Panel PC 700

User's Manual

Version: **1.80 (January 2009)**
Model number: **MAPPC700-ENG**

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Chapter 1 • General information

Information:

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1. Manual history

Version	Date	Change
1.0 Preliminary	07.05.2005	- First version
1.1 Preliminary	31.05.2005	- Technical data updated - New dimension diagrams (fan) - Cutout diagrams updated - Mounting chapter updated - Photos updated
1.2 Preliminary	31.01.2006	- 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.

Table 1: Manual history

Version	Date	Change
1.30	09.10.2006	- 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 579). - SDL cable with extender 5CASDL.0300-10 and 5CASDL.0400-10 added (see section "SDL cable with extender 5CASDL.0x00-10" on page 582). - 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	13.12.2006	- Error in the SDL cable model number overview corrected. - Texts for all SDL cables changed. - Error in the image in table 380 "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 98). - Font symbol assigned to the character format symbol. - 2 GB USB flash drive 5MMUSB.2048-00 added (see section "USB flash drive" on page 566). - Document now includes the chm tag "Filename". - SDL cable flex 5CASDL.0xxx-03 added (see section "SDL flex cable 5CASDL.0xxx-03" on page 585). - SDL cable flex with extender 5CASDL.0xxx-13 added (see section "SDL flex cable with extender 5CASDL.0x00-13" on page 590). - Fan kit installation and exchange added (see chapter 7 "Maintenance / Servicing", section "Fan kit installation and replacement" on page 610.) - Add-on hard disk 40 GB - 5AC600.HDDI-05 added (see section "Add-on hard disk 40 GB - 5AC600.HDDI-05" on page 191). - Slide-in hard disk 40 GB - 5AC600.HDDS-02 added (see section "Slide-in hard disk 40 GB - 5AC600.HDDS-02" on page 220). - PCI SATA RAID controller 5ACPCI.RAIC-01 added (see section "PCI SATA RAID 2 x 60 GB, 24x7 - 5ACPCI.RAIC-01" on page 231). - 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.

Table 1: Manual history

Version	Date	Change
1.50	23.02.2007	- Description of SDL cable flex with extender updated (see section "SDL flex cable with extender 5CASDL.0x00-13" on page 590). - All cable specification diagrams updated. - Section "SDL flex cable - test description" on page 512 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 482 added
1.60	11.06.2007	- Section "Panel PC 700 with Automation Runtime" on page 488 added - Information in section "Interface covers 5AC600.ICOV-00" on page 527 expanded. - Figure 10 "Ambient temperatures - 5PC720.1505-01 with 855GME (ETX / XTX) CPU boards" on page 54 and figure 11 "Ambient temperatures - 5PC720.1505-02 with 855GME (ETX / XTX) CPU boards" on page 56 corrected. - Section "Ethernet cable lengths for ETH1" on page 263 added - Section "USB flash drive" on page 566 updated. - Section "Exchanging the legend strips" on page 620 added - Section "Grounding concept" on page 264 added - Section "Connection examples" on page 266 in Chapter 3 "Commissioning" updated.
1.70	01.02.2008	- 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 482 and "Panel PC 700 with Windows CE" on page 485 updated. - Temperature/humidity diagram information expanded. - Replacement fan filters 5AC700.FA00-00, 5AC700.FA02-00 expanded (see page 601). - Section "Changing the battery" on page 607 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 235 added - CPU boards 855GME (XTX) expanded (see Section "CPU boards 855GME (XTX)" on page 29). - 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 236). - Viewing angle information revised - B&R power supplies as accessories added (see section "Power supplies" on page 523). - 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.

Table 1: Manual history

Version	Date	Change
1.80	04.11.2008	- Information for determining the battery status added (possible starting with the new system unit revisions). - Section "Power management" on page 64 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 239) and replacement hard disk 5ACPCI.RAIC-04 (see page 242) added. - Add-on hard disk 80 GB 24x7 ET - 5AC600.HDDI-06 (see page 194) 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 602). - Add-on hard disk 40 GB 24x7 5AC600.HDDI-02 added on page 182. - Add-on hard disk 60 GB 24x7 5AC600.HDDI-03 added on page 185. - Add-on hard disk 80 GB 24x7 5AC600.HDDI-04 added on page 188. - 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 525. - Correction of monitor diagonal dimensions for 5PC720.1706-00 and 5PC720.1906-00. - Windows XP Professional added in chapter 4 "Software" on page 480. - 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 101.

Table 1: Manual history

2. Safety guidelines

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 contacts of connectors 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 who are familiar with the transport, mounting, installation, commissioning, and operation of the product and who have the appropriate qualifications (e.g. IEC 60364). National accident prevention guidelines must be followed.
The safety guidelines, connection descriptions (rating plate and documentation) and limit values listed in the technical data must be read carefully and must be observed before installation and commissioning.

2.4 Transport and storage

During transport and storage, devices must be protected from excessive stress (mechanical load, temperature, humidity, aggressive atmosphere, 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, and 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 voltage-carrying parts 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.

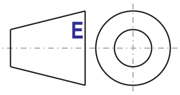
3. Organization of safety notices

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 2: Organization of safety notices

4. Guidelines



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

5. Model numbers

5.1 System units

Model number	Short description	Comment
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 clamps: 0TB103.91).	See page 100
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 clamps: 0TB103.91).	See page 106
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 clamps: 0TB103.91).	See page 112
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 clamps: 0TB103.91).	See page 118
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 clamps: 0TB103.91).	See page 124
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 clamps: 0TB103.91).	See page 129
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 clamps: 0TB103.91).	See page 135
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 clamps: 0TB103.91).	See page 140
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 clamps: 0TB103.91).	See page 145

Table 3: Model numbers - System units

Model number	Short description	Comment
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 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 clamps: 0TB103.91).	See page 150
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 clamps: 0TB103.91).	See page 156
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 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 clamps: 0TB103.91).	See page 162

Table 3: Model numbers - System units (cont.)

5.2 CPU boards 815E (ETX)

Model number	Short description	Comment
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.	Cancelled 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 4: Model numbers - 815E (ETX) CPU boards

5.3 CPU boards 855GME (ETX)

Model number	Short description	Comment
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.	
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.	
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.	
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.	
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.	

Table 5: Model numbers - 855GME (ETX) CPU boards

Model number	Short description	Comment
5PC600.E855-05	**CPU board 855GME CM-1000** Intel Pentium M CPU board, 1000 MHz, 400 MHz FSB, 512 KB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	

Table 5: Model numbers - 855GME (ETX) CPU boards (cont.)

5.4 CPU boards 855GME (XTX)

Model number	Short description	Comment
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.	
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.	
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.	
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.	
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.	
5PC600.X855-05	**CPU board 855GME CM-1000** Intel Pentium M CPU board, 1000 MHz, 400 MHz FSB, 512 KB L2 cache; chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	

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

5.5 Heat sink

Model number	Short description	Comment
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.	Cancelled 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.	
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.	

Table 7: Model numbers - Heat sinks

5.6 Main memory

Model number	Short description	Comment
5MMSDR.0128-01	**SO-DIMM SDRAM 128 MB PC133** SO-DIMM SDRAM 128 MB PC133 for 815E CPU boards (ETX).	Cancelled 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).	
5MMDDR.0512-00	**SO-DIMM DDR-SDRAM 512 MB PC2700** SO-DIMM DDR-SDRAM 512 MB PC2700 for 855GME CPU boards (ETX / XTX).	
5MMDDR.1024-00	**SO-DIMM DDR-SDRAM 1024 MB PC2700** SO-DIMM DDR-SDRAM 1024 MB PC2700 for 855GME CPU boards (ETX / XTX).	

Table 8: Model numbers - main memory

5.7 Drives

Model number	Short description	Comment
5AC600.CFSI-00	**Add-on CompactFlash slot** CompactFlash slot (add-on); for installation in an APC620 or PPC700.	
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.	Cancelled 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.	Cancelled 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.	Cancelled 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.	Cancelled 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.	
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.	
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.	
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.	
5AC600.CFSS-00	**Slide-in CF 2-slot** Slide-in CompactFlash adapter for 2 CompactFlash cards (via IDE and USB 2.0)	

Table 9: Model numbers - Drives

Model number	Short description	Comment
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.	
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.	
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.	
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.	Cancelled 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.	Cancelled 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.	
5ACPCI.RAIC-00	**PCI RAID controller ATA/100** PCI Raid controller	Cancelled 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.	Cancelled 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.	
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.	Cancelled 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	
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.	
5ACPCI.RAIC-04	**Replacement SATA-HDD 160 GB** 1 piece Hard disk 160 GB SATA, replacement part for 5ACPCI.RAIC-03	

Table 9: Model numbers - Drives (cont.)

5.8 Interface options

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

Table 10: Model numbers - Interfaces

5.9 Fan kits

Model number	Short description	Comment
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).	40 x 40 x 20
5PC700.FA02-00	**Panel PC 700 fan kit** For Panel PC 700 10.4" with 2 PCI slots (5PC720.1043-01).	60 x 60 x 10
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).	60 x 60 x 20

Table 11: Model numbers - Fan kits

5.10 Accessories

5.10.1 Batteries

Model number	Short description	Comment
0AC201.9	**Lithium batteries (5x)** Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	**Lithium battery (1x)** Lithium battery, 1 pc., 3 V / 950 mAh, button cell	

Table 12: Model numbers - Batteries

5.10.2 Supply voltage connectors

Model number	Short description	Comment
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.	
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.	

