahrenheit).	None	-

Table 172: 815E (ETX) CPU Board Monitor setting options

Miscellaneous

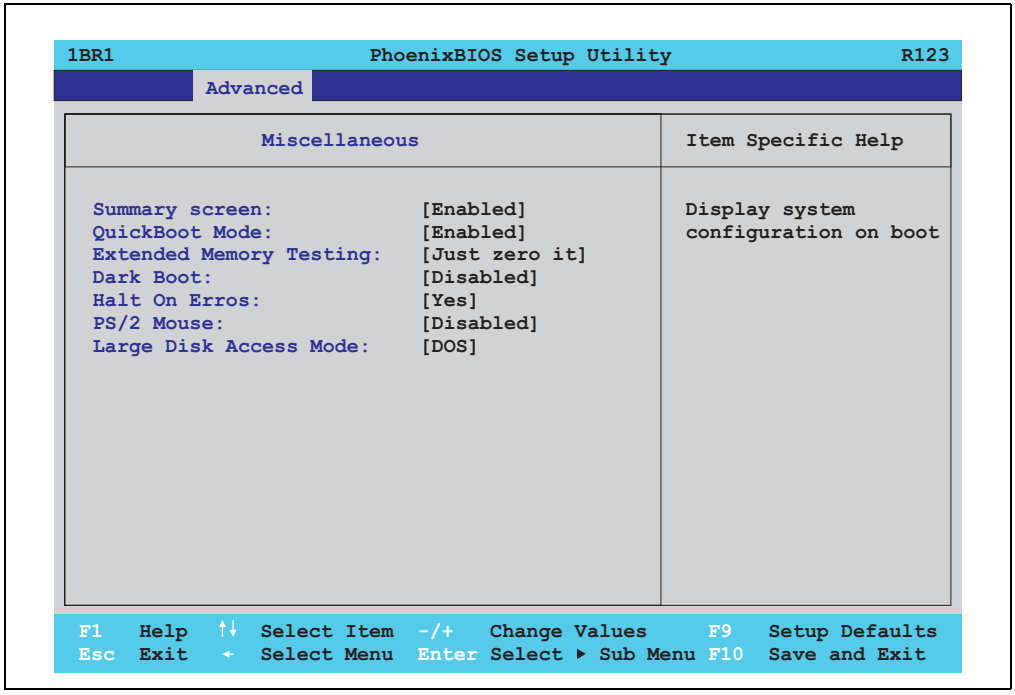


Figure 198: 815E (ETX) Miscellaneous

BIOS setting	Meaning	Setting options	Effect
Summary screen	Set whether or not the system summary screen should open when the system is started (see figure 180 "815E (ETX) BIOS Summary screen", on page 341).	Enabled	Enables this function.
		Disabled	Disables this function.
QuickBoot mode	Speeds up the booting process on the system by skipping several tests.	Enabled	Enables this function.
		Disabled	Disables this function.
Extended memory testing	This function determines the method by which the main memory over 1 MB is tested.	Just zero it	The main memory is quickly tested.
		None	The main memory is not tested at all.
		Normal	This option is only available when the function "QuickBoot Mode" has been set to "disabled." The main memory is tested more slowly than with "Just zero It."
Dark boot	Sets whether the diagnostics screen (see figure 179 "815E (ETX) BIOS diagnostic screen", on page 340) should be displayed when the system is started.	Enabled	Enables this function. The diagnostics screen is not displayed.
		Disabled	Disables this function. The diagnostics screen is displayed.

Table 173: 815E (ETX) Miscellaneous setting options

BIOS setting	Meaning	Setting options	Effect
Halt on errors	This option sets whether the system should pause the Power On Self Test (POST) when it encounters an error.	Yes	The system pauses. The system pauses every time an error is encountered.
		No	The system does not pause. All errors are ignored.
PS/2 mouse	Sets whether the PS/2 mouse port should be activated.	Disabled	Deactivates the port.
		Enabled	Activates the port. The IRQ12 is reserved, and is not available for other components.
Large disk access mode	This option is intended for hard discs with more than 1024 cylinders, 16 heads, and more than 63 sectors per track. Setting options: DOS	Other	For non-compatible access (e.g. Novell, SCO Unix.)
		DOS	For MS DOS compatible access.

Table 173: 815E (ETX) Miscellaneous setting options (Forts.)

Main Board/Panel Features

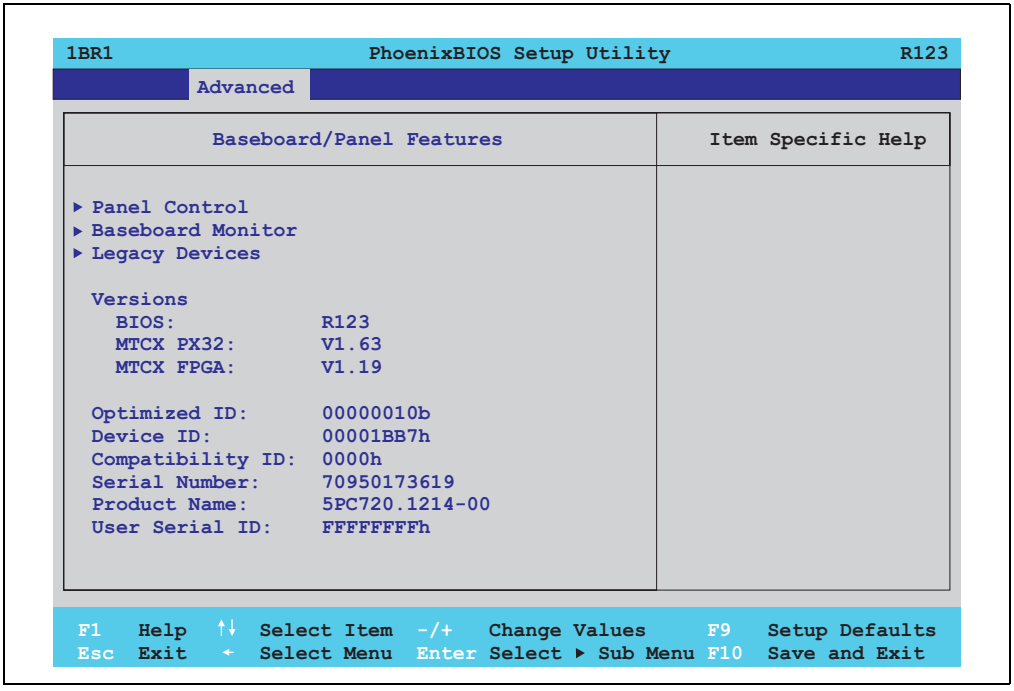


Figure 199: 815E (ETX) Baseboard/Panel Features

BIOS setting	Meaning	Setting options	Effect
Panel control	For special setup of connected panels (display units).	Enter	Opens the submenu See "Panel control", on page 373
Main board monitor	Display of various temperatures and fan speeds.	Enter	Opens the submenu See "Main board monitor", on page 374

Table 174: 815E (ETX) Baseboard/Panel Features setting options

BIOS setting	Meaning	Setting options	Effect
Legacy devices	Special settings for the interface can be changed here.	Enter	Opens the submenu See "Legacy devices", on page 375
BIOS	Displays the BIOS version.	None	-
MTCX PX32	Displays the MTCX PX32 firmware version.	None	-
MTCX FPGA	Displays the MTCX FPGA firmware version.	None	-
Optimized ID	Displays the DIP switch setting of the configuration switch.	None	-
Device ID	Displays the hexadecimal value of the hardware device ID.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Serial Number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
User serial ID	Displays the user serial ID. This 8 digit hex value can be freely assigned by the user (e.g. to give the device a unique ID) and can only be changed with using the "B&R Control Center" via the ADI driver.	None	-

Table 174: 815E (ETX) Baseboard/Panel Features setting options

Panel control

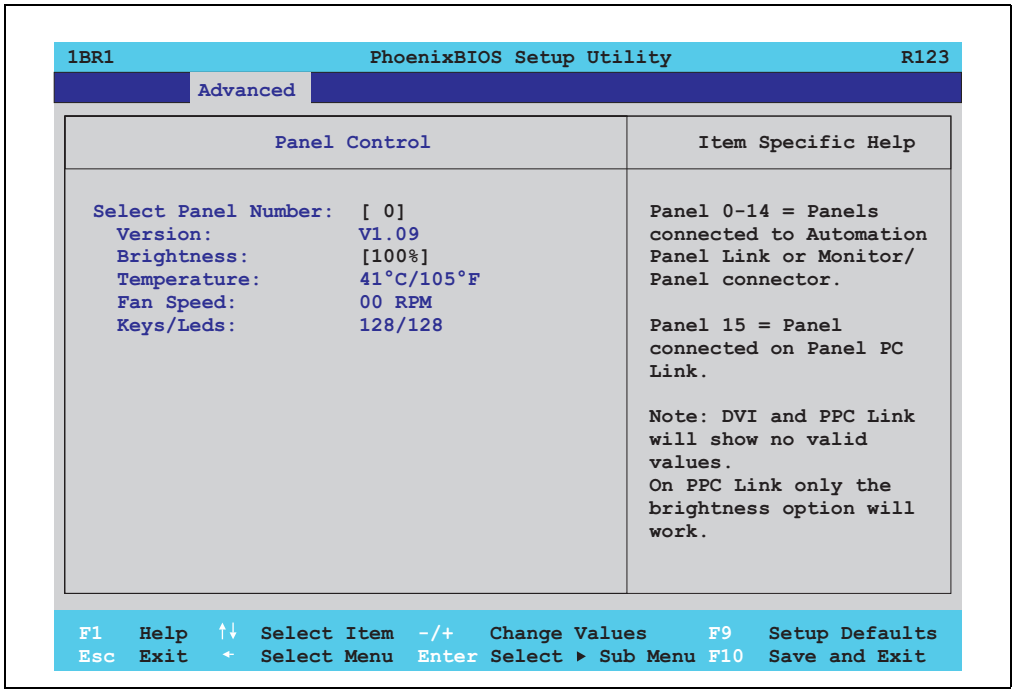


Figure 200: 815E (ETX) Panel Control

BIOS setting	Meaning	Setting options	Effect
Select panel number	Selection of the panel number for which the values should be read out and/or changed.	0 ... 15	Selection of panel 0 ... 15. Panel 15 is specifically intended for panel PC 700 systems.
Version	Displays the firmware version of the SDLR controller.	None	-
Brightness	For setting the brightness of the selected panel.	0%, 25%, 50%, 75%, 100%	For setting the brightness (in %) of the selected panel. Changes take effect after saving and restarting the system (e.g. by pressing <F10>).
Temperature	Displays the selected panel's temperature (in degrees Celsius and Fahrenheit).	None	-
Fan speed	Displays fan speed for the selected panel.	None	-
Keys/LEDs	Displays the available keys and LEDs on the selected panel.	None	-

Table 175: 815E (ETX) Panel Control setting options

Main board monitor

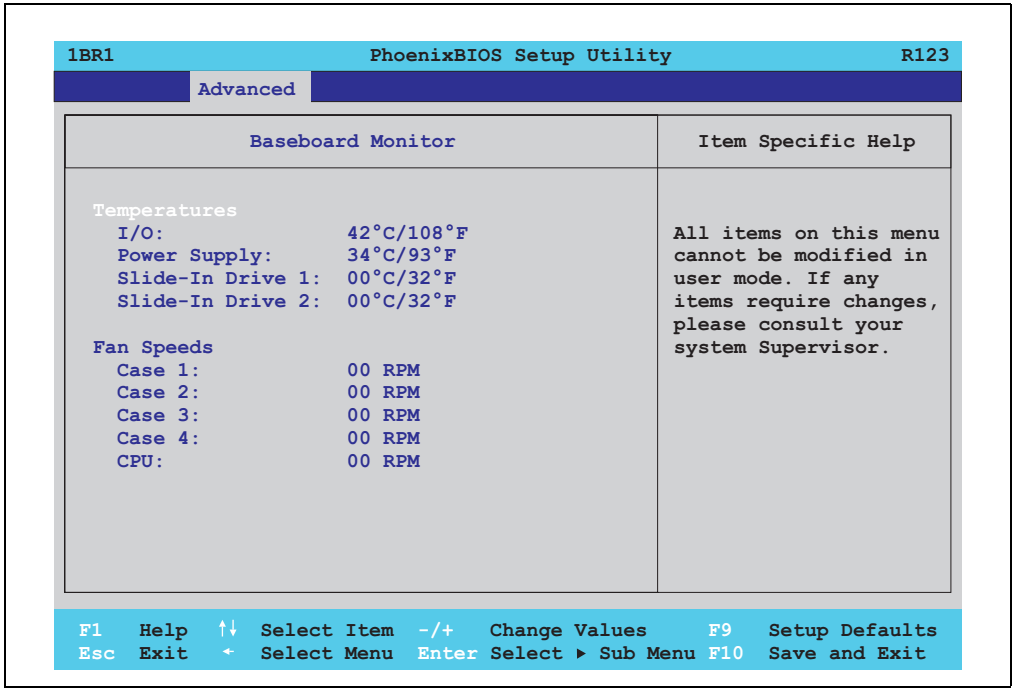


Figure 201: 815E (ETX) Baseboard Monitor

BIOS setting	Meaning	Setting options	Effect
I/O	Displays the temperature in the I/O area in degrees Celsius and Fahrenheit.	None	-
Power supply	Displays the temperature in the power supply area in degrees Celsius and Fahrenheit.	None	-
Slide-in drive 1	Displays the temperature of the slide-in drive 1 in degrees Celsius and Fahrenheit.	None	-
Slide-in drive 2	Displays the temperature of the slide-in drive 2 in degrees Celsius and Fahrenheit.	None	-
Case 1	Displays the fan speed of housing fan 1.	None	-
Case 2	Displays the fan speed of housing fan 2.	None	-
Case 3	Displays the fan speed of housing fan 3.	None	-
Case 4	Displays the fan speed of housing fan 4.	None	-
CPU	Displays the fan speed of the processor fan.	None	-

Table 176: 815E (ETX) Baseboard Monitor setting options

Legacy devices

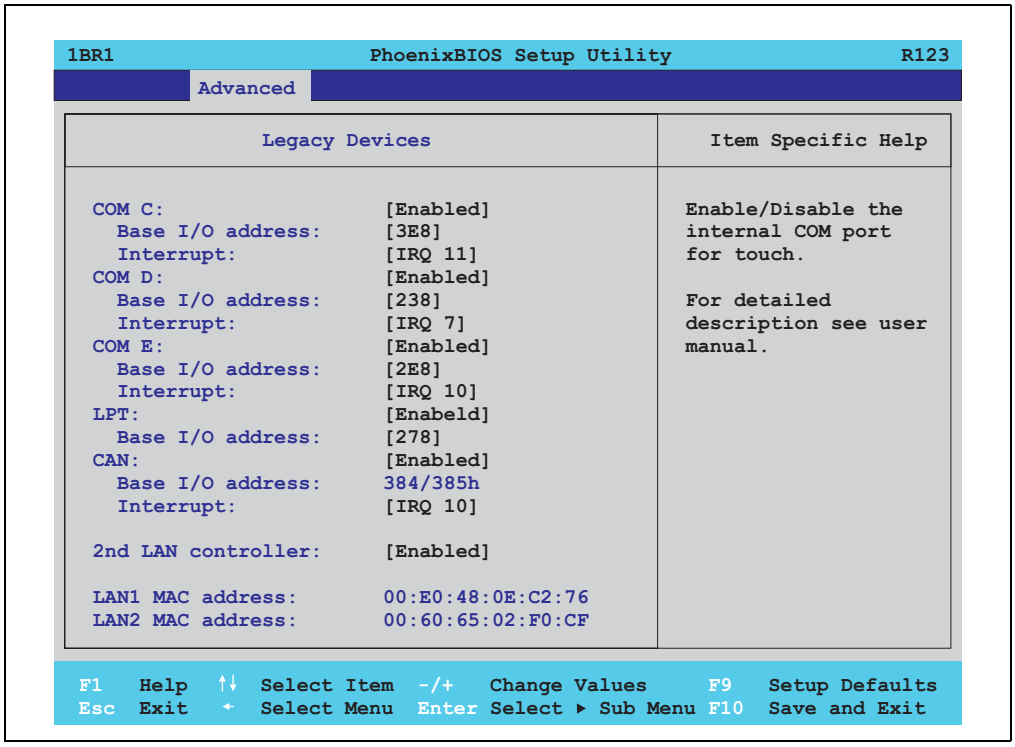


Figure 202: 815E (ETX) Legacy Devices

BIOS setting	Meaning	Setting options	Effect
COM C	Settings for the internal serial interfaces in the system. This setting activates the touch screen in panel PC 700 systems, and, using SDL and LDL transfer technology, also in Automation Panel 900 display units.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the COM C port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM C port. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4, IRQ 5, IRQ 10, IRQ 11, IRQ 12, IRQ 15	Selected interrupt is assigned.
COM D	Configuration of the COM D port for the serial interface of an automation panel link slot.	Disabled	Disables the interface.
		Enabled	Enables the interface.

Table 177: 815E (ETX) Legacy Devices setting options

BIOS setting	Meaning	Setting options	Effect
Base I/O address	Configuration of the base I/O address for the serial COM D port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM D port. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4, IRQ 5, IRQ 10, IRQ 11, IRQ 12, IRQ 15	Selected interrupt is assigned.
COM E	Configuration of the optional COM E port on a B&R add-on interface (IF option).	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Configuration of the base I/O address for the serial COM E port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM E port. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4, IRQ 5, IRQ 10, IRQ 11, IRQ 12, IRQ 15	Selected interrupt is assigned.
LPT	This setting is specific to B&R and should not be changed.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Configuration of the base I/O address for the optional LPT. A yellow star indicates a conflict with another device.	278, 378, 3BC	Selected base I/O address is assigned.
CAN	Configuration of the CAN port of a B&R add-on interface card.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	384/385h	None	-
Interrupt	Selection of the interrupt for the CAN port.	IRQ 10	Selected interrupt is assigned.
		NMI	NMI interrupt is assigned.
2nd LAN controller	For turning the onboard LAN controller (ETH2) on and off.	Disabled	Disables the controller.
		Enabled	Enables the controller.
LAN1 MAC address	Displays the MAC addresses for the ETH1 network controller.	None	-
LAN2 MAC address	Displays the MAC addresses for the ETH2 network controller.	None	-

Table 177: 815E (ETX) Legacy Devices setting options (Forts.)

1.1.6 Security

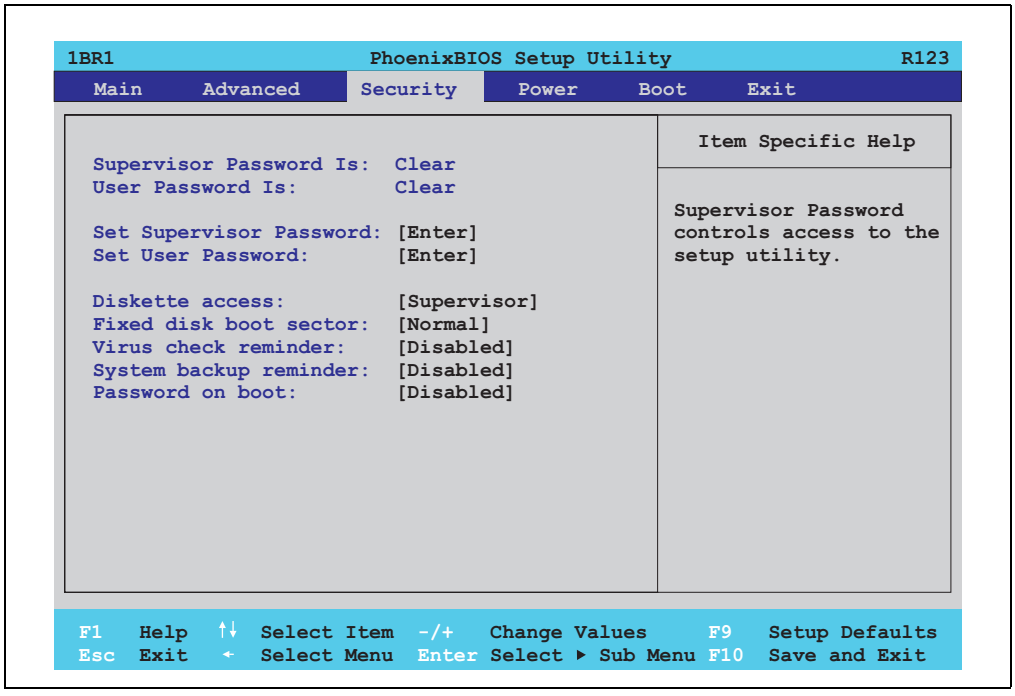


Figure 203: 815E (ETX) Security Menu

BIOS setting	Meaning	Setting options	Effect
Supervisor password is	Displays whether or not a supervisor password has been set.	None	Display **set**: A supervisor password has been set. Display **clear**: No supervisor password has been set.
User password is	Displays whether or not a user password has been set.	None	Display **set**: A user password has been set. Display **clear**: No user password has been set.
Set supervisor password	To enter/change a supervisor password. A supervisor password is necessary to edit all BIOS settings.	Enter maximum 7 alphanumeric characters - not case sensitive.	Press Enter and enter password two times. The password must be 7 alphanumeric characters or less. Needed to enter BIOS setup. To change the password, enter the old password once and then the new password twice.
Set user password	To enter/change a user password. A user password allows the user to edit only certain BIOS settings.	Enter maximum 7 alphanumeric characters - not case sensitive.	Press Enter and enter password two times. The password must be 7 alphanumeric characters or less. Needed to enter BIOS setup. To change the password, enter the old password once and then the new password twice.

Table 178: 815E (ETX) Security setting options

BIOS setting	Meaning	Setting options	Effect
Diskette access	Access to the diskette drive is controlled here. Either or the supervisor or the user has access to it. Does not work with USB diskette drives.	Supervisor	Supervisor password is needed to access a diskette drive.
		User	User password is needed to access a diskette drive.
Fixed disk boot sector	The boot sector of the primary hard drive can be write protected against viruses with this option.	Normal	Write access allowed.
		Write protect	Boot sector is write protected.
Virus check reminder	This function opens a reminder when the system is started to scan for viruses.	Disabled	Disables this function.
		Daily	A reminder appears every day when the system is started.
		Weekly	A reminder appears the first time the system is started after every Sunday.
		Monthly	A reminder appears the first time the system is started each month.
System backup reminder	This function opens a reminder when the system is started to create a system backup.	Disabled	Disables this function.
		Daily	A reminder appears every day when the system is started.
		Weekly	A reminder appears the first time the system is started after every Sunday.
		Monthly	A reminder appears the first time the system is started each month.
Password at boot	This function requires a supervisor or user password when the system is started. Only possible when a supervisor or user password is enabled.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 178: 815E (ETX) Security setting options (Forts.)

1.1.7 Power

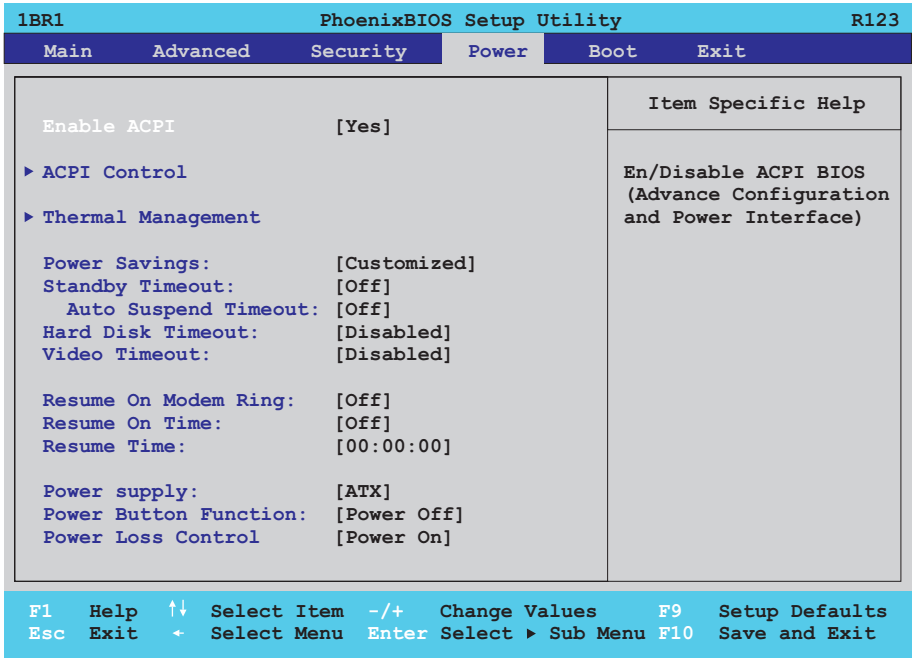


Figure 204: 815E (ETX) Power Menu

BIOS setting	Meaning	Setting options	Effect
Enable ACPI	This option turns the ACPI function (Advanced Configuration and Power Interface) on or off. This is an advanced plug & play and power management functionality.	Yes	Enables this function.
		No	Disables this function.
ACPI control	Configuration of specific limits.	Enter	Opens the submenu See "ACPI control", on page 381
Thermal management	Configuration of specific CPU limits.	Enter	Opens the submenu See "Thermal management", on page 382
Power savings	This function determines if and how the power save function is used.	Disabled	Deactivates the power savings function.
		Customized	Power management is configured by adjusting the individual settings.
		Maximum power Savings	Maximum power savings function.
		Maximum performance	Power savings function to maximize performance.

Table 179: 815E (ETX) Power setting options

BIOS setting	Meaning	Setting options	Effect
Standby timeout	Set here when the system should enter standby mode. During standby, various devices and the display will be deactivated. This option only available when "power savings" is set to customized.	Off	No standby.
		1, 2, 4, 8 minutes	Time in minutes until standby.
Auto suspend timeout	Set here when the system should enter suspend mode to save electricity. This option only available when "power savings" is set to customized.	Off	No standby.
		5, 10, 15, 20, 30, 40, 60 Minutes	Time in minutes until standby.
Hard disk timeout	Set here how long after the last access the hard disk should enter standby mode. This option only available when "power savings" is set to customized.	Disabled	Disables this function.
		10, 15, 30, 45 seconds	Time in seconds until standby.
		1, 2, 4, 6, 8, 10, 15 Minutes	Time in minutes until standby.
Video timeout	The time span of system inactivity after which the screen is turned off can be set here. **Information:** **The setting can only be used if the "power savings" function is set to customized.**	Disabled	Disables this function.
		10, 15, 30 sec	Time in seconds until standby.
		1, 2, 4, 6, 8, 10, 15 min	Time in minutes until standby.
Resume on modem ring	If an external modem is connected to a serial port and the telephone rings, the system starts up.	Off	Disables this function.
		On	Enables this function.
Resume on time	This function enables the system to start at the time set under "resume time."	Off	Disables this function.
		On	Enables this function.
Resume time	Time setting for the option "resume on time" (when the system should start up).	[00:00:00]	Personal setting of the time in the format (hh:mm:ss).
Power supply	The type of power supply being used can be entered here.	ATX	An ATX compatible power supply is being used. **Information:** **Since the PPC700 series has an ATX power supply, ATX should be selected.**
		AT	An AT compatible power supply is being used.
Power button Function	This option determines the function of the power button.	Power off	Shuts down the system.
		Sleep	The system enters sleep mode.
Power Loss Control	This option determines how the system reacts to a power outage.	Stay off	The system does not turn back on. The system remains off until the power button is pressed.
		Power-on	The system turns back on.
		Last State	The system resumes the last state it was in before the power outage.

Table 179: 815E (ETX) Power setting options (Forts.)

ACPI control

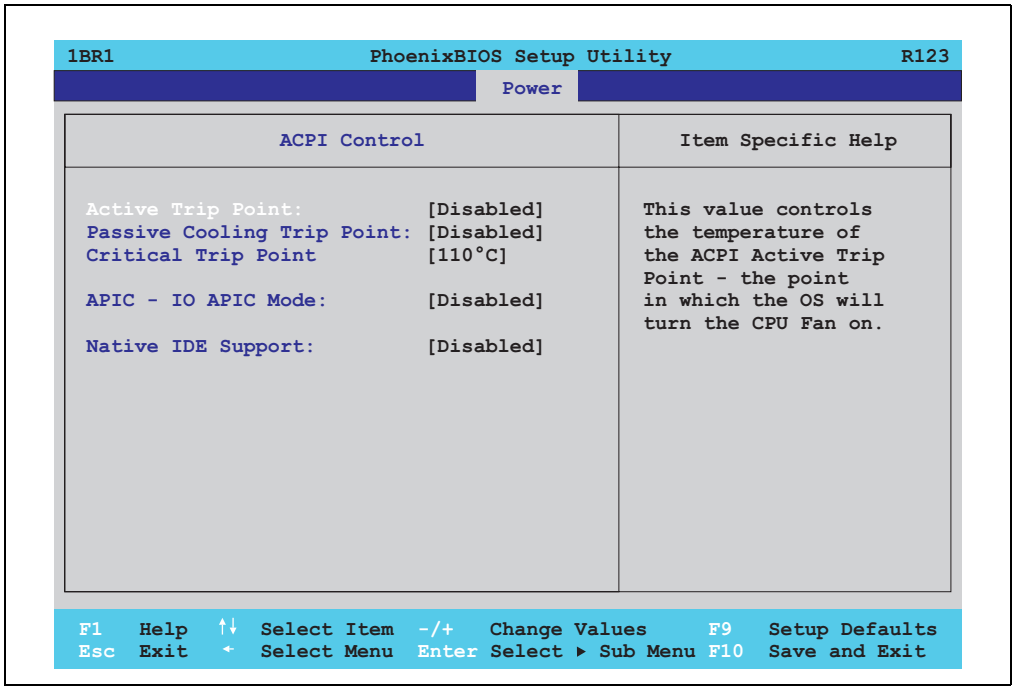


Figure 205: 815E (ETX) ACPI Control

BIOS setting	Meaning	Setting options	Effect
Active trip point	With this function, an optional CPU fan above the operating system can be set to turn on when the CPU reaches the set temperature.	Disabled	Disables this function.
		40°... 100°C	Temperature setting for the active trip point. Can be set in 5 degree increments.
Passive Cooling Trip Point	With this function, a temperature can be set at which the CPU automatically reduces its speed.	Disabled	Disables this function.
		40°... 100°C	Temperature setting for the passive cooling trip point. Can be set in 5 degree increments.
Critical Trip Point	With this function, a temperature can be set at which the operating system automatically shuts itself down. **Warning!** **This function should never be deactivated, as this would allow the CPU to rise above the temperature specifications.**	Disabled	Disables this function.
		40°... 110°C	Temperature setting for the critical trip point. Can be set in 5 degree increments.

Table 180: 815E (ETX) ACPI Control setting options

BIOS setting	Meaning	Setting options	Effect
APIC - I/O APIC mode	This option controls the functionality of the advanced interrupt controller in the processor.	Disabled	Disables the function
		Enabled	Enables this function. The activation of this option is only effective if it takes place before the operating system (Windows XP) is activated. There are then 23 IRQs available.
Native IDE support	The native IDE support offers the possibility to make 4 hard disk controllers (2 x primary ATA for a total of 4 devices, and 2 x secondary ATA for another 2 devices) accessible through Windows XP.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 180: 815E (ETX) ACPI Control setting options (Forts.)

Thermal management

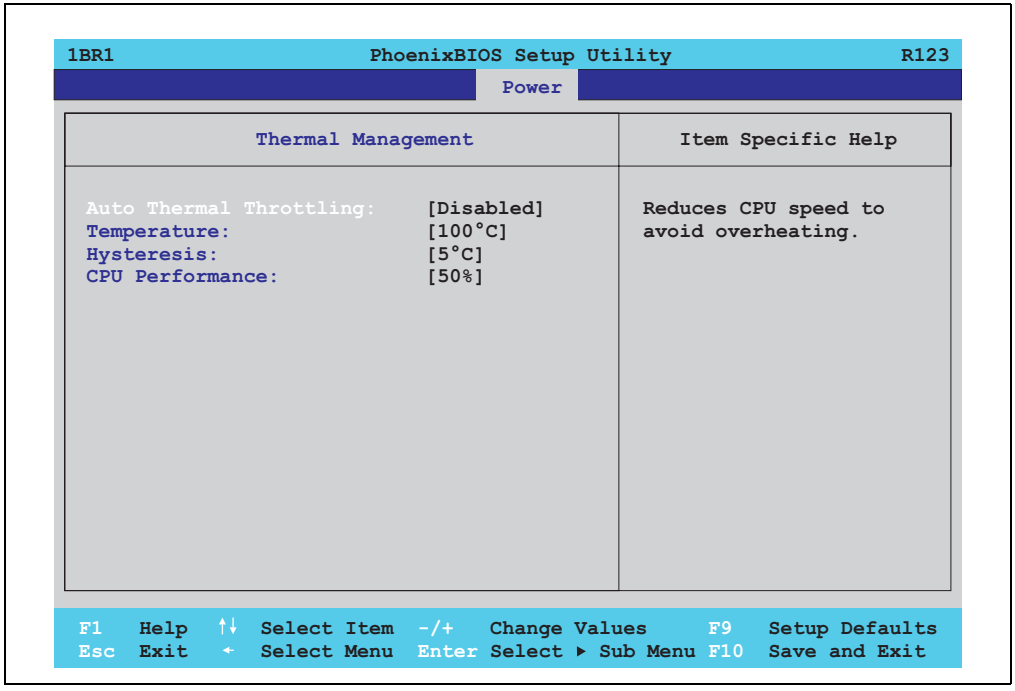


Figure 206: 815E (ETX) Thermal Management

BIOS setting	Meaning	Setting options	Effect
Auto thermal throttling	Reduces the CPU speed when it exceeds the limit set in the "temperature" option by the amount set in the "CPU performance" option.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 181: 815E (ETX) Thermal Management

BIOS setting	Meaning	Setting options	Effect
Temperature	Temperature limit for the setting "auto thermal throttling."	75°C ... 110°C	Can be set in increments of 5°C.
Hysteresis	When auto thermal throttling has been activated and the temperature sinks by the number of degrees in this setting, the processor resumes 100% performance.	3°C ... 6°C	Can be set in increments of 1°C.
CPU performance	When the CPU reaches the temperature set in the "temperature" option, the CPU is throttled by the amount (%) set in this option.	13%, 25%, 50%, 75%	CPU performance throttled by amount selected, in percent.

Table 181: 815E (ETX) Thermal Management (Forts.)

1.1.8 Boot

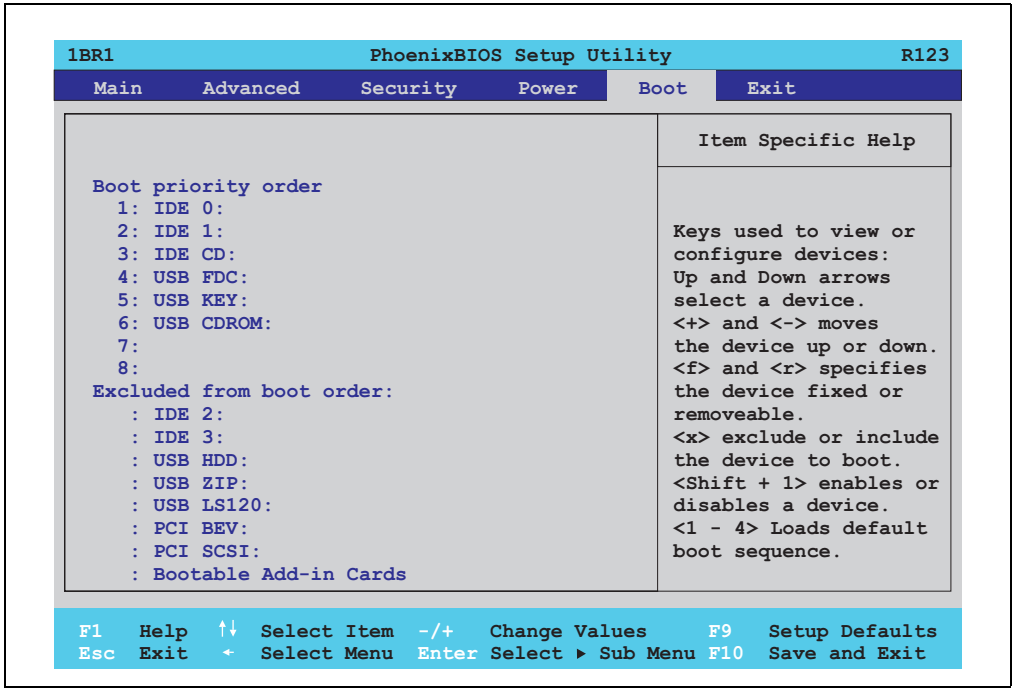


Figure 207: 815E (ETX) Boot Menu

BIOS setting	Meaning	Setting options	Effect
1:		IDE 0, IDE 1, IDE 2, IDE 3, IDE CD USB FDC, USB KEY USB CDROM USB HDD, USB ZIP USB LS120, PCI BEV, PCI SCSI, bootable add-in cards	Use the up arrow ↑ and down arrow ↓ to select a device. Then, use the <+> und <-> keys to change the boot priority of the drive. To add a device to the "boot priority order" list from the "excluded from boot order" list, use the <x> key. In the same way, the <x> key can move boot devices down out of the boot priority order. The keys 1 - 4 can load preset boot sequences.
2:			
3:			
4:			
5:			
6:			
7:			
8:			

Table 182: 815E (ETX) Boot setting options

1.1.9 Exit

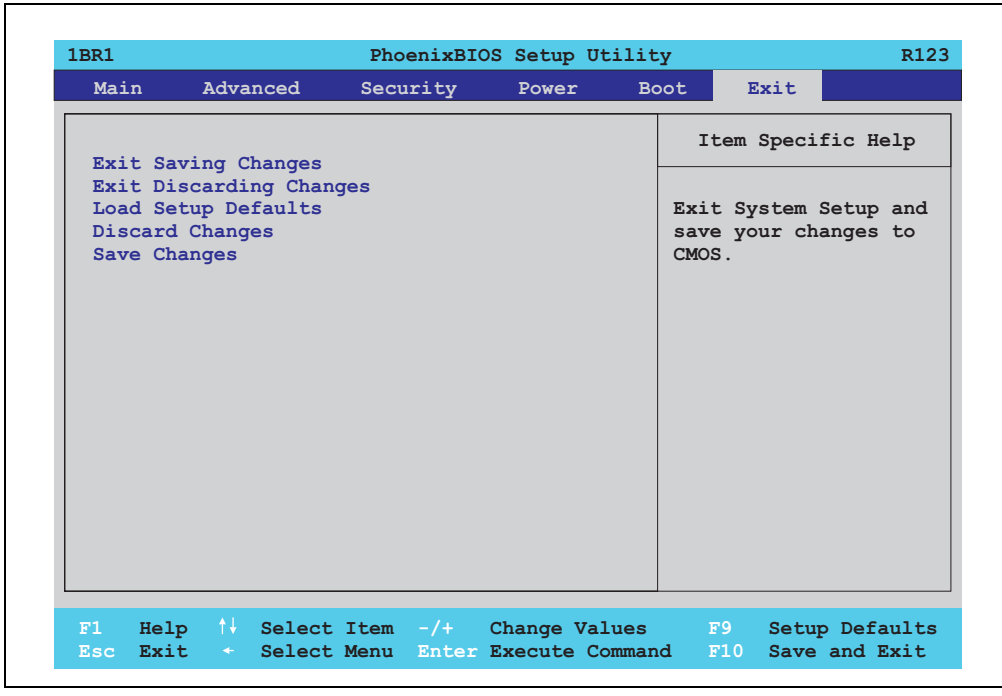


Figure 208: 815E (ETX) Exit Menu

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.	Yes / No	-

Table 183: 815E (ETX) Exit setting options

BIOS setting	Meaning	Setting options	Effect
Exit discarding changes	With this item you can close BIOS setup without saving the changes made. The system is then rebooted.	Yes / No	-
Load setup defaults	This item loads the BIOS setup defaults, which are defined by the DIP switch settings. These settings are loaded for all BIOS configurations.	Yes / No	-
Discard Changes	Should unknown changes have been made and not yet saved, they can be discarded.	Yes / No	-
Save changes	Settings are saved, and the system is not restarted.	Yes / No	-

Table 183: 815E (ETX) Exit setting options (Forts.)

1.1.10 Profile overview - BIOS default settings - 815E (ETX)

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 default settings are the optimized values that will be used.

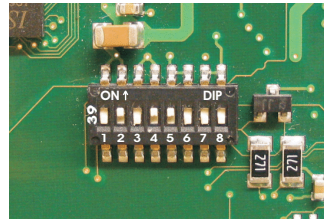


Figure 209: DIP switch on system unit

The first six DIP switches (1-6) are used to set the profiles. The rest (7,8) are reserved.

Number	Optimized for	DIP switch setting							
		1	2	3	4	5	6	7[1)]	8[1)]
Profile 0	Automation PC 620 system units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	**On**	Off	Off	Off	Off	Off	-	-
Profile 2	Automation PC 620 system units 5PC600.SX02-00, 5PC600.SX02-01, 5PC600.SX05-00 and 5PC600.SX05-01.	Off	**On**	Off	Off	Off	Off	-	-
Profile 3	Panel PC 700 system unit 5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00.	**On**	**On**	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 system unit 5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	**On**	Off	Off	Off	-	-

Table 184: 815E (ETX) Profile overview

1) Reserved.

The following pages provide an overview of the BIOS default settings for the different DIP switch configurations.

Personal settings

If changes have been made to the BIOS defaults, they can be entered in the following tables for backup.

Main

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
System Time	-	-	-	-	-	
System Date	-	-	-	-	-	
SMART device monitoring	Enabled	Enabled	Enabled	Enabled	Enabled	
BIOS Date	-	-	-	-	-	
IDE channel 0 master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
IDE channel 0 slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
IDE channel 1 master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
IDE channel 1 slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 185: 815E (ETX) Main Profile settings overview

Advanced

Advanced chipset/graphics control

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Graphics engine 1	Auto	Auto	Auto	Auto	Auto	
Graphics memory size	1MB	1MB	1MB	1MB	1MB	
Enable memory gap	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 186: 815E (ETX) Advanced Chipset/Graphics Control Profile settings overview

PCI/PNP Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
PNP OS installed	Yes	Yes	Yes	Yes	Yes	
Reset configuration data	No	No	No	No	No	
Secured setup configuration	Yes	Yes	Yes	Yes	Yes	
PCI IRQ line 1	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
PCI IRQ line 2	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
PCI IRQ line 3	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
PCI IRQ line 4	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
Onboard LAN IRQ line	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
Onboard USB EHCI IRQ line	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
Default primary video adapter	PCI	PCI	PCI	PCI	PCI	
Assign IRQ to SMB	Enabled	Enabled	Enabled	Enabled	Enabled	
PCI device, slot #1						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Enabled	Enabled	Enabled	Enabled	Enabled	
Latency timer	Default	Default	Default	Default	Default	
PCI device, slot #2						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Enabled	Enabled	Enabled	Enabled	Enabled	
Latency timer	Default	Default	Default	Default	Default	
PCI device, slot #3						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Enabled	Enabled	Enabled	Enabled	Enabled	
Latency timer	Default	Default	Default	Default	Default	

Table 187: 815E (ETX) PCI/PNP Configuration Profile settings overview

PCI device, slot #4	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Enabled	Enabled	Enabled	Enabled	Enabled	
Latency timer	Default	Default	Default	Default	Default	

Table 187: 815E (ETX) PCI/PNP Configuration Profile settings overview (Forts.)

Memory cache

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Memory cache	Enabled	Enabled	Enabled	Enabled	Enabled	
Cache system BIOS area	Write protect	Write protect	Write protect	Write protect	Write protect	
Cache video BIOS area	Write protect	Write protect	Write protect	Write protect	Write protect	
Cache extended memory area	Write back	Write back	Write back	Write back	Write back	
Cache D000 - D3FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache D400 - D7FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache D800 - DBFF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache DC00 - DFFF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache E000 - E3FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache E400 - E7FF	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 188: 815E (ETX) Memory Cache Profile settings overview

I/O Device Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Local bus IDE adapter	Primary	**Both**	**Both**	Primary	**Both**	
Primary IDE UDMA66/100	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI host controller 1	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI host controller 2	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI host controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Legacy USB Support	Enabled	Enabled	Enabled	Enabled	Enabled	
AC97 audio controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN PXE ROM	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Serial port A	Enabled	Enabled	Enabled	Enabled	Enabled	
Base I/O address	3F8	3F8	3F8	3F8	**2F8**	
Interrupt	IRQ 4	IRQ 4	IRQ 4	IRQ 4	IRQ 4	
Serial port B	Enabled	Enabled	Enabled	Enabled	Enabled	
Mode	Normal	Normal	Normal	Normal	Normal	

Table 189: 815E (ETX) I/O Device Configuration Profile settings overview

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Base I/O address	3F8	3F8	3F8	3F8	**2F8**	
Interrupt	IRQ 3	IRQ 3	IRQ 3	IRQ 3	IRQ 3	
Parallel port	Enabled	Enabled	Enabled	Enabled	Enabled	
Base I/O address	378	378	378	378	378	

Table 189: 815E (ETX) I/O Device Configuration Profile settings overview (Forts.)

Keyboard Features

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
NumLock	On	On	On	On	On	
Key click	Disabled	Disabled	Disabled	Disabled	Disabled	
Keyboard auto-repeat rate	30/sec	30/sec	30/sec	30/sec	30/sec	
Keyboard auto-repeat delay	1/2 sec	1/2 sec	1/2 sec	1/2 sec	1/2 sec	

Table 190: 815E (ETX) Keyboard Features Profile settings overview

CPU board monitor

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
VCC 3.3V voltage	-	-	-	-	-	
CPU core voltage	-	-	-	-	-	
5Vsb voltage	-	-	-	-	-	
Battery voltage	-	-	-	-	-	
CPU temperature	-	-	-	-	-	

Table 191: 815E (ETX) CPU Board Monitor Profile settings overview

Miscellaneous

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Summary screen	Enabled	Enabled	Enabled	Enabled	Enabled	
QuickBoot mode	Enabled	Enabled	Enabled	Enabled	Enabled	
Extended memory testing	Just zero it	Just zero it	Just zero it	Just zero it	Just zero it	
Dark boot	Disabled	Disabled	Disabled	Disabled	Disabled	
Halt on errors	Yes	Yes	Yes	Yes	Yes	
PS/2 mouse	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Large disk access mode	DOS	DOS	DOS	DOS	DOS	

Table 192: 815E (ETX) Miscellaneous Profile settings overview

Main Board/Panel Features

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Versions	-	-	-	-	-	
BIOS	-	-	-	-	-	
MTCX	-	-	-	-	-	
FPGA	-	-	-	-	-	
Optimized ID	-	-	-	-	-	
Device ID	-	-	-	-	-	
Compatibility ID	-	-	-	-	-	
Serial Number	-	-	-	-	-	
Product name	-	-	-	-	-	
User serial ID	-	-	-	-	-	
Panel control						
Select panel number	0	0	0	**15**	**15**	
Version	-	-	-	-	-	
Brightness	100%	100%	100%	100%	100%	
Temperature	-	-	-	-	-	
Fan speed	-	-	-	-	-	
Keys/LEDs	-	-	-	-	-	
Main board monitor						
Temperatures	-	-	-	-	-	
I/O	-	-	-	-	-	
Power supply	-	-	-	-	-	
Slide-in drive 1	-	-	-	-	-	
Slide-in drive 2	-	-	-	-	-	
Fan speeds	-	-	-	-	-	
Case 1	-	-	-	-	-	
Case 2	-	-	-	-	-	
Case 3	-	-	-	-	-	
Case 4	-	-	-	-	-	
CPU	-	-	-	-	-	
Legacy devices						
COM C	Disabled	Disabled	Disabled	**Enabled**	**Enabled**	
Base I/O address	-	-	-	**3E8h**	**3E8h**	
Interrupt	-	-	-	**11**	**11**	
COM D	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupt	-	-	-	-	-	

Table 193: 815E (ETX) Baseboard/Panel Features Profile settings overview

Legacy devices	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
COM E	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupt	-	-	-	-	-	
LPT	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
CAN	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupt	-	-	-	-	-	
2nd LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	
LAN1 MAC address	-	-	-	-	-	
LAN2 MAC address	-	-	-	-	-	

Table 193: 815E (ETX) Baseboard/Panel Features Profile settings overview (Forts.)

Security

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Supervisor password is	Clear	Clear	Clear	Clear	Clear	
User password is	Clear	Clear	Clear	Clear	Clear	
Set supervisor password	-	-	-	-	-	
Set user password	-	-	-	-	-	
Diskette access	Supervisor	Supervisor	Supervisor	Supervisor	Supervisor	
Fixed disk boot sector	Normal	Normal	Normal	Normal	Normal	
Virus check reminder	Disabled	Disabled	Disabled	Disabled	Disabled	
System backup reminder	Disabled	Disabled	Disabled	Disabled	Disabled	
Password at boot	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 194: 815E (ETX) Security Profile settings overview

Power

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Enable ACPI	Yes	Yes	Yes	Yes	Yes	
Power savings	Disabled	Disabled	Disabled	Disabled	Disabled	
Standby timeout	-	-	-	-	-	
Auto suspend timeout	-	-	-	-	-	
Hard disk timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Video timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Resume on modem ring	Off	Off	Off	Off	Off	
Resume on time	Off	Off	Off	Off	Off	
Resume time	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	
Power supply	ATX	ATX	ATX	ATX	ATX	
Power button function	Power off	Power off	Power off	Power off	Power off	
Power Loss Control	Power-on	Power-on	Power-on	Power-on	Power-on	
ACPI control						
Active trip point	Disabled	Disabled	Disabled	Disabled	Disabled	
Passive Cooling Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Critical Trip Point	110°C	110°C	110°C	110°C	110°C	
APIC - I/O APIC mode	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Native IDE support	Disabled	Disabled	Disabled	Disabled	Disabled	
Thermal management						
Auto thermal throttling	Enabled	Enabled	Enabled	Enabled	Enabled	
Temperature	100°C	100°C	100°C	100°C	100°C	
Hysteresis	5°C	5°C	5°C	5°C	5°C	
CPU performance	50%	50%	50%	50%	50%	

Table 195: 815E (ETX) Power Profile settings overview

Boot

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Boot priority order						
1:	IDE 0	**PCI BEV**	IDE 0	IDE 0	IDE 0	
2:	IDE 1	**IDE 0**	IDE 1	IDE 1	IDE 1	
3:	IDE CD	**IDE 1**	IDE CD	IDE CD	IDE CD	
4:	USB FDC	**IDE CD**	USB FDC	USB FDC	**USB FDD**	
5:	USB KEY	**USB FDC**	USB KEY	USB KEY	USB KEY	
6:	USB CDROM	**USB KEY**	USB CDROM	USB CDROM	USB CDROM	
7:	-	**USB CDROM**	**IDE 2**	-	**IDE 2**	
8:	-	-	**IDE 3**	-	**IDE 3**	
Excluded from boot order						
:	IDE 2	IDE 2	**USB HDD**	IDE 2	**USB HDD**	
:	IDE 3	IDE 3	**USB ZIP**	IDE 3	**USB ZIP**	
:	USB HDD	USB HDD	**USB LS120**	USB HDD	**USB LS120**	
:	USB ZIP	USB ZIP	**PCI BEV**	USB ZIP	**PCI BEV**	
:	USB LS120	USB LS120	**PCI SCSI**	USB LS120	**PCI SCSI**	
:	PCI BEV	**PCI SCSI**	**Bootable add-in cards**	PCI BEV	**Bootable add-in cards**	
:	PCI SCSI	**Bootable add-in cards**		PCI SCSI		
:	Bootable add-in cards			Bootable add-in cards		

Table 196: 815E (ETX) Boot Profile settings overview

1.2 855GME (ETX) BIOS description

Information:

- **The following diagrams and BIOS menu items including descriptions refer to BIOS version 1.30. It is therefore possible that these diagrams and BIOS descriptions do not correspond with the installed BIOS version.**
- **The setup defaults are the settings recommended by B&R. The setup defaults are dependant on the DIP switch configuration on the baseboard (see section 1.2.9 "Profile overview - BIOS default settings - 855GME (ETX)", on page 441).**

1.2.1 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 on the Panel PC 700 systems is produced by Phoenix.

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 is buffered by a battery, and remains in the PPC700 even when the power is turned off (no 24 V supply).

1.2.2 BIOS setup and boot procedure

BIOS is immediately activated when switching on the power supply of the Panel PC 700 system 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 <F2> 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 as soon as the following message appears on the lower margin of the display (during POST):

"Press <F2> to enter SETUP"

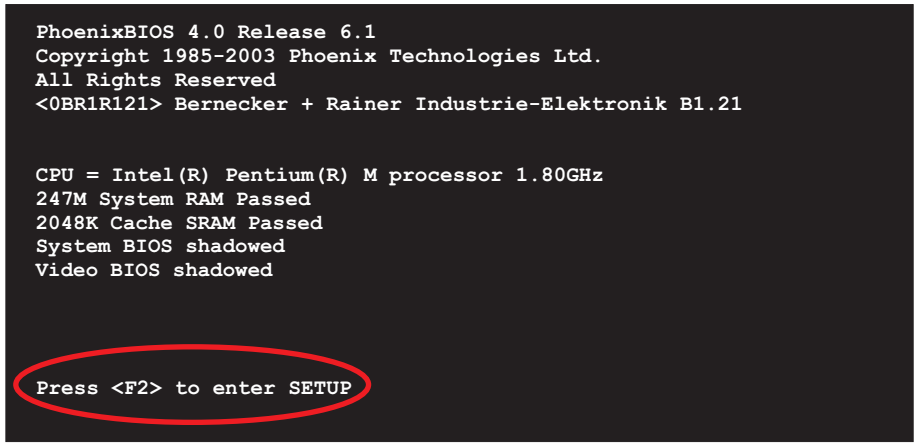


Figure 210: 855GME (ETX) BIOS Diagnostics Screen

Summary screen

After the POST, the summary screen displays the most important system characteristics.

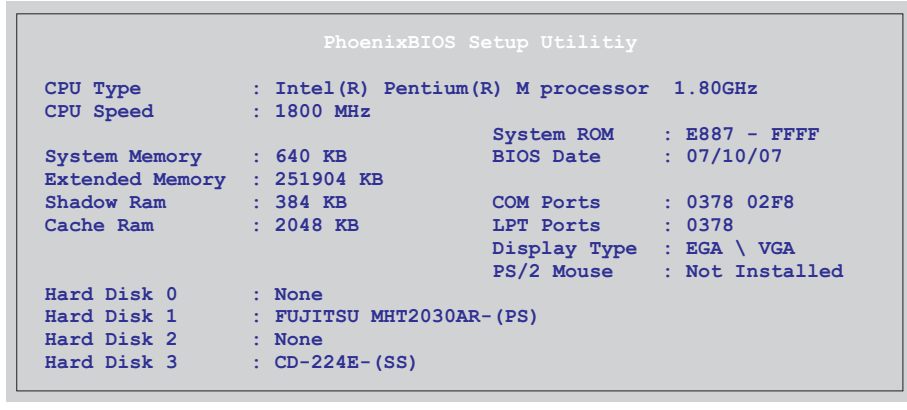


Figure 211: 855GME (ETX) BIOS Summary Screen

1.2.3 BIOS setup keys

The following keys are active during the POST:

Key	Function
F2	Enters the BIOS setup menu.
ESC	Cues the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER>, select the device from which will be booted.
<Spacebar>	Pressing the spacebar skips the system RAM check.
<Pause>	Pressing the <pause> key stops the POST. Press any other key to resume the POST.

Table 197: Keys relevant to 855GME (ETX) during POST

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

Key	Function
Cursor ↑	Moves to the previous item.
Cursor ↓	Go to the next item.
Cursor ←	Move to the item on the left.
Cursor →	Move to the item on the right.
<ESC>	Exits the submenu.
PageUp ↑	Moves the cursor to the top of the current BIOS setup page.
PageDown ↓	Moves the cursor to the bottom of the current BIOS setup page.
<F1> or <Alt+H>	Opens a help window showing the key assignments.
<F5> or <->	Scrolls to the previous option for the selected BIOS setting.
<F6> or <+> or <spacebar>	Scrolls to the next option for the selected BIOS setting.
<F8>	Load optimized default values for all pages.
<F9>	Load setup default values for all pages.
<F10>	Saves settings and closes BIOS setup.
<Enter>	Opens submenu for a BIOS setup menu item, or displays the configurable values of a BIOS setup item.

Table 198: 855GME (ETX) - relevant keys

The following sections explain the individual BIOS setup menu items in detail.

BIOS setup menu item	Function	From page
Main	The basic system configurations (e.g. time, date, hard disk parameters) can be set in this menu.	398
Advanced	Advanced BIOS options such as cache areas, PnP, keyboard repeat rate, as well as settings specific to B&R integrated hardware, can be configured here.	408
Security	For setting up the system's security functions.	432
Power	Setup of various APM (Advanced Power Management) options.	434
Boot	The boot order can be set here.	438

Table 199: Overview of 855GME (ETX) BIOS menu items

BIOS setup menu item	Function	From page
Exit	To end the BIOS setup.	439

Table 199: Overview of 855GME (ETX) BIOS menu items (Forts.)

1.2.4 Main

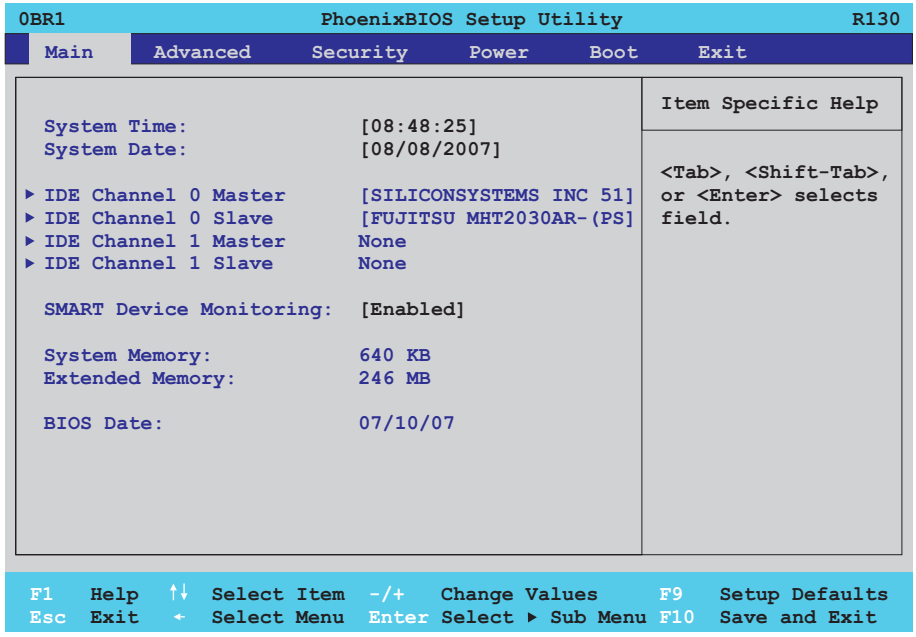


Figure 212: 855GME (ETX) Main

BIOS setting	Meaning	Setting options	Effect
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.	Changes the System time	Set the system time in the format (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 the system date	Set the system date in the format (mm:dd:yyyy).
IDE channel 0 master	The drive in the system that is connected to the IDE channel 0 master (previously "primary master") port is configured here.	Enter	Opens the submenu See "IDE channel 0 master", on page 400.
IDE channel 0 slave	The drive in the system that is connected to the IDE channel 0 slave (previously "primary slave") port is configured here.	Enter	Opens the submenu See "IDE channel 0 slave", on page 402.

Table 200: 855GME (ETX) Main setting options

BIOS setting	Meaning	Setting options	Effect
IDE channel 1 master	The drive in the system that is connected to the IDE channel 1 master (previously "secondary master") port is configured here.	Enter	Opens the submenu See "IDE channel 1 master", on page 404.
IDE channel 1 slave	The drive in the system that is connected to the IDE channel 1 slave (previously "secondary slave") port is configured here.	Enter	Opens the submenu See "IDE channel 1 slave", on page 406.
SMART device monitoring	S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) is implemented in the today's hard drives. This technology allows you to detect reading or rotational problems with the hard drive, and much more.	Enabled	Activates this function. In the future, a message regarding impending errors is produced.
		Disabled	Deactivates this function.
System Memory	Displays the amount of main memory installed. Between 0 and 640 KB.	None	-
Extended memory	Displays the available main memory from the first MB to the maximum memory capacity.	None	-
BIOS Date	The creation date of the software stored in BIOS is displayed here.	None	-

Table 200: 855GME (ETX) Main setting options (Forts.)

IDE channel 0 master

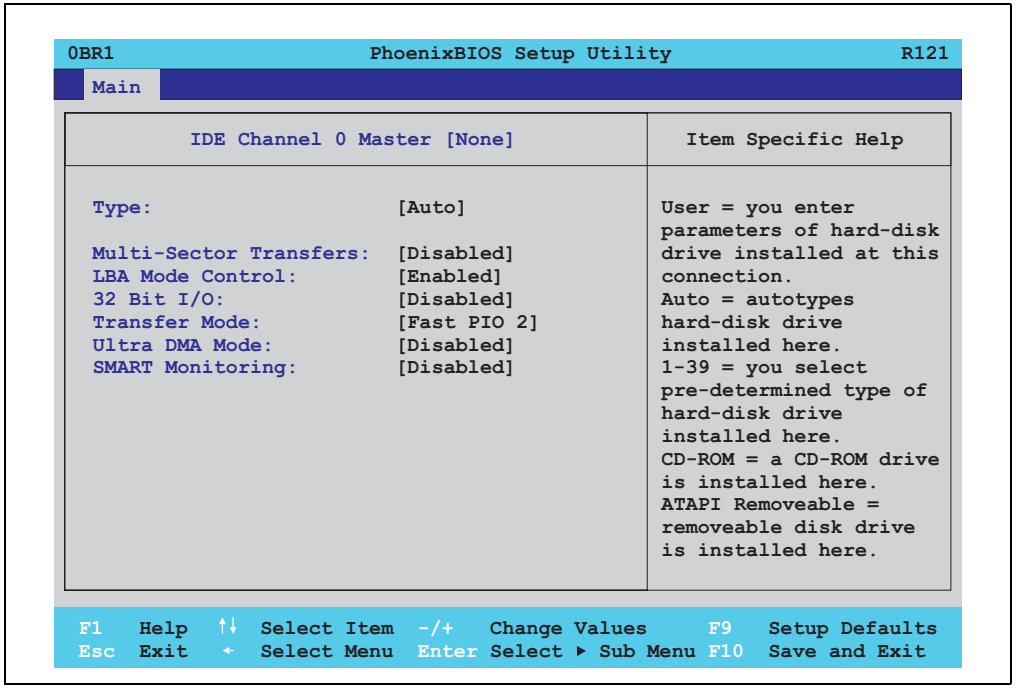


Figure 213: 855GME (ETX) IDE Channel 0 Master Setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the IDE channel 0 master (previously "primary master") is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 201: 855GME (ETX) IDE Channel 0 Master setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the IDE channel 0 master drive and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the IDE channel 0 master drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the IDE channel 0 master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 201: 855GME (ETX) IDE Channel 0 Master setting options (Forts.)

IDE channel 0 slave

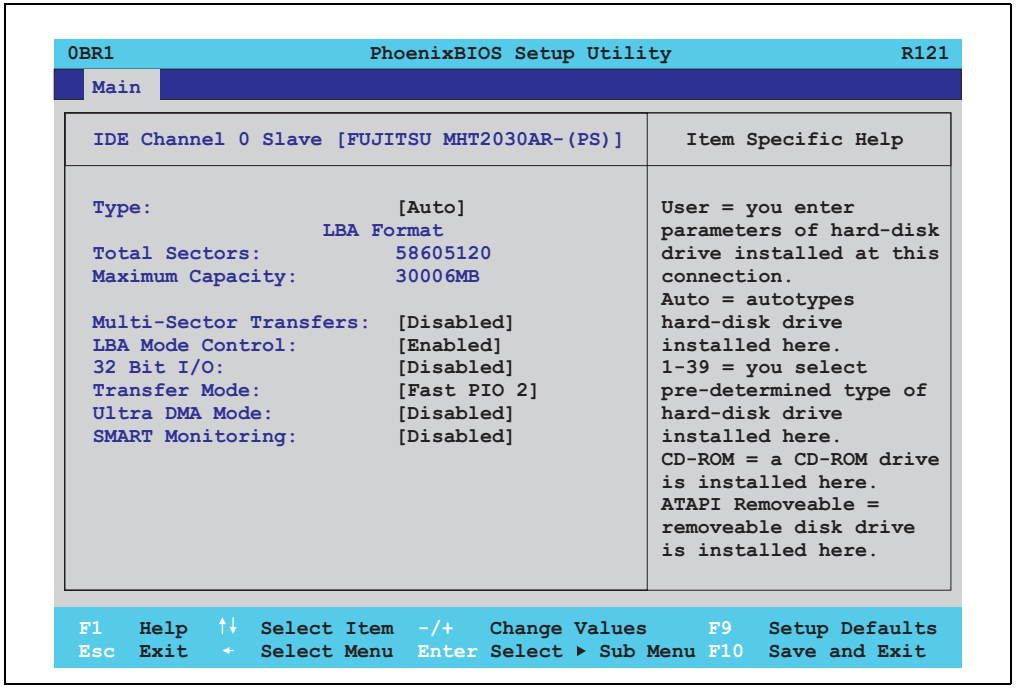


Figure 214: 855GME (ETX) IDE channel 0 slave setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the IDE channel 0 slave (previously "primary slave") is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 202: 855GME (ETX) IDE Channel 0 Slave setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the IDE channel 0 slave and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the IDE channel 0 slave drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the IDE channel 0 slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 202: 855GME (ETX) IDE Channel 0 Slave setting options (Forts.)

IDE channel 1 master

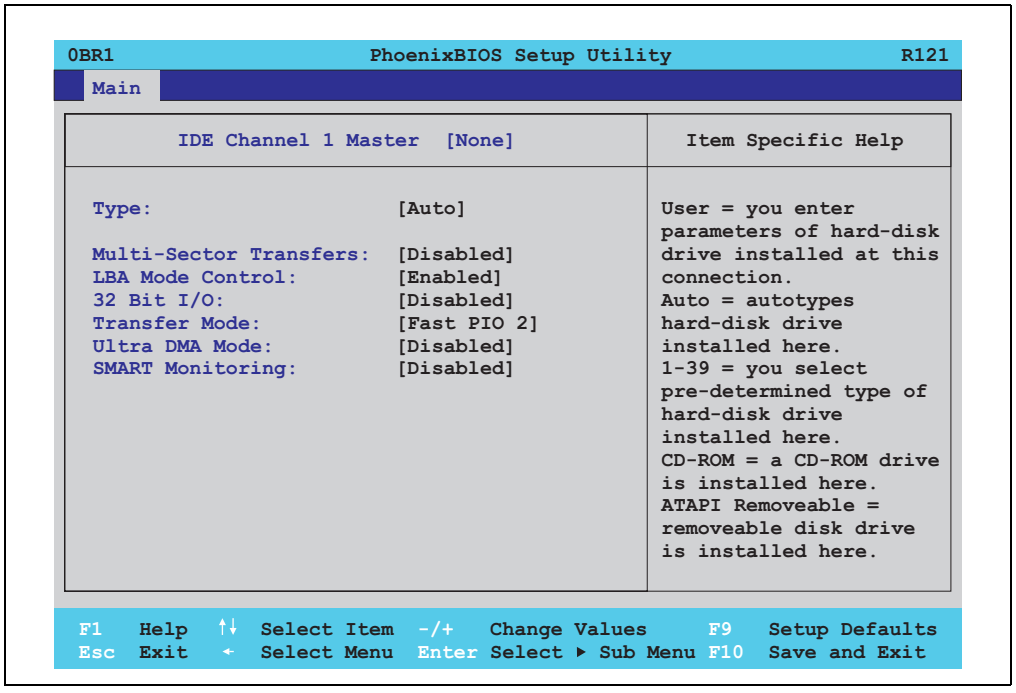


Figure 215: 855GME (ETX) IDE Channel 1 Master Setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the IDE channel 1 master (previously "secondary master") is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 203: 855GME (ETX) IDE Channel 1 Master setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the IDE channel 1 master and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the IDE channel 1 master drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the IDE channel 1 master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 203: 855GME (ETX) IDE Channel 1 Master setting options (Forts.)

IDE channel 1 slave

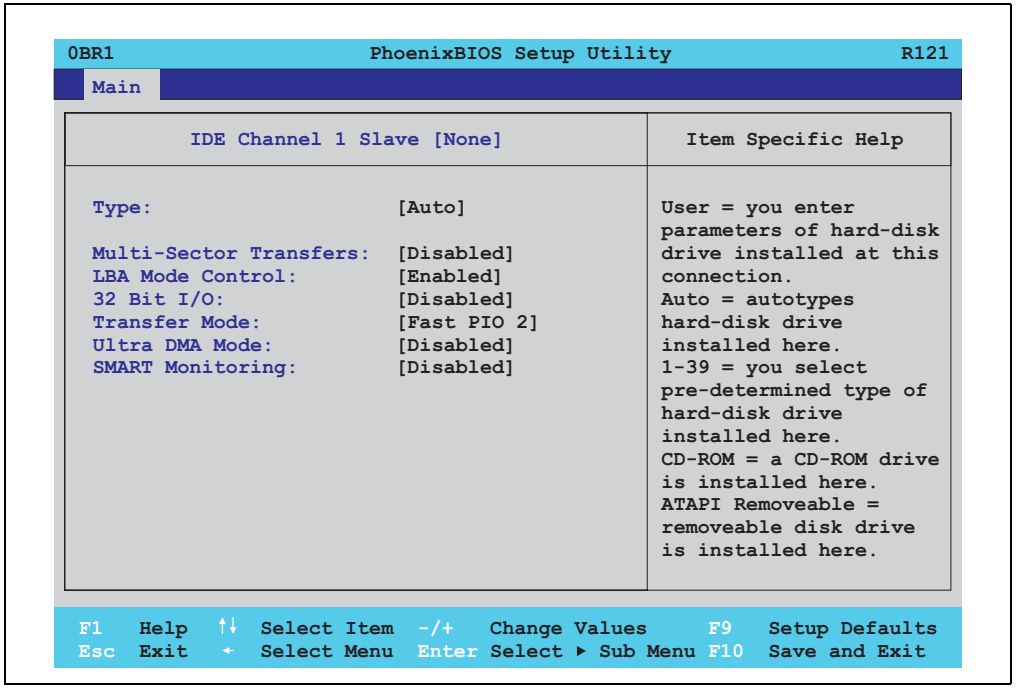


Figure 216: 855GME (ETX) IDE channel 1 slave setup

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the IDE channel 1 slave (previously "secondary slave") is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for IDE disk drives that are not mentioned here.
		CD-ROM	CD-ROM = CD-ROM drive
		ATAPI removable	The removable media drive is treated as a hard drive or floppy drive.
		IDE removable	The IDE removable drive is treated as a hard drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive.	Disabled	Disables this function.
		2, 4, 8 or 16 sectors	Number of sectors per block.
LBA mode control	This option activates the logical block addressing for IDE. This function enables support of drives larger than 540 MB. Only possible when manually setting up the drive.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 204: 855GME (ETX) IDE Channel 1 Slave setting options

BIOS setting	Meaning	Setting options	Effect
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.
Transfer mode	The communication path between the IDE channel 1 slave drive and the system memory is defined here. Only possible when manually setting up the drive.	Default	Default setting.
		Fast PIO 1 - Fast PIO 4 / DMA2	Manual configuration of PIO mode.
Ultra DMA mode	The data transfer rate to and from the IDE channel 1 slave drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Disabled	Disables this function. Do not use UDMA mode.
		Mode 0 - Mode 5	Manual setting option for UDMA mode.
SMART monitoring	Indicates whether the IDE channel 1 slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 204: 855GME (ETX) IDE Channel 1 Slave setting options (Forts.)

Advanced

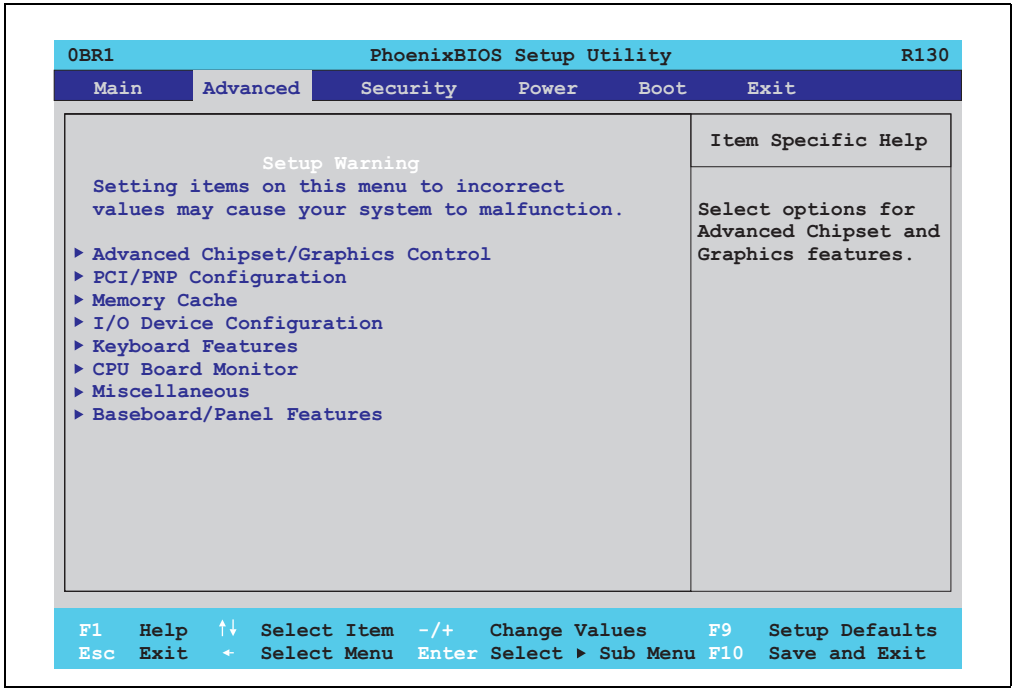


Figure 217: 855GME - advanced setup menu - overview

BIOS setup menu	Meaning	Setting options	Effect
Advanced chipset/graphics control	Setup of advanced chipset and graphics functions.	Enter	Opens the submenu See "Advanced chipset/graphics control", on page 409.
PCI/PNP Configuration	Configures PCI devices.	Enter	Opens the submenu See "PCI/PNP Configuration", on page 411.
Memory cache	Configuration of the memory cache resources.	Enter	Opens the submenu See "Memory cache", on page 418.
I/O Device Configuration	Configures the I/O devices.	Enter	Opens the submenu See "I/O Device Configuration", on page 420.
Keyboard Features	Configuration of the keyboard options.	Enter	Opens the submenu See "Keyboard Features", on page 423.
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens the submenu See "CPU board monitor", on page 424.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc.).	Enter	Opens the submenu See "Miscellaneous", on page 425.
Main Board/Panel Features	Displays device specific information and setup of device specific values.	Enter	Opens the submenu See "Main Board/Panel Features", on page 426.

Table 205: 855GME (ETX) Advanced Menu setting options

Advanced chipset/graphics control

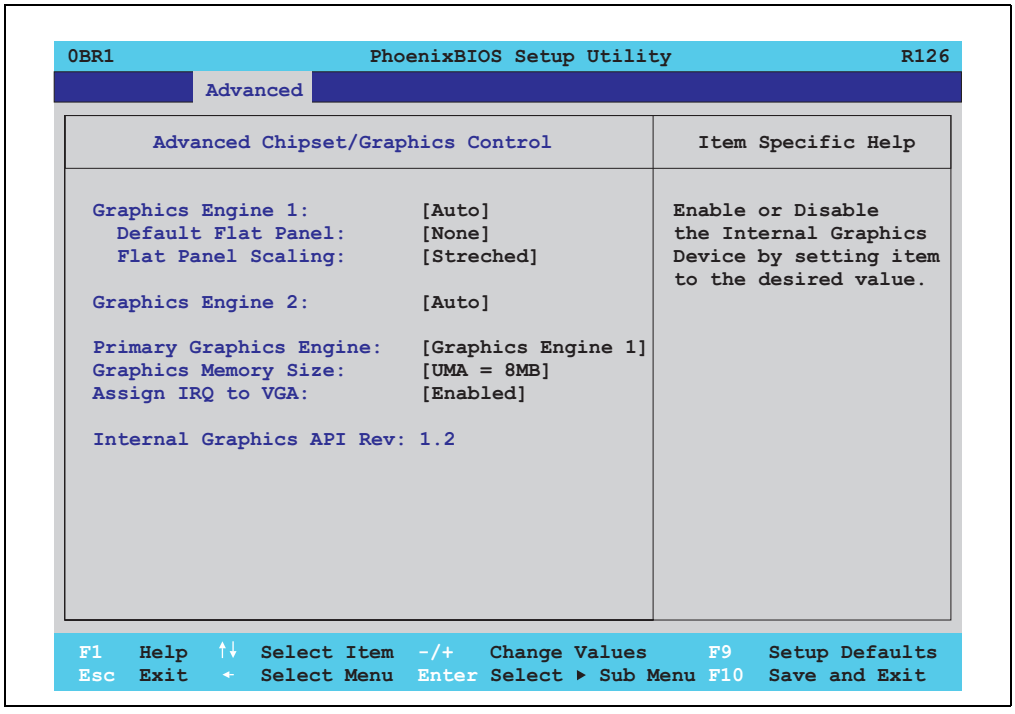


Figure 218: 855GME (ETX) Advanced Chipset Control

BIOS setting	Meaning	Setting options	Effect
Graphics engine 1	Settings can be made for the onboard video controller (internal graphics device).	Auto	Automatic setting of Graphic Engine 1. The resolution is set using a read-out of the connected panel's EDID data. **Information:** **If EDID data older than V1.1 is read, it is not passed on to the VGA BIOS**
		Disabled	Disable graphics controller. **Information:** **The onboard video controller must be activated to make video output possible. Deactivate only for use of an external PCI graphics card.**
Default flat panel	Should the connected panel fail to be automatically recognized, a predefined resolution can be set manually here.	None	A predefined resolution has not been set.
		VGA, SVGA, XGA, XGA2, SXGA, UXGA	VGA = 640 x 480 resolution SVGA = 800 x 600 resolution XGA = 1024 x 768 resolution XGA2 = 1024 x 768 resolution SXGA = 1280 x 1024 resolution UXGA = 1600 x 1200 resolution
Flat panel scaling	For setting whether the video signal should be centered on the panel (stamp format), or fill the entire display (stretched).	Centered	Display is centered.
		Stretched	Display is stretched to fit screen.
Graphics engine 2	Settings can be made for the second onboard video controller (only with an AP Link card).	Auto	Automatic setting of Graphic Engine 2. The resolution is set using a read-out of the connected panel's EDID data.
		Disabled	Deactivates the graphics interface.
Graphics engine	Selection of the primary video output line. **Information:** **The "Primary graphics engine" setting is only relevant from the booting of the system until a graphics driver is started (e.g. in Windows).**	Graphics engine 1	The display devices on the monitor / panel plug are the primary video output.
		Graphics engine 2	The Panel PC 700 display is the primary video output.
Graphics memory size	For setting how much of the main memory (in MB) the graphics controller can use.	1 MB	1 MB main memory to be used by the graphics controller.
		UMA = 8 MB	8 MB main memory to be used by the graphics controller.
		UMA = 16 MB	16 MB main memory to be used by the graphics controller.
		UMA = 32 MB	32 MB main memory to be used by the graphics controller.
Assign IRQ to VGA	This is where an IRQ is reserved and automatically assigned for the CPU board's onboard graphics.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 206: 855GME (ETX) Advanced Chipset Control setting options

BIOS setting	Meaning	Setting options	Effect
Internal graphics API Rev	Displays the internal graphics API version number.	None	-

Table 206: 855GME (ETX) Advanced Chipset Control setting options (Forts.)

PCI/PNP Configuration

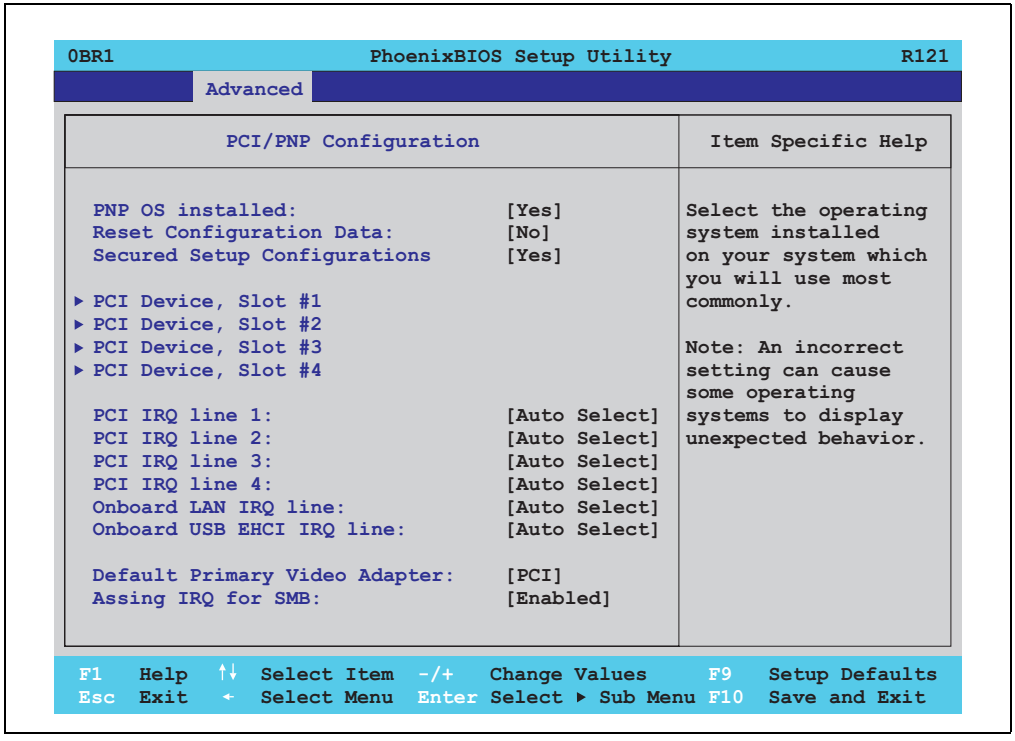


Figure 219: 815GME (ETX) - PCI/PNP configuration

BIOS setting	Meaning	Setting options	Effect
PNP OS installed	If the operating system being used is plug & play capable, then this option informs BIOS that the operating system will handle the distribution of resources in the future.	Yes	The ISA PnP resources are not assigned. The resource assignment sequence is as follows: 1. Motherboard devices 2. PCI devices
		No	The resource assignment sequence is as follows: 1. Motherboard devices 2. ISA PnP devices 3. PCI devices

Table 207: 855GME (ETX) PCI/PNP Configuration setting options

BIOS setting	Meaning	Setting options	Effect
Reset configuration data	During booting, the assigned resources are stored in the Flash (ESCD).	Yes	When the system is reset after leaving the BIOS setup, all ECSD entries (extended system configuration data) are deleted.
		No	Disables this function. Resources are not reset.
Secured setup configuration	This option protects the setup configuration from interference from a PnP operating system.	Yes	Prevents a PnP operating system from changing system settings.
		No	Disables this function. Changes are allowed.
PCI device, slot #1	Advanced configuration of the PCI slot number 1.	Enter	Opens the submenu See "PCI device, slot #1", on page 414
PCI device, slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens the submenu See "PCI device, slot #2", on page 415
PCI device, slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens the submenu See "PCI device, slot #3", on page 416
PCI device, slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens the submenu See "PCI device, slot #4", on page 417
PCI IRQ line 1	Under this option, the external PCI interrupt 1 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the plug & play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI IRQ line 2	Under this option, the external PCI interrupt 2 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the plug & play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI IRQ line 3	Under this option, the external PCI interrupt 3 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the plug & play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI IRQ line 4	Under this option, the external PCI interrupt 4 is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the plug & play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
Onboard LAN IRQ line	Under this option, the onboard LAN interrupt is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the plug & play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
Onboard USB EHCI IRQ line	Under this option, the USB EHCI interrupt is assigned to an ISA interrupt.	Auto-select	The interrupt is automatically assigned according to the plug & play guidelines.
		Disabled	Disables this function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.

Table 207: 855GME (ETX) PCI/PNP Configuration setting options (Forts.)

BIOS setting	Meaning	Setting options	Effect
Default primary video adapter	This option sets the first activated graphics card (either an existing AGP or the PCI graphics card).	PCI	A PCI graphics card is set as the default display device.
		AGP	An AGP graphics card is set as the default display device.
Assign IRQ for SMB	Use this function to set whether or not the SM (System Management) bus controller is assigned a PCI interrupt.	Enabled	Automatic assignment of a PCI interrupt.
		Disabled	No assignment of an interrupt.

Table 207: 855GME (ETX) PCI/PNP Configuration setting options (Forts.)

PCI device, slot #1

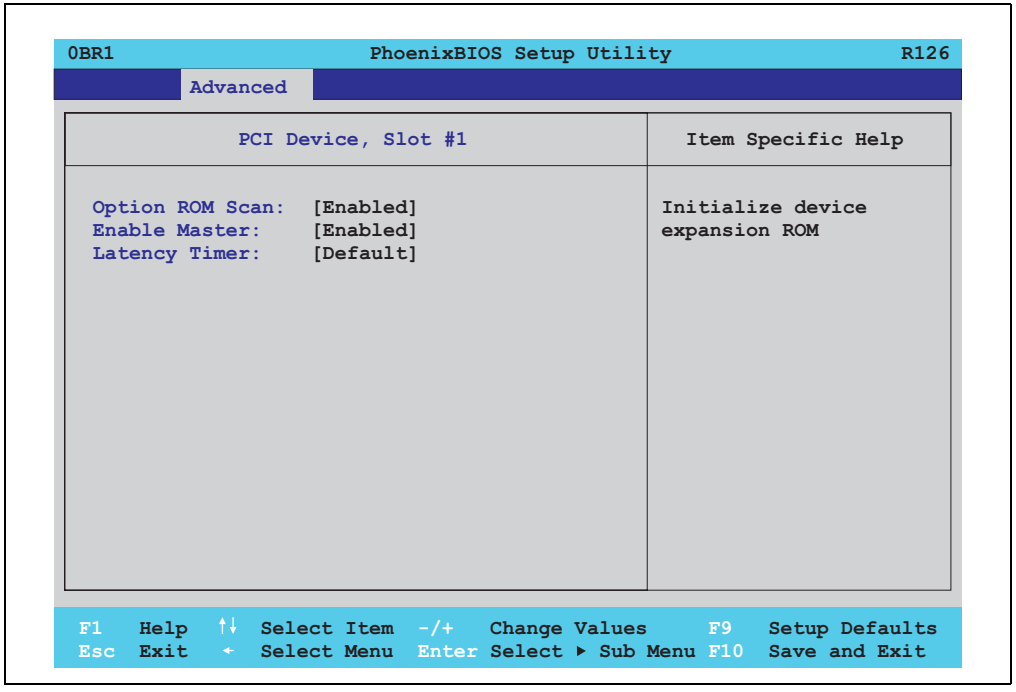


Figure 220: 855GME (ETX) - PCI device, slot #1

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 208: 855GME (ETX) - PCI device, slot #1 - setting options

PCI device, slot #2

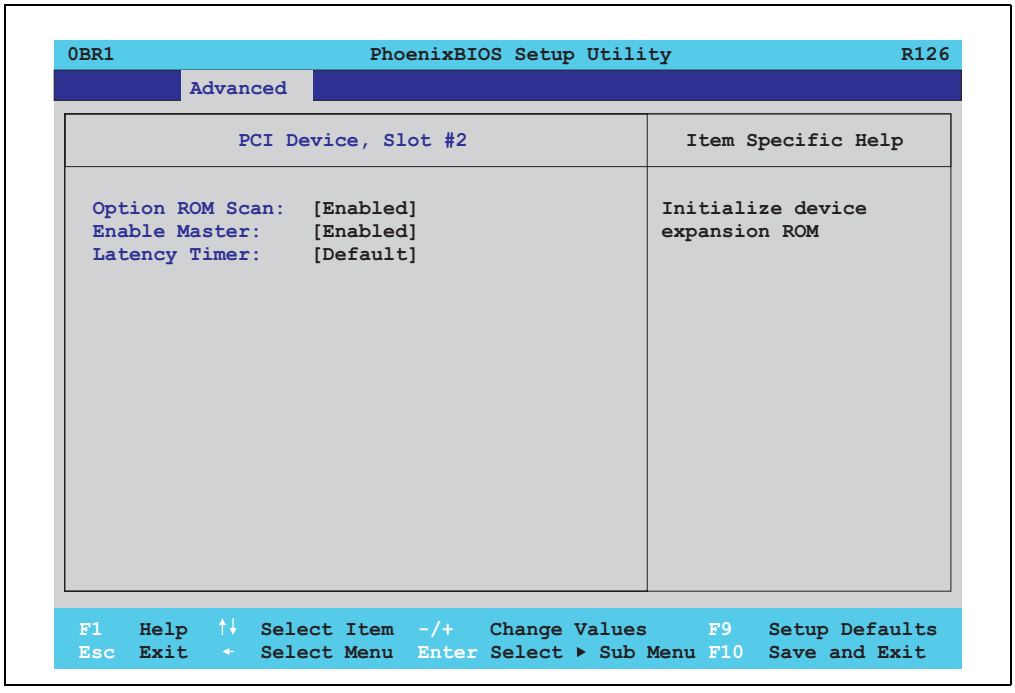


Figure 221: 855GME (ETX) - PCI device, slot #2

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 209: 855GME (ETX) - PCI device, slot #2 - setting options

PCI device, slot #3

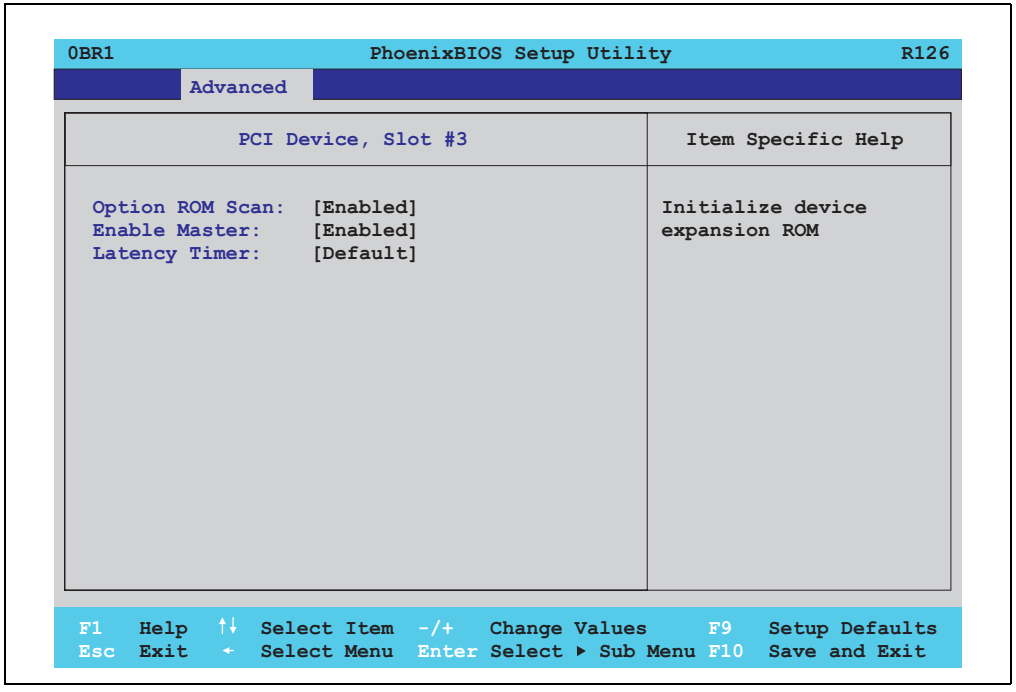


Figure 222: 855GME (ETX) - PCI device, slot #3

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 210: 855GME (ETX) - PCI device, slot #3 - setting options

PCI device, slot #4

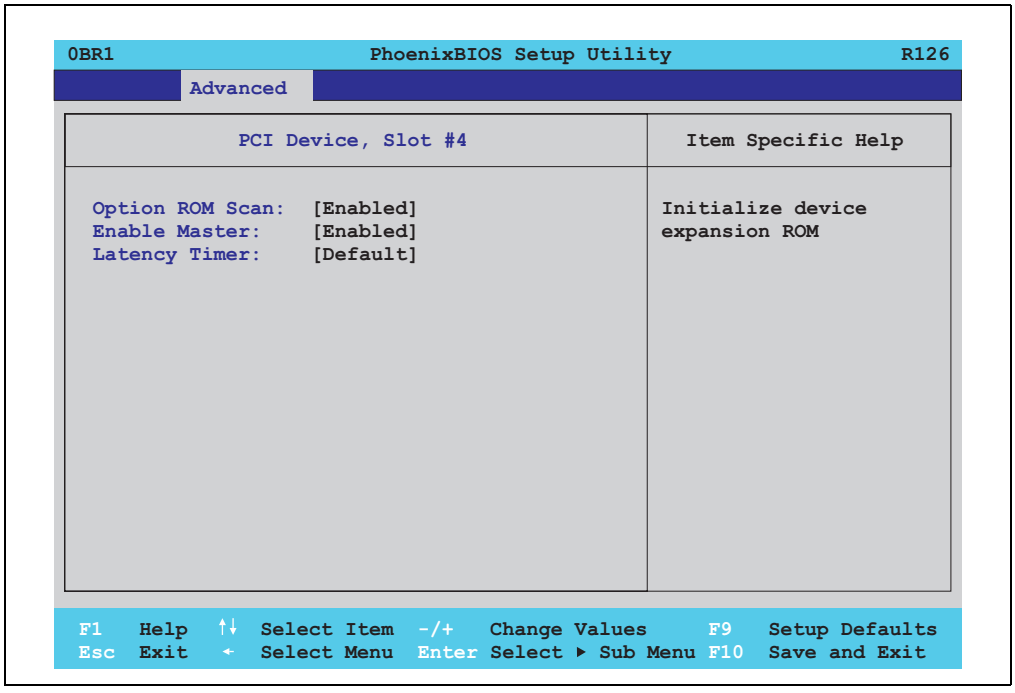


Figure 223: 855GME (ETX) - PCI device, slot #4

BIOS setting	Meaning	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Enables this function.
		Disabled	Disables this function.
Enable master	Sets the PCI device to be treated as the PCI bus master. Not all PCI devices can function as PCI bus master! Check device description.	Enabled	Enables this function.
		Disabled	Disables this function.
Latency timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	Default	Default setting. Default
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Value set manually.

Table 211: 855GME (ETX) - PCI device, slot #4 - setting options

Memory cache

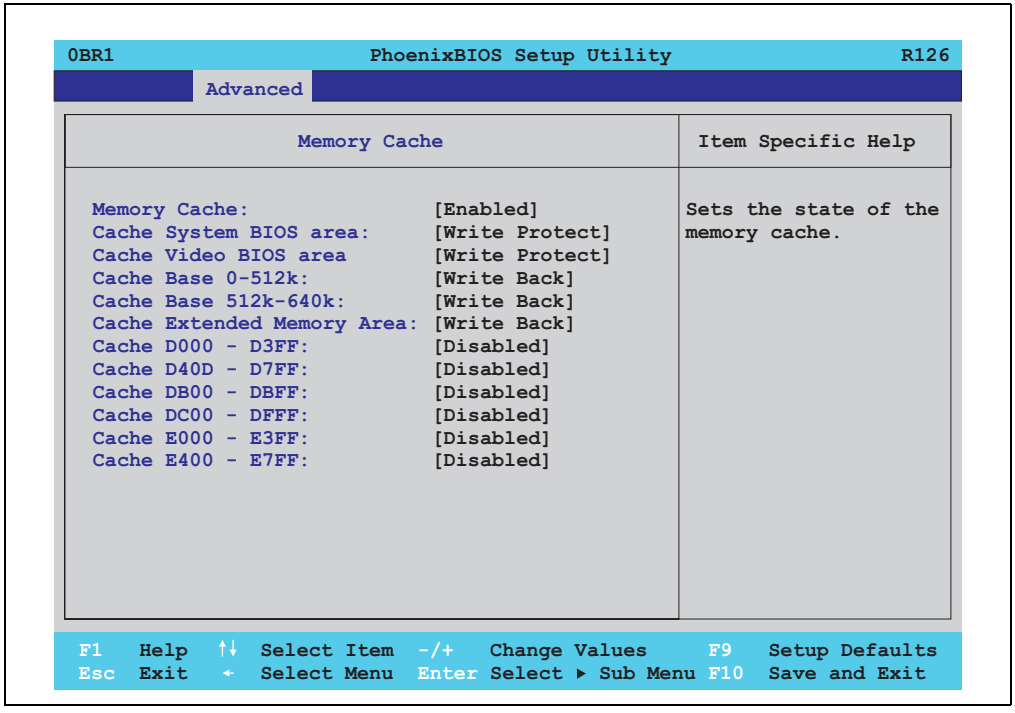


Figure 224: 855GME (ETX) Memory Cache

BIOS setting	Meaning	Setting options	Effect
Memory cache	Enable/ disable utilization of the L2 cache.	Enabled	Enables this function.
		Disabled	Disables this function.
Cache system BIOS area	Set whether or not the system BIOS should be buffered.	Write protect	System BIOS is mapped in the cache.
		Uncached	System BIOS is not mapped in the cache.
Cache video BIOS area	Set whether or not the video BIOS should be buffered.	Write protect	Video BIOS is mapped in the cache.
		Uncached	Video BIOS is not mapped in the cache.
Cache base 0-512k	Set whether the memory content should be mapped in the cache (0-512k), and when necessary, written in the main memory.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.

Table 212: 855GME (ETX) Memory Cache setting options

BIOS setting	Meaning	Setting options	Effect
Cache base 512-640k	Set whether the memory content should be mapped in the cache (512-640k), and when necessary, written in the main memory.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache extended memory area	Configure how the memory content of the system memory above 1MB should be mapped.	Uncached	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache D000 - D3FF	Configure how the memory content of D000-D3FF should be mapped.	Disabled	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache D400 - D7FF	Configure how the memory content of D400-D7FF should be mapped.	Disabled	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache DB00 - DBFF	Configure how the memory content of D800-DBFF should be mapped.	Disabled	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache DC00 - DFFF	Configure how the memory content of DC00-DFFF should be mapped.	Disabled	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache E000 - E3FF	Configure how the memory content of E00-E3FF should be mapped.	Disabled	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.
Cache E400 - E7FF	Configure how the memory content of E400-E7FF should be mapped.	Disabled	No mapping.
		Write through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write protect	Memory content is mapped in the cache.
		Write back	Memory content is mapped only when necessary.

Table 212: 855GME (ETX) Memory Cache setting options (Forts.)

I/O Device Configuration

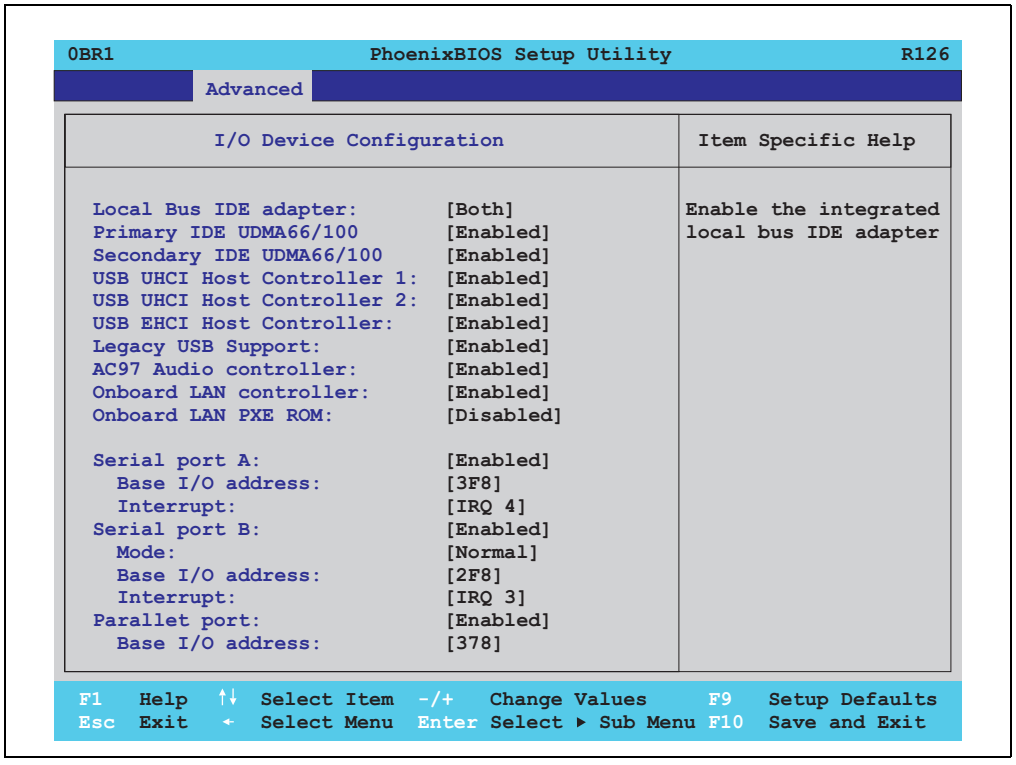


Figure 225: 855GME (ETX) I/O Device Configuration

BIOS setting	Meaning	Setting options	Effect
Local bus IDE adapter	Function for enabling/disabling the PCI IDE controllers (primary and secondary).	Disabled	Deactivates both PCI IDE controllers (primary and secondary).
		Primary	Activates the primary IDE controller only.
		Secondary	Activates the secondary IDE controller only.
		Both	Activates both PCI IDE controllers (primary and secondary).
Primary IDE UDMA66/100	Setup the data transfer rate for a device connected to the primary IDE channel. This option is only available when a primary IDE drive is connected.	Disabled	The maximum data transfer rate is UDMA33.
		Enabled	The maximum data transfer rate is UDMA66 or higher.
Secondary IDE UDMA66/100	Setup the data transfer rate for a device connected to the secondary IDE channel. This option is only available when a secondary IDE drive is connected.	Disabled	The maximum data transfer rate is UDMA33.
		Enabled	The maximum data transfer rate is UDMA66.

Table 213: 855GME (ETX) I/O Device Configuration setting options

BIOS setting	Meaning	Setting options	Effect
USB UHCI host controller 1	Configuration of the USB UHCI controller 1 for USB port 0 and 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller 2	Configuration of the USB UHCI controller 2 for USB port 2 and 3. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller	Configuration of the USB EHCI controller. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	When enabled, the USB 2.0 support is activated as soon as a USB 2.0 device is connected to the interface.
Legacy USB Support	Here IRQs are assigned to the USB connections.	Disabled	No IRQ assigned. It is not possible to boot from a USB device (USB stick, USB floppy, USB CD ROM, etc.)! However, a connected USB keyboard can be used to access and configure the BIOS setup, boot menu or optional RAID boot menu. USB devices will not function after completing the BIOS POST routine. USB devices only work after starting the operating system with USB support (e.g. Windows XP). MS-DOS does not support the use of USB devices.
		Enabled	IRQ assigned. Booting from USB devices is now possible. Supported USB devices work with MS-DOS (e.g. USB keyboard, etc).
AC97 audio controller	For turning the AC97 audio controller on and off.	Disabled	AC97 sound is deactivated.
		Enabled	AC97 sound is activated.
Onboard LAN controller	For turning the ICH4 on-board LAN controller (for ETH1) on and off.	Disabled	Deactivates the LAN controller or the ETH1 interface.
		Enabled	Activates the LAN controller or the ETH1 interface.
Onboard LAN PXE ROM	For turning the remote boot BIOS extension for the onboard LAN controller (ETH1) on and off.	Disabled	Disables this function.
		Enabled	Enables this function.
Serial port A	For the configuration of serial port A (COM1).	Disabled	Port A deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Base I/O address	Selection of the base I/O address for port A. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Base I/O address is manually assigned.
Interrupt	Selection of the interrupt for port A. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Manual assignment of the interrupt.

Table 213: 855GME (ETX) I/O Device Configuration setting options (Forts.)

BIOS setting	Meaning	Setting options	Effect
Serial port B	For the configuration of serial port B (COM2).	Disabled	Port B deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Mode	This option is for setting the serial port B as either a standard interface or as an infrared interface.	Normal	Serial port B is used as a standard interface.
		IR	The serial interface is used as an infrared interface, and allows data transfers up to 115 kBit/s.
Base I/O address	Selection of the base I/O address for port B. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Selected base I/O address is manually assigned.
Interrupt	Selection of the interrupt for port B. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Selected interrupt is assigned.
Parallel port	For configuring the hardware security key (dongle), which accessed internally through the parallel interface.	Disabled	Deactivates the port.
		Enabled	Activates the port. The base I/O address must then be set.
		Auto	First BIOS and then the operating system configure the port automatically.
Base I/O address	Selection of the base I/O address for the parallel port.	378, 278, 3BC	Base I/O address is manually assigned.

Table 213: 855GME (ETX) I/O Device Configuration setting options (Forts.)

Keyboard Features

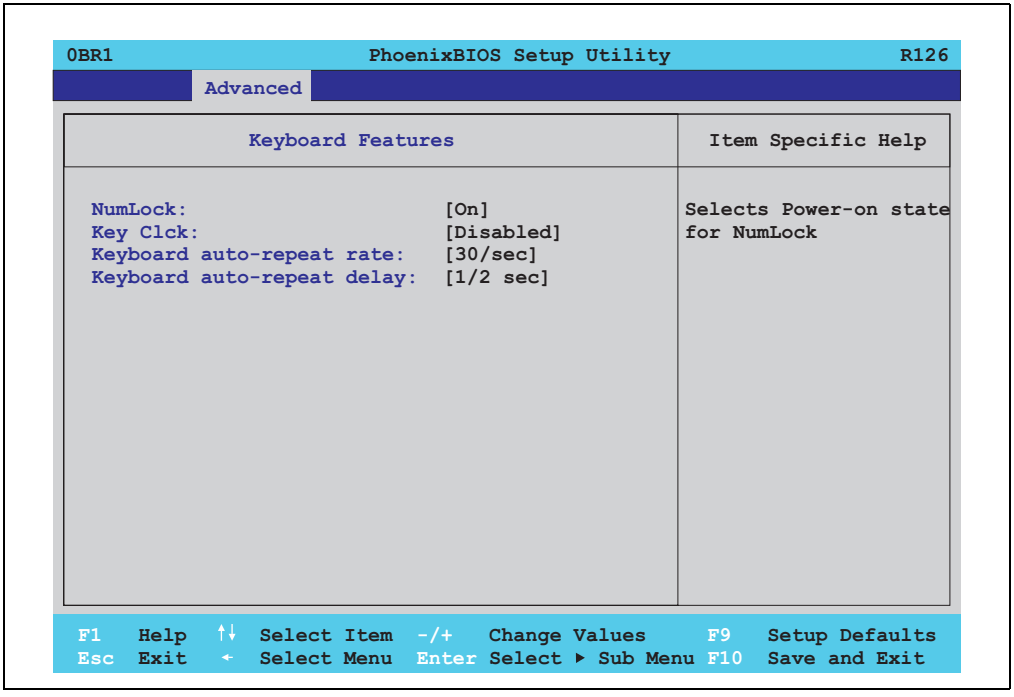


Figure 226: 855GME (ETX) Keyboard Features

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.
		Auto	Numeric keypad is activated, if present.
Key click	Using this option, the clicking of the keys can be turned on or off.	Disabled	Disables this function.
		Enabled	Enables this function.
Keyboard auto-repeat rate	For setting the speed of repetition when a key is held down.	30/sec, 26.7/sec, 21.8/sec, 18.5/sec, 13.3/sec, 10/sec, 6/sec, 2/sec	Settings from 2 to 30 characters per second.
Keyboard auto-repeat delay	For setting the amount of delay after the key is pressed before the auto-repeat begins.	1/4 sec, 1/2 sec, 3/4 sec, 1 sec	Setting of the desired delay.

Table 214: 855GME (ETX) Keyboard Features setting options

CPU board monitor

Information:

The displayed voltage values (e.g. core voltage, battery voltage) on this BIOS Setup page represent uncalibrated information values. These cannot be used to draw any conclusions about any hardware alarms or error conditions. The hardware components used have automatic diagnostics functions that can be applied in the event of error.

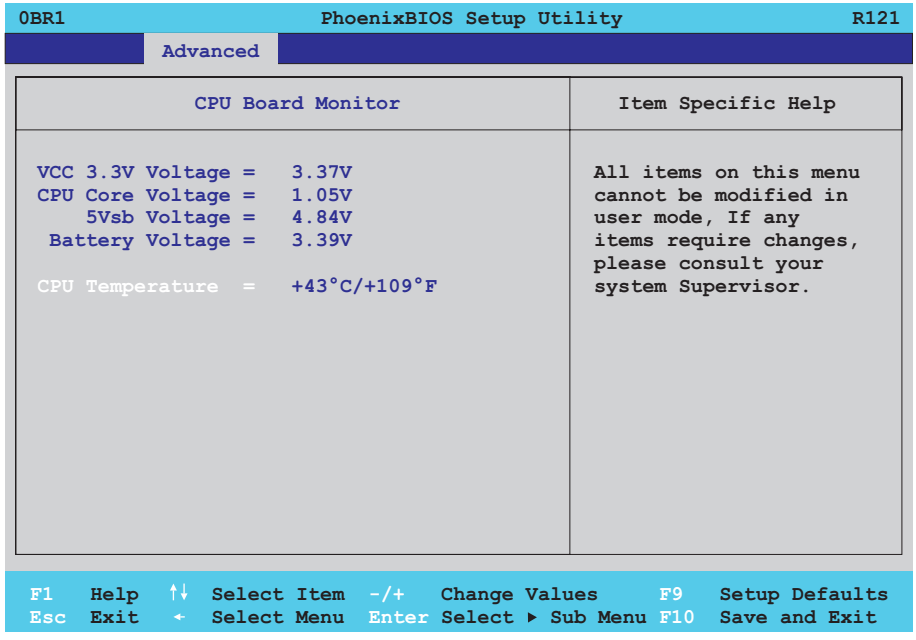


Figure 227: 855GME (ETX) - CPU board monitor

BIOS setting	Meaning	Setting options	Effect
VCC 3.3V voltage	Displays the current voltage of the 3.3 volt supply (in volts).	None	-
CPU core voltage	Displays the processor's core voltage (in volts).	None	-
5Vsb voltage	Displays the 5 V standby voltage (in volts).	None	-
Battery voltage	Displays the battery voltage (in volts).	None	-
CPU temperature	Displays the processor's temperature (in degrees Celsius and Fahrenheit).	None	-

Table 215: 855GME (ETX) - CPU board monitor - setting options

Miscellaneous

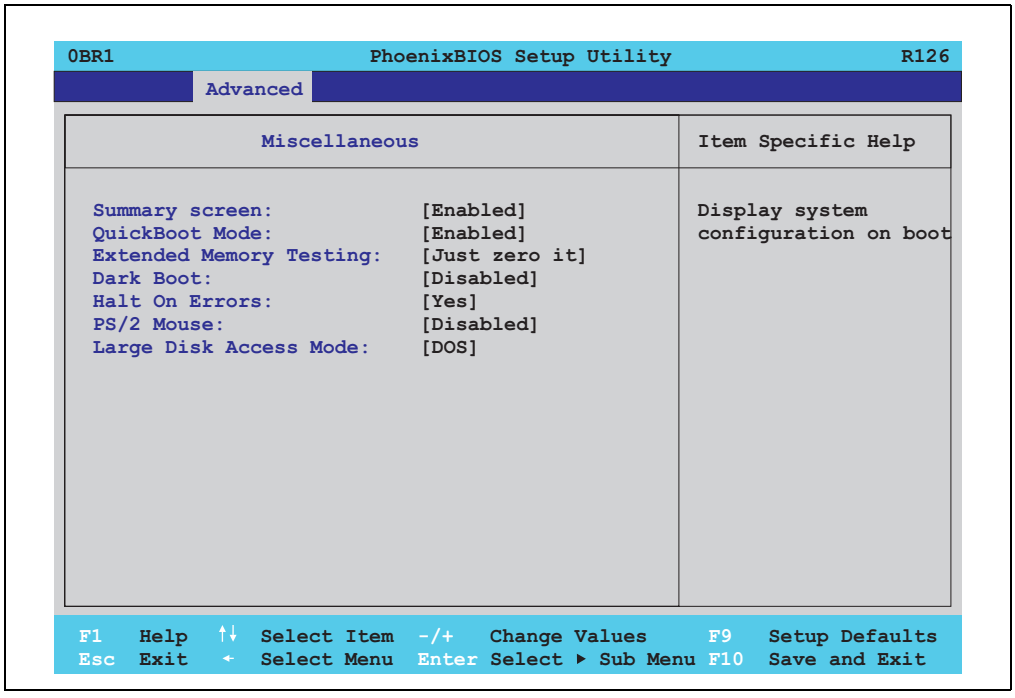


Figure 228: 855GME (ETX) miscellaneous

BIOS setting	Meaning	Setting options	Effect
Summary screen	Set whether or not the system summary screen should open when the system is started (see figure 211 "855GME (ETX) BIOS Summary Screen", on page 396).	Enabled	Enables this function.
		Disabled	Disables this function.
QuickBoot mode	Speeds up the booting process by skipping several tests.	Enabled	Enables this function.
		Disabled	Disables this function.
Extended memory testing	This function determines the method by which the main memory over 1 MB is tested.	Just zero it	The main memory is quickly tested.
		None	The main memory is not tested at all.
		Normal	This option is only available when the function "QuickBoot Mode" has been set to "disabled." The main memory is tested more slowly than with "Just zero It."
Dark boot	Sets whether the diagnostics screen (see figure 210 "855GME (ETX) BIOS Diagnostics Screen", on page 396) should be displayed when the system is started.	Enabled	Enables this function. The diagnostics screen is not displayed.
		Disabled	Disables this function. The diagnostics screen is displayed.

Table 216: 855GME (ETX) Miscellaneous setting options

BIOS setting	Meaning	Setting options	Effect
Halt on errors	This option sets whether the system should pause the Power On Self Test (POST) when it encounters an error.	Yes	The system pauses. The system pauses every time an error is encountered.
		No	The system does not pause. All errors are ignored.
PS/2 mouse	Sets whether the PS/2 mouse port should be activated.	Disabled	Deactivates the port.
		Enabled	Activates the port. The IRQ12 is reserved, and is not available for other components.
Large disk access mode	This option is intended for hard discs with more than 1024 cylinders, 16 heads, and more than 63 sectors per track. Setting options: DOS	Other	For non-compatible access (e.g. Novell, SCO Unix.)
		DOS	For MS DOS compatible access.

Table 216: 855GME (ETX) Miscellaneous setting options (Forts.)

Main Board/Panel Features

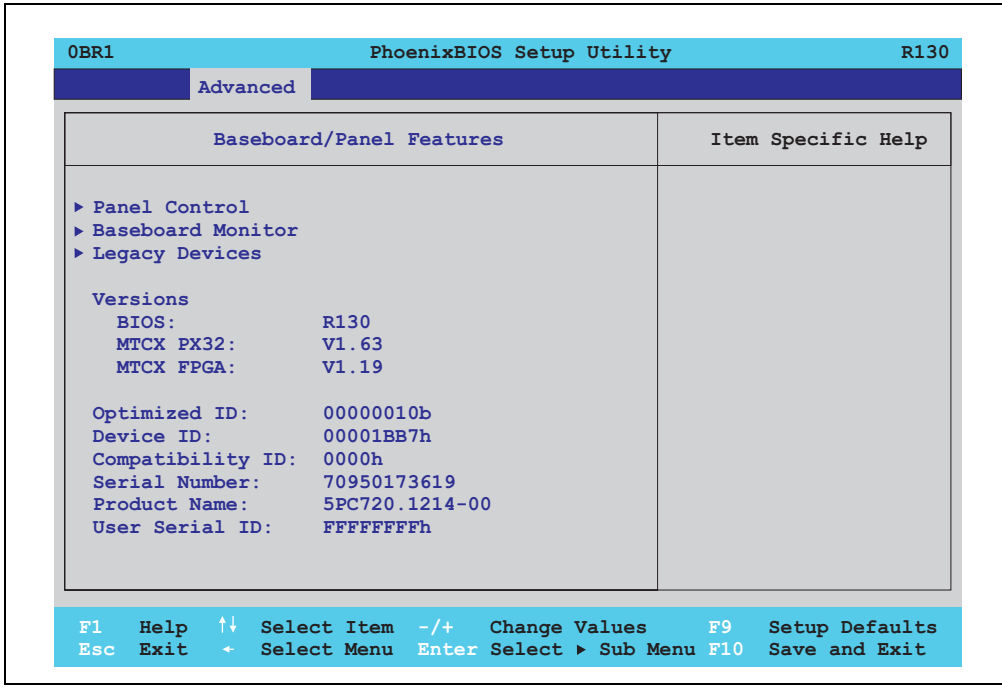


Figure 229: 855GME (ETX) Baseboard/Panel Features

BIOS setting	Meaning	Setting options	Effect
Panel control	For special setup of connected panels.	Enter	Opens the submenu See "Panel control", on page 428.
Main board monitor	Display of various temperatures and fan speeds.	Enter	Opens the submenu See "Main board monitor", on page 429.

Table 217: 855GME (ETX) Baseboard/Panel Features setting options

BIOS setting	Meaning	Setting options	Effect
Legacy devices	Special settings for the interface can be changed here.	Enter	Opens the submenu See "Legacy devices", on page 430.
BIOS	Displays the BIOS version.	None	-
MTCX PX32	Displays the MTCX PX32 firmware version.	None	-
MTCX FPGA	Displays the MTCX FPGA firmware version.	None	-
Optimized ID	Displays the DIP switch setting of the configuration switch.	None	-
Device ID	Displays the hexadecimal value of the hardware device ID.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Serial Number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
User serial ID	Displays the hexadecimal value of the user serial ID number. This number can only be changed with "control center," available from B&R.	None	-

Table 217: 855GME (ETX) Baseboard/Panel Features setting options (Forts.)

Panel control

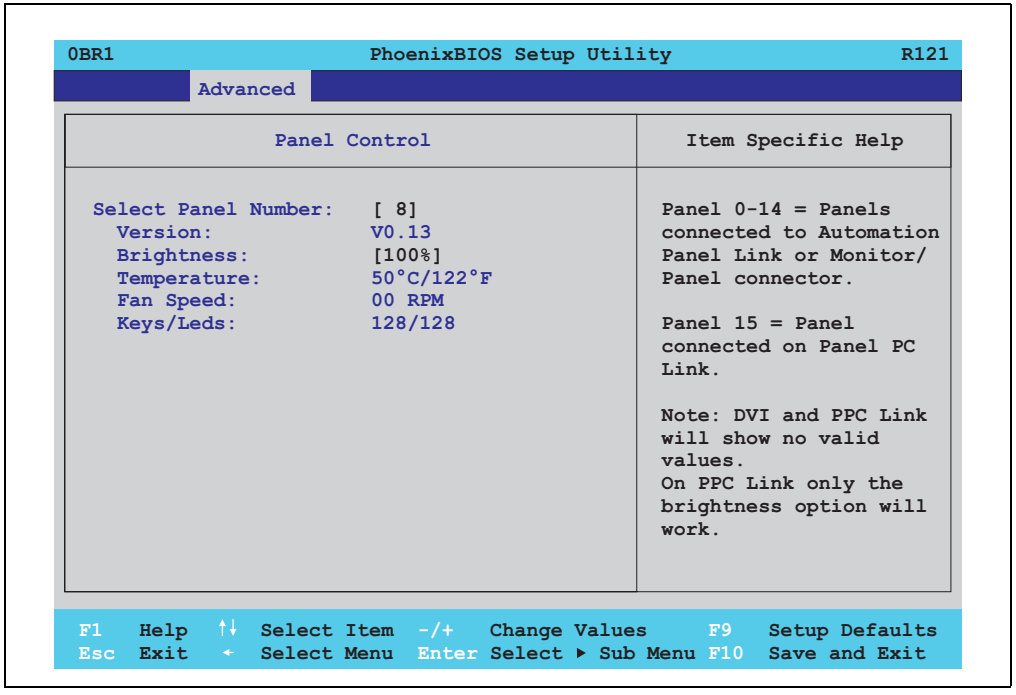


Figure 230: 855GME (ETX) Panel Control

BIOS setting	Meaning	Setting options	Effect
Select panel number	Selection of the panel number for which the values should be read out and/or changed.	0 ... 15	Selection of panel 0 ... 15. Panel 15 is specifically intended for panel PC 700 systems.
Version	Displays the firmware version of the SDLR controller.	None	-
Brightness	For setting the brightness of the selected panel.	0%, 25%, 50%, 75%, 100%	For setting the brightness (in %) of the selected panel. Changes take effect after saving and restarting the system (e.g. by pressing <F10>).
Temperature	Displays the selected panel's temperature (in degrees Celsius and Fahrenheit).	None	-
Fan speed	Displays fan speed for the selected panel.	None	-
Keys/LEDs	Displays the available keys and LEDs on the selected panel.	None	-

Table 218: 855GME (ETX) Panel Control setting options

Main board monitor

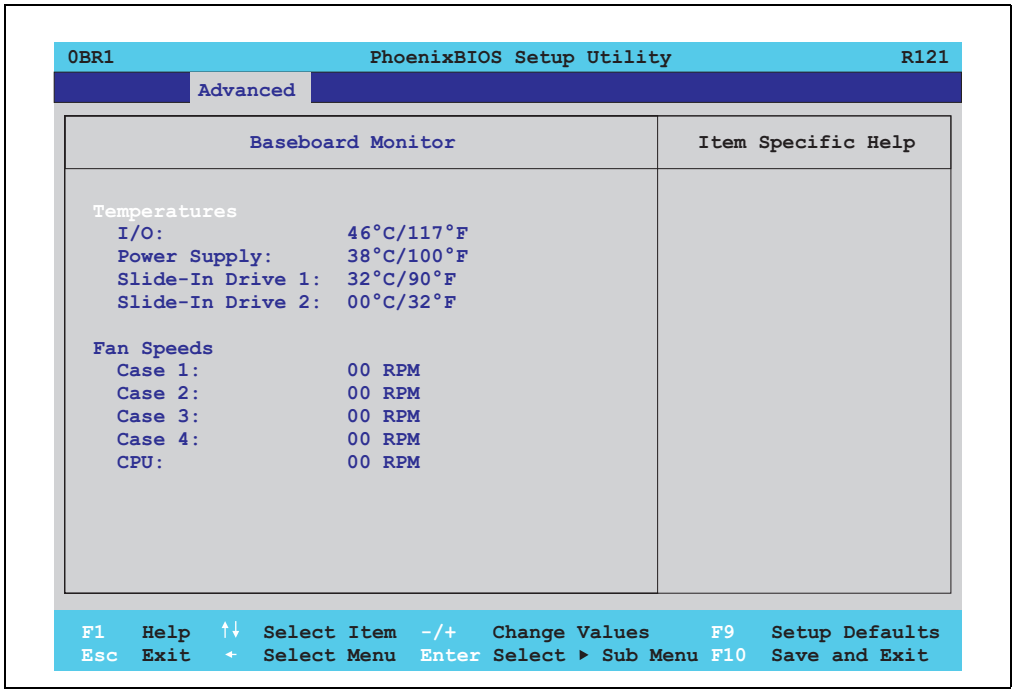


Figure 231: 855GME (ETX) - baseboard monitor

BIOS setting	Meaning	Setting options	Effect
CMOS battery	Displays the battery status. **n.a.** - not available, either MTCX does not support the firmware (starting with these versions "Main Board/Panel Features", on page 480) or the hardware is too old. **Good** - Battery is OK **Bad** - Battery is damaged.	None	-
I/O	Displays the temperature in the I/O area in degrees Celsius and Fahrenheit.	None	-
Power supply	Displays the temperature in the power supply area in degrees Celsius and Fahrenheit.	None	-
Slide-in drive 1	Displays the temperature of the slide-in drive 1 in degrees Celsius and Fahrenheit.	None	-
Slide-in drive 2	Displays the temperature of the slide-in drive 2 in degrees Celsius and Fahrenheit.	None	-
Case 1	Displays the fan speed of housing fan 1.	None	-
Case 2	Displays the fan speed of housing fan 2.	None	-
Case 3	Displays the fan speed of housing fan 3.	None	-

Table 219: 855GME (ETX) - baseboard monitor - setting options

BIOS setting	Meaning	Setting options	Effect
Case 4	Displays the fan speed of housing fan 4.	None	-
CPU	Displays the fan speed of the processor fan.	None	-

Table 219: 855GME (ETX) - baseboard monitor - setting options

Legacy devices

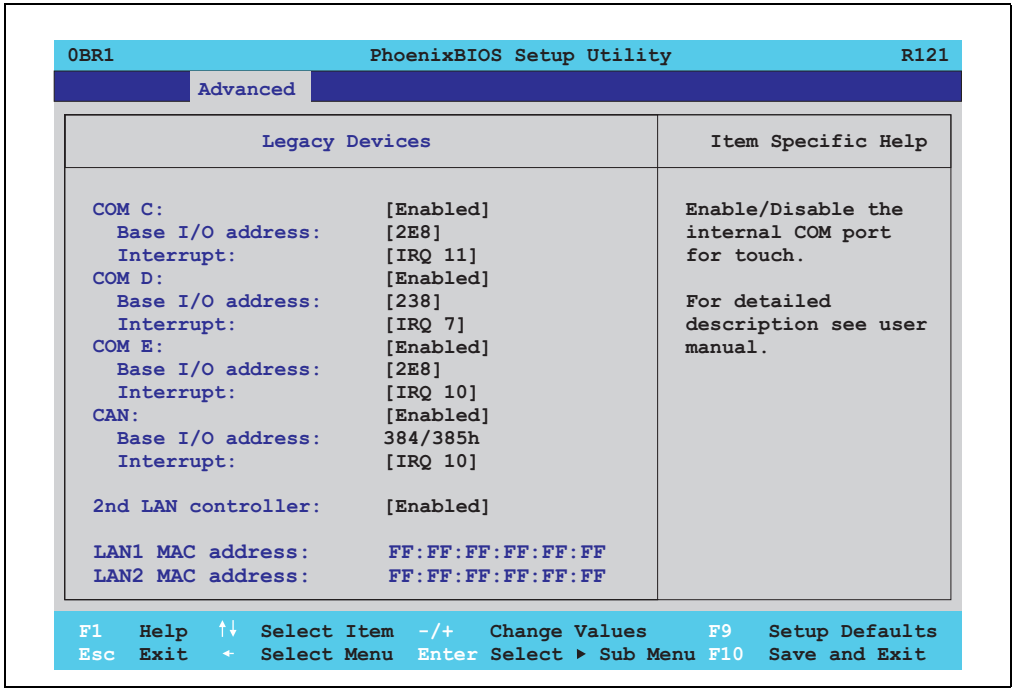


Figure 232: 855GME (ETX) Legacy Devices

BIOS setting	Meaning	Setting options	Effect
COM C	Settings for the internal serial interfaces in the system. This setting activates the touch screen in panel PC 700 systems, and, using SDL transfer technology, also in Automation Panel 900 display units.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the COM C port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.

Table 220: 855GME (ETX) Legacy Devices setting options

BIOS setting	Meaning	Setting options	Effect
Interrupt	Selection of the interrupt for the COM C port. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ 10, IRQ 11, IRQ 12	Selected interrupt is assigned.
COM D	Configuration of the COM D port for the serial interface of an automation panel link slot. The interface is used to operate the touch screen on connected Automation Panel 900 units.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Configuration of the base I/O address for the serial COM D port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM D port. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ 10, IRQ 11, IRQ 12	Selected interrupt is assigned.
COM E	Configuration of the optional COM E port on a B&R add-on interface (IF option).	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Configuration of the base I/O address for the serial COM E port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM E port. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ 10, IRQ 11, IRQ 12	Selected interrupt is assigned.
CAN	Configuration of the CAN port of a B&R add-on interface card.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	384/385h	None	-
Interrupt	Selection of the interrupt for the CAN port.	IRQ 10	Selected interrupt is assigned.
		NMI	NMI interrupt is assigned.
2nd LAN controller	For turning the onboard LAN controller (ETH2) on and off.	Disabled	Disables the controller.
		Enabled	Enables the controller.
LAN1 MAC address	Displays the MAC addresses for the ETH1 network controller.	None	-
LAN2 MAC address	Displays the MAC addresses for the ETH2 network controller.	None	-

Table 220: 855GME (ETX) Legacy Devices setting options (Forts.)

1.2.5 Security

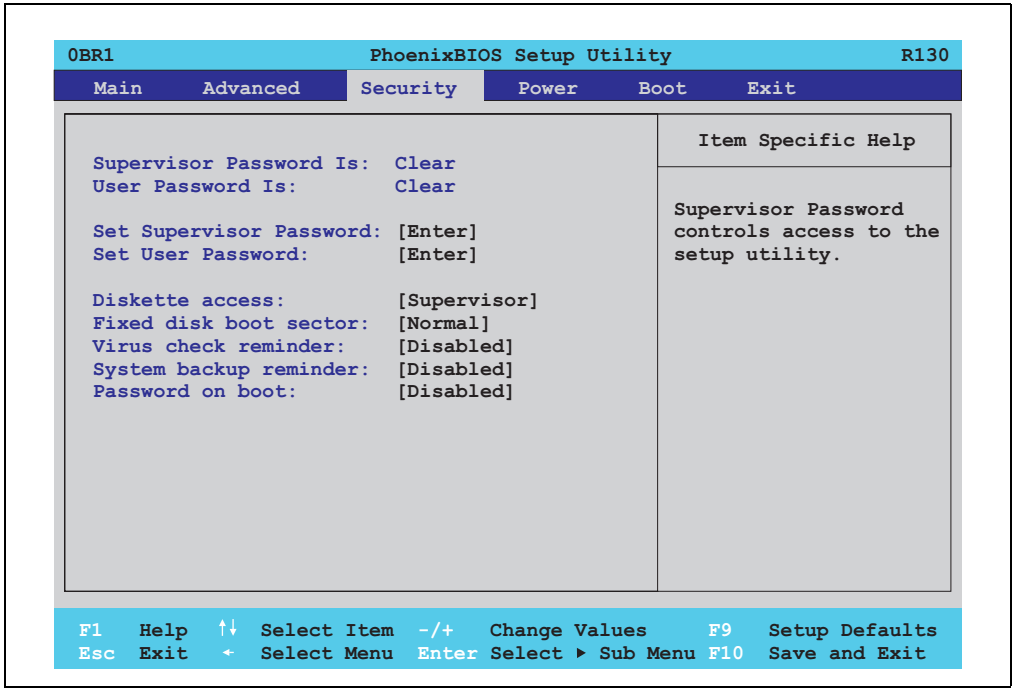


Figure 233: 855GME (ETX) Security Menu

BIOS setting	Meaning	Setting options	Effect
Supervisor password is	Displays whether or not a supervisor password has been set.	None	Display **set**: A supervisor password has been set. Display **clear**: No supervisor password has been set.
User password is	Displays whether or not a user password has been set.	None	Display **set**: A user password has been set. Display **clear**: No user password has been set.
Set supervisor password	To enter/change a supervisor password. A supervisor password is necessary to edit all BIOS settings.	Enter maximum 7 alphanumeric characters - not case sensitive.	Press Enter and enter password two times. The password must be 7 alphanumeric characters or less. Needed to enter BIOS setup. To change the password, enter the old password once and then the new password twice.
Set user password	To enter/change a user password. A user password allows the user to edit only certain BIOS settings.	Enter maximum 7 alphanumeric characters - not case sensitive.	Press Enter and enter password two times. The password must be 7 alphanumeric characters or less. Needed to enter BIOS setup. To change the password, enter the old password once and then the new password twice.

Table 221: 855GME (ETX) Security setting options

BIOS setting	Meaning	Setting options	Effect
Diskette access	Access to the diskette drive is controlled here. Either or the supervisor or the user has access to it. Does not work with USB diskette drives.	Supervisor	Supervisor password is needed to access a diskette drive.
		User	User password is needed to access a diskette drive.
Fixed disk boot sector	The boot sector of the primary hard drive can be write protected against viruses with this option.	Normal	Write access allowed.
		Write protect	Boot sector is write protected.
Virus check reminder	This function opens a reminder when the system is started to scan for viruses.	Disabled	Disables this function.
		Daily	A reminder appears every day when the system is started.
		Weekly	A reminder appears the first time the system is started after every Sunday.
		Monthly	A reminder appears the first time the system is started each month.
System backup reminder	This function opens a reminder when the system is started to create a system backup.	Disabled	Disables this function.
		Daily	A reminder appears every day when the system is started.
		Weekly	A reminder appears the first time the system is started after every Sunday.
		Monthly	A reminder appears the first time the system is started each month.
Password at boot	This function requires a supervisor or user password when the system is started. Only possible when a supervisor or user password is enabled.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 221: 855GME (ETX) Security setting options (Forts.)

1.2.6 Power

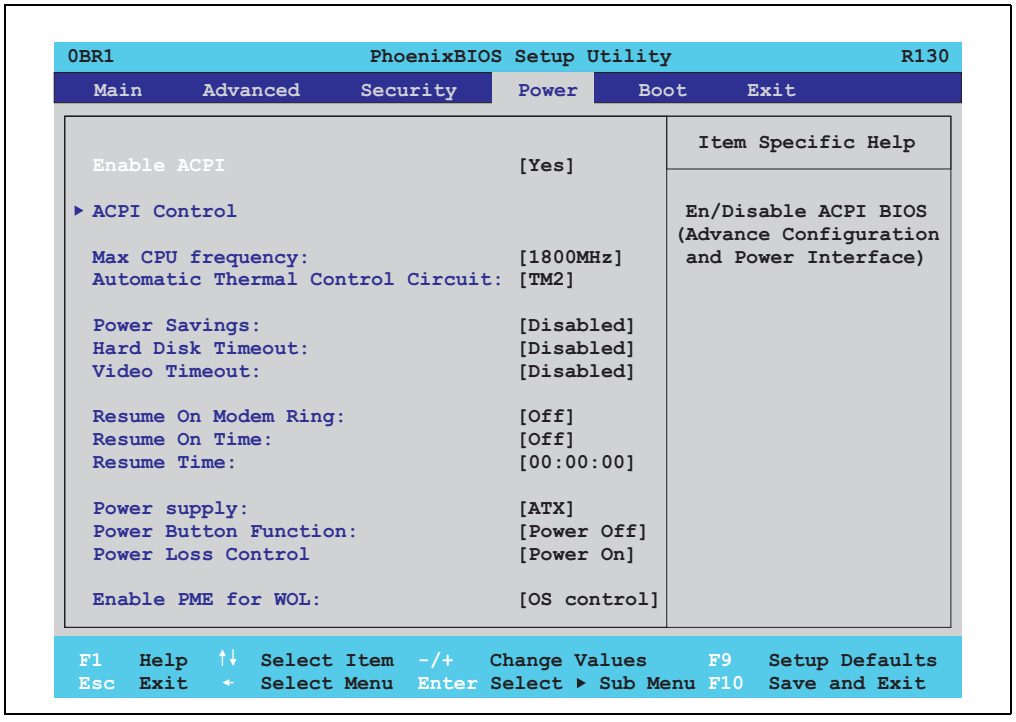


Figure 234: 855GME (ETX) Power menu

BIOS setting	Meaning	Setting options	Effect
Enable ACPI	This option turns the ACPI function (Advanced Configuration and Power Interface) on or off. This is an advanced plug & play and power management functionality.	Yes	Enables this function.
		No	Disables this function.
ACPI control	Configuration of specific limits.	Enter	Opens the submenu See "ACPI control", on page 436
Max CPU frequency	This option makes it possible to determine the maximum CPU frequency for Pentium M processors. This option is not shown for Celeron M processors.	MHz processor frequency steps - depending on the processor being used	Determining the frequency. Low heat build-up, therefore low processing power.
Automatic thermal control circuit	This function monitors the CPUs temperature. If the maximum operating temperature of the CPU is exceeded, the performance of the processor is throttled.	Disabled	Disables this function.
		TM1	Operation with 50% load.
		TM2	Operation in accordance with Intel's Geyserville specifications.

Table 222: 855GME (ETX) Main setting options

BIOS setting	Meaning	Setting options	Effect
Power savings	This function determines if and how the power save function is used.	Disabled	Deactivates the power savings function.
		Customized	Power management is configured by adjusting the individual settings.
		Maximum power Savings	Maximum power savings function.
		Maximum performance	Power savings function to maximize performance.
Hard disk timeout	Set here how long after the last access the hard disk should enter standby mode. This option only available when "power savings" is set to customized.	Disabled	Disables this function.
		10, 15, 30, 45 seconds	Time in seconds until standby.
		1, 2, 4, 6, 8, 10, 15 Minutes	Time in minutes until standby.
Video timeout	The time span of system inactivity after which the screen is turned off can be set here. **Information:** **The setting can only be used if the "power savings" function is set to customized.**	Disabled	Disables this function.
		10, 15, 30 sec	Time in seconds until standby.
		1, 2, 4, 6, 8, 10, 15 min	Time in minutes until standby.
Resume on modem ring	If an external modem is connected to a serial port and the telephone rings, the system starts up.	Off	Disables this function.
		On	Enables this function.
Resume on time	This function enables the system to start at the time set under "resume time."	Off	Disables this function.
		On	Enables this function.
Resume time	Time setting for the option "resume on time" (when the system should start up).	[00:00:00]	Personal setting of the time in the format (hh:mm:ss).
Power supply	The type of power supply being used can be entered here.	ATX	An ATX compatible power supply is being used.
		AT	An AT compatible power supply is being used.
Power button Function	This option determines the function of the power button.	Power off	Shuts down the system.
		Sleep	The system enters sleep mode.
Power Loss Control	This option determines how the system reacts to a power outage.	Stay off	The system does not turn back on. The system remains off until the power button is pressed.
		Power-on	The system turns back on.
		Last State	The system resumes the last state it was in before the power outage.
Enable PME for WOL	When this option is enabled, the PME (Power Management Event) signal is activated for controlling the WOL (Wake On LAN) function for the operating system. This setting affects both Ethernet interfaces (ETH1 and ETH2).	OS control	Evaluation of the PME signal is only active if it has been accordingly activated in the operating system driver. The system can only be woken up from the S4: hibernate mode - Suspend-to-Disk status.
		Enabled	The function, WOL and the evaluation of the PME signal is always enabled.
		Disabled	Disables the function - no WOL possible.

Table 222: 855GME (ETX) Main setting options (Forts.)

ACPI control

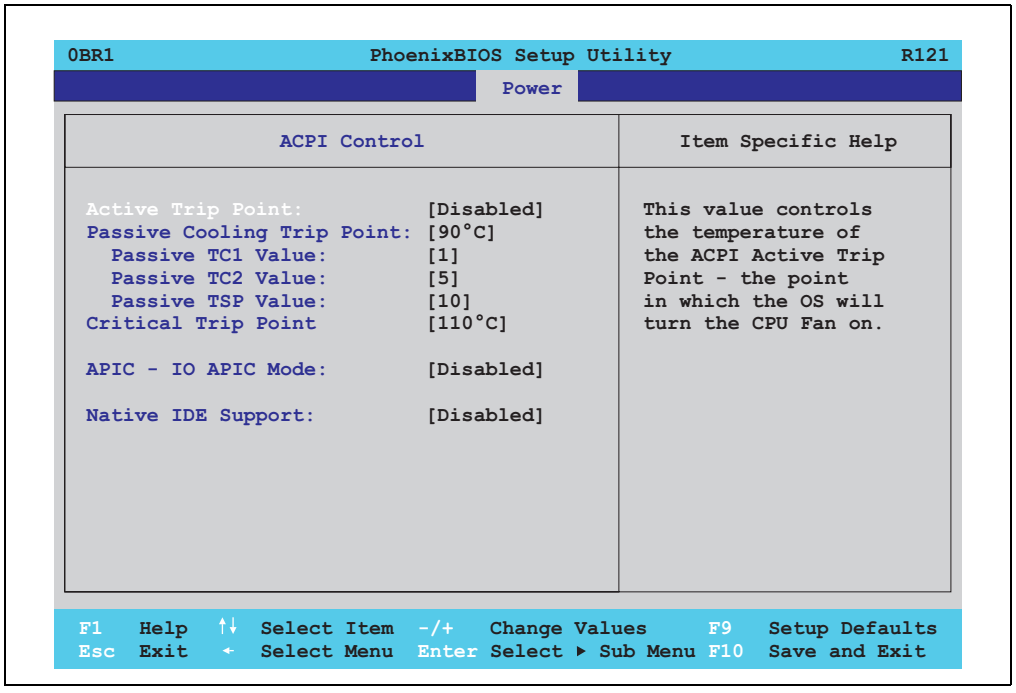


Figure 235: 855GME (ETX) ACPI Control

BIOS setting	Meaning	Setting options	Effect
Active trip point	With this function, an optional CPU fan above the operating system can be set to turn on when the CPU reaches the set temperature. **Information:** **This function is not supported by MS-DOS.**	Disabled	Disables this function.
		40°C .. 100°C	Temperature setting for the active trip point. Can be set in 5 degree increments.
Passive Cooling Trip Point	With this function, a temperature can be set at which the CPU automatically reduces its speed. **Information:** **This function is not supported by MS-DOS.**	Disabled	Disables this function.
		40°C .. 100°C	Temperature setting for the passive cooling trip point. Can be set in increments of 5 degrees Celsius.
Passive TC1 Value	Can only be set if a value was defined manually under the item "Passive cooling trip point".	1 .. 16	Can be defined in single steps.

Table 223: 855GME (ETX) ACPI Control setting options

BIOS setting	Meaning	Setting options	Effect
Passive TC2 Value	Can only be set if a value was defined manually under the item "Passive cooling trip point".	1 .. 16	Can be defined in single steps.
Passive TSP Value	Can only be set if a value was defined manually under the item "Passive cooling trip point".	2 .. 30	Can be defined in double steps.
Critical Trip Point	With this function, a temperature can be set at which the operating system automatically shuts itself down. **Information:** **This function is not supported by MS-DOS.**	40°C ... 110°C	Temperature setting for the critical trip point. Can be set in increments of 5 degrees Celsius.
APIC - I/O APIC mode	This option controls the functionality of the advanced interrupt controller in the processor.	Disabled	Disables this function.
		Enabled	Enables this function. The activation of this option is only effective if it takes place before the operating system (Windows XP) is activated. There are then 23 IRQs available.
Native IDE support	The native IDE support offers the possibility to make 4 hard disk controllers (2 x primary ATA for a total of 4 devices, and 2 x secondary ATA for another 2 devices) accessible through Windows XP. **Information:** **This function is not supported by MS-DOS.**	Disabled	Disables this function.
		Enabled	Enables this function.

Table 223: 855GME (ETX) ACPI Control setting options (Forts.)

1.2.7 Boot

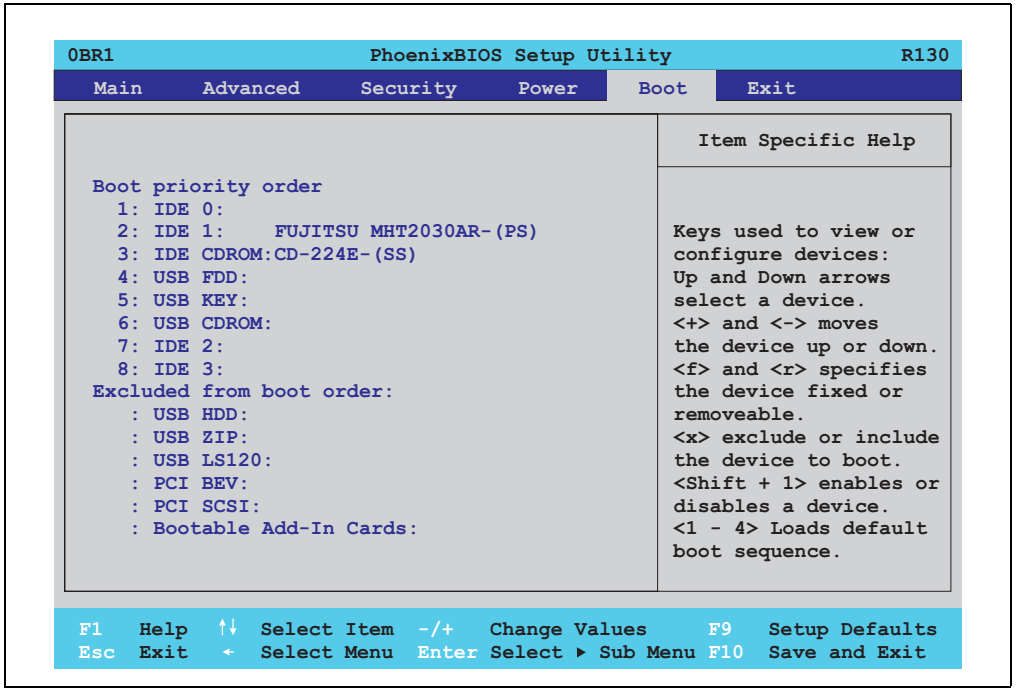


Figure 236: 855GME (ETX) Boot menu

BIOS setting	Meaning	Setting options	Effect
1:		IDE 0, IDE 1, IDE 2, IDE 3, IDE CD USB FDC, USB KEY USB CDROM USB HDD, USB ZIP USB LS120, PCI BEV, PCI SCSI, bootable add-in cards	Use the up arrow ↑ and down arrow ↓ to select a device. Then, use the <+> und <-> keys to change the boot priority of the drive. To add a device to the "boot priority order" list from the "excluded from boot order" list, use the <x> key. In the same way, the <x> key can move boot devices down out of the boot priority order. The keys 1 - 4 can load preset boot sequences.
2:			
3:			
4:			
5:			
6:			
7:			
8:			

Table 224: 855GME (ETX) Boot setting options

1.2.8 Exit

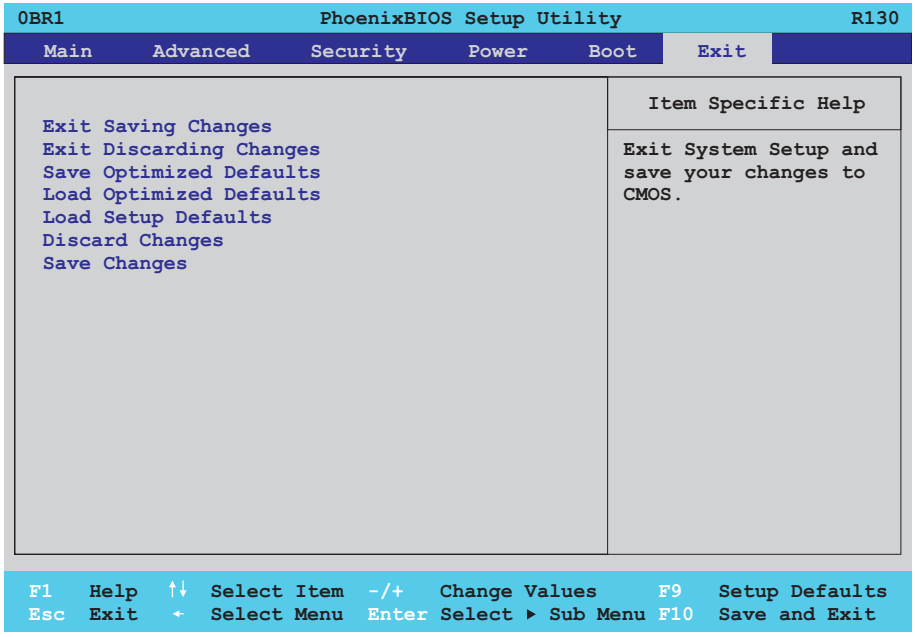


Figure 237: 855GME (ETX) Exit Menu

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.	Yes / No	-
Exit discarding changes	With this item you can close BIOS setup without saving the changes made. The system is then rebooted.	Yes / No	-
Save optimized defaults	Saves the BIOS values entered by the customer.	Yes / No	
Load optimized defaults	Loads into CMOS the BIOS values saved by the customer. **Information:** **Only shown if "Save Optimized Defaults" has been executed.**	Yes / No	
Load setup defaults	This item loads the BIOS setup defaults, which are defined by the DIP switch settings. These settings are loaded for all BIOS configurations.	Yes / No	-

Table 225: 855GME (ETX) Exit setting options

BIOS setting	Meaning	Setting options	Effect
Discard Changes	Should unknown changes have been made and not yet saved, they can be discarded.	Yes / No	-
Save changes	Settings are saved, and the system is not restarted.	Yes / No	-

Table 225: 855GME (ETX) Exit setting options

1.2.9 Profile overview - BIOS default settings - 855GME (ETX)

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 default settings are the optimized values that will be used.

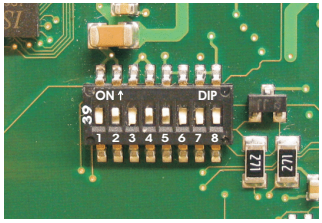


Figure 238: DIP switch on system unit

The first six DIP switches (1-6) are used to set the profiles. The rest (7,8) are reserved.

Number	Optimized for	DIP switch setting							
		1	2	3	4	5	6	7[1)]	8[1)]
Profile 0	Automation PC 620 system units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	**On**	Off	Off	Off	Off	Off	-	-
Profile 2	Automation PC 620 system units 5PC600.SX02-00, 5PC600.SX02-01, 5PC600.SF03-00, 5PC600.SX05-00 and 5PC600.SX05-01.	Off	**On**	Off	Off	Off	Off	-	-
Profile 3	Panel PC 700 system unit 5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00.	**On**	**On**	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 system unit 5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	**On**	Off	Off	Off	-	-

Table 226: 855GME (XTX) profile overview

1) Reserved.

The following pages provide an overview of the BIOS default settings for the different DIP switch configurations.

Personal settings

If changes have been made to the BIOS defaults, they can be entered in the following tables for backup.

Main

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
System Time	-	-	-	-	-	
System Date	-	-	-	-	-	
SMART device monitoring	Enabled	Enabled	Enabled	Enabled	Enabled	
Primary master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Primary slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Secondary master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Secondary slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	
LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 227: 855GME (ETX) Main profile settings overview

Advanced

Advanced chipset/graphics control

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Graphics engine 1	Auto	Auto	Auto	Auto	Auto	
Default flat panel	XGA	XGA	XGA	None	None	
Flat panel scaling	Stretched	Stretched	Stretched	Stretched	Stretched	
Graphics engine 2	Auto	Auto	Auto	Auto	Auto	
Graphics engine	Graphics engine 1	Graphics engine 1	Graphics engine 1	Graphics engine 1	Graphics engine 1	
Graphics memory size	UMA = 8 MB	UMA = 8 MB	UMA = 8 MB	UMA = 8 MB	UMA = 8 MB	
Enable memory gap	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 228: 855GME (ETX) Advanced Chipset/Graphics Control profile settings overview

PCI/PNP Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
PNP OS installed	Yes	Yes	Yes	Yes	Yes	
Reset configuration data	No	No	No	No	No	
Secured setup configuration	Yes	Yes	Yes	Yes	Yes	
PCI IRQ line 1	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
PCI IRQ line 2	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
PCI IRQ line 3	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
PCI IRQ line 4	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
Onboard LAN IRQ line	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
Onboard USB EHCI IRQ line	Auto-select	Auto-select	Auto-select	Auto-select	Auto-select	
Default primary video adapter	PCI	PCI	PCI	PCI	PCI	
Assign IRQ to SMB	Enabled	Enabled	Enabled	Enabled	Enabled	
PCI device, slot #1						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
PCI device, slot #2						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	

Table 229: 855GME (ETX) PCI/PNP Configuration Profile settings overview

PCI device, slot #3	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
PCI device, slot #4						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
PCI/PNP ISA IRQ Resource Exclusion						
IRQ 3	Available	Available	Available	Available	Available	
IRQ 4	Available	Available	Available	Available	Available	
IRQ 5	Available	Available	Available	Available	Available	
IRQ 7	Available	Available	Available	Available	Available	
IRQ 9	Available	Available	Available	Available	Available	
IRQ 10	Available	Available	Available	Available	Available	
IRQ 11	Available	Available	Available	Available	Available	
IRQ 12	Available	Available	Available	Available	Available	
IRQ 15	Available	Available	Available	Available	Available	

Table 229: 855GME (ETX) PCI/PNP Configuration Profile settings overview (Forts.)

Memory cache

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Memory cache	Enabled	Enabled	Enabled	Enabled	Enabled	
Cache system BIOS area	Write protect	Write protect	Write protect	Write protect	Write protect	
Cache video BIOS area	Write protect	Write protect	Write protect	Write protect	Write protect	
Cache base 0-512k	Write back	Write back	Write back	Write back	Write back	
Cache base 512-640k	Write back	Write back	Write back	Write back	Write back	
Cache extended memory area	Write back	Write back	Write back	Write back	Write back	
Cache D000 - D3FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache D400 - D7FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache D800 - DBFF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache DC00 - DFFF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache E000 - E3FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache E400 - E7FF	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 230: 855GME (ETX) Memory Cache profile settings overview

I/O Device Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Local bus IDE adapter	Primary	**Both**	**Both**	Primary	**Both**	
Primary IDE UDMA66/100	Enabled	Enabled	Enabled	Enabled	Enabled	
Secondary IDE UDMA66/100	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI host controller 1	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI host controller 2	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI host controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Legacy USB Support	Enabled	Enabled	Enabled	Enabled	Enabled	
AC97 audio controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN PXE ROM	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Serial port A	Enabled	Enabled	Enabled	Enabled	Enabled	
Base I/O address	3F8	3F8	3F8	3F8	3F8	
Interrupt	IRQ 4	IRQ 4	IRQ 4	IRQ 4	IRQ 4	
Serial port B	Enabled	Enabled	Enabled	Enabled	Enabled	
Mode	Normal	Normal	Normal	Normal	Normal	
Base I/O address	3F8	3F8	3F8	3F8	**2F8**	
Interrupt	IRQ 3	IRQ 3	IRQ 3	IRQ 3	IRQ 3	
Parallel port	Enabled	Enabled	Enabled	Enabled	Enabled	
Base I/O address	378	378	378	378	378	

Table 231: 855GME (ETX) I/O Device Configuration Profile settings overview

Keyboard Features

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
NumLock	On	On	On	On	On	
Key click	Disabled	Disabled	Disabled	Disabled	Disabled	
Keyboard auto-repeat rate	30/sec	30/sec	30/sec	30/sec	30/sec	
Keyboard auto-repeat delay	1/2 sec	1/2 sec	1/2 sec	1/2 sec	1/2 sec	

Table 232: 855GME (ETX) Keyboard Features profile settings overview

CPU board monitor

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
VCC 3.3V voltage	-	-	-	-	-	
CPU core voltage	-	-	-	-	-	
5Vsb voltage	-	-	-	-	-	
Battery voltage	-	-	-	-	-	
CPU temperature	-	-	-	-	-	

Table 233: 855GME (ETX) - CPU board monitor - profile setting overview

Miscellaneous

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Summary screen	Enabled	Enabled	Enabled	Enabled	Enabled	
QuickBoot mode	Enabled	Enabled	Enabled	Enabled	Enabled	
Extended memory testing	Just zero it	Just zero it	Just zero it	Just zero it	Just zero it	
Dark boot	Disabled	Disabled	Disabled	Disabled	Disabled	
Halt on errors	Yes	Yes	Yes	Yes	Yes	
PS/2 mouse	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Large disk access mode	DOS	DOS	DOS	DOS	DOS	

Table 234: 855GME (ETX) - miscellaneous - profile setting overview

Main Board/Panel Features

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Versions	-	-	-	-	-	
BIOS	-	-	-	-	-	
MTCX	-	-	-	-	-	
FPGA	-	-	-	-	-	
Optimized ID	-	-	-	-	-	
Device ID	-	-	-	-	-	
Compatibility ID	-	-	-	-	-	
Serial Number	-	-	-	-	-	
Product name	-	-	-	-	-	
User serial ID	-	-	-	-	-	
Panel control						
Select panel number	0	0	0	0	0	
Version	-	-	-	-	-	
Brightness	100%	100%	100%	100%	100%	

Table 235: 855GME (ETX) Baseboard/Panel Features profile settings overview

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Temperature	-	-	-	-	-	
Fan speed	-	-	-	-	-	
Keys/LEDs	-	-	-	-	-	
Main board monitor						
Temperatures	-	-	-	-	-	
I/O	-	-	-	-	-	
Power supply	-	-	-	-	-	
Slide-in drive 1	-	-	-	-	-	
Slide-in drive 2	-	-	-	-	-	
Fan speeds	-	-	-	-	-	
Case 1	-	-	-	-	-	
Case 2	-	-	-	-	-	
Case 3	-	-	-	-	-	
Case 4	-	-	-	-	-	
CPU	-	-	-	-	-	
Legacy devices						
COM C	Disabled	Disabled	Disabled	**Enabled**	**Enabled**	
Base I/O address	-	-	-	**3E8h**	**3E8h**	
Interrupt	-	-	-	**11**	**11**	
COM D	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupt	-	-	-	-	-	
COM E	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupt	-	-	-	-	-	
LPT	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
CAN	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupt	-	-	-	-	-	
2nd LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 235: 855GME (ETX) Baseboard/Panel Features profile settings overview (Forts.)

Security

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Supervisor password is	Clear	Clear	Clear	Clear	Clear	
User password is	Clear	Clear	Clear	Clear	Clear	
Set supervisor password	-	-	-	-	-	
Set user password	-	-	-	-	-	
Diskette access	Supervisor	Supervisor	Supervisor	Supervisor	Supervisor	
Fixed disk boot sector	Normal	Normal	Normal	Normal	Normal	
Virus check reminder	Disabled	Disabled	Disabled	Disabled	Disabled	
System backup reminder	Disabled	Disabled	Disabled	Disabled	Disabled	
Password at boot	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 236: 855GME (ETX) Security profile settings overview

Power

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Enable ACPI	Yes	Yes	Yes	Yes	Yes	
Max CPU frequency	Dependant on processor	Dependant on processor	Dependant on processor	Dependant on processor	Dependant on processor	
Automatic thermal control circuit	TM2	TM2	TM2	TM2	TM2	
Power savings	Disabled	Disabled	Disabled	Disabled	Disabled	
Standby timeout	-	-	-	-	-	
Auto suspend timeout	-	-	-	-	-	
Hard disk timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Video timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Resume on modem ring	Off	Off	Off	Off	Off	
Resume on time	Off	Off	Off	Off	Off	
Resume time	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	
Power supply	ATX	ATX	ATX	ATX	ATX	
Power button function	Power off	Power off	Power off	Power off	Power off	
Power Loss Control	Power-on	Power-on	Power-on	Power-on	Power-on	
ACPI control						
Active trip point	Disabled	Disabled	Disabled	Disabled	Disabled	
Passive Cooling Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Critical Trip Point	110°C	110°C	110°C	110°C	110°C	
APIC - I/O APIC mode	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Native IDE support	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 237: 855GME (ETX) Power profile settings overview

Boot

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Boot priority order						
1:	IDE 0	**PCI BEV**	IDE 0	IDE 0	IDE 0	
2:	IDE 1	**IDE 0**	IDE 1	IDE 1	IDE 1	
3:	IDE CD	**IDE 1**	IDE CD	IDE CD	IDE CD	
4:	USB FDC	**IDE CD**	USB FDC	USB FDC	**USB FDD**	
5:	USB KEY	**USB FDC**	USB KEY	USB KEY	USB KEY	
6:	USB CDROM	**USB KEY**	USB CDROM	USB CDROM	USB CDROM	
7:	-	**USB CDROM**	-	**IDE 2**	**IDE 2**	
8:	-	-	-	**IDE 3**	**IDE 3**	
Excluded from boot order						
:	IDE 2	IDE 2	IDE 2	**USB HDD**	**USB HDD**	
:	IDE 3	IDE 3	IDE 3	**USB ZIP**	**USB ZIP**	
:	USB HDD	USB HDD	USB HDD	**USB LS120**	**USB LS120**	
:	USB ZIP	USB ZIP	USB ZIP	**PCI BEV**	**PCI BEV**	
:	USB LS120	USB LS120	USB LS120	**PCI SCSI**	**PCI SCSI**	
:	PCI BEV	**PCI SCSI**	PCI BEV	**Bootable add-in cards**	**Bootable add-in cards**	
:	PCI SCSI	**Bootable add-in cards**	PCI SCSI			
:	Bootable add-in cards		Bootable add-in cards			

Table 238: 855GME (ETX) - boot - profile setting overview

1.3 855GME (XTX) BIOS description

Information:

- **The following diagrams and BIOS menu items including descriptions refer to BIOS version 1.16. It is therefore possible that these diagrams and BIOS descriptions do not correspond with the installed BIOS version.**
- **The setup defaults are the settings recommended by B&R. The setup defaults are dependant on the DIP switch configuration on the baseboard (see section 1.3.10 "Profile overview - BIOS default settings - 855GME (XTX)", on page 495).**

1.3.1 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 the Automation PC 620 systems is produced by American Megatrends Inc.

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, and remains in the PPC700 even when the power is turned off (no 24VDC supply).

1.3.2 BIOS setup and boot procedure

BIOS is immediately activated when switching on the power supply of the PPC700 system 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 <Del> 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 DEL key must be pressed as soon as the following message appears on the monitor (during POST):

"Press DEL to run SETUP"

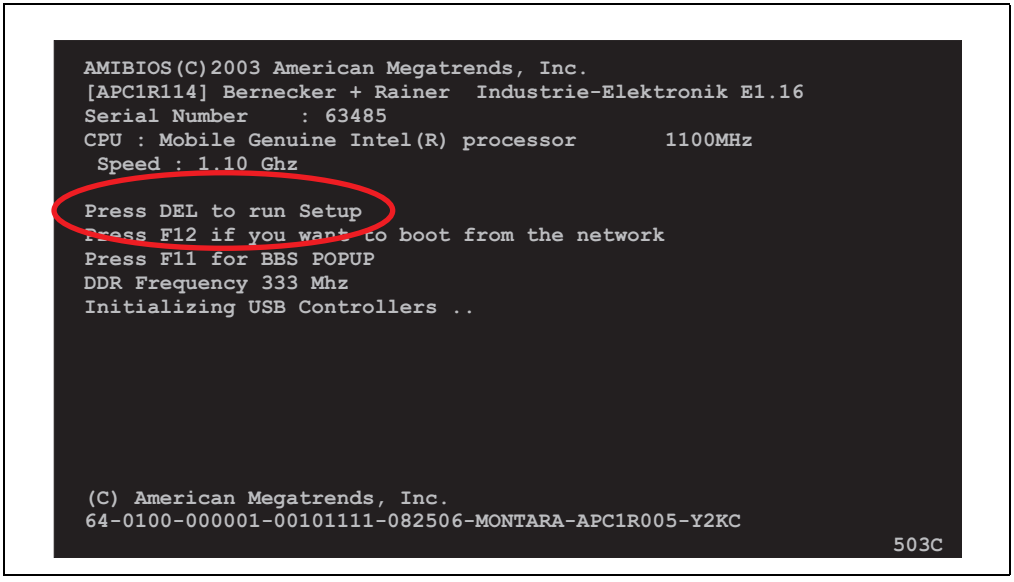


Figure 239: 855GME (XTX) - BIOS diagnostics screen

1.3.3 BIOS setup keys

The following keys are enabled during the POST:

Key	Function
ESC	The system RAM check can be skipped by pressing ESC.
Del	Enters the BIOS setup menu.
F12	Using the F12 key, you can boot from the network.
F11	Cues the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER>, select the device from which will be booted.
<Pause>	Pressing the <pause> key stops the POST. Press any other key to resume the POST.