Table 13: Model numbers - Supply voltage connectors

5.10.3 CompactFlash cards

Model number	Short description	Comment
5CFCRD.0032-02	**CompactFlash 32 MB SanDisk/A** CompactFlash card with 32 MB NAND flash and IDE/ATA interface.	Cancelled since 12/2005 Replaced by 5CFCRD.0064-03
5CFCRD.0064-02	**CompactFlash 64 MB SanDisk/A** CompactFlash card with 64 MB NAND flash and IDE/ATA interface.	Cancelled 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	Cancelled since 12/2005 Replaced by 5CFCRD.0128-03

Table 14: Model numbers - CompactFlash cards

Model number	Short description	Comment
5CFCRD.0256-02	**CompactFlash 256 MB SanDisk/A** CompactFlash card with 256 MB NAND flash and IDE/ATA interface	Cancelled 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	Cancelled 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	Cancelled 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	Cancelled since 12/2005 Replaced by 5CFCRD.2048-03
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	

Table 14: Model numbers - CompactFlash cards (cont.)

5.10.4 USB flash drives

Model number	Short description	Comment
5MMUSB.0128-00	**USB flash drive 128 MB SanDisk** USB 2.0 flash drive 128 MB	Cancelled since 12/2005 Replaced by 5MMUSB.2048-00
5MMUSB.0256-00	**USB flash drive 256 MB SanDisk** USB 2.0 flash drive 256 MB	Cancelled since 03/2007 Replaced by 5MMUSB.2048-00
5MMUSB.0512-00	**USB flash drive 512 MB SanDisk** USB 2.0 flash drive 512 MB	Cancelled since 07/2007 Replaced by 5MMUSB.2048-00
5MMUSB.1024-00	**USB flash drive 1 GB SanDisk** USB 2.0 flash drive 1 GB	Cancelled since 03/2007 Replaced by 5MMUSB.2048-00
5MMUSB.2048-00	**USB flash drive 2 GB SanDisk** USB 2.0 flash drive 2 GB	

Table 15: Model numbers - USB flash drives

5.10.5 Cables

Model number	Short description	Comment
5CADVI.0018-00	**DVI-D cable 1.8 m / single** Single cable, DVI-D/m:DVI-D/m; length: 1.8m	
5CADVI.0050-00	**DVI-D cable 5 m / single** Single cable, DVI-D/m:DVI-D/m; length: 5 m	
5CADVI.0100-00	**DVI-D cable 10 m / single** 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	**5 m flex SDL cable** SDL cable for fixed and flexible 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.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	**10 m flex SDL cable** 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	**15 m flex SDL cable** 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	**20 m flex SDL cable** 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	**25 m flex SDL cable** 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	**30 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 30 m	
5CASDL.0300-10	**30 m SDL cable with extender** SDL cable with extender for a fixed type of layout; length 30 m	Cancelled since 12/2006 Replaced by 5CASDL.0300-13

Table 16: Model numbers - Cables

Model number	Short description	Comment
5CASDL.0300-13	**30 m SDL flex cable with extender** SDL cable with extender for fixed and flexible type of layout; length: 30 m	
5CASDL.0400-10	**40 m SDL cable with extender** SDL cable with extender for a fixed type of layout; length 40 m	Cancelled since 12/2006 Replaced by 5CASDL.0400-13
5CASDL.0400-13	**40 m SDL flex cable with extender** SDL cable with extender for fixed and flexible type of layout; length: 40 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	
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 16: Model numbers - Cables (cont.)

5.10.6 Power supplies

Model number	Short description	Comment
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 17: Model numbers - power supplies

Model number	Short description	Comment
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	

Table 17: Model numbers - power supplies (cont.)

5.10.7 External UPS

Model number	Short description	Comment
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)	

5.10.8 Ethernet PCI interface cards

Model number	Short description	Comment
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 18: Model numbers for Ethernet PCI interface cards

5.10.9 Miscellaneous

Model number	Short description	Comment
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	
5AC900.1000-00	**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" portrait format** For Panel PC 5PC781.1043-00. For 1 device.	
5AC900.104X-01	**Legend strip template 10.4" landscape format** 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.	

Table 19: Model numbers - Other items

Model number	Short description	Comment
5AC900.1200-00	**USB interface cover (attached)** Front side USB interface cover (attached) for Automation Panel 900 and Panel PC 700 devices.	
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).	Cancelled since 10/2006 Replacement type 5MD900.USB2-01
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).	
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).	
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).	

Table 19: Model numbers - Other items (cont.)

5.11 Software

Model number	Short description	Comment
5SWHMI.0000-00	**HMI Drivers & Utilities DVD** Contains drivers, utilities, software upgrades and user's manuals for B&R panel system products (see B&R homepage – Industrial PCs, Visualization and Operation).	
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.	
9S0000.08-020	**OEM Microsoft Windows XP Professional** CD, English; Only delivered with a new industrial PC.	
9S0000.09-090	**OEM Microsoft Windows XP Professional Multilanguage** CDs; Only delivered with a new industrial PC.	
5SWWXP.0600-GER	**OEM Microsoft Windows XP Professional SP3** CD, German; Only delivered with a new industrial PC.	
5SWWXP.0600-ENG	**OEM Microsoft Windows XP Professional SP3** CD, English; Only delivered with a new industrial PC.	
5SWWXP.0600-MUL	**OEM Microsoft Windows XP Professional SP3 Multilingual** CDs; Only delivered with a new industrial PC.	
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.	Cancelled since 10/2005

Table 20: Model numbers - Software

Model number	Short description	Comment
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.	Cancelled 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.	Cancelled 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.	Cancelled since 10/2007 Replacement type 5SWWXP.0415-ENG
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.	Cancelled 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.	Cancelled 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.	Cancelled 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.	Cancelled since 07/2007
5SWWCE.0515-ENG	**WinCE5.0 Pro PPC700 E855GME** Order Microsoft 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; CompactFlash separately (at least 128 MB).	
5SWWCE.0516-ENG	**WinCE5.0 Pro PPC700 X855GME** Order Microsoft 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** Order Microsoft 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; CompactFlash separately (at least 128 MB).	
5SWWCE.0616-ENG	**WinCE5.0 ProPlus PPC700 X855GME** Order Microsoft 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).	
5SWWXP.0415-ENG	**WinXPe FP2007 PPC700 E855GME** Order Microsoft Windows XP embedded English, Feature Pack 2007, for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; CompactFlash separately (at least 512 MB). Only delivered with a new PC.	
5SWWXP.0416-ENG	**WinXPe FP2007 PPC700 X855GME** Order Microsoft Windows XP embedded English, Feature Pack 2007, 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 512 MB). Only delivered with a new PC.	

Table 20: Model numbers - Software (cont.)

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. Fieldbus systems (CAN bus, ETHERNET Powerlink™) are used to handle the communication to I/O systems with axis control.

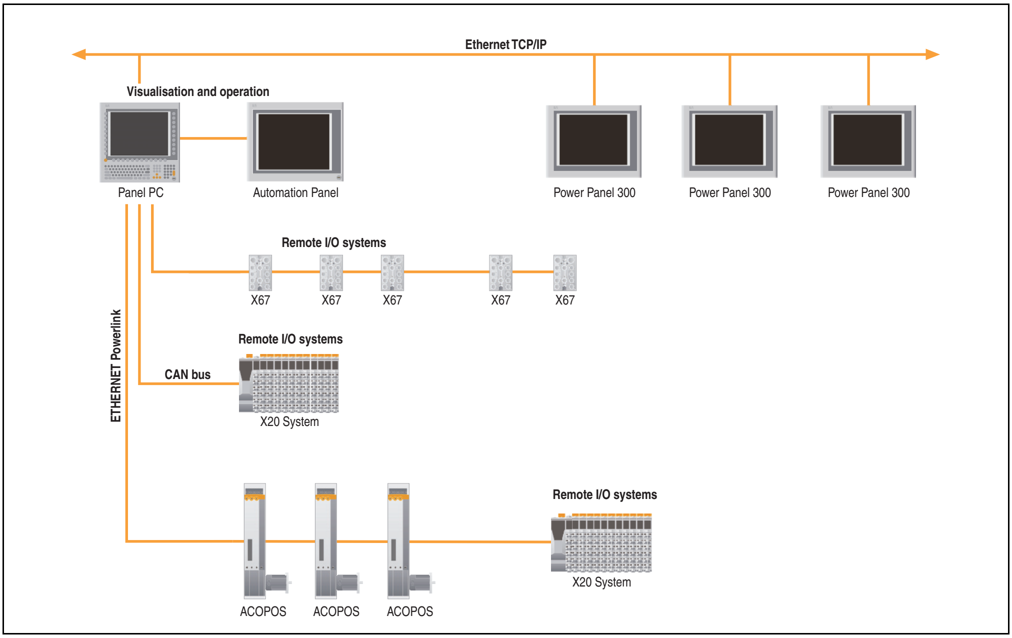


Figure 1: Typical topologies

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 interface option
- RS232/422/485 interface option
- Fan-free operation1)
- 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)

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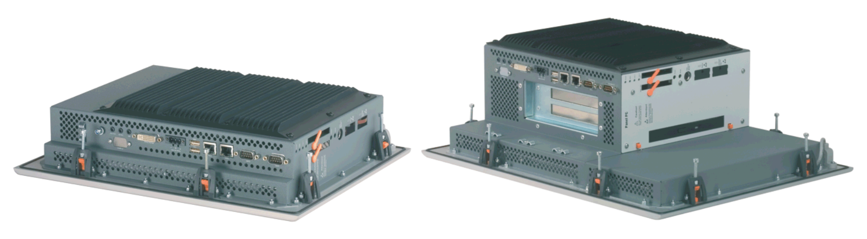
1) Dependent on the device configuration and the ambient temperature.

1.2 System components / Configuration

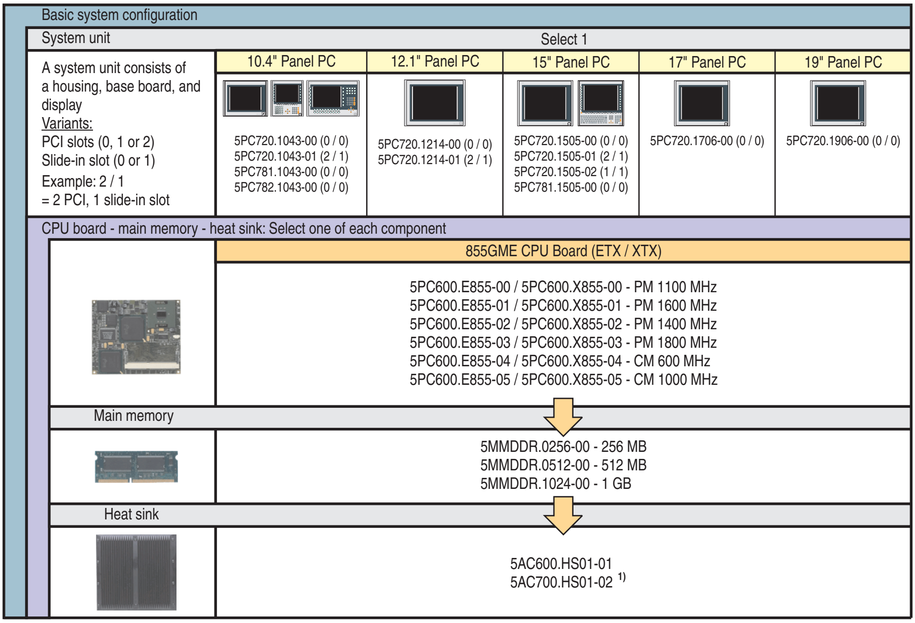


The PPC700 system can be assembled to meet individual requirements and operating conditions.

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



Basic system configuration

System unit — Select 1

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

10.4" Panel PC	12.1" Panel PC	15" Panel PC	17" Panel PC	19" Panel PC
5PC720.1043-00 (0 / 0) 5PC720.1043-01 (2 / 1) 5PC781.1043-00 (0 / 0) 5PC782.1043-00 (0 / 0)	5PC720.1214-00 (0 / 0) 5PC720.1214-01 (2 / 1)	5PC720.1505-00 (0 / 0) 5PC720.1505-01 (2 / 1) 5PC720.1505-02 (1 / 1) 5PC781.1505-00 (0 / 0)	5PC720.1706-00 (0 / 0)	5PC720.1906-00 (0 / 0)

CPU board - main memory - heat sink: Select one of each component

855GME CPU Board (ETX / XTX)

5PC600.E855-00 / 5PC600.X855-00 - PM 1100 MHz
5PC600.E855-01 / 5PC600.X855-01 - PM 1600 MHz
5PC600.E855-02 / 5PC600.X855-02 - PM 1400 MHz
5PC600.E855-03 / 5PC600.X855-03 - PM 1800 MHz
5PC600.E855-04 / 5PC600.X855-04 - CM 600 MHz
5PC600.E855-05 / 5PC600.X855-05 - CM 1000 MHz

Main memory

5MMDDR.0256-00 - 256 MB
5MMDDR.0512-00 - 512 MB
5MMDDR.1024-00 - 1 GB

Heat sink

5AC600.HS01-01
5AC700.HS01-02 1)

1) Mandatory use in connection with the 855GME CPU boards 5PC600.E855-01 / 5PC600.X855-01 and 5PC600.E855-03 /5PC600.X855-03.

Figure 2: Configuration - Basic system

Explanation:

1) Select a system unit.

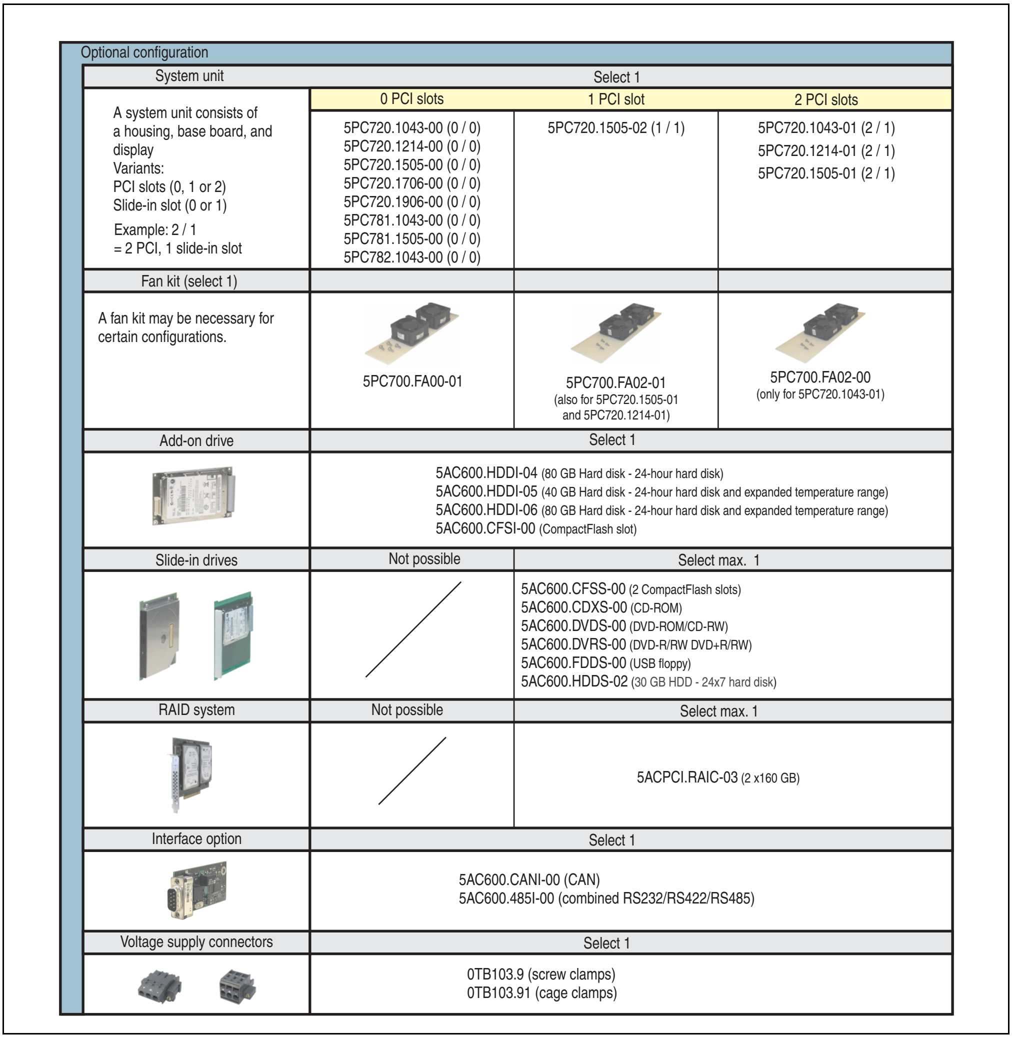
2) Choose one 855GME CPU board (ETX or XTX).

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 45).

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.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.HDDI-06 (80 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 (2 x160 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 46).
- 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 additional interface can be added using an interface option.
- 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.