Table 239: 855GME (XTX) - keys relevant to BIOS during 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 item.
Cursor →	Go to the next item.
+ -	Changes the setting of the selected function.

Table 240: 855GME (XTX) keys relevant to BIOS in the BIOS menu

Key	Function
Enter	Changes to the selected menu.
PageUp ↑	Change to the previous page.
PageDown ↓	Change to the previous page.
Pos 1	Jumps to the first BIOS menu item or object.
End	Jumps to the last BIOS menu item or object.
F2 / F3	The colors of the BIOS Setup are switched.
F7	Changes are reset.
F9	These settings are loaded for all BIOS configurations.
F10	Save and close.
Esc	Exits the submenu.

Table 240: 855GME (XTX) keys relevant to BIOS in the BIOS menu (Forts.)

The following sections explain the individual BIOS main menu items in detail.

BIOS setup menu item	Function	From page
Main	You can configure the ground configuration time and date in this menu.	453
Advanced	Advanced BIOS options such as cache areas, PnP, keyboard repeat rate, as well as settings specific to B&R integrated hardware, can be configured here.	454
Boot	The boot order can be set here.	486
Security	For setting up the system's security functions.	488
Power	Setup of various APM (Advanced Power Management) options.	491
Exit	To end the BIOS setup.	493

Table 241: Overview of 855GME (XTX) BIOS menu items

1.3.4 Main

Immediately after the DEL button is pressed during startup, the main BIOS setup menu appears.

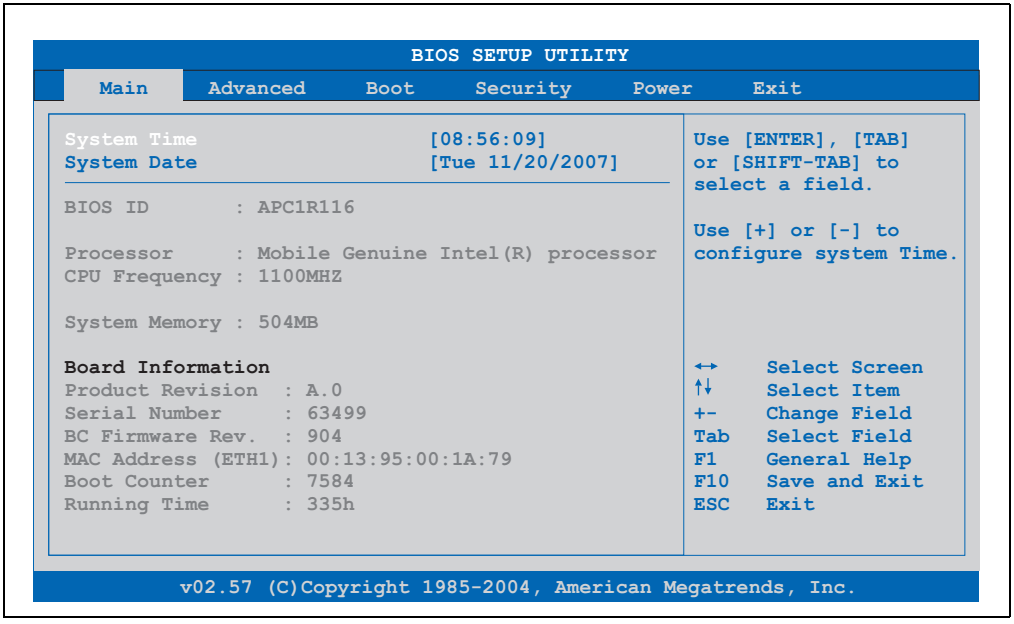


Figure 240: 855GME (XTX) BIOS Main menu

BIOS setting	Meaning	Setting options	Effect
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.	Changes the System time	Set the system time in the format (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 the system date	Set the system date in the format (mm:dd:yyyy).
BIOS ID	Displays the BIOS recognition.	None	-
Processor	Processor display.	None	-
CPU Frequency	CPU frequency display.	None	-
System Memory	System memory display.	None	-
Product Revision	Displays the CPU board HW revision.	None	-
Serial Number	Displays the CPU board serial number.	None	-
BC Firmware Rev.	Displays the CPU board controller firmware revision.	None	-
MAC Address (ETH1)	Displays the assigned MAC address.	None	-

Table 242: 855GME (XTX) Main menu setting options

BIOS setting	Meaning	Setting options	Effect
Boot Counter	Boot counter display.	None	-
Running Time	Runtime display.	None	-

Table 242: 855GME (XTX) Main menu setting options (Forts.)

1.3.5 Advanced

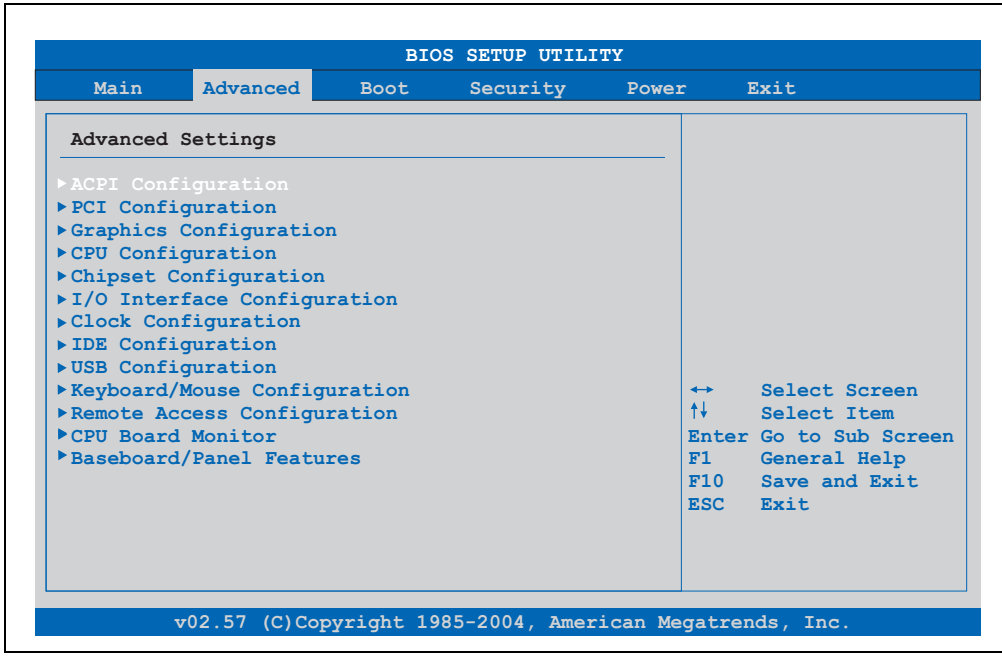


Figure 241: 855GME (XTX) Advanced menu

BIOS setting	Meaning	Setting options	Effect
ACPI configuration	Configures the APCI devices.	Enter	Opens the submenu See "ACPI configuration", on page 455
PCI Configuration	Configures PCI devices.	Enter	Opens the submenu See "PCI Configuration", on page 457
Graphics configuration	Configures the graphics settings.	Enter	Opens the submenu See "Graphics configuration", on page 459
CPU configuration	Configures the CPU settings.	Enter	Opens the submenu See "CPU configuration", on page 461
Chipset configuration	Configures the chipset functions.	Enter	Opens the submenu See "Chipset configuration", on page 462
I/O interface configuration	Configures the I/O devices.	Enter	Opens the submenu See "I/O interface configuration", on page 463

Table 243: 855GME (XTX) Advanced menu setting options

BIOS setting	Meaning	Setting options	Effect
Clock Configuration	Configures the clock settings.	Enter	Opens the submenu See "Clock Configuration", on page 465
IDE Configuration	Configures the IDE functions.	Enter	Opens the submenu See "IDE Configuration", on page 466
USB configuration	Configures USB settings	Enter	Opens the submenu See "USB configuration", on page 473
Keyboard/mouse configuration	Configures the keyboard/mouse options.	Enter	Opens the submenu See "Keyboard/mouse configuration", on page 476
Remote access configuration	Configures the remote access settings	Enter	Opens the submenu See "Remote access configuration", on page 477
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens the submenu See "CPU board monitor", on page 479
Main Board/Panel Features	Displays device specific information and setup of device specific values.	Enter	Opens the submenu See "Main Board/Panel Features", on page 480

Table 243: 855GME (XTX) Advanced menu setting options (Forts.)

ACPI configuration

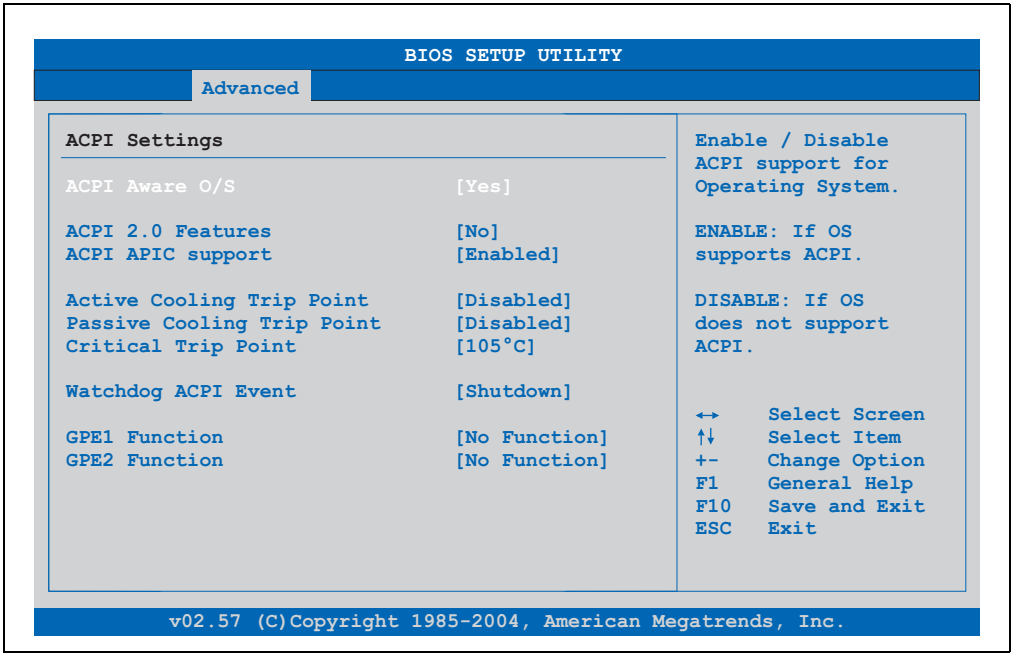


Figure 242: 855GME (XTX) Advanced ACPI Configuration

BIOS setting	Meaning	Setting options	Effect
ACPI Aware O/S	This function determines if the operating system supports the ACPI function (Advanced Configuration and Power Interface).	Yes	The operating system supports ACPI.
		No	The operating system does not support ACPI.
ACPI 2.0 features	This function determines if the operating system supports the ACPI 2.0 specifications.	Yes	The operating system supports ACPI 2.0.
		No	The operating system does not support ACPI 2.0.
ACPI APIC support	This option controls the support of the advanced programmable interrupt controller in the processor.	Enabled	Enables this function.
		Disabled	Disables the function
Active Cooling Trip Point	With this function, an optional CPU fan above the operating system can be set to turn on when the CPU reaches the set temperature.	Disabled	Disables this function.
		50°C, 60°C, 70°C, 80°C, 90°C	Temperature setting for the active trip point. Can be set in 10 degree increments.
Passive Cooling Trip Point	With this function, a temperature can be set at which the CPU automatically reduces its speed.	Disabled	Disables this function.
		50°C, 60°C, 70°C, 80°C, 90°C	Temperature setting for the active trip point. Can be set in 10 degree increments.
Critical Trip Point	With this function, a temperature can be set at which the system automatically shuts itself down.	80°C, 85°C, 90°C, 95°C, 100°C, 105°C, 110°C	Temperature setting for the critical trip point. Can be set in 5 degree increments.
Watchdog ACPI event	System monitoring of the ACPI function.	Shutdown	The system is shut down.
		Restart	Restarts the system.
GPE1 function	Setting the GPE1 function.	No function	Not used.
		Lid switch	-
GPE2 function	Setting the GPE2 function.	No function	Not used.
		Sleep button	-

Table 244: 855GME (XTX) Advanced ACPI Configuration setting options

PCI Configuration

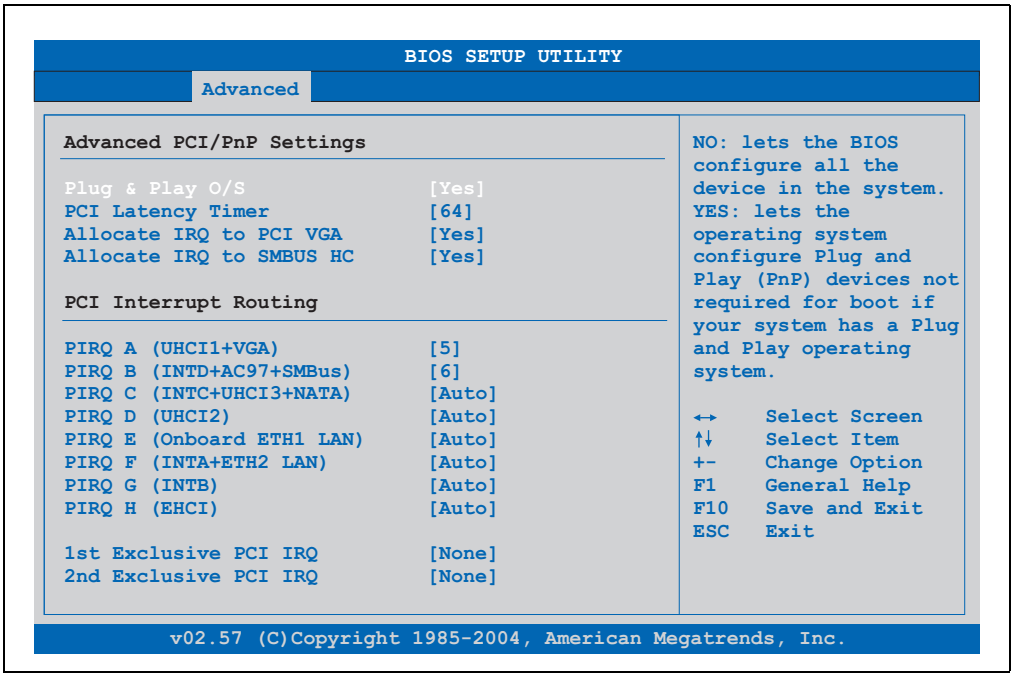


Figure 243: 855GME (XTX) Advanced PCI Configuration

BIOS setting	Meaning	Setting options	Effect
Plug & Play O/S	BIOS is informed if Plug & Play is capable on the operating system.	Yes	The operating system handles the distribution of resources.
		No	BIOS handles the distribution of resources.
PCI Latency Timer	This option controls how long one card can continue to use the PCI bus master after another PCI card has requested access.	32, 64, 96, 128, 160, 192, 224, 248	Value set manually.
Allocate IRQ to PCI VGA	This function is used to determine if an interrupt is assigned to the PCI VGA.	Yes	Automatic assignment of an interrupt.
		No	No assignment of an interrupt.
Allocate IRQ to SMBUS HC	Use this function to set whether or not the SM (System Management) bus controller is assigned a PCI interrupt.	Yes	Automatic assignment of a PCI interrupt.
		No	No assignment of an interrupt.
PIRQ A (UHCI1+VGA)	Under this option, the external PCI interrupt A is assigned to an ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
PIRQ B (INTD+AC97+SMBus)	Under this option, the external PCI interrupt B is assigned to and ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.

Table 245: 855GME (XTX) Advanced PCI Configuration setting options

BIOS setting	Meaning	Setting options	Effect
PIRQ C (INTC +UHCI3+NATA)	Under this option, the external PCI interrupt C is assigned to and ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
PIRQ D (UHCI2)	Under this option, the external PCI interrupt D is assigned to and ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
PIRQ E (Onboard ETH1 LAN)	Under this option, the external PCI interrupt E is assigned to an ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
PIRQ F (INTA+ETH2 LAN)	Under this option, the external PCI interrupt F is assigned to an ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
PIRQ G (INTB)	Under this option, the external PCI interrupt G is assigned to an ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
PIRQ H (EHCI)	Under this option, the external PCI interrupt H is assigned to an ISA interrupt.	Auto	The interrupt is automatically assigned according to the Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
1st exclusive PCI IRQ	With this option you can determine if the IRQ assigned to the PIRQ x is handled exclusively (no IRQ sharing). **Information:** **Is only displayed if a PIRQ is manually set (e.g. 5).**	None	No interrupt is assigned.
		5	Assigning PIRQ A.
		6	Assigning PIRQ B.
2nd exclusive PCI IRQ	With this option you can determine if the IRQ assigned to the PIRQ x is handled exclusively (no IRQ sharing). **Information:** **Is only displayed if PIRQ is manually configured and not equal to PIRQ A (e.g.: 6).**	None	No interrupt is assigned.
		5	Assigning PIRQ A.
		6	Assigning PIRQ B.

Table 245: 855GME (XTX) Advanced PCI Configuration setting options (Forts.)

Graphics configuration

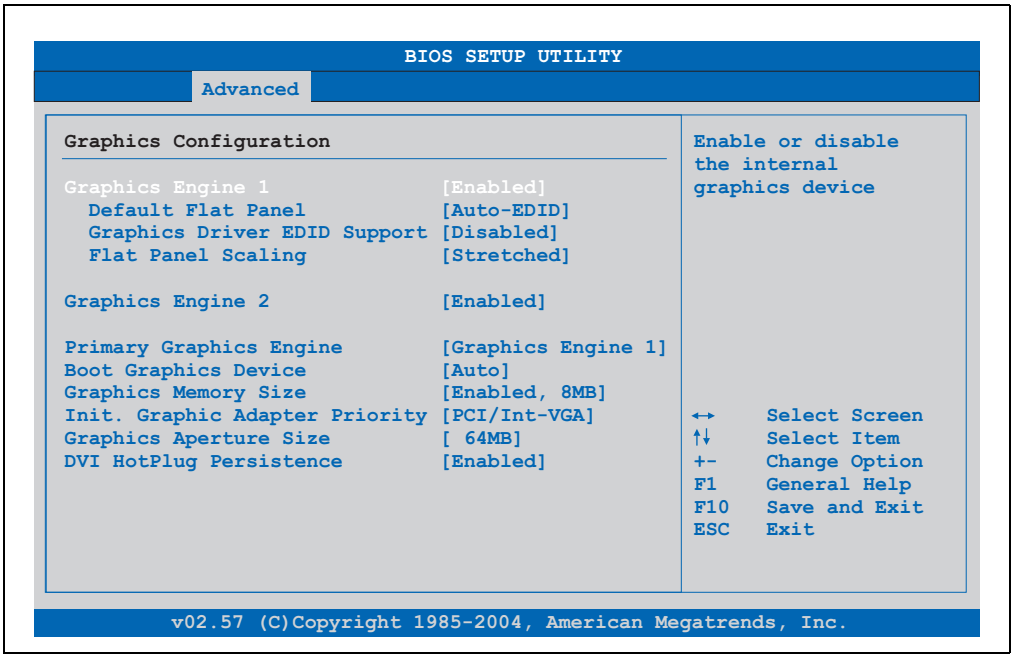


Figure 244: 855GME (XTX) Advanced Graphics Configuration

BIOS setting	Meaning	Setting options	Effect
Graphics engine 1	The onboard graphics controller 1 is activated/deactivated here.	Enabled	Enables this function.
		Disabled	Disables this function.
Default flat panel	Settings can be made for the resolution.	Auto-EDID	Automatic setting of the resolution (using a read-out of the connected panel's EDID data).
		VGA 1x18 (002h) VGA 1x18 (013h) SVGA 1x18 (004h) XGA 1x18 (006h) XGA 2x18 (007h) XGA 1x24 (008h) XGA 2x24 (012h) SXGA 2x24 (00Ah) UXGA 2x24 (00Ch)	VGA = 640 x 480 resolution SVGA = 800 x 600 resolution XGA = 1024 x 768 resolution SXGA = 1280 x 1024 resolution UXGA = 1600 x 1200 resolution
		Customized EDID 1	Graphics card reads the EDID 1 data.
		Customized EDID 2	Graphics card reads the EDID 2 data.
		Customized EDID 3	Graphics card reads the EDID 3 data.
Graphics driver EDID support	If this function is enabled, the following operating system graphics driver can read EDID data on its own. When disabled, the VGA data is taken over by BIOS.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 246: 855GME (XTX) Advanced Graphics Configuration setting options

BIOS setting	Meaning	Setting options	Effect
Flat panel scaling	The screen optimization of the flat screen is determined here.	Centered	Screen output centered.
		Stretched	Screen output adjusted.
Graphics engine 2	Settings can be made for the onboard graphics controller 2.	Enabled	Enables this function.
		Disabled	Disables this function.
Graphics engine	The primary onboard graphics controller can be selected here.	Graphics engine 1	Activation of graphics engine 1
		Graphics engine 2	Activation of graphics engine 2
Boot graphics device	You can select which display mode should be booted here.	Auto	Display mode selected automatically.
		CRT only	Only CRT is booted.
		Engine 2 only	Only engine 2 is booted.
		CRT + Engine 2	CRT and engine 2 are booted.
		Engine 1 only	Only engine 1 is booted.
		CRT + Engine 1	CRT and engine 1 are booted.
Graphics memory size	Reserves a memory location in the RAM for the onboard graphics controller, into which the memory access will be directed.	Enabled, 1MB	1 MB main memory is reserved for the onboard video controller.
		Enabled, 4MB	4 MB main memory is reserved for the onboard video controller.
		Enabled, 8MB	8 MB main memory is reserved for the onboard video controller.
		Enabled, 16MB	16 MB main memory is reserved for the onboard video controller.
		Enabled, 32MB	32 MB main memory is reserved for the onboard video controller.
Init. Graphic adapter priority	This option allows you to set which graphics card should be initialized first.	PCI/Int-VGA	PCI/Int-VGA adapter is first installed.
		Internal VGA	Internal VGA adapter is first installed.
Graphics aperture size	Reserves a memory location in the RAM for the graphics card. **Information:** **The size with the best performance is the same size as the working memory.**	64MB, 128MB, 256MB	Value set manually.
DVI HotPlug persistence	Affects both graphics engines. When enabled, the operating system graphics driver attempts to restore the most recent configuration.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 246: 855GME (XTX) Advanced Graphics Configuration setting options (Forts.)

CPU configuration

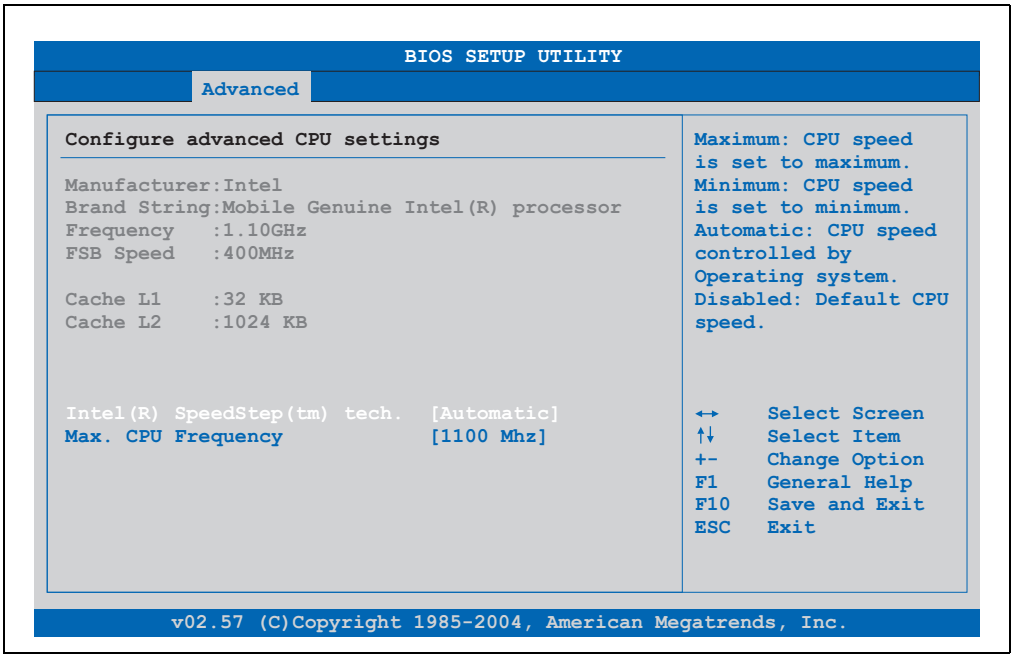


Figure 245: 855GME (XTX) Advanced CPU Configuration

BIOS setting	Meaning	Setting options	Effect
Manufacturer	Manufacturer's display.	None	-
Brand string	Display of CPU values	None	-
Frequency	Processor speed display	None	-
FSB speed	Cycle display of all addressed components. (Front side bus)	None	-
L1 cache	Displays first level cache memory area.	None	-
L2 cache	Displays first level cache memory area.	None	-
Intel (R) SpeedStep (tm) tech.	The computing capacity can be set with this option.	Maximum speed	Maximum computing capacity
		Minimum speed	Minimum computing capacity.
		Automatic	Computing capacity selected automatically.
		Disabled	Disables this function.
Max. CPU frequency	The maximum CPU speed can be set here. **Information:** **Is only visible if the "Intel (R) SpeedStep (tm) tech." option is set to automatic or maximum speed.**	1100 MHz, 1000 MHz, 900 MHz, 800 MHz, 600 MHz;	Value set manually.

Table 247: 855GME (XTX) Advanced CPU Configuration setting options

Chipset configuration

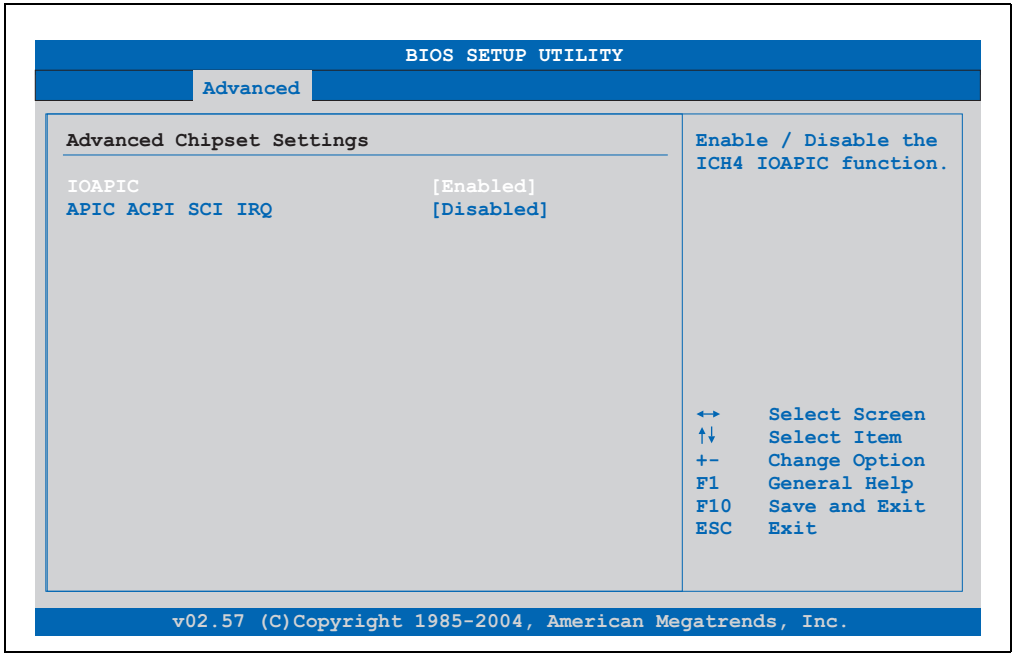


Figure 246: 855GME (XTX) Advanced Chipset Configuration

BIOS setting	Meaning	Setting options	Effect
IOAPIC	This option is used to activate or deactivate the APIC (Advanced Programmable Interrupt Controller). **Information:** **The IRQ resources available to the system are expanded when the APIC mode is enabled.**	Disabled	Deactivates this function.
		Enabled	Activates this function.
APIC ACPI SCI IRQ	This option is used to activate or deactivate the APIC (Advanced Programmable Interrupt Controller). **Information:** **The IRQ resources available to the system are expanded when the APIC mode is enabled.**	Disabled	Deactivates this function.
		Enabled	Activates this function.

Table 248: 855GME (XTX) Advanced Chipset setting options

I/O interface configuration

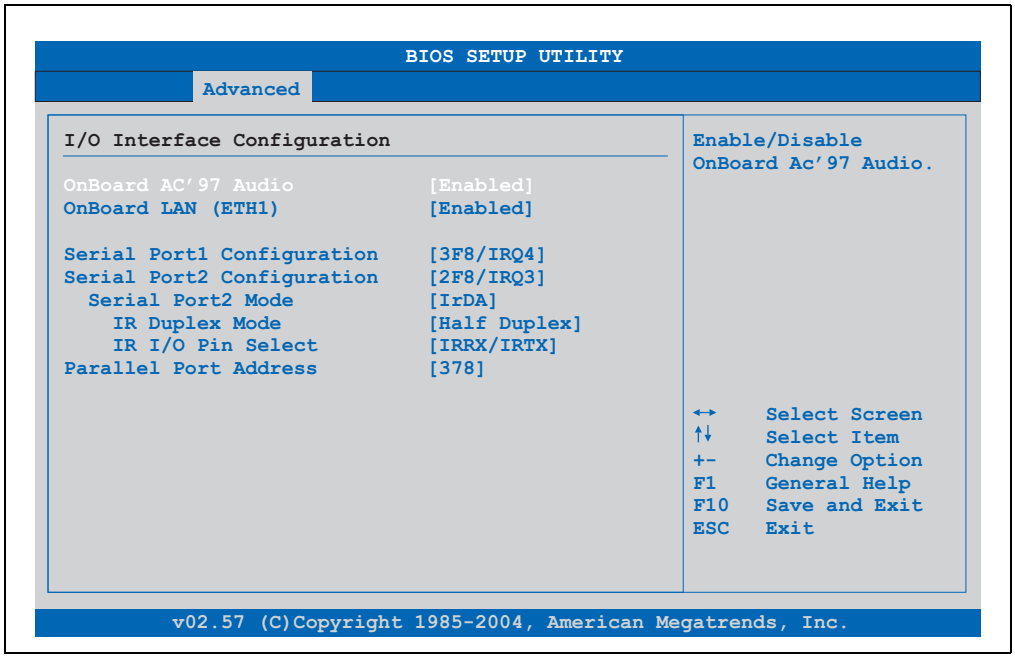


Figure 247: 855GME (XTX) I/O Interface Configuration

BIOS setting	Meaning	Setting options	Effect
OnBoard AC'97 Audio	For turning the Onboard AC'97 audio controller on and off.	Enabled	Enables AC'97 sound.
		Disabled	Disables AC'97 sound.
Onboard LAN (ETH1)	For turning the on-board LAN controller (for ETH1) on and off.	Disabled	Deactivates the LAN controller or the ETH1 interface.
		Enabled	Activates the LAN controller or the ETH1 interface.
Serial port 1 configuration	For the configuration of serial port 1 (COM1).	Disabled	Port 1 deactivated.
		3F8/IRQ4	Assignment of the base I/O address and the interrupt.
		3E8 / IRQ4	Assignment of the base I/O address and the interrupt.
Serial port 2 configuration	For the configuration of serial port 2 (COM1).	Disabled	Port 1 deactivated.
		2F8/IRQ3	Assignment of the base I/O address and the interrupt.
		2E8 / IRQ3	Assignment of the base I/O address and the interrupt.

Table 249: 855GME (XTX) Advanced I/O Interface Configuration setting options

BIOS setting	Meaning	Setting options	Effect
Serial port 2 mode	This option is for setting the serial port B as either a standard interface or as an infrared interface (not currently supported).	Normal	Standard interface.
		IrDA	IrDA interface (compliant serial infrared port).
		ASK IR	Interface for IR devices (amplitude shift keyed infrared port).
IR duplex mode	The interface duplex drive can be configured with this option. **Information:** **Only visible if the "Serial Port2 Mode" function is set to IrDA or ASK IR.**	Half-duplex	Half-duplex drive.
		Full-duplex	Full-duplex drive.
IR I/O pin select	With this option, the infrared (IR) function on the on-board I/O chip can be determined. **Information:** **Only visible if the "Serial Port2 Mode" function is set to IrDA or ASK IR.**	IRRX/IRTX	An internal infrared device is used.
		SINB/SOUTB	An external infrared device is used.
Parallel port address	The address of the parallel interface can be defined with this option. **Information:** **Address is automatically set, even if the function is disabled.**	Disabled	Deactivates the port.
		378, 278, 3BC	Manual assignment of the port address.

Table 249: 855GME (XTX) Advanced I/O Interface Configuration setting options (Forts.)

Clock Configuration

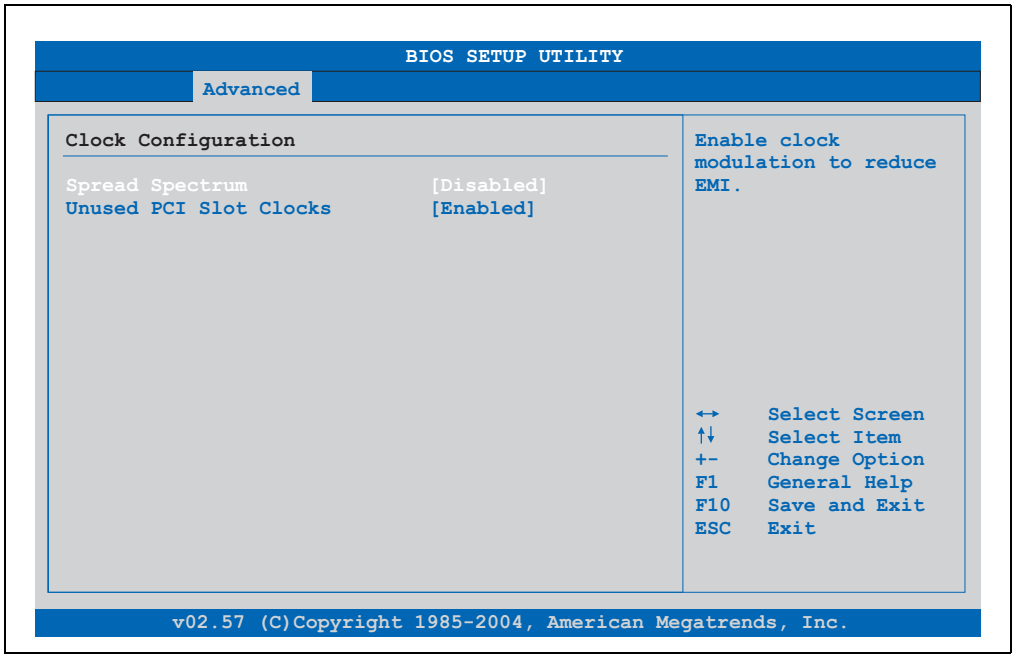


Figure 248: 855GME (XTX) Advanced Clock Configuration

BIOS setting	Meaning	Setting options	Effect
Spread spectrum	With this option, the cycle frequency can be modulated by reducing electromagnetic disturbances.	Disabled	Disables this function.
		Enabled	Enables this function.
Unused PCI slot clocks	This option activates or deactivates the unused PCI slot cycle.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 250: 855GME (XTX) Advanced Clock Configuration setting options

IDE Configuration

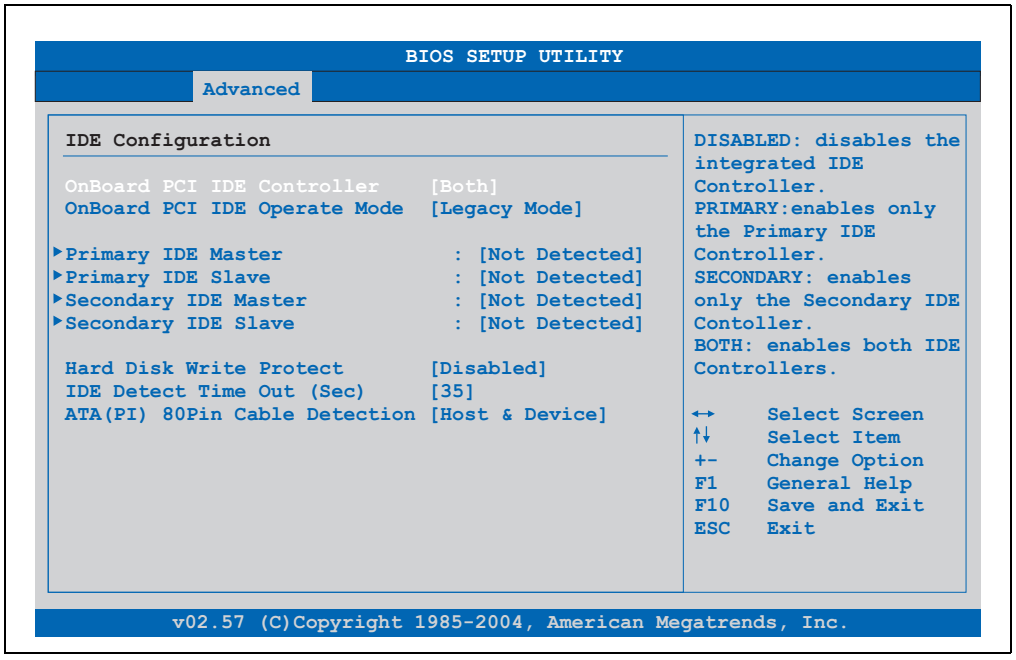


Figure 249: 855GME (XTX) Advanced IDE Configuration

BIOS setting	Meaning	Setting options	Effect
OnBoard PCI IDE controller	Both the IDE controllers found on the board can be configured here.	Disabled	Disables this function.
		Primary	Activates the primary IDE channel.
		Secondary	Activates the secondary IDE channel.
		Both	Activates both IDE channels (primary and secondary).
OnBoard PCI IDE operate mode	The PCI IDE operate mode found on the board is configured here.	Legacy mode	Activates legacy mode
		Native mode	Activates the native mode (suited for Windows XP and Windows 2000).
Primary IDE Master	The drive in the system that is connected to the IDE primary master port is configured here.	Enter	Opens the submenu See "Primary IDE Master", on page 467
Primary IDE slave	The drive in the system that is connected to the IDE primary slave port is configured here.	Enter	Opens the submenu See "Primary IDE slave", on page 469
Secondary IDE Master	The drive in the system that is connected to the IDE secondary master port is configured here.	Enter	Opens the submenu See "Secondary IDE Master", on page 470

Table 251: 855GME (XTX) Advanced IDE Configuration setting options

BIOS setting	Meaning	Setting options	Effect
Secondary IDE slave	The drive in the system that is connected to the IDE secondary slave port is configured here.	Enter	Opens the submenu See "Secondary IDE slave", on page 472
Hard disk write protect	Write protection for the hard drive can be enabled/disabled here.	Disabled	Disables this function.
		Enabled	Enables this function.
IDE Detect Time Out (Sec)	Configuring the time overrun limit value for the ATA/ATAPI device identification.	0, 5, 10, 15, 20, 25, 30, 35	Value set manually.
ATA (PI) 80 pin cable detection	Detects whether an 80 pin cable is connected to the drive, the controller or to both. **Information:** **This cable should be used whenever possible, otherwise error messages will appear.**	Host & device	Using both IDE controllers (motherboard, disk drive).
		Host	Using the IDE controller motherboard.
		Device	Using the IDE disk drive controller.

Table 251: 855GME (XTX) Advanced IDE Configuration setting options (Forts.)

Primary IDE Master

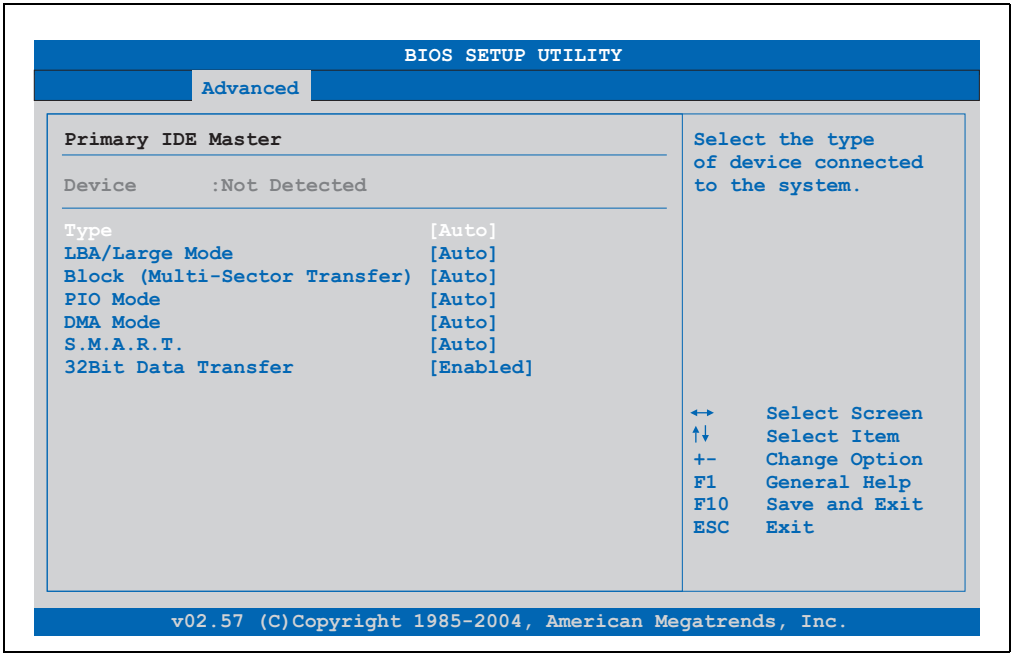


Figure 250: 855GME (XTX) Primary IDE Master

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the primary master is configured here.	Not installed	No drive installed.
		Auto	Automatic recognition of the drive and setup of appropriate values.
		CD/DVD	CD -/ DVD drive.
		ARMD	ARMD - drive (zip drive)
LBA/Large Mode	This option activates the logical block addressing / large mode for IDE.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
Block (Multi-Sector Transfer)	This option enables the block mode for IDE hard drives. When this option is enabled, the number of blocks per request from the configuration sector of the hard drive is read.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
PIO Mode	The PIO mode determines the data rate of the hard drive. **Information:** **The higher the PIO mode, the shorter the data cable must be.**	Auto	Automatic configuration of PIO mode.
		0, 1, 2, 3, 4	Manual configuration of PIO mode.
DMA Mode	The data transfer rate to and from the primary master drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Auto	Automatic definition of the transfer rate.
		SWDMA0, SWDMA1, SWDAM2, MWDMA0, MWDMA1, MWDMA2;	Manual definition of the transfer rate.
S.M.A.R.T.	Monitoring function of modern hard drives (self-monitoring, analysis and reporting technology).	Auto	Automatic detection and enabling.
		Disabled	Disables this function.
		Enabled	Enables this function.
32 Bit Data Transfer	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 252: 855GME (XTX) Primary IDE Master setting options

Primary IDE slave

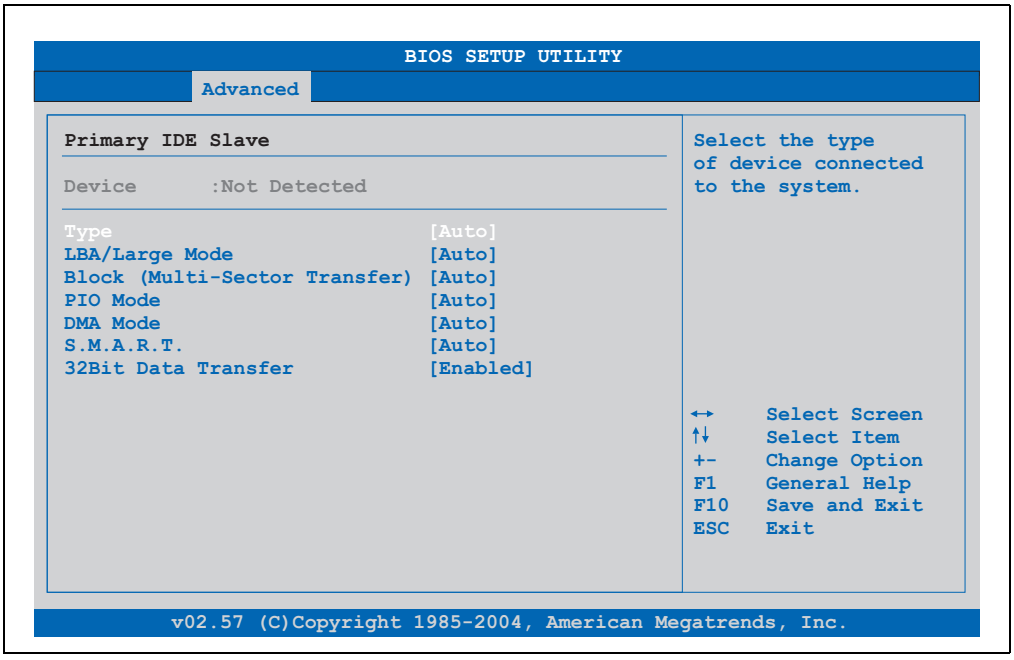


Figure 251: 855GME (XTX) - primary IDE slave

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the primary slave is configured here.	Not installed	No drive installed.
		Auto	Automatic recognition of the drive and setup of appropriate values.
		CD/DVD	CD -/ DVD drive
		ARMD	ARMD - drive (zip drive)
LBA/Large Mode	This option activates the logical block addressing / large mode for IDE.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
Block (Multi-Sector Transfer)	This option enables the block mode for IDE hard drives. When this option is enabled, the number of blocks per request from the configuration sector of the hard drive is read.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
PIO Mode	The PIO mode determines the data rate of the hard drive. **Information:** **The higher the PIO mode, the shorter the data cable must be.**	Auto	Automatic configuration of PIO mode.
		0, 1, 2, 3, 4	Manual configuration of PIO mode.

Table 253: 855GME (XTX) - primary IDE slave - setting options

BIOS setting	Meaning	Setting options	Effect
DMA Mode	The data transfer rate to and from the primary slave drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Auto	Automatic definition of the transfer rate.
		SWDMA0, SWDMA1, SWDAM2, MWDMA0, MWDMA1, MWDMA2;	Manual definition of the transfer rate.
S.M.A.R.T.	Monitoring function of modern hard drives (self-monitoring, analysis and reporting technology).	Auto	Automatic detection and enabling.
		Disabled	Disables this function.
		Enabled	Enables this function.
32 Bit Data Transfer	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 253: 855GME (XTX) - primary IDE slave - setting options

Secondary IDE Master

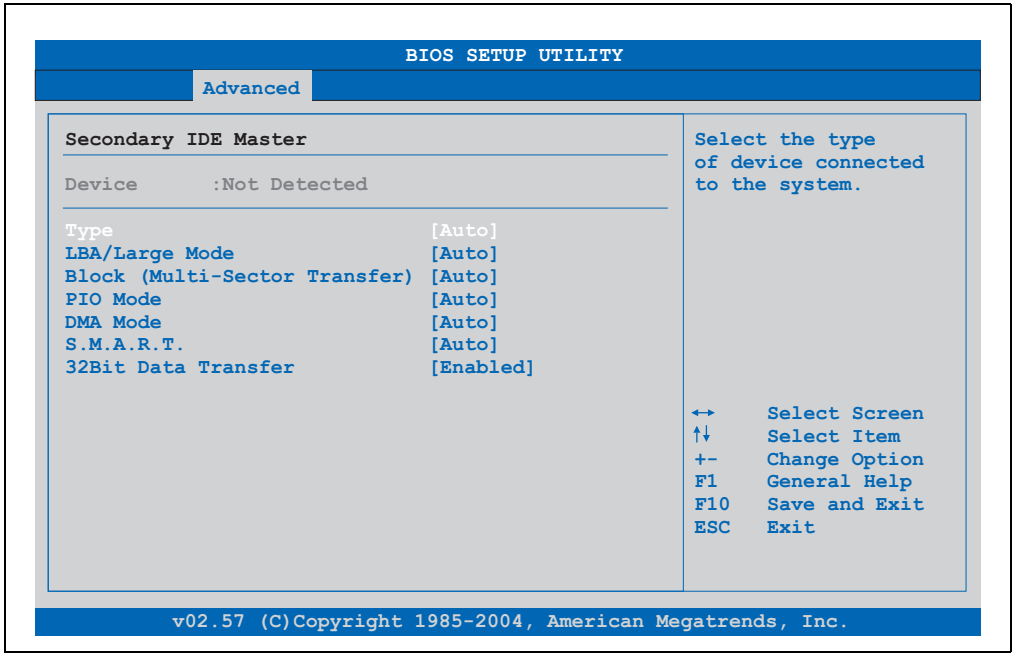


Figure 252: 855GME (XTX) Secondary IDE Master

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the secondary master is configured here.	Not installed	No drive installed.
		Auto	Automatic recognition of the drive and setup of appropriate values.
		CD/DVD	CD -/ DVD drive
		ARMD	ARMD - drive (zip drive)
LBA/Large Mode	This option activates the logical block addressing / large mode for IDE.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
Block (Multi-Sector Transfer)	This option enables the block mode for IDE hard drives. When this option is enabled, the number of blocks per request from the configuration sector of the hard drive is read.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
PIO Mode	The PIO mode determines the data rate of the hard drive. **Information:** **The higher the PIO mode, the shorter the data cable must be.**	Auto	Automatic configuration of PIO mode.
		0, 1, 2, 3, 4	Manual configuration of PIO mode.
DMA Mode	The data transfer rate to and from the secondary master drive is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Auto	Automatic definition of the transfer rate.
		SWDMA0, SWDMA1, SWDAM2, MWDMA0, MWDMA1, MWDMA2;	Manual definition of the transfer rate.
S.M.A.R.T.	Monitoring function of modern hard drives (self-monitoring, analysis and reporting technology).	Auto	Automatic detection and enabling.
		Disabled	Disables this function.
		Enabled	Enables this function.
32 Bit Data Transfer	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 254: 855GME (XTX) Secondary IDE Master setting options

Secondary IDE slave

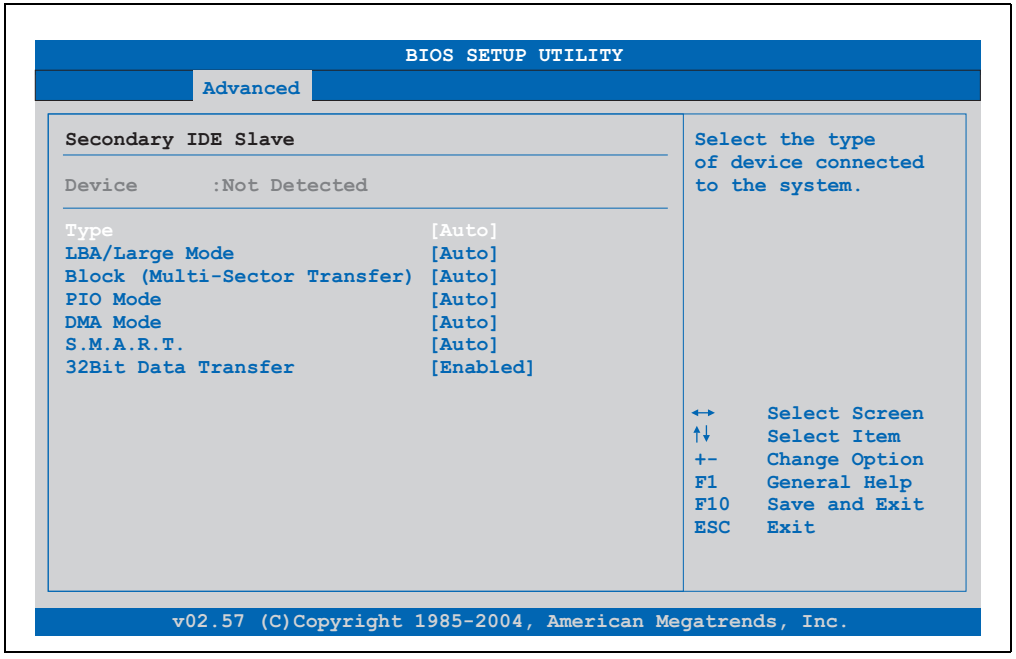


Figure 253: 855GME (XTX) Secondary IDE Slave

BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the secondary slave is configured here.	Not installed	No drive installed.
		Auto	Automatic recognition of the drive and setup of appropriate values.
		CD/DVD	CD -/ DVD drive
		ARMD	ARMD - drive (zip drive)
LBA/Large Mode	This option activates the logical block addressing / large mode for IDE.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
Block (Multi-Sector Transfer)	This option enables the block mode for IDE hard drives. When this option is enabled, the number of blocks per request from the configuration sector of the hard drive is read.	Disabled	Disables this function.
		Auto	Automatic enabling of this function when supported by the system.
PIO Mode	The PIO mode determines the data rate of the hard drive. **Information:** **The higher the PIO mode, the shorter the data cable must be.**	Auto	Automatic configuration of PIO mode.
		0, 1, 2, 3, 4	Manual configuration of PIO mode.

Table 255: 855GME (XTX) Secondary IDE Slave setting options

BIOS setting	Meaning	Setting options	Effect
DMA Mode	The data transfer rate to and from the secondary slave is defined here. The DMA mode must be activated in the Windows device manager in order to guarantee maximum performance. Only possible when manually setting up the drive.	Auto	Automatic definition of the transfer rate.
		SWDMA0, SWDMA1, SWDAM2, MWDMA0, MWDMA1, MWDMA2;	Manual definition of the transfer rate.
S.M.A.R.T.	Monitoring function of modern hard drives (self-monitoring, analysis and reporting technology).	Auto	Automatic detection and enabling.
		Disabled	Disables this function.
		Enabled	Enables this function.
32 Bit Data Transfer	This function enables 32-bit data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 255: 855GME (XTX) Secondary IDE Slave setting options (Forts.)

USB configuration

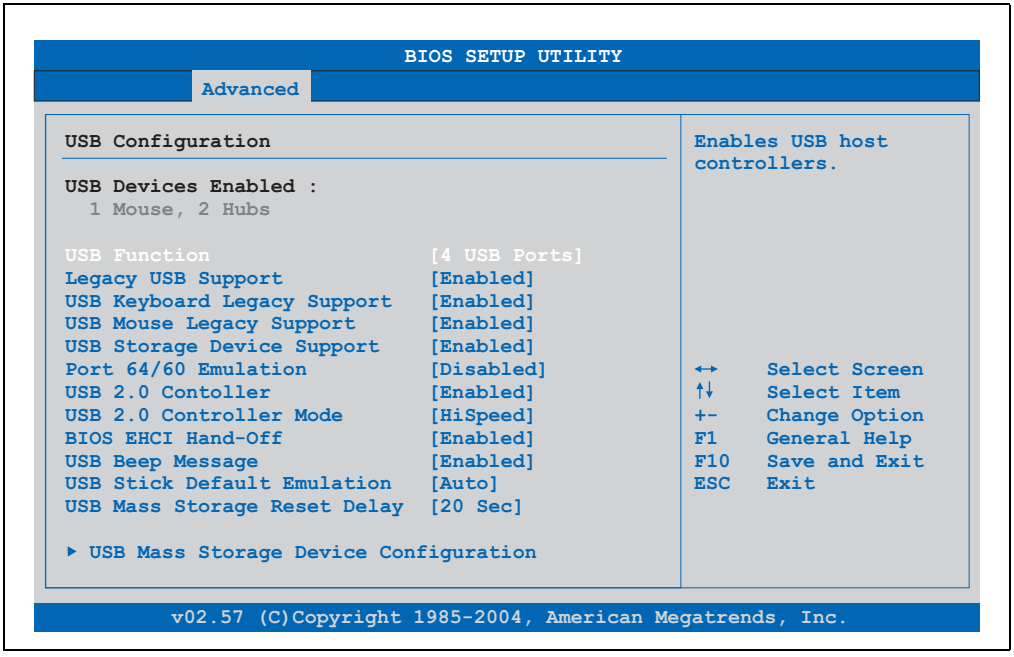


Figure 254: 855GME (XTX) Advanced USB Configuration

BIOS setting	Meaning	Setting options	Effect
USB Function	USB ports can be enabled/disabled here.	Disabled	Disables the USB port.
		2 USB ports, 4 USB ports, 6 USB ports (not support by the APC620 / PPC700) .	Manual selection of the USB port.
Legacy USB Support	Legacy USB support can be enabled/disabled here. USB interfaces do not function during startup. USB is supported again after the operating system has started. A USB keyboard is still recognized during the POST.	Disabled	Disables this function.
		Enabled	Enables this function.
		Auto	Automatic enabling.
USB Keyboard Legacy Support	USB keyboard support can be enabled/disabled here. **Information:** **If this function is disabled, a USB keyboard is also not supported during the POST.**	Disabled	Disables this function.
		Enabled	Enables this function.
USB Mouse Legacy Support	USB mouse support can be enabled/disabled here.	Disabled	Disables this function.
		Enabled	Enables this function.
USB Storage Device Support	USB storage device support can be enabled/disabled here.	Disabled	Disables this function.
		Enabled	Enables this function.
Port 64/60 Emulation	Port 64/60 emulation can be enabled/disabled here.	Disabled	USB keyboard functions in all systems excluding Windows NT.
		Enabled	USB keyboard functions in Windows NT.
USB 2.0 Controller	USB 2.0 mode can be activated/deactivated here.	Enabled	Enables this function.
		Disabled	Disables this function.
USB 2.0 Controller Mode	Settings can be made for the USB controller.	Full Speed	12 MBps
		Hi Speed	480 MBps
BIOS EHCI Hand-Off	The support for the operating system can be set up without the fully automatic EHCI function.	Disabled	Disables the function
		Enabled	Enables this function.
USB Beep Message	The warning tone can be activated/deactivated here.	Disabled	Disables this function.
		Enabled	Enables this function.
USB Stick Default Emulation	You can set how the USB device is to be used.	Auto	USB devices with fewer than 530MB of memory are simulated as floppy disk drives and devices with larger capacities are simulated as hard drives.
		Hard Disk	An HDD-formatted drive can be used as an FDD (e.g. zip drive) for starting the system.

Table 256: 855GME (XTX) Advanced USB Configuration setting options

BIOS setting	Meaning	Setting options	Effect
USB Mass Storage Reset Delay	The waiting time that the USB device POST requires after the device start command can be set. **Information:** **The message "No USB mass storage device detected" is displayed if no USB memory device has been installed.**	10 Sec, 20 Sec, 30 Sec, 40 Sec	Value set manually.
USB mass storage device configuration	This is where the USB mass memory device is configured. **Information:** **Is only visible when the "USB stick default emulation" function is set to AUTO.**	Enter	Opens the submenu See "USB mass storage device configuration", on page 475

Table 256: 855GME (XTX) Advanced USB Configuration setting options (Forts.)

USB mass storage device configuration

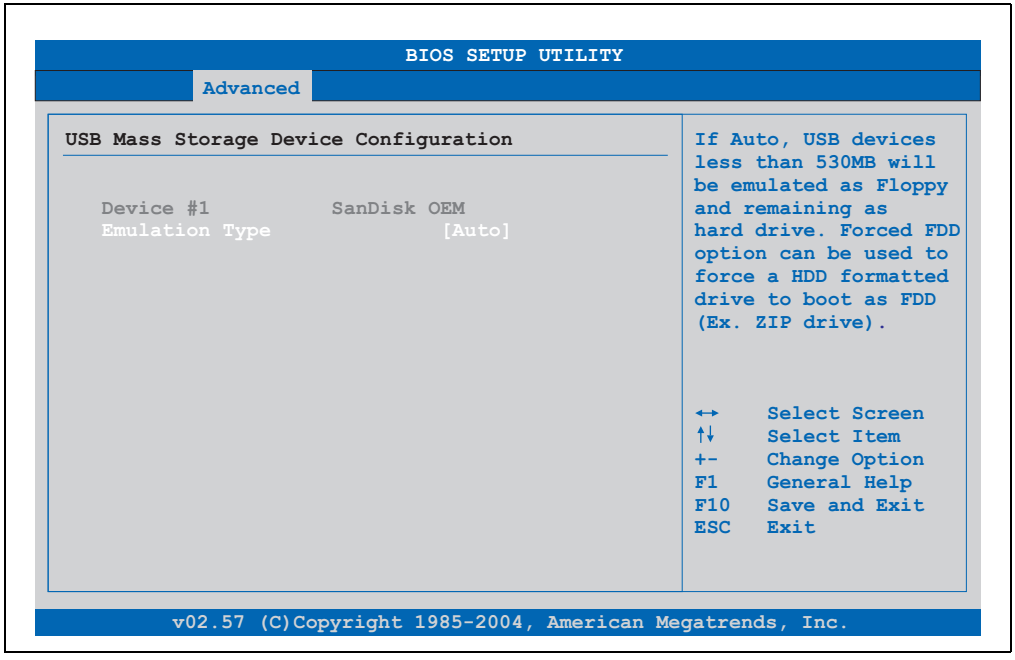


Figure 255: 855GME (XTX) USB mass storage device configuration

BIOS setting	Meaning	Setting options	Effect
Emulation type	With this option, the device to be plugged into the USB interface can be selected.	Auto	Automatic selection of the function.
		Floppy	Using a floppy disk drive.
		Forced FDD	A hard disk image is connected as a floppy image. Functions only in the FAT12, FAT16 or FAT32 formats.
		Hard Disk	Using a hard disk
		CDROM	Using a CD-ROM drive, it is assumed as 'bootable'.

Table 257: 855GME (XTX) USB mass storage device configuration

Keyboard/mouse configuration

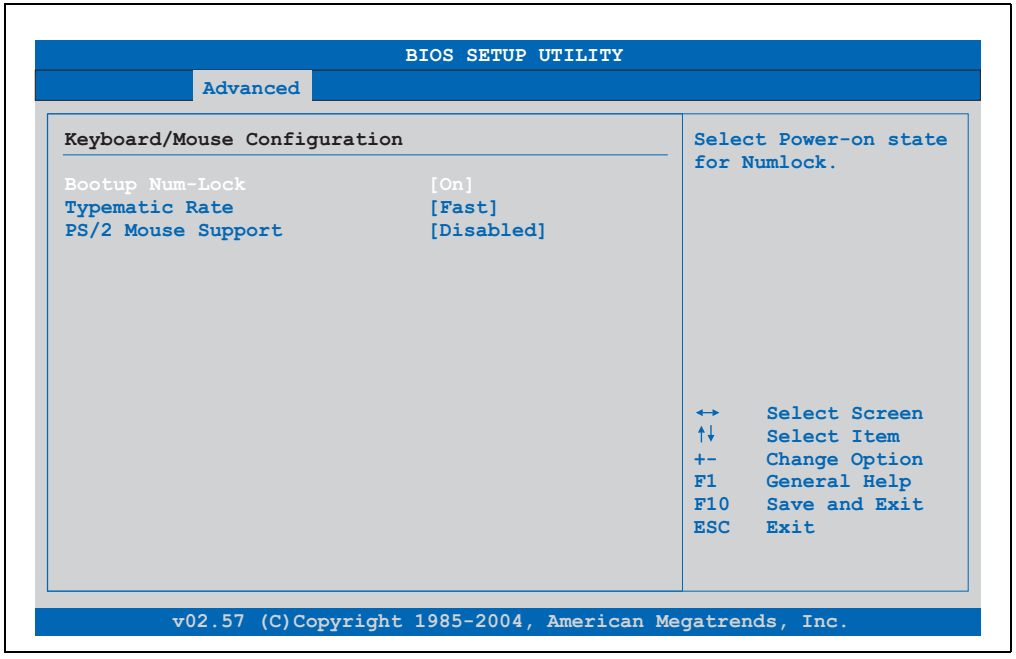


Figure 256: 855GME (XTX) - advanced keyboard/mouse configuration

BIOS setting	Meaning	Setting options	Effect
Boot-up Num-lock	With this field you can define the state of the NumLock key when booting.	Off	Only the cursor functions of the numerical keypad are activated.
		On	Numeric keypad is enabled.
Typematic rate	The key repeat function is set here.	Slow	Slow key repeat.
		Fast	Fast key repeat.

Table 258: 855GME (XTX) - advanced keyboard/mouse configuration - setting options

BIOS setting	Meaning	Setting options	Effect
PS/2 mouse support	Sets whether the PS/2 mouse port should be activated.	Disabled	Disables this function.
		Enabled	Enables this function.
		Auto	Automatic activation of the function if PS/2 mouse port is supported.

Table 258: 855GME (XTX) - advanced keyboard/mouse configuration - setting options

Remote access configuration

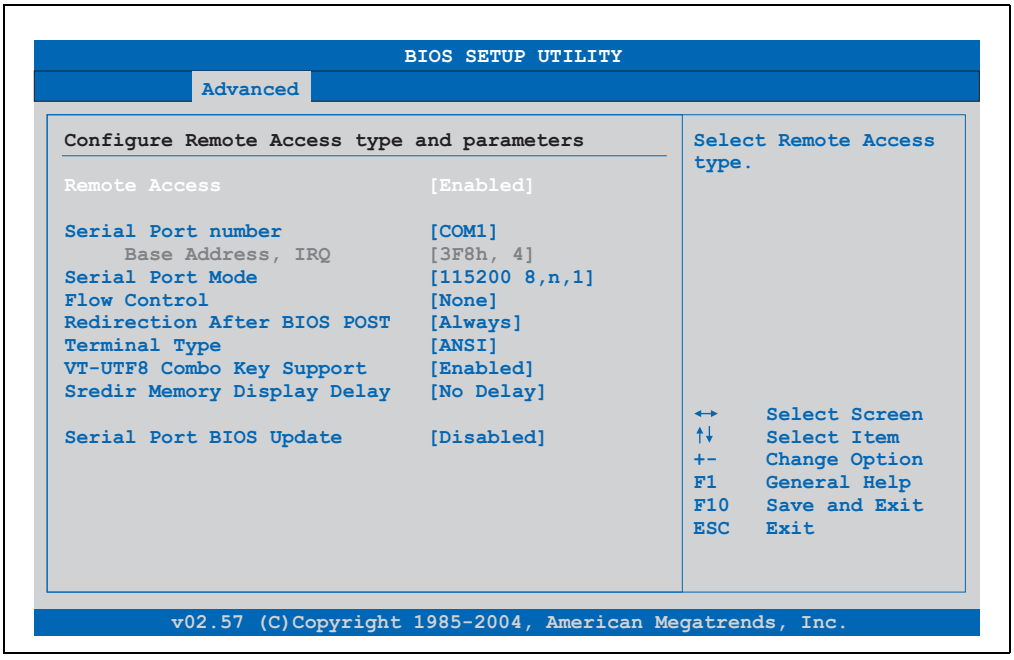


Figure 257: 855GME (XTX) - advanced remote access configuration

BIOS setting	Meaning	Setting options	Effect
Remote access	The remote access function can be enabled/disabled here.	Disabled	Disables this function.
		Enabled	Enables this function.
Serial port number	The serial interface can be set using this option, as long as disabled is not entered in the remote access field.	COM1	Activates the COM1 interface.
		COM2	Activates the COM2 interface.
Base address, IRQ	Serial connection display for the logical address and interrupt, as long as disabled is not entered in the remote access field.	None	-

Table 259: 855GME (XTX) - advanced remote access configuration - setting options

BIOS setting	Meaning	Setting options	Effect
Serial port mode	The serial interface transfer rate is defined here, as long as disabled is not entered in the remote access field.	115200 8,n,1 57600 8,n,1 38400 8,n,1 19200 8,n,1 09600 8,n,1	Value set manually.
Flow control	The interface configuration is carried out here, as long as disabled is not entered in the remote access field. This setting determines how the transfer is controlled via the interface. **Information:** **The setting must be the same on the terminal and the server.**	None	The interface is operated without transfer control.
		Hardware	The interface transfer control is carried out through hardware. This mode must be supported by a cable.
		Software	The interface transfer control is carried out through software.
Redirection after BIOS POST	The redirection after start up can be set here, as long as disabled is not entered in the remote access field.	Disabled	The redirection is switched off after start up.
		Boot loader	Redirection is enabled during system start up and charging.
		Always	Redirection is always enabled.
Terminal type	The type of connection can be chosen here, as long as disabled is not entered in the remote access field.	ANSI, VT100, VT-UTF8	Manual configuration of the connection type.
VT-UTF8 Combo Key Support	With this option, the VT-UTF8 Combo Key Support for the ANSI and VT100 connections can be enabled, as long as disabled is not entered in the remote access field.	Disabled	Disables this function.
		Enabled	Enables this function.
Sredir Memory Display Delay	The memory output delay can be set using this option, as long as disabled is not entered in the remote access field (Sredir -> serial redirection).	No delay	No delay.
		Delay 1 sec, Delay 2 sec, Delay 4 sec	Value set manually.
Serial port BIOS update	During system start up, the update is loaded via the serial interface in the processor. **Information:** **If this option is disabled, the boot time is reduced.**	Disabled	Disables this function.
		Enabled	Enables this function.

Table 259: 855GME (XTX) - advanced remote access configuration - setting options (Forts.)

CPU board monitor

Information:

The displayed voltage values (e.g. core voltage, battery voltage) on this BIOS Setup page represent uncalibrated information values. These cannot be used to draw any conclusions about any hardware alarms or error conditions. The hardware components used have automatic diagnostics functions that can be applied in the event of error.

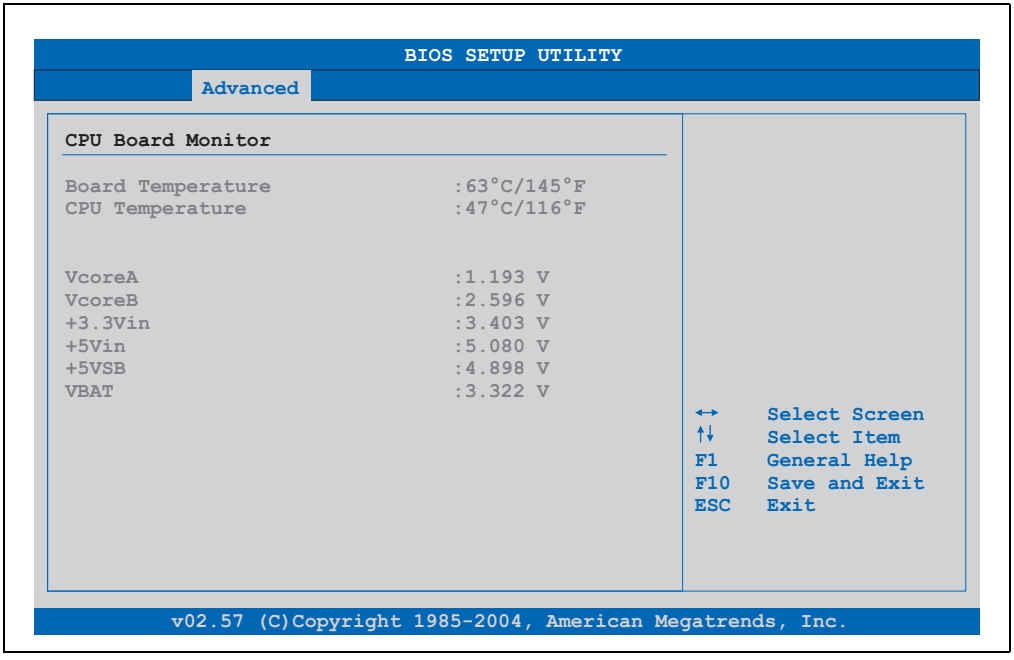


Figure 258: 855GME (XTX) - advanced CPU board monitor

BIOS setting	Meaning	Setting options	Effect
Board temperature	Displays the selected panel's temperature (in degrees Celsius and Fahrenheit).	None	-
CPU temperature	Displays the processor's temperature (in degrees Celsius and Fahrenheit).	None	-
VcoreA	Displays the processor's core voltage A in volts.	None	-
VcoreB	Displays the DDR's core voltage B in volts.	None	-
+3.3Vin	Displays the current voltage of the 3.3 volt supply.	None	-

Table 260: 855GME (XTX) - advanced remote access configuration - setting options

BIOS setting	Meaning	Setting options	Effect
+5Vin	Displays the current voltage of the 5 volt supply.	None	-
+5VSB	Displays the current level of the jumper.	None	-
VBAT	Displays the battery voltage (in volts).	None	-

Table 260: 855GME (XTX) - advanced remote access configuration - setting options

Main Board/Panel Features

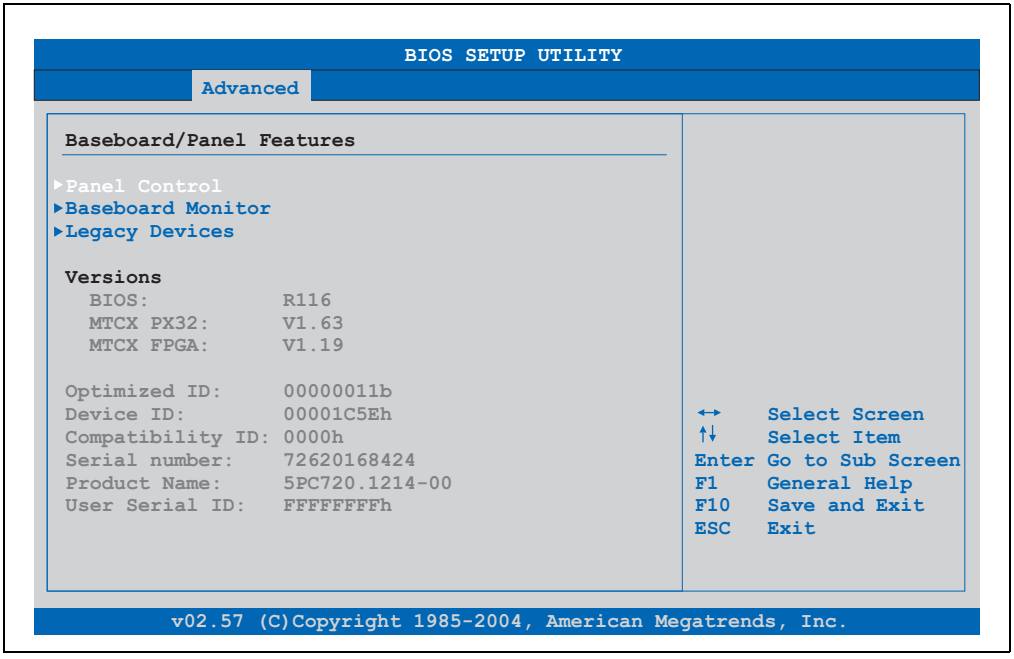


Figure 259: 855GME (XTX) Advanced Baseboard/Panel Features

BIOS setting	Meaning	Setting options	Effect
Panel control	For special setup of connected panels (display units).	Enter	Opens the submenu See "Panel control", on page 481
Main board monitor	Display of various temperatures and fan speeds.	Enter	Opens the submenu See "Main board monitor", on page 482
Legacy devices	Special settings for the interface can be changed here.	Enter	Opens the submenu See "Legacy devices", on page 484
BIOS	Displays the BIOS version.	None	-
MTCX PX32	Displays the MTCX PX32 firmware version.	None	-
MTCX FPGA	Displays the MTCX FPGA firmware version.	None	-

Table 261: 855GME (XTX) Advanced Baseboard/Panel Features setting options

BIOS setting	Meaning	Setting options	Effect
Optimized ID	Displays the DIP switch setting of the configuration switch.	None	-
Device ID	Displays the hexadecimal value of the hardware device ID.	None	-
Compatibility ID	Displays the version of the device within the same B&R device code. This ID is needed for Automation Runtime.	None	-
Serial number	Displays the B&R serial number.	None	-
Product name	Displays the B&R model number.	None	-
User serial ID	Displays the hexadecimal value of the user serial ID number. This number can only be changed with "control center," available from B&R.	None	-

Table 261: 855GME (XTX) Advanced Baseboard/Panel Features setting options (Forts.)

Panel control

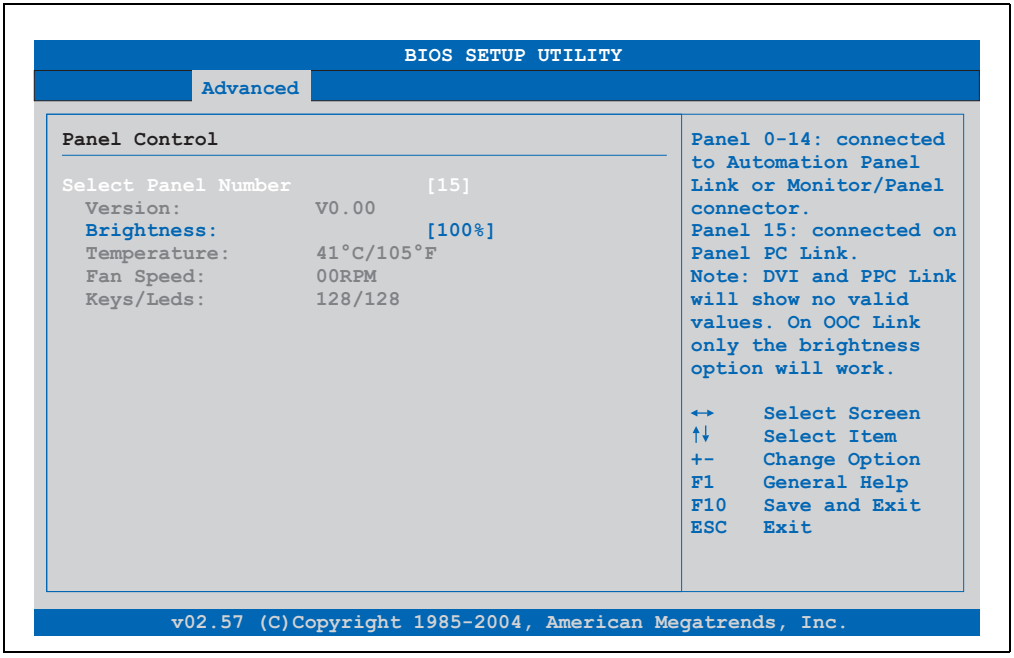


Figure 260: 855GME (XTX) Panel Control

BIOS setting	Meaning	Setting options	Effect
Select panel number	Selection of the panel number for which the values should be read out and/or changed.	0...15	Selection of panel 0 ... 15. Panel 15 is specifically intended for panel PC 700 systems. .
Version	Displays the firmware version of the SDLR controller.	None	-
Brightness	For setting the brightness of the selected panel.	00%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%	For setting the brightness (in %) of the selected panel. Changes take effect after saving and restarting the system (e.g. by pressing <F10>).
Temperature	Displays the selected panel's temperature (in degrees Celsius and Fahrenheit).	None	-
Fan speed	Displays fan speed for the selected panel.	None	-
Keys/LEDs	Displays the available keys and LEDs on the selected panel.	None	-

Table 262: 855GME (XTX) Panel Control setting options

Main board monitor

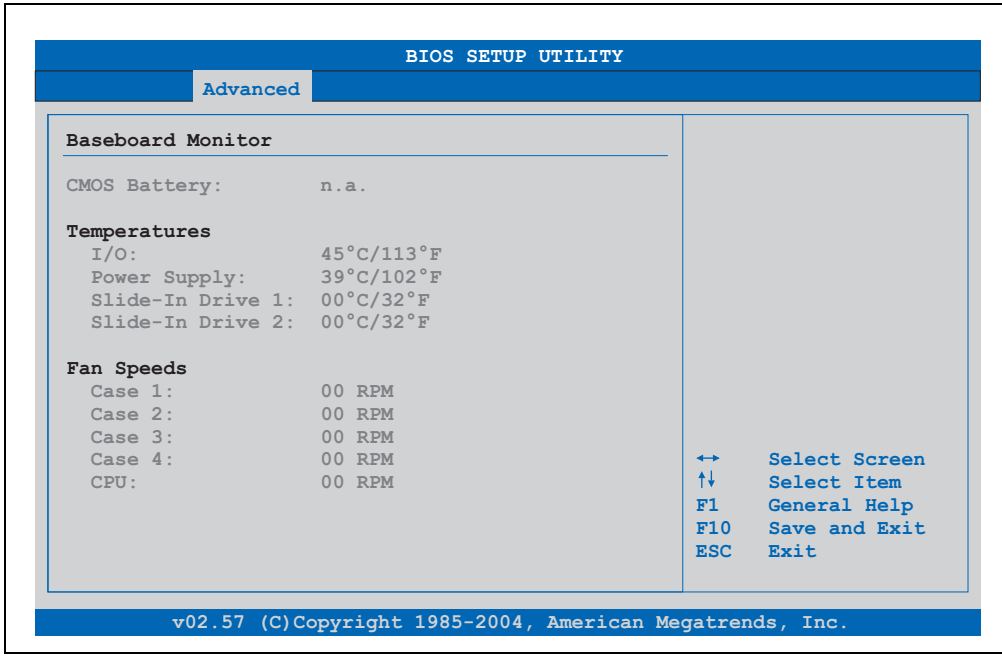


Figure 261: 855GME (XTX) - baseboard monitor

BIOS setting	Meaning	Setting options	Effect
CMOS battery	Displays the battery status. **n.a.** - not available, either MTCX does not support the firmware (starting with these versions "Main Board/Panel Features", on page 480) or the hardware is too old. **Good** - Battery is OK **Bad** - Battery is damaged.	None	-
I/O	Displays the temperature in the I/O area in degrees Celsius and Fahrenheit.	None	-
Power supply	Displays the temperature in the power supply area in degrees Celsius and Fahrenheit.	None	-
Slide-in drive 1	Displays the temperature of the slide-in drive 1 in degrees Celsius and Fahrenheit.	None	-
Slide-in drive 2	Displays the temperature of the slide-in drive 2 in degrees Celsius and Fahrenheit.	None	-
Case 1	Displays the fan speed of housing fan 1.	None	-
Case 2	Displays the fan speed of housing fan 2.	None	-
Case 3	Displays the fan speed of housing fan 3.	None	-
Case 4	Displays the fan speed of housing fan 4.	None	-
CPU	Displays the fan speed of the processor fan.	None	-

Table 263: 855GME (XTX) - baseboard monitor setting options

Legacy devices

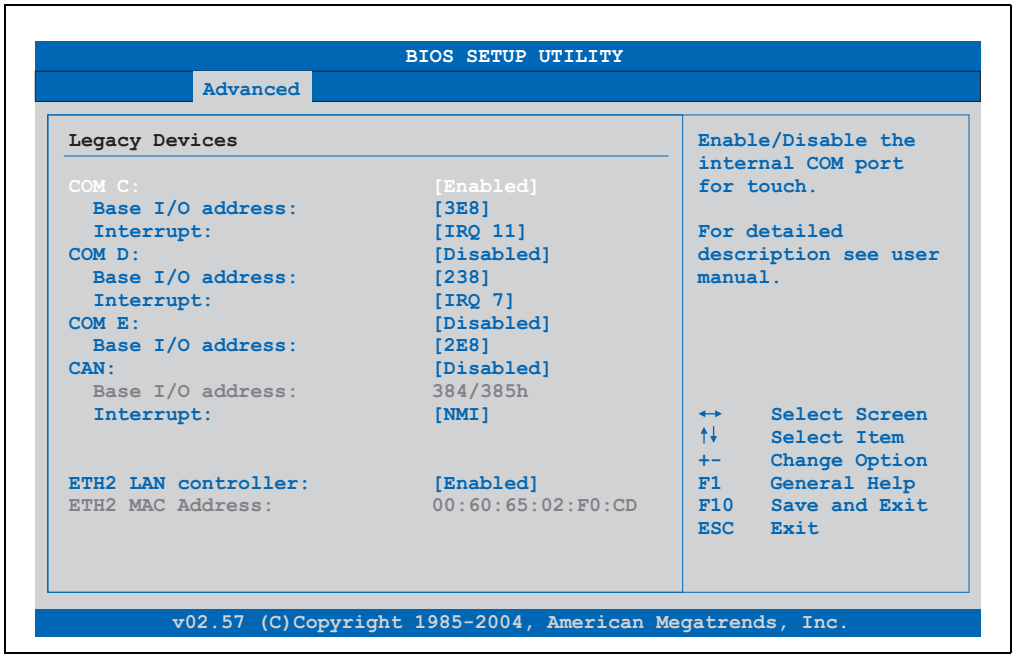


Figure 262: 855GME (XTX) - Legacy devices

BIOS setting	Meaning	Setting options	Effect
COM C	Settings for the internal serial interfaces in the system. This setting activates the touch screen in panel PC 700 systems, and, using SDL transfer technology, also in Automation Panel 900 display units.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the COM C port. A yellow star indicates a conflict with another device.	328, 338, 3E8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM C port. A yellow star indicates a conflict with another device.	IRQ 5, IRQ 6, IRQ 11, IRQ 12	Selected interrupt is assigned.
COM D	Setting for the COM D port for the serial interface of an Automation Panel Link slot. The interface is used to operate the touch screen on connected Automation Panel 900 units.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the COM D port. A yellow star indicates a conflict with another device.	238, 328, 338	Selected base I/O address is assigned.