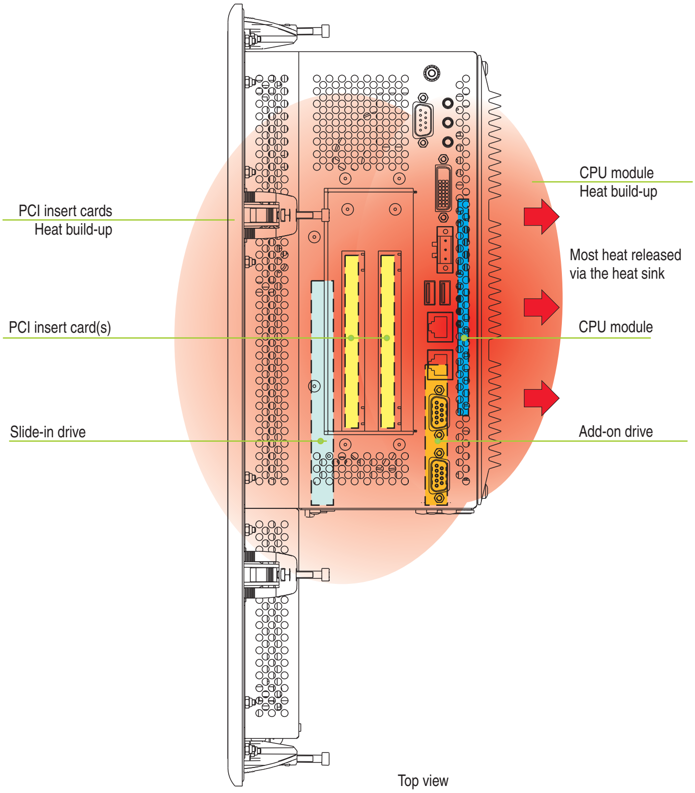
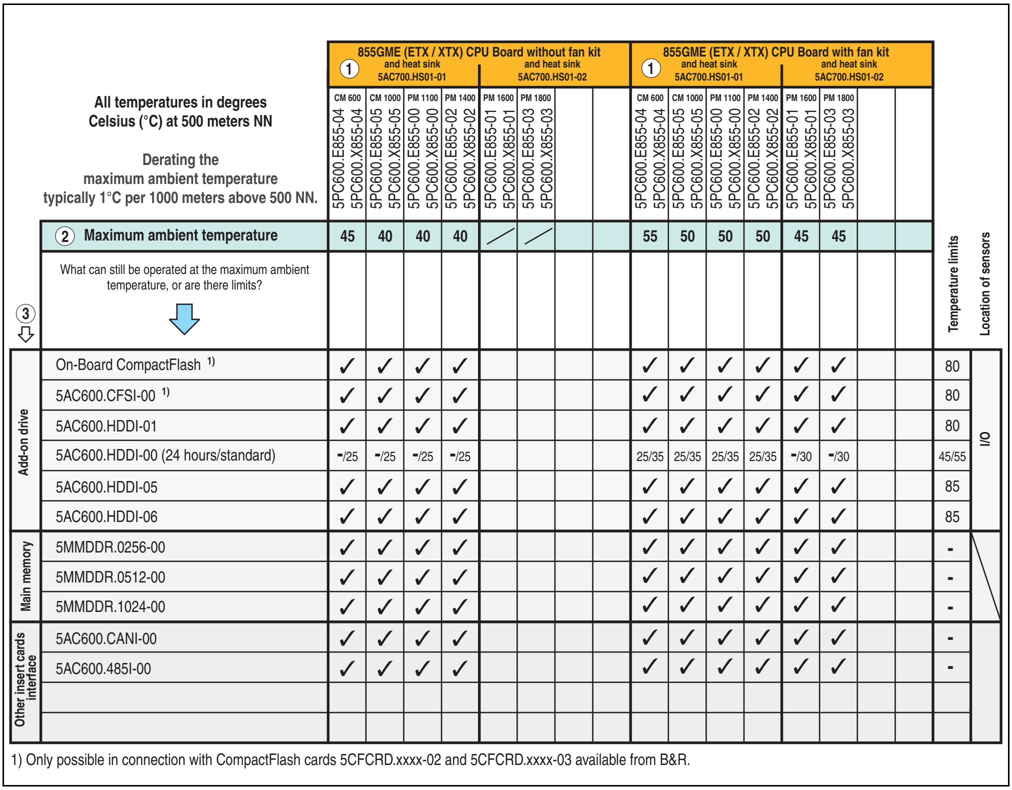


Figure 4: Example of worst-case conditions for temperature measurement

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.

		① 855GME (ETX / XTX) CPU Board without fan kit								① 855GME (ETX / XTX) CPU Board with fan kit								Temperature limits	Location of sensors
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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
	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	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Other insert cards interface	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

[1] Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 and 5CFCRD.xxxx-03 available from B&R.

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

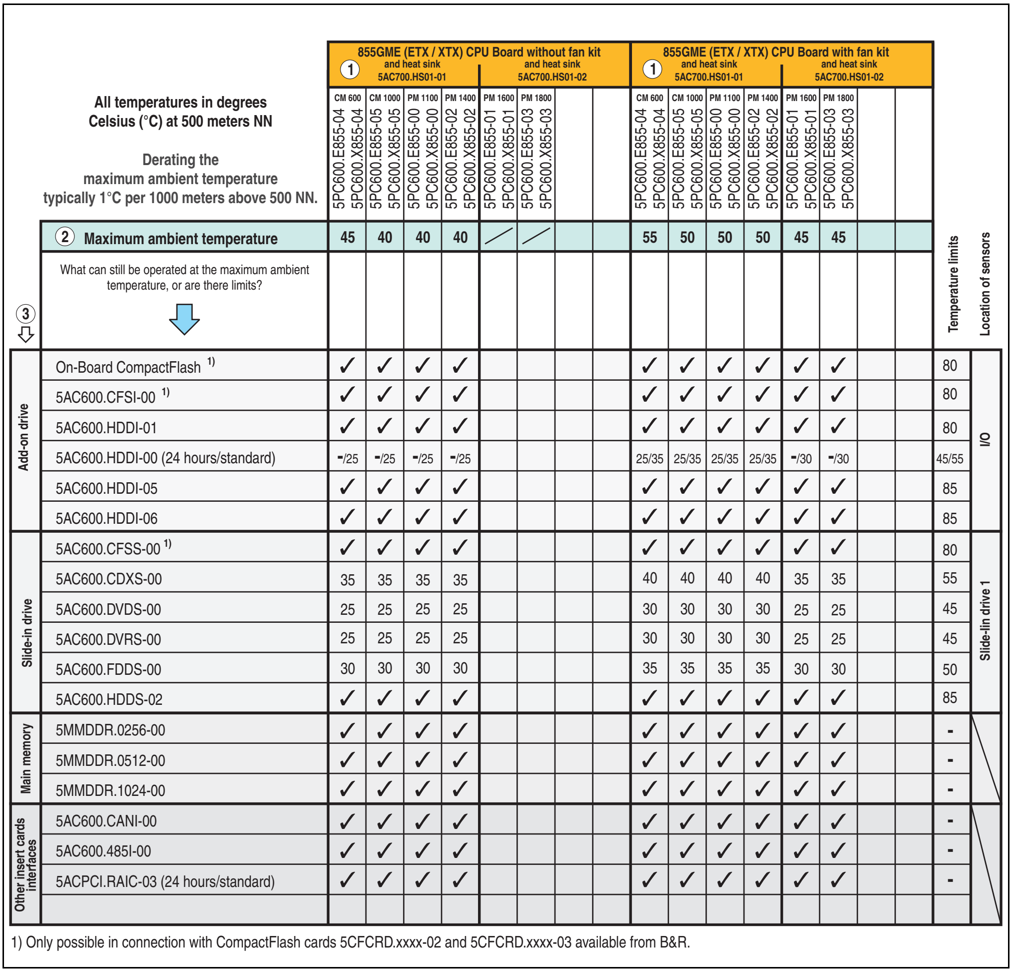
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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



All temperatures in degrees Celsius (°C) at 500 meters NN

Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.

		① 855GME (ETX / XTX) CPU Board without fan kit								① 855GME (ETX / XTX) CPU Board with fan kit									
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				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	/	/			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	
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)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 and 5CFCRD.xxxx-03 available from B&R.

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

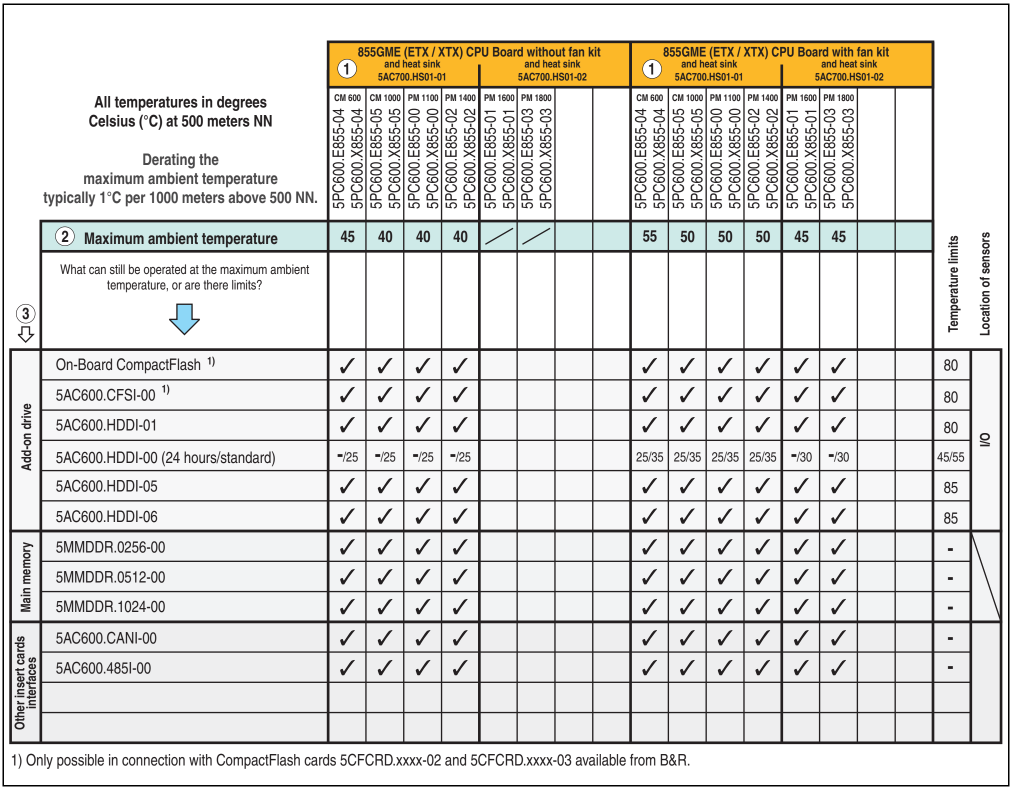
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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								855GME (ETX / XTX) CPU Board with fan kit ①									
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				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	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?																	Temperature limits	Location of sensors
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	
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-02 and 5CFCRD.xxxx-03 available from B&R.

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

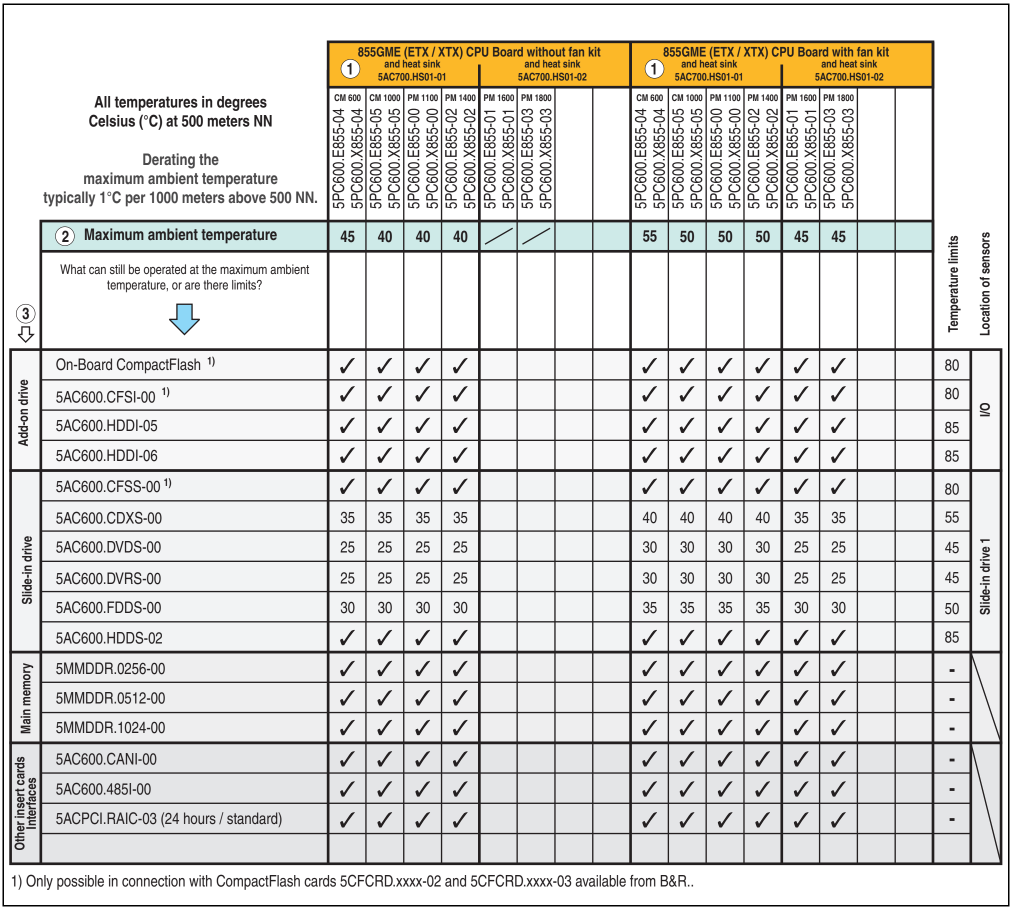
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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.

		① 855GME (ETX / XTX) CPU Board without fan kit								① 855GME (ETX / XTX) CPU Board with fan kit								Temperature limits	Location of sensors
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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
	5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
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)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

[1] Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 and 5CFCRD.xxxx-03 available from B&R..

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

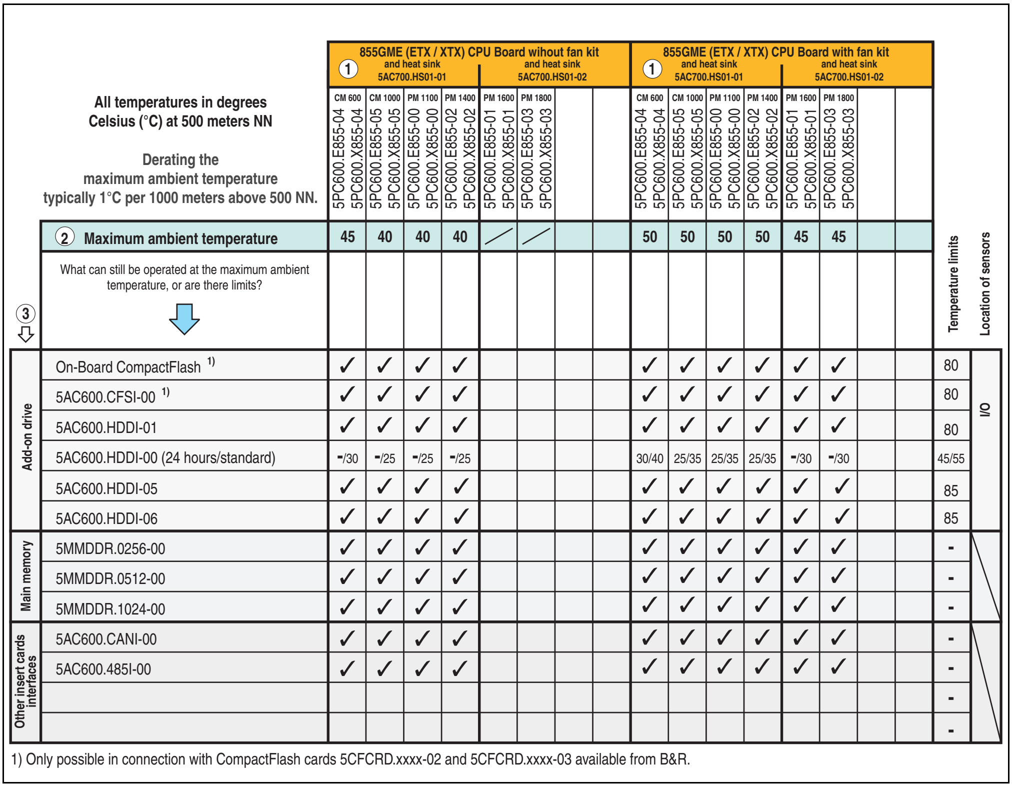
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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



	All temperatures in degrees Celsius (°C) at 500 meters NN Derating the maximum ambient temperature typically 1°C per 1000 meters above 500 NN.	① 855GME (ETX / XTX) CPU Board wihout fan kit								① 855GME (ETX / XTX) CPU Board with fan kit								Temperature limits	Location of sensors
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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
	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	
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-02 and 5CFCRD.xxxx-03 available from B&R.

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

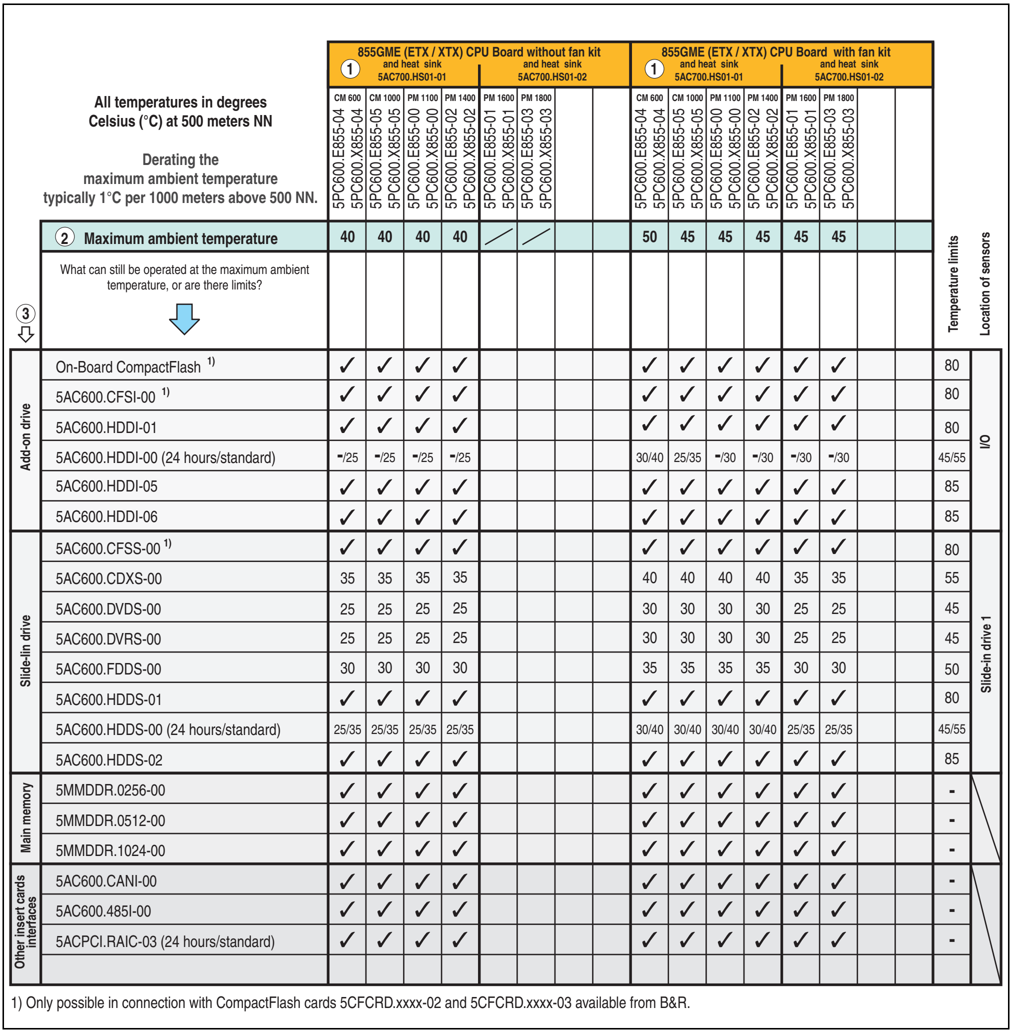
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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								855GME (ETX / XTX) CPU Board with fan kit									
		① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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			Temperature limits	Location of sensors
	② Maximum ambient temperature	40	40	40	40	/	/			50	45	45	45	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					30/40	25/35	-/30	-/30	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
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 interfaces	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5ACPCI.RAIC-03 (24 hours/standard)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 and 5CFCRD.xxxx-03 available from B&R.