Table 264: 855GME (XTX) Legacy Devices setting options

BIOS setting	Meaning	Setting options	Effect
Interrupt	Selection of the interrupt for the COM D port. A yellow star indicates a conflict with another device.	IRQ 5, IRQ 6, IRQ 7, IRQ 12	Selected interrupt is assigned.
COM E	Configuration of the optional COM E port on a B&R add-on interface (IF option).	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the COM E port. A yellow star indicates a conflict with another device.	2E8, 328, 338	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM E port. A yellow star indicates a conflict with another device.	IRQ 5, IRQ 6, IRQ 10, IRQ 12	Selected interrupt is assigned.
CAN	Configuration of the CAN port of a B&R add-on CAN interface card (IF option).	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the CAN port.	None	-
Interrupt	Selection of the interrupt for the CAN port. A yellow star indicates a conflict with another device.	IRQ 10 and NMI	Selected interrupt is assigned.
ETH2 LAN controller	For turning the onboard LAN controller (ETH2) on and off.	Disabled	Disables the controller.
		Enabled	Enables the controller.
ETH2 MAC Address	Displays the Ethernet 2 controller MAC address.	None	-

Table 264: 855GME (XTX) Legacy Devices setting options (Forts.)

1.3.6 Boot

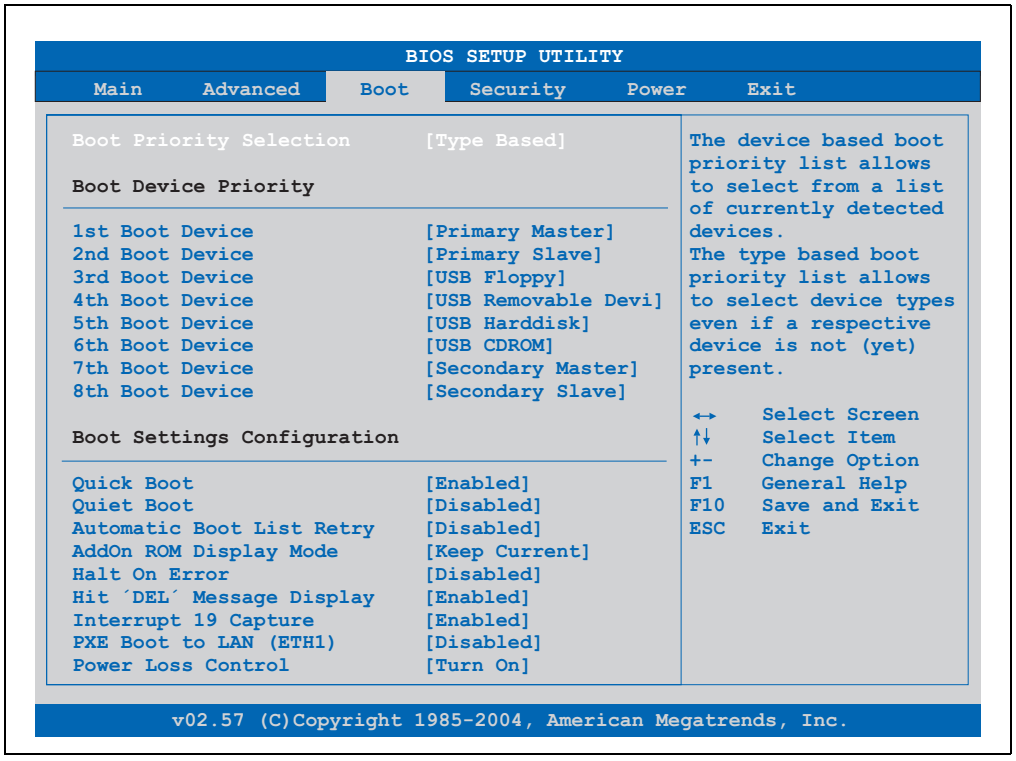


Figure 263: 855GME (XTX) Boot menu

BIOS setting	Meaning	Setting options	Effect
Boot Priority Selection	The priority for when the drives should be booted can be set here.	Device Based	Selection from a list of determined equipment.
		Type Based	Allows the selection of unavailable equipment.
1st Boot Device	The boot drives can be set using this option.	Disabled, primary master, primary slave, secondary master, secondary slave, Legacy floppy, USB floppy, USB harddisk, USB CDROM, USB removable device, onboard LAN (ETH1), external LAN, PCI mass storage PCI SCSI card, any PCI BEV device, onboard PCI SATA, third master third slave	Selecting the desired function.
2nd Boot Device			
3rd Boot Device			
4th Boot Device			
5th Boot Device			
6th Boot Device			
7th Boot Device			
8th Boot Device			

Table 265: 855GME (XTX) Boot menu setting options

BIOS setting	Meaning	Setting options	Effect
Quick Boot	This function reduces the boot time by skipping lines.	Disabled	Disables this function.
		Enabled	Enables this function.
Quiet Boot	Determines if POST message or OEM logo is displayed.	Disabled	POST message display.
		Enabled	OEM logo display instead of POST message.
Automatic Boot List Retry	With this option, the operating system automatically restarts following startup failure.	Disabled	Disables this function.
		Enabled	Enables this function.
Add-On ROM Display Mode	Sets the display mode for the ROM (during the booting procedure).	Force BIOS	An additional BIOS part can be displayed.
		Keep Current	BIOS information is displayed.
Halt On Error	This option sets whether the system should pause the Power On Self Test (POST) when it encounters an error.	Disabled	The system does not pause. All errors are ignored.
		Enabled	The system pauses. The system pauses every time an error is encountered.
Hit 'DEL' Message Display	Settings can be made here for the "Hit 'DEL' Message" display. **Information:** **When quiet boot is activated the message is not displayed.**	Disabled	The message is not displayed.
		Enabled	The message is displayed.
Interrupt 19 Capture	This function can be used to incorporate the BIOS interrupt.	Disabled	Disables this function.
		Enabled	Enables this function.
PXE boot to LAN (ETH1)	Activating/Deactivating the function to boot from LAN.	Disabled	Disables this function.
		Enabled	Enables this function.
Power Loss Control	Determines if the system is on/off following power loss.	Remain Off	Remains off.
		Turn On	Powers on.
		Last State	Enables the previous state.

Table 265: 855GME (XTX) Boot menu setting options (Forts.)

1.3.7 Security

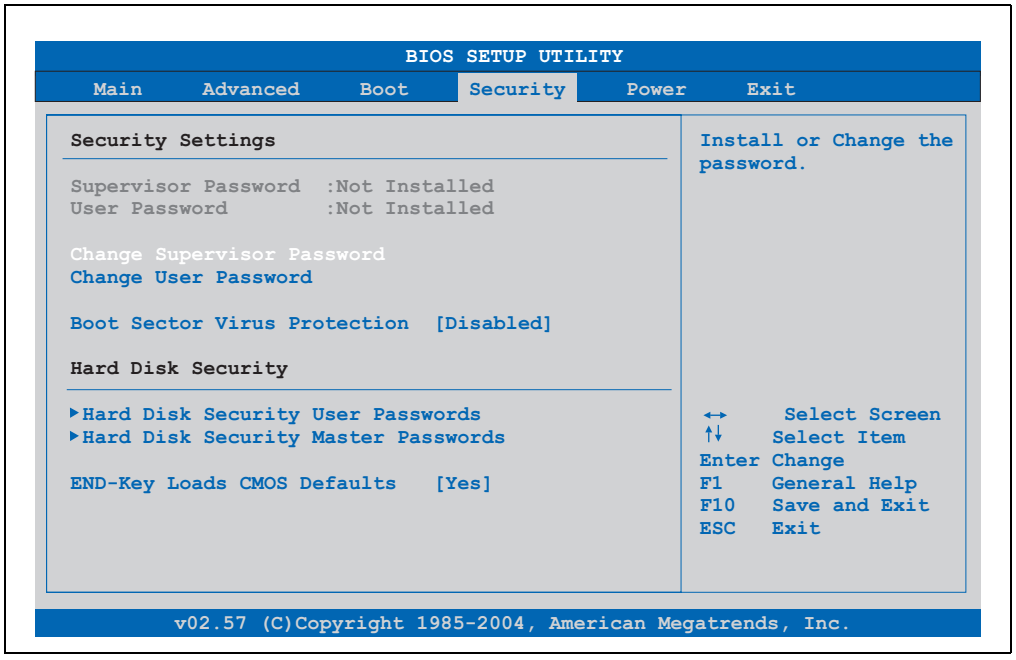


Figure 264: 855GME (XTX) Security menu

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	-
Change Supervisor Password	To enter/change a supervisor password. A supervisor password is necessary to edit all BIOS settings.	Enter	Enter password.
Change User Password	To enter/change a user password. A user password allows the user to edit only certain BIOS settings.	Enter	Enter password.
Boot Sector Virus Protection	With this option, a warning is issued when the boot sector is accessed through a program or virus. **Information:** **With this option, only the boot sector is protected, not the entire hard drive.**	Disabled	Disables this function.
		Enabled	Enables this function.
Hard disk security user password	The hard disk security user password can be created here.	Enter	Opens the submenu See "Hard disk security user password", on page 489

Table 266: 855GME (XTX) Security menu setting options

BIOS setting	Meaning	Setting options	Effect
Hard disk security master password	The hard disk security master password can be created here.	Enter	Opens the submenu See "Hard disk security master password", on page 490
END-key loads CMOS defaults	Using this function, CMOS can be loaded by pressing the END key during POST.	Yes	Enables this function.
		No	Disables this function.

Table 266: 855GME (XTX) Security menu setting options (Forts.)

Hard disk security user password

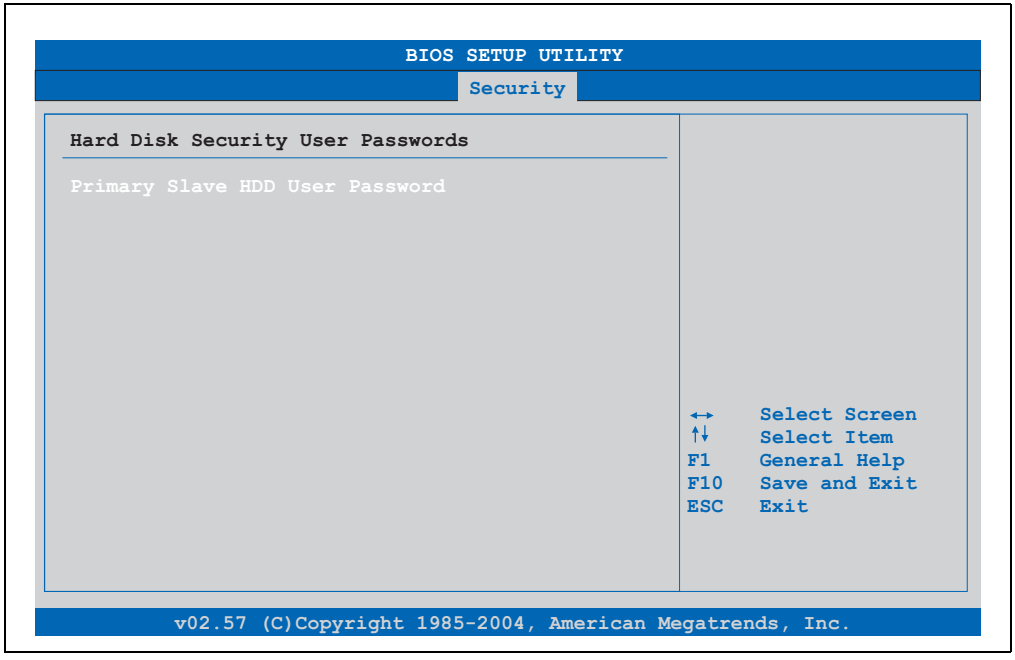


Figure 265: 855GME (XTX) Hard disk security user password

BIOS setting	Meaning	Setting options	Effect
Primary slave HDD user password	This function makes it possible to use the user password to change or configure each hard drive without having to reboot the device. A user password allows the user to edit only certain BIOS settings.	Enter	Enter password.

Table 267: 855GME (XTX) Hard disk security user password

Hard disk security master password

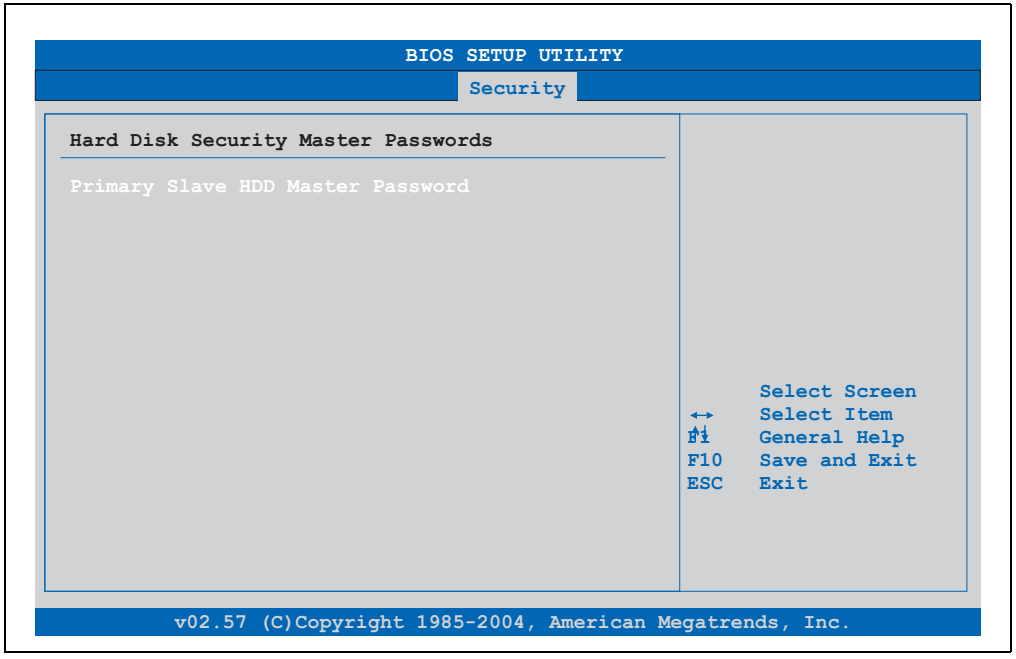


Figure 266: 855GME (XTX) Hard disk security master password

BIOS setting	Meaning	Setting options	Effect
Primary Slave HDD Master Password	This function makes it possible to use the user password to change or configure each hard drive without having to reboot the device.	Enter	Enter password.

Table 268: 855GME (XTX) Hard disk security master password

1.3.8 Power

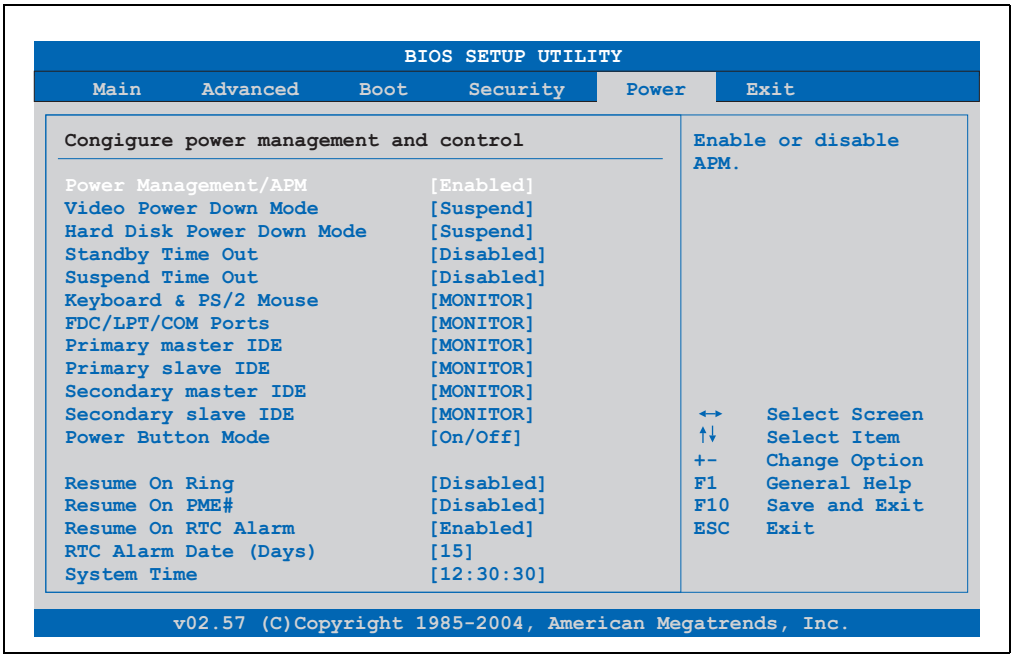


Figure 267: 855GME (XTX) Power menu

BIOS setting	Meaning	Setting options	Effect
Power Management/APM	This option switches the APM function on or off. This is an advanced plug & play and power management functionality.	Disabled	Disables this function.
		Enabled	Enables this function.
Video Power Down Mode	This option allows you to set the energy saving mode for the monitor.	Disabled	Do not switch off the monitor.
		Standby	Monitor goes to standby mode.
		Suspend	Monitor goes to suspend mode.
Hard Disk Power Down Mode	This option allows you to set the energy saving mode for the hard drive.	Disabled	Do not switch off the hard drive.
		Standby	Monitor goes to standby mode.
		Suspend	Hard drive goes to suspend mode.
Standby time out	Using this option, you can configure how long the system stays inactive until standby mode is executed.	Disabled	Disables this function.
		1 min, 2 min, 4 min, 8 min, 10 min, 20 min 30 min, 40 min;	Value set manually.
Suspend Time Out	Using this option, you can configure how long the system stays inactive (all components but the CPU are shut off, if possible) before entering suspend mode.	Disabled	Disables this function.
		1 min, 2 min, 4 min, 8 min, 10 min, 20 min 30 min, 40 min, 50 min, 60 min;	Value set manually.

Table 269: 855GME (XTX) Power menu setting options

BIOS setting	Meaning	Setting options	Effect
Keyboard & PS/2 Mouse	The monitoring of activities during power saving mode is determined here.	MONITOR	Keyboard or PS/2 mouse activities return the system to its normal state from a particular energy saving mode.
		IGNORE	Activities are ignored.
FDC/LPT/COM ports	The monitoring of activities during power saving mode is determined here.	MONITOR	Activities in the IRQ of specific connections or devices return the system to its normal state from power saving mode.
		IGNORE	Activities are ignored.
Primary master IDE	This option is used to determine whether or not BIOS monitors the activities of these components.	MONITOR	Activities in the IRQ of specific connections or devices return the system to its normal state from power saving mode.
		IGNORE	Activities are ignored.
Primary slave IDE	This option is used to determine whether or not BIOS monitors the activities of these components.	MONITOR	Activities in the IRQ of specific connections or devices return the system to its normal state from power saving mode.
		IGNORE	Activities are ignored.
Secondary master IDE	This option is used to determine whether or not BIOS monitors the activities of these components.	MONITOR	Activities in the IRQ of specific connections or devices return the system to its normal state from power saving mode.
		IGNORE	Activities are ignored.
Secondary slave IDE	This option is used to determine whether or not BIOS monitors the activities of these components.	MONITOR	Activities in the IRQ of specific connections or devices return the system to its normal state from power saving mode.
		IGNORE	Activities are ignored.
Power Button Mode	This function determines the function of the power button.	On/Off	Power button switches on/off.
		Suspend	Power button switches power saving mode on.
Resume On Ring	When the modem receives an incoming call, the PC is brought out of power saving mode.	Disabled	Disables this function.
		Enabled	Enables this function.
Resume on PME#	With this option, you can switch the PME wakeup function on or off.	Disabled	Disables this function.
		Enabled	Enables this function.
Resume On RTC Alarm	With this option, you can activate the alarm and enter the date and time for the system start.	Disabled	Disables this function.
		Enabled	Enables this function.
RTC alarm date (days)	Setting the date for the system start. **Information:** **Setting with "+"/"-".**	Every day	System starts daily.
		01-31	System start takes place on the manually set date.

Table 269: 855GME (XTX) Power menu setting options (Forts.)

BIOS setting	Meaning	Setting options	Effect
System Time	Setting the time for the system start.	Changing the time	Individually setting the system time in (hh:mm:ss) format. (hh:mm:ss).

Table 269: 855GME (XTX) Power menu setting options (Forts.)

1.3.9 Exit

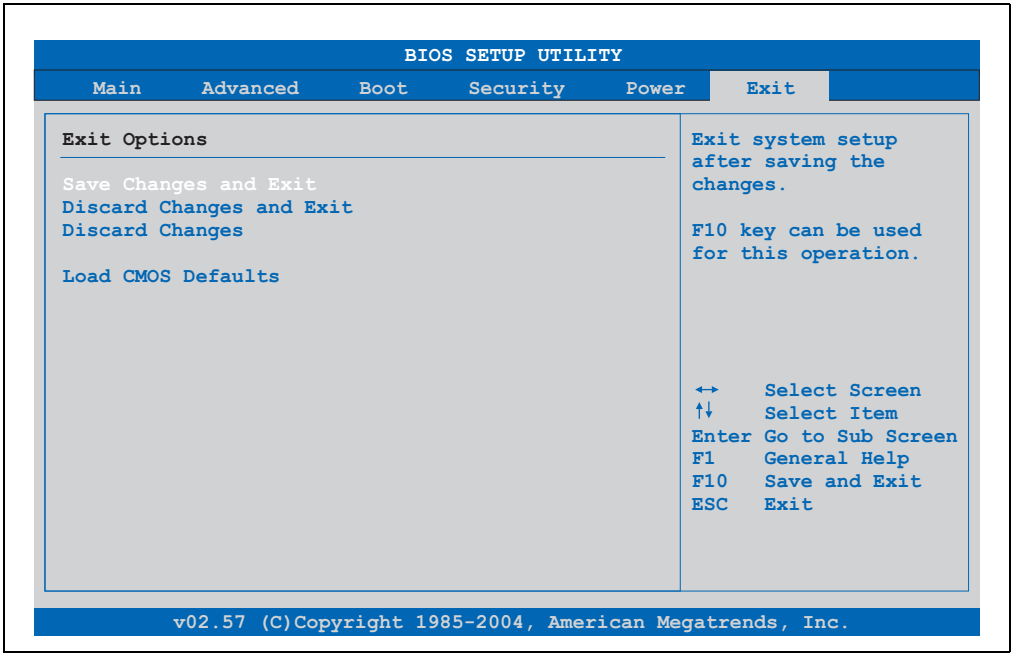


Figure 268: 855GME (XTX) - Exit menu

BIOS setting	Meaning	Setting options	Effect
Save Changes and Exit	BIOS setup is closed with this item. Changes made are saved in CMOS after confirmation, and the system is rebooted.	OK / Cancel	
Discard Changes and Exit	With this item you can close BIOS setup without saving the changes made. The system is then rebooted.	OK / Cancel	
Discard 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 270: 855GME - (XTX) Exit menu - Setting options

BIOS setting	Meaning	Setting options	Effect
Load CMOS Defaults	This item loads the CMOS default values, which are defined by the DIP switch settings. These settings are loaded for all BIOS configurations.	OK / Cancel	

Table 270: 855GME - (XTX) Exit menu - Setting options (Forts.)

1.3.10 Profile overview - BIOS default settings - 855GME (XTX)

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 default settings are the optimized values that will be used.

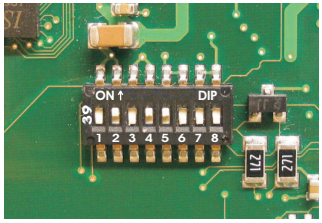


Figure 269: DIP switch on system unit

The first six DIP switches (1-6) are used to set the profiles. The rest (7,8) are reserved.

Number	Optimized for	DIP switch setting							
		1	2	3	4	5	6	7[1)]	8[1)]
Profile 0	Automation PC 620 system units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	On	Off	Off	Off	Off	Off	-	-
Profile 2	Automation PC 620 system units 5PC600.SX02-00, 5PC600.SX02-01, 5PC600.SF03-00, 5PC600.SX05-00 and 5PC600.SX05-01.	Off	On	Off	Off	Off	Off	-	-
Profile 3	Panel PC 700 system unit 5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00.	On	On	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 system unit 5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	On	Off	Off	Off	-	-

Table 271: 855GME (XTX) Profile overview

1) Reserved.

The following pages provide an overview of the BIOS default settings for the different DIP switch configurations. Settings highlighted in yellow are variations from the BIOS default profile (=profile 0).

Personal settings

If changes have been made to the BIOS defaults, they can be entered in the following tables for backup.

Main

Main	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
System Time	-	-	-	-	-	
System Date	-	-	-	-	-	
BIOS ID	-	-	-	-	-	
Processor	-	-	-	-	-	
CPU Frequency	-	-	-	-	-	
System Memory	-	-	-	-	-	
Product Revision	-	-	-	-	-	
Serial Number	-	-	-	-	-	
BC Firmware Rev.	-	-	-	-	-	
Mac address (ETH1)	-	-	-	-	-	
Boot Counter	-	-	-	-	-	
Running times	-	-	-	-	-	

Table 272: 855GME (XTX) Main profile settings overview

Advanced

ACPI settings

ACPI settings	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
ACPI Aware O/S	Yes	Yes	Yes	Yes	Yes	
ACPI 2.0 features	No	No	No	No	No	
ACPI APIC support	Enabled	Enabled	Enabled	Enabled	Enabled	
Active Cooling Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Passive Cooling Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Critical Trip Point	105	105	105	105	105	
Watching ACPI	Shutdown	Shutdown	Shutdown	Shutdown	Shutdown	
GPE1 function	No function	No function	No function	No function	No function	
GPE2 function	No function	No function	No function	No function	No function	

Table 273: 855GME (XTX) - advanced profile setting options

PCI Configuration

PCI Configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Plug & Play O/S	Yes	No	Yes	Yes	Yes	
PCI latency timer	64	64	64	64	64	
Allocate IRQ to PCI VGA	Yes	Yes	Yes	Yes	Yes	
Allocate IRQ to SM-BUS HC	Yes	Yes	Yes	Yes	Yes	
PIRQ A (UHCI1+VGA)	Auto	Auto	Auto	Auto	Auto	
PIRQ B (INTD+AC97+SMBus)	Auto	Auto	Auto	Auto	Auto	
PIRQ C (INTC+UHCI3+NATA)	Auto	Auto	Auto	Auto	Auto	
PIRQ D (UHCI2)	Auto	Auto	Auto	Auto	Auto	
PIRQ E (Onboard ETH1 LAN)	Auto	Auto	Auto	Auto	Auto	
PIRQ F (INTA+ETH2 LAN)	Auto	Auto	Auto	Auto	Auto	
PIRQ G (INTB)	Auto	Auto	Auto	Auto	Auto	
PIRQ H (EHCI)	Auto	Auto	Auto	Auto	Auto	

Table 274: 855GME - (XTX) PCI configuration - profile setting overview

Graphics configuration

Graphics configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Graphics engine 1	Enabled	Enabled	Enabled	Enabled	Enabled	
Default flat panel	Auto-EDID	Auto-EDID	Auto-EDID	Auto-EDID	Auto-EDID	
Graphics driver EDID support	Disabled	Disabled	Disabled	Disabled	Disabled	
Flat panel scaling	Stretched	Stretched	Stretched	Stretched	Stretched	
Graphics engine 2	Enabled	Enabled	Enabled	Enabled	Enabled	
Graphics engine	Graphics engine 1	Graphics engine 1	Graphics engine 1	Graphics engine 1	Graphics engine 1	
Boot graphics device	Auto	Auto	Auto	Auto	Auto	
Graphics memory size	Enabled, 8MB	Enabled, 8MB	Enabled, 8MB	Enabled, 8MB	Enabled, 8MB	
Init. Graphic adapter priority	PCI/Int-VGA	PCI/Int-VGA	PCI/Int-VGA	PCI/Int-VGA	PCI/Int-VGA	
Graphics aperture size	64MB	64MB	64MB	64MB	64MB	
DVI HotPlug persistence	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 275: 855GME - (XTX) Graphics configuration - profile setting overview

CPU configuration

CPU configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Manufacture:	-	-	-	-	-	
Brand string	-	-	-	-	-	
Frequency	-	-	-	-	-	
FSB speed	-	-	-	-	-	
L1 cache	-	-	-	-	-	
L2 cache	-	-	-	-	-	
Intel (R) SpeedStep (tm) tech	Automatic	Automatic	Automatic	Automatic	Automatic	
Max. CPU frequency	-	-	-	-	-	

Table 276: 855GME - (XTX) CPU configuration - profile setting overview

Chipset configuration

Chipset configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
IOAPIC	Disabled	**Enabled**	Disabled	Disabled	Disabled	
APIC ACPI SCI IRQ	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 277: 855GME - (XTX) Chipset configuration - profile setting overview

I/O interface configuration

I/O interface configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
OnBoard AC97 audio	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN (ETH1)	Enabled	Enabled	Enabled	Enabled	Enabled	
Serial port 1 configuration	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	3F8/IRQ4	
Serial port 2 configuration	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	2F8/IRQ3	
Serial port 2 mode	Normal	Normal	Normal	Normal	Normal	
Parallel port address	378	378	378	378	378	

Table 278: 855GME (XTX) - I/O interface configuration - profile settings overview

Clock Configuration

Clock Configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Spread spectrum	Disabled	Disabled	Disabled	Disabled	Disabled	
Unused PCI slot clocks	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 279: 855GME - (XTX) Clock configuration - profile setting overview

IDE Configuration

IDE Configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
OnBoard PCI IDE controller	Primary	**Both**	**Both**	Primary	**Both**	
Onboard PCI IDE operate mode	Legacy mode	Legacy mode	Legacy mode	Legacy mode	Legacy mode	
Hard disk write protect	Disabled	Disabled	Disabled	Disabled	Disabled	
IDE Detect Time Out (Sec)	35	35	35	35	35	
ATA(PI) 80 pin cable detection	Host & device	Host & device	Host & device	Host & device	Host & device	
Primary IDE Master						
Type	Auto	Auto	Auto	Auto	Auto	
LBA/Large Mode	Auto	Auto	Auto	Auto	Auto	
Block (Multi-Sector Transfer)	Auto	Auto	Auto	Auto	Auto	
PIO Mode	Auto	Auto	Auto	Auto	Auto	
DMA Mode	Auto	Auto	Auto	Auto	Auto	
S.M.A.R.T.	Auto	Auto	Auto	Auto	Auto	
32Bit data transfer	Enabled	Enabled	Enabled	Enabled	Enabled	
Primary IDE slave						
Type	Auto	Auto	Auto	Auto	Auto	
LBA/Large Mode	Auto	Auto	Auto	Auto	Auto	
Block (Multi-Sector Transfer)	Auto	Auto	Auto	Auto	Auto	
PIO Mode	Auto	Auto	Auto	Auto	Auto	
DMA Mode	Auto	Auto	Auto	Auto	Auto	
S.M.A.R.T.	Auto	Auto	Auto	Auto	Auto	
32Bit data transfer	Enabled	Enabled	Enabled	Enabled	Enabled	
Secondary IDE Master						
Type	Auto	Auto	Auto	Auto	Auto	
LBA/Large Mode	Auto	Auto	Auto	Auto	Auto	
Block (Multi-Sector Transfer)	Auto	Auto	Auto	Auto	Auto	
PIO Mode	Auto	Auto	Auto	Auto	Auto	
DMA Mode	Auto	Auto	Auto	Auto	Auto	
S.M.A.R.T.	Auto	Auto	Auto	Auto	Auto	
32Bit data transfer	Enabled	Enabled	Enabled	Enabled	Enabled	
Secondary IDE slave						
Type	Auto	Auto	Auto	Auto	Auto	
LBA/Large Mode	Auto	Auto	Auto	Auto	Auto	

Table 280: 855GME - (XTX) IDE configuration - profile setting overview

Secondary IDE slave	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Block (Multi-Sector Transfer)	Auto	Auto	Auto	Auto	Auto	
PIO Mode	Auto	Auto	Auto	Auto	Auto	
DMA Mode	Auto	Auto	Auto	Auto	Auto	
S.M.A.R.T.	Auto	Auto	Auto	Auto	Auto	
32Bit data transfer	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 280: 855GME - (XTX) IDE configuration - profile setting overview

USB configuration

USB configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
USB Function	4 USB Ports	4 USB Ports	4 USB Ports	4 USB Ports	4 USB Ports	
Legacy USB Support	Enabled	Enabled	Enabled	Enabled	Enabled	
USB Keyboard Legacy Support	Enabled	Enabled	Enabled	Enabled	Enabled	
USB Mouse Legacy Support	Disabled	Disabled	Disabled	Disabled	Disabled	
USB Storage Device Support	Enabled	Enabled	Enabled	Enabled	Enabled	
Port 64/60 Emulation	Disabled	Disabled	Disabled	Disabled	Disabled	
USB 2.0 Controller	Enabled	Enabled	Enabled	Enabled	Enabled	
USB 2.0 Controller Mode	HiSpeed	HiSpeed	HiSpeed	HiSpeed	HiSpeed	
BIOS EHCI Hand-Off	Disabled	Disabled	Disabled	Disabled	Disabled	
USB Beep Message	Enabled	Enabled	Enabled	Enabled	Enabled	
USB Stick Default Emulation	Hard Disk	Hard Disk	Hard Disk	Hard Disk	Hard Disk	
USB Mass Storage Reset Delay	20 Sec	20 Sec	20 Sec	20 Sec	20 Sec	

Table 281: 855GME - (XTX) USB configuration - profile setting overview

Keyboard/mouse configuration

Keyboard/mouse configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Boot-up Num-lock	On	On	On	On	On	
Typematic rate	Fast	Fast	Fast	Fast	Fast	
PS/2 mouse support	Disabled	**Enabled**	Disabled	Disabled	Disabled	

Table 282: 855GME (XTX) - keyboard/mouse configuration - profile setting overview

Remote access configuration

Remote access configuration	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Remote access	Disabled	Disabled	Disabled	Disabled	Disabled	
Serial port BIOS update	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 283: 855GME - (XTX) remote access configuration - profile setting overview

CPU board monitor

CPU board monitor	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Board temperature	-	-	-	-	-	
CPU temperature	-	-	-	-	-	
VcoreA	-	-	-	-	-	
VcoreB	-	-	-	-	-	
+3.3Vin	-	-	-	-	-	
+5Vin	-	-	-	-	-	
+5VSB	-	-	-	-	-	
VBAT	-	-	-	-	-	

Table 284: 855GME (XTX) - CPU board monitor - profile setting overview

Main Board/Panel Features

Main Board/Panel Features	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Panel control						
Select panel number	-	-	-	-	-	
Version	-	-	-	-	-	
Brightness	100	100	100	100	100	
Temperature		-	-	-	-	
Fan speed	-	-	-	-	-	
Keys/LEDs	-	-	-	-	-	
Main board monitor						
CMOS battery	-	-	-	-	-	
I/O	-	-	-	-	-	
Power supply	-	-	-	-	-	
Slide-in drive 1	-	-	-	-	-	
Slide-in drive 2	-	-	-	-	-	
Case 1	-	-	-	-	-	
Case 2	-	-	-	-	-	

Table 285: 855GME (XTX) Baseboard/Panel Features profile settings overview

Main board monitor	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Case 3	-	-	-	-	-	
Case 4	-	-	-	-	-	
CPU	-	-	-	-	-	
Legacy devices						
COM C	Disabled	**Enabled**	Disabled	**Enabled**	**Enabled**	
Base I/O address	-	**3E8h**	-	**3E8h**	**3E8h**	
Interrupt	-	**11**	-	**11**	**11**	
COM D	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address						
Interrupt						
COM E	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address						
Interrupt						
CAN	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address						
Interrupt						
ETH2 LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	
ETH2 MAC Address	-	-	-	-	-	
Versions						
BIOS	-	-	-	-	-	
MTCX PX32	-	-	-	-	-	
MTCX FPGA	-	-	-	-	-	
Optimized ID	-	-	-	-	-	
Device ID	-	-	-	-	-	
Compatibility ID	-	-	-	-	-	
Serial number	-	-	-	-	-	
Product name	-	-	-	-	-	
User serial OD	-	-	-	-	-	

Table 285: 855GME (XTX) Baseboard/Panel Features profile settings overview

Boot

Boot	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Boot Priority Selection	Type Based	Type Based	Type Based	Type Based	Type Based	
1st Boot Device	Primary master	**Onboard LAN**	Primary master	Primary master	Primary master	
2nd Boot Device	Primary slave	**Primary master**	Primary slave	Primary slave	Primary slave	
3rd Boot Device	USB floppy	**Primary slave**	USB floppy	USB floppy	USB floppy	
4th Boot Device	USB removable device	**USB floppy**	USB removable device	USB removable device	USB removable device	
5th Boot Device	USB hard disk	**USB removable device**	USB hard disk	USB hard disk	USB hard disk	
6th Boot Device	USB CDROM	**USB CDROM**	USB CDROM	USB CDROM	USB CDROM	
7th Boot Device	Disabled	**Secondary master**	**Secondary master**	Disabled	**Secondary master**	
8th Boot Device	Disabled	Disabled	**Secondary slave**	Disabled	**Secondary slave**	
Quick Boot	Enabled	Enabled	Enabled	Enabled	Enabled	
Quiet Boot	Disabled	Disabled	Disabled	Disabled	Disabled	
Automatic Boot List Retry	Disabled	Disabled	Disabled	Disabled	Disabled	
Add-On ROM Display Mode	Keep Current	Keep Current	Keep Current	Keep Current	Keep Current	
Halt On Error	Disabled	Disabled	Disabled	Disabled	Disabled	
Hit 'DEL' Message Display	Enabled	Enabled	Enabled	Enabled	Enabled	
Interrupt 19 Capture	Disabled	Disabled	Disabled	Disabled	Disabled	
PXE boot to LAN (ETH1)	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Power Loss Control	Turn On	Turn On	Turn On	Turn On	Turn On	

Table 286: 855GME (XTX) - boot - profile setting overview

Security

Security	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Supervisor Password	-	-	-	-	-	
User Password	-	-	-	-	-	
Change Supervisor Password	-	-	-	-	-	
Change User Password	-	-	-	-	-	
Boot Sector Virus Protection	Disabled	Disabled	Disabled	Disabled	Disabled	
Hard disk security user password	-	-	-	-	-	
Hard disk security master password	-	-	-	-	-	
END-key loads CMOS default	Yes	Yes	Yes	Yes	Yes	

Table 287: 855GME (XTX) - security - profile setting options

Power

Power	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Power Management/APM	Enabled	Enabled	Enabled	Enabled	Enabled	
Video Power Down Mode	Suspend	Suspend	Suspend	Suspend	Suspend	
Hard Disk Power Down Mode	Suspend	Suspend	Suspend	Suspend	Suspend	
Standby time out	Disabled	Disabled	Disabled	Disabled	Disabled	
Suspend Time Out	Disabled	Disabled	Disabled	Disabled	Disabled	
Keyboard & PS/2 Mouse	MONITOR	MONITOR	MONITOR	MONITOR	MONITOR	
FDC/LPT/COM ports	MONITOR	MONITOR	MONITOR	MONITOR	MONITOR	
Primary master IDE	MONITOR	MONITOR	MONITOR	MONITOR	MONITOR	
Primary slave IDE	MONITOR	MONITOR	MONITOR	MONITOR	MONITOR	
Secondary master IDE	MONITOR	MONITOR	MONITOR	MONITOR	MONITOR	
Secondary slave IDE	MONITOR	MONITOR	MONITOR	MONITOR	MONITOR	
Power Button Mode	On/Off	On/Off	On/Off	On/Off	On/Off	
Resume On Ring	Disabled	Disabled	Disabled	Disabled	Disabled	
Resume on PME#	Disabled	Disabled	Disabled	Disabled	Disabled	
Resume On RTC Alarm	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 288: 855GME (XTX) - power - profile setting overview

1.4 BIOS Error signals (beep codes)

While the Automation PC 620 is booting, the following messages and errors can occur with BIOS. These errors are signaled by different beeping codes.

1.4.1 BIOS 815E (ETX) and 855GME (ETX)

Beeping code	Meaning	Necessary user action
1	Everything OK	-
1-2	1x long 2x short - checksum error in the ROM	BIOS updates
1-2-2-3	BIOS checksum error	BIOS updates.
1-3-1-1	Test DRAM refresh, DRAM module is not set properly.	Send industrial PC to B&R for checking.
1-3-1-3	Test 8742 keyboard controller, self test of the keyboard controller failed.	Send industrial PC to B&R for checking.
1-3-4-1	RAM error at address xxxx	Send industrial PC to B&R for checking.
1-3-4-3	RAM error at data bit xxxx, at the lowest bit of the memory bus	Send industrial PC to B&R for checking.
1-4-1-1	RAM error at data bit xxxx, at the highest bit of the memory bus	Send industrial PC to B&R for checking.
2-1-2-3	ROM copyright has an error	Send industrial PC to B&R for checking.
2-2-3-1	Unexpected interrupt	Check interrupt settings in BIOS.

Table 289: BIOS post code messages BIOS 815E (ETX) and 855GME (ETX)

1.4.2 BIOS 855GME (XTX)

Beeping code	Meaning	Necessary user action
1x short	Memory refresh failed.	Load BIOS defaults. In the event that the error persists, send industrial PC to B&R for testing.
2x short	Parity error: POST error (error in one of the hardware testing procedures)	Check the placement of the inserted card. In the event that the error persists, send industrial PC to B&R for testing.
3x short	Base 64 KB memory failure: Basic memory defect, RAM error within the initial 64 KB.	Send industrial PC to B&R for checking.
4x short	Timer not operational: System timer.	Send industrial PC to B&R for checking.
5x short	Processor error: Processor defect.	Send industrial PC to B&R for checking.
6x short	8042 gate A20 failure: Keyboard controller defect (block 8042/ A20 gate). Processor cannot switch to protected mode.	Send industrial PC to B&R for checking.
7x short	Processor exception interrupt error: Virtual mode exception error (CPU generated an interrupt error.	Send industrial PC to B&R for checking.
8x short	Display memory read/write error: Video memory not accessible; graphic card defect or not built in (no fatal error).	Check inserted graphic card position and eventually exchange. In the event that the error persists, send industrial PC to B&R for testing.
9x short	ROM-checksum error: ROM-BIOS-checksum incorrect, EPROM, EEPROM or Flash-ROM component defect, BIOS defect or incorrectly updated.	Send industrial PC to B&R for checking.

Table 290: BIOS post code messages BIOS 855GME (XTX)

Beeping code	Meaning	Necessary user action
10x short	CMOS shutdown register read/write error: CMOS cannot be read/written.	Send industrial PC to B&R for checking.
11x short	Cache Error / external Cache bad: L2 - Cache on the mainboard is defected.	Send industrial PC to B&R for checking.

Table 290: BIOS post code messages BIOS 855GME (XTX) (Forts.)

1.5 Distribution of resources

1.5.1 RAM address assignment

RAM address	Resource
000000h - 0003FFh	Interrupt vectors
000400h - 09FFFFh	MS-DOS program area
0A0000h - 0AFFFFh	VGA graphics
0B8000h - 0BBFFFh	VGA Text Mode
0C0000h - 0CFFFFh	VGA BIOS
0D0000h - 0CFFFFh	VGA BIOS freely available.
0E0000h - 0EBFFFh	USB
0E4000h - 0FFFFFh	System BIOS (Phoenix)
100000h -	SDRAM

Table 291: RAM address assignment

1.5.2 DMA channel assignment

DMA channel	Resource
0	Available
1	Available
2	Floppy disk drive (FDC)
3	LPT (ECP) [1)]
4	Reserved
5	Available
6	Available
7	Available

Table 292: DMA channel assignment

1) Available if LPT is not being operated in ECP mode.

1.5.3 I/O address assignment

I/O address	Resource
000h -01Fh	DMA controller 1
020h - 03Fh	Interrupt controller 1
040h - 05Fh	Timer
060h - 06Fh	Keyboard controller
070h - 071h	Real-time clock, NMI mask, CMOS
080h	Debug port (POST code)
081h - 09Fh	Page register - DMA controller
0A0h - 0BFh	Interrupt controller 2
0C0h - 0DFh	DMA controller 2
0F0h - 0FFh	FPU
170h - 177h	Secondary Hard Disk IDE channel
1F0h - 1F7h	Primary Hard Disk IDE channel
238h - 023F	COM5
278h - 27Fh	Hardware Security Key (LPT2)
2E8h - 2EFh	COM4
2F8h - 2FFh	COM2
376h - 376h	Secondary Hard Disk IDE channel
378h - 37Fh	LPT1 (printer connection)
384h - 385h	CAN controller
3B0h - 3BBh	VGA controller
3BCh - 3BFh	LPT3
3C0h - 3DFh	VGA controller
3E8h - 3EFh	COM3
3F6h - 3F6h	Primary Hard Disk IDE channel
3F0h - 3F7h	FDD controller
3F8h - 3FFh	COM1
LPT1 + 400h	ECP Port, LPT+400h
CF8h - CFBh	PCI config address register
CFCh - CFFh	PCI config data register
4100h - 417Fh	MTCX
FF00h - FF07h	IDE bus master register

Table 293: I/O address assignment

1.5.4 Interrupt assignments in PCI mode

IRQ		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	NMI	NONE
System timer		●																	
Keyboard			●																
IRQ cascade				●															
COM1 (Serial port A)					❍	●													
COM2 (Serial port B)					●	❍													
LPT1					❍	❍	❍	❍	●		❍	❍	❍	❍		❍			❍
LPT2					❍	❍	❍	❍	❍		❍	❍	❍	❍		❍			●
LPT3					❍	❍	❍	❍	❍		❍	❍	❍	❍		❍			●
PS/2 mouse														●					
ACPI[1)]											●								
FDD								●											❍
Real-time clock										●									
Coprocessor (FPU)															●				
Primary IDE channel																●			
Secondary IDE channel																	●		
B&R	COM3 (COM C)				❍	❍	❍		❍			❍	❍	❍					●
	COM4 (COM D)				❍	❍	❍		❍			❍	❍	❍					●
	COM5 (COM E)				❍	❍	❍		❍			❍	❍	❍					●
	CAN											❍						❍	●

Table 294: IRQ interrupt assignments in PCI mode

1) **A**dvanced **C**onfiguration and **P**ower **I**nterface.

● ... Default setting
❍ ... Optional setting

1.5.5 Interrupt assignments in APIC mode

A total of 23 IRQs are available in the APIC mode (**A**dvanced **P**rogrammable **I**nterrupt **C**ontroller). The activation of this option is only effective if it takes place before the operating system (Windows XP) is activated. There are then 23 IRQs available.

IRQ		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	NMI	NONE
System timer		●																									
Keyboard			●																								
IRQ cascade				●																							
COM1 (Serial port A)					❍	●																					
COM2 (Serial port B)					●	❍																					
LPT1					❍	❍	❍	❍	●		❍	❍	❍	❍		❍											❍
LPT2					❍	❍	❍	❍	❍		❍	❍	❍	❍		❍											●
PS/2 mouse														●													
ACPI[1)]											●																
FDD								●																			❍
Real-time clock										●																	
Coprocessor (FPU)															●												
Primary IDE channel																●											
Secondary IDE channel																	●										
B&R	COM3 (COM C)				❍	❍	❍		❍			❍	❍	❍													●
	COM4 (COM D)				❍	❍	❍		❍			❍	❍	❍													●
	COM5 (COM E)				❍	❍	❍		❍			❍	❍	❍													●
	CAN											❍														❍	●
PIRQ A [2)]																		●									
PIRQ B [3)]																			●								
PIRQ C [4)]																				●							
PIRQ D [5)]																					●						
PIRQ E [6)]																						●					
PIRQ F																							●				
PIRQ G																								●			
PIRQ H [7)]																									●		

Table 295: IRQ interrupt assignments in APIC mode

1) **A**dvanced **C**onfiguration and **P**ower **I**nterface.
2) PIRQ A: for PCI; PCI IRQ line 1 + USB UHCI controller #1 + graphics controller.
3) PIRQ B: for PCI; PCI IRQ line 2 + AC97 Audio controller + SM Bus.
4) PIRQ C: for PCI; PCI RIQ line 3 + USB UHCI controller #3 + native IDE.
5) PIRQ D: for PCI; PCI IRQ line 4 + USB UHCI controller #2.
6) PIRQ E: LAN controller.
7) PIRQ H: USB EHCI controller.

● ... Default setting
❍ ... Optional setting

The PCI resources are assigned to fixed IRQ lines when the APIC function is enabled. The following image shows the connections to the individual PCI slots.

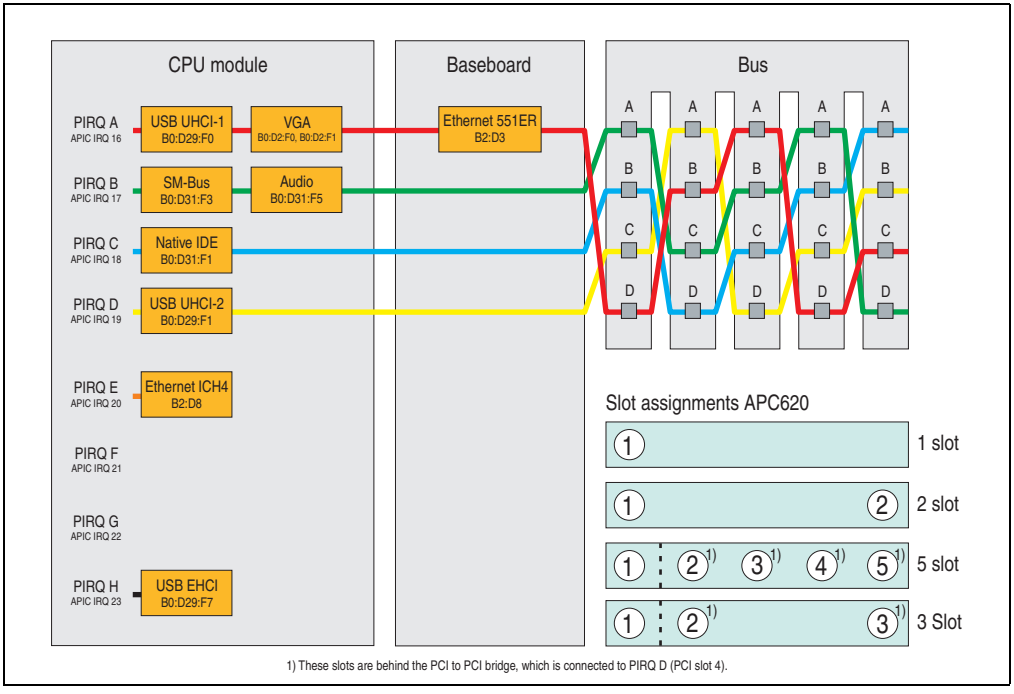


Figure 270: PCI routing with activated APIC CPU boards 815E (ETX), 855GME (ETX)

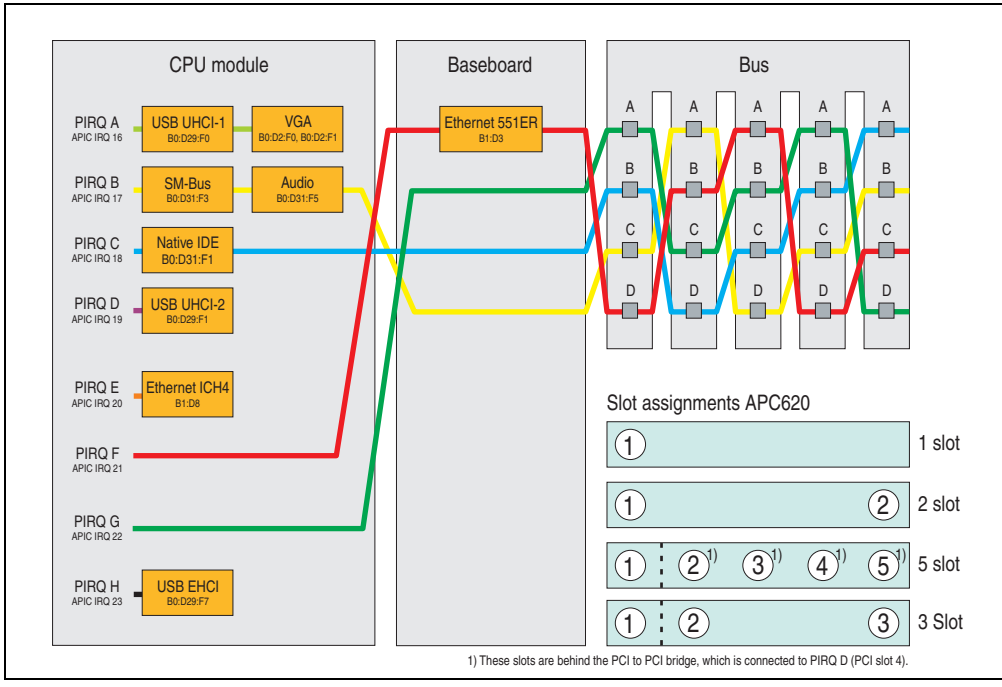


Figure 271: PCI routing with activated APIC CPU boards 855GME (XTX)

1.5.6 Inter-IC (I²C) bus

I²C address	Resource	Note
A0h	EEPROM	EEPROM for CMOS data - cannot be used
B0h	Reserved	Cannot be used
58h	Reserved	Cannot be used

Table 296: Inter-IC (I²C) bus resources

1.5.7 System Management (SM) bus

SM Bus address	SM device	Note
12h	SMART_CHARGER	
14h	SMART_SELECTOR	
16h	SMART_BATTERY	
D2h	Clock Generator	

Table 297: Inter-IC (I²C) bus resources

2. Upgrade information

2.1 BIOS upgrade

Warning!

The upgrade procedures described in the following pages must be carried out for all APC620/PPC700 systems with software versions lower than those listed in the following table.

CPU board software	815E (ETX)	855GME (ETX)
BIOS	< R017	< R007
MTCX PX32 firmware	< V1.19	< V1.19
MTCX FPGA firmware	< V1.06	< V1.06

Table 298: CPU board software versions

Automation Panel Link	Transceiver (5DLSDL.1000-01)	Receiver (5DLSDL.1000-00)
SDLR version	< V0.03	< V0.03

Table 299: Automation panel link software versions

An upgrade might be necessary for the following reason:

- To update implemented functions or to add newly implemented functions or components to the BIOS setup (information about changes can be found in the Readme files of the BIOS upgrade).

2.1.1 What information do I need?

Information:

Individually saved BIOS settings are deleted when upgrading the BIOS.

Before starting the upgrade, you should know the CPU board type (815E or 855GME) and the various software versions.

Which CPU board do I have?

After switching on the PPC700, the installed CPU board can be identified by the letters "B" and "C".

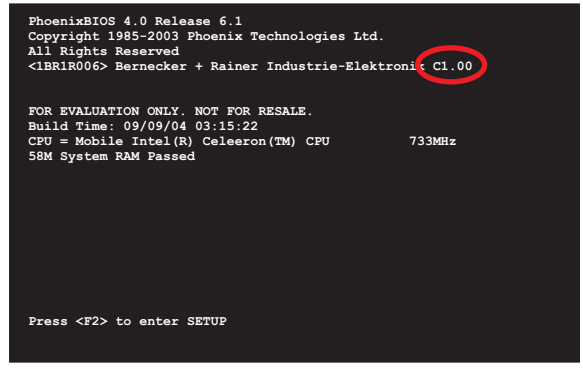


Figure 272: Differentiating between 815E and 855GME CPU boards

Letter	CPU board	Model number
B	855GME (ETX)	5PC600.E855-00 5PC600.E855-01 5PC600.E855-02 5PC600.E855-03 5PC600.E855-04 5PC600.E855-05
C	815E (ETX)	5PC600.E815-00 5PC600.E815-02 5PC600.E815-03
E	855GME (XTX)	5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04 5PC600.X855-05

Table 300: Differentiating between 815E (ETX) and 855GME (ETX / XTX) CPU boards

Which BIOS version and firmware are already installed on the PPC700?

This information can be found on the same BIOS setup page for both the 815E (ETX) and the 855GME (ETX / XTX)CPU boards:

- After switching on the PPC700, you can get to the BIOS Setup by pressing "F2" or "DEL".
- From the BIOS main menu "advanced" (top), select "baseboard/panel features" (bottom):

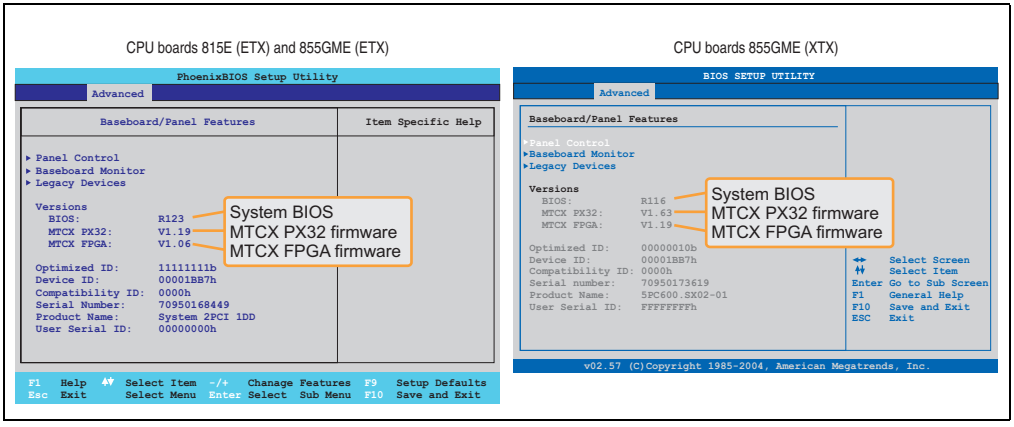


Figure 273: Software versions

Which firmware is installed on the Automation Panel Link transceiver/receiver?

This information can be found on the same BIOS setup page for both the 815E (ETX) and the 855GME (ETX / XTX)CPU boards:

- After switching on the PPC700, you can get to the BIOS Setup by pressing "F2" or "DEL".
- From the BIOS main menu "advanced" (top), select "baseboard/panel features" (bottom) and then "panel control":

Information:

The version can only be shown if an Automation Panel with Automation Panel Link SDL transceiver (5DLSDL.1000-01) and Automation Panel Link SDL receiver (5DLSDL.1000-00) is connected.

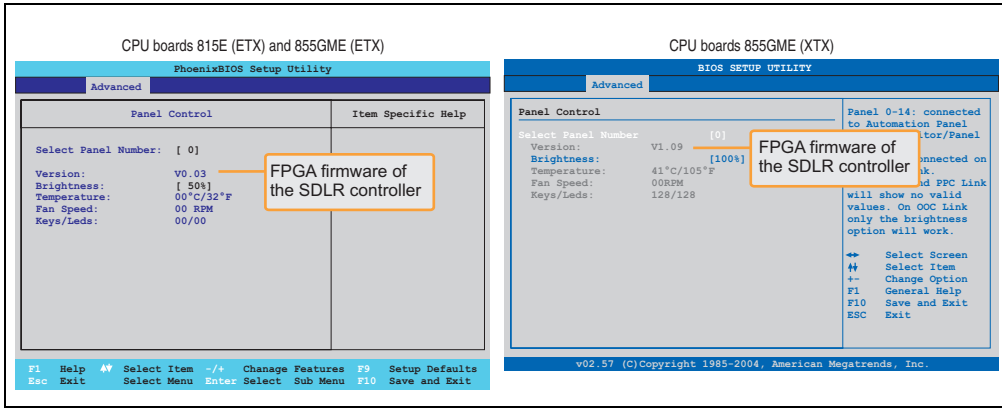


Figure 274: Firmware version of Automation Panel Link SDL transceiver/receiver

2.1.2 Upgrade BIOS for 815E (ETX)

- Create bootable MS-DOS startup disk.

Information:

In MS-DOS, Win95 and Win98, a blank HD disk can be made bootable using the command line command "sys a:" or "format a: /s".

Information concerning creating a bootable diskette in Windows XP cab be found on page 438.

- Copy the contents of the *.zip file to the bootable media. If the B&R upgrade was already added when the bootable media was created using the B&R Embedded OS Installer, then this step is not necessary.
- Connect the bootable media to the PPC700 and reboot the device.
- The following start menu will be shown after booting:

```
1. Upgrade PHOENIX BIOS for i815E (5PC600.E815-xx)

2. Exit to MS-DOS
```

Concerning point 1:
BIOS is automatically upgraded (default after 5 seconds).

Concerning point 2:
Returns to the shell (MS-DOS).

- The system must be rebooted after a successful upgrade.

Information:

When the system has rebooted, setup default values must be reloaded after the message, "`System CMOS checksum bad`" (press F1 or select "load setup defaults" in the BIOS setup "exit" menu). Afterwards, the time and date must be set again.

2.1.3 Upgrade BIOS for 855GME (ETX)

- Create bootable media.

Information:

In MS-DOS, Win95 and Win98, a blank HD disk can be made bootable using the command line command "sys a:" or "format a: /s".

Information concerning creating a bootable diskette in Windows XP cab be found on page 438.

Information concerning creating a USB flash drive for a B&R upgrade can be found on page 528.

Information concerning creating a CompactFlash card for a B&R upgrade can be found on page 530.

- Copy the contents of the *.zip file to the bootable media. If the B&R upgrade was already added when the bootable media was created using the B&R Embedded OS Installer, then this step is not necessary.
- Connect the bootable media to the Panel PC 700 and reboot the device.
- The following start menu will be shown after booting:

```
1. Upgrade PHOENIX BIOS for i855GME (5PC600.E855-xx)

2. Exit to MS-DOS
```

Concerning point 1:
BIOS is automatically upgraded (default after 5 seconds).

Concerning point 2:
Returns to the shell (MS-DOS).

- The system must be rebooted after a successful upgrade.

Information:

When the system has rebooted, setup default values must be reloaded after the message, "`System CMOS checksum bad`" (press F1 or select "load setup defaults" in the BIOS setup "exit" menu).

Starting with BIOS version V1.15, the time and date no longer has to be set again after a BIOS upgrade (stays the same).

2.1.4 Upgrade BIOS for 855GME (XTX)

- Create bootable media.

Information:

In MS-DOS, Win95 and Win98, a blank HD disk can be made bootable using the command line command "sys a:" or "format a: /s".

Information concerning creating a bootable diskette in Windows XP cab be found on page 438.

Information concerning creating a USB flash drive for a B&R upgrade can be found on page 528.

Information concerning creating a CompactFlash card for a B&R upgrade can be found on page 530.

- Copy the contents of the *.zip file to the bootable media. If the B&R upgrade was already added when the bootable media was created using the B&R Embedded OS Installer, then this step is not necessary.
- Connect the bootable media to the Panel PC 700 and reboot the device.
- The following start menu will be shown after booting:

```
1. Upgrade PHOENIX BIOS for i855GME (5PC600.X855-xx)

2. Exit to MS-DOS
```

Concerning point 1:
BIOS is automatically upgraded (default after 5 seconds).

Concerning point 2:
Returns to the shell (MS-DOS).

- The system must be rebooted after a successful upgrade.

Information:

After the system restart, the warning "CMOS checksum BAD" is displayed, but BIOS boots through it. The setup can be opened using the "Del" key and the setup defaults must be loaded again using either the "F9" key or the menu item "Exit" - "Load CMOS defaults".

2.1.5 Windows XP Embedded and BIOS upgrade

If the following error message appears after upgrading BIOS:

```
"Copy Error"

"Setup cannot copy the file Audio3d.dll"
```

then the audio driver must be reinstalled.

To do this, use the audio driver from the B&R Homepage (**www.br-automation.com**).

During the installation of the audio driver, the following 2 files must be manually selected from the following directories.

ksuser.dll in the directory ...\Windows\system32

ks.sys in the directory ...\Windows\system32\drivers

This applies to 815E and 855ME CPU boards.

The graphics driver must be re-installed to enable all possible resolutions when using an 815E CPU board.

2.2 Upgrade the firmware

With the APC620 / Panel PC firmware upgrade (MTCX, SDLR), the firmware of a number of controllers (MTCX, SDLR) can be updated, depending on the construction of the PPC700 system.

2.2.1 Procedure

- Create bootable media.

Information:

In MS-DOS, Win95 and Win98, a blank HD disk can be made bootable using the command line command "sys a:" or "format a: /s".

Information concerning creating a bootable diskette in Windows XP cab be found on page 438.

Information concerning creating a USB flash drive for a B&R upgrade can be found on page 528.

Information concerning creating a CompactFlash card for a B&R upgrade can be found on page 530.

- Copy the contents of the *.zip file to the bootable media. If the B&R upgrade was already added when the bootable media was created using the B&R Embedded OS Installer, then this step is not necessary.
- Connect the bootable media to the Panel PC 700 and reboot the device.

Information:

- **The following boot menu options including descriptions are based on version 1.28 of the APC620 / Panel PC Firmware upgrade (MTCX, SDLR) disk. In some cases, these descriptions might not match the version you are currently using.**

Boot menu options:

```
1. Upgrade MTCX (APC620/PPC700) PX32 and FPGA
2. Upgrade SDLT (APC620) only
3. Upgrade SDLR (AP800/AP900) on monitor/panel
   3.1. Upgrade SDLR on AP 0 (AP800/AP900)
   3.2. Upgrade SDLR on AP 1 (AP800/AP900)
```

```
   3.3. Upgrade SDLR on AP 2 (AP800/AP900)

   3.4. Upgrade SDLR on AP 3 (AP800/AP900)

   3.5. Upgrade all SDLR (AP800/AP900)

   3.6. Return to main menu

4. Upgrade SDLR (AP800/AP900) on AP link slot

   4.1. Upgrade SDLR on AP 8 (AP800/AP900)

   4.2. Upgrade SDLR on AP 9 (AP800/AP900)

   4.3. Upgrade SDLR on AP 10 (AP800/AP900)

   4.4. Upgrade SDLR on AP 11 AP800/AP900)

   4.5. Upgrade all SDLR (AP800/AP900)

   4.6. Return to main menu

5. Upgrade Add-on UPS (Firmware and Battery Settings).

   5.1. Upgrade Add-on UPS Firmware (5AC600.UPSI-00)

   5.2. Upgrade Battery Settings (5AC600.UPSB-00)

   5.3. Return to main menu

6. Exit
```

Concerning point 1:
Automatically upgrade PX32 and FPGA for MTCX (default after 5 seconds).

Concerning point 2:
The FPGA of the SDLT controller on the AP Link slot is automatically updated.

Concerning point 3:
Submenu 1 is opened for upgrading the SDLR controller on the Monitor/Panel plug.

3.1. Upgrade SDLR on AP 0 (AP800/AP900) - The SDLR controller on Automation Panel 0 is automatically updated.

3.2. Upgrade SDLR on AP 1 (AP800/AP900) - The SDLR controller on Automation Panel 1 is automatically updated.

3.3. Upgrade SDLR on AP 2 (AP800/AP900) - The SDLR controller on Automation Panel 2 is automatically updated.

3.4. Upgrade SDLR on AP 3 (AP800/AP900) - The SDLR controller on Automation Panel 3 is automatically updated.

3.5. Upgrade all SDLR (AP800/AP900) - All SDLR controllers on all Automation Panels on the monitor/panel are automatically upgraded (default after 5 sec).

3.6. Return to Main Menu

Concerning point 4:
Submenu 2 is opened for upgrading the SDLR controller on the AP Link slot.

4.1. Upgrade SDLR on AP 8 (AP800/AP900) - The SDLR controller on Automation Panel 8 is automatically updated.

4.2. Upgrade SDLR on AP 9 (AP800/AP900) - The SDLR controller on Automation Panel 9 is automatically updated.

4.3. Upgrade SDLR on AP 10 (AP800/AP900) - The SDLR controller on Automation Panel 10 is automatically updated.

4.4. Upgrade SDLR on AP 11 (AP800/AP900) - The SDLR controller on Automation Panel 11 is automatically updated.

4.5. Upgrade all SDLR (AP800/AP900) - All SDLR controllers on all Automation Panels on the AP Link slot are automatically upgraded (default after 5 sec).

4.6. Return to Main Menu

Concerning point 5:
Submenu 3 for the add-on UPS firmware and upgrade and the battery settings upgrade is opened.

5.1. Upgrade add-on UPS firmware (5AC600.UPSI-00)- The firmware for the add-on UPSI is automatically upgraded.

5.2. Upgrade battery settings (5AC600.UPSB-00) - The battery settings for 5AC600.UPSB-00 are automatically upgraded.

5.3. Return to Main Menu

Concerning point 6:
Returns to the shell (MS-DOS).

Information:

The system must be powered off and on again after a successful controller upgrade.

2.2.2 Possible upgrade problems and version dependencies

1. The SDLR firmware can only be updated if an Automation Panel with Automation Panel Link Transceiver (5DLSDL.1000-01) and Automation Panel Link Receiver (5DLSDL.1000-00) is connected. This update is only permitted in an office environment (clean environment - no disturbances) because a software error in versions older than V0.03 can cause errors. This error

can cause the Automation Panel to remain off after an update. If this error occurs, the Automation Panel Link Transceiver (5DLSDL.1000-01) or Automation Panel Link Receiver (5DLSDL.1000-00) must be exchanged or sent in for repair.

2. Daisy Chain operation of 2 Automation Panel 900 units is supported starting with SDLR version V00.08 or V01.01 and MTCX PX32 V01.33 and MTCX FPGA V01.11 (contents of the MTCX upgrade disk V01.04).

3. Operation of an SDLT adapter in the AP Link slot is supported starting with MTCX PX32 V01.50 and MTCX FPGA V01.12 (contents of the MTCX upgrade disk V01.07).

4. When using a functional SDL connection with an installed SDLR version V00.03 or lower, the SDLR must first be updated to version V00.05 or higher. Only then can the MTCX PX32 and FPGA be updated. If the MTCX PX32 and FPGA is updated first, then the SDLR FW can no longer be updated.

5. Starting with SDLR version V00.05 or V01.01, the MTCX PX32 must be higher than or equal to V01.23 and the MTCX FPGA must higher than or equal to V01.09. Otherwise, full SDL functionality is not possible.

6. SDL with equalizer is first supported starting with SDLR version V01.04 and MTCX PX32 version V01.55 and MTCX FPGA version V01.15. An SDLT with version V00.02 is required on the AP Link slot (contents of the MTCX upgrade disk V01.10). SDL with equalizer allows longer distances (max. 40m) depending on the AP being used. Detailed information for this can be found in the APC620 or PPC700 user's manual.

7. Automation Panel Link transceivers (5DLSDL.1000-01) or Automation Panel Link receivers (5DLSDL.1000-00) with a Firmware version lower than or equal to V00.10 can no longer be combined with Automation Panel Link transceivers (5DLSDL.1000-01) or Automation Panel Link receivers (5DLSDL.1000-00) with a Firmware higher than or equal to V01.04. Daisy Chain mode is not possible with such a combination.

8. The menu items "2. Upgrade MTCX PX32 only" and "3. Upgrade MTCX FPGA only" have been removed from the boat menu starting with MTCX Upgrade Disk V01.13.

9. The menu items "3. Upgrade SDLR on Monitor/Panel" and "4. Upgrade SDLR on AP Link Slot" (starting with MTCX upgrade disk V01.13) for upgrading the Automation Panel 800 series have been expanded.

10. The ID AP8H was changed to SDL8 (AP800 series).

11. The menu item "5. Upgrade add-on UPS (firmware and battery settings)", starting with MTCX upgrade disk V01.16, has been inserted.

12. Starting with MTCX upgrade disk V01.16, all firmware files are equipped with an XML header; as a result, the name assignment has changed (compatible with Automation Studio and Automation Runtime).

13. If a UPS (e.g. 5AC600.UPSI-00) + battery unit (e.g. 5AC600.UPSB-00) is connected to the system and operable, then after an upgrade of the MTCX or SDLT you must either disconnect the battery or push the Power button (to put the system in Standby mode), before executing the required power off/on. If not, the firmware upgrade will not work because the UPS buffers the system.

14. Starting with UPS firmware V01.10, the APC620/PPC700 ADI driver + Control Center V01.80 should be used in order to configure the new options "configurable LowBatteryShutdownTime" and UL compliant "OverCurrentEnable".

15. The IF option Add-On Module CAN with SJA1000 (5AC600.CANI-01) is only supported starting with MTCX FPGA V01.23 (MTCX Upgrade DISK V01.24).

2.3 Creating an MS-DOS boot diskette in Windows XP

- Place an empty 1.44 MB HD diskette in the disk drive.
- Open Windows Explorer.
- Right-click on the 3½" floppy icon and select "**Format...**".

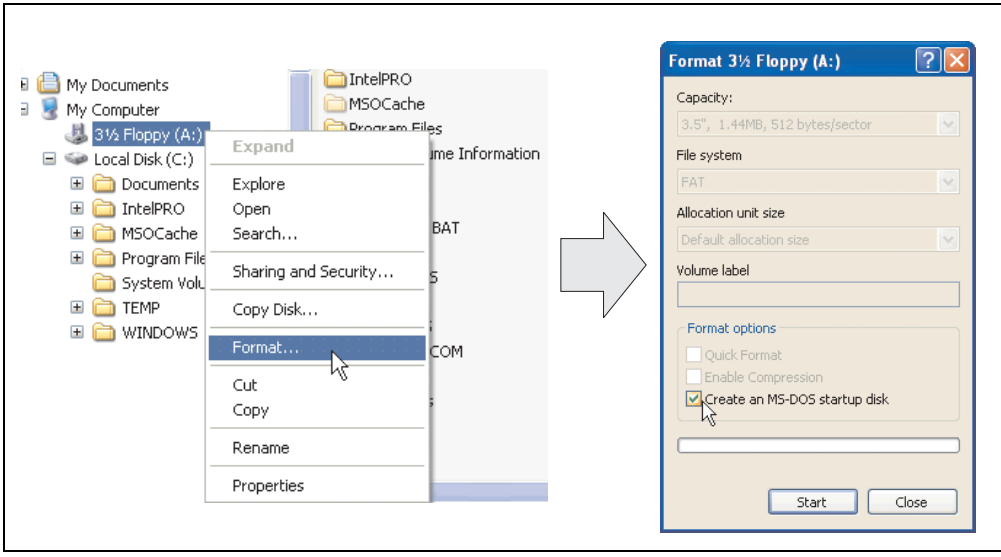


Figure 275: Creating a bootable diskette in Windows XP - step 1

- Then select the checkbox **"Create an MS-DOS startup disk"**, press **"Start"** and acknowledge the warning message with "OK".

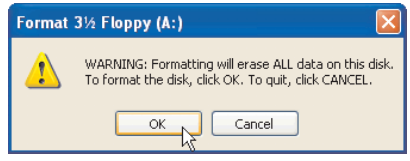


Figure 276: Creating a bootable diskette in Windows XP - step 2

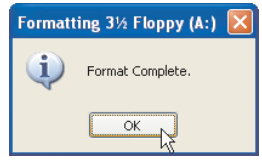


Figure 277: Creating a bootable diskette in Windows XP - step 3

After creating the startup disk, some of the files must be deleted because of the size of the update.

When doing this, all files (hidden, system files, etc.) must be shown on the diskette.

In Explorer, go to the Tools menu, select Folder Options... and open the View tab. Now deactivate the option Hide protected operating system files (Recommended) (activated by default) and activate the option Show hidden files and folders.

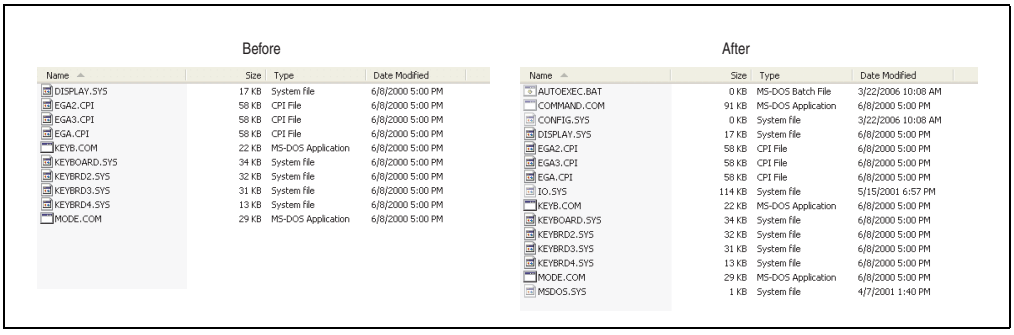


Figure 278: Creating a bootable diskette in Windows XP - step 4

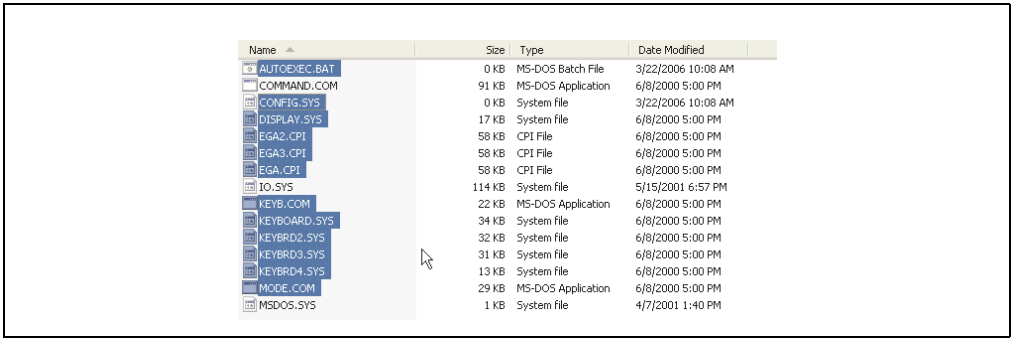


Figure 279: Creating a bootable diskette in Windows XP - step 5

Now all files (marked) except Command.com, IO.sys and MSDOS.sys can be deleted.