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

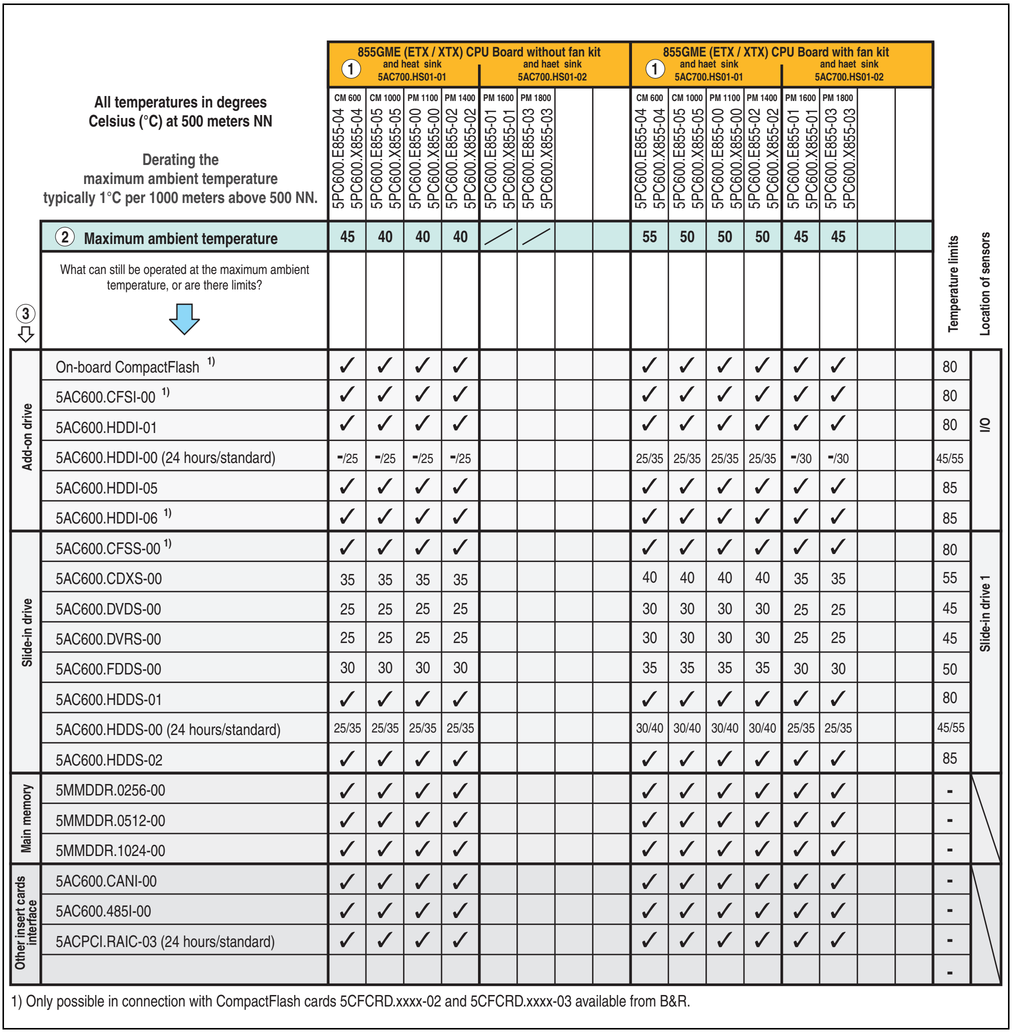
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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.

		① 855GME (ETX / XTX) CPU Board without fan kit								① 855GME (ETX / XTX) CPU Board with fan kit									
		and heat sink 5AC700.HS01-01				and haet sink 5AC700.HS01-02				and haet sink 5AC700.HS01-01				and haet sink 5AC700.HS01-02					
		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			Temperature limits	Location of sensors
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	
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)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
																		-	

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 and 5CFCRD.xxxx-03 available from B&R.

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

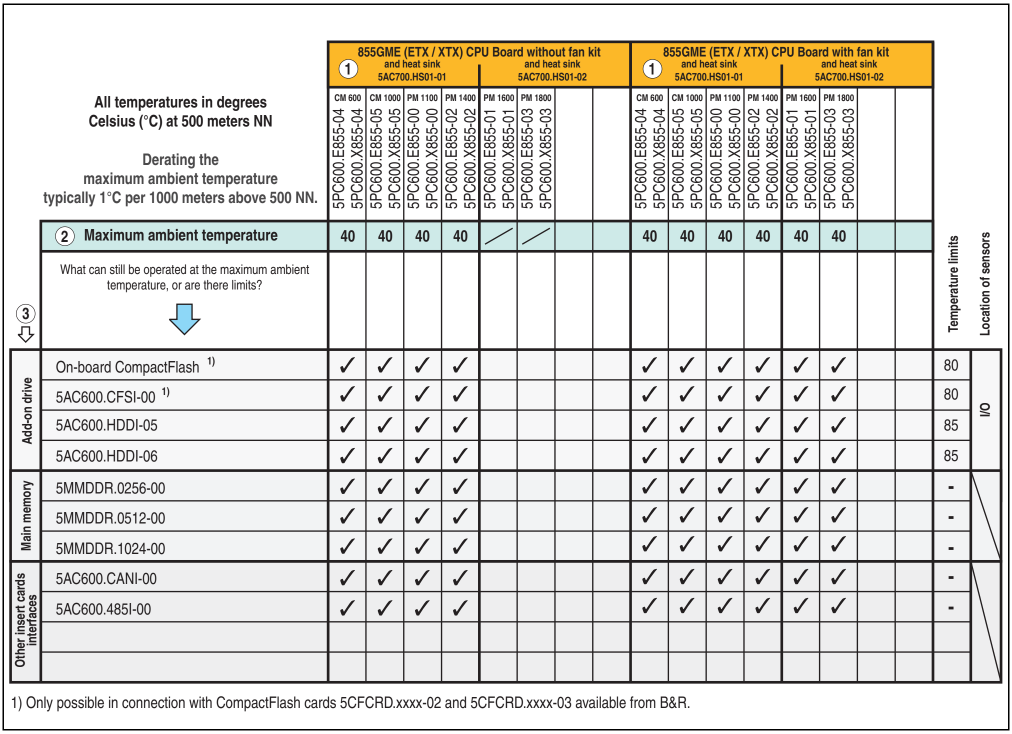
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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.

		① 855GME (ETX / XTX) CPU Board without fan kit								① 855GME (ETX / XTX) CPU Board with fan kit									
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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	40	40	40	40	/	/			40	40	40	40	40	40				
③	What can still be operated at the maximum ambient temperature, or are there limits?																	Temperature limits	Location of sensors
Add-on drive	On-board CompactFlash 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 1)	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
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-02 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

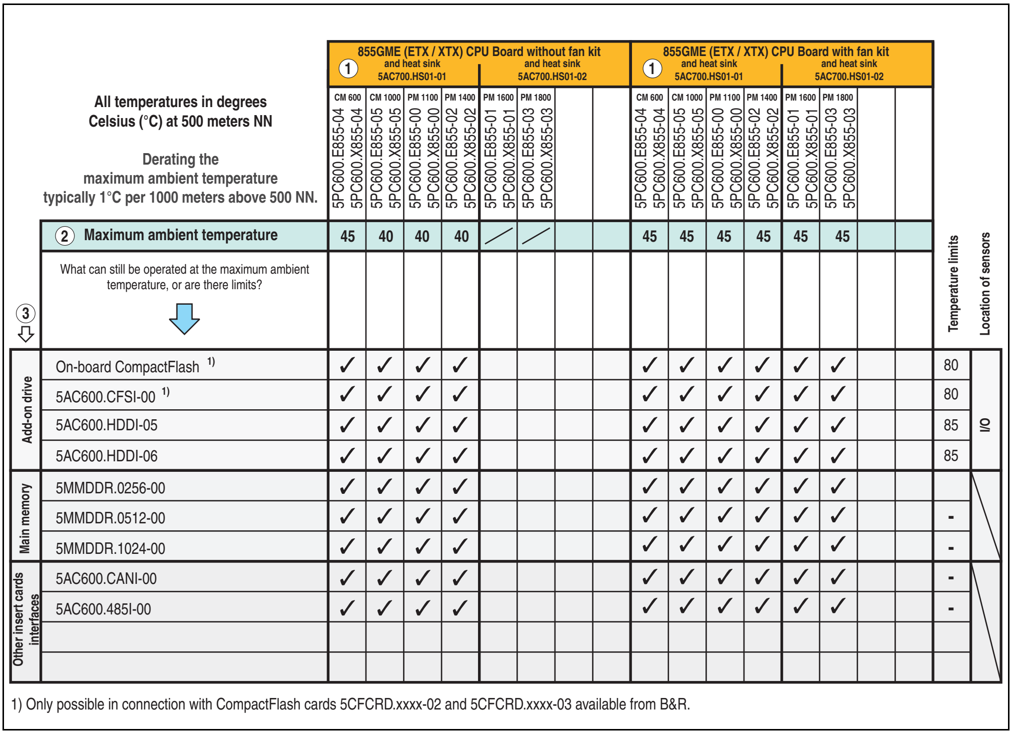
For systems containing one of the following components, the minimum ambient temperature is +5°C: 5AC600.HDDI-00.
If none of these components are used, then the minimum ambient temperature is 0°C.

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.

What can still be operated at the maximum ambient temperature, or are there limits? ③

		855GME (ETX / XTX) CPU Board without fan kit ①								855GME (ETX / XTX) CPU Board with fan kit ①								Temperature limits	Location of sensors
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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	/	/			45	45	45	45	45	45				
Add-on drive	On-board CompactFlash [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	I/O
	5AC600.CFSI-00 [1]	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			80	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
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-02 and 5CFCRD.xxxx-03 available from B&R.

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

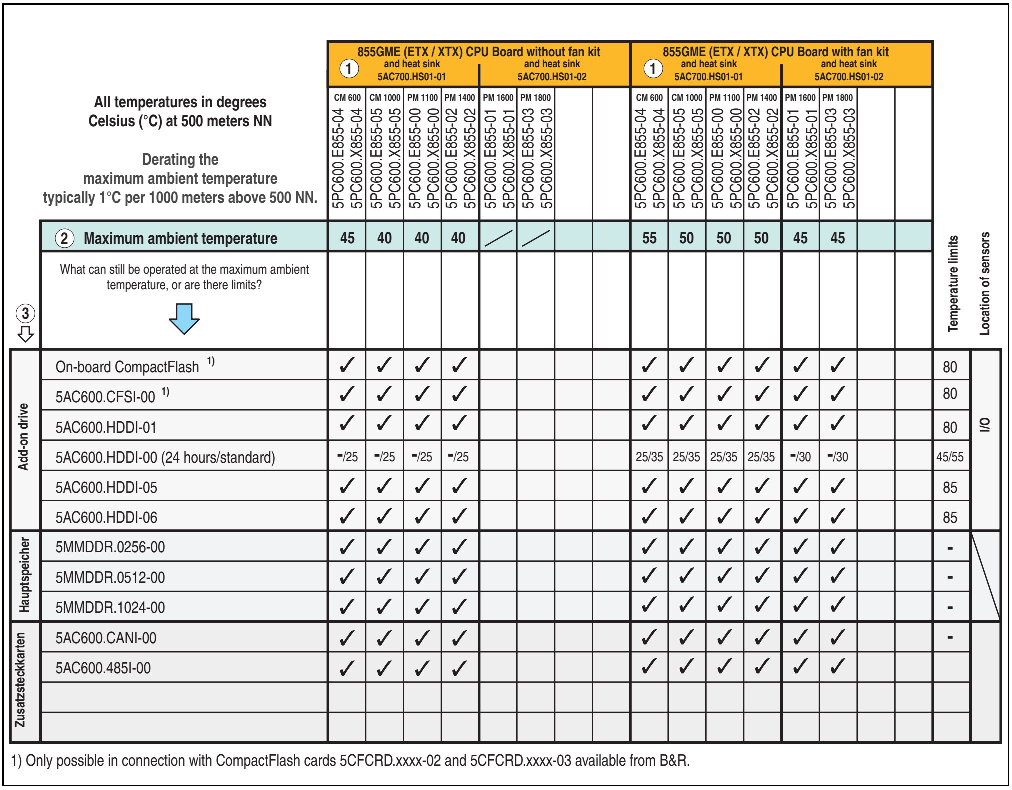
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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								855GME (ETX / XTX) CPU Board with fan kit ①									
		and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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			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	
Hauptspeicher	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Zusatzsteckkarten	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓				

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 and 5CFCRD.xxxx-03 available from B&R.

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

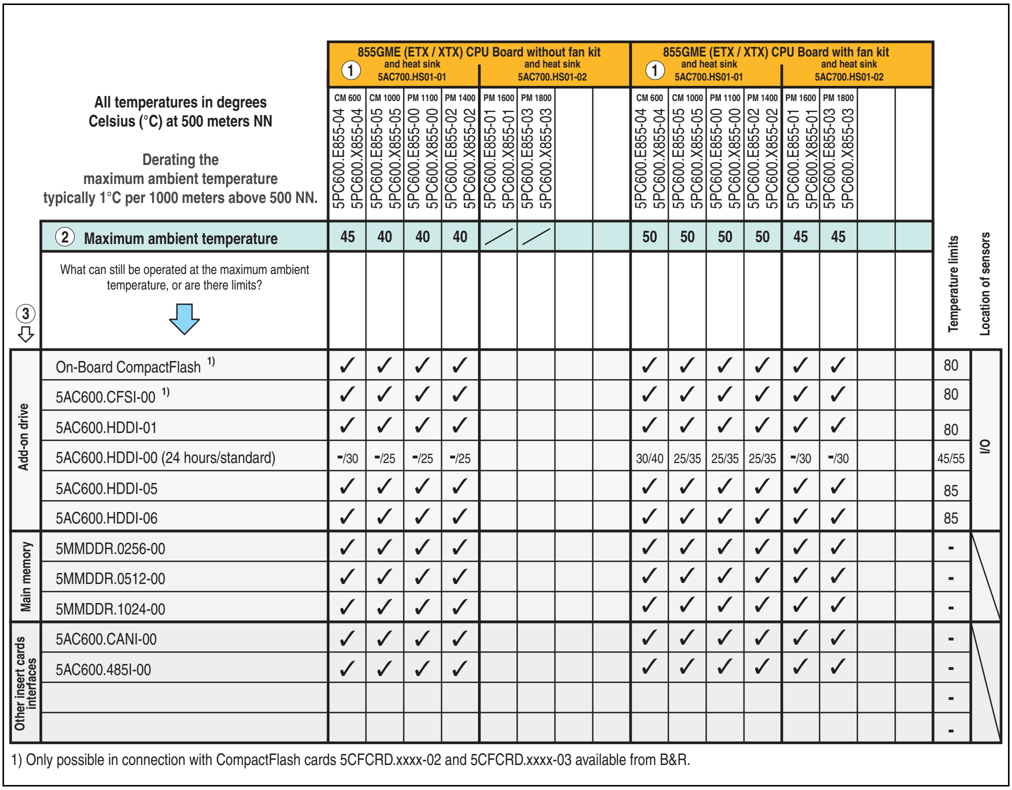
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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



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								855GME (ETX / XTX) CPU Board with fan kit								Temperature limits	Location of sensors
		① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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)	-/30	-/25	-/25	-/25					30/40	25/35	25/35	25/35	-/30	-/30			45/55	
	5AC600.HDDI-05	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
	5AC600.HDDI-06	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			85	
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-02 and 5CFCRD.xxxx-03 available from B&R.

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

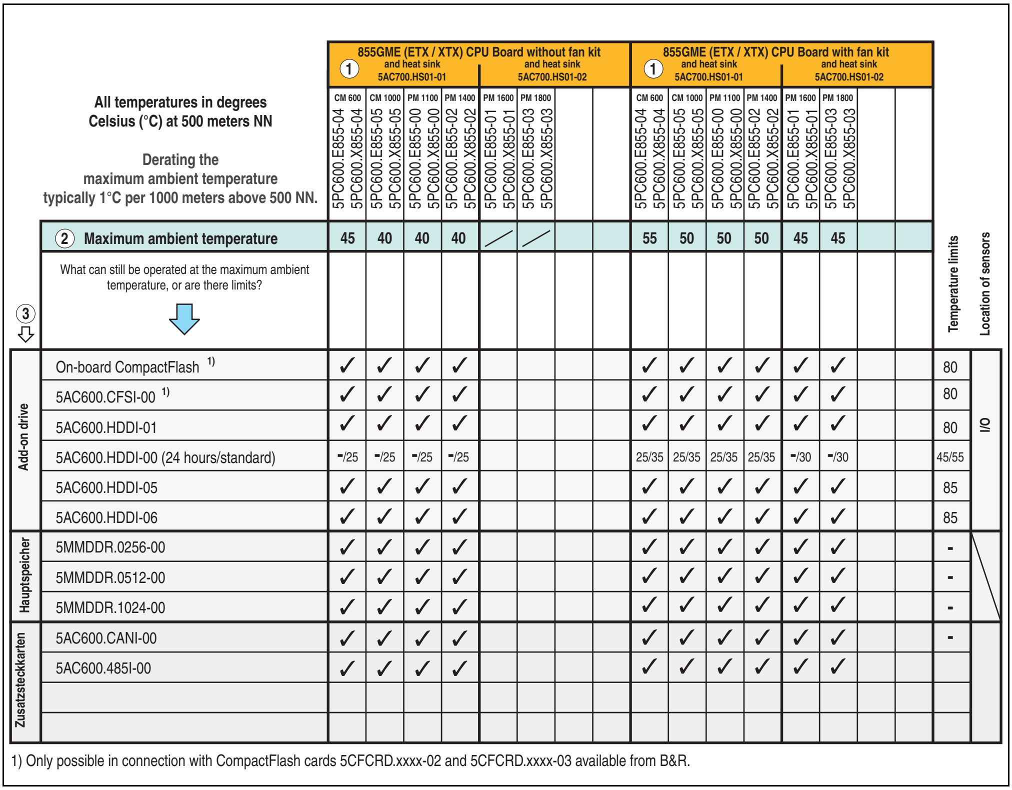
For a description of this image, see section 2.1.13 "How is the the maximum ambient temperature determined?".