2.4 Creating a bootable USB flash drive for B&R upgrade files

When used in connection with a B&R industrial PC, it is possible to upgrade BIOS from one of the USB flash drives available from B&R. To do this, the USB flash drive must be prepared accordingly. This is done with the B&R Embedded OS Installer, which can be downloaded for free from the B&R homepage (**www.br-automation.com**).

2.4.1 Requirements

The following peripherals are required for creating a bootable USB flash drive:

- B&R USB flash drive
- B&R Industrial PC
- USB Media Drive
- B&R Embedded OS Installer (V3.00 or higher)

2.4.2 Procedure

- Connect the USB flash drive to the PC.
- If the drive list is not refreshed automatically, the list must be updated using the command **Drives > Refresh**.
- Mark the desired USB flash drive in the drive list.
- Change to the **Action** tab and select **Install a B&R Update to a USB flash drive** as type of action.
- Enter the path to the MS-DOS operating system files. If the files are part of a ZIP archive, then click on the button **By ZIP file...**. If the files are stored in a directory on the hard drive, then click on the button **By folder...**.
- In the **B&R Upgrade** text box, it's also possible to enter the path to the ZIP file for the B&R Upgrade Disk and select the file.
- Click on the **Start action** button in the toolbar.

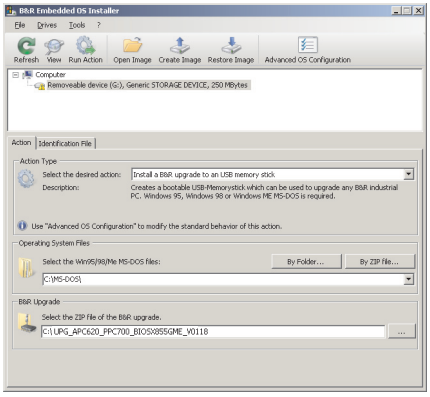


Figure 280: Creating a USB flash drive for B&R upgrade files

2.4.3 Where do I get MS-DOS?

Information concerning creating an MS-DOS boot diskette can be found in section 2.3 "Creating an MS-DOS boot diskette in Windows XP", on page 526. Then the files from the diskette are to be copied to your hard drive.

2.5 Creating a bootable CompactFlash card for B&R upgrade files

When used in connection with a B&R industrial PC, it is possible to upgrade BIOS from one of the CompactFlash cards available from B&R. To do this, the CompactFlash card must be prepared accordingly. This is done with the B&R Embedded OS Installer, which can be downloaded for free from the B&R homepage (**www.br-automation.com**).

2.5.1 Requirements

The following peripherals are required for creating a bootable CompactFlash card:

- CompactFlash card
- B&R Industrial PC
- B&R Embedded OS Installer (V3.10 or higher)

2.5.2 Procedure

- Insert the CompactFlash card in the CF slot on the industrial PC.
- If the drive list is not refreshed automatically, the list must be updated using the command **Drives > Refresh**.
- Select the desired CompactFlash card from the drive list.
- Change to the **Action** tab and select **Install a B&R Update to a CompactFlash card** as type of action.
- Enter the path to the MS-DOS operating system files. If the files are part of a ZIP archive, then click on the button **By ZIP file...**. If the files are stored in a directory on the hard drive, then click on the button **By folder...**.
- In the **B&R Upgrade** text box, it's also possible to enter the path to the ZIP file for the B&R Upgrade Disk and select the file.
- Click on the **Start action** button in the toolbar.

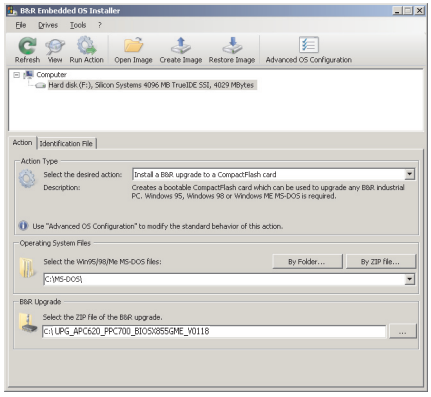


Figure 281: Creating a CompactFlash card for B&R upgrade files

2.5.3 Where do I get MS-DOS?

Information concerning creating an MS-DOS boot diskette can be found in section 2.3 "Creating an MS-DOS boot diskette in Windows XP", on page 526. Then the files from the diskette are to be copied to your hard drive.

2.6 Upgrade problems

Potential upgrade problems are listed in the Liesmich.txt or Readme.txt files on the upgrade disks.

3. Panel PC 700 with Windows XP Professional

Figure 282: Windows XP Professional Logo

Model number	Short description	Note
9S0000.08-010	**OEM Microsoft Windows XP Professional German** CD, German; Only delivered with a new PC.	Canceled since 10/2008
9S0000.08-020	**OEM Microsoft Windows XP Professional English** CD, English; Only delivered with a new PC.	Canceled since 10/2008
9S0000.09-090	**OEM Microsoft Windows XP Professional Multilanguage** CDs; Only delivered with a new PC.	Canceled since 10/2008
5SWWXP.0600-GER	**WinXP Professional with SP3, GER** Microsoft OEM Windows XP Professional Service Pack 3, CD, German. Only available with a new device.	
5SWWXP.0600-ENG	**WinXP Professional with SP3, ENG** Microsoft OEM Windows XP Professional Service Pack 3, CD, English. Only available with a new device.	
5SWWXP.0600-MUL	**WinXP Professional with SP3, MUL** Microsoft OEM Windows XP Professional Service Pack 3, CD, multi-language. Only available with a new device.	
5SWWXP.0500-GER	**WinXP Professional with SP 2c, GER** Microsoft OEM Windows XP Professional Service Pack 2c, CD, German. Only available with a new device.	
5SWWXP.0500-ENG	**WinXP Professional with SP 2c, ENG** Microsoft OEM Windows XP Professional Service Pack 2c, CD, English. Only available with a new device.	
5SWWXP.0500-MUL	**WinXP Professional with SP 2c, MUL** Microsoft OEM Windows XP Professional Service Pack 2c, CD, multi-language. Only available with a new device.	

Table 301: Model numbers - Windows XP Professional

3.1 Installation

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

3.1.1 Installation on PCI SATA RAID controller - 5ACPCI.RAIC-03, 5ACPCI.RAIC-05

The following steps are necessary for installing Windows XP Professional on the PCI SATA RAID controller:

1) Download the RAID driver from the B&R homepage (**www.br-automation.com**) and copy the files to a diskette.
2) Connect the Media Drive (5MD900.USB2-01 or 5MD900.USB-00) to the USB port.
3) Insert the diskette and Windows XP Professional CD in the the Media Drive and boot from the CD.
4) Press the F6 key during setup to install a third-party SCSI or a driver.
5) Press the "s" key when asked about installing an additional drive. Insert the disk in the floppy drive. Press "Enter" and select the driver.
6) Follow the setup instructions.
7) The setup copies the files to the Windows XP Professional folder and restarts the Panel PC 700.

Information:

- **Windows XP setup supports not all USB-FDD drives (see Microsoft KB 916196).**
- **Depending on the system it could be neccesary to change the boot order in BIOS.**

3.2 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**).

Information:

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

4. Panel PC 700 with Windows XP Embedded

Figure 283: Windows XP Embedded Logo

Model number	Short description	Note
9S0001.19-020	**OEM Microsoft Windows XP Embedded APC620 815E w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image for APC620 systems with a 815E CPU board. Only delivered with a new industrial PC.	Canceled since 10/2005
9S0001.20-020	**OEM Microsoft Windows XP Embedded APC620/PPC700 855GME w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image for APC620/PPC700 systems with a 855GME CPU board. Only delivered with a new industrial PC.	Canceled since 10/2007 Replacement type 5SWWXP.0415-ENG
9S0001.27-020	**OEM Microsoft Windows XP Embedded (incl. SP2) APC620 815E w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image including SP2 for APC620 systems with a 815E CPU board. Only delivered with a new industrial PC.	Canceled since 10/2005
9S0001.28-020	**OEM Microsoft Windows XP Embedded (incl. SP2) APC620/PPC700 855GME w/CF, English** 512 MB CompactFlash card with Windows XP Embedded image including SP2 for APC620/PPC700 systems with a 855GME CPU board. Only delivered with a new industrial PC.	Canceled since 10/2007 Replacement type 5SWWXP.0415-ENG
5SWWXP.0415-ENG	**WinXPe FP2007 PPC700 E855GME** Microsoft OEM Windows XP Embedded Feature Pack 2007, English; for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; order CompactFlash separately (at least 512 MB).	
5SWWXP.0416-ENG	**WinXPe FP2007 PPC700 X855GME** Microsoft OEM Windows XP Embedded Feature Pack 2007, English; for PPC700 with CPU boards 5PC600.X855-00, 5PC600.X855-01, 5PC600.X855-02, 5PC600.X855-03, 5PC600.X855-04, 5PC600.X855-05; order CompactFlash separately (at least 512 MB).	

Table 302: Model numbers - Windows XP Embedded

4.1 General information

Windows XP embedded is the modular version of the desktop operating system Windows XP Professional. Windows XP embedded is based on the same binary files as Windows XP Professional and is optimally tailored to the hardware being used. In other words, only the functions and modules required by the respective device are included. Windows XP embedded is also based on the same reliable code as Windows XP Professional. It provides industry with leading reliability, improvements in security and performance, and the latest technology for Web browsing and extensive device support.

4.2 Features with FP2007 (Feature Pack 2007)

The feature list shows the most important device functions in Windows XP embedded with Feature Pack 2007 (FP2007).

Function	Present
Enhanced write filter (EWF)	✓
File Based Write Filter	✓
Page file	Configurable
Administrator account	✓
User account	Configurable
Explorer shell	✓
Registry filter	✓
Internet Explorer 6.0 + SP2	✓
Internet information service (IIS)	-
Terminal service	✓
Windows Firewall	✓
MSN-Explorer	-
Outlook Express	-
Administrative Tools	✓
Remote Desktop	✓
Remote Assistance	-
.NET Framework	-
ASP.NET	-
Codepages/User Locale/Keyboard	✓
Disk Management Service	✓
Windows Installer Service	✓
Class Installer	✓
CoDevice Installer	✓
Media Player	-
DirectX	-
Accessories	✓
Number of fonts	89

Table 303: Device functions in Windows XP embedded with FP2007

4.3 Installation

Upon request, Windows XP Embedded can be preinstalled at B&R Austria on a suitable CompactFlash card (min. 512 MB - must be specified when placing order). The system is then automatically configured after it has been switched on for the first time. This procedure takes approximately 30 minutes, and the device will be rebooted a number of times.

Brief instructions for creating your own Windows XP embedded images or a suitable "Target Designer Export Files Guide" can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

4.4 Touch screen driver

The touch screen driver (Elo) must be manually installed and calibrated. The driver can be downloaded from the download area on the B&R homepage (**www.br-automation.com**).

5. Panel PC 700 with Windows Embedded Standard 2009

Figure 284: Windows Embedded Standard 2009 Logo

Model number	Short description	Note
5SWWXP.0715-ENG	**WES2009 PPC700 855GME ETX** Microsoft OEM Windows Embedded, Standard 2009, English; for PPC700 with ETX CPU board with 855GME chipset; order CompactFlash separately (at least 1 GB).	
5SWWXP.0716-ENG	**WES2009 PPC700 855GME XTX** Microsoft OEM Windows Embedded, Standard 2009, English; for PPC700 with XTX CPU board with 855GME chipset; order CompactFlash separately (at least 1 GB).	

Table 304: Model numbers - Windows Embedded Standard 2009

5.1 General information

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

5.2 Features with WES2009 (Windows Embedded Standard 2009)

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

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

Table 305: Device functions in Windows Embedded Standard 2009

5.3 Installation

Upon request, Windows Embedded Standard 2009 can be preinstalled at B&R Austria on a suitable CompactFlash card (min. 1GB). The PPC700 system is then automatically configured after it has been switched on for the first time. This procedure takes approximately 30 minutes, and the device will be rebooted a number of times.

5.4 Drivers

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

5.4.1 Touch screen driver

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

Information:

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

6. Panel PC 700 with Windows CE

Model number	Short description	Note
5SWWCE.0515-ENG	**WinCE5.0 Pro PPC700 E855GME** Microsoft OEM Windows CE 5.0 Professional English; for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; order CompactFlash separately (at least 128 MB).	
5SWWCE.0516-ENG	**WinCE5.0 Pro PPC700 X855GME** Microsoft OEM Windows CE 5.0 Professional, English; for PPC700 with CPU boards 5PC600.X855-00, 5PC600.X855-01, 5PC600.X855-02, 5PC600.X855-03, 5PC600.X855-04, 5PC600.X855-05; CompactFlash separately (at least 128 MB).	
5SWWCE.0615-ENG	**WinCE5.0 ProPlus PPC700 E855GME** Microsoft OEM Windows CE 5.0 Professional plus English; for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; order CompactFlash separately (at least 128 MB).	
5SWWCE.0616-ENG	**WinCE5.0 ProPlus PPC700 X855GME** Microsoft OEM Windows CE 5.0 Professional plus English; for PPC700 with CPU boards 5PC600.X855-00, 5PC600.X855-01, 5PC600.X855-02, 5PC600.X855-03, 5PC600.X855-04, 5PC600.X855-05; CompactFlash separately (at least 128 MB).	
5SWWCE.0815-ENG	**WinCE6.0 Pro PPC700 E855GME** Microsoft OEM Windows CE 6.0 Professional, English; for PPC700 E855GME; order CompactFlash separately (at least 128 MB).	
5SWWCE.0816-ENG	**WinCE6.0 Pro PPC700 X855GME** Microsoft OEM Windows CE 6.0 Professional, English; for PPC700 X855GME; order CompactFlash separately (at least 128 MB).	

Table 306: Model numbers - Windows CE

6.1 General information

B&R Windows CE is an operating system which is optimally tailored to B&R's devices. It includes only the functions and modules which are required by each device. This makes this operating system extremely robust and stable. A further advantage of B&R Windows CE compared to other operating systems are the low licensing costs.

6.2 Windows CE 5.0 features

Detailed information about Windows CE for B&R devices can be downloaded in the download area on the B&R homepage (**www.br-automation.com**).

Features	Windows CE 5.0
Supported screen resolutions	VGA (TFT), SVGA (TFT), XGA (TFT)
Chipset	Intel 855GME
Color depth	16 bit or 65536 colors[1)]
Graphics card driver	Intel(R) embedded graphics driver
Main memory	Automatic detection and use of up to 512 MB RAM
Boot time / Startup time	Approx. 39 seconds
Screen rotation	not supported
Web browser	Internet Explorer
.NET	Compact Framework
Image size	Approx. 31 MB[2)] , uncompressed
Custom keys	Supported
PVI	Supported
Automation Device Interface	Supported
Remote Desktop Protocol for thin clients	Supported
B&R VNC Viewer	Supported
B&R Task Manager	Supported
B&R Picture Viewer	Supported
Compatible with zenOn	Yes
Compatible with Wonderware	No
Serial interfaces for any use	3
DirectX	No
Audio ports	"Line OUT" and "MIC" are supported. "Line IN" is not supported.

Table 307: Windows CE 5.0 features

1) The color depth depends on the display used.

2) Use the function *"Compress Windows CE Image"* in the B&R Embedded OS Installer to reduce the image size.

6.3 Windows CE 6.0 features

Detailed information about Windows CE for B&R devices can be downloaded in the download area on the B&R homepage (**www.br-automation.com**).

Features	Windows CE 6.0
Supported screen resolutions	VGA (TFT), SVGA (TFT), XGA (TFT)
Chipset	Intel 855GME
Color depth	16 bit or 65536 colors[1)]
Graphics card driver	Intel® embedded graphics driver
Main memory	Automatic detection and use of up to 512 MB RAM
Boot time / Startup time	Approx. 20 seconds
Screen rotation	not supported
Web browser	Internet Explorer
.NET	Compact Framework
Image size	Approx. 33 MB[2)] , uncompressed
Custom keys	Supported
PVI	Supported
Automation Device Interface	Supported
Remote Desktop Protocol for thin clients	Supported
B&R VNC Viewer	Supported
B&R Task Manager	Supported
B&R Picture Viewer	Supported
Compatible with zenOn	Yes
Compatible with Wonderware	No
Serial interfaces for any use	3
DirectX	No
Audio ports	"Line OUT" and "MIC" are supported. "Line IN" is not supported.

Table 308: Windows CE 6.0 features

1) The color depth depends on the display used.

2) Use the function *"Compress Windows CE Image"* in the B&R Embedded OS Installer to reduce the image size.

6.4 Differences between Windows CE 6.0 and Windows CE 5.0

- 2 GB of virtual RAM per process (Windows CE 5.0: 32 MB).
- Simultaneous operation of up to 32,000 processes (Windows CE 5.0: 32 processes).

6.5 Requirements

The device must fulfill the following criteria to be able run the Windows CE operating system.

- At least 128 MB main memory.
- At least one 128 MB CompactFlash card (size should be specified when ordered).

6.6 Installation

Windows CE is usually preinstalled at the B&R plant.

6.6.1 B&R Embedded OS Installer

The B&R Embedded OS Installer allows you to install existing B&R Windows CE images. The four files (NK.BIN, BLDR, LOGOXRES.BMP, and LOGOQVGA.BMP) must be provided from an already functioning B&R Windows CE installation.

The B&R Embedded OS Installer can be downloaded from the download area on the B&R homepage (**www.br-automation.com**). Further information is available in the online help for the B&R Embedded OS Installer.

7. Panel PC 700 with Automation Runtime

An integral component of Automation Studio™ is Automation Runtime, the software kernel which allows applications to run on a target system. This runtime environment offers numerous important advantages:

- Guaranteed highest possible performance for the hardware being used
- Runs on all B&R target systems
- Makes the application hardware-independent
- Applications can be easily ported between B&R target systems
- Cyclic system guarantees deterministic behavior
- Configurable jitter tolerance in all task classes
- Supports all relevant programming language such as IEC 61131-3 and C
- Extensive function library conforming to IEC 61131-3 as well as the expanded B&R Automation library
- Integrated into Automation NET. Access to all networks and bus systems via function calls or the Automation Studio™ configuration

8. B&R Automation Device Interface (ADI) driver - Control Center

The ADI (Automation Device Interface) enables access to specific functions of B&R devices. Settings for this device can be read and edited using the B&R Control Center applet in the control panel.

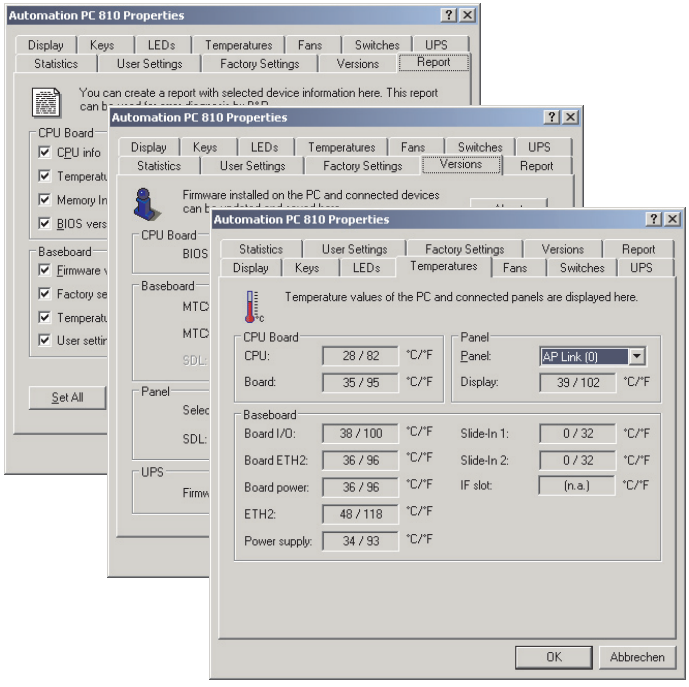


Figure 285: ADI Control Center screenshots - Examples (symbol photo)

Information:

The displayed temperature and voltage values (e.g. CPU temperature, core voltage, battery voltage) on the corresponding ADI page represent uncalibrated information values. These cannot be used to draw any conclusions about any hardware alarms or error conditions. The hardware components used have automatic diagnostics functions that can be applied in the event of error.

8.1 Functions

Information:

The functions provided by the Automation Device Interface (ADI) - Control Center vary according to device series.

- Adjusting the display-specific parameters of connected Panels
- Reading of device-specific keys
- Activation of device specific LEDs on a foil keypad
- Reading temperatures, fan speeds, statistical data, and switch settings
- Reading user settings and factory settings
- Reading software versions
- Updating and securing firmware
- Creating reports about the current system (support assistance)
- Setting the SDL equalizer value for the SDL cable adjustment
- Configuring an optional mounted UPS
- Change the user serial ID.

Supports following systems:

- Automation PC 620
- Automation PC 810
- Automation PC 820
- Panel PC 300
- Panel PC 700
- Panel PC 725
- Panel PC 800
- Power Panel 100/200
- Power Panel 300/400
- Power Panel 500
- Mobile Panel 40/50
- Mobile Panel 100/200
- Automation Panel 800 (in connection with Automation PCs and Panel PCs)
- Automation Panel 900 (in connection with Automation PCs and Panel PCs)

8.2 Installation

A detailed description of the Control Center can be found in the integrated online help. The B&R Automation Device Interface (ADI) driver (also contains Control Center) can be downloaded for free from the download area on the B&R homepage (**www.br-automation.com**).

1. Download and unzip the ZIP archive

2. Close all applications

3. Run BrSetup.exe (e.g. double-click on it in Explorer).

- or -

1. Right click on BrSetup.inf in explorer and select "Install".

Information:

The ADI driver is already included in the B&R images of embedded operating systems.

If a more current ADI driver version exists (see the B&R homepage download area), it can be installed later. A potentially activated "Enhanced Write Filter (EWF)" must be taken into consideration when installing.

8.3 SDL equalizer setting

1) Start the **Control Center** in the **Control Panel**.

2) Then select the **Display** tab.

3) Click on **Settings**. This opens the following dialog box:

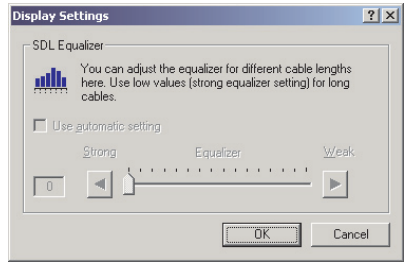


Figure 286: ADI Control Center - SDL equalizer settings

You can change the display's SDL equalizer settings in this dialog box. The equalizer is integrated in the Automation Panel and adapts the DVI signal to various cable lengths. The equalizer value is automatically calculated based on the cable length: You may set a different equalizer value in order to obtain the best possible display quality (e.g. with low-quality cables or poor DVI signal quality).

The value is optimally defined for the cable length when using the "Automatic setting".

The equalizer value can only be changed if the function is supported by Automation Panel 900 (starting with Panel Firmware version 1.04 or higher).

Chapter 5 • Standards and certifications

1. Applicable European directives

- EMC directive 2004/108/EG
- Low-voltage directive 2006/95/EG
- Machine directives 98/37/EG beginning 12/29/2009: 2006/42/EG

2. Overview of standards

Standard	Description
EN 55011 Class A	Electromagnetic compatibility (EMC), radio disturbance product standard, industrial, scientific, and medical high-frequency devices (ISM devices), limit values and measurement procedure; group 1 (devices that do not create HF during material processing) and group 2 (devices that create HF during material processing)
EN 55022 Class A	Electromagnetic compatibility (EMC), radio disturbance characteristics, information technology equipment (ITE devices), limits and methods of measurement
EN 60060-1	High-voltage test techniques - part 1: General specifications and testing conditions
EN 60068-2-1	Environmental testing - part 2: Tests; test A: Dry cold
EN 60068-2-2	Environmental testing - part 2: Tests; test B: Dry heat
EN 60068-2-3	Environmental testing - part 2: Tests; test and guidance: Damp heat, constant
EN 60068-2-6	Environmental testing - part 2: Tests; test: Vibration (sinusoidal)
EN 60068-2-14	Environmental testing - part 2: Tests; test N: Change of temperature
EN 60068-2-27	Environmental testing - part 2: Tests; test and guidance: Shock
EN 60068-2-30	Environmental testing - part 2: Tests; test and guidance: Damp heat, cyclic
EN 60068-2-31	Environmental testing - part 2: Tests; test: Drop and topple, primarily for equipment-type specimens
EN 60068-2-32	Environmental testing - part 2: Tests; test: Free fall
EN 60204-1	Safety of machinery, electrical equipment on machines - part 1: General requirements
EN 60529	Degrees of protection provided by enclosures (IP code)
EN 60721-3-2	Classification of environmental conditions - part 3: Classification of groups of environmental parameters and their severities, section 2: Transport
EN 60721-3-3	Classification of environmental conditions - part 3: Classification of groups of environmental parameters and their severities, section 3: Stationary use at weather-protected locations
EN 61000-4-2	Electromagnetic compatibility (EMC) - part 4-2: Testing and measuring techniques; electrostatic discharge immunity test

Table 309: Overview of standards

Standard	Description
EN 61000-4-3	Electromagnetic compatibility (EMC) - part 4-3: Testing and measuring techniques; radiated radio-frequency electromagnetic field immunity test
EN 61000-4-4	Electromagnetic compatibility (EMC) - part 4-4: Testing and measuring techniques; electrical fast transient/burst immunity test
EN 61000-4-5	Electromagnetic compatibility (EMC) - part 4-5: Testing and measuring techniques; surge immunity test
EN 61000-4-6	Electromagnetic compatibility (EMC) - part 4-6: Testing and measuring techniques; immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-8	Electromagnetic compatibility (EMC) - part 4-8: Testing and measuring techniques; power frequency magnetic field immunity test
EN 61000-4-11	Electromagnetic compatibility (EMC) - part 4-11: Testing and measuring techniques; voltage dips, short interruptions and voltage variations immunity tests
EN 61000-4-12	Electromagnetic compatibility (EMC) - part 4-12: Testing and measuring techniques; oscillatory waves immunity test
EN 61000-4-17	Electromagnetic compatibility (EMC) - part 4-12: Testing and measuring techniques; ripple on DC input power port immunity test
EN 61000-6-2	Electromagnetic compatibility (EMC), generic immunity standard - part 2: industrial environment
EN 61000-6-4	Electromagnetic compatibility (EMC), generic emission standard - part 2: industrial environment
EN 61131-2 IEC 61131-2	Product standard, programmable logic controllers - part 2: Equipment requirements and tests
UL 508	Industrial control equipment (UL = Underwriters Laboratories)
47 CFR	Federal Communications Commission (FCC), 47 CFR Part 15 Subpart B Class A

Table 309: Overview of standards (Forts.)

3. Emission requirements (emission)

Emissions	Test carried out according to	Limits according to
Network-related emissions	EN 55011 / EN 55022	EN 61000-6-4: Generic standard (industrial areas)
		EN 55011: Industrial, scientific, and medical (ISM) radio-frequency equipment, class A (industrial areas)
		EN 55022: Information technology equipment (ITE devices), class A (industrial areas)
		EN 61131-2: Programmable logic controllers
		47 CFR Part 15 Subpart B Class A (FCC)
Emissions, Electromagnetic emissions	EN 55011 / EN 55022	EN 61000-6-4: Generic standard (industrial areas)
		EN 55011: Industrial, scientific, and medical (ISM) radio-frequency equipment, class A (industrial areas)
		EN 55022: Information technology equipment (ITE devices), class A (industrial areas)
		EN 61131-2: Programmable logic controllers
		47 CFR Part 15 Subpart B Class A (FCC)

Table 310: Overview of limits and testing guidelines for emissions

3.1 Network-related emissions

Test carried out according to EN 55011 / EN 55022	Limits according to EN 61000-6-4	Limits according to EN 55011 Class A	Limits according to EN 55022 Class A
Power mains connections 150 kHz - 500 kHz	-	79 dB (µV) Quasi-peak value 66 dB (µV) Average	79 dB (µV) Quasi-peak value 66 dB (µV) Average
Power mains connections 500 kHz - 30 MHz	-	73 dB (µV) Quasi-peak value 60 dB (µV) Average	73 dB (µV) Quasi-peak value 60 dB (µV) Average
AC mains connections 150 kHz - 500 kHz	79 dB (µV) Quasi-peak value 66 dB (µV) Average	-	-
AC mains connections 500 kHz - 30 MHz	73 dB (µV) Quasi-peak value 60 dB (µV) Average	-	-
Other connections 150 kHz - 500 kHz	-	-	97 - 87 dB (µV) und 53 - 43 dB (µA) Quasi-peak value 84 - 74 dB (µV) und 40 - 30 dB (µA) Average
Other connections 500 kHz - 30 MHz	-	-	87 dB (µV) and 43 dB (µA) Quasi-peak value 74 dB (µV) and 30 dB (µA) Average
Tests according to EN 55011 / EN 55022	**Limits according to EN 61131-2**	**Limits according to 47 CFR Part 15 Subpart B class A**	
Power mains connections [1)] 150 kHz - 500 kHz	79 dB (µV) Quasi-peak value 66 dB (µV) Average	-	
Power mains connections 500 kHz - 30 MHz	73 dB (µV) Quasi-peak value 60 dB (µV) Average	-	
AC mains connections 150 kHz - 500 kHz	-	79 dB (µV) Quasi-peak value 66 dB (µV) Average	
AC mains connections 500 kHz - 30 MHz	-	73 dB (µV) Quasi-peak value 60 dB (µV) Average	

Table 311: Test requirements - Network-related emissions for industrial areas

Test carried out according to EN 55011 / EN 55022	Limits according to EN 61131-2	Limits according to 47 CFR Part 15 Subpart B class A	
Other connections 150 kHz - 500 kHz	Only informative for cable lengths > 10 m 40 - 30 dB (µA) Quasi-peak value 30 - 20 dB (µA) Average	-	-
Other connections 500 kHz - 30 MHz	Only informative for cable lengths > 10 m 30 dB (µA) Quasi-peak value 20 dB (µA) Average	-	-

Table 311: Test requirements - Network-related emissions for industrial areas (Forts.)

1) AC network connections only with EN 61131-2

3.2 Emissions, electromagnetic emissions

Test carried out according to EN 55011 / EN 55022	Limits according to EN 61000-6-4	Limits according to EN 55011 Class A	Limits according to EN 55022 Class A
30 MHz - 230 MHz measured at a distance of 10 m	< 40 dB (µV/m) Quasi-peak value	< 40 dB (µV/m) Quasi-peak value	< 40 dB (µV/m) Quasi-peak value
230 MHz - 1 GHz measured at a distance of 10 m	< 47 dB (µV/m) Quasi-peak value	< 47 dB (µV/m) Quasi-peak value	< 47 dB (µV/m) Quasi-peak value
Test carried out according to EN 55011 / EN 55022	**Limits according to EN 61131-2**		
30 MHz - 230 MHz measured at a distance of 10 m	< 40 dB (µV/m) Quasi-peak value		
230 MHz - 1 GHz measured at a distance of 10 m	< 47 dB (µV/m) Quasi-peak value		
Test carried out	**Limits according to 47 CFR Part 15 Subpart B class A**		
30 MHz - 88 MHz measured at a distance of 10 m	< 90 dB (µV/m) Quasi-peak value		
88 MHz - 216 MHz measured at a distance of 10 m	< 150 dB (µV/m) Quasi-peak value		
216 MHz - 960 MHz measured at a distance of 10 m	< 210 dB (µV/m) Quasi-peak value		
> 960 MHz measured at a distance of 10 m	< 300 dB (µV/m) Quasi-peak value		

Table 312: : Test requirements - Electromagnetic emissions for industrial areas

4. Requirements for immunity to disturbances (immunity)

Immunity	Test carried out according to	Limits according to
Electrostatic discharge (ESD)	EN 61000-4-2	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity against high-frequency electromagnetic fields (HF field)	EN 61000-4-3	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity to high-speed transient electrical disturbances (burst)	EN 61000-4-4	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity to surge voltages	EN 61000-4-5	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity to conducted disturbances	EN 61000-4-6	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity against magnetic fields with electrical frequencies	EN 61000-4-8	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity to voltage dips, short-term interruptions and voltage fluctuations	EN 61000-4-11	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
Immunity to damped vibration	EN 61000-4-12	EN 61000-6-2: Generic standard (industrial areas)
		EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers

Table 313: Overview of limits and testing guidelines for immunity

Evaluation criteria according to EN 61000-6-2

Criteria A:
The operating equipment must continue to work as intended **during** the test. There should be no interference in the operating behavior and no system failures below a minimum operating quality as defined by the manufacturer.

Criteria B:
The operating equipment must continue to work as directed **after** the test. There should be no interference in the operating behavior and no system failures below a minimum operating quality as defined by the manufacturer.

Criteria C:
A temporary function failure is permitted if the function restores itself, or the function can be restored by activating configuration and control elements.

Criteria D:
Deterioration or failure of the function, which can no longer be established (operating equipment destroyed).

4.1 Electrostatic discharge (ESD)

Test carried out according to EN 61000-4-2	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
Contact discharge to powder-coated and bare metal housing parts	±4 kV, 10 discharges, criteria B	±4 kV, 10 discharges, criteria B	
Discharge through the air to plastic housing parts	±8 kV, 10 discharges, criteria B	±8 kV, 10 discharges, criteria B	

Table 314: Test requirements - Electrostatic discharge (ESD)

4.2 High-frequency electromagnetic fields (HF field)

Test carried out according to EN 61000-4-3	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
Housing, completely wired	80 MHz - 1 GHz, 10 V/m, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	2 GHz - 2.7 GHz, 1 V/m, 1.4 GHz - 2 GHz, 3 V/m, 80 MHz - 1 GHz, 10 V/m, 80% amplitude modulation at 1 kHz, duration 3 seconds, criteria A	

Table 315: Test requirements - High-frequency electromagnetic fields (HF field)

4.3 High-speed transient electrical disturbances (burst)

Test carried out according to EN 61000-4-4	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
AC power I/O	±2 kV, criteria B	-	
AC power inputs	-	±2 kV, criteria B	
AC power outputs	-	±1 kV, criteria B	
DC power I/O >10 m [1)]	±2 kV, criteria B	-	
DC power inputs >10 m	-	±2 kV, criteria B	
DC power outputs >10 m	-	±1 kV, criteria B	
Functional ground connections, signal lines and I/Os >3 m	±1 kV, criteria B	±1 kV, criteria B	
Unshielded AC I/O >3 m	-	±2 kV, criteria B	
Analog I/O	±1 kV, criteria B	±1 kV, criteria B	

Table 316: Test requirements - High-speed transient electrical disturbances (burst)

1) For EN 55024 without length limitation.

4.4 Surges (surge)

Test carried out according to EN 61000-4-5	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
AC power I/O, L to L	±1 kV, criteria B	±1 kV, criteria B	
AC power I/O, L to PE	±2 kV, criteria B	±2 kV, criteria B	
DC power I/O, L+ to L-, >10 m	±0.5 kV, criteria B	-	
DC power I/O, L to PE, >10 m	±0.5 kV, criteria B	-	
DC power inputs, L+ to L-	-	±0.5 kV, criteria B	
DC power inputs, L to PE	-	±1 kV, criteria B	
DC power outputs, L+ to L-	-	±0.5 kV, criteria B	
DC power outputs, L to PE	-	±0.5 kV, criteria B	
Signal connections >30 m	±1 kV, criteria B	±1 kV, criteria B	
All shielded cables	-	±1 kV, criteria B	

Table 317: Test requirements - Surge voltages

4.5 Conducted disturbances

Test carried out according to EN 61000-4-6	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
AC power I/O	150 kHz - 80 MHz, 10 V, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	

Table 318: Test requirements - Conducted disturbances

Test carried out according to EN 61000-4-6	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
DC power I/O	150 kHz - 80 MHz, 10 V, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	
Functional ground connections	0.15 - 80 MHz, 10 V, 80% amplitude modulation with 1 kHz, Length 3 seconds, criteria A	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	
Signal connections >3 m	0.15 - 80 MHz, 10 V, 80% amplitude modulation with 1 kHz, Length 3 seconds, criteria A	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	

Table 318: Test requirements - Conducted disturbances (Forts.)

4.6 Magnetic fields with electrical frequencies

Test carried out according to EN 61000-4-8	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
Test direction x, test in the field of an induction coil 1 m x 1 m	30 A/m, criteria A	30 A/m, criteria A	
Test direction y, test in the field of an induction coil 1 m x 1 m	30 A/m, criteria A	30 A/m, criteria A	
Test direction z, test in the field of an induction coil 1 m x 1 m	30 A/m, criteria A	30 A/m, criteria A	

Table 319: Test requirements - Magnetic fields with electrical frequencies

4.7 Voltage dips, fluctuations and short-term interruptions

Test carried out according to EN 61000-4-11	Limits according to EN 61000-6-2	Limits according to EN 61131-2	
AC power inputs	Voltage dip 70% (30% reduction), 0.5 periods, criteria B	-	
AC power inputs	Voltage dip 40% (60% reduction), 5 periods, criteria C	-	
AC power inputs	Voltage dip 40% (60% reduction), 50 periods, criteria C	-	
AC power inputs	Voltage interruptions < 5% (> 95% reduction), 250 periods, criteria C	-	
AC power inputs	-	20 interruptions, 0.5 periods, criteria A	
DC power inputs	-	20 interruptions for 10 ms < UN - 15%, criteria A	

Table 320: Test requirements - Voltage dips, fluctuations, and short-term interruptions

4.8 Damped vibration

Test carried out according to EN 61000-4-12	Limits according to EN 61131-2		
Power I/O, L to L	±1 kV, 1 MHz, repeat rate 400/seconds, length 2 seconds, connection lengths 2 m, criteria B		
Power I/O, L to PE	±2.5 kV, 1 MHz, repeat rate 400/seconds, length 2 seconds, connection lengths 2 m, criteria B		

Table 321: Test requirements - Damped vibration

5. Mechanical conditions

Vibration	Test carried out according to	Limits according to
Vibration operation	EN 60068-2-6	EN 61131-2: Programmable logic controllers
		EN 60721-3-3 class 3M4
Vibration during transport (packaged)	EN 60068-2-6	EN 60721-3-2 class 2M1
		EN 60721-3-2 class 2M2
		EN 60721-3-2 class 2M3
Shock during operation	EN 60068-2-27	EN 61131-2: Programmable logic controllers
		EN 60721-3-3 class 3M4
Shock during transport (packaged)	EN 60068-2-27	EN 60721-3-2 class 2M1
		EN 60721-3-2 class 2M2
		EN 60721-3-2 class 2M3
Toppling (packaged)	EN 60068-2-31	EN 60721-3-2 class 2M1
		EN 60721-3-2 class 2M2
		EN 60721-3-2 class 2M3
Free fall (packaged)	EN 60068-2-32	EN 61131-2: Programmable logic controllers

Table 322: Overview of limits and testing guidelines for vibration

5.1 Vibration operation

Test carried out according to EN 60068-2-6	Limits according to EN 61131-2		Limits according to EN 60721-3-3 class 3M4		
Vibration during operation: Uninterrupted duty with moveable frequency in all 3 axes (x, y, z), 1 octave per minute	10 sweeps for each axis		10 sweeps for each axis		
	Frequency	**Limit value**	**Frequency**	**Limit value**	
	5 - 9 Hz	Amplitude 3.5 mm	2 - 9 Hz	Amplitude 3 mm	
	9 - 150 Hz	Acceleration 1 g	9 - 200 Hz	Acceleration 1 g	

Table 323: Test requirements - Vibration during operation

5.2 Vibration during transport (packaged)

Test carried out according to EN 60068-2-6	Limits according to EN 60721-3-2 class 2M1		Limits according to EN 60721-3-2 class 2M2		Limits according to EN 60721-3-2 class 2M3	
Vibration during transport: Uninterrupted duty with moveable frequency in all 3 axes (x, y, z)	10 sweeps for each axis, packaged		10 sweeps for each axis, packaged		10 sweeps for each axis, packaged	
	Frequency	**Limit value**	**Frequency**	**Limit value**	**Frequency**	**Limit value**
	2 - 9 Hz	Amplitude 3.5 mm	2 - 9 Hz	Amplitude 3.5 mm	2 - 8 Hz	Amplitude 7.5 mm
	9 - 200 Hz	Acceleration 1 g	9 - 200 Hz	Acceleration 1 g	8 - 200 Hz	Acceleration 2 g
	200 - 500 Hz	Acceleration 1.5 g	200 - 500 Hz	Acceleration 1.5 g	200 - 500 Hz	Acceleration 4 g

Table 324: Test requirements - Vibration during transport (packaged)

5.3 Shock during operation

Test carried out according to EN 60068-2-27	Limits according to EN 61131-2	Limits according to EN 60721-3-3 class 3M4	
Shock during operation: Pulse (half-sine) stress in all 3 axes (x, y, z)	Acceleration 15 g, length 11 ms, 18 shocks	Acceleration 15 g, length 11 ms	

Table 325: Test requirements - Shock during operation

5.4 Shock during transport (packaged)

Test carried out according to EN 60068-2-27	Limits according to EN 60721-3-2 class 2M1	Limits according to EN 60721-3-2 class 2M2	Limits according to EN 60721-3-2 class 2M3
Pulse (half-sine) stress in all 3 axes (x, y, z)	Acceleration 10 g, Length 11 ms, each 3 shocks, packaged	Acceleration 30 g, Length 6 ms, each 3 shocks, packaged	Acceleration 100 g, Length 6 ms, each 3 shocks, packaged

Table 326: Test requirements - Shock during transport

5.5 Toppling

Test carried out according to EN 60068-2-31	Limits according to EN 60721-3-2 class 2M1		Limits according to EN 60721-3-2 class 2M2		Limits according to EN 60721-3-2 class 2M3	
Drop and topple	Devices: Drop/topple on each edge		Devices: Drop/topple on each edge		Devices: Drop/topple on each edge	
	Weight	**Required**	**Weight**	**Required**	**Weight**	**Required**
	<20 kg	Yes	<20 kg	Yes	<20 kg	Yes
	20 - 100 kg	-	20 - 100 kg	Yes	20 - 100 kg	Yes
	>100 kg	-	>100 kg	-	>100 kg	Yes

Table 327: Test requirements - Toppling

5.6 Free fall (packaged)

Test carried out according to EN 60068-2-32	Limits according to EN 61131-2		Limits according to EN 60721-3-2 class 2M1		Limits according to EN 60721-3-2 class 2M2		Limits according to EN 60721-3-2 class 2M3	
Free fall	Devices with delivery packaging each with 5 fall tests		Devices packaged		Devices packaged		Devices packaged	
	Weight	**Height**	**Weight**	**Height**	**Weight**	**Height**	**Weight**	**Height**
	<10 kg	1.0 m	<20 kg	0.25 m	<20 kg	1.2 m	<20 kg	1.5 m
	10 - 40 kg	0.5 m	20 - 100 kg	0.25 m	20 - 100 kg	1.0 m	20 - 100 kg	1.2 m
	> 40 kg	0.25 m	>100 kg	0.1 m	>100 kg	0.25 m	>100 kg	0.5 m
	Devices with product packaging each with 5 fall tests							
	Weight	**Height**						
	<10 kg	0.3 m						
	10 - 40 kg	0.3 m						
	> 40 kg	0.25 m						

Table 328: Test requirements - Toppling

6. Climate conditions

Temperature / humidity	Test carried out according to	Limits according to
Worst case operation	UL 508	UL 508: Industrial control equipment EN 61131-2: Programmable logic controllers
Dry heat	EN 60068-2-2	EN 61131-2: Programmable logic controllers
Dry cold	EN 60068-2-1	EN 61131-2: Programmable logic controllers
Large temperature fluctuations	EN 60068-2-14	EN 61131-2: Programmable logic controllers
Temperature fluctuations in operation	EN 60068-2-14	EN 61131-2: Programmable logic controllers
Humid heat, cyclic	EN 60068-2-30	EN 61131-2: Programmable logic controllers
Humid heat, constant (storage)	EN 60068-2-3	EN 61131-2: Programmable logic controllers

Table 329: Overview of limits and testing guidelines for temperature and humidity

6.1 Worst case operation

Test carried out according to UL 508	Limits according to UL 508	Limits according to EN 61131-2	
Worst case during operation. Operation of the device with the max. ambient temperature specified in the data sheet at the max. specified load	3 hours at max. ambient temperature (min. +40°C) duration approx. 5 hours	3 hours at max. ambient temperature (min. +40°C) duration approx. 5 hours	

Table 330: Test requirements - Worst case during operation

6.2 Dry heat

Test carried out according to EN 60068-2-2	Limits according to EN 61131-2		
Dry heat	16 hours at +70°C for 1 cycle, then 1 hour acclimatization and function testing, duration approximately 17 hours		

Table 331: Test requirements - Dry heat

6.3 Dry cold

Test carried out according to EN 60068-2-1	Limits according to EN 61131-2		
Dry cold	16 hours at -40°C for 1 cycle, then 1 hour acclimatization and function testing, duration approximately 17 hours		

Table 332: Test requirements - Dry cold

6.4 Large temperature fluctuations

Test carried out according to EN 60068-2-14	Limits according to EN 61131-2		
Large temperature fluctuations	3 hours at -40°C and 3 hours at +70°C, 2 cycles, then 2 hours acclimatization and function testing, duration approximately 14 hours		

Table 333: Test requirements - Large temperature fluctuations

6.5 Temperature fluctuations in operation

Test carried out according to EN 60068-2-14	Limits according to EN 61131-2		
Open devices: These can also have a housing and are installed in switching cabinets	3 hours at +5°C and 3 hours at 55°C, 5 cycles, temperature gradient 3°C / min, the unit is occasionally supplied with voltage during testing, duration approximately 30 hours		
Closed devices: These are devices whose data sheet specifies a surrounding housing (enclosure) with the corresponding safety precautions	3 hours at +5°C and 3 hours at +55°C, 5 cycles, temperature gradient 3°C / min, the unit is occasionally supplied with voltage during testing, duration approximately 30 hours		

Table 334: Test requirements - Temperature fluctuations during operation

6.6 Humid heat, cyclic

Test carried out according to EN 60068-2-30	Limits according to EN 61131-2		
Alternating climate	24 hours at +25°C / +55°C and 97% / 83% RH, 2 cycles, then 2 hours acclimatization, function testing and insulation, duration approximately 50 hours		

Table 335: Test requirements - Humid heat, cyclic

6.7 Humid heat, constant (storage)

Test carried out according to EN 60068-2-3	Limits according to EN 61131-2		
Humid heat, constant (storage)	48 hours at +40°C and 92.5% RH, then insulation test within 3 hours, duration approximately 49 hours		

Table 336: Test requirements - Humid heat, constant (storage)

7. Safety

Safety	Test carried out according to	Limits according to
Ground resistance	EN 61131-2	EN 60204-1: Electrical equipment of machines
		EN 61131-2: Programmable logic controllers
Insulation resistance		EN 60204-1: Electrical equipment of machines
High voltage	EN 60060-1	EN 61131-2: Programmable logic controllers
		UL 508: Industrial control equipment
Residual voltage	EN 61131-2	EN 60204-1: Electrical equipment of machines
		EN 61131-2: Programmable logic controllers
Overload	UL 508	EN 61131-2: Programmable logic controllers
		UL 508: Industrial control equipment
Simulation component defect	UL 508	EN 61131-2: Programmable logic controllers
		UL 508: Industrial control equipment
Voltage range		EN 61131-2: Programmable logic controllers

Table 337: Overview of limits and testing guidelines for safety

7.1 Ground resistance

Test carried out according to EN 61131-2	Limits according to EN 60204-1[1)]		Limits according to EN 61131-2
Ground resistance: housing (from any metal part to the ground terminal)	Smallest effective cross section of the protective ground conductor for the branch being tested	Maximum measured voltage drop at a test current of 10 A	Test current 30 A for 2 min, $< 0.1\ \Omega$
	1.0 mm²	3.3 V	
	1.5 mm²	2.6 V	
	2.5 mm²	1.9 V	
	4.0 mm²	1.4 V	
	> 6.0 mm²	1.0 V	

Table 338: Test requirements - Ground resistance

1) See EN 60204-1:1997 page 62, table 9.

7.2 Insulation resistance

Test carried out	Limits according to EN 60204-1[1)]		
Insulation resistance: main circuits to protective ground conductor	> 1 MΩ at 500 V DC voltage		

Table 339: Test requirements - Insulation resistance

1) See EN 60204-1:1997 page 62, table 9.

7.3 High voltage

Test carried out according to EN 60060-1	Limits according to EN 61131-2[1)]				Limits according to UL 508		
High voltage: Primary circuit to secondary circuit and to protective ground circuit (transformers, coils, varistors, capacitors and components used to protect against over-voltage can be removed before the test)	Input voltage	Test voltage			Input voltage	Test voltage	
		1.2/50 µs voltage surge peak	AC, 1 min	DC, 1 min		AC, 1 min	DC, 1 min
	0 - 50 VAC 0 - 60 VDC	850 V	510 V	720 V	≤ 50 V	500 V	707 V
	50 - 100 VAC 60 - 100 VDC	1360 V	740 V	1050 V	> 50 V	1000 V + 2 x U_N	(1000 V + 2 x U_N) x 1.414
	100 - 150 VAC 100 - 150 VDC	2550 V	1400 V	1950 V			
	150 - 300 VAC 150 - 300 VDC	4250 V	2300 V	3250 V			
	300 - 600 VAC 300 - 600 VDC	6800 V	3700 V	5250 V			
	600 - 1000 VAC 600 - 1000 VDC	10200 V	5550 V	7850 V			

Table 340: Test requirements - High voltage

1) See EN 61131-2:2003 page 104, table 59.

7.4 Residual voltage

Test carried out according to EN 61131-2	Limits according to EN 60204-1	Limits according to EN 61131-2	
Residual voltage after switching off	< 60 V after 5 sec (active parts) < 60 V after 1 sec (plug pins)	< 60 V after 5 sec (active parts) < 60 V after 1 sec (plug pins)	

Table 341: Test requirements - Residual voltage

7.5 Overload

Test carried out according to UL 508	Limits according to EN 61131-2	Limits according to UL 508	
Overload of transistor outputs	50 switches, 1.5 I_N, 1 sec on / 9 sec off	50 switches, 1.5 I_N, 1 sec on / 9 sec off	

Table 342: Test requirements - Overload

7.6 Defective component

Test carried out according to UL 508	Limits according to EN 61131-2	Limits according to UL 508	
Simulation of how components in power supply became defective	Non-flammable surrounding cloth No contact with conductive parts	Non-flammable surrounding cloth No contact with conductive parts	

Table 343: Test requirements - Defective component

7.7 Voltage range

Test carried out according to	Limits according to EN 61131-2			
Supply voltage	Measurement value	Tolerance min/max		
	24 VDC 48 VDC 125 VDC	-15% +20%		
	24 VAC 48 VAC 100 VAC 110 VAC 120 VAC 200 VAC 230 VAC 240 VAC 400 VAC	-15% +10%		

Table 344: Test requirements - Voltage range

8. Other tests

Other tests	Test carried out according to	Limits according to
Protection type	-	EN 60529: Degrees of protection provided by enclosures (IP code)

Table 345: Overview of limits and testing guidelines for other tests

8.1 Protection type

Test carried out according to	Limits according to EN 60529	Limits according to EN 60529	
Protection of the operating equipment	IP2. Protection against large solid foreign bodies =12.5 mm diameter	IP.6 Protection against large solid foreign bodies: Dust-proof	
Protection of personnel	IP2. Protection against touching dangerous parts with finger	IP.6 Protection against touching dangerous parts with conductor	
Protection against water permeation with damaging consequences	IP.0 Not protected	IP.5 Protected against sprayed water	

Table 346: Test requirements - Protection

9. SDL flex cable - test description

9.1 Torsion

9.1.1 Test structure

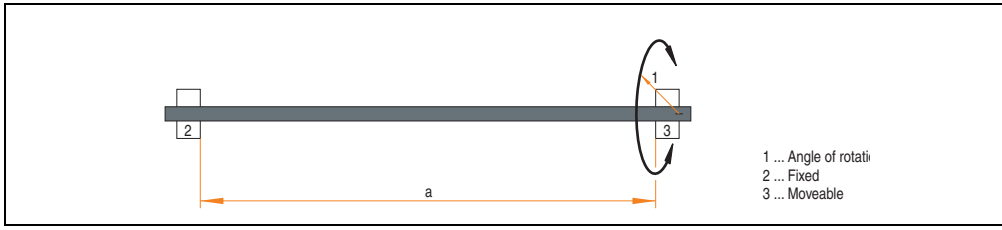


Figure 287: Test structure - torsion

9.1.2 Test conditions

- Distance a: 450 mm
- Rotation angle: ± 85°
- Velocity: 50 cycles / minute
- Special feature: The cable was clamped down twice in the machine.

9.1.3 Individual tests

- Visible pixel errors: At the beginning of the test, the minimum equalizer setting was determined. This is the value between 0-15 at which no more pixel errors are visible. If the equalizer setting is changed due to the mechanical load, this is noted.
- Touch screen for function (with a 21.3" Automation Panel - 5AP920.2138-01)
- USB mouse function
- Hot plug function tested by unplugging the USB plug
- After a test duration of 15000 cycles, the test was ended with a result of "OK".

9.2 Cable drag chain

9.2.1 Test structure

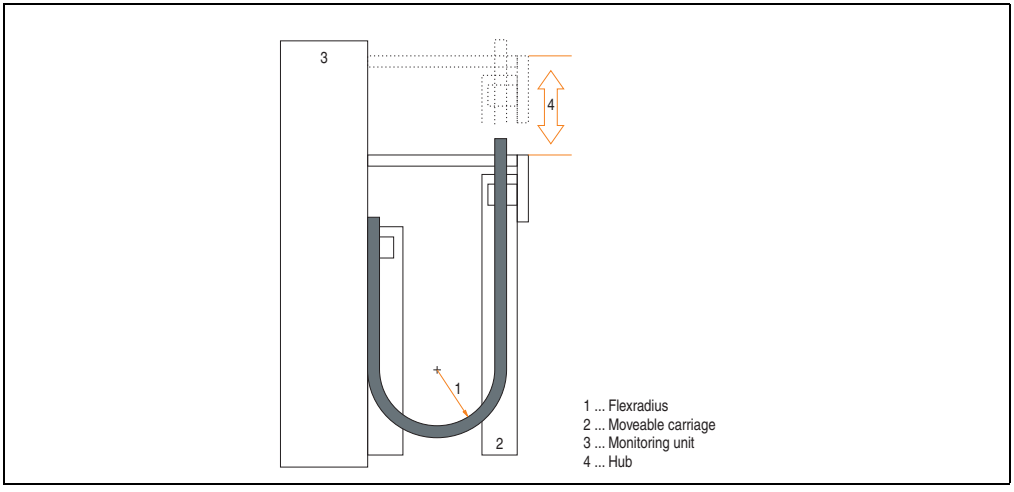


Figure 288: Test structure - Cable drag chain

9.2.2 Test conditions

- Flex radius: 180 mm (= 15 x cable diameter)
- Hub: 460 mm
- Velocity: 4800 cycles / hour
- Special feature: The cable was clamped down twice in the machine.

9.2.3 Individual tests:

- Visible pixel errors: At the beginning of the test, the minimum equalizer setting is determined. This is the value between 0-15 at which no more pixel errors are visible. If the equalizer setting is changed due to the mechanical load, this is noted.
- Touch screen for function (with a 21.3" Automation Panel - 5AP920.2138-01)
- USB mouse function
- Hot plug function tested by unplugging the USB plug
- After a test duration of 30,000 cycles, the test was ended with a result of "OK".

10. International certifications

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

Certifications	
USA and Canada	All important B&R products are tested and listed by Underwriters Laboratories and checked quarterly by a UL inspector. This mark is valid for the USA and Canada and simplifies certification of your machines and systems in these areas.
Europe	All harmonized EN standards for the applicable directives are met.

Table 347: International Certifications

Chapter 6 • Accessories

1. Overview

Model number	Short description	Note
0AC201.91	**Lithium batteries, 4 pcs**. Lithium batteries, 4 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	**Lithium battery, 1 pc.** Lithium battery, 1 pc., 3 V / 950 mAh, button cell	
0TB103.9	**Plug 24V 5.08 3-pin screw clamps** 24 VDC 3-pin connector, female. Screw clamps, 2.5 mm², protected against vibration by the screw flange	
0TB103.91	**Plug 24V 5.08 3-pin cage clamps** 24 VDC 3-pin connector, female. Cage clamps, 2.5 mm², protected against vibration by the screw flange	
0PS102.0	**Power supply, 1-phase, 2.1 A** 24 VDC power supply, 1-phase, 2.1 A, input 100-240 VAC, wide range, DIN rail mounting	
0PS104.0	**Power supply, 1-phase, 4.2 A** 24 VDC power supply, 1 phase, 4.2 A, input 115/230 VAC, auto select, DIN rail mounting	
0PS105.1	**Power supply, 1-phase, 5 A** 24 VDC power supply, 1 phase, 5 A, input 115/230 VAC, manual select, DIN rail mounting	
0PS105.2	**Power supply, 1-phase, 5 A, redundant** 24 VDC power supply, 1 phase, 5 A, redundant through parallel operation, input 115/230 VAC, manual select, DIN rail mounting	
0PS110.1	**Power supply, 1-phase, 10 A** 24 VDC power supply, 1 phase, 10 A, input 115/230 VAC, manual select, DIN rail mounting	
0PS110.2	**Power supply, 1-phase, 10 A, redundant** 24 VDC power supply, 1 phase, 10 A, redundant through parallel operation, input 115/230 VAC, manual select, DIN rail mounting	
0PS120.1	**Power supply, 1-phase, 20 A** 24 VDC power supply, 1 phase, 20 A, input 115/230 VAC, auto select, DIN rail mounting	
0PS305.1	**Power supply, 3-phase, 5 A** 24 VDC power supply, 3-phase, 5 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	
0PS310.1	**Power supply, 3-phase, 10 A** 24 VDC power supply, 3-phase, 10 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	
0PS320.1	**Power supply, 3-phase, 20 A** 24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	

Table 348: Model numbers - Accessories

Model number	Short description	Note
0PS340.1	**Power supply, 3-phase, 40 A** 24 VDC power supply, 3-phase, 40 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	
9A0100.11	**UPS 24 VDC** 24 VDC input, 24 VDC output, serial interface	
9A0100.14	**UPS battery unit type B** 24 V; 2.2 Ah; including battery cage	
9A0100.15	**UPS battery unit type B (replacement part)** 2 x 12 V; 2.2 Ah; for battery unit 9A0100.14	
9A0017.01	**RS232 Null Modem Cable, 0.6 m** To connect UPS and load system (9-pin DSUB socket - 9-pin DSUB socket)	
9A0017.02	**RS232 Null Modem Cable, 1.8 m** To connect UPS and load system (9-pin DSUB socket - 9-pin DSUB socket)	
4A0006.00-000	**Lithium battery, 1 pc.** Lithium battery, 1 pc., 3 V / 950 mAh, button cell	
5A5003.03	**Front cover** Front cover for the USB 2.0 Media Drive 5MD900.USB2-00.	
5AC600.ICOV-00	**Interface covers** Interface covers for APC620 and PPC700 devices; 5 pieces	
5AC900.1200-01	**USB port cap IP65 M20 /2** Front-side USB port cap (attached) knurled, short, not slotted.	
5AC900.1200-02	**USB port cap IP65 M20 /3** Front-side USB port cap (attached) knurled, tall, not slotted.	
5AC900.1200-03	**USB port cap IP65 M20 /4** Front-side USB port cap (attached) knurled, tall, slotted.	
5AC900.1000-00	**Adapter DVI-A/m to CRT DB15HD/f** Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	
5AC900.104X-00	**Legend strip template 10.4"** For Panel PC 5PC781.1043-00. For 1 device.	
5AC900.104X-01	**Legend strip template 10.4"** For Panel PC 5PC782.1043-00. For 1 device.	
5AC900.150X-01	**Legend strip template 15"** For Panel PC 5PC781.1505-00. For 4 devices.	
5AC900.1200-00	**USB port cap (attached)** Front side USB port cap (attached) for Automation Panel 900 and Panel PC 700 devices.	
5CFCRD.0512-06	**CompactFlash 512 MB B&R** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.1024-06	**CompactFlash 1024 MB B&R** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.2048-06	**CompactFlash 2048 MB B&R** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.4096-06	**CompactFlash 4096 MB B&R** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.8192-06	**CompactFlash 8192 MB B&R** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	

Table 348: Model numbers - Accessories

Model number	Short description	Note
5CFCRD.016G-06	**CompactFlash 16 GB B&R** CompactFlash card with 16 GB SLC NAND flash and IDE/ATA interface	
5CFCRD.032G-06	**CompactFlash 32 GB B&R** CompactFlash card with 32 GB SLC NAND flash and IDE/ATA interface	
5CFCRD.0512-04	**CompactFlash 512 MB B&R** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.1024-04	**CompactFlash 1024 MB B&R** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.2048-04	**CompactFlash 2048 MB B&R** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.4096-04	**CompactFlash 4096 MB B&R** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.8192-04	**CompactFlash 8192 MB B&R** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.016G-04	**CompactFlash 16 GB B&R** CompactFlash card with 16 GB SLC NAND flash and IDE/ATA interface	
5CFCRD.0064-03	**CompactFlash 64 MB SSI** CompactFlash card with 64 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.0128-03	**CompactFlash 128 MB SSI** CompactFlash card with 128 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.0256-03	**CompactFlash 256 MB SSI** CompactFlash card with 256 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.0512-03	**CompactFlash 512 MB SSI** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.1024-03	**CompactFlash 1024 MB SSI** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.2048-03	**CompactFlash 2048 MB SSI** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.4096-03	**CompactFlash 4096 MB SSI** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.8192-03	**CompactFlash 8192 MB SSI** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	
5CFCRD.0032-02	**CompactFlash 32 MB SanDisk/A** CompactFlash card with 32 MB flash PROM and IDE/ATA interface.	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.0064-02	**CompactFlash 64 MB SanDisk/A** CompactFlash card with 64 MB flash PROM and IDE/ATA interface.	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.0128-02	**CompactFlash 128 MB SanDisk/A** CompactFlash card with 128 MB flash PROM and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.0256-02	**CompactFlash 256 MB SanDisk/A** CompactFlash card with 256 MB flash PROM and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.0512-02	**CompactFlash 512 MB SanDisk/A** CompactFlash card with 512 MB flash PROM and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0064-03

Table 348: Model numbers - Accessories

Model number	Short description	Note
5CFCRD.1024-02	**CompactFlash 1024 MB SanDisk/A** CompactFlash card with 1024 MB flash PROM and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.2048-02	**CompactFlash 2048 MB SanDisk/A** CompactFlash card with 2048 MB flash PROM and IDE/ATA interface	Canceled since 12/2005 Replaced by 5CFCRD.0064-03
5MD900.USB2-00	**USB 2.0 drive DVD-ROM/CD-RW FDD CF USB** USB 2.0 drive combination, consists of DVD-ROM/CD-RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24 V DC. (Order 0TB103.9 screw clamp or 0TB103.91 cage clamps separately).	
5MD900.USB2-01	**USB 2.0 drive DVD-RW/CD-RW FDD CF USB** USB 2.0 drive combination; consists of DVD-R/RW DVD+R/RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24V DC; (Order 0TB103.9 screw clamp or 0TB103.91 cage clamps separately).	
5AC600.SRAM-00	**APC620/PPC700 SRAM module 512kB** 512 KB SRAM module for APC620 and PPC700.	
5MMUSB.0128-00	**USB flash drive 128 MB SanDisk** USB 2.0 flash drive 128 MB	
5MMUSB.0256-00	**USB flash drive 256 MB SanDisk** USB 2.0 flash drive 256 MB	
5MMUSB.0512-00	**USB flash drive 512 MB SanDisk** USB 2.0 flash drive 512 MB	
5MMUSB.1024-00	**USB flash drive 1 GB SanDisk** USB 2.0 flash drive 1 GB	
5MMUSB.2048-00	**USB flash drive 2 GB SanDisk** USB 2.0 flash drive 2 GB	
5MMUSB.2048-01	**USB flash drive 2 GB B&R** USB 2.0 flash drive 2 GB	
5SWHMI.0000-00	**HMI Drivers & Utilities DVD**	
5CADVI.0018-00	**DVI-D cable 1.8 m** Single cable, DVI-D/m:DVI-D/m; length: 1.8 m	
5CADVI.0050-00	**DVI-D cable 5 m** Single cable, DVI-D/m:DVI-D/m; length: 5 m	
5CADVI.0100-00	**DVI-D cable 10 m** Single cable, DVI-D/m:DVI-D/m; length: 10 m	
5CASDL.0018-00	**SDL cable 1.8 m** SDL cable for a fixed type of layout; length: 1.8 m	
5CASDL.0018-01	**SDL cable 1.8 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 1.8 m	
5CASDL.0018-03	**SDL flex cable 1.8 m** SDL cable for fixed and flexible type of layout; length: 1.8 m	
5CASDL.0050-00	**SDL cable 5 m** SDL cable for a fixed type of layout; length: 5 m	
5CASDL.0050-01	**SDL cable 5 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 5 m	
5CASDL.0050-03	**SDL flex cable 5 m** SDL cable for fixed and flexible type of layout; length: 5 m	

Table 348: Model numbers - Accessories

Model number	Short description	Note
5CASDL.0100-00	**SDL cable 10 m** SDL cable for a fixed type of layout; length: 10 m	
5CASDL.0100-01	**SDL cable 10 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 10 m	
5CASDL.0100-03	**SDL flex cable 10 m** SDL cable for fixed and flexible type of layout; length: 10 m	
5CASDL.0150-00	**SDL cable 15 m** SDL cable for a fixed type of layout; length: 15 m	
5CASDL.0150-01	**SDL cable 15 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 15 m	
5CASDL.0150-03	**SDL flex cable 15 m** SDL cable for fixed and flexible type of layout; length: 15 m	
5CASDL.0200-00	**SDL cable 20 m** SDL cable for a fixed type of layout; length: 20 m	
5CASDL.0200-03	**SDL flex cable 20 m** SDL cable for fixed and flexible type of layout; length: 20 m	
5CASDL.0250-00	**SDL cable 25 m** SDL cable for a fixed type of layout; length: 25 m	
5CASDL.0250-03	**SDL flex cable 25 m** SDL cable for fixed and flexible type of layout; length: 25 m	
5CASDL.0300-00	**SDL cable 30 m** SDL cable for a fixed type of layout; length: 30 m	
5CASDL.0300-03	**SDL flex cable 30 m** SDL cable for fixed and flexible type of layout; length: 30 m	
5CASDL.0300-10	**SDL cable with extender 30 m** SDL cable with extender for a fixed type of layout; length 30 m	
5CASDL.0300-13	**SDL flex cable with extender 30 m** SDL cable with extender for fixed and flexible type of layout; length: 30 m	
5CASDL.0400-10	**SDL cable with extender 40 m** SDL cable with extender for a fixed type of layout; length 40 m	
5CASDL.0400-13	**SDL flex cable with extender 40 m** SDL cable with extender for fixed and flexible type of layout; length: 40 m	
9A0014.02	**RS232 cable DB9/f:DB9/m 1.8 m** RS232 extension cable for remote operation of a display unit with touch screen; length 1.8 m.	
9A0014.05	**RS232 cable DB9/f:DB9/m 5 m** RS232 extension cable for remote operation of a display unit with touch screen; length 5 m.	
9A0014.10	**RS232 cable DB9/f:DB9/m 10 m** RS232 extension cable for remote operation of a display unit with touch screen; length 10 m.	
5CAUSB.0018-00	**USB 2.0 cable, A/m:B/m 1.8 m** USB 2.0 connection cable; plug type A - type B; length 1.8 m	
5CAUSB.0050-00	**USB 2.0 cable, A/m:B/m 5 m** USB 2.0 connection cable; plug type A - type B; length 5 m	
5AC700.FA00-00	**PPC700 replacement fan filter 0PCI 5 piece** For Panel PC 700 10.4", 12.1", 15", 17" and 19" with 0 PCI slots (5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00).	

Table 348: Model numbers - Accessories

Model number	Short description	Note
5AC700.FA02-00	**PPC700 replacement fan filter 1.2PCI 5 piece** For Panel PC 700 10.4" and 15" with 1 and 2 PCI slots (5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02).	
5ACPCI.ETH1-01	**PCI Ethernet card 10/100** half size PCI Ethernet card, 1 Ethernet connection	
5ACPCI.ETH3-01	**PCI Ethernet card 10/100 3port** half size PCI Ethernet card, 3 Ethernet connections	

Table 348: Model numbers - Accessories

2. Replacement CMOS batteries

The lithium battery is needed for buffering the BIOS and real-time clock.

The battery is subject to wear and must be replaced when the battery power ("Bad" status) is insufficient (see "Changing the battery", on page 675).

2.1 Order data

Model number	Description	Figure
0AC201.91	Lithium batteries, 4 pcs., 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 1 piece, 3 V / 950 mAh button cell	

Table 349: Order data - Lithium batteries

2.2 Technical data

Information:

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.

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.

Features	0AC201.91	4A0006.00-000
Capacity	950 mAh	
Voltage	3 V	
Self discharge at 23°C	< 1% per year	
Storage time	Max. 3 years at 30° C	

Table 350: Technical data - Lithium batteries

Environment	0AC201.91	4A0006.00-000
Storage temperature	-20 to 60°C	
Relative humidity	0 to 95% (non-condensing)	

Table 350: Technical data - Lithium batteries (Forts.)

3. Supply voltage connector (TB103 3-pin)

3.1 General information

This single row 3-pin terminal block is mainly used to connect the supply voltage.

3.2 Order data

Model number	Description	Figure
0TB103.9	Plug for the 24 V supply voltage (screw clamps)	0TB103.9
0TB103.91	Plug for the 24 V supply voltage (cage clamps)	0TB103.91

Table 351: Order data - TB103

3.3 Technical data

Information:

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.

Name	0TB103.9	0TB103.91
Number of pins	3	
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	

Table 352: TB103 Technical data

Name	0TB103.9	0TB103.91
Resistance between contacts	≤ 5 mΩ	
Nominal voltage according to VDE / UL,CSA	250 V / 300 V	
Current load according to VDE / UL,CSA	14.5 A / 10 A per contact	
Terminal size	0.08 mm² - 3.31 mm²	
Cable type	Copper wires only (no aluminum wires!)	

Table 352: TB103 Technical data (Forts.)

4. Power Supplies

In order to meet demands for complete, comprehensive system solutions, power supplies are available in the B&R product line for mounting rail installation. This extensive spectrum ranges from single-phase power supplies that supply 2.1 A up to three-phase power supplies that supply 40 A. All switching power supplies can manage a wide range of AC and DC input voltages. This input ranges from 100 to 240 VAC or 400 to 500 VAC and from 85 to 375 VDC. Devices are protected against short circuit, overload, and open circuit, which allows them to be operated without functional limitations or derating even when overloads between 15% and 25% occur.

Figure 289: B&R power supplies (examples)

Two mini power supplies (PS102 and PS104) in robust plastic housing are available in the lower performance range. A well-designed cooling concept allows several different mounting orientations. The functional DIN rail allows fast mounting and removal. Wiring is essentially performed in seconds thanks to the spring clamps being used. The compact design, easy mounting and several different mounting orientations make the two smallest power supplies in this product line components that can be used practically anywhere.

4.1 Model numbers and brief technical overview

The technical data listed in the following tables should act as a brief selection guide. For more detailed technical data, data sheets are available for download from production description section of the B&R homepage (**www.br-automation.com**).

4.1.1 Single-phase power supplies

Features	0PS102.0	0PS104.0	0PS105.1	0PS105.2	0PS110.1	0PS110.2	0PS120.1
Output power	50 W	100 W	120 W	120 W	240 W	240 W	480 W
AC input voltage	85-264 V	85-132 V 184-264 V	85-132 V 176-264 V	85-132 V 176-264 V	85-132 V 176-264 V	85-132 V 176-264 V	85-132 V 176-264 V
DC input voltage	85-375 V	220-375 V	210-375 V	210-375 V	210-375 V	210-375 V	-
Output voltage	24-28 V	24-28 V	24 V	24 V	24-28 V	24-28 V	24-28 V
Output current at 24 V	2.1 A	4.2 A	5 A	5 A	10 A	10 A	20 A
Parallel operation	No	Yes	Yes	Yes	Yes	Yes	Yes
Current balancing	No	Yes	No	Yes	No	Yes	Yes

Table 353: Single-phase power supplies

4.1.2 Three-phase power supplies

Features	0PS305.1	0PS310.1	0PS320.1	0PS340.1
Output power	120 W	240 W	490 W	960 W
AC input voltage	340-576 V	340-576 V	340-576 V	340-576 V
DC input voltage	450-820 V	450-820 V	450-820 V	450-820 V
Output voltage	24-28 V	24-28 V	24 V	24 V
Output current at 24 V	5 A	10 A	20 A	40 A
Parallel operation	Yes	Yes	Yes	Yes
Current balancing	No	Yes	Yes	Yes

Table 354: Three-phase power supplies

5. External UPS

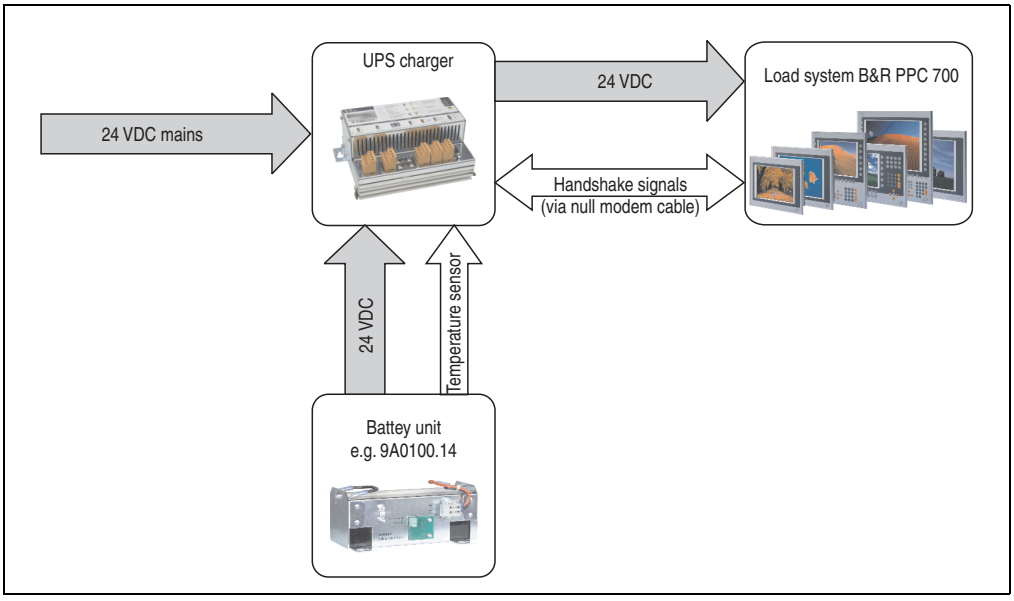


Figure 290: Block diagram of the UPS

5.1 General information

For supply with an external UPS, a UPS charging unit, a battery unit and a null modem cable are required.

In normal operation, the 24 VDC supply voltage is put straight through to the load system. If the supply voltage fails, the rechargeable UPS batteries power the PC to allow controlled shutdown without loss of data.

Data and commands are exchanged between the UPS and the load system via the handshake signals for an RS232 interface.

More information concerning an external UPS is available in the "UPS manual", which can be downloaded from the B&R homepage (**www.br-automation.com**).

5.2 Order data

Model number	Description	Note
9A0100.11	**UPS 24 VDC** 24 VDC input, 24 VDC output, serial interface	
9A0100.14	**UPS battery unit type B** 24 V; 2.2 Ah; including battery cage	
9A0100.15	**UPS battery unit type B (replacement part)** 2 x 12 V; 2.2 Ah; for battery unit 9A0100.14	
9A0017.01	**RS232 Null Modem Cable, 0.6 m** To connect UPS and load system (9-pin DSUB socket - 9-pin DSUB socket)	
9A0017.02	**RS232 Null Modem Cable, 1.8 m** To connect UPS and load system (9-pin DSUB socket - 9-pin DSUB socket)	

Table 355: UPS - Order data

6. Interface covers 5AC600.ICOV-00

The interface covers protect interfaces from dirt and dust when not in use.

6.1 Order data

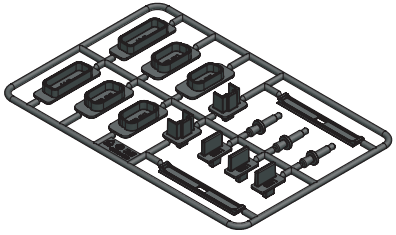
Model number	Description	Figure
5AC600.ICOV-00	**Interface covers** Interface covers for APC620 and PPC700 devices; 5 pieces	

Table 356: Order data - PPC700 interface cover

6.2 Contents of delivery

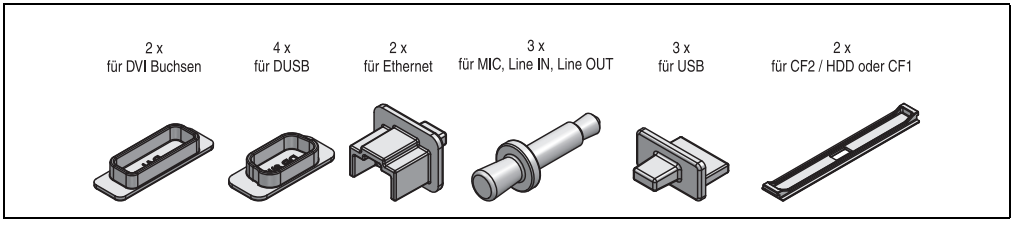


Figure 291: Interface cover - contents of delivery

Information:

THe CF card interface cover cannot be used on PPC700 devices.

7. DVI - monitor adapter 5AC900.1000-00

This adapter enables a standard monitor to be connected to the DVI-I interface.

7.1 Order data

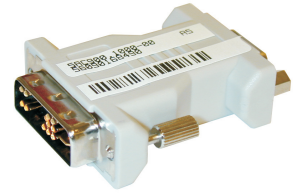
Model number	Description	Figure
5AC900.1000-00	**Adapter DVI-A/m to CRT DB15HD/f** Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	

Table 357: Order data - DVI - CRT adapter

8. USB port cap (attached) - Discontinued

Front side USB port cap (attached) for Automation Panel 900 and Panel PC 700 devices.

8.1 Order data

Model number	Description	Figure
5AC900.1200-00	**USB port cap (attached)** Front side USB port cap (attached) for Automation Panel 900 and Panel PC 700 devices.	

Table 358: Order data - USB port cap (attached)

8.2 Installation

- Remove old cover.
- Feed the USB port cap through the small opening (see red markings).

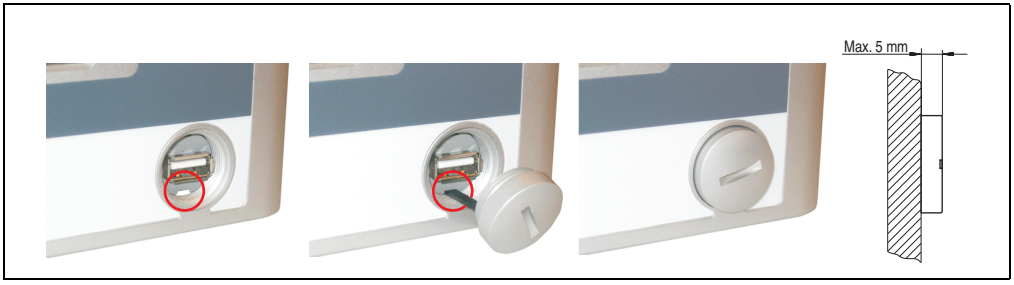


Figure 292: Front side USB port cap - installation

- With the cover screwed on, the front side of the display is raised a maximum of 5 mm.

9. USB port cap (attached)

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

9.1 Order data

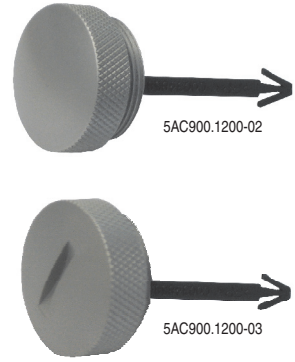
Model number	Description	Figure
5AC900.1200-01	**USB port cap IP65 M20 /2** Front-side USB port cap (attached) knurled, short, not slotted.	
5AC900.1200-02	**USB port cap IP65 M20 /3** Front-side USB port cap (attached) knurled, tall, not slotted.	
5AC900.1200-03	**USB port cap IP65 M20 /4** Front-side USB port cap (attached) knurled, tall, slotted.	

Table 359: Order data - USB port cap (attached)

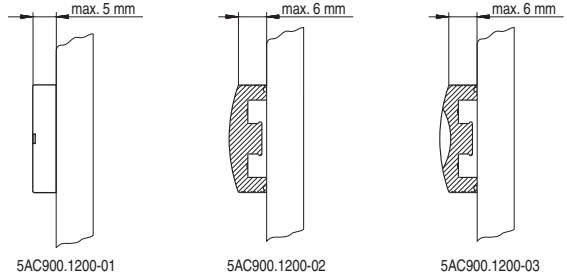


Figure 293: USB port cap (attached) - Height

10. CompactFlash cards 5CFCRD.xxxx-06

10.1 General information

Information:

B&R CompactFlash cards 5CFCRD.xxxx-06 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 chapter 3 "Commissioning" section 12 "Known problems / issues", on page 337.

Information:

The 5CFCRD.xxxx-06 CompactFlash cards are supported on B&R devices with WinCE Version ≥ 6.0.

10.2 Order data

Model number	Description	Figure
5CFCRD.0512-06	CompactFlash 512 MB B&R (SLC)	CompactFlash card
5CFCRD.1024-06	CompactFlash 1 GB B&R (SLC)	
5CFCRD.2048-06	CompactFlash 2 GB B&R (SLC)	
5CFCRD.4096-06	CompactFlash 4 GB B&R (SLC)	
5CFCRD.8192-06	CompactFlash 8 GB B&R (SLC)	
5CFCRD.016G-06	CompactFlash 16 GB B&R (SLC)	
5CFCRD.032G-06	CompactFlash 32 GB B&R (SLC)	

Table 360: Order data - CompactFlash cards

10.3 Technical data

Caution!

A sudden loss of power may result in data loss! In very rare cases, mass memory may also be damaged.

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

Information:

The following characteristics, features and limit values only apply to this accessory and can deviate from those specified for the fully assembled device. The data specifications for the fully assembled device take precedence over those of individual components.

Features	5CFCRD.0512-06	5CFCRD.1024-06	5CFCRD.2048-06	5CFCRD.4096-06	5CFCRD.8192-06	5CFCRD.016G-06	5CFCRD.032G-06
Capacity	512 MB	1 GB	2 GB	4 GB	8 GB	16 GB	32 GB
MTBF (at 25°C)	>3,000,000 hours (at 25°C)						
Maintenance	None						
Data reliability	< 1 unrecoverable error in 10^{14} bit read accesses						
Data retention	10 years						
Lifetime monitoring	Yes						
Supported operating modes	PIO Mode 0-6, Multiword DMA Mode 0-4, Ultra DMA Mode 0-4						
Continuous reading Typical Maximum	33 MB/s 35 MB/s	33 MB/s 35 MB/s	33 MB/s 35 MB/s	33 MB/s 34 MB/s	33 MB/s 34 MB/s	36 MB/s 37 MB/s	36 MB/s 37 MB/s
Continuous writing Typical Maximum	15 MB/s 18 MB/s	15 MB/s 18 MB/s	15 MB/s 18 MB/s	14 MB/s 17 MB/s	14 MB/s 17 MB/s	28 MB/s 30 MB/s	28 MB/s 30 MB/s
Endurance							
Guaranteed data volume Guaranteed[1)] Results for 5 years[1)]	50 TB 27.40 GB/day	100 TB 54.79 GB/day	200 TB 109.59 GB/day	400 TB 219.18 GB/day	800 TB 438.36 GB/day	1600 TB 876.72 GB/day	3200 TB 1753.44 GB/day
Clear/write cycles Guaranteed	100,000						
SLC flash	Yes						
Wear leveling	Static						
Error Correction Coding (ECC)	Yes						

Table 361: Technical data - 5CFCRD.xxxx-06 CompactFlash cards

Endurance	5CFCRD. 0512-06	5CFCRD. 1024-06	5CFCRD. 2048-06	5CFCRD. 4096-06	5CFCRD. 8192-06	5CFCRD. 016G-06	5CFCRD. 032G-06
S.M.A.R.T. Support	Yes						
Support							
Hardware	PP300/400, PP500, PPC300, PPC700, PPC725, PPC800, APC620, APC810, APC820						
Windows XP Professional	No	No	No	Yes	Yes	Yes	Yes
Windows XP Embedded	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows Embedded Standard 2009	No	Yes	Yes	Yes	Yes	Yes	Yes
Windows CE 6.0	Yes	Yes	Yes	Yes	Yes	Yes[2)]	Yes[2)]
Windows CE 5.0	No	No	No	No	No	No	No
PVI Transfer	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)	≥ V3.2.3.8 (part of PVI Development Setup ≥ V2.06.00.3011)	≥ V3.6.8.40 (part of PVI Development Setup ≥ V3.0.0.3020)	≥ V4.0.0.8 (part of PVI Development Setup ≥ V3.0.2.3014)
B&R Embedded OS Installer	≥ V3.10	≥ V3.10	≥ V3.10	≥ V3.10	≥ V3.10	≥ V3.20	≥ V3.21
Mechanical characteristics							
Dimensions Length Width Thickness	36.4 ±0.15 mm 42.8 ±0.10 mm 3.3 ±0.10 mm						
Weight	10 g						
Environmental characteristics							
Ambient temperature Operation Storage Transport	0 to 70°C -65 to 150°C -65 to 150°C						
Relative humidity Operation/Storage/Transport	Max. 85% at 85°C						
Vibration Operation/Storage/Transport	20 G peak, 20- 2000 Hz, 4 in each direction (JEDEC JESD22, method B103) 5.35 G RMS, 15 min per level (IEC 68-2-6)						
Shock Operation/Storage/Transport	1.5k G peak, 0.5 ms 5 times (JEDEC JESD22, method B110) 30 G, 11 ms 1 time (IEC 68-2-27)						
Altitude	Max. 4572 m						

Table 361: Technical data - 5CFCRD.xxxx-06 CompactFlash cards (Forts.)

1) Endurance of B&R CFs (with linear written block size 128 kB)

2) Not supported by B&R Embedded OS installer.

10.3.1 Temperature humidity diagram

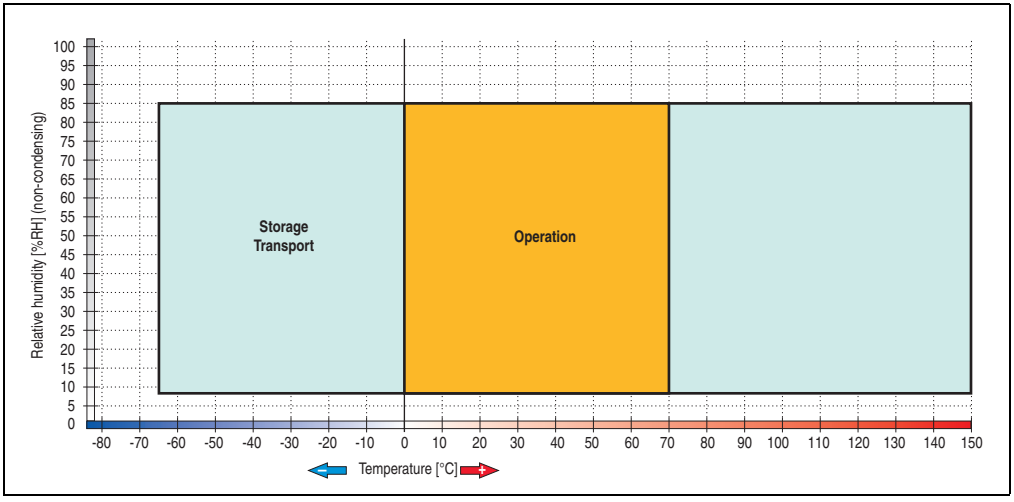


Figure 294: Temperature humidity diagram - CompactFlash cards 5CFCRD.xxxx-06

10.4 Dimensions

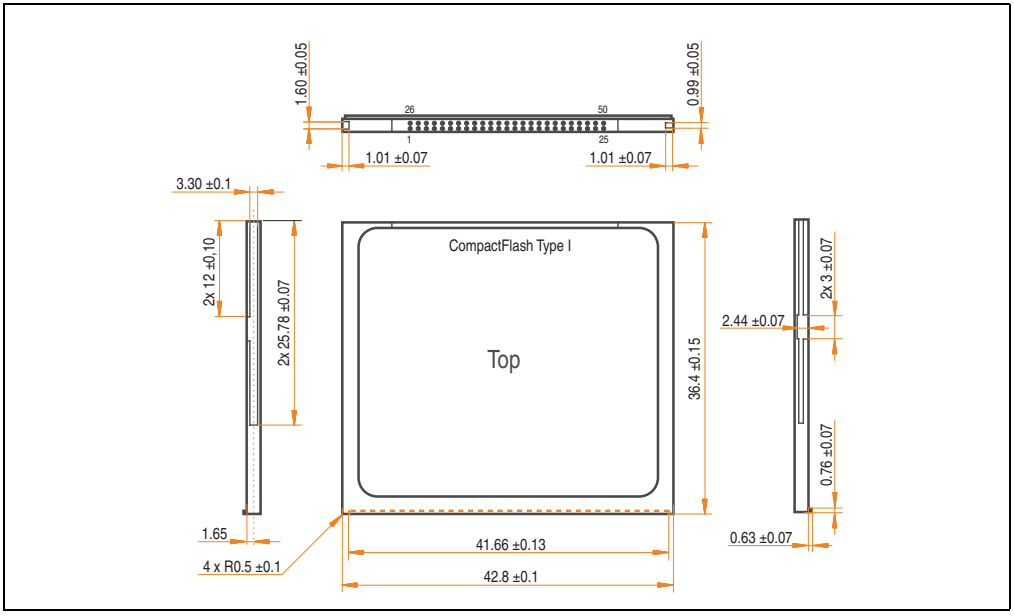


Figure 295: Dimensions - CompactFlash card Type I

10.5 Benchmark

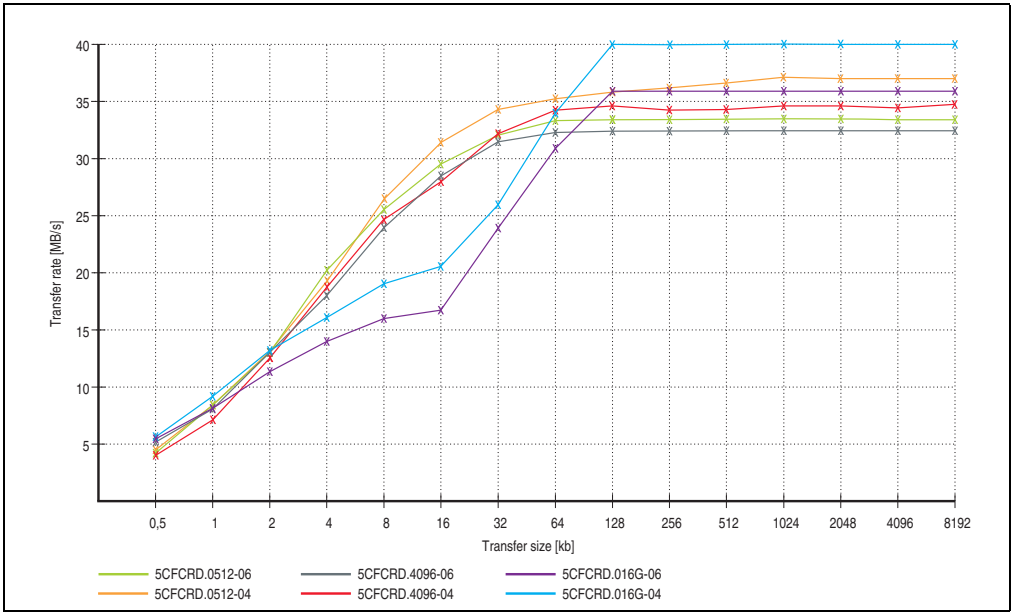


Figure 296: ATTO Benchmark v2.34 comparison when reading - 5CFCRD.xxxx-04 with 5CFCRD.xxxx-06

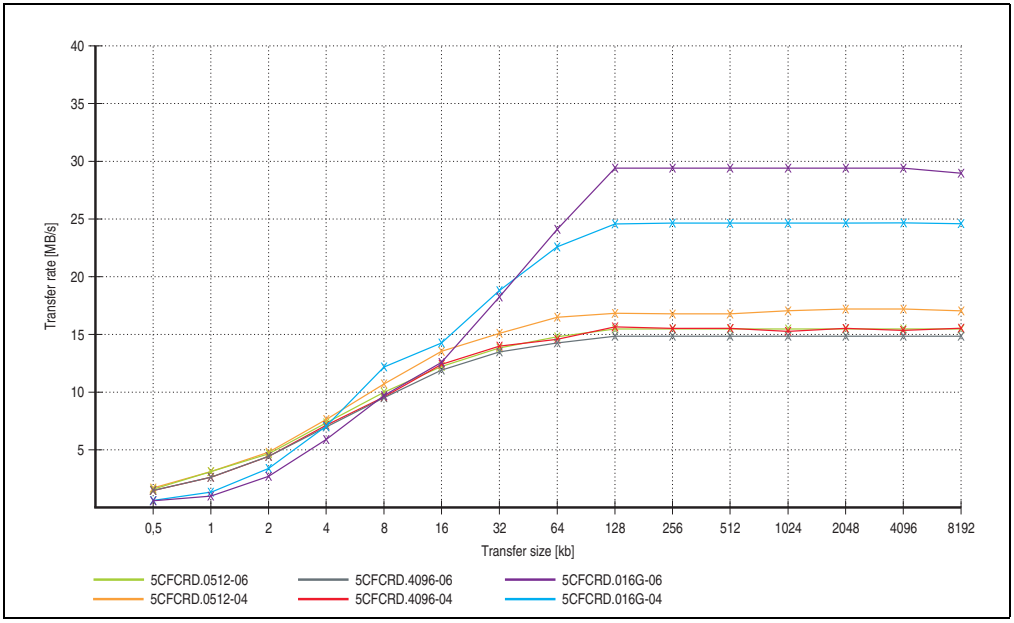


Figure 297: ATTO Benchmark v2.34 comparison when writing - 5CFCRD.xxxx-04 with 5CFCRD.xxxx-06

11. CompactFlash cards 5CFCRD.xxxx-04

11.1 General information

Information:

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 chapter 3 "Commissioning", section 12 "Known problems / issues", on page 337.

Information:

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

11.2 Order data

Model number	Description	Figure
5CFCRD.0512-04	512 MB B&R CompactFlash card	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 362: Order data - CompactFlash cards

11.3 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.

Information:

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.

Features	5CFCRD.0512-04	5CFCRD.1024-04	5CFCRD.2048-04	5CFCRD.4096-04	5CFCRD.8192-04	5CFCRD.016G-04
MTBF (at 25°C)	> 3,000,000 hours					
Maintenance	None					
Data reliability	< 1 unrecoverable error in 10^{14} bit read accesses					
Data retention	10 years					
Lifetime monitoring	Yes					
Supported operating modes	PIO Mode 0-6, Multiword DMA Mode 0-4, Ultra DMA Mode 0-4					
Continuous reading	Typically 35 MB/s(240X)[1)2)] Max. 37 MB/s (260X)[1) 2)]	Typically 35 MB/s (240X)[1) 2)] Max. 37 MB/s (260X)[1) 2)]	Typically 35 MB/s (240X)[1) 2)] Max. 37 MB/s (260X)[1) 2)]	Typically 33 MB/s (220X)[1) 2)] Max. 34 MB/s (226X)[1) 2)]	Typically 27 MB/s (180X)[1) 2)] Max. 28 MB/s (186X)[1) 2)]	Typically 36 MB/s (240X)[1) 2)] Max. 37 MB/s (247X)[1) 2)]
Continuous writing	Typically 17 MB/s (110X) Max. 20 MB/s (133X)	Typically 17 MB/s (110X) Max. 20 MB/s (133X)	Typically 17 MB/s (110X) Max. 20 MB/s (133X)	Typically 16 MB/s (106X) Max. 18 MB/s (120X)	Typically 15 MB/s (100X) Max. 17 MB/s (110X)	Typically 18 MB/s (120X) Max. 19 MB/s (126X)
Endurance						
Guaranteed amount of data [3)] Results in 5 years [3)]	50 TB 27.40 GB/day	100 TB 54.79 GB/day	200 TB 109.59 GB/day	400 TB 219.18 GB/day	800 TB 438.36 GB/day	1600 TB 876.72 GB/day
Clear/write cycles Guaranteed Typical[4)]	100,000 2,000,000					
SLC flash	Yes					
Wear leveling	Static					
Error Correction Coding (ECC)	Yes					

Table 363: Technical data - CompactFlash cards 5CFCRD.xxxx-04

Support	5CFCRD.0512-04	5CFCRD.1024-04	5CFCRD.2048-04	5CFCRD.4096-04	5CFCRD.8192-04	5CFCRD.016G-04
Hardware	PP300/400, PPC300, PPC700, PPC725, PPC800, APC620, APC810, APC820					
Windows XP Professional	-	-	-	Yes	Yes	Yes
Windows XP Embedded	Yes	Yes	Yes	Yes	Yes	Yes
Windows Embedded Standard 2009	-	Yes	Yes	Yes	Yes	Yes
Windows CE 6.0	Yes	Yes	Yes	Yes	Yes	Yes [5]
Windows CE 5.0	-	-	-	-	-	-
PVI Transfer Tool	V3.2.3.8 (part of PVI Development Setup V2.06.00.3011)					-
B&R Embedded OS Installer	V3.10					-
Mechanical characteristics						
Dimensions Length Width Thickness	36.4 ±0.15 mm 42.8 ±0.10 mm 3.3 ±0.10 mm					
Weight	10 g					
Environmental characteristics						
Ambient temperature Operation Bearings Transport	0 to 70°C -65 to 150°C -65 to 150°C					
Relative humidity Operation/Storage/Transport	Max. 85% at 85°C					
Vibration Operation/Storage/Transport	20 G peak, 20- 2000 Hz, 4 in each direction (JEDEC JESD22, method B103) 5.35 G RMS, 15 min per level (IEC 68-2-6)					
Shock Operation/Storage/Transport	1.5k G peak, 0.5 ms 5 times (JEDEC JESD22, method B110) 30 G, 11 ms 1 time (IEC 68-2-27)					
Altitude	Max. 15,000 feet (4,572 m)					

Table 363: Technical data - CompactFlash cards 5CFCRD.xxxx-04 (Forts.)

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) The file is written/read sequentially in True IDE mode with the DOS program Thruput.exe.

3) Endurance of B&R CF cards (linear written block size with 128 kB)

4) Depending on the average file size.

5) Not supported by B&R Embedded OS installer.

11.3.1 Temperature humidity diagram

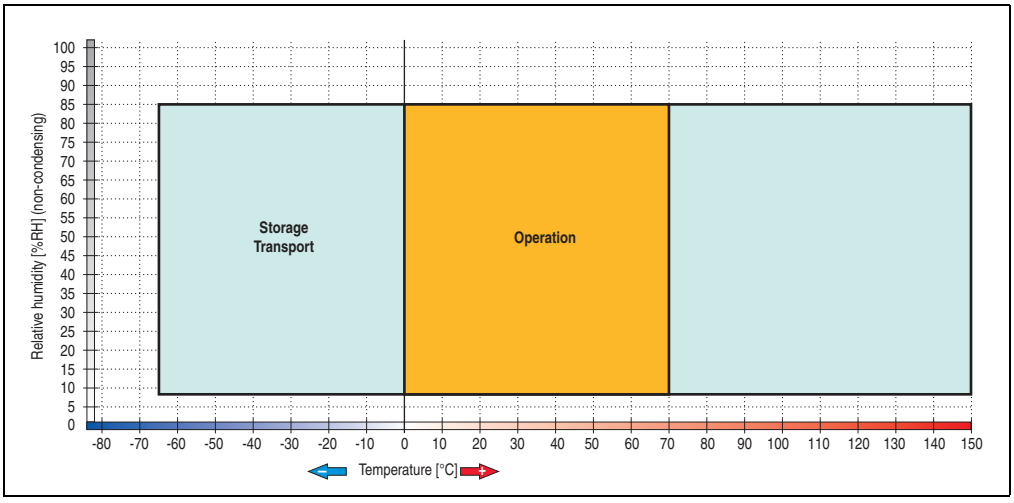


Figure 298: Temperature humidity diagram - CompactFlash cards 5CFCRD.xxxx-04

11.4 Dimensions

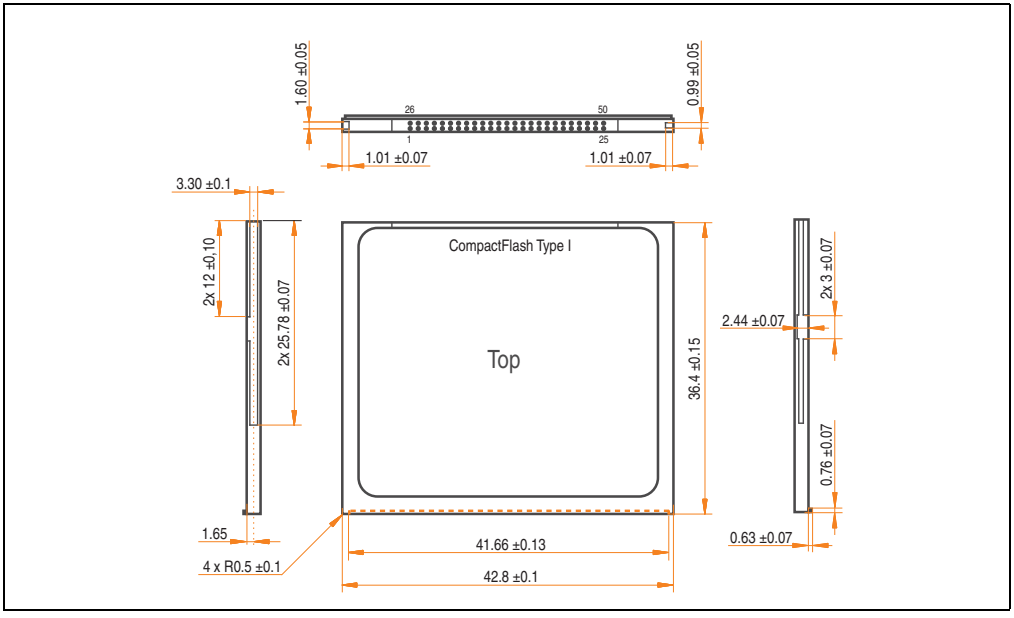


Figure 299: Dimensions - CompactFlash card Type I

11.5 Benchmark

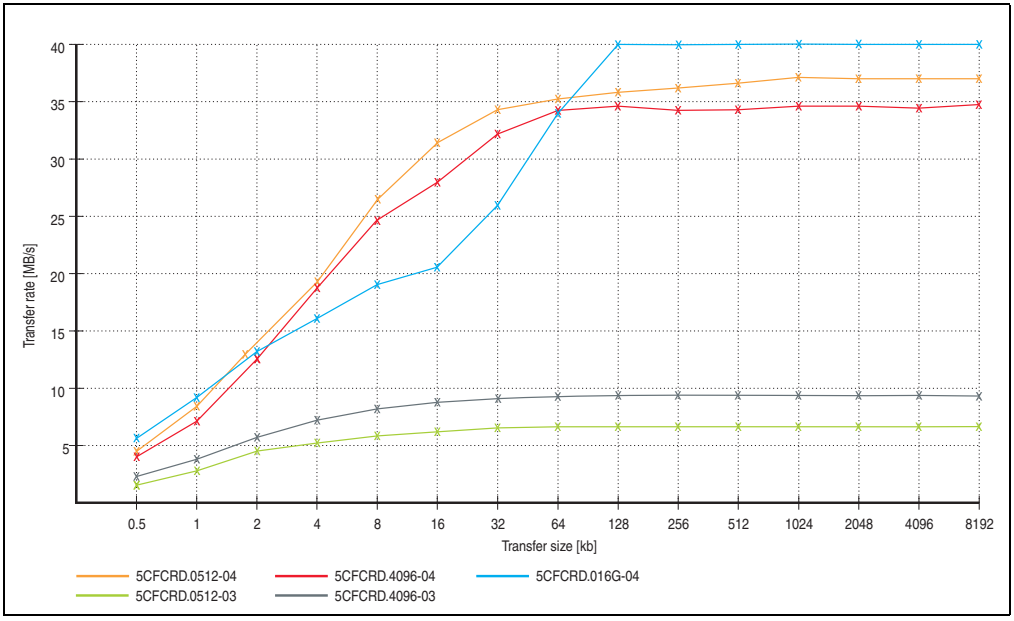


Figure 300: ATTO disk benchmark v2.34 comparison (reading)

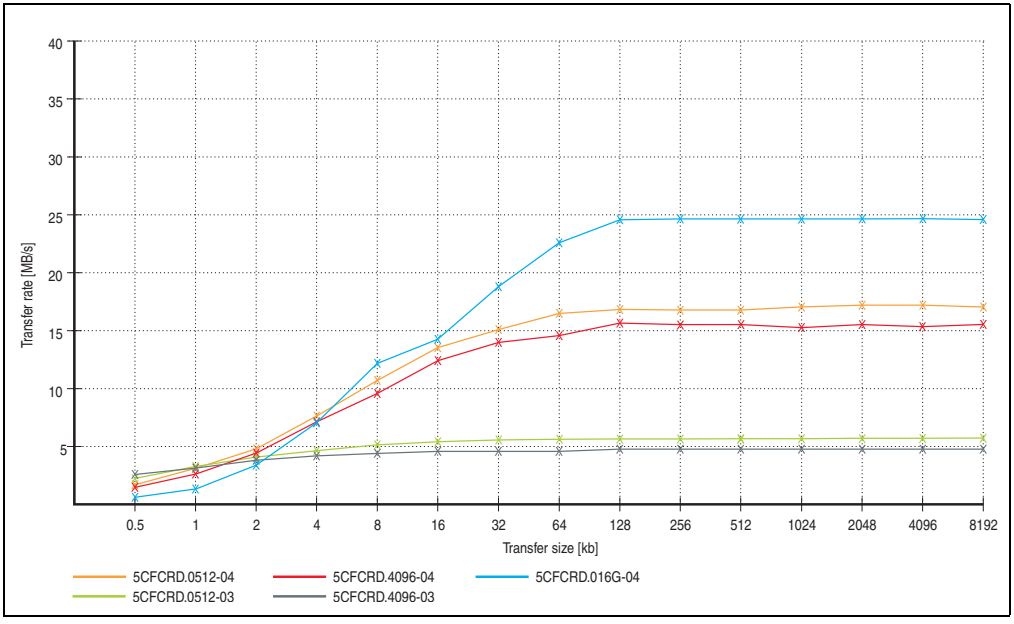


Figure 301: ATTO disk benchmark v2.34 comparison (writing)

12. CompactFlash cards - 5CFCRD.xxxx-03

12.1 General information

Information:

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

See chapter 3 "Commissioning", section 12 "Known problems / issues", on page 337.

Information:

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

12.2 Order data

Model number	Description	Figure
5CFCRD.0064-03	CompactFlash 64 MB SSI	CompactFlash card
5CFCRD.0128-03	CompactFlash 128 MB SSI	
5CFCRD.0256-03	CompactFlash 256 MB SSI	
5CFCRD.0512-03	CompactFlash 512 MB SSI	
5CFCRD.1024-03	CompactFlash 1024 MB SSI	
5CFCRD.2048-03	CompactFlash 2048 MB SSI	
5CFCRD.4096-03	CompactFlash 4096 MB SSI	
5CFCRD.8192-03	CompactFlash 8192 MB SSI	

Table 364: Order data - CompactFlash cards

12.3 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.

Information:

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.

Features	5CFCRD. 0064-03	5CFCRD. 0128-03	5CFCRD. 0256-03	5CFCRD. 0512-03	5CFCRD. 1024-03	5CFCRD. 2048-03	5CFCRD. 4096-03	5CFCRD. 8192-03
MTBF (at 25°C)	> 4,000,000 hours							
Maintenance	None							
Data reliability	< 1 unrecoverable error in 10^{14} bit read accesses							
Data retention	10 years							
Lifetime monitoring	Yes							
Supported operating modes	PIO Mode 0-4, Multiword DMA Mode 0-2							
Continuous reading	Typically 8 MB/s							
Continuous writing	Typically 6 MB/s							
Endurance								
Clear/write cycles Typical	> 2,000,000							
SLC flash	Yes							
Wear leveling	Static							
Error Correction Coding (ECC)	Yes							
Support								
Hardware	MP100/200, PP100/200, PP300/400, PPC700, PPC725, PPC300, PPC800 Provit 2000, Provit 5000, APC620, APC680, APC810, APC820							
Windows XP Professional	-	-	-	-	-	-	Yes	Yes
Windows XP Embedded	-	-	-	Yes	Yes	Yes	Yes	Yes
Windows Embedded Standard 2009	-	-	-	-	Yes	Yes	Yes	Yes
Windows CE 6.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 365: Technical data - CompactFlash cards 5CFCRD.xxxx-03

Support	5CFCRD. 0064-03	5CFCRD. 0128-03	5CFCRD. 0256-03	5CFCRD. 0512-03	5CFCRD. 1024-03	5CFCRD. 2048-03	5CFCRD. 4096-03	5CFCRD. 8192-03
Windows CE 5.0	Yes	Yes	Yes	Yes	Yes	-	-	-
PVI Transfer Tool	V2.57 (part of PVI Development Setup V2.5.3.3005)							
B&R Embedded OS Installer	V2.21							
Mechanical characteristics								
Dimensions Length Width Thickness	36.4 ±0.15 mm 42.8 ±0.10 mm 3.3 ±0.10 mm							
Weight	11.4 g							
Environmental characteristics								
Ambient temperature Operation Bearings Transport	0 to 70°C -50 to 100°C -50 to 100°C							
Relative humidity Operation/Storage/Transport	8 to 95%, non-condensing							
Vibration Operation Storage/Transport	max. 16.3 g (159 m/s^2 0-peak) max. 30 g (294 m/s^2 0-peak)							
Shock Operation Storage/Transport	Max. 1000 g (9810 m/s^2 0-peak) Max. 3000 g (29,430 m/s^2 0-peak)							
Altitude	Maximum 80,000 feet (24,383 meters)							

Table 365: Technical data - CompactFlash cards 5CFCRD.xxxx-03 (Forts.)

12.3.1 Temperature humidity diagram

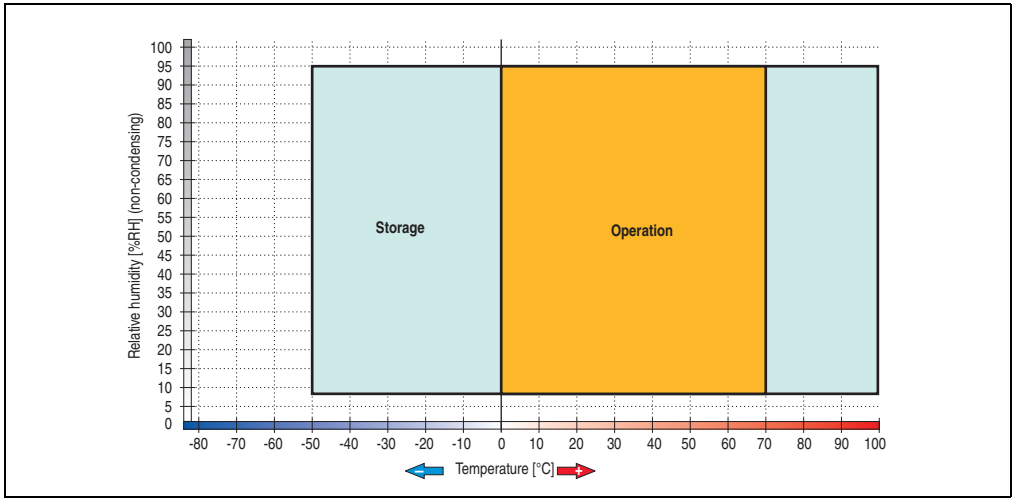


Figure 302: Temperature humidity diagram - CompactFlash cards 5CFCRD.xxxx-03

12.4 Dimensions

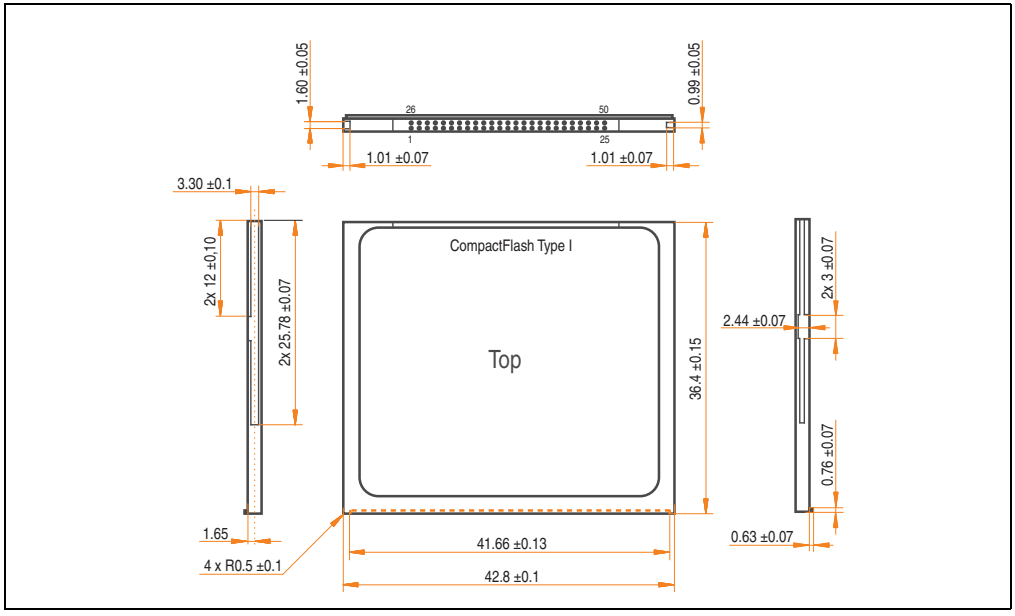


Figure 303: Dimensions - CompactFlash card Type I

13. CompactFlash cards 5CFCRD.xxxx-02

13.1 General information

Information:

SanDisk CompactFlash cards 5CFCRD.xxxx-02 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 chapter 3 "Commissioning", section 8 "Known problems / issues", on page 311.

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.

13.2 Order data

Model number	Description	Figure
5CFCRD.0032-02	CompactFlash 32 MB SanDisk/A	
5CFCRD.0064-02	CompactFlash 64 MB SanDisk/A	
5CFCRD.0128-02	CompactFlash 128 MB SanDisk/A	
5CFCRD.0256-02	CompactFlash 256 MB SanDisk/A	
5CFCRD.0512-02	CompactFlash 512 MB SanDisk/A	
5CFCRD.1024-02	CompactFlash 1024 MB SanDisk/A	
5CFCRD.2048-02	CompactFlash 2048 MB SanDisk/A	

Table 366: Order data - CompactFlash cards

13.3 Technical data

Information:

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.

Features	5CFCRD.xxxx-02
MTBF (at 25°C)	> 3,000,000 hours
Maintenance	None
Data reliability	< 1 unrecoverable error in 10^{14}bit read accesses < 1 faulty correction in 10^{20}bit read accesses
Write/erase procedures	> 2,000,000 times
Mechanical characteristics	
Dimensions Length Width Thickness	 36.4 ± 0.15 mm 42.8 ± 0.10 mm 3.3 mm ± 0.10 mm
Weight	11.4 g
Environmental characteristics	
Ambient temperature Operation Bearings Transport	 0 to 70°C -25 to 85°C -25 to 85°C
Relative humidity Operation / Storage	 8 to 95%, non-condensing
Vibration Operation / Storage	 Maximum 30 g (point to point)
Shock Operation / Storage	 Maximum 3,000 g
Altitude	24,000 meters

Table 367: Technical data - CompactFlash cards 5CFCRD.xxxx-02

13.4 Dimensions

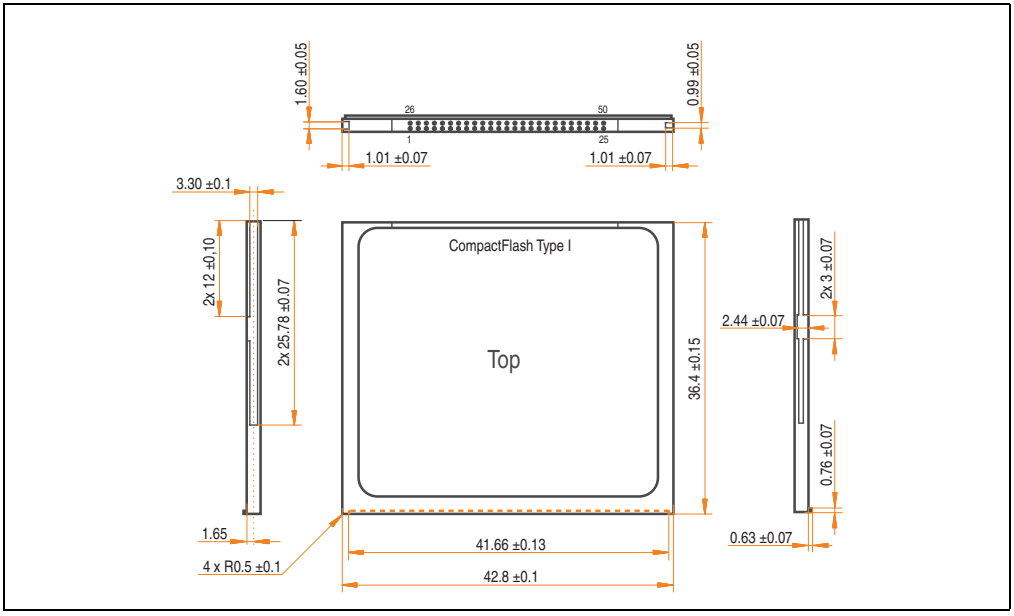
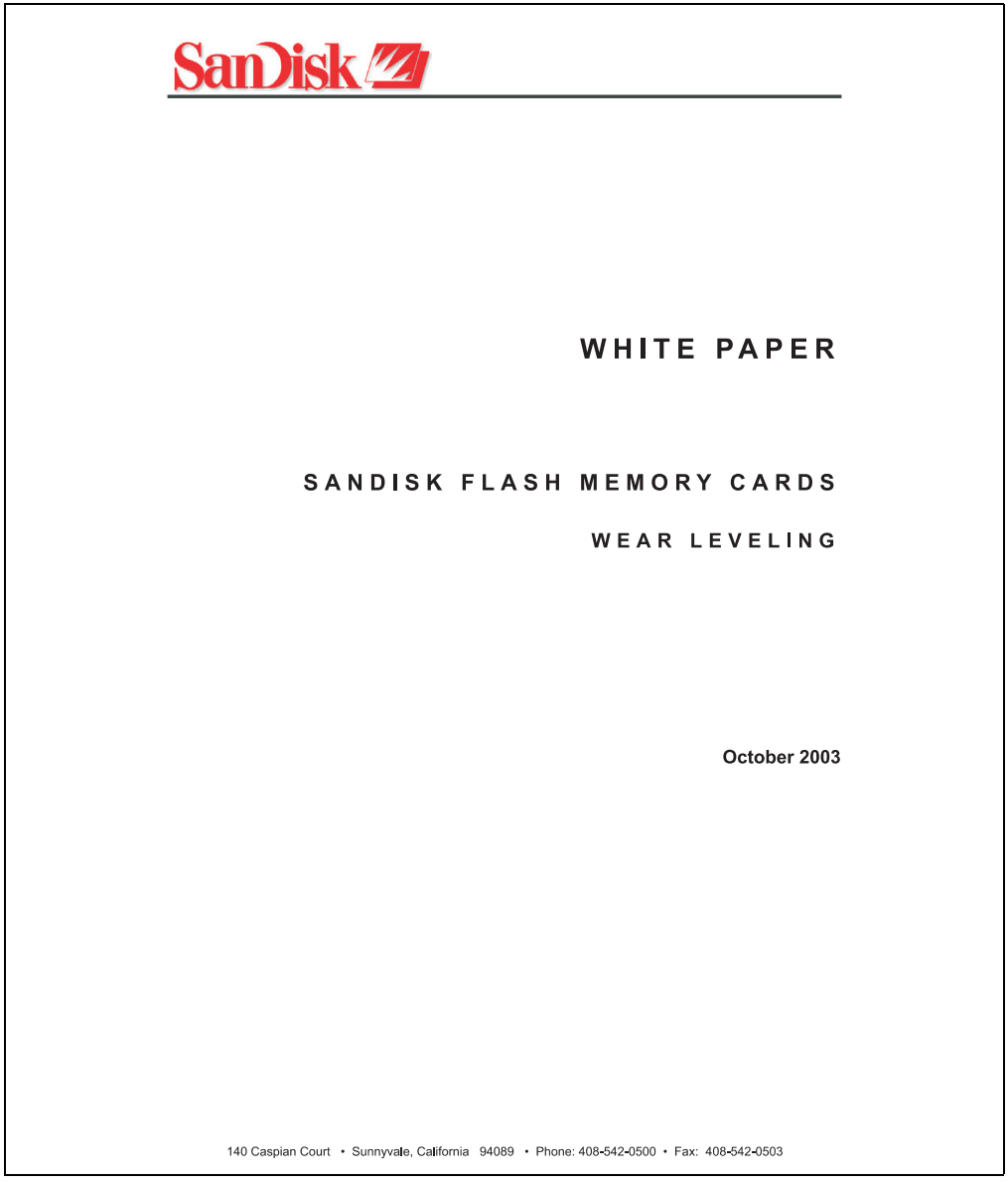


Figure 304: Dimensions - CompactFlash card Type I

13.5 Calculating the lifespan

SanDisk provides a 6-page "white paper" for the lifespan calculation of CompactFlash cards (see following pages). This document can also be found on the SanDisk homepage.



SanDisk

WHITE PAPER

SANDISK FLASH MEMORY CARDS

WEAR LEVELING

October 2003

140 Caspian Court • Sunnyvale, California 94089 • Phone: 408-542-0500 • Fax: 408-542-0503

Figure 305: SanDisk white paper - page 1 of 6

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Lit. No. 80-36-00278 10/03 Printed in U.S.A.

Figure 306: SanDisk white paper - page 2 of 6

OVERVIEW

This purpose of this white paper is to help SanDisk customers understand the benefits of wear leveling and to assist customers in calculating life expectancy of SanDisk cards in specific applications.

Flash memory is susceptible to wear as a result of the repeated program and erase cycles that are inherent in typical data storage applications. Applications in which this is a major concern include hard disk replacement applications where write operations occur frequently. How a storage system manages the wear of the memory is key to understanding the extended reliability of the host that relies on these storage systems.

WEAR LEVELING METHODOLOGY

Current products available in the industrial channel use NAND flash memory. It is important to understand the NAND memory architecture to gain insight into the wear leveling mechanism.

Each memory chip is divided into blocks. A block is an array of memory cells organized as sectors. The number of blocks and sectors vary from product to product. The minimum unit for a write or read operation is a page (or sector). The minimum unit for an erase operation is a block. Physical blocks are logically grouped into zones. For the current technology, a typical zone size is 4 MB. However, this may change from product to product. Wear leveling is done within a zone. The current firmware does not spread the wear across the capacity of the card. Each zone has about 3% additional “spare blocks” beyond what is assigned to meet the logical capacity of the flash card. This group of blocks is commonly referred to as the “Erase Pool”.

With the introduction of SanDisk’s Write-before-Erase architecture, each time a host writes data to the same logical address (CHS or LBA), data is written into a newly assigned, empty physical block from the “Erase Pool”. The intrinsic nature of writing to a new physical location each time a logical address is written to is the basis for wear leveling found in SanDisk cards. This action spreads the writes over the zone, thus greatly extending the overall life of the card. The methodology of using a large number of physical addresses to manage a smaller logical address table allows for rotation of the physical addresses among the entire group of physical blocks within a zone. The resulting wear leveling optimizes the effective life of the media and avoids prematurely reaching the end of life on frequently written to host addresses.

When a card detects that a block has reached the end of its useful life, it removes that block from the blocks that are available for write operations. The result is a reduction of the size of the erase pool. This does not affect the capacity of the card as seen by the host. When the pool of blocks available for write operations has been exhausted due to wear, the card will reach the end of its useful life for write operations.

Figure 307: SanDisk white paper - page 3 of 6

Current SanDisk products do not preempt wear leveling events during normal operation of the card. Applications typically don't require such management beyond the natural wear leveling that occurs during normal host operations. As a result, the effectiveness of wear leveling in current SanDisk products is dependent upon host usage. It is important for customers whose applications do not fall into this typical usage pattern to understand how their applications will affect the lifetime of the card.

LIFE EXPECTANCY SCENARIOS

►best case analysis

In a typical application, large data files are written to the card occupying contiguous sequential logical address space. This results in optimal wear leveling and provides card life exceeding the specification for card endurance. This increased endurance is achieved as follows: The 2,000,000 endurance cycles specification (I-Grade only) is a result of large amounts of test data collected from a very large sample set that accounts for the extreme limits of the test population. With the 3% additional erase pool being used in an ideal fashion, the distribution is narrowed and the card will survive beyond its specified lifetime.

►worst case analysis

In the worst-case application, data will be written as single sectors to random addresses across the card. These single sector writes will exercise the erase pool more rapidly, requiring the system to perform a "garbage collection" operation to free up new blocks for subsequent write operations. At the extreme, each single sector write would cause one block to be programmed and erased. As a typical block size is 16kB or 32 sectors, the amount of wear is increased by a factor of 31 since 32 physical sectors are written and erased for each sector the host writes. Spreading this wear across the erase pool results in an effective 1/30 usable lifetime. This case is an extreme example and is only included to show the range of application dependence. This result is comparable to other vendor's cards based on memory with a 16kB erase block.

►analysis of host dependence

In assessing the life expectancy of a card in a given system several factors need to be understood. These factors include the types of files and their corresponding sizes, frequency of card write operations and file system behavior (including data structures). The types of files must be considered since some files, such as operating systems or executable files, typically remain in fixed locations once they are stored in the card. This limits the number of physical blocks available for circulation into the erase pool. The remaining capacity after these files have been accounted for can then be divided by the typical size of files that will be updated over the lifetime of the card. Related to this calculation is how the file system overwrites existing files. Typical operating system behavior, such as DOS, will allocate new blocks from the file allocation table, or FAT, and so repeated file writes will occupy a new set of addresses on the card. This is very beneficial in spreading wear across the card since it forces the card to cycle the entire physical

Figure 308: SanDisk white paper - page 4 of 6

area being used for such files. Special cases to consider include those where the files being updated are very small. Typically an operating system uses a minimum number of sectors to store a file, referred to as a cluster. Typical cluster sizes range from 8 to 64 sectors in size. The cluster size is important for files that are the same or smaller than the 32-sector block since these may trigger garbage collection operations. If these updates happen in a random fashion (sequential updates would not be affected by cluster size) lifetime may be reduced as a result. Finally, the frequency of such updates is then used to determine how long it will take before the card reaches its statistical limit for endurance. These factors can be combined in an equation that can be used to calculate the minimum time a card will function in that application:

$$lifetime = 2{,}000{,}000 \times \frac{\left(C_{zone} - C_{fixed}\right) \times \left(1 - k_r \times \frac{32 - N_{cluster}}{32}\right)}{FS_{typ}} \times \frac{1}{f_w}$$

where Czone is the total capacity of the zone, Cfixed is the capacity used by fixed files, Ncluster is the cluster size, FStyp is the average file size and fw is the average frequency at which files are updated. kr is a factor that is 0 for file sizes that are typically over 16kB or for applications that are not random in the order in which such files are updated.

Example 1

In this example 128 KB of data is updated once a day. The zone has 500 KB worth of fixed files. A 4 MB zone size is assumed.

$$lifetime = 2{,}000{,}000 \times \frac{(4000 - 500) \times (1 - 0)}{128} \times \frac{1}{1/day}$$

$$lifetime = 149828\,years$$

Example 2

This example is a data logging operation using a 1GB card where a 4kB file is updated every five seconds. This would result in sequential address being written.

$$lifetime = 2{,}000{,}000 \times \frac{4000}{4} \times \frac{1}{1/5\,\mathrm{sec}}$$

$$lifetime = 317\,years$$

Figure 309: SanDisk white paper - page 5 of 6

Example 3

This example is a data logging operation using the same 1GB card where a new 4kB file is written every five seconds. But in this case the cluster size is 4kB and it is expected that, due to file system fragmentation, the logical addresses will be written randomly.

$$lifetime = 2{,}000{,}000 \times \frac{4 \times \left(1 - 1 \times \frac{32-8}{32}\right)}{.004} \times \frac{1}{1/5\,\text{sec}}$$

$$lifetime = 79.3\,years$$

CONCLUSION

These examples are general in nature but show how the equation can be used as a guideline for calculating card lifetime in different applications. They also demonstrate that SanDisk card architecture exceeds reasonable life expectancy in typical applications. If a particular applications behaves in such a way that this equation cannot be applied, the SanDisk Applications Engineering group can assist in performing card lifetime analysis.

For more information, please visit the SanDisk Web site at: www.sandisk.com

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URL: http://www.sandisk.com

Figure 310: SanDisk white paper - page 6 of 6

14. USB Media Drive - 5MD900.USB2-00

Figure 311: USB Media Drive - 5MD900.USB2-00

14.1 Features

- Desk-top or rack-mount operation (mounting rail brackets)
- Integrated USB diskette drive
- Integrated DVD-ROM/CD-RW drive
- Integrated CompactFlash slot IDE/ATAPI (Hot Plug capable)
- Integrated USB 2.0 connection (up to 480 MBit high speed)
- +24 VDC supply (back side)
- USB/B 2.0 connection (back side)
- Optional front cover (see also section 14.8 "Front cover 5A5003.03 for the USB Media Drive", on page 618)

14.2 Technical data

Information:

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.

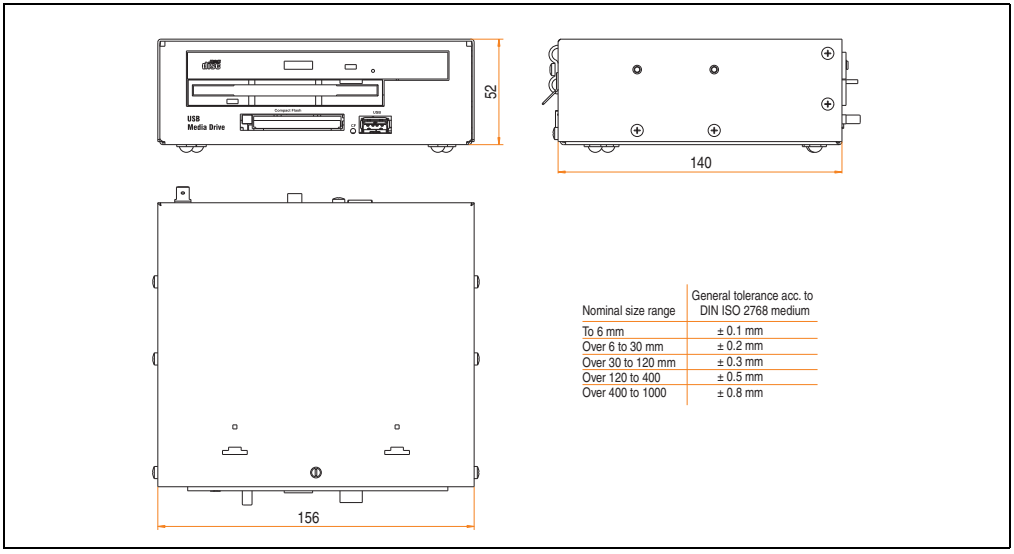
Features - entire device	5MD900.USB2-00
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s)
Maximum cable length	5 m (not including hub)
Power supply Rated voltage	 24 VDC ±25%
Features - diskette drive	
Data capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
Data transfer rate	250 kbits (720 KB) or 500 kbits (1.25 MB and 1.44 MB)
Rotation speed	Up to 360 rpm
Diskette media	High density (2HD) or normal density (2DD) 3.5" diskettes
MTBF	30,000 POH (Power-On Hours)
Features - DVD-ROM/CD-RW drive	
Write speed CD-R CD-RW	 24x, 16x, 10x and 4x 10x and 4x
Reading rate CD DVD	 24x 8x
Data transfer rate	Max. 33.3 MB/s
Access time (average) CD DVD	 85 ms 110 ms
Revolution speed	Max. 5136 rpm ± 1%
Starting time (0 rpm to read access)	19 seconds (maximum)
Host interface	IDE (ATAPI)
Readable media CD DVD	 CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW DVD-ROM, DVD-R, DVD-RW, DVD-RAM
Non-write protected media CD	 CD-R, CD-RW
Compatible formats	CD-DA, CD-ROM Mode 1/ Mode 2, CD-ROM XA Mode 2 (Form 1, Form 2), Photo CD (single/multi-session), Enhanced CD, CD-Text, DVD-ROM, DVD-R, DVD-Video (Double Layer) DVD-RAM (4.7 GB, 2.6 GB)
Write-methods	Disk at once, session at once, packet write, track at once

Table 368: Technical data - USB Media Drive 5MD900.USB2-00

Features - DVD-ROM/CD-RW drive	5MD900.USB2-00
Laser class	Class 1 laser
Data buffer capacity	2 MB
Noise level (complete read access)	Approx. 45 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
CompactFlash slot layout	
CompactFlash Type Amount Connection	 Type I 1 slot IDE/ATAPI
CompactFlash LED	Signals read or write access to an inserted CompactFlash card
Hot Plug capable	Yes
Features - USB connections	
USB A on the front side Power supply	Connection of further peripheral devices Max. 500 mA
USB B back side	Connection to the system
Mechanical characteristics	
Outer dimensions (without slide-in) Width Length Height	 70 mm 100 mm 9.5 mm
Weight	Approx. 1.1 kg (without front cover)
Environmental characteristics	
Ambient temperature Operation Bearings Transport	 5 to 45°C -20 to 60°C -40 to 60°C
Relative humidity Operation Bearings Transport	 20 to 80%, non-condensing 5 to 90%, non-condensing 5 to 95%, non-condensing
Vibration Operation Bearings Transport	 5 - 500 Hz: 0.3 g (2.9 m/s^2 0-peak) 10 - 100 Hz: 2 g (19.6 m/s^2 0-peak) 10 - 100 Hz: 2 g (19.6 m/s^2 0-peak)
Shock Operation Bearings Transport	 Max. 5 g (49 m/s^2 0-peak) and 11 ms duration Max. 60 g (588 m/s^2 0-peak) and 11 ms duration Max. 60 g (588 m/s^2 0-peak) and 11 ms duration
Altitude	Max. 3000 meters

Table 368: Technical data - USB Media Drive 5MD900.USB2-00 (Forts.)

14.3 Dimensions



Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Figure 312: Dimensions - 5MD900.USB2-00

14.4 Dimensions with front cover

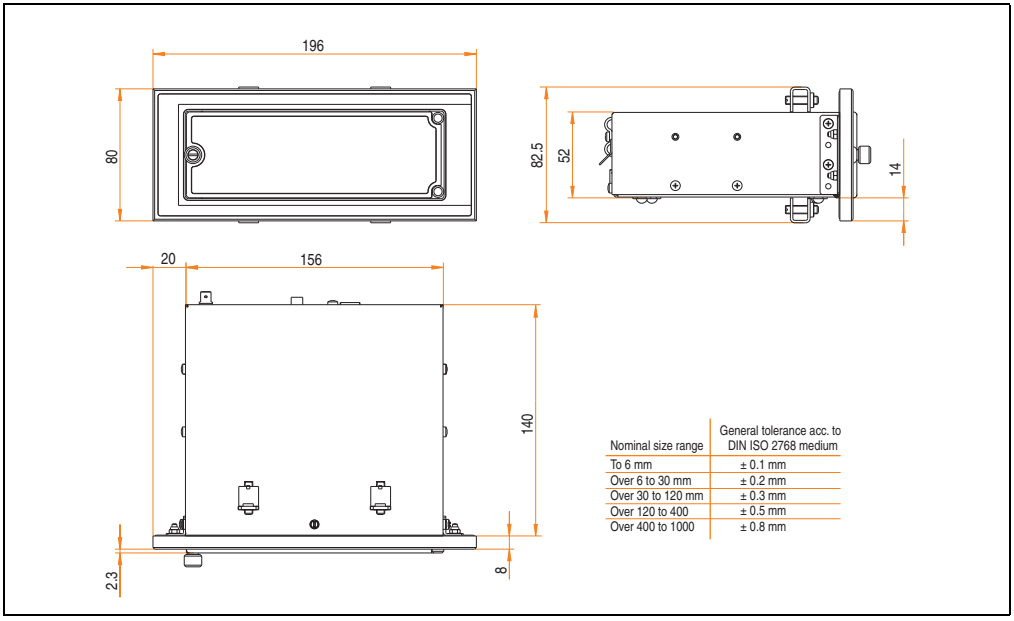


Figure 313: Dimensions - USB Media Drive with front cover

14.5 Contents of delivery

Amount	Component
1	USB Media Drive complete unit
2	Mounting rail brackets

Table 369: Contents of delivery - USB Media Drive 5MD900.USB2-00

14.6 Interfaces

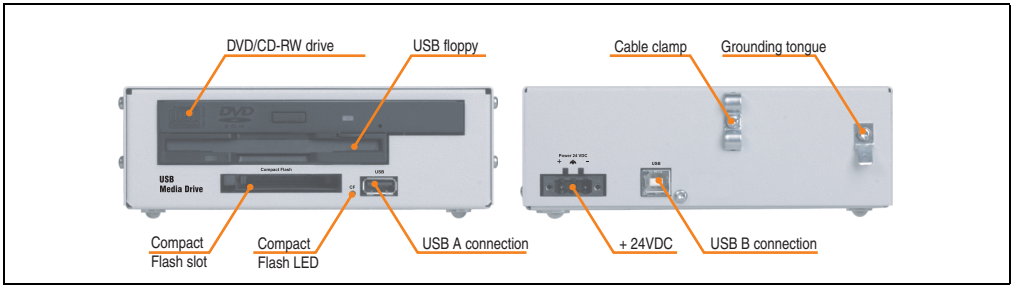


Figure 314: Interfaces - 5MD900.USB2-00

14.7 Installation

The USB Media Drive can be operated as a desk-top device (rubber feet) or as a rack-mount device (2 mounting rail brackets included).

14.7.1 Mounting orientation

Because of limits to the mounting orientation with the components used (floppy, DVD-CDRW drive), the USB media drive is only permitted to be mounted and operated as shown in the following figure.

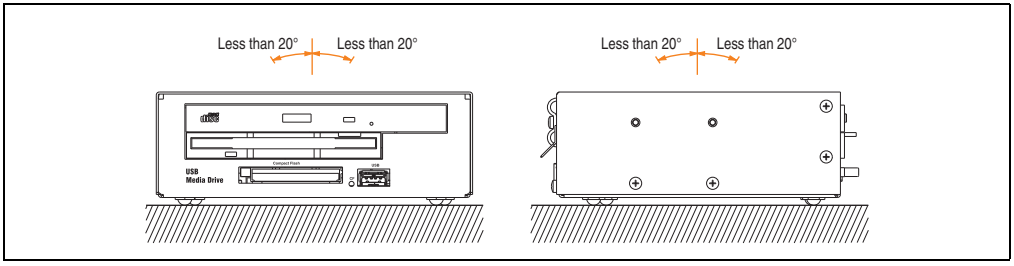


Figure 315: Mounting orientation - 5MD900.USB2-00

14.8 Front cover 5A5003.03 for the USB Media Drive

This front cover can also be mounted on the front of the USB media drive (model number 5MD900.USB2-00 or 5MD900.USB2-01) to protect the interface.

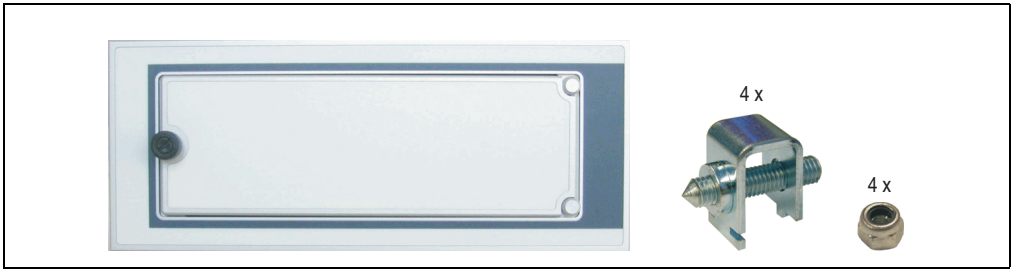


Figure 316: Front cover 5A5003.03

14.8.1 Technical data

Features	5A5003.03
Front cover design / colors Dark gray border around the cover Light gray background	 Pantone 432CV Pantone 427CV

Table 370: Technical data - 5A5003.03

14.8.2 Dimensions

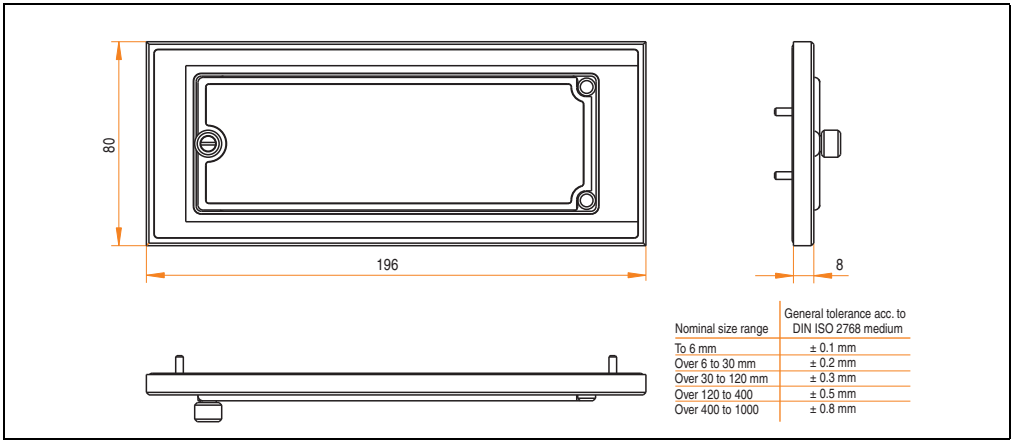


Figure 317: Dimensions - 5A5003.03

14.8.3 Installation

The front cover is attached with 2 mounting rail brackets (included with USB Media Drive) and 4 M3 locknuts. The USB media drive and front cover can be mounted as a whole in (for example) a switching cabinet door.

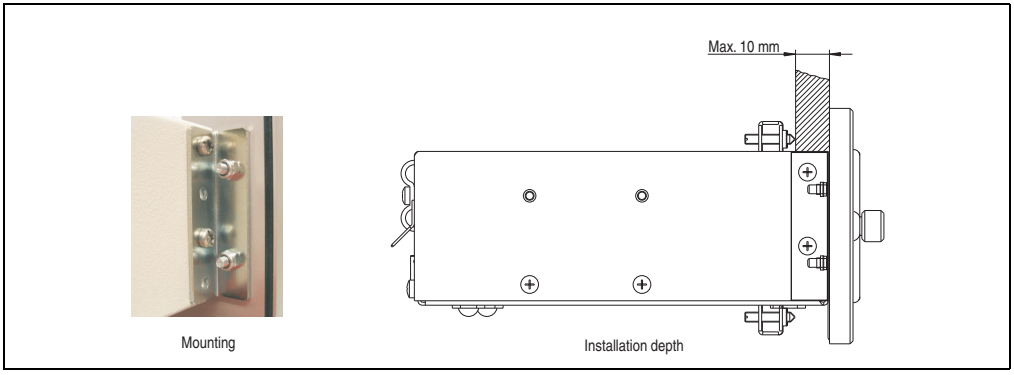


Figure 318: Front cover mounting and installation depth

15. USB Media Drive - 5MD900.USB2-01

Figure 319: USB Media Drive - 5MD900.USB2-01

15.1 Features

- Desk-top or rack-mount operation (mounting rail brackets)
- Integrated USB diskette drive
- Integrated DVD-RW/CD-RW drive
- Integrated CompactFlash slot IDE/ATAPI (Hot Plug capable)
- Integrated USB 2.0 connection (up to 480 MBit high speed)
- +24 VDC supply (back side)
- USB/B 2.0 connection (back side)
- Optional front cover (see also section 15.9 "Front cover 5A5003.03 for the USB Media Drive", on page 626)

15.2 Technical data

Information:

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.

Features - entire device	5MD900.USB2-01
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s)
Maximum cable length	5 m (not including hub)
Power supply Rated voltage	 24 VDC ±25%
Features - diskette drive	
Data capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
Data transfer rate	250 kbits (720 KB) or 500 kbits (1.25 MB and 1.44 MB)
Rotation speed	Up to 360 rpm
Diskette media	High density (2HD) or normal density (2DD) 3.5" diskettes
MTBF	30,000 POH (Power-On Hours)
Features - DVD-RW/CD-RW drive	
Write speed CD-R CD-RW DVD-R DVD-RW DVD-RAM[1)] DVD+R DVD+R (double layer) DVD+RW	 24x, 16x, 10x and 4x 10x and 4x 8x, 4x and 2x 4x and 2x 3x and 2x 8x, 4x and 2x 2x,4x 4x and 2x
Reading rate CD DVD	 24x 8x
Data transfer rate	Max. 33.3 MB/s
Access time (average) CD / DVD	 130 ms (24x) / 130 ms (8x)
Revolution speed	Max. 5090 rpm ± 1%
Starting time (0 rpm to read access) CD DVD	 14 seconds (maximum) 15 seconds (maximum)
Host interface	IDE (ATAPI)
Readable media CD DVD	 CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW DVD-ROM, DVD-R, DVD-RW. DVD-RAM, DVD+R, DVD+R (double layer), DVD+RW

Table 371: Technical data - USB Media Drive 5MD900.USB2-01

Features - DVD-RW/CD-RW drive	5MD900.USB2-01
Non-write protected media	
CD	CD-R, CD-RW
DVD	DVD-R/RW, DVD-RAM (4.7 GB), DVD+R/RW, DVD+R (double layer)
Compatible formats	CD-DA, CD-ROM mode 1/mode 2 CD-ROM XA mode 2 (form 1, form 2) Photo CD (single/multi-session), Enhanced CD, CD text DVD-ROM, DVD-R, DVD-RW, DVD-Video DVD-RAM (4.7 GB, 2.6 GB) DVD+R, DVD+R (double layer), DVD+RW
Write-methods	
CD	Disk at once, session at once, packet write, track at once
DVD	Disk at once, incremental, over-write, sequential, multi-session
Laser class	Class 1 laser
Data buffer capacity	8 MB
Noise level (complete read access)	Approx. 48 dBA at 50 cm
Lifespan	60,000 POH (Power-On Hours)
Opening/closing the drawer	> 10,000 times
CompactFlash slot layout	
CompactFlash	
Type	Type I
Amount	1 slot
Connection	IDE/ATAPI
CompactFlash LED	Signals read or write access to an inserted CompactFlash card
Hot Plug capable	Yes
Features - USB connections	
USB A on the front side	Connection of further peripheral devices
Power supply	Max. 500 mA
Type	2.0
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s)
USB B back side	Connection to the system
Mechanical characteristics	
Outer dimensions (without slide-in)	
Width	70 mm
Length	100 mm
Height	9.5 mm
Weight	Approx. 1.1 kg (without front cover)
Environmental characteristics	
Ambient temperature	
Operation	5 to 45°C
Bearings	-20 to 60°C
Transport	-40 to 60°C
Relative humidity	
Operation	20 to 80%, non-condensing
Bearings	5 to 90%, non-condensing
Transport	5 to 95%, non-condensing

Table 371: Technical data - USB Media Drive 5MD900.USB2-01 (Forts.)

Environmental characteristics	5MD900.USB2-01
Vibration	
Operation	5 - 500 Hz: 0.3 g (2.9 m/s^2 0-peak)
Bearings	10 - 100 Hz: 2 g (19.6 m/s^2 0-peak)
Transport	10 - 100 Hz: 2 g (19.6 m/s^2 0-peak)
Shock	
Operation	Max. 5 g (49 m/s^2 0-peak) and 11 ms duration
Bearings	Max. 60 g (588 m/s^2 0-peak) and 11 ms duration
Transport	Max. 60 g (588 m/s^2 0-peak) and 11 ms duration
Altitude	Max. 3000 meters

Table 371: Technical data - USB Media Drive 5MD900.USB2-01 (Forts.)

1) DVD RAM drivers are not provided by the manufacturer. Support of DVD RAM function by the burning software "Nero" (model number 5SWUTI.0000-00) or other burning software packages and drivers from third party providers.

15.3 Dimensions

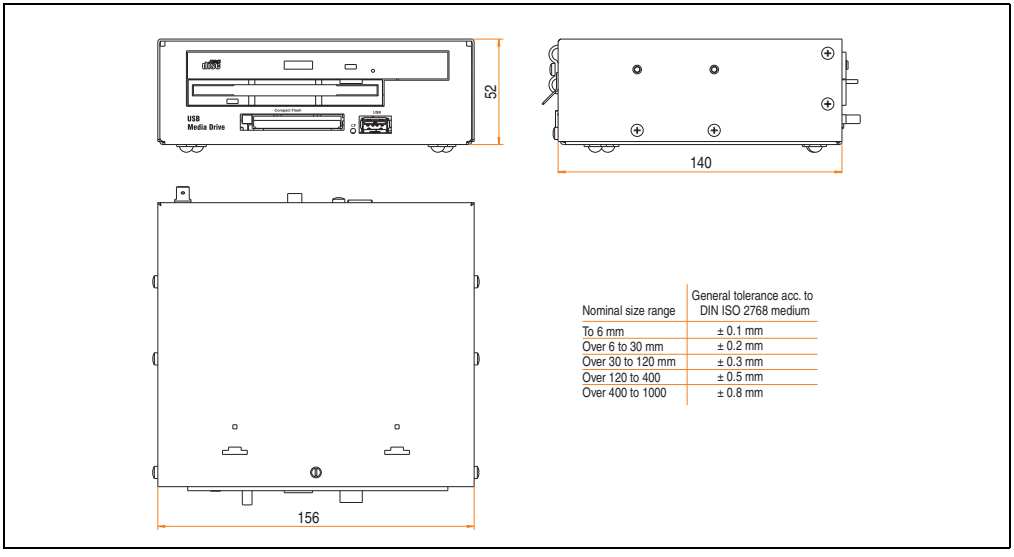


Figure 320: Dimensions - 5MD900.USB2-01

15.4 Dimensions with front cover

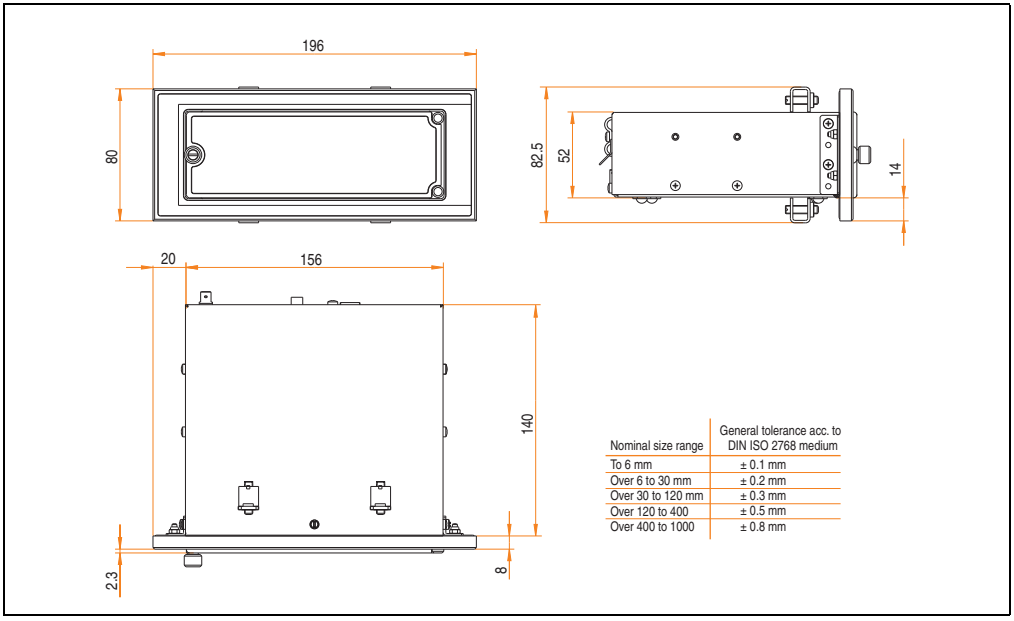


Figure 321: Dimensions - USB Media Drive with front cover

15.5 Cutout installation

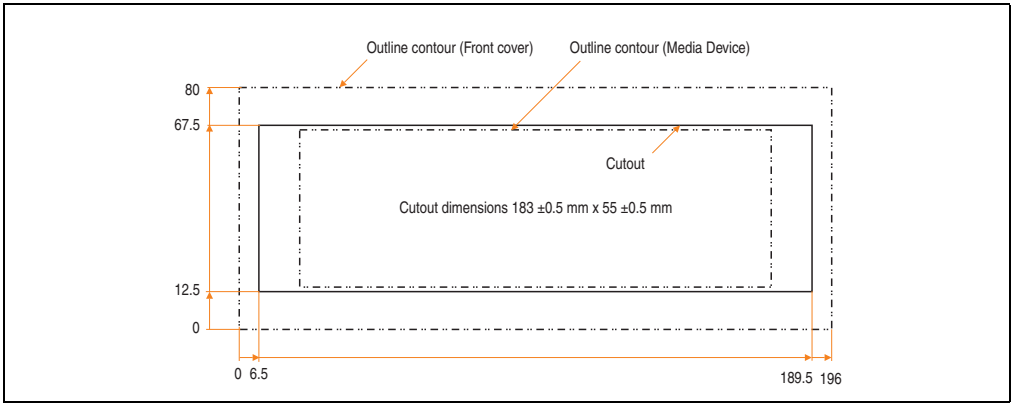


Figure 322: Installation cutout - USB Media Drive with front cover

15.6 Contents of delivery

Amount	Component
1	USB Media Drive complete unit
2	Mounting rail brackets

Table 372: Contents of delivery - USB Media Drive - 5MD900.USB2-01

15.7 Interfaces

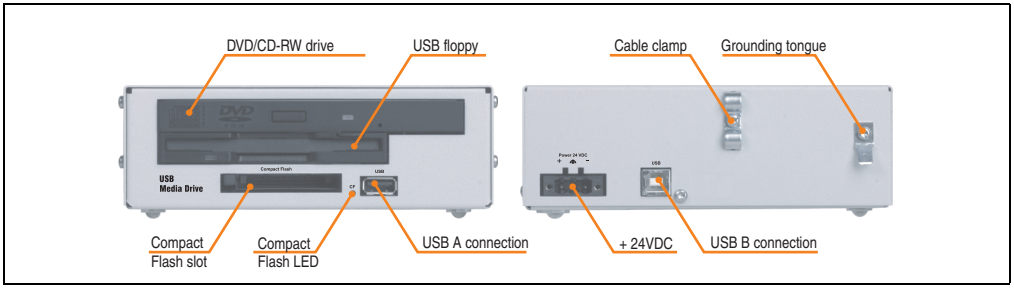


Figure 323: Interfaces - 5MD900.USB2-01

15.8 Installation

The USB Media Drive can be operated as a desk-top device (rubber feet) or as a rack-mount device (2 mounting rail brackets included).

15.8.1 Mounting orientation

Because of limits to the mounting orientation with the components used (floppy, DVD-CDRW drive), the USB media drive is only permitted to be mounted and operated as shown in the following figure.

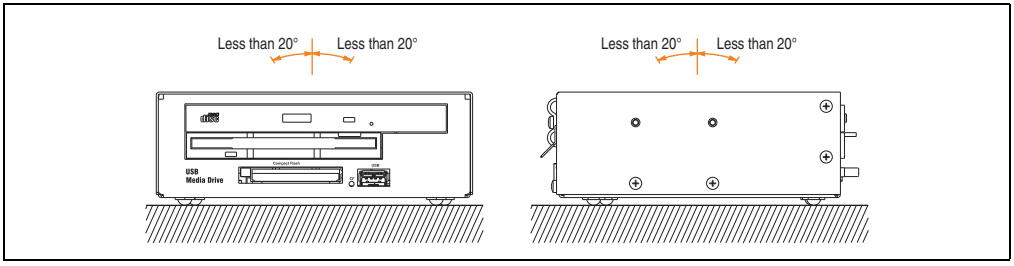


Figure 324: Mounting orientation - 5MD900.USB2-01

15.9 Front cover 5A5003.03 for the USB Media Drive

This front cover can also be mounted on the front of the USB media drive (model number 5MD900.USB2-00 or 5MD900.USB2-01) to protect the interface.

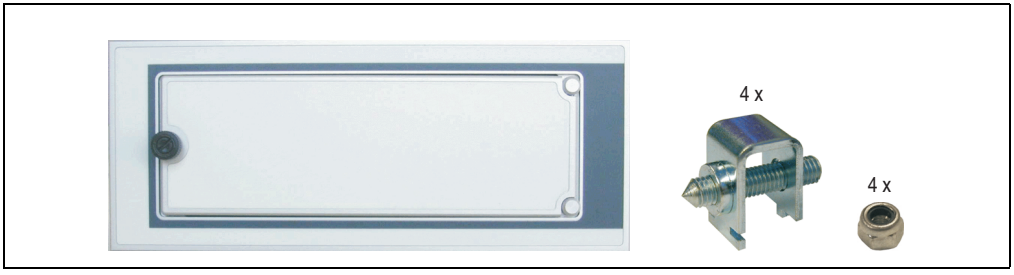


Figure 325: Front cover 5A5003.03

15.9.1 Technical data

Features	5A5003.03
Front cover design / colors Dark gray border around the cover Light gray background	 Pantone 432CV Pantone 427CV

Table 373: Technical data - 5A5003.03

15.9.2 Dimensions

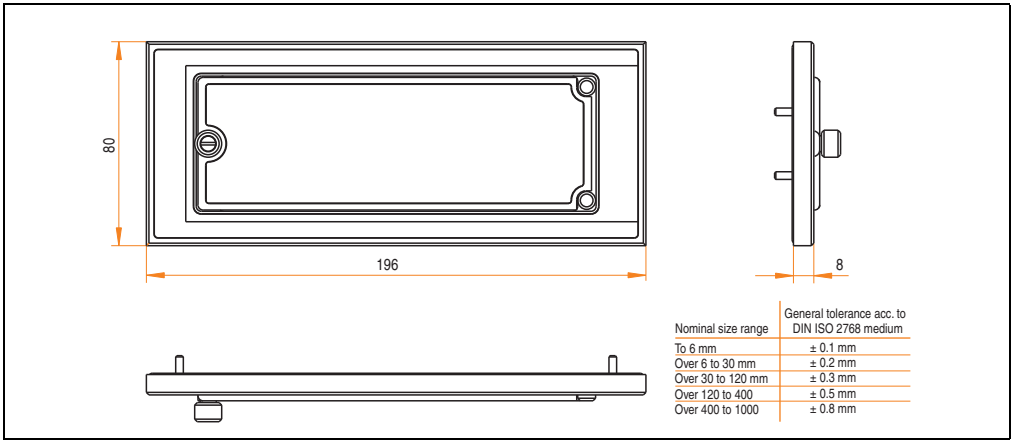


Figure 326: Dimensions - 5A5003.03

15.9.3 Installation

The front cover is attached with 2 mounting rail brackets (included with USB Media Drive) and 4 M3 locknuts. The USB media drive and front cover can be mounted as a whole in (for example) a switching cabinet door.

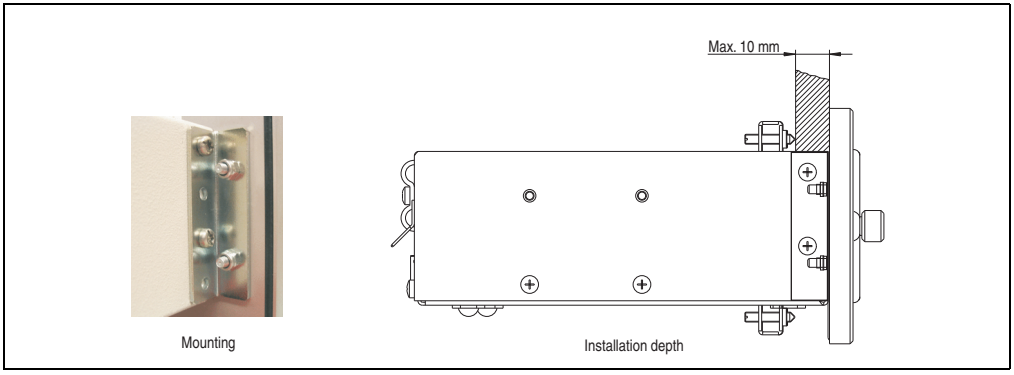


Figure 327: Front cover mounting and installation depth

16. USB flash drive

Information:

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 (e.g. the SanDisk Cruzer Micro flash drive with 2 GB):

- **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.**

16.1 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 be converted immediately into an additional drive where data can be read or written.

16.2 Order data

Model number	Description	Figure
5MMUSB.2048-00	**USB flash drive 2 GB SanDisk** Cruzer Micro	
5MMUSB.2048-01	**USB flash drive 2 GB B&R** USB 2.0 flash drive 2 GB	

Table 374: Order data - USB flash drives

16.3 Technical data - 5MMUSB.2048-00

Information:

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.

Features	5MMUSB.2048-00
LED	1 LED (green), signals data transfer (send and receive)
Power supply Current requirements	Via the USB port 650 µA in sleep mode, 150 mA read/write
Interface Type Transfer rate Sequential reading Sequential writing Connection	USB specification 2.0 high speed device, mass storage class, USB-IF and WHQL certified USB 1.1 and 2.0 compatible Up to 480 MBit (high speed) Max. 8.7 MB/second Max. 1.7 MB/second To each USB type A interface
MTBF (at 25°C)	100,000 hours
Data retention	10 years
Maintenance	None
Operating system support	Windows CE 4.2, CE 5.0, ME, 2000, XP and Mac OS 9.1.x+, OS X v10.1.2+
Mechanical characteristics	
Dimensions Length Width Thickness	 52.2 mm 19 mm 7.9 mm
Environmental characteristics	
Ambient temperature Operation Bearings Transport	 0 to 45°C -20 to 60°C -20 to 60°C
Relative humidity Operation Bearings Transport	 10 to 90%, non-condensing 5 to 90%, non-condensing 5 to 90%, non-condensing
Vibration Operation Bearings Transport	 at 10 500 Hz: 2 g (19.6 m/s^2 0-peak), oscillation rate 1/minute At 10 - 500 Hz: 4 g (39.2 m/s^2 0-peak), oscillation rate 1/minute At 10 - 500 Hz: 4 g (39.2 m/s^2 0-peak), oscillation rate 1/minute
Shock Operation Bearings Transport	 Max. 40 g (392 m/s^2 0-peak) and 11 ms duration Max. 80 g (784 m/s^2 0-peak) and 11 ms length Max. 80 g (784 m/s^2 0-peak) and 11 ms length

Table 375: Technical data - USB flash drive 5MMUSB.2048-00

Environmental characteristics	
Altitude	
Operation	3,048 meters
Bearings	12,192 meters
Transport	12,192 meters

Table 375: Technical data - USB flash drive 5MMUSB.2048-00 (Forts.)

16.3.1 Temperature humidity diagram

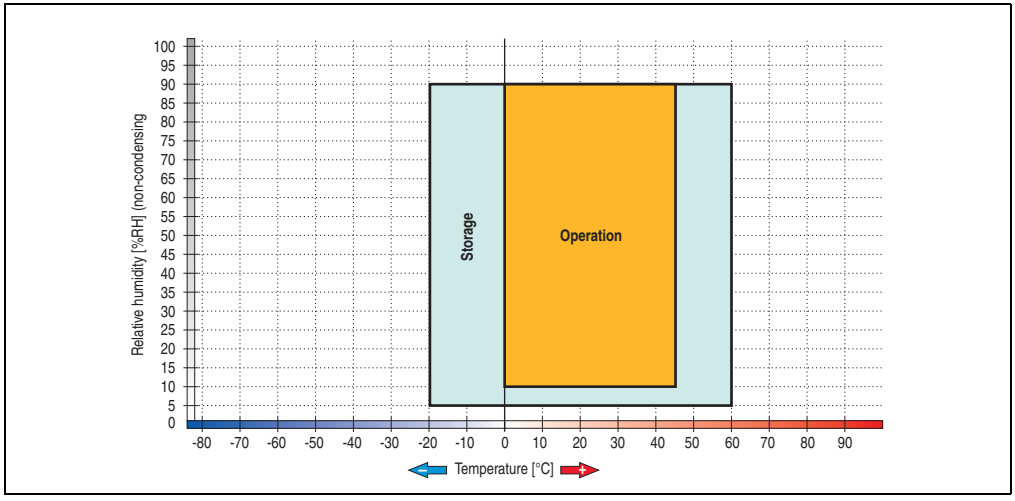


Figure 328: Temperature humidity diagram - USB flash drive - 5MMUSB.2048-00

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

16.4 Technical data - 5MMUSB.2048-01

Information:

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.

Features	5MMUSB.2048-01
LED	1 LED (green), signals data transfer (send and receive)
Power supply Current requirements	Via the USB port max. 500 µA sleep mode, max. 120 mA read/write
Interface Type Transfer rate Sequential reading Sequential writing Connection	USB specification 2.0 high speed device, mass storage class, USB-IF and WHQL certified USB 1.1 and 2.0 compatible Up to 480 MBit (high speed) Max. 31 MB/second Max. 30 MB/second To each USB type A interface
MTBF	> 3,000,000 hours
Data retention	> 10 years
Maintenance	None
Operating system support	Windows CE, ME, 2000, XP, Vista und Mac OS 9 or newer, Linux 2.4 or newer
Mechanical characteristics	
Dimensions Length Width Thickness	 67.85 mm 17.97 mm 8.35 mm
Environmental characteristics	
Ambient temperature Operation Bearings Transport	 0 to 70°C -50 to 100°C -50 to 100°C
Relative humidity Operation Bearings Transport	 85%, non-condensing 85%, non-condensing 85%, non-condensing
Vibration Operation Bearings Transport	 At 20 - 2000 Hz: 20 g (peak) At 20 - 2000 Hz: 20 g (peak) At 20 - 2000 Hz: 20 g (peak)
Shock Operation Bearings Transport	 max. 1500 g (peak) max. 1500 g (peak) max. 1500 g (peak)

Table 376: Technical data - USB flash drive 5MMUSB.2048-01

Environmental characteristics	5MMUSB.2048-01
Altitude	
Operation	3,048 meters
Bearings	12,192 meters
Transport	12,192 meters

Table 376: Technical data - USB flash drive 5MMUSB.2048-01 (Forts.)

16.4.1 Temperature humidity diagram

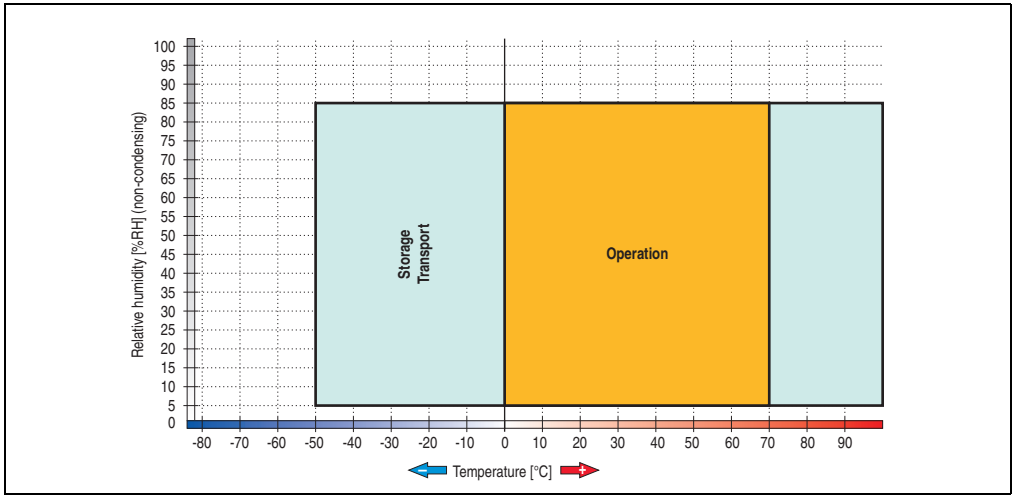


Figure 329: Temperature humidity diagram - USB flash drive - 5MMUSB.2048-01

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

17. HMI Drivers & Utilities DVD 5SWHMI.0000-00

Figure 330: HMI Drivers & Utilities DVD 5SWHMI.0000-00

Model number	Short description	Note
5SWHMI.0000-00	**HMI Drivers & Utilities DVD**	

Table 377: Model number - HMI Drivers & Utilities DVD

This DVD contains drivers, utilities, software upgrades and user's manuals for B&R Panel system products (see B&R homepage **www.br-automation.com** – Industrial PCs, Visualization and Operation).

At the time of its creation, the content on the DVD is identical to the files found in the download area of the B&R homepage (under Service – “Material Related Downloads”).

BIOS upgrades for the products

- Automation PC 620 / Panel PC 700 CPU Board 815E und 855GME BIOS
- Automation PC 620 / Panel PC 700 CPU Board X855GME BIOS
- Automation PC 620 / Panel PC 700 CPU Board 945GME N270 BIOS
- Automation PC 680
- Automation PC 810 / Automation PC 820 / Panel PC 800 B945GME BIOS
- Automation PC 810 / Panel PC 800 945GME N270 CPU Board BIOS
- Automation PC 810 / Panel PC 800 GM45 CPU Board BIOS
- Provit 2000 products - IPC2000/2001/2002

- Provit 5000 products - IPC5000/5600/5000C/5600C
- Power Panel 100 BIOS devices
- Mobile Panel 100 BIOS devices
- Power Panel 100 / Mobile Panel 100 User Boot Logo
- Power Panel 100 / Mobile Panel 100 REMHOST Utility
- Power Panel 300/400 BIOS devices
- Power Panel 300/400 BIOS User Boot Logo
- Panel PC 310

Drivers for the devices

- Automation Device Interface (ADI)
- Audio
- Chipset
- CD-ROM
- LS120
- Graphics
- Network
- PCI / SATA RAID controller
- Touch screen
- Touchpad
- Interfacecard

Firmware Upgrades

- Automation PC 620 / Panel PC 700 (MTCX, SDLR, SDLT)
- Automation PC 810 (MTCX, SDLR, SDLT)
- Automation PC 820 (MTCX, SDLR, SDLT)
- Mobile Panel 100 (SMCX)
- Panel PC 300 (MTCX)
- Power Panel 100 (aPCI)
- Power Panel 300/400 (aPCI)
- Power Panel 300/400 (MTCX)
- Panel PC 800 (MTCX, SDLR, SDLT)
- UPS firmware

Utilities / Tools

- B&R Embedded OS Installer
- Windows CE Tools
- User Boot Logo Conversion Utility
- SATA RAID Installations Utility
- Automation Device Interface (ADI)
- CompactFlash endurance calculator (Silicon Systems)
- Miscellaneous
- MTC Utilities
- Key Editor
- MTC & Mkey Utilities
- Mkey Utilities
- UPS configuration software
- ICU ISA configuration
- Intel PCI NIC Boot ROM
- Diagnostic Utilities

Windows

- Windows CE 6.0
- Windows CE 5.0
- Windows CE 4.2
- Windows CE 4.1
- Windows CE Tools
- Windows Embedded Standard 2009
- Thin Client
- Windows NT Embedded
- Windows XP Embedded
- VNC Viewer

MCAD templates for

- Industrial PCs
- Operator Interface devices
- Legend Strips templates
- Customized designs

ECAD templates for

- Industrial PCs
- Automation PCs
- Automation Panel 900
- Panel (Power Panel)

Documentation for

- Automation PC 620
- Automation PC 680
- Automation PC 810
- Automation PC 820
- Automation Panel 800
- Automation Panel 900
- Panel PC 310
- Panel PC 700
- Panel PC 725
- Panel PC 800
- Power Panel 15/21/35/41
- Power Panel 100/200
- Power Panel 300/400
- Mobile Panel 40/50
- Mobile Panel 100/200
- Mobile Panel connection box
- Provit 2000
- Provit 3030
- Provit 4000
- Provit 5000
- Provit Benchmark
- Provit Mkey
- Windows CE 5.0 help
- Windows CE 6.0 help
- Windows NT Embedded application guide
- Windows XP Embedded application guide
- UPS - uninterruptible power supply

- Implementation instructions
- B&R Hilscher feldbus cards (CANopen, DeviceNet, PROFIBUS, PROFINET)

Service tools

- Acrobat Reader 5.0.5 (freeware in German, English and French)
- Power Archiver 6.0 (freeware in German, English and French)
- Internet Explorer 5.0 (German and English)
- Internet Explorer 6.0 (German and English)

18. Cables

18.1 DVI cable 5CADVI.0xxx-00

The DVI cables 5CADVI.0xxx-00 are designed for fixed layout.

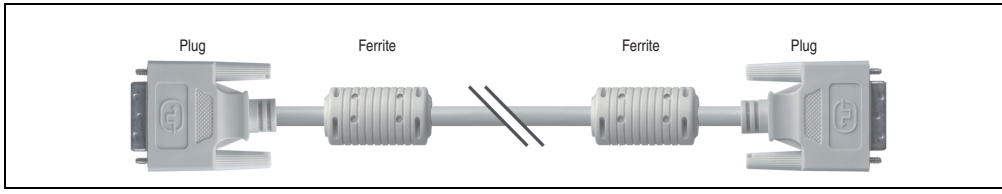


Figure 331: DVI extension cable - 5CADVI.0xxx-00 (similar)

Caution!

The DVI cable can only be plugged in and unplugged when the device is turned off.

18.1.1 Order data

Model number	Description	Note
5CADVI.0018-00	**DVI-D cable 1.8 m** Single cable, DVI-D/m:DVI-D/m; length: 1.8 m	
5CADVI.0050-00	**DVI-D cable 5 m** Single cable, DVI-D/m:DVI-D/m; length: 5 m	
5CADVI.0100-00	**DVI-D cable 10 m** Single cable, DVI-D/m:DVI-D/m; length: 10 m	

Table 378: Model numbers - DVI cables

18.1.2 Technical data

Features	5CADVI.0018-00	5CADVI.0050-00	5CADVI.0100-00
Length Tolerance	1.8 m ±30 mm	5 m ±50 mm	10 m ±100 mm
Cable diameter Maximum	8.5 mm		
Shielding	Individual cable pairs and entire cable		
Connector type Connection cycles	2x DVI-D (18+1), male 100		
Wire cross section	AWG 28		
Line resistance	Max. 237 Ω/km		
Insulation resistance	Min. 100 MΩ/km		
Flexibility	Limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5x cable diameter, 20 cycles / minute)		
Flex radius Fixed layout	See figure "Flex radius specification", on page 639 5x cable diameter (plug - ferrite magnet and ferrite magnet - ferrite magnet)		
Weight	Approx. 300 g	Approx. 590 g	Approx. 2100 g

Table 379: Technical data - DVI cable 5CADVI.0xxx-00

18.1.3 Flex radius specification

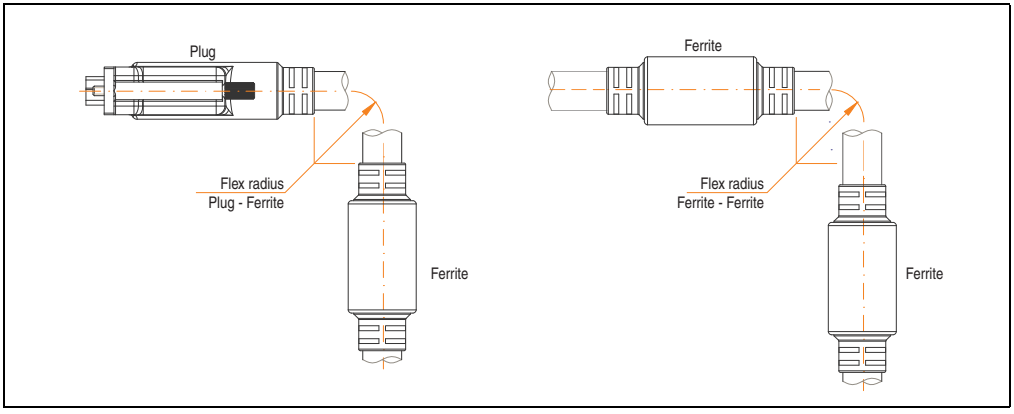


Figure 332: Flex radius specification

18.1.4 Cable specifications

The following figure shows the pin assignments for the DVI cable available at B&R. If you want to build a suitable cable yourself, it should be wired according to these specifications.

Warning!

If a self-built cable is used, B&R cannot guarantee that it will function properly. The DVI cables provided by B&R are guaranteed to function properly.

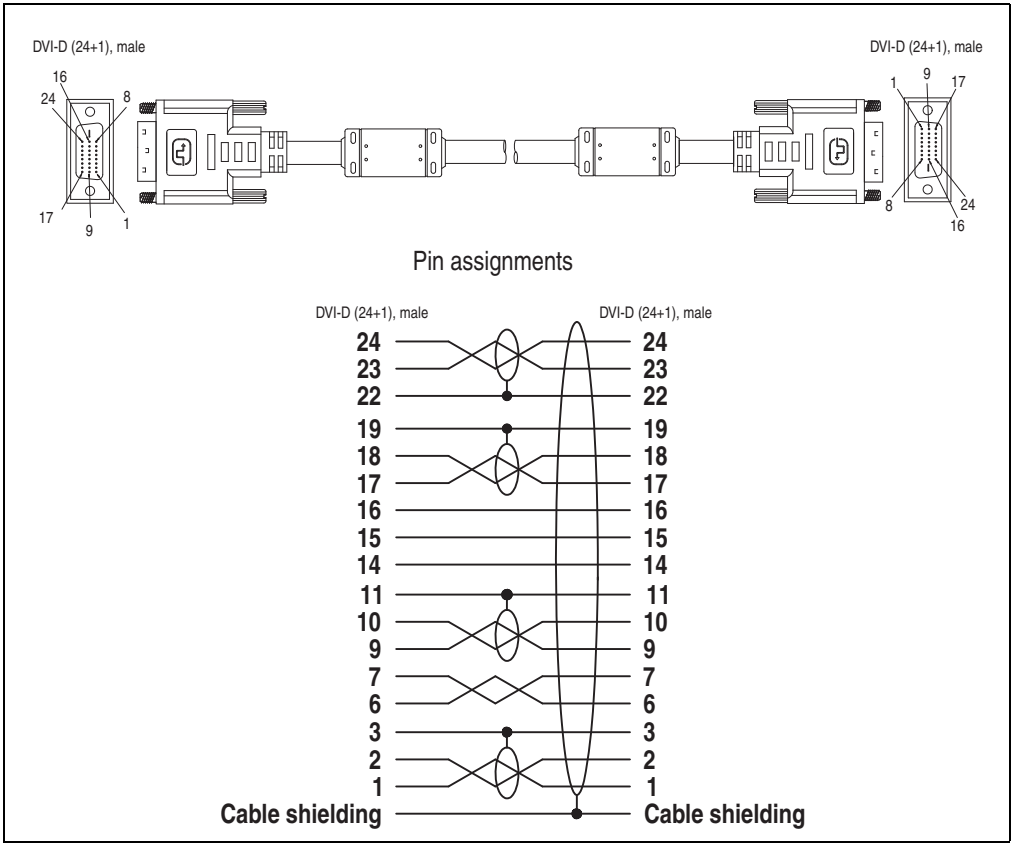


Figure 333: Pin assignments - DVI cable

18.2 SDL cable 5CASDL.0xxx-00

The SDL cables 5CASDL.0xxx-00 are designed for fixed layout. Use of the SDL flex cable 5CASDL.0xxx-03 is required for a flexible installation (e.g. in swing arm systems).

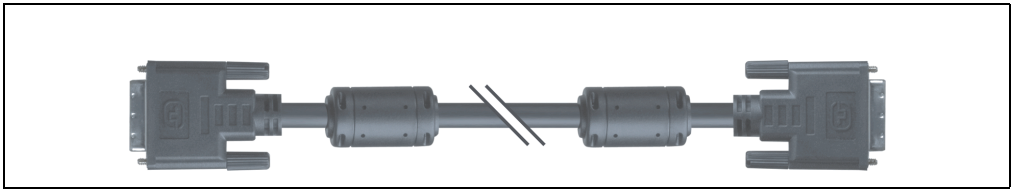


Figure 334: SDL extension cable (similar)

Caution!

The SDI cable can only be plugged in and unplugged when the device is turned off.

18.2.1 Order data

Model number	Description	Note
5CASDL.0018-00	**SDL cable 1.8 m** SDL cable for a fixed type of layout; length: 1.8 m	
5CASDL.0050-00	**SDL cable 5 m** SDL cable for a fixed type of layout; length: 5 m	
5CASDL.0100-00	**SDL cable 10 m** SDL cable for a fixed type of layout; length: 10 m	
5CASDL.0150-00	**SDL cable 15 m** SDL cable for a fixed type of layout; length: 15 m	
5CASDL.0200-00	**SDL cable 20 m** SDL cable for a fixed type of layout; length: 20 m	
5CASDL.0250-00	**SDL cable 25 m** SDL cable for a fixed type of layout; length: 25 m	
5CASDL.0300-00	**SDL cable 30 m** SDL cable for a fixed type of layout; length: 30 m	

Table 380: Model numbers - SDL cables

18.2.2 Technical data

Features	5CASDL.0018-00	5CASDL.0050-00	5CASDL.0100-00	5CASDL.0150-00	5CASDL.0200-00	5CASDL.0250-00	5CASDL.0300-00
Length Tolerance	1.8 m ±50 mm	5 m ±80 mm	10 m ±100 mm	15 m ±120 mm	20 m ±150 mm	25 m ±200 mm	30 m ±200 mm
Cable diameter Typical Maximum	8.6 ±0.2 mm 9 mm		11 ±0.2 mm 11.5 mm				
Shielding	Individual cable pairs and entire cable						
Connector type Connection cycles	2x DVI-D (24+1), male 100						
Wire cross section	AWG 28		AWG 24				
Line resistance	Max. 237 Ω/km		Max. 93 Ω/km				
Insulation resistance	Min. 10 MΩ/km						
Flexibility	Limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5x cable diameter, 20 cycles / minute)						
Halogen-free	No						
Flex radius Fixed layout	See figure "Flex radius specification", on page 642 5x cable diameter (plug - ferrite magnet and ferrite magnet - ferrite magnet)						
Weight	Approx. 300 g	Approx. 590 g	Approx. 2100 g	Approx. 3000 g	Approx. 4100 g	Approx. 5100 g	Approx. 6100 g

Table 381: Technical data - SDL cables 5CASDL.0xxx-00

18.2.3 Flex radius specification

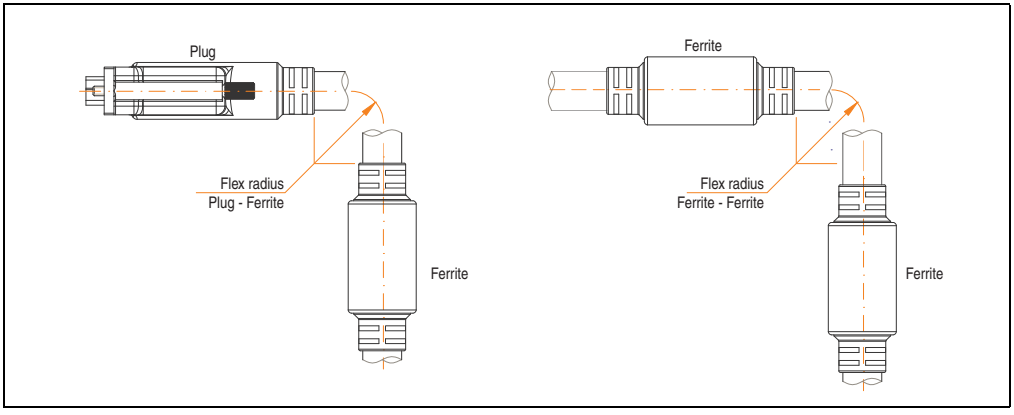


Figure 335: Flex radius specification

18.2.4 Cable specifications

The following figure shows the pin assignments for the SDL cable available at B&R. If you want to build a suitable cable yourself, it should be wired according to these specifications.

Warning!

If a self-built cable is used, B&R cannot guarantee that it will function properly. The SDL cables provided by B&R are guaranteed to function properly.

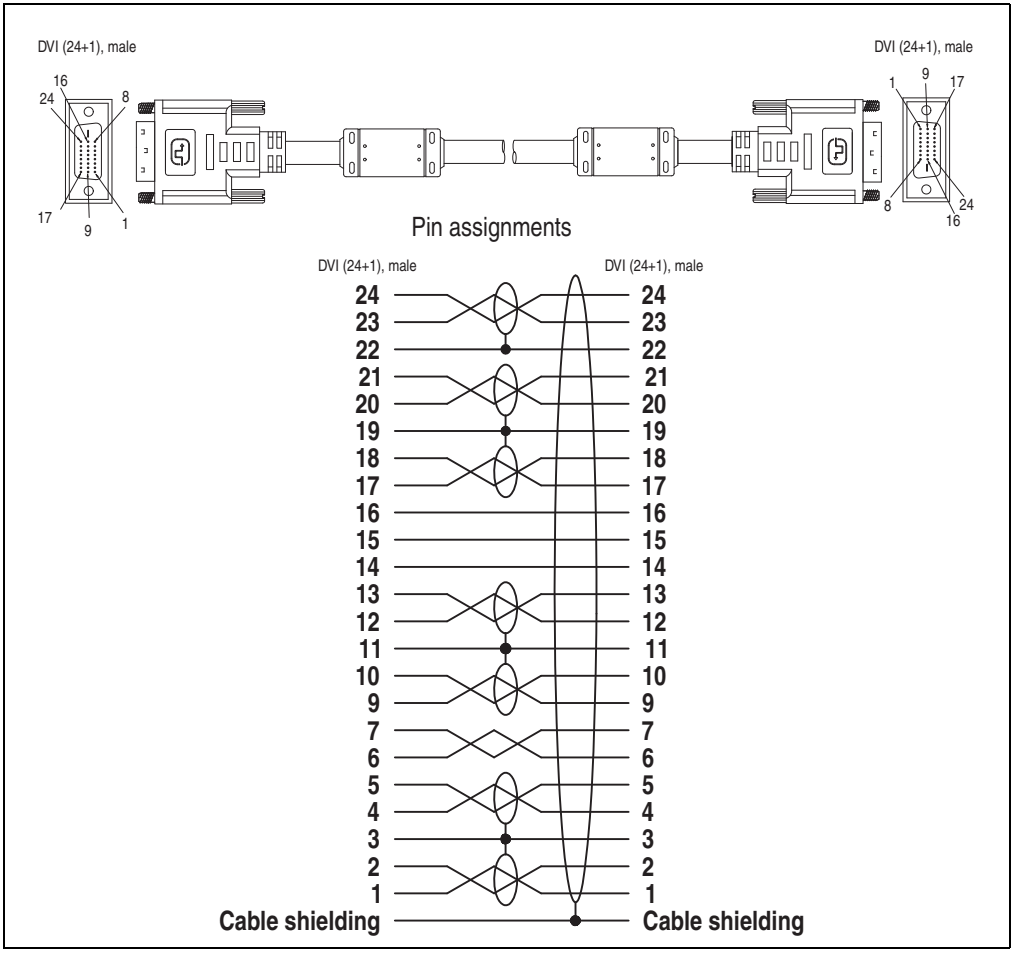


Figure 336: Pin assignments - SDL cable 5CASDL.0xxx-00

18.3 SDL cable with 45° plug 5CASDL.0xxx-01

The SDL cables 5CASDL.0xxx-01 are designed for fixed layout.

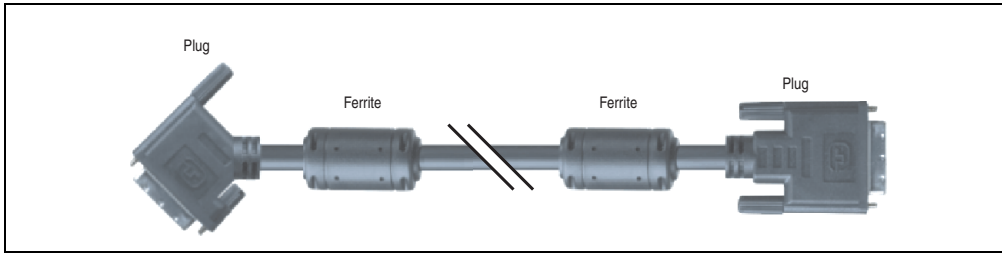


Figure 337: SDL cable with 45° plug (similar)

Caution!

The SDI cable can only be plugged in and unplugged when the device is turned off.

18.3.1 Order data

Model number	Description	Note
5CASDL.0018-01	**SDL cable 1.8 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 1.8 m	
5CASDL.0050-01	**SDL cable 5 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 5 m	
5CASDL.0100-01	**SDL cable 10 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 10 m	
5CASDL.0150-01	**SDL cable 15 m 45°** SDL cable for fixed type of layout with one-sided 45° plug; length: 15 m	

Table 382: Model numbers - SDL cables with 45° plug

18.3.2 Technical data

Features	5CASDL.0018-01	5CASDL.0050-01	5CASDL.0100-01	5CASDL.0150-01
Length Tolerance	1.8 m ±50 mm	5 m ±80 mm	10 m ±100 mm	15 m ±120 mm
Cable diameter Maximum	9 mm		11.5 mm	
Shielding	Individual cable pairs and entire cable			
Connector type Connection cycles	2x DVI-D (24+1), male 100			
Wire cross section	AWG 28		AWG 24	
Line resistance	Max. 237 Ω/km		Max. 93 Ω/km	
Insulation resistance	Min. 10 MΩ/km			
Flexibility	Limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5x cable diameter, 20 cycles / minute)			
Halogen-free	No			
Flex radius Fixed layout	See figure "Flex radius specification", on page 645 5x cable diameter (plug - ferrite magnet and ferrite magnet - ferrite magnet)			
Weight	Approx. 300 g	Approx. 590 g	Approx. 2100 g	Approx. 3000 g

Table 383: Technical data - SDL cable with 45° plug 5CASDL.0xxx-01

18.3.3 Flex radius specification

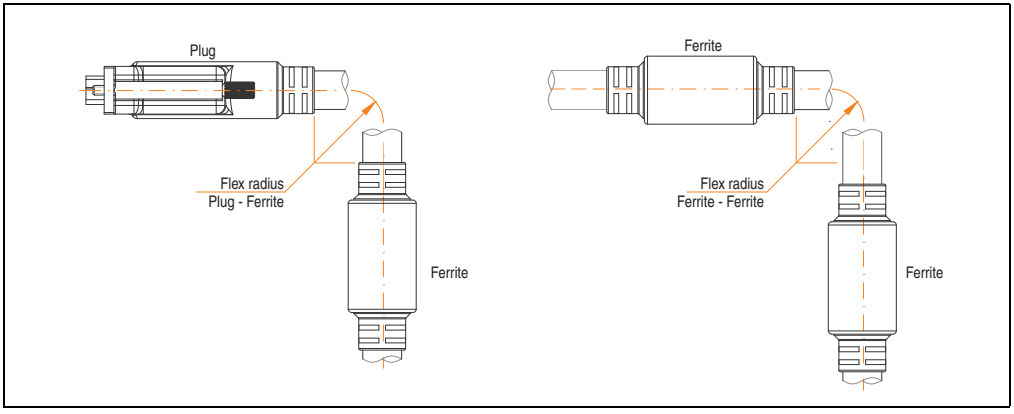


Figure 338: Flex radius specification

18.3.4 Cable specifications

The following figure shows the pin assignments for the SDL cable available at B&R. If you want to build a suitable cable yourself, it should be wired according to these specifications.

Warning!

If a self-built cable is used, B&R cannot guarantee that it will function properly. The SDL cables provided by B&R are guaranteed to function properly.

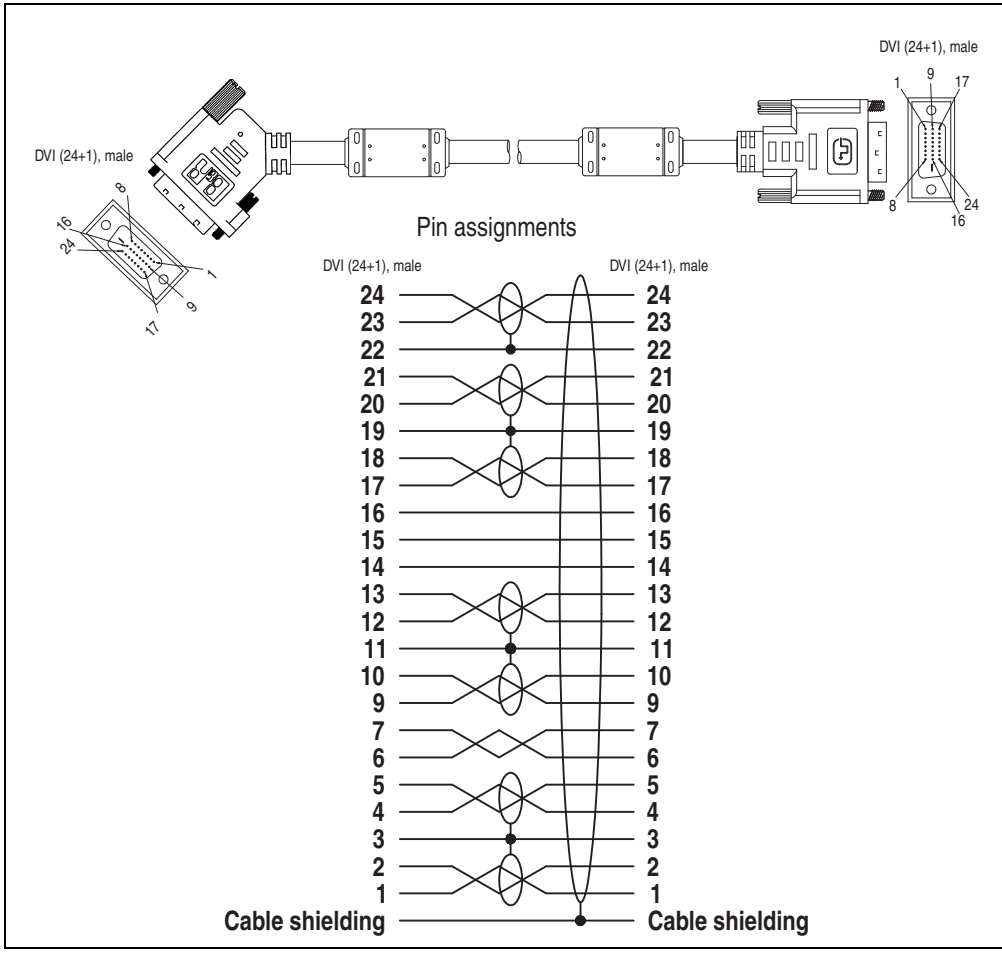


Figure 339: Pin assignments - SDL cable with 45° plug 5CASDL.0xxx-01

18.4 SDL cable with extender 5CASDL.0x00-10

The SDL cables (with extender) 5CASDL.0xxx-10 are designed for fixed layout. Use of the SDL flex cable (with extender) 5CASDL.0x00-13 is required for a flexible installation (e.g. in swing arm systems).

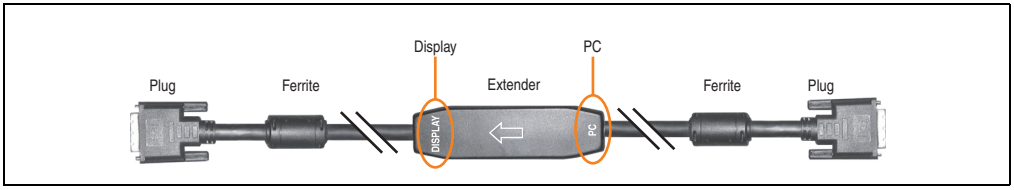


Figure 340: SDL cable with extender - 5CASDL.0x00-10 (similar)

Caution!

SDL cables with extender can only be plugged in and unplugged when the device is turned off. The correct direction of connection (Display, PC) for the wiring is illustrated on the middle of the extender.

18.4.1 Order data

Model number	Description	Note
5CASDL.0300-10	**SDL cable with extender 30 m** SDL cable with extender for a fixed type of layout; length 30 m	Canceled since 12/2006 Replaced by 5CASDL.0300-13
5CASDL.0400-10	**SDL cable with extender 40 m** SDL cable with extender for a fixed type of layout; length 40 m	Canceled since 12/2006 Replaced by 5CASDL.0400-13

Table 384: Model numbers - SDL cable with extender

18.4.2 Technical data

Features	5CASDL.0300-10	5CASDL.0400-10
Length Tolerance	30 m ± 200 mm	40 m ± 200 mm
Dimensions - Extender box	Height 18.5 mm, width 35 mm, length 125 mm	
Cable diameter Maximum	11.5 mm	
Shielding	Individual cable pairs and entire cable	
Connector type Connection cycles	2x DVI-D (24+1), male 100	
Wire cross section	AWG 24	
Line resistance	Max. 93 Ω/km	
Insulation resistance	Min. 10 MΩ/km	

Table 385: Technical data - SDL cable with extender 5CASDL.0x00-10

Features	5CASDL.0300-10	5CASDL.0400-10
Flexibility	Limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5x cable diameter, 20 cycles / minute)	
Flex radius Fixed layout	See figure "Flex radius specification", on page 648 5 x cable diameter (of plug - ferrite magnet and ferrite magnet - extender)	
Weight	Approx. 6100 g	Approx. 8100 g

Table 385: Technical data - SDL cable with extender 5CASDL.0x00-10 (Forts.)

18.4.3 Flex radius specification

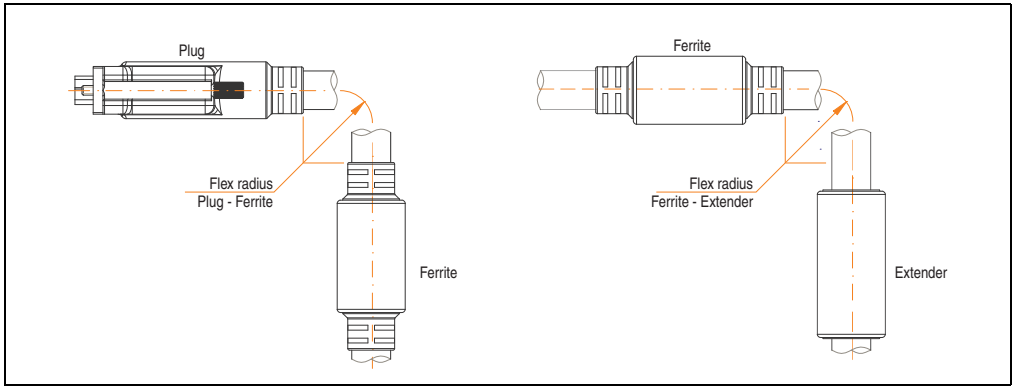


Figure 341: Flex radius specification

18.4.4 Cable connection

The SDL cable with extender must be connected correctly between the Panel PC 700 and Automation Panel 900 display unit. The signal direction is indicated on the extender unit for this purpose:

- Connect the end labeled "PC" with the video output of the Panel PC 700 (monitor/panel).
- The "Display" end should be connected to the display unit Automation Panel 900 via Automation Panel Link insert card.

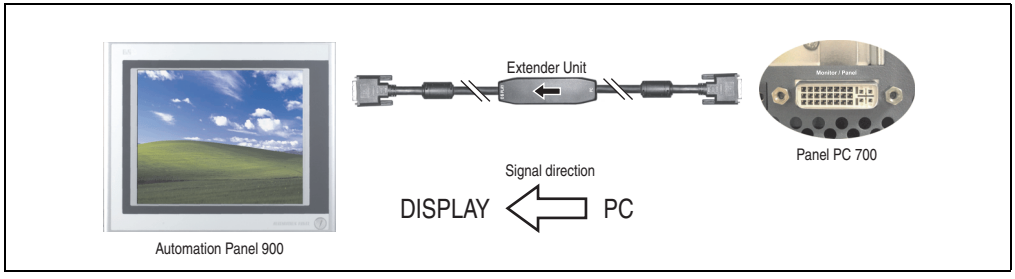


Figure 342: Example of signal direction for the SDL cable with extender - PPC700

18.4.5 Cable specifications

The following figure shows the pin assignments for the SDL cable with extender available at B&R.

Information:

Only B&R SDL cables with extender can be used.

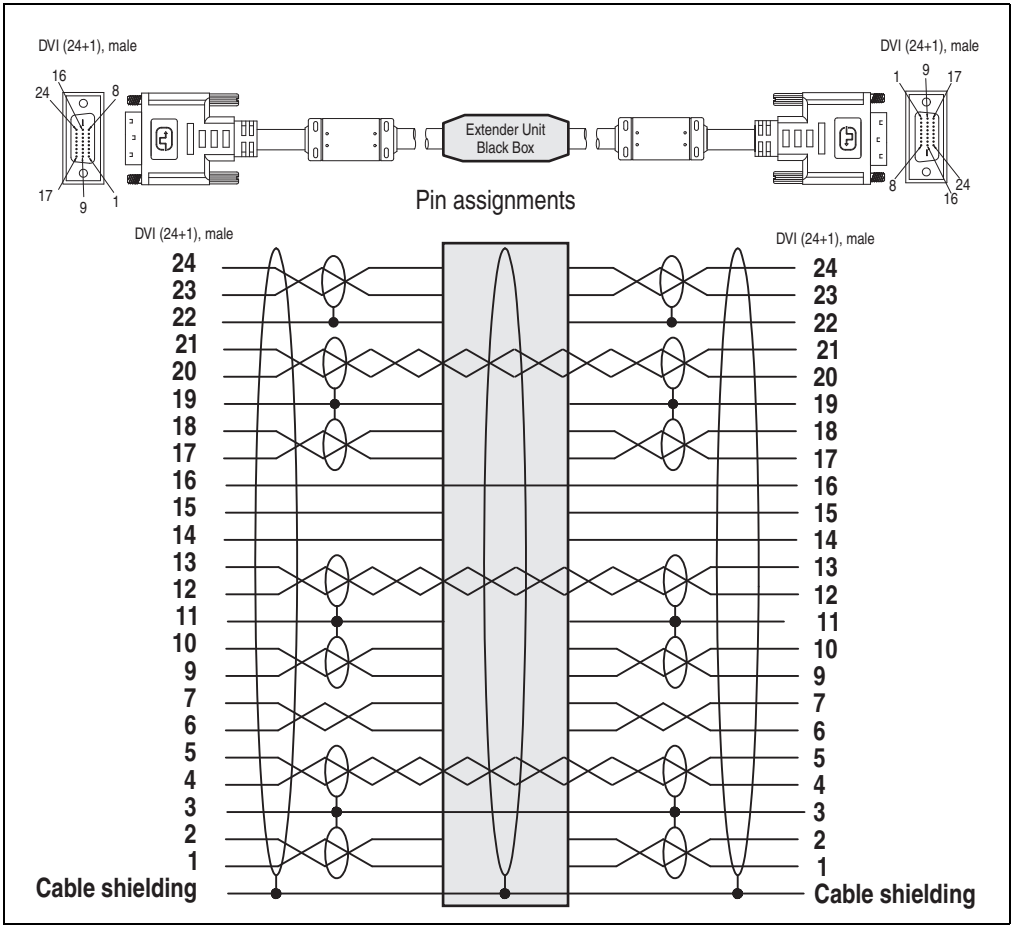


Figure 343: Pin assignments - SDL cable with extender 5CASDL.0x00-10

18.5 SDL flex cable 5CASDL.0xxx-03

The SDL flex cables 5CASDL.0xxx-03 are designed for both fixed and flexible installations (e.g. in swing arm systems).

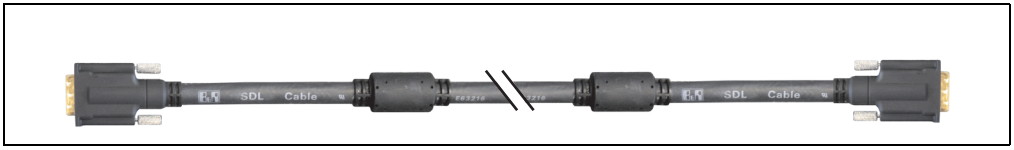


Figure 344: SDL cable 5CASDL.0xxx-03 (similar)

Caution!

The SDI cable can only be plugged in and unplugged when the device is turned off.

18.5.1 Order data

Model number	Description	Note
5CASDL.0018-03	**SDL flex cable 1.8 m** SDL cable for fixed and flexible type of layout; length: 1.8 m	
5CASDL.0050-03	**SDL flex cable 5 m** SDL cable for fixed and flexible type of layout; length: 5 m	
5CASDL.0100-03	**SDL flex cable 10 m** SDL cable for fixed and flexible type of layout; length: 10 m	
5CASDL.0150-03	**SDL flex cable 15 m** SDL cable for fixed and flexible type of layout; length: 15 m	
5CASDL.0200-03	**SDL flex cable 20 m** SDL cable for fixed and flexible type of layout; length: 20 m	
5CASDL.0250-03	**SDL flex cable 25 m** SDL cable for fixed and flexible type of layout; length: 25 m	
5CASDL.0300-03	**SDL flex cable 30 m** SDL cable for fixed and flexible type of layout; length: 30 m	

Table 386: Model numbers - SDL cable 5CASDL.0xxx-03

18.5.2 Technical data

Mechanical characteristics	5CASDL.0018-03	5CASDL.0050-03	5CASDL.0100-03	5CASDL.0150-03	5CASDL.0200-03	5CASDL.0250-03	5CASDL.0300-03
Length Tolerance	1.8 m ±20 mm	5 m ±45 mm	10 m ±90 mm	15 m ±135 mm	20 m ±180 mm	25 m ±225 mm	30 m ±270 mm
Cable diameter Maximum	12 mm						
Shielding	Individual cable pairs and entire cable						
Connector type Connection cycles Contacts Mechanical protection	2x DVI-D (24+1), male Min. 200 Gold plated Metal cover with crimped stress relief						
Max. tension During installation During operation	≤ 400 N ≤ 50 N						
Materials Cable shield Color	RoHS compliant Aluminum foil clad + tinned copper mesh Black (similar to RAL 9005)						
Flexibility	Flexible; valid for ferrite magnet - ferrite magnet (tested 300,000 cycles with 15x cable diameter, 4800 cycles / hour)						
Halogen-free	Yes						
Flex radius Fixed layout flexible installation	See figure "Flex radius specification", on page 652 6x cable diameter (of plug - ferrite magnet) 10x cable diameter (of ferrite magnet - ferrite magnet) 15x cable diameter (of ferrite magnet - ferrite magnet)						
Weight	Approx. 450 g	Approx. 1000 g	Approx. 2000 g	Approx. 3000 g	Approx. 4000 g	Approx. 5000 g	Approx. 6000 g
Electrical properties (at 20°C)							
Wire cross section	24 AWG (control wires) 26 AWG (DVI, USB, data)						
Line resistance 24 AWG 26 AWG	≤ 95 Ω/km ≤ 145 Ω/km						
Insulation resistance	> 200 MΩ/km						
Wave impedance	100 ±10 Ω						
Test voltage Wire / wire Wire / shield	1 kV_{eff} 0.5 kV_{eff}						
Operating voltage	≤ 30 V						
Environmental characteristics							
Temperature resistance Fixed installation Moving Bearings	-20 to 80°C -5 to 60°C -20 to 80°C						
Fire resistance	Fire resistant according to UL758 (cable vertical flame test)						

Table 387: Technical data - SDL cable 5CASDL.0xxx-03

Standards and certifications	5CASDL.0018-03	5CASDL.0050-03	5CASDL.0100-03	5CASDL.0150-03	5CASDL.0200-03	5CASDL.0250-03	5CASDL.0300-03
Torsion load	100,000 cycles (tested angle of rotation: ±85° speed: 50 cycles / minute)						
Cable drag chain	300,000 cycles Tested flex radius: 180 mm;15x cable diameter; hub: 460 mm; speed: 4800 cycles / hour						
Approbation	UL AWM 20236 80°C 30 V						
Oil and hydrolysis resistance	According to VDE 0282-10						

Table 387: Technical data - SDL cable 5CASDL.0xxx-03 (Forts.)

18.5.3 Flex radius specification

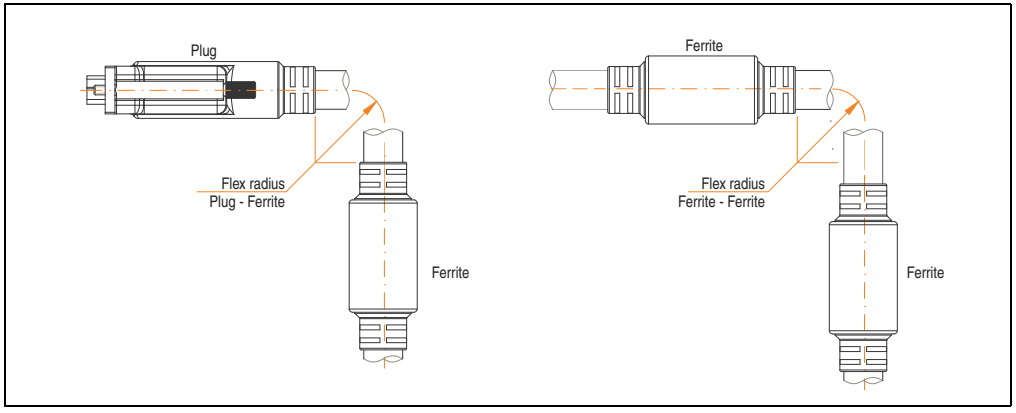


Figure 345: Flex radius specification

18.5.4 Dimensions

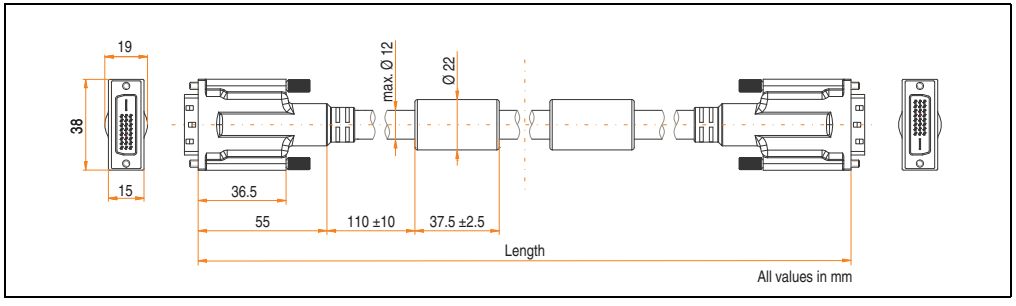
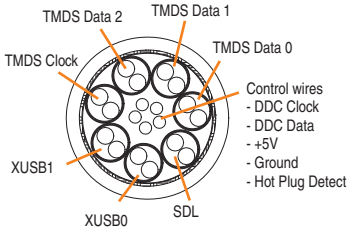


Figure 346: Dimensions - SDL cable 5CASDL.0xxx-03

18.5.5 Structure

Element	Assignment	Cross section	
DVI	TMDS data 0	26 AWG	
	TMDS data 1	26 AWG	
	TMDS data 2	26 AWG	
	TMDS cycle	26 AWG	
USB	XUSB0	26 AWG	
	XUSB1	26 AWG	
Data	SDL	26 AWG	
Control wires	DDC cycle	24 AWG	
	DDC data	24 AWG	
	+ 5 V	24 AWG	
	mass	24 AWG	
	Hot Plug detect	24 AWG	

Schematic display

Table 388: Structure - SDL cable 5CASDL.0xxx-03

18.5.6 Cable specifications

The following figure shows the pin assignments for the SDL cable available at B&R. If you want to build a suitable cable yourself, it should be wired according to these specifications.

Warning!

If a self-built cable is used, B&R cannot guarantee that it will function properly.

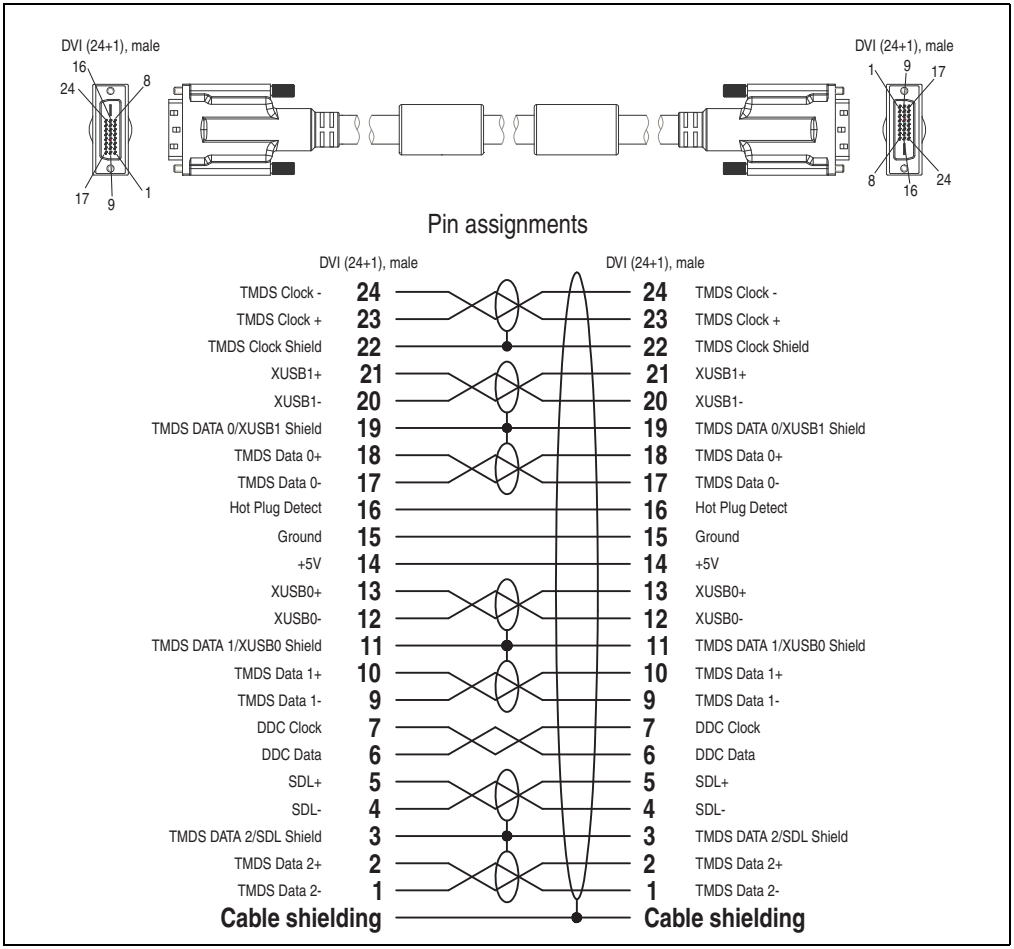


Figure 347: Pin assignments - SDL cable 5CASDL.0xxx-03

18.6 SDL flex cable with extender 5CASDL.0x00-13

The SDL flex cables (with extender) 5CASDL.0x00-13 are designed for both fixed and flexible installations (e.g. in swing arm systems).

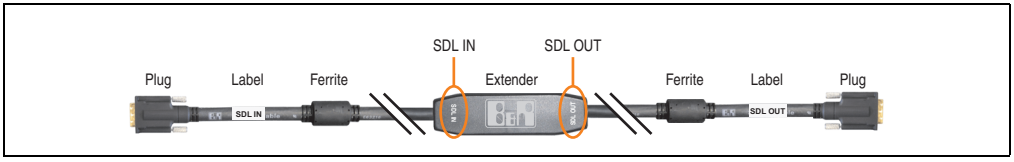


Figure 348: SDL flex cable with extender - 5CASDL.0x00-13 (similar)

Caution!

SDL cables with extender can only be plugged in and unplugged when the device is turned off. The correct direction of connection (SDL IN, SDL OUT) for the wiring is illustrated on the middle of the extender and between the ferrite magnet and plug (with a sticker).

18.6.1 Order data

Model number	Description	Note
5CASDL.0300-13	**SDL flex cable with extender 30 m** SDL cable with extender for fixed and flexible type of layout; length: 30 m	
5CASDL.0400-13	**SDL flex cable with extender 40 m** SDL cable with extender for fixed and flexible type of layout; length: 40 m	

Table 389: Model numbers - SDL flex cable with extender

18.6.2 Technical data

Features	5CASDL.0300-13	5CASDL.0400-13
Length Tolerance	30 m ±200 mm	40 m ±200 mm
Dimensions - Extender box	Height 18.5 mm, width 35 mm, length 125 mm	
Cable diameter Maximum	12 mm	
Shielding	Individual cable pairs and entire cable	
Connector type Connection cycles Contacts Mechanical protection	2x DVI-D (24+1), male Min. 200 Gold plated Metal cover with crimped stress relief	
Max. tension During installation During operation	 ≤ 400 N ≤ 50 N	

Table 390: Technical data - SDL flex cable with extender 5CASDL.0x00-13

Features	5CASDL.0300-13	5CASDL.0400-13
Materials Cable shield Color	RoHS compliant Aluminum foil clad + tinned copper mesh Black (similar to RAL 9005)	
Flexibility	Flexible; valid for ferrite magnet - ferrite magnet (tested 300,000 cycles with 15x cable diameter, 4800 cycles / hour)	
Halogen-free	Yes	
Flex radius Fixed layout flexible installation	See figure "Flex radius specification", on page 657 6x cable diameter (of plug - ferrite magnet) 10x cable diameter (of ferrite magnet - extender) 15x cable diameter (of ferrite magnet - ferrite magnet)	
Weight	Approx. 6200 g	Approx. 8000 g
Electrical properties (at 20°C)		
Wire cross section	24 AWG (control wires) 26 AWG (DVI, USB, data)	
Line resistance 24 AWG 26 AWG	 ≤ 95 Ω/km ≤ 145 Ω/km	
Insulation resistance	> 200 MΩ/km	
Wave impedance	100 ±10 Ω	
Test voltage Wire / wire Wire / shield	 1 kV_{eff} 0.5 kV_{eff}	
Operating voltage	≤ 30 V	
Environmental characteristics		
Temperature resistance Fixed installation Moving Bearings	 -20 to 60°C -5 to 60°C -20 to 60°C	
Fire resistance	Fire resistant according to UL758 (cable vertical flame test)	
Standards and certifications		
Torsion load	100,000 cycles (tested angle of rotation: ±85° speed: 50 cycles / minute)	
Cable drag chain	300,000 cycles Tested flex radius: 180 mm;15x cable diameter; hub: 460 mm; speed: 4800 cycles / hour	
Approbation	UL AWM 20236 80°C 30 V	
Oil and hydrolysis resistance	According to VDE 0282-10	

Table 390: Technical data - SDL flex cable with extender 5CASDL.0x00-13 (Forts.)

18.6.3 Flex radius specification

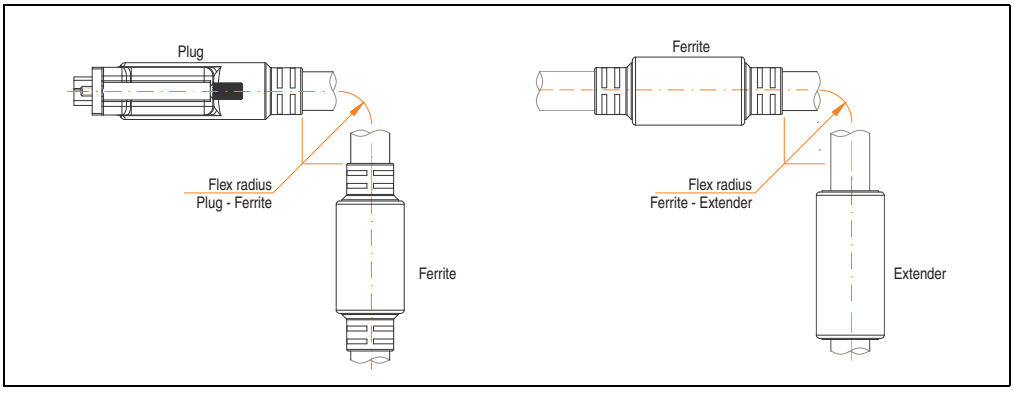


Figure 349: Flex radius specification

18.6.4 Dimensions

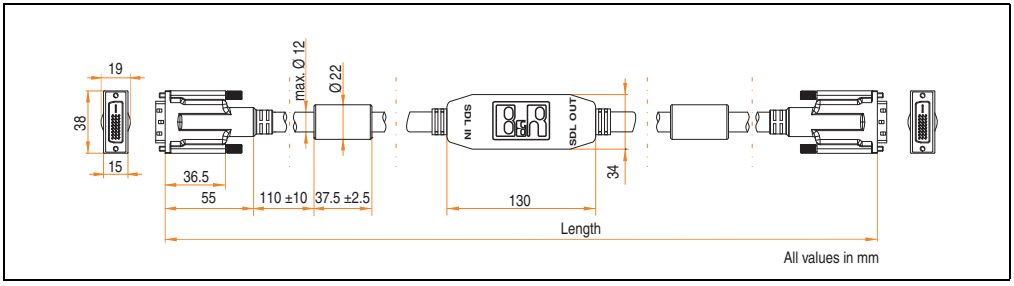


Figure 350: Dimensions - SDL flex cable with extender 5CASDL.0x00-13

18.6.5 Cable connection

The SDL flex cable with extender must be connected correctly between the Industrial PC and Automation Panel 900 display unit. The signal direction is indicated on the extender unit for this purpose:

- Connect the end labeled "SDL IN" with the video output of the Automation PC 620 or Panel PC 700 (monitor/panel output) or Panel OUT of an AP900 AP Link card.
- The "SDL OUT" end should be connected to the display unit (e.g. Automation Panel 900) via the Automation Panel Link insert card (Panel IN).

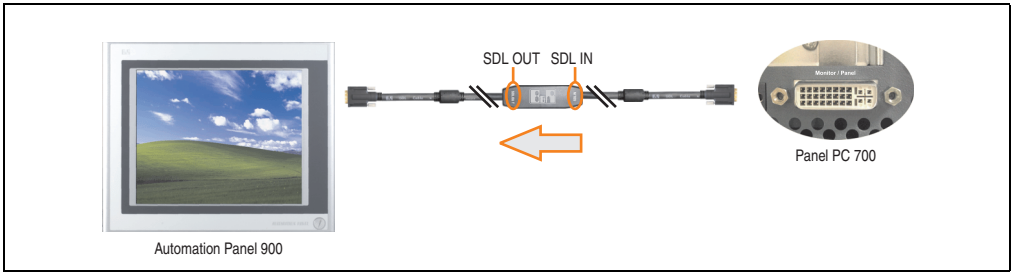


Figure 351: Example of signal direction for the SDL flex cable with extender - PPC700

18.6.6 Cable specifications

The following figure shows the pin assignments for the SDL flex cable with extender available at B&R.

Information:

Only B&R SDL flex cables with extender can be used.

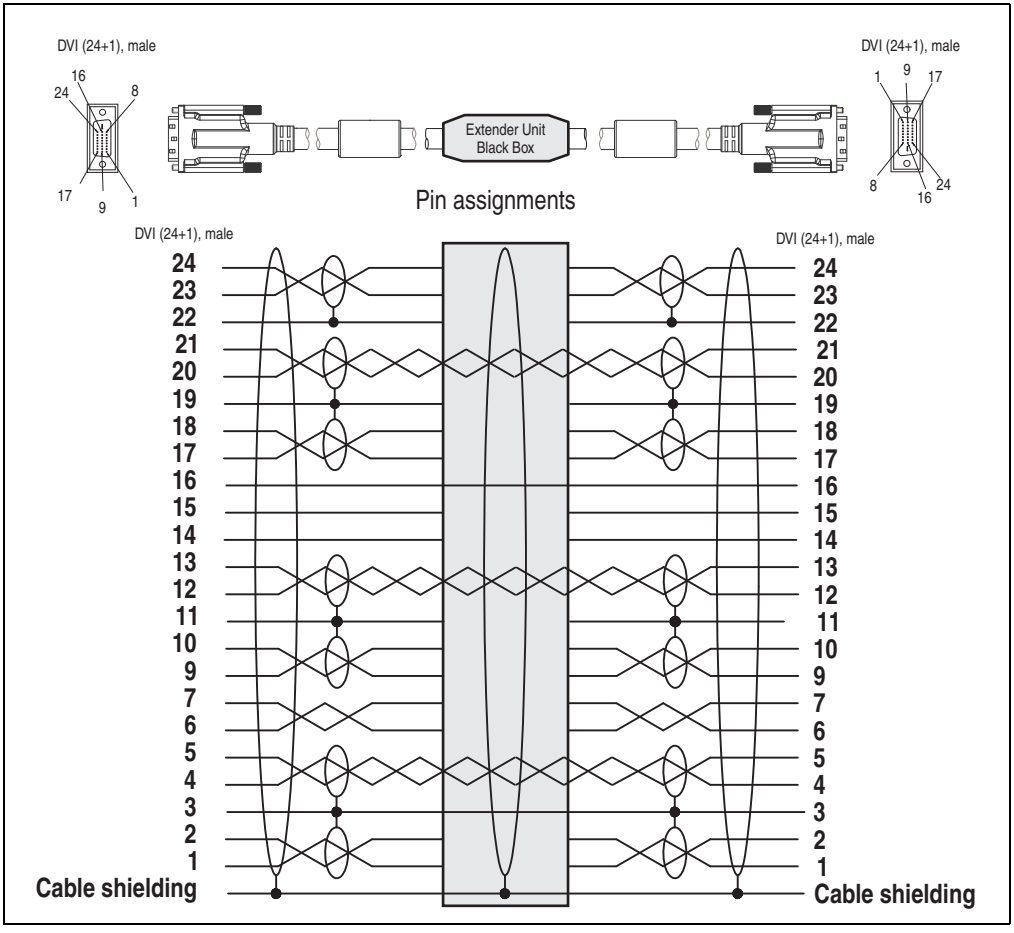


Figure 352: Pin assignments - SDL flex cable with extender 5CASDL.0x00-13

18.7 RS232 cable

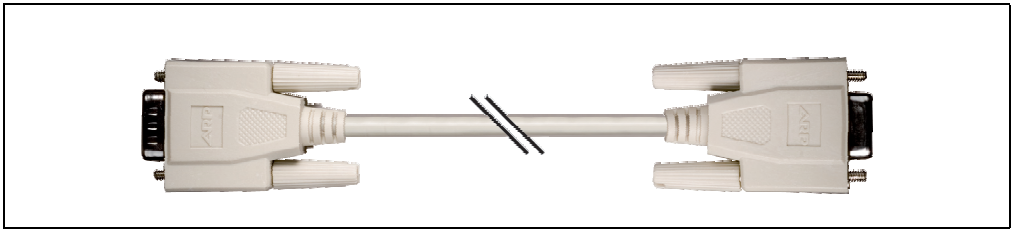


Figure 353: RS232 extension cable (similar)

18.7.1 Order data

Model number	Description	Note
9A0014.02	**RS232 cable DB9/f:DB9/m 1.8 m** RS232 extension cable for remote operation of a display unit with touch screen, length 1.8 m.	
9A0014.05	**RS232 cable DB9/f:DB9/m 5 m** RS232 extension cable for remote operation of a display unit with touch screen, length 5 m.	
9A0014.10	**RS232 cable DB9/f:DB9/m 10 m** RS232 extension cable for remote operation of a display unit with touch screen, length 10 m.	

Table 391: Model numbers - RS232 cables

18.7.2 Technical data

Features	9A0014.02	9A0014.05	9A0014.10
Length Tolerance	1.8 m ±50 mm	5 m ±80 mm	10 m ±100 mm
Outer diameter	Max. 5 mm		
Shielding	Entire cable		
Connector type	DSUB (9-pin), male / female		
Wire cross section	AWG 26		
Flexibility	Flexible		
Flex radius	Min. 70 mm		

Table 392: Technical data - RS232 cables

18.7.3 Cable specifications

The following figure shows the pin assignments for the RS232 cable available at B&R. If you want to build a suitable cable yourself, it should be wired according to these specifications.

Warning!

If a self-built cable is used, B&R cannot guarantee that it will function properly. The RS232 cables provided by B&R are guaranteed to function properly.

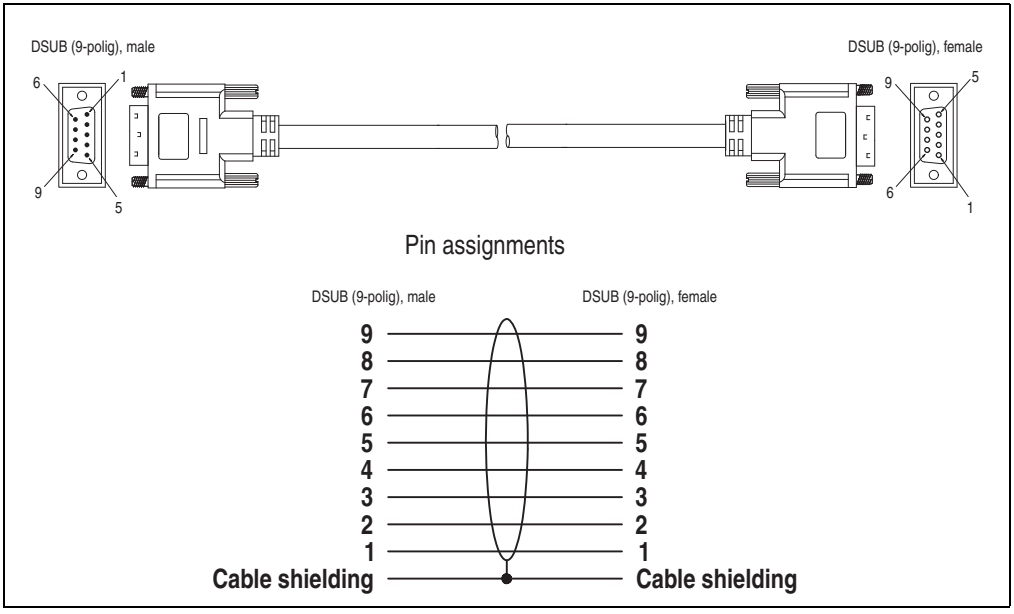


Figure 354: Pin assignments - RS232 cable

18.8 USB cable

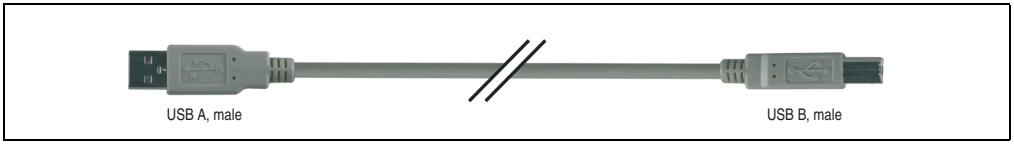


Figure 355: USB extension cable (similar)

18.8.1 Order data

Model number	Description	Note
5CAUSB.0018-00	**USB 2.0 cable, A/m:B/m 1.8 m** USB 2.0 connection cable; plug type A - type B; length 1.8 m	
5CAUSB.0050-00	**USB 2.0 cable, A/m:B/m 5 m** USB 2.0 connection cable; plug type A - type B; length 5 m	

Table 393: Model numbers - USB cables

18.8.2 Technical data

Features	5CAUSB.0018-00	5CAUSB.0050-00
Length Tolerance	1.8 m ±30 mm	5 m ±50 mm
Outer diameter	Max. 5 mm	
Shielding	Entire cable	
Connector type	USB type A male and USB type B male	
Wire cross section	AWG 24, 28	
Flexibility	Flexible	
Flex radius	Min. 100 mm	

Table 394: Technical data - USB cables

18.8.3 Cable specifications

The following figure shows the pin assignments for the USB cable available at B&R. If you want to build a suitable cable yourself, it should be wired according to these specifications.

Warning!

If a self-built cable is used, B&R cannot guarantee that it will function properly. The USB cables provided by B&R are guaranteed to function properly.

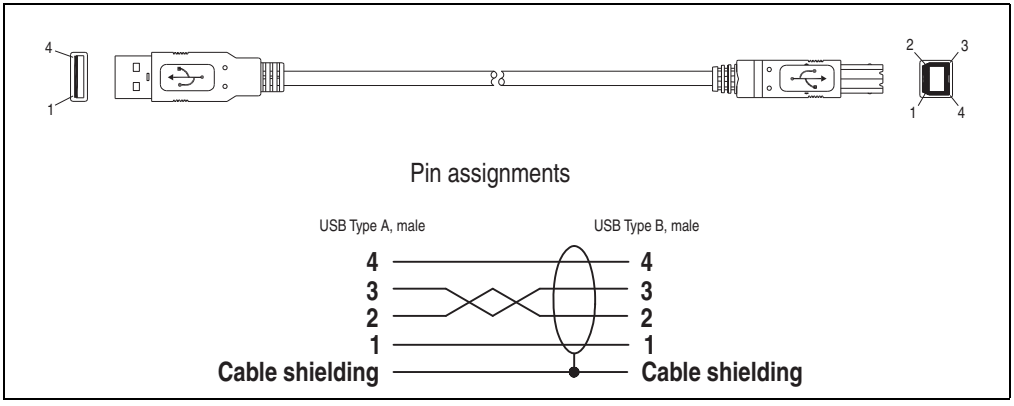


Figure 356: Pin assignments - USB cable

19. Legend strip templates

Panel PC 700 devices with keys are delivered with partially pre-labeled key legend strips (F1, F2, etc.). The key legend strip slots are accessible on the back of the Panel PC 700 device (above and below).

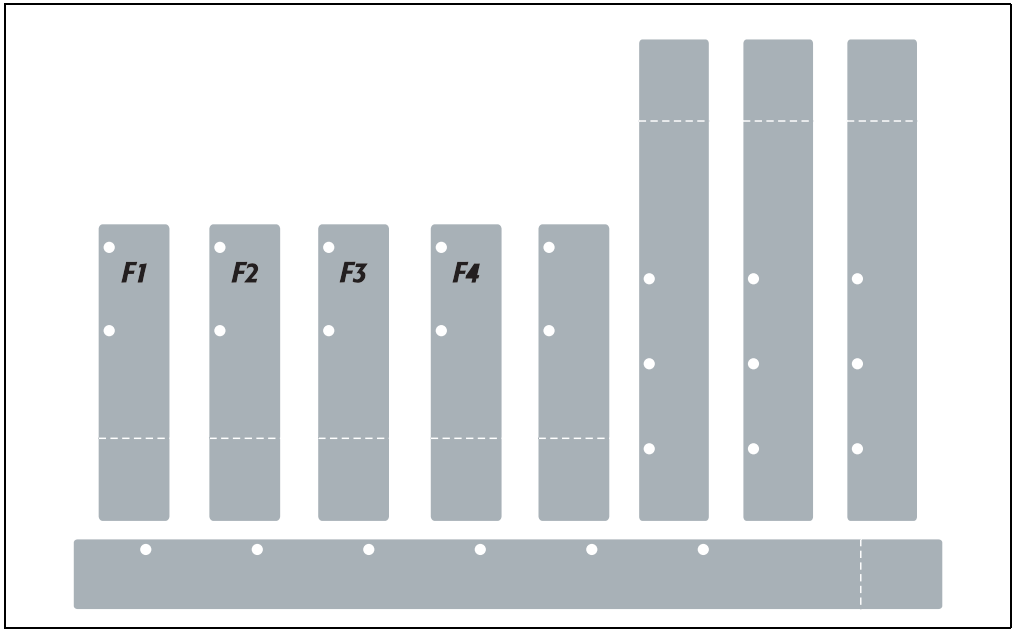


Figure 357: Legend strip templates

Printable legend strips (A4 format) can be ordered from B&R (see table 20 "Model numbers - Other items", on page 39). They can be printed using a standard laser printer (b/w or color) in a temperature range from -40°C to +125°C. A print template (available for Corel Draw version 7, 9 and 10) for the respective legend strip template can be downloaded from the B&R homepage (**www.br-automation.com**). The print templates can also be found on the HMI Drivers & Utilities DVD (model number 5SWHMI.0000-00).

19.1 Order data

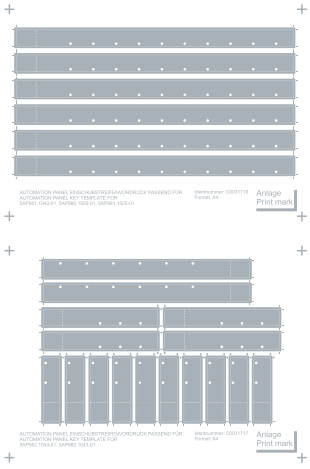
Model number	Description	Figure
5AC900.104X-00	**Legend strip template 10.4" portrait format** Legend strip template for Panel PC 700 system unit 5PC781.1043-00. For 1 device.	Examples of legend strip templates 
5AC900.104X-01	**Legend strip template 10.4" landscape format** Legend strip template for Panel PC 700 system unit 5PC782.1043-00. For 1 device.	
5AC900.150X-01	**Legend strip template 15"** Legend strip template for Panel PC 700 system unit 5PC781.1505-00. For 4 devices.	

Table 395: Order data - Legend strip templates

20. Replacement fan

Information:

The fan filters are subject to wear, and should be checked with appropriate frequency to determine whether the air flow provides sufficient cooling. An exchange or cleaning of the filter kit is appropriate at that time.

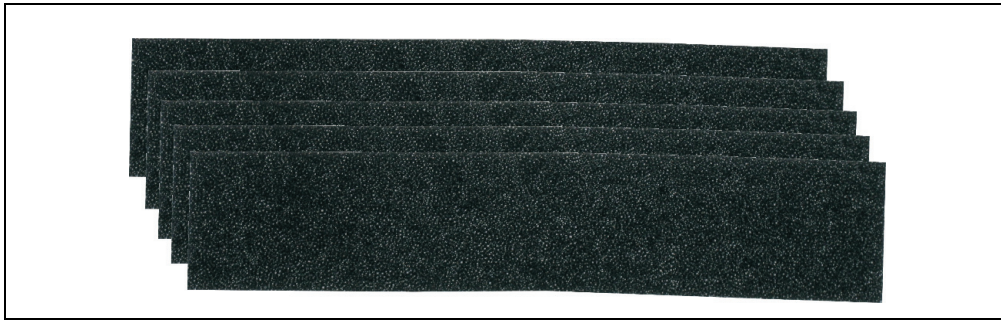


Figure 358: Replacement fan

20.1 5AC700.FA00-00

This fan filter can be used as an option for 10.4", 12.1", 15", 17" and 19" Panel PC 700 system units with 0 PCI slots (5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00).

20.2 5AC700.FA02-00

This fan filter can be used as an option for 10.4", 12.1" or 15" Panel PC 700 system units with 1 and 2 PCI slots (PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02).

21. SRAM module - 5AC600.SRAM-00

The 512 KB SRAM module increases PPC700 application possibilities. It is inserted internally on the baseboard (depending on revision) and doesn't require a PCI slot. Nonvolatile data can be stored on it. The module is backed up by the PPC700 battery.

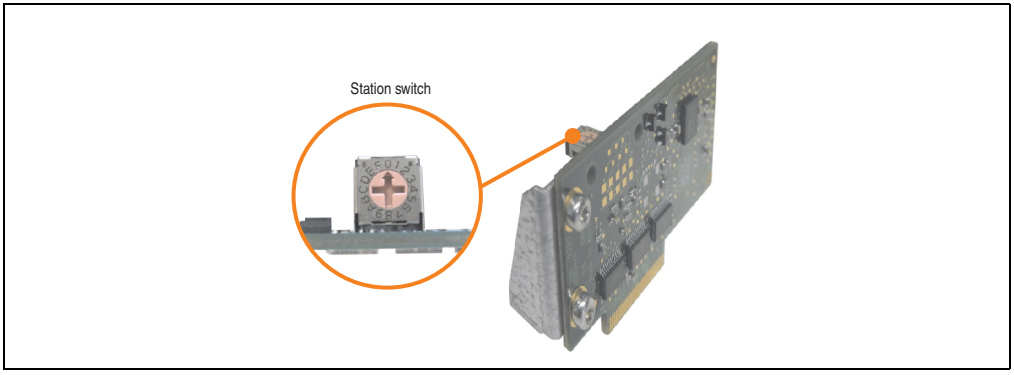


Figure 359: SRAM module - 5AC600.SRAM-00

The following system unit hardware revisions are required before mounting the SRAM module:

- 5PC720.1043-01 starting with Rev. I0
- 5PC720.1214-01 starting with Rev. D0
- 5PC720.1505-01 starting with Rev. L0
- 5PC720.1505-02 starting with Rev. K0

21.1 Technical data

Features	5AC600.SRAM-00
Connection to system	via the PCI bus (PCI PnP)
Memory Quantity Battery-buffered Remanent variables for AR (Automation Runtime) in power fail mode	SRAM 512 kB Yes 256 kB with CPU board 5PC600.E855-xx and 5PC600.X855-xx 192 kB with CPU board 5PC600.X945-00
Station switch	16 digits (0-F)
Data rate	Up to 31 MB/s for write access Up to 25 MB/s for read access

Table 396: Technical data - 5AC600.SRAM-00

Features	5AC600.SRAM-00	
PCI configuration space	**Value**	**Meaning**
Vendor ID	1677h	B & R
Device ID	A085h	5AC600.SRAM-00
Status	0200h	DEVSEL timing medium
HeaderType	00h	Single function device
The card is registered in the PCI Configuration Space as Single Function Device	**Value**	**Meaning**
Device 0		
Base class	05h	Memory controller
Sub class	00h	RAM
Command	0000h	Bus master (not used)
IRQ	-	Not used
BAR0	512	kByte memory area
BAR1	4	Byte I/O area

Table 396: Technical data - 5AC600.SRAM-00

21.2 Driver support

The module is presently only supported in an Automation Runtime environment. Driver for other operating systems (e.g. Windows XP) are available upon request.

21.3 Installation

- Remove the side cover of the PPC700.
- Screw on the M3x5 Torx included in the delivery to the baseboard of the module.

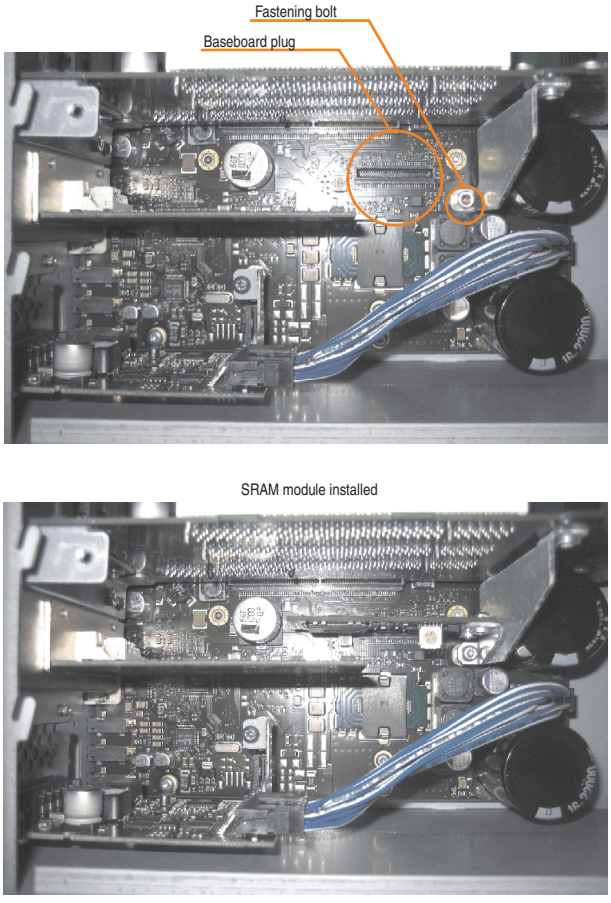


Figure 360: SRAM module installation

22. Ethernet PCI interface cards

22.1 PCI Ethernet card 10/100 - 5ACPCI.ETH1-01

The universal (3.3 V and 5 V) half-size PCI Ethernet card has a 10/100 MBit/s network connection and can be inserted in a 16-bit PCI slot and operated as an additional network interface.

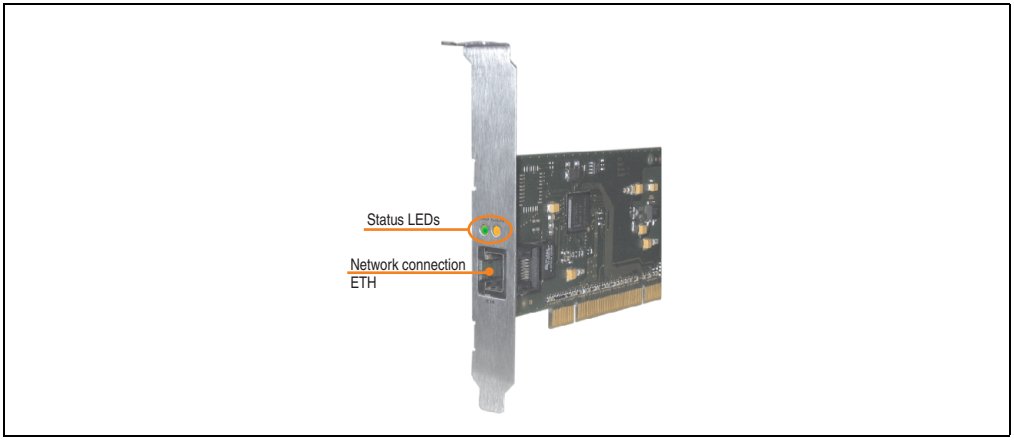


Figure 361: PCI Ethernet card 10/100 - 5ACPCI.ETH1-01

22.1.1 Technical data

Ethernet connection			
Controller	Intel 82551ER		RJ45 twisted pair (10BaseT/100BaseT), female
Power supply	Universal card (2 notches) for 3.3 V or 5 V		
Cabling	S/STP (Cat5e)		
Transfer rate	10/100 MBit/s [1]		
Cable length	max. 100 m (min. Cat5e)		
LED	**On**	**Off**	
Green	100 Mbit/s	10 Mbit/s	
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)	

Table 397: Ethernet connection ETH

1) Both operating modes possible. Change-over takes place automatically.

22.1.2 Driver support

A special driver is necessary for operating the Intel Ethernet controller 82551ER. Drivers for Windows XP Professional, Windows XP Embedded, and DOS are available for download on the B&R Homepage in the download area (www.br-automation.com).

Information:

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

22.1.3 Dimensions

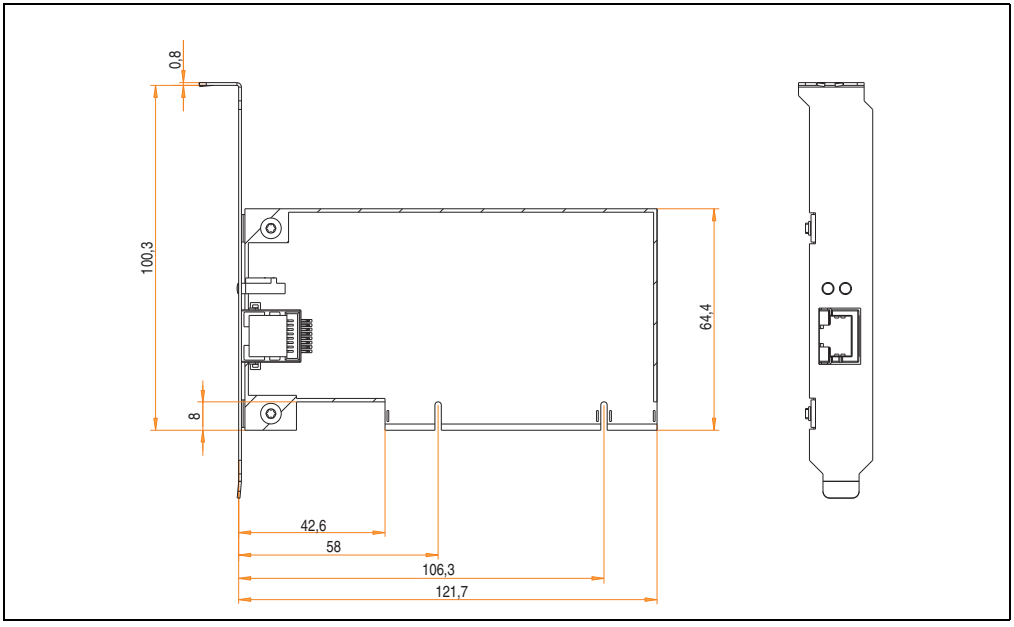


Figure 362: Dimensions - 5ACPCI.ETH1-01

22.2 PCI Ethernet card 10/100 - 5ACPCI.ETH3-01

The universal (3.3 V and 5 V) half-size PCI Ethernet card has three 10/100 MBit/s network connections and can be inserted in a 16-bit PCI slot and operated as an additional network interface.

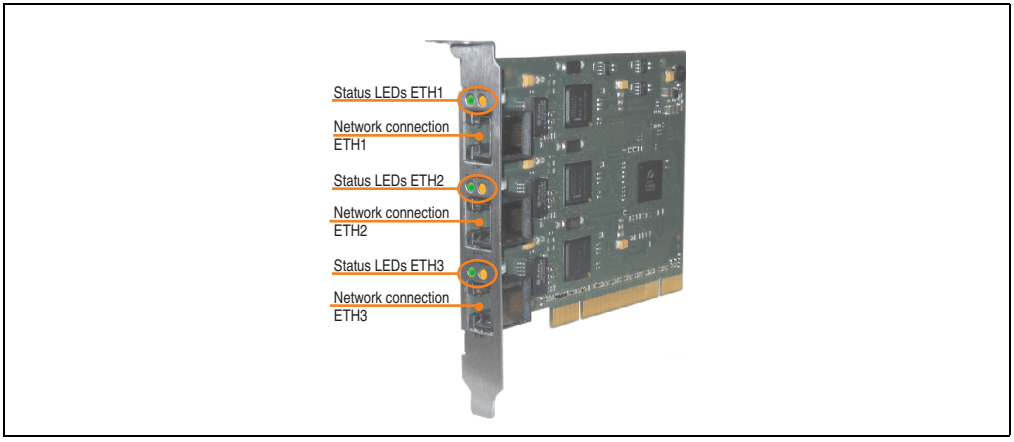


Figure 363: PCI Ethernet card 10/100 - 5ACPCI.ETH3-01

22.2.1 Technical data

Ethernet connections		
Controller	each with Intel 82551ER	3 x RJ45 twisted pair (10BaseT/100BaseT), female
Power supply	Universal card (2 notches) for 3.3 V or 5 V	
Cabling	each S/STP (Cat5e)	
Transfer rate	each 10/100 MBit/s [1]	
Cable length	each max. 100 m (min. Cat5e)	
LED	**On**	**Off**
Green	100 Mbit/s	10 Mbit/s
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)

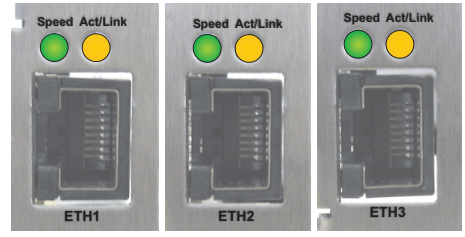


Table 398: Ethernet connections ETH1, ETH2, ETH3

1) Both operating modes possible. Change-over takes place automatically.

22.2.2 Driver support

A special driver is necessary for operating the Intel Ethernet controller 82551ER. Drivers for Windows XP Professional, Windows XP Embedded, and DOS are available for download on the B&R Homepage in the download area (www.br-automation.com).

Information:

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

22.2.3 Dimensions

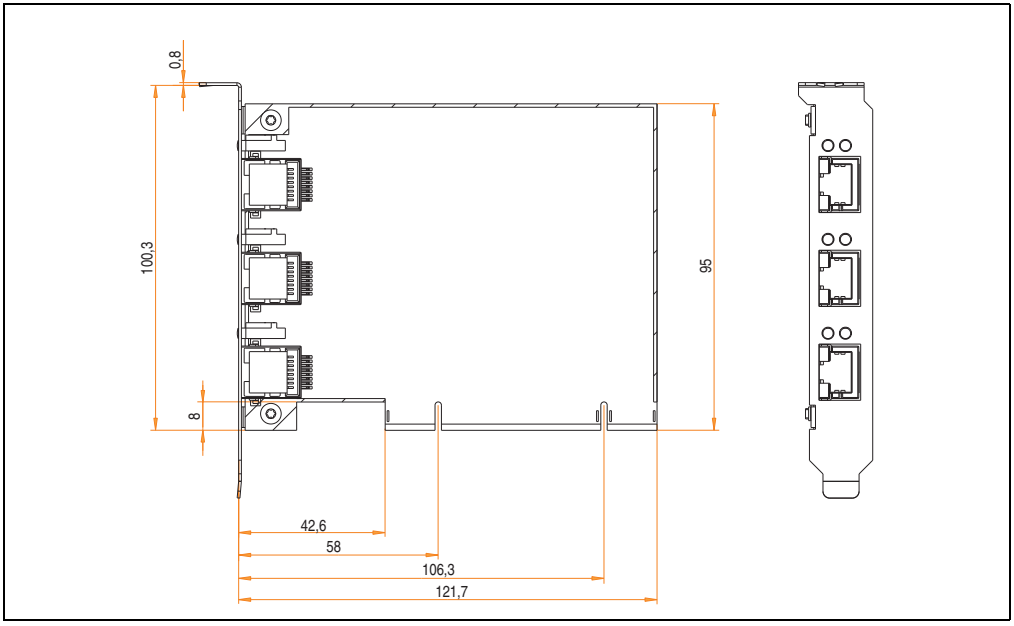


Figure 364: Dimensions - 5ACPCI.ETH3-01

Chapter 7 • Maintenance / Servicing

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

1. Changing the battery

The lithium battery buffers the internal real-time clock (RTC) and the CMOS data. The buffer duration of the battery is at least 4 years (at 50°C, 8.5 µA current requirements of the supplied components and a self discharge of 40%).

Information:

- **The product design allows the battery to be changed with the PPC700 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.

1.1 Battery check

The battery status (good or bad) is checked every time the device is turned on, as well as every 24 hours. The check involves applying a load to the battery for a short time (approx. 1 second), followed by an evaluation. The evaluated battery status is displayed in the BIOS Setup pages 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
OK	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 399: Meaning of battery status OK - Bad

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.

The following replacement lithium batteries are available:

- 4A0006.00-000 (1 piece)
- 0AC201.91 (4 pcs.)

1.2 Procedure

- Disconnect the power supply to the Panel PC 700 (also see information on page 675).
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Remove the black plastic cover from the battery compartment and carefully pull out the battery using removal strips.

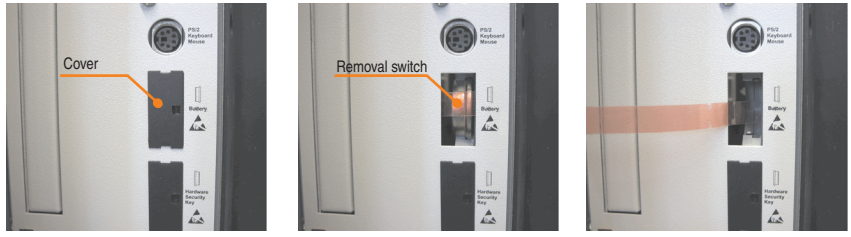


Figure 365: Battery removal

- Insert the new battery with correct polarity. The battery should not be held by its edges. Insulated tweezers may also be used for inserting the battery.

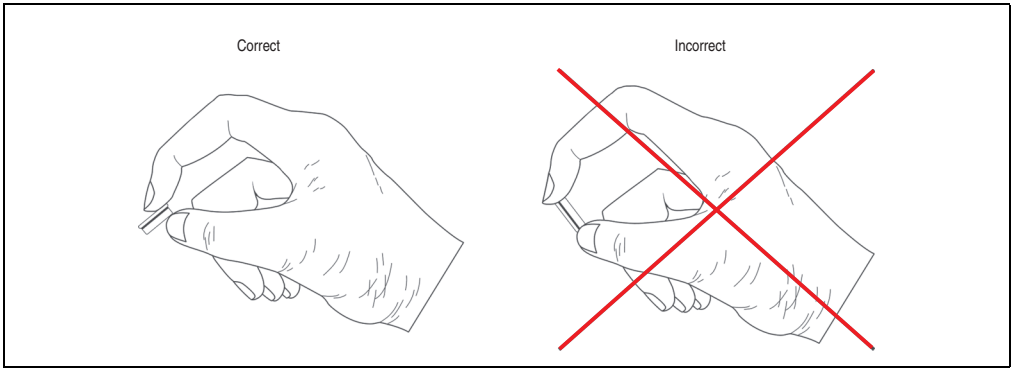


Figure 366: Battery handling

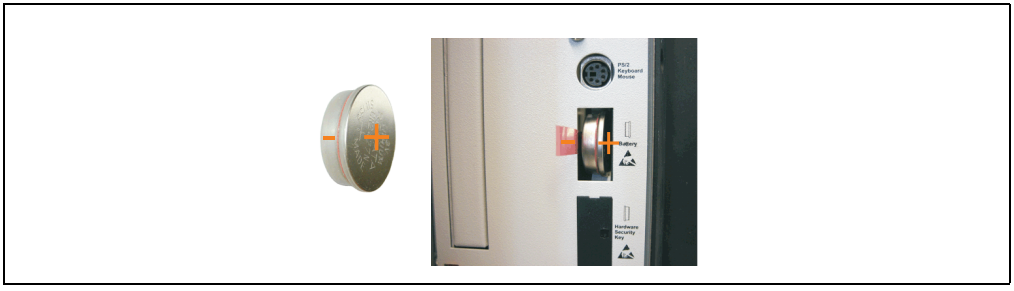


Figure 367: Battery polarity

- To make the next battery change easier, be sure the removal strip is in place when inserting battery.
- Reconnect the power supply to the Panel PC 700 by plugging the power cable back in and pressing the power button (also see information on page 675).
- Reset the data and time in BIOS (see information on page 675).

Warning!

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

2. Changing the CompactFlash

By pressing the ejection lever (see figure) with a pointed object (i.e. pen) the exchange of the CompactFlash card is quickly and safely.

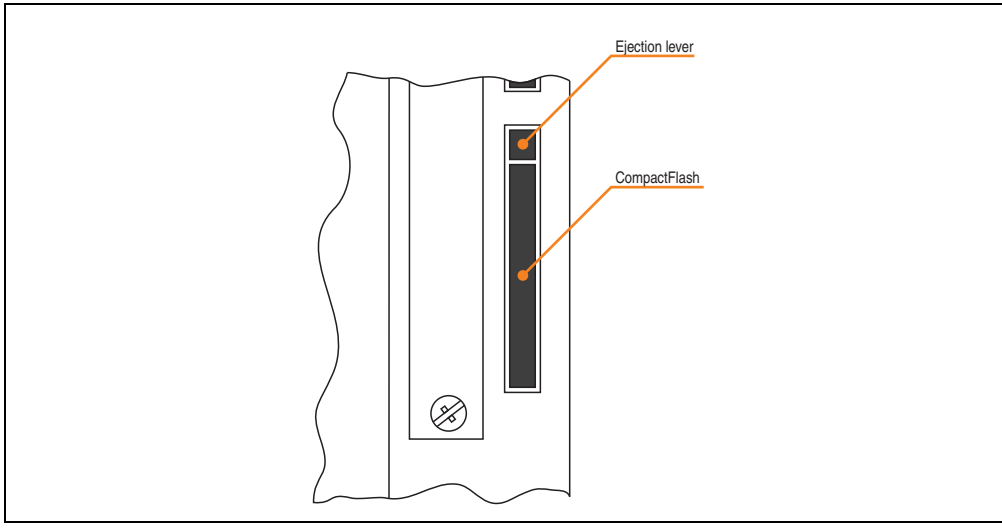


Figure 368: CompactFlash + ejection lever (representation picture)

Caution!

The power must be turned off before inserting or removing the CompactFlash card!

3. Fan kit installation and replacement

3.1 Procedure - PPC700 without PCI slots

The procedure for devices without PCI slots (5PC720.1043-00, 5PC720.1214-00, 5PC720.1505-00, 5PC720.1706-00, 5PC720.1906-00, 5PC781.1043-00, 5PC781.1505-00, 5PC782.1043-00) is explained step-by-step in the following example (5PC720.1505-00).

- Disconnect the power supply to the Panel PC 700.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Loosen the nuts on the clamp (using hex key) and lift the clamp to remove. Loosen the screws on the fan kit cover (using Torx screw driver size 10) and remove the cover.

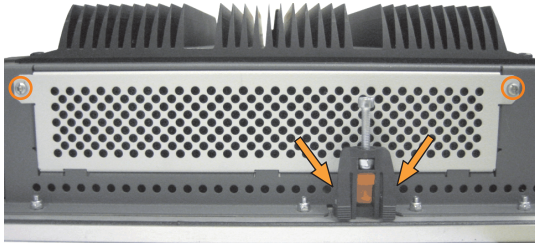


Figure 369: Removing the fan kit cover

- There are two arrows on the fans that indicate the direction of air flow and the direction of fan rotation.

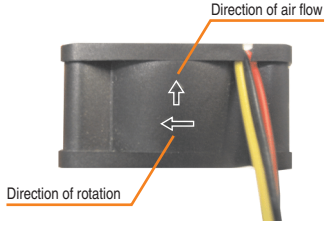


Figure 370: Marking for direction of airflow / fan rotation

Warning!

The fans must be installed so that the air flows toward the inside of the housing.

- Align fans over the fastening bolts (see arrows). Feed cables through the opening in the housing (see square) into the main board of the PPC700.

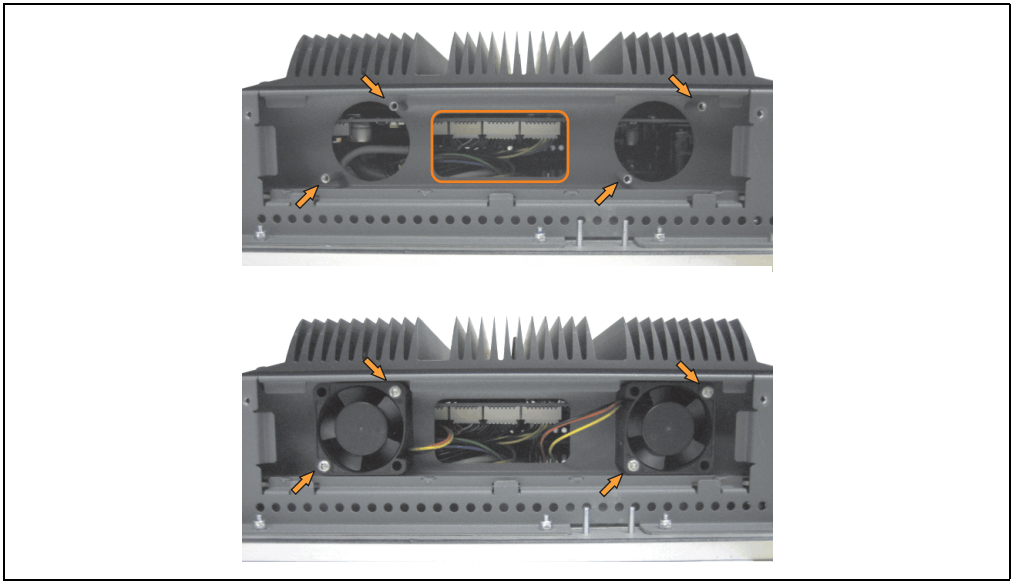


Figure 371: Fan Installation

- Secure fans with the 4 included Torx (T10) screws.
- Loosen the marked nuts (using hex key) and open the cover (open carefully because of cable).

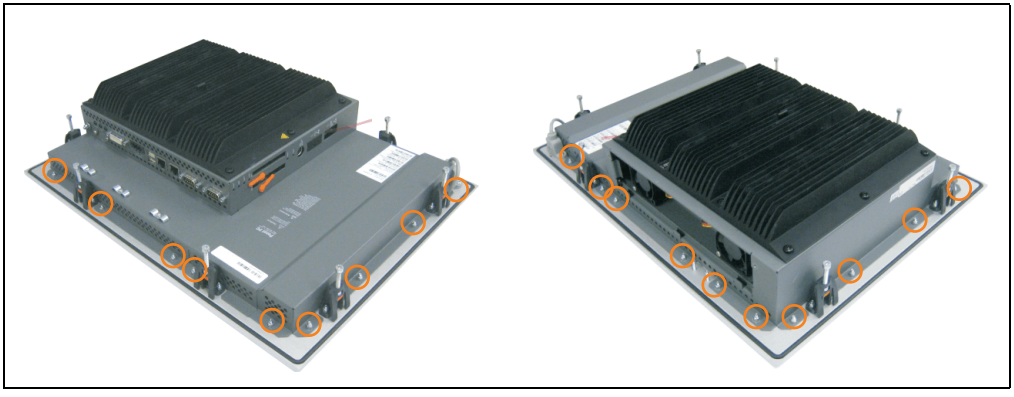


Figure 372: Removing the cover

- The fan connection cable must be connected to the main circuit board at the right position (fan 1 at position 1, fan 2 at position 2).

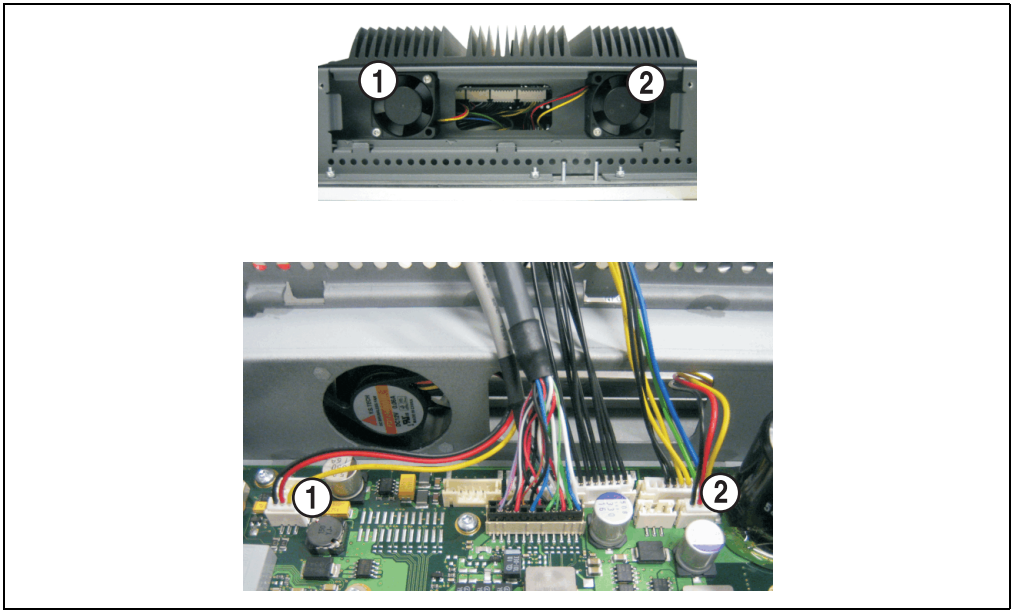


Figure 373: Fan cable connection on the main board

- Place dust filter in the fan kit cover and replace removed components (cover, filter kit cover) in reverse order.

3.2 Procedure - PPC700 with 1 and 2 PCI slots

The procedure for devices with 2 PCI slots (5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01, 5PC720.1505-02) is explained step-by-step in the following example (5PC720.1505-01).

- Disconnect the power supply to the Panel PC 700.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Loosen the screws on the fan kit cover (using Torx screw driver size 10) and remove the cover.

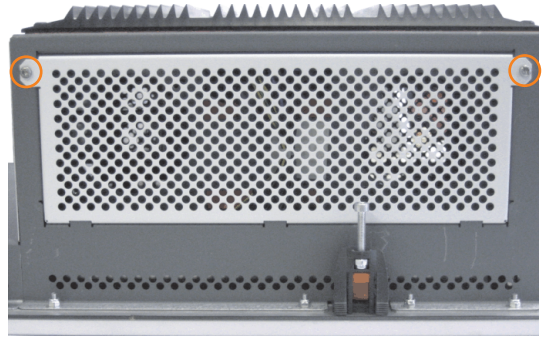


Figure 374: Removing the fan kit cover

- If a PCI card is in place, it must be removed before moving on to the next step.
- There are two arrows on the fans that indicate the direction of air flow and the direction of fan rotation.

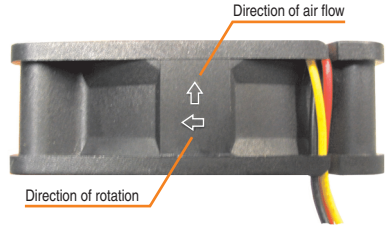


Figure 375: Marking for direction of airflow / fan rotation

Warning!

The fans must be inserted so that the air flows toward the inside of the housing.

- Remove the clamp screw (see circle). Align fans over the fastening bolts (see arrows). Feed cables through the opening in the housing (see square) into the main board of the PPC700.

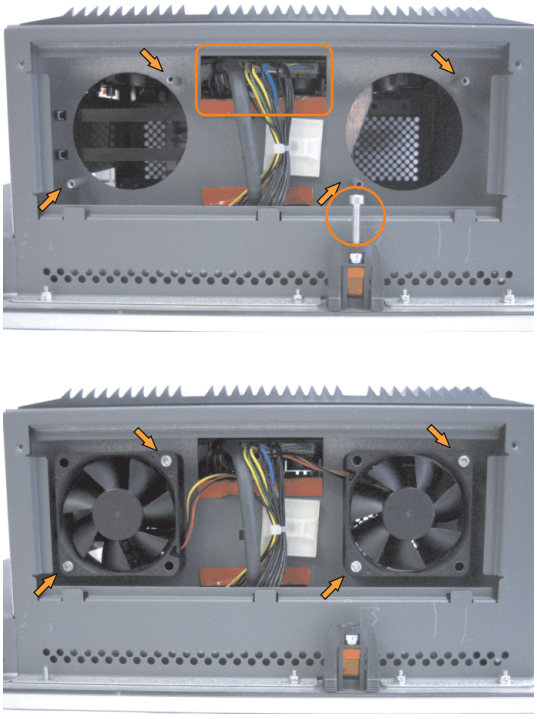


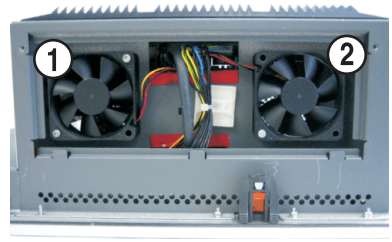
Figure 376: Fan Installation

- Secure fans with the 4 included Torx (T10) screws.

- Loosen the screws on the side cover (using Torx screw driver size 10) and remove the cover.

Figure 377: Removing the side cover

- The fan connection cable must be connected to the main circuit board at the right position (fan 1 at position 1, fan 2 at position 2).



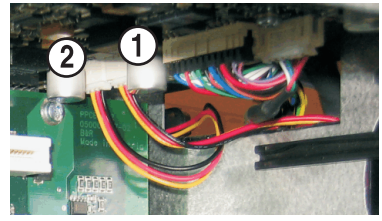


Figure 378: Fan cable connection on the main board

- If a PCI card was previously in place, it can now be re-inserted.
- Place dust filter in the fan kit cover and replace removed components (filter kit cover, side cover) in reverse order.

4. Slide-in drive - installation and exchange

A slide-in drive can be installed and exchanged in system units with 1 or 2 PCI slots.

4.1 Installation procedure

- Disconnect the power supply to the Panel PC 700.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Remove the light-gray side cover. This generally requires removing 5 Torx screws (T10).

Figure 379: Example - Side cover removal on the system unit 5PC720.1505-02

- Remove the slide-in dummy module.

Figure 380: Removing the slide-in dummy module

- Insert the slide-in drive.

Figure 381: Installing the slide-in drive

- Attach the side cover.

4.2 Exchange procedure

- Disconnect the power supply to the Panel PC 700.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Remove the light-gray side cover. This generally requires removing 5 Torx screws (T10).

Figure 382: Example - Side cover removal on the system unit 5PC720.1505-02

- Remove both slide-in slot releasing mechanisms outwards. The slide-in drive is pushed a few mm upwards for easy removal.

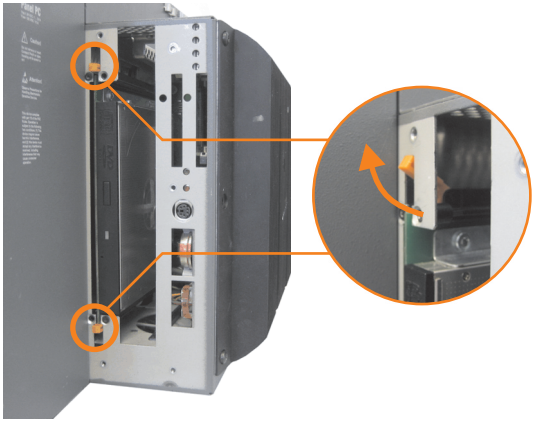


Figure 383: Release the slide-in slot releasing mechanisms

- Removing the slide-in drive.
- Move the slide-in slot releasing mechanism to the start position and insert the new slide-in drive.

Figure 384: Installing the slide-in drive

- Attach the side cover.

5. Exchanging the legend strips

The function keys can be individually labeled by simply exchanging the legend strips (see "Legend strip templates", on page 664). The designated slots for the legend strips can be accessed on the back of the PPC700 device.

5.1 Procedure

1) Place the Panel PC on a clean, even surface with the display facing down.

2) Remove blank legend strips and replace with printed ones.

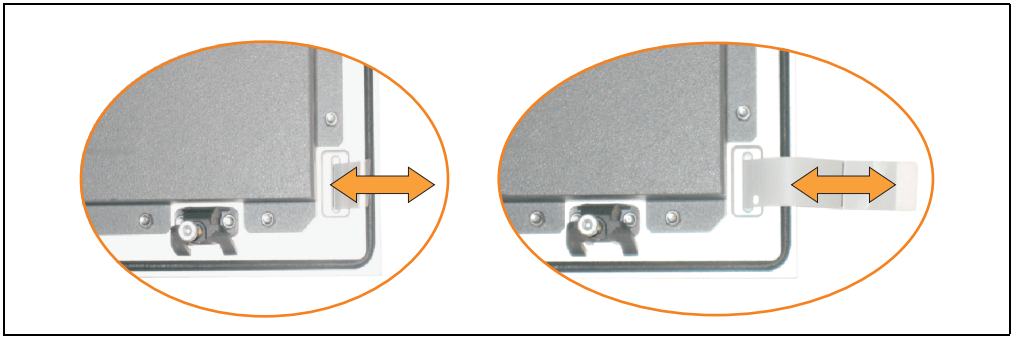


Figure 385: Exchange legend strips

6. Exchanging a PCI SATA RAID hard disk

In the example, the assumption is made that the secondary hard disk (HDD1) is defective. A size 10 Torx screwdriver is needed for exchanging the hard disk.

Exchange procedure:

- Remove the power supply to the device (Automation PC 620 / Panel PC 700).
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body.
- Remove the side cover.
- Remove the SATA RAID insert.
- Loosen the 4 appropriate mounting screws (M3x5) - see Figure 386 "Screw assignment on the back side of the SATA RAID controller", on page 690.

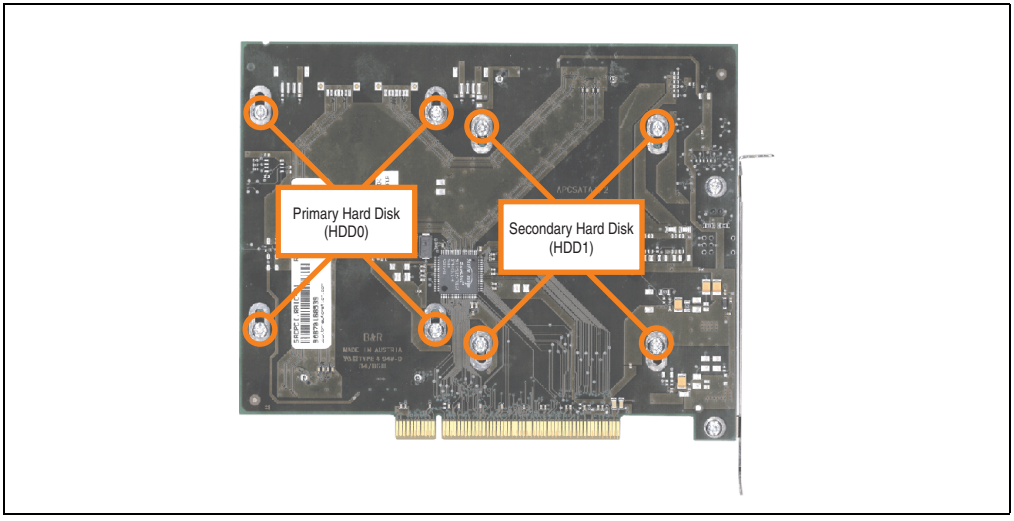


Figure 386: Screw assignment on the back side of the SATA RAID controller

- On the front side, slide the hard disk down and away (image 1).

- Carefully plug the new hard disk into the connector (image 2).

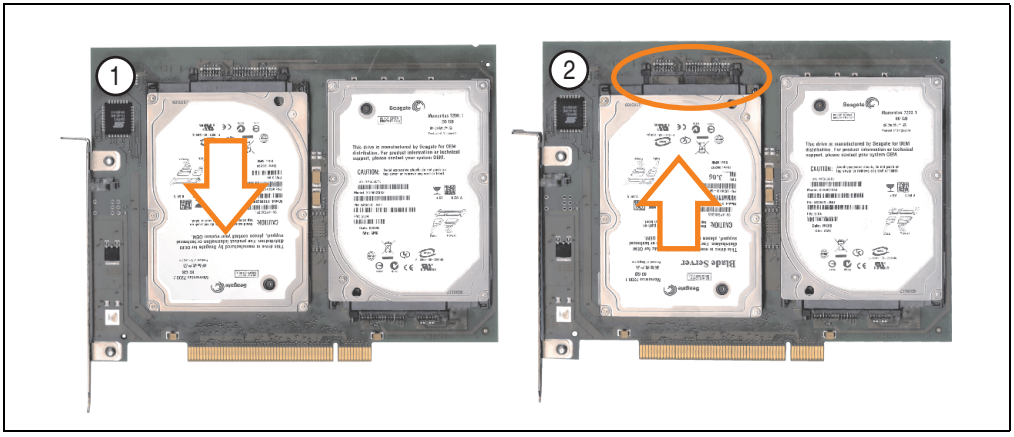


Figure 387: Hard disk exchange

- Re-secure the hard disk using the 4 fastening screws (M3x5) used earlier.
- Reassemble device in the reverse order.
- An error message is output by the RAID BIOS after starting the system "`RAID1 set is in Critical status - press any key to enter Configuration Utility`".

A rebuild must be executed in the SATA RAID BIOS - for more information on this, see the section "Rebuild mirrored set", on page 324.

Appendix A

1. Temperature sensor locations

Sensors monitor temperature values at different locations in the PPC700 (inside CPU, CPU board, power supply, slide-in drive 1, slide-in drive 2, I/O). The temperatures[1)] can be read in BIOS (menu item "advanced" - baseboard/panel features - baseboard monitor) or in Microsoft Windows XP/embedded, using B&R Control Center[2)] .

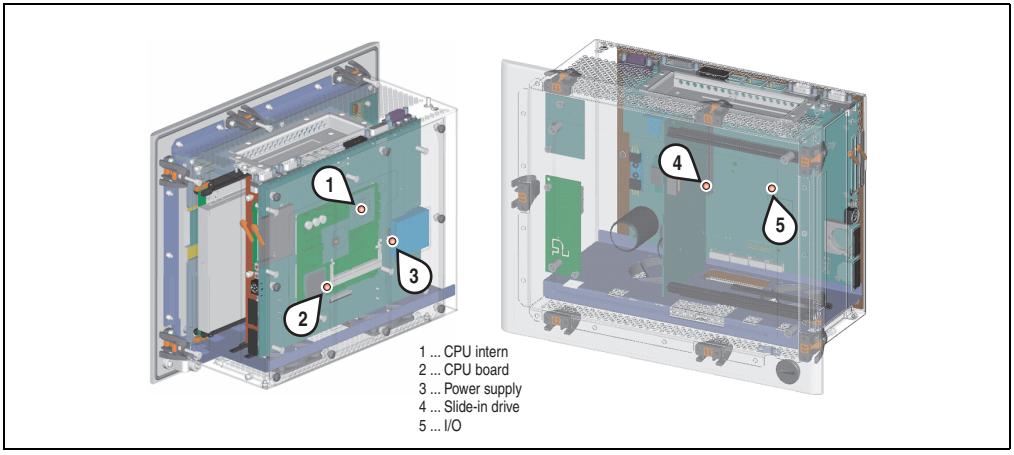


Figure 388: Temperature sensor locations

Position	Measurement point for	Measurement	Max. specified
1	CPU internal	Processor temperature (sensor integrated on the CPU board).	90°C
2	CPU board[1)]	CPU board temperature (sensor integrated in the CPU board).	95°C
3	Power supply	Power supply temperature (sensor on the power supply).	95°C
4	Slide-in drive 1/2	Temperature of a slide-in drive (the sensor is integrated on the slide-in drive).	Drive dependent
5	I/O	Temperature under an add-on drive (sensor on the baseboard).	Max. 85°C Drive dependent

Table 400: Temperature sensor locations

1) This sensor is only provided in 5PC600.X855-xx CPU boards.

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. Maintenance Controller Extended (MTCX)

The MTCX controller (FPGA processor) is located on the main board (part of every system unit) of Automation PC 620 and Panel PC 700 devices.

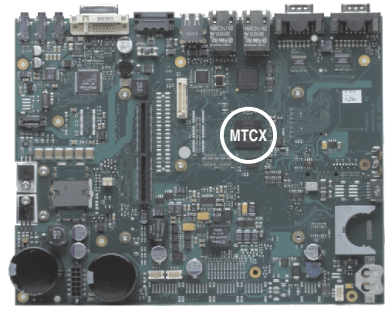


Figure 389: MTCX controller location

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

- Power on (power OK sequencing) and power fail logic
- Watchdog handling (NMI and reset handling)
- Temperature monitoring (I/O area, power supply, slide-in drive 1/2)
- Fan control (3 housing fans)
- Key handling / coordination (matrix keyboard on Automation Panel 900 devices configurable using B&R Key Editor, PS/2 keyboard)
- LED handling (matrix keyboard with LEDs on Automation Panel 900 devices configurable using B&R Key Editor)
- 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, power on and fan hours 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 (HDD, panel lock, Link 1)

The functions of the MTCX can be expanded via Firmware upgrade[1)] . The version can be read in BIOS (menu item "advanced" - baseboard/panel features) or in Microsoft Windows XP/embedded, using B&R Control Center.

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

2.1 Temperature monitoring - Fan control

The MTCX constantly monitors the temperature using temperature sensors (see section 1 "Temperature sensor locations", on page 693), which directly determine how the fan is controlled. The RPM depends on the temperature measured. The limit values depend on the MTCX firmware version being used.

Sensor range	Start-up temperature	Max fan speed at:
CPU	39°C	55°C
Power supply	39°C	55°C
Slide-in drive 1/2	39°C	55°C
I/O	39°C	55°C

Table 401: Temperature limits for fan control

The fans stop again when the temperature drops below 37°C.

3. B&R Key Editor

On display units, it is often necessary to adjust the function keys and LEDs for the application software being used. The B&R Key Editor makes it quick and easy to adapt the application to a unique configuration.

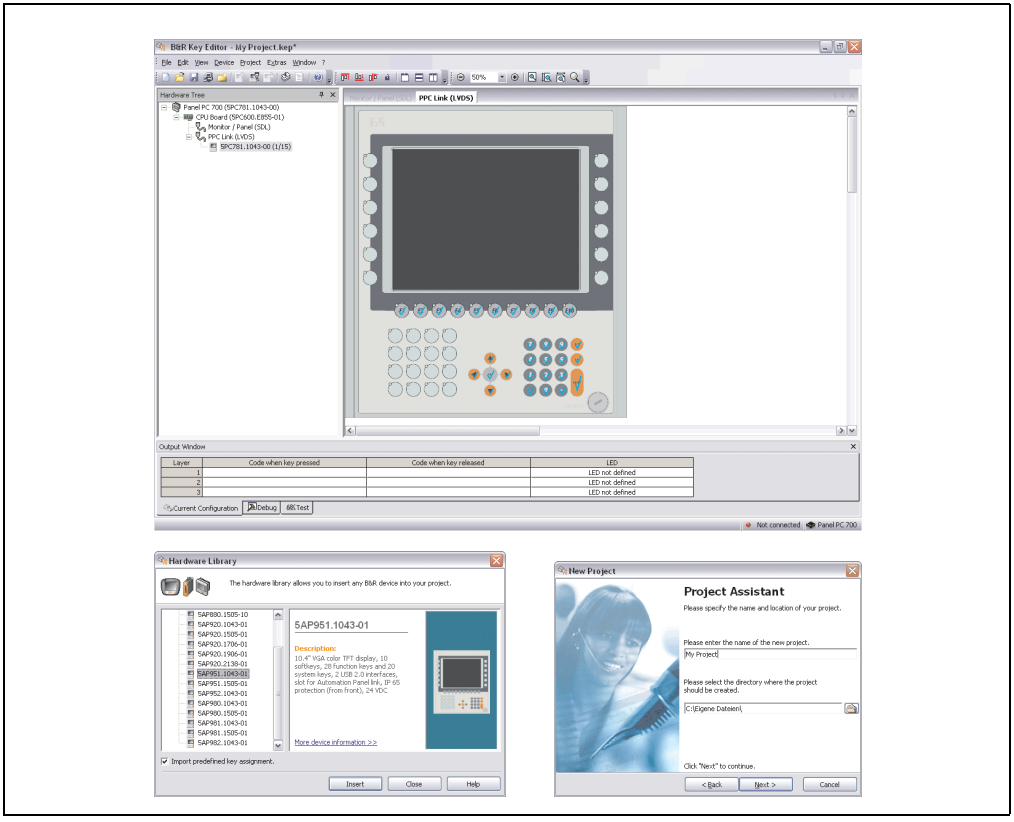


Figure 390: B&R Key Editor screenshots Version 3.10 (representation picture)

Features:

- Configuration of normal keys like on a keyboard (A, B, C, etc.)
- Keyboard shortcuts (CTRL+C, SHIFT+DEL, etc.) on one key
- Special key functions (change brightness, etc.)
- Assign functions to LEDs (HDD access, power, etc.)
- 4 assignments per key possible (using layer function)
- Configuration of panel locking time when multiple Automation Panel 900 devices are connected to Automation PCs and Panel PCs devices.

Supports following systems (Version 3.10):

- Automation PC 620
- Automation PC 810
- Automation PC 820
- Automation Panel 800
- Automation Panel 900
- IPC2000, IPC2001, IPC2002
- IPC5000, IPC5600
- IPC5000C, IPC5600C
- Mobile Panel 40/50
- Mobile Panel 100/200
- Panel PC 300
- Panel PC 700
- Panel PC 800
- Power Panel 100/200
- Power Panel 300/400
- Power Panel 500 (the Key Editor device file must be downloaded separately from the B&R homepage)

A detailed guide for configuring keys and LEDs can be found in the B&R Key Editor's online help.

The B&R Key Editor can be downloaded for free from the download area on the B&R homepage (**www.br-automation.com**). Additionally, it can also be found on the B&R HMI Drivers & Utilities DVD (model number 5SWHMI.0000-00).

4. B&R Automation Device Interface (ADI) development kit

This software can be used to activate functions of the B&R Automation Device Interface (ADI) from Windows applications, which, for example, were created using the following development tools:

- Microsoft Visual C++ 6.0
- Microsoft Visual Basic 6.0
- Microsoft eMbedded Visual C++ 4.0
- Microsoft Visual Studio 2005 (or newer)

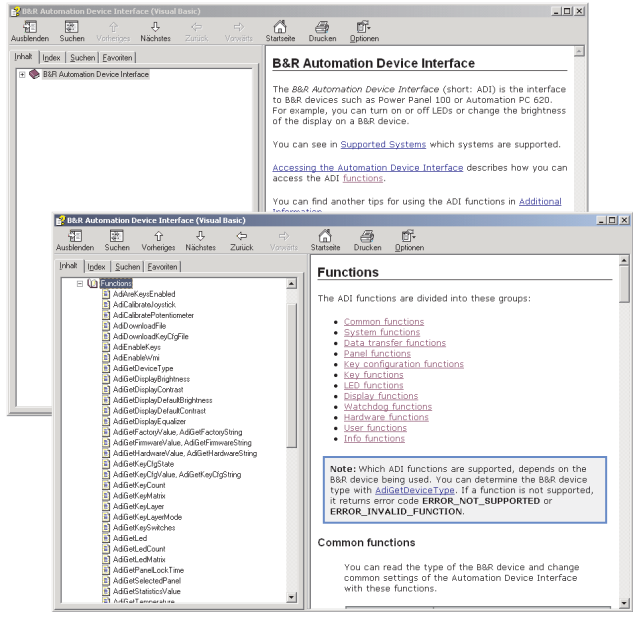


Figure 391: ADI development kit screenshots (Version 3.10)

Features:

- One Microsoft Visual Basic module with declarations for the ADI functions.
- Header files and import libraries for Microsoft Visual C++.
- Help files for Visual Basic and Visual C++.
- Sample projects for Visual Basic and Visual C++.
- ADI DLL (for testing the applications, if no ADI driver is installed).

Supports following systems (Version 3.10 and higher):

- Automation PC 620
- Automation PC 810
- Automation PC 820
- Mobile Panel 40/50
- Mobile Panel 100/200
- Panel PC 300
- Panel PC 700
- Panel PC 800
- Power Panel 100/200
- Power Panel 300/400
- Power Panel 500

The ADI driver suitable for the device must be installed on the stated product series. The ADI driver is already included in the B&R images of embedded operating systems.

A detailed description of using the ADI functions can be found in the integrated online help.

The B&R Automation Device Interface (ADI) development kit can be downloaded for free from the download area on the B&R homepage (**www.br-automation.com**).

5. B&R Automation Device Interface (ADI) .NET SDK

This software can be used to activate functions of the B&R Automation Device Interface (ADI) from .NET applications, which were created using Microsoft Visual Studio 2005 (or newer).

Supported programming languages:

- Visual Basic
- Visual C++
- Visual C#
- Visual J#

System requirements:

- Developingsystem: PC with Windows XP/7 with
  - Microsoft Visual Studio 2005 or newer
  - Microsoft .NET Framework 2.0 and / or Microsoft .NET Compact Framework 2.0 or newer

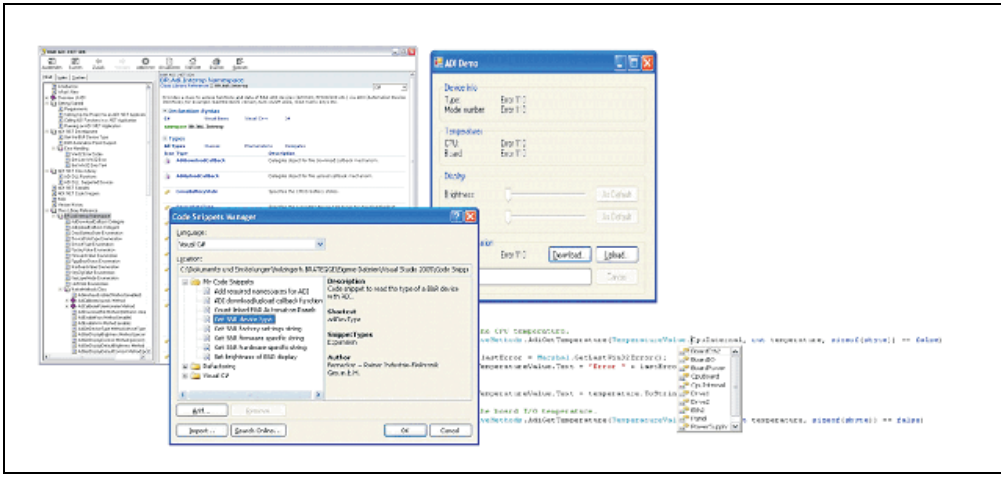


Figure 392: ADI .NET SDK Screenshots (Version 1.50)

Features:

- ADI .NET Class Library.
- Help files in HTML Help 1.0 format (.chm file) and MS Help 2.0 format (.HxS file).
- Sample projects and code snippets for Visual Basic, Visual C++, Visual C# and Visual J#.
- ADI DLL (for testing the applications, if no ADI driver is installed).

Supports following systems (Version 1.50 and higher):

- Automation PC 620
- Automation PC 810
- Automation PC 820
- Mobile Panel 40/50
- Mobile Panel 100/200
- Panel PC 300
- Panel PC 700
- Panel PC 800
- Power Panel 100/200
- Power Panel 300/400
- Power Panel 500

The ADI driver suitable for the device must be installed on the stated product series. The ADI driver is already included in the B&R images of embedded operating systems.

A detailed description of using the ADI functions can be found in the integrated online help.

The ADI .NET SDK can be downloaded for free from the download area on the B&R homepage (**www.br-automation.com**).

6. Touch Screen - Elo Accu Touch

Information:

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

Elo Accu touch screen	Specifications
Manufacturer	Elo
Accuracy For < 18" diagonals For > 18" diagonals	 Typically < than 0.080 inches (2.032 mm) Maximum error in all directions 0.180 inches (4.752 mm) Maximum 1% of the diagonal for the active area of the touch screens
Response time	< 10 ms
Release pressure	< 113 grams
Resolution	4096 x 4096 touch points
Light permeability	Up to 80% ±5%
Temperature Operation Bearings Transport	 -10 to 50°C -40 to 71°C -40 to 71°C
Relative humidity Operation Bearings Transport	 Max. 90% at max. 35°C Max. 90% at max. 35°C for 240 hours, non-condensing Max. 90% at max. 35°C for 240 hours, non-condensing
Waterproofing	IP65
Lifespan	35 million touch operations on the same point
Chemical resistance [1)]	Acetone, ammonia-based glass cleaner, normal food and drinks, hexane, methylene chloride, methyl ethyl ketone, mineral spirits, turpentine, isopropyl alcohol
Activation	Finger, pointer, credit card, glove
Drivers	Touch screen drivers can be downloaded from the download area on the B&R homepage (**www.br-automation.com**). Additionally, they can also be found on the B&R HMI Drivers and Utilities DVD (Mod. No. 5SWHMI.0000-00).

Table 402: Technical data - Elo Accu Touch

1) The active area of the touch screen is resistant to these chemicals for a timeframe of one hour at 21°C.

6.1 Temperature humidity diagram

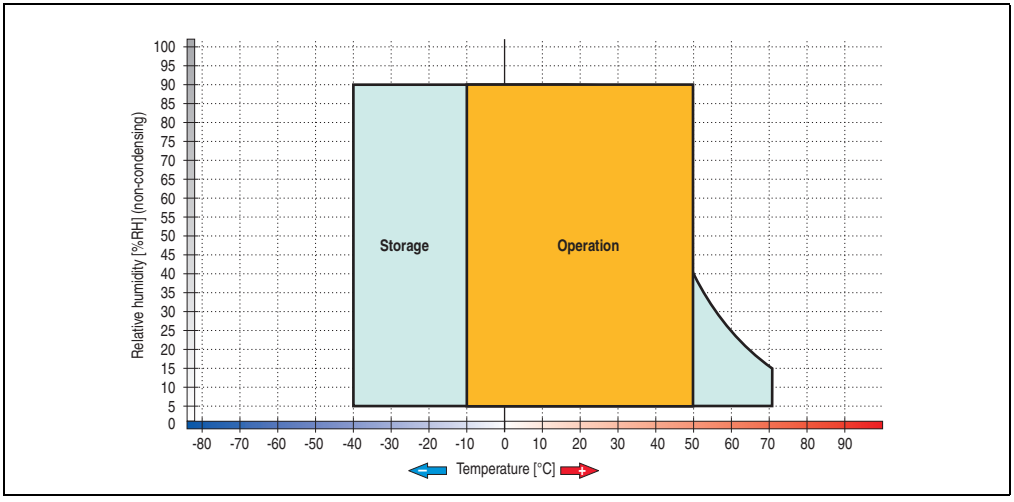


Figure 393: Temperature humidity diagram - Elo Accu touch screen 5-wire

Temperature data is for operation at 500 meters. Derating the max. ambient temperature - typically 1°C per 1000 meters (from 500 meters above sea level).

6.2 Cleaning

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

7. 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:

Information:

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 Dowandol DRM/PM	Formaldehyde 37 - 42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene White spirits	Trichloroethane Ethyl acetate Diethyl ether N-Butyl acetate Amyl acetate Butylcellosolve Ether
Acetone Methyl ethyl ketone Dioxan Cyclohexanone MIBK Isophorone	Formic acid <50% Acetic acid <50% Phosphoric acid <30% Hydrochloric acid <36% Nitric acid <10% Trichloracetic acid <50% Sulphuric acid <10%	Sodium hypochlorite <20% Hydrogen peroxide <25% Potassium carbonate Washing agents Fabric conditioner Ferric chloride Ferrous chloride (FeCl2) Ferrous chloride (FeCl3) Dibutyl phthalate Dioctyl phthalate Sodium carbonate
Ammonia <40% Caustic soda <40% Potassium hydroxide Alkali carbonate Bichromate Potassium Acetonitrile Sodium bisulphate	Cutting oil Diesel oil Linseed oil Paraffin oil Blown castor oil Silicon oil Turpentine oil substitute Universal brake fluid Aviation fuel Gasoline Water Sea water Decon	

Table 403: 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.

8. 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.

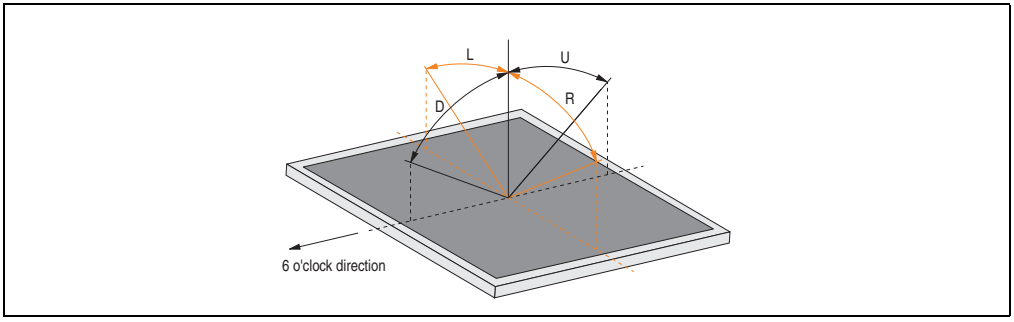


Figure 394: Viewing angle definition

9. Glossary

A

ACPI

Abbreviation for "**A**dvanced **C**onfiguration and **P**ower **I**nterface". Configuration interface that enables the operating system to control the power supply for each device connected to the PC. With ACPI, the computer's BIOS is only responsible for the details of communication with the hardware.

ADI

Abbreviation for »Automation Device Interface« The ADI interface allows access to specific functions (e.g. brightness control, firmware updates, static value read) of B&R devices. The settings can be read or changed in the Control Panel with the B&R Control Center Applet (already included in the B&R embedded operating system).

APC

An abbreviation for "**A**utomation **PC**".

API

Abbreviation for "**A**pplication **P**rogram **I**nterface" The interface, which allows applications to communicate with other applications or with the operating system.

Automation Runtime

A uniform runtime system for all B&R automation components.

B

Baud rate

Measurement unit for data transfer speed. It indicates the number of states for a transferred signal per second and is measured using the baud unit of measurement. 1 baud = 1 bit/sec or 1 bps.

BIOS

An abbreviation for "**B**asic **I**nput/**O**utput **S**ystem". Core software for computer systems with essential routines for controlling input and output processes on hardware components, for performing tests after system start and for loading the operating system. Although BIOS is used to configure a system's performance, the user does not usually come into contact with it.

Bit

Binary digit > binary position, binary character, smallest discrete unit of information. A bit can have the value 0 or 1.

Bit rate

The number of bits that can be transferred within a specified time unit. 1 bit/sec = 1 baud.

Bootstrap loader

A program that automatically runs when the computer is switched on or restarted. After some basic hardware tests have been carried out, the bootstrap loader starts a larger loader and hands over control to it, which in turn boots the operating system. The bootstrap loader is typically found in ROM on the computer.

Byte

Data format [1 byte = 8 bits] and a unit for characterizing information amounts and memory capacity. The following units are the commonly used units of progression: KB, MB, GB.

B&R Automation Runtime

Windows-based program for creating installation disks to install B&R Automation Runtime™ on the target system.

C

Cache

Background memory, also known as non-addressable memory or fast buffer memory. It is used to relieve the fast main memory of a computer. For example, data that should be output to slower components by the working memory (e.g. disk storage, printers) is stored temporarily in cache memory and output from there at an appropriate speed for the target devices.

CAN

An abbreviation for "**C**ontroller **A**rea **N**etwork" (serial bus system). Structure according to ISO 11898; Bus medium: twisted pair. Good transfer properties in short distances less than 40 m with a 1 MBit/sec data transfer rate. Maximum number of stations: Theoretically unlimited, but practically limited up to 64. Real-time capable (i.e. defined maximum latency times for messages with high priority). High reliability using error detection, error handling, troubleshooting. Hamming distance.

CD-ROM

Abbreviation for "**C**ompact **D**isc **R**ead-**O**nly **M**emory". A removable data medium with a capacity of ~700 MB. CD-ROMs are optically scanned.

CE mark

A CE mark for a product. It consists of the letters "CE" and indicates conformity to all EU guidelines for the labeled product. It indicates that the individual or corporate body who has performed or attached the label assures that the product conforms to all EU guidelines for complete harmonization. It also indicates that all mandatory conformity evaluation procedures have taken place.

CMOS

"CMOS" is a battery powered memory area where fundamental parameters of an IBM (or compatible) personal computer are stored. Information such as the type of hard drive, size of the working memory and the current date and time are required when booting the computer. As the name suggests, the memory is based on CMOS technology standards.

COM

A device name used to access serial ports in MS-DOS. The first serial port can be accessed under COM1, the second under COM2, etc. A modem, mouse, or serial printer is typically connected to a serial port.

COM1

Device name for the first serial port in a PC system. The input/output area for COM1 is usually found at address 03F8H. Generally, the COM1 port is assigned to IRQ 4. In many systems, an RS232 serial mouse is connected to COM1.

COM2

Device name for the second serial port in a PC system. The input/output area for COM2 is usually found at address 02F8H. Generally, the COM2 port is assigned to IRQ 3. In many systems, a modem is connected to COM2.

COM3

Device name for a serial port in a PC system. The input/output area for COM3 is usually found at address 03E8H. Generally, the COM3 port is assigned to IRQ 4. In many systems, COM3 is used as an alternative for COM1 or COM2 if peripheral devices are already connected to COM1 and COM2.

CompactFlash®

CompactFlash memory cards [CF cards] are exchangeable nonvolatile mass memory systems with very small dimensions [43 x 36 x 3.3 mm, approximately half the size of a credit card]. In addition to the flash memory chips, the controller is also present on the cards. CF cards provide complete PC card / ATA functionality and compatibility. A 50-pin CF card can be simply inserted in a passive 68-pin type II adapter card. It conforms to all electrical and mechanical PC card interface specifications. CF cards were launched by SanDisk back in 1994. Currently, memory capacities reach up to 64 GB per unit. Since 1995, CompactFlash Association [CFA] has been looking after standardization and the worldwide distribution of CF technology

CPU

An abbreviation for "**C**entral **P**rocessing **U**nit". Interprets and executes commands. It is also known as a "microprocessor" or "processor" for short. A processor is able to receive, decode and execute commands, as well as transfer information to and from other resources via the computer bus.

CTS

An abbreviation for "**C**lear **T**o **S**end". A signal used when transferring serial data from modem to computer, indicating its readiness to send the data. CTS is a hardware signal which is transferred via line number 5 in compliance with the RS-232-C standard.

D

DCD

An abbreviation for "**D**ata **C**arrier **D**etected". A signal used in serial communication that is sent by the modem to the computer it is connected to, indicating that it is ready for transfer.

Dial-up

Data is transferred over the telephone network using a modem or an ISDN adapter.

DIMM

"Double In-line Memory Module" consisting of one or more RAM chips on a small circuit board that is connected with the motherboard of a computer.

DMA

Direct **M**emory **A**ccess > Accelerated direct access to a computer's RAM by bypassing the CPU.

DRAM

An abbreviation for "**D**ynamic **R**andom **A**ccess **M**emory". Dynamic RAM consists of an integrated semiconductor circuit that stores information based on the capacitor principle. Capacitors lose their charge in a relatively short time. Therefore, dynamic RAM circuit boards must contain a logic that allows continual recharging of RAM chips. Since the processor cannot access dynamic RAM while it is being recharged, one or more waiting states can occur when reading or writing data. Although it is slower, dynamic RAM is used more often than static RAM since the simple design of the circuits means that it can store four times more data than static RAM.

DSR

An abbreviation for "**D**ata **S**et **R**eady". A signal used in serial data transfer, which is sent by the modem to the computer it is connected to, indicating its readiness for processing. DSR is a hardware signal which is sent via line number 6 in compliance with the RS-232-C standard.

DTR

An abbreviation for "**D**ata **T**erminal **R**eady". A signal used in serial data transfer that is sent by the computer to the modem it is connected to, indicating the computer's readiness to accept incoming signals.

DVD

An abbreviation for "**D**igital **V**ersatile **D**isc". The next generation of optical data carrier technology is able to store a higher volume of data than conventional CDs. Standard DVDs, which have a single layer, can hold 4.7 GB. Dual-layer DVDs can hold 8.5 GB. Double-sided DVDs can therefore hold up to 17 GB. A special drive is needed for DVDs. Conventional CDs can also be played on DVD drives.

DVI

Abbreviation for "**D**igital **V**isual **I**nterface" An interface for the digital transfer of video data.

DVI-A

Analog only

DVI-D

Digital only

DVI-I

Integrated, i.e. analog and digital

E

EDID data

Abbreviation for "**E**xtended **D**isplay **I**dentification **D**ata". EDID data contains the characteristics of monitors / TFT displays transferred as 128 KB data blocks to the graphics card via the Display Data Channel (DDC). This EDID data can be used to set the graphics card to the monitor properties.

EIDE

An abbreviation for "**E**nhanced **I**ntegrated **D**rive **E**lectronics". An expansion of the IDE standard. Enhanced IDE is considered the standard for hardware interfaces. This interface is designed for drives with an integrated drive controller.

EMC

"**E**lectro**m**agnetic **C**ompatibility" The ability of a device or a system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment [IEV 161-01-07].

EPROM

Erasable **PROM** > (completely with ultraviolet light).

Ethernet

An IEEE 802.3 standard for networks. Ethernet uses bus or star topology and controls the traffic on communication lines using the access procedure CSMA/CD (Carrier Sense Multiple Access with Collision Detection). Network nodes are connected using coaxial cables, fiber optic cables or twisted pair cabling. Data transfer on an Ethernet network takes place in frames of variable lengths that consist of supply and controller information as well as 1500 bytes of data. The Ethernet standard provides base band transfers at 10 megabit and 100 megabit per second.

Ethernet POWERLINK

An enhancement of standard Ethernet. It enables data exchange under strict real-time conditions with cycle times down to 200 µs and jitter under 1 µs. This makes Ethernet power available on all communication levels of automation technology – from control levels to I/O. Ethernet POWERLINK was initiated by the company B&R Industrie-Elektronik and is now managed by the open end user and vendor association, EPSG - Ethernet POWERLINK Standardization Group (**www.ethernet-powerlink.org**).

F

FDD

Abbreviation for "**F**loppy **D**isk **D**rive". Reading device for removable magnetic memory from the early days of PC technology. Due to their sensitivity and moving components, FDDs have been almost completely replaced by CompactFlash memory in modern automation solutions.

Fiber optics

Fiber optic cable

FIFO

An abbreviation for "**F**irst **I**n **F**irst **O**ut". A queuing organization method whereby elements are removed in the same order as they were inserted. The first element inserted is the first one removed. Such an organization method is typical for a list of documents that are waiting to be printed.

Firmware

Programs stored permanently in read-only memory. Firmware is software used to operate computer-controlled devices that generally stays in the device throughout its lifespan or over a long period of time. Such software includes operating systems for CPUs and application

programs for industrial PCs as well as programmable logic controllers (e.g. the software in a washing machine controller). This software is written in read-only memory (ROM, PROM, EPROM) and cannot be easily replaced.

Floppy

Also known as a diskette. A round plastic disk with an iron oxide coating that can store a magnetic field. When the floppy disk is inserted in a disk drive, it rotates so that the different areas (or sectors) of the disk's surface are moved under the read/write head. This allows the magnetic orientation of the particle to be modified and recorded. Orientation in one direction represents binary 1, while the reverse orientation represents binary 0.

FPC

An abbreviation for "**F**lat **P**anel **C**ontroller".

FPD

An abbreviation for "**F**lat **P**anel **D**isplay".

FTP

"**F**ile **T**ransfer **P**rotocol" Rules for transferring data over a network from one computer to another computer. This protocol is based on TCP/IP, which has established itself as the standard for transferring data over Ethernet networks. FTP is one of the most used protocols on the Internet. It is defined in RFC 959 in the official regulations for Internet communication.

G

GB

Gigabyte (1 GB = 230 or 1,073,741,824 Bytes)

H

Handshake

Method of synchronization for data transfer when data is sent at irregular intervals. The sender signals that data can be sent, and the receiver signals when new data can be received.

HDD

An abbreviation for "**H**ard **D**isk **D**rive". Fixed magnetic mass memory with high capacities, e.g. 120 GB.

I

IDE

An abbreviation for "**I**ntegrated **D**rive **E**lectronics". A drive interface where the controller electronics are integrated in the drive.

Interface

From the hardware point of view, an interface is the connection point between two modules/devices/systems. The units on both sides of the interface are connected by the interface lines so that data, addresses, and control signals can be exchanged. The term interface includes all functional, electrical and constructive conditions [encoding, signal level, pin assignments] that characterize the connection point between the modules, devices, or systems. Depending on the type of data transfer, a differentiation is made between parallel [e.g. Centronics, IEEE 488] and serial interfaces [e.g. V.24, TTY, RS232, RS422, RS485], which are set up for different transfer speeds and transfer distances. From the point of view of software, the term "interface" describes the transfer point between program modules using specified rules for transferring the program data.

ISA

An abbreviation for "**I**ndustry **S**tandard **A**rchitecture". A term given for the bus design which allows expansion of the system with plug-in cards that can be inserted in PC expansion slots.

ISO

International Organization for Standardization > Worldwide federation of national standardization institutions from over 130 countries. ISO is not an acronym for the name of the organization; it is derived from the Greek word "isos", meaning "equal" (**www.iso.ch**).

J

Jitter

Jitter is a term that describes time deviations of cyclic events. If, for example, an event should take place every 200ìs and it actually occurs every 198 to 203ìs, then the jitter is 5ìs. Jitter has many causes. It originates in the components and transfer media of networks because of noise, crosstalk, electromagnetic interference and many other random occurrences. In automation technology, jitter is a measure of the quality of synchronization and timing.

Jumper

A small plug or wire link for adapting the hardware configuration used to connect the different points of an electronic circuit.

L

LCD

An abbreviation for "**L**iquid **C**rystal **D**isplay". A display type, based on liquid crystals that have a polarized molecular structure and are enclosed between two transparent electrodes as a thin layer. If an electrical field is applied to the electrodes, the molecules align themselves with the field and form crystalline arrangements that polarize the light passing through. A polarization filter, which is arranged using lamellar electrodes, blocks the polarized light. In this way, a cell

(pixel) containing liquid crystals can be switched on using electrode gates, thus coloring this pixel black. Some LCD displays have an electroluminescent plate behind the LCD screen for lighting. Other types of LCD displays can use color.

LED

An abbreviation for "**L**ight **E**mitting **D**iode". A semiconductor diode which converts electrical energy into light. LEDs work on the principle of electroluminescence. They are highly efficient because they do not produce much heat in spite of the amount of light they emit. For example, "operational status indicators" on floppy disk drives are LEDs.

LPT

Logical device name for line printers. In MS-DOS, names are reserved for up to three parallel printer ports with the names LPT1, LPT2 and LPT3. The first parallel port (LPT1) is usually identical to the primary parallel output device PRN (in MS-DOS the logical device name for the printer). The abbreviation LPT stands for "Line Printer Terminal".

M

MB

Megabyte (1 MB = 220 or 1,048,576 bytes).

Microprocessor

Highly integrated circuit with the functionality of a CPU, normally housed on a single chip. It comprises a control unit, arithmetic and logic unit, several registers and a link system for connecting memory and peripheral components. The main performance features are the internal and external data bus and address bus widths, the command set and the clock frequency. Additionally, a choice can be made between CISC and RISC processors. The first commercially available worldwide microprocessor was the Intel 4004. It came on the market in 1971.

MIPS

Million instructions per second > Measurement for the computing speed of computers.

Motherboard

A circuit board that houses the main components of a computer such as the CPU switching circuit, co-processors, RAM, ROM for firmware, interface circuits, and expansion slots for hardware expansions.

MTBF

An abbreviation for "**M**ean **t**ime **b**etween **f**ailure". The average time which passes before a hardware component fails and repair is needed. This time is usually expressed in thousands or ten thousands of hours, sometimes known as power-on hours (POH).

MTC

An abbreviation for "**M**ain**t**enance **C**ontroller". The MTC is an independent processor system that provides additional functions for a B&R industrial PC that are not available with a normal PC. The MTC communicates with the B&R industrial PC via the ISA bus (using a couple register).

MTCX

An abbreviation for »**M**ain**t**enance **C**ontroller E**X**tended«. The MTCX is an independent processor system that provides additional functions for a B&R industrial PC that are not available with a normal PC. The MTC communicates with the B&R industrial PC via the ISA bus (using a couple register).

Multitasking

Multitasking is an operating mode in an operating system that allows several computer tasks to be executed virtually simultaneously.

O

OEM

Abbreviation for "**O**riginal **E**quipment **M**anufacturer"; A company that integrates third-party and in-house manufactured components into their own product range and then distributes these products under its own name.

OPC

OLE for Process Control > A communication standard for components in the area of automation. The goal of OPC development is to provide an open interface that builds on Windows-based technologies such as OLE, COM and DCOM. It allows problem-free standardized data transfer between controllers, operating and monitoring systems, field devices and office applications from different manufacturers. This development is promoted by the OPC Foundation, which is made up of over 200 companies from around the world, including Microsoft and other leading companies. Nowadays, OPC is also interpreted as a synonym for Openness, Productivity and Connectivity, symbolizing the new possibilities that this standard opens up.

OPC server

The missing link between connection modules for the Interbus and the visualization application. It communicates serially with the connection modules via the ISA or PCI bus or Ethernet.

P

Panel

A common term for B&R display units (with or without keys).

PCI Bus

Abbreviation for "**P**eripheral **C**omponent **I**nterconnect bus". Developed by Intel as an intermediary/local bus for the latest PC generations. It is basically a synchronous bus. The main clock of the CPU is used for synchronization. The PCI bus is microprocessor-independent, 32-bit and 64-bit compatible, and supports both 3.3 V and 5 V cards and devices.

PCMCIA

An abbreviation for "**P**ersonal **C**omputer **M**emory **C**ard **I**nternational **A**ssociation". An association of manufacturers and dealers who are dedicated to the cultivation and further development of common standards for peripheral devices based on PC cards with a slot for such cards. PC cards are mainly used for laptops, palmtops (and other portable computers), and intelligent electronic devices. Version 1 of the PCMCIA standard was introduced in 1990.

PLC

Programmable Logic Controller; Computer-based control device that functions using an application program. The application program is relatively easy to create using standardized programming languages [IL, FBD, LAD, AS, ST]. Because of its serial functionality, reaction times are slower compared to connection-oriented control. Today, PLCs are available in device families with matched modular components for all levels of an automation hierarchy.

PnP

An abbreviation for "**P**lug and **P**lay". Specifications developed by Intel. Using Plug and Play allows a PC to automatically configure itself so that it can communicate with peripheral devices (e.g. monitors, modems, and printers). Users can connect a peripheral device (plug) and it immediately runs (play) without having to manually configure the system. A Plug and Play PC requires a BIOS that supports Plug and Play and a respective expansion card.

POH

An abbreviation for "**P**ower **O**n **H**ours". See MTBF.

POST

An abbreviation for "**P**ower-**O**n **S**elf **T**est". A set of routines that are stored in ROM on the computer and that test different system components, e.g. RAM, disk drive and the keyboard in order to determine that the connection is operating correctly and ready for operation. POST routines notify the user of problems that occur. This is done using several signal tones or by displaying a message that frequently accompanies a diagnosis value on the standard output or standard error devices (generally the monitor). If the POST runs successfully, control is transferred over to the system's bootstrap loader.

POWERLINK

See "Ethernet POWERLINK".

PROFIBUS-DP

PROFIBUS for "decentralized peripherals". PROFIBUS DB can be used to allow simple digital and analog I/O modules as well as intelligent signal and data processing units to be installed in the machine room, which among other things can significantly reduce cabling costs. Often used for time-critical factory automation applications.

Q

QVGA

Abbreviation for "**Q**uarter **V**ideo **G**raphics **A**rray". Usually a screen resolution of 320 × 240 pixels.

QUXGA

Abbreviation for "**Q**uad **U**ltra E**x**tended **G**raphics **A**rray". Generally a screen resolution of 3200 × 2400 pixels (4:3). Quad implies the 4x greater pixel resolution compared to the UXGA.

QWUXGA

Abbreviation for "**Q**uad **WUXGA**"; Generally a screen resolution of 3840 × 2400 pixels (8:5, 16:10).

R

RAM

An abbreviation for "**R**andom **A**ccess **M**emory". Semiconductor memory which can be read or written to by the microprocessor or other hardware components. Memory locations can be accessed in any order. The various ROM memory types do allow random access, but they cannot be written to. The term RAM refers to a more temporary memory that can be written to as well as read.

Real time

A system is operating in real time or has real-time capability if the input sizes (e.g. signals, data) are received and processed in a defined time period, and the results are made available in real time for a partner system or the system environment. See also "real-time demands" and "real-time system".

ROM

An abbreviation for "**R**ead-**O**nly **M**emory". Semiconductor memory where programs or data were permanently stored during the production process.

RS232

Recommended **S**tandard **N**umber **232**. Oldest and most widespread interface standard, also called a V.24 interface. All signals are referenced to ground making this an unbalanced interface. High level: -3 to -30 V, low level: +3 to +30 V; cable lengths up to 15 m, transfer rates up to 20 kbit/s; for point-to-point connections between 2 stations.

RS422

Recommended **S**tandard **N**umber **422**. Interface standard, balanced operation, increased immunity to disturbances. High level: 2 to -6 V, low level: +2 to +6 V; four-line connection [inverted/non-inverted], permissible cable length up to 1200 m, transfer rates up to 10 MBit/s, 1 sender can transfer simplex with up to 10 receivers.

RS485

Recommended **S**tandard **N**umber **485**. Interface standard upgraded from RS422. High level: 1.5 to -6 V, low level: +1.5 to +6 V; two-line connection [half-duplex mode] or four-line connection [full-duplex mode]; permissible cable length up to 1200 m, transfer rates up to 10 Mbit/s. Up to 32 stations (sender/receiver) can be connected to an RS485 bus.

RTS

An abbreviation for "**R**equest **T**o **S**end". A signal used in serial data transfer for requesting send permission. For example, it is sent from a computer to the modem connected to it. The RTS signal is assigned to pin 4 according to the hardware specifications of the RS-232-C standard.

RXD

An abbreviation for "Receive (**RX**) **D**ata". A line for transferring serial data received from one device to another, e.g. from a modem to a computer. For connections complying with the RS-232-C standard, the RXD is connected to pin 3 of the plug.

S

SDRAM

An abbreviation for "**S**ynchronous **D**ynamic **R**andom **A**ccess **M**emory". A construction of dynamic semiconductor components (DRAM) that can operate with higher clock rates than conventional DRAM switching circuits. This is made possible using block access. For each access, the DRAM determines the next memory addresses to be accessed.

SFC

Sequential function chart > Graphic input language for PLCs used to represent sequential control.

Slot PLC

PC insert card that has full PLC functionality. On the PC, it is coupled via a DPR with the process using a fieldbus connection. It is programmed externally or using the host PC.

SoftPLC

Synonym for SoftPLC.

SUXGA

Abbreviation for **S**uper **U**ltra **E**xtended **G**raphics **A**rray; Generally a screen resolution of 2048 × 1536 pixels (4:3). An alternative name is QXGA (**Q**uad **E**xtended **G**raphics **A**rray), which is 4x the pixel resolution of XGA.

SVGA

Abbreviation for "**S**uper **V**ideo **G**raphics **A**rray"; Graphics standard with a resolution of at least 800×600 pixels and at least 256 colors.

Switch

Device, similar to a hub, that takes data packets received in a network and, unlike a hub, does not pass them on to all network nodes, instead only to the respective addressee. Unlike a hub, a switch provides targeted communication within a network that only takes place between sender and receiver. Other network nodes are not involved.

SXGA

Abbreviation for Super Extended Graphics Array. Graphics standard with a screen resolution of 1280 × 1024 pixels (aspect ratio 5:4).

SXGA+

Abbreviation for SXGA Plus; Generally 1400 × 1050 pixels.

System units

Provit system units consist of a mainboard (without processor), slots for RAM modules, VGA controller, serial and parallel interfaces, and connections for the FPD, monitor, PS/2 AT keyboard, PS/2 mouse, USB, Ethernet (for system units with Intel Celeron and Pentium III processors), Panelware keypad modules and external FDD.

T

Task

Program unit that is assigned a specific priority by the real-time operating system. It contains a complete process and can consist of several modules.

TCP/IP

Transmission Control Protocol/Internet Suit of Protocols. Network protocol that has become the generally accepted standard for data exchange in heterogeneous networks. TCP/IP is used both in local networks for communication between various computer and also for LAN to WAN access.

TFT display

LCD (Liquid Crystal Display) technology where the display consists of a large grid of LCD cells. Each pixel is represented by a cell, whereby electrical fields produced in the cells are supported by thin film transistors (TFT) that result in an active matrix. In its simplest form, there is exactly one thin film transistor per cell. Displays with an active matrix are generally used in laptops and notebooks because they are thin, offer high-quality color displays and can be viewed from all angles.

Touch screen

Screen with touch sensors for selecting options in a displayed menu using the tip of the finger.

TXD

An abbreviation for "Transmit (**TX**) **D**ata". A line for the transfer of serial data sent from one device to another, e.g. from a computer to a modem. For connections complying with the RS-232-C standard, the TXD is connected to pin 2 of the plug.

U

UART

An abbreviation for "**U**niversal **A**synchronous **R**eceiver-**T**ransmitter". A module generally consisting of a single integrated circuit that combines the circuits required for asynchronous serial communication for both sending and receiving. UART represents the most common type of circuit in modems for connecting to a personal computer.

UDMA

An abbreviation for "**U**ltra **D**irect **M**emory **A**ccess". A special IDE data transfer mode that allows high data transfer rates for drives. There have been many variations in recent times.
UDMA33 mode transfers 33 megabytes per second.
UDMA66 mode transfers 66 megabytes per second.
UDMA100 mode transfers 100 megabytes per second.
Both the mainboard and the hard drive must support the specification to implement modifications.

UPS

Abbreviation for "**U**ninterruptible **P**ower **S**upply". See "UPS".

USB

An abbreviation for »**U**niversal **S**erial **B**us« A serial bus with a bandwidth of up to 12 megabits per second (Mbit/s) for connecting a peripheral device to a microcomputer. Up to 127 devices can be connected to the system using a single multipurpose connection, the USB bus (e.g. external CD drives, printers, modems as well as the mouse and keyboard). This is done by connecting the devices in a row. USB allows devices to be changed when the power supply is switched on (hot plugging) and multi-layered data flow.

UPS

An abbreviation for "**U**ninterruptible **P**ower **S**upply". The UPS supplies power to systems that cannot be connected directly to the power mains for safety reasons because a power failure could lead to loss of data. The UPS allows the PC to be shut down securely without losing data if a power failure occurs.

UXGA

Abbreviation for "**U**ltra **E**xtended **G**raphics **A**rray" Generally a screen resolution of 1600 × 1200 pixels (aspect ratio 4:3, 12:9).

V

VGA

An abbreviation for "**V**ideo **G**raphics **A**dapter". A video adapter which can handle all EGA (Enhanced Graphics Adapter) video modes and adds several new modes.

W

Windows CE

Compact 32-bit operating system with multitasking and multithreading that Microsoft developed especially for the OEM market. It can be ported for various processor types and has a high degree of real-time capability. The development environment uses proven, well-established development tools. It is an open and scalable Windows operating system platform for many different devices. Examples of such devices are handheld PCs, digital wireless receivers, intelligent mobile phones, multimedia consoles, etc. In embedded systems, Windows CE is also an excellent choice for automation technology.

WSXGA

Wide SXGA, generally 1600 × 900 pixels (16:9).

WUXGA

Wide UXGA, generally 1920 × 1200 pixels (16:10).

WXGA

Wide XGA, generally 1280 × 768 pixels.

X

XGA

An abbreviation for "E**X**tended **G**raphics **A**rray". An expanded standard for graphics controllers and monitors that was introduced by IBM in 1990. This standard supports 640x480 resolution with 65,536 colors or 1024x768 resolution with 256 colors. This standard is generally used in workstation systems.

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