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								855GME (ETX / XTX) CPU Board with fan kit									
		① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02				① and heat sink 5AC700.HS01-01				and heat sink 5AC700.HS01-02					
		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? ⇩																	Temperature limits	Location of sensors
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	
Hauptspeicher	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	\
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
Zusatzsteckkarten	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓			-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓				

1) Only possible in connection with CompactFlash cards 5CFCRD.xxxx-02 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-hour1) or standard1) 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 figure "Temperature sensor locations" on page 625. The value listed in the table represents the defined maximum temperature for this measurement point2) . An alarm is not triggered when this temperature is exceeded. The temperatures2) can be read in BIOS (menu item "Advanced" - Baseboard/panel features - Baseboard 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.

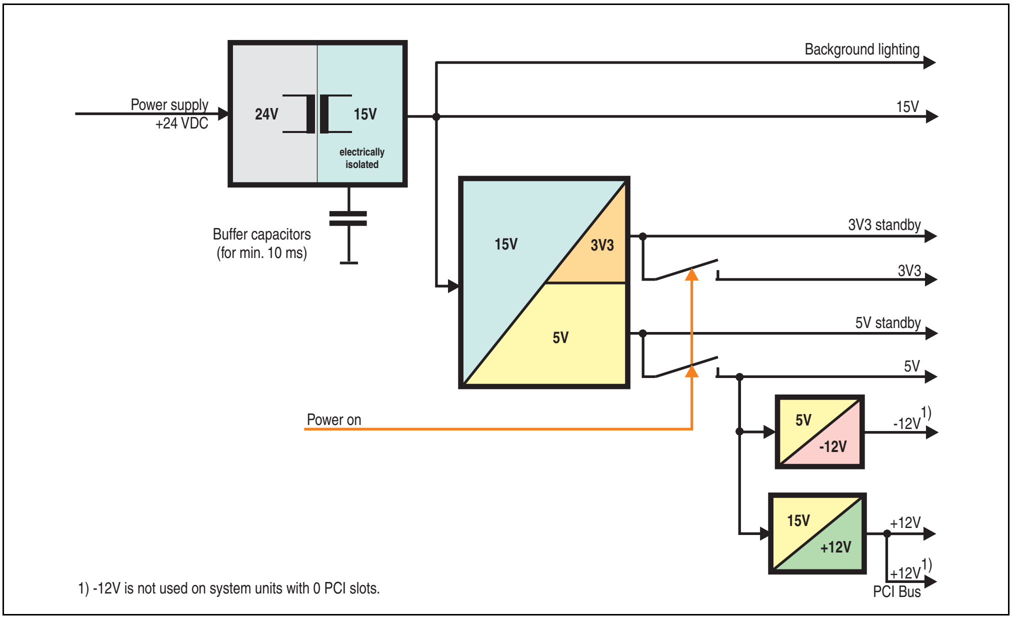
2.2 Power management

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 21: Revision dependent block diagram

If an older system unit revision is used, its necessary to read the power management information in section 2.2.6 "Power management obsolete" on page 70.



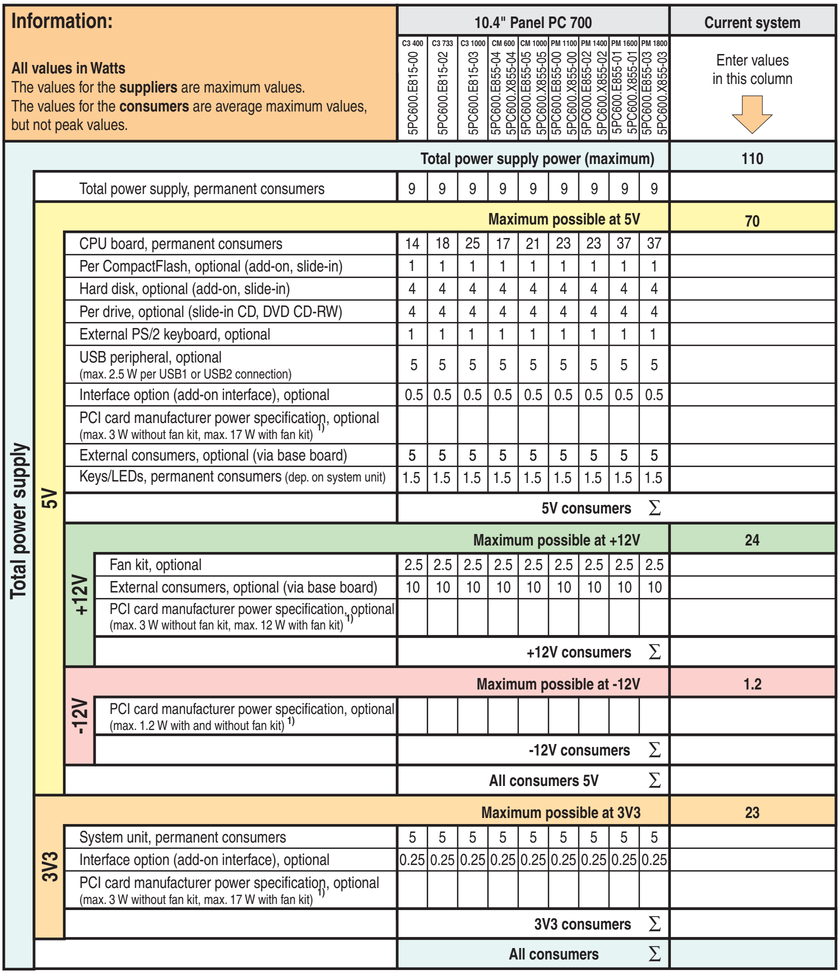
1) -12V is not used on system units with 0 PCI slots.

Figure 17: Block diagram - supply voltage

2.2.1 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 22: 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 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	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									

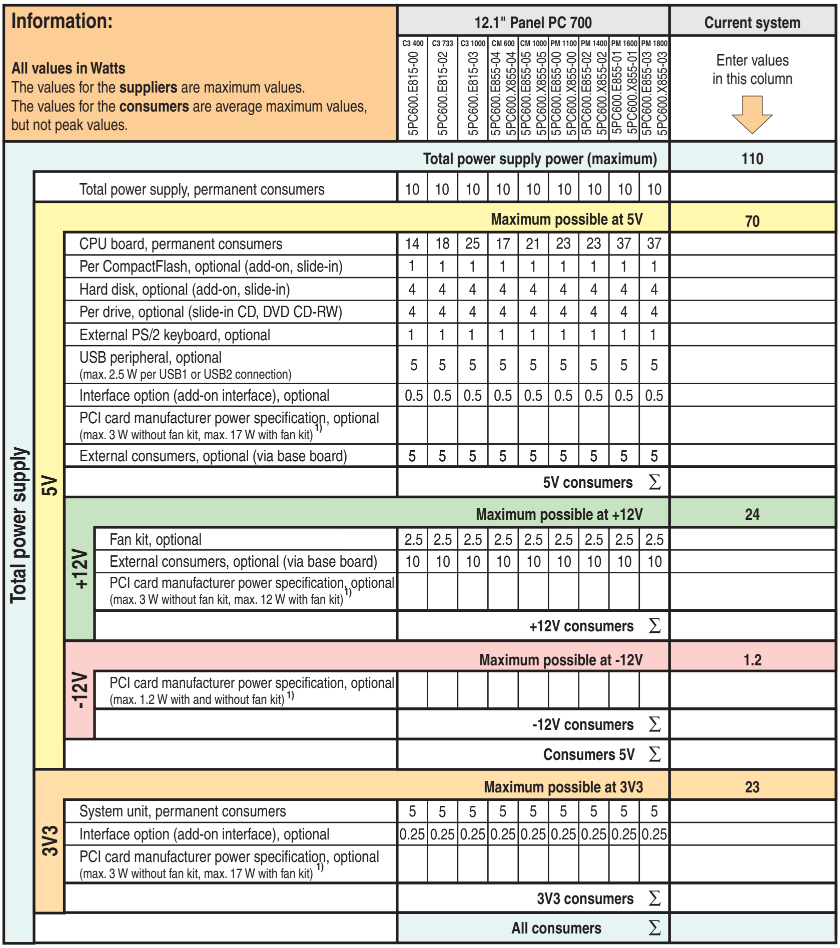
1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

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

2.2.2 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 23: 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 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	10	10	10	10	10	10	10	10	10	
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	
	5V consumers ∑										
+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 ∑										
-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 ∑										
	Consumers 5V ∑										
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 ∑										
	All consumers ∑										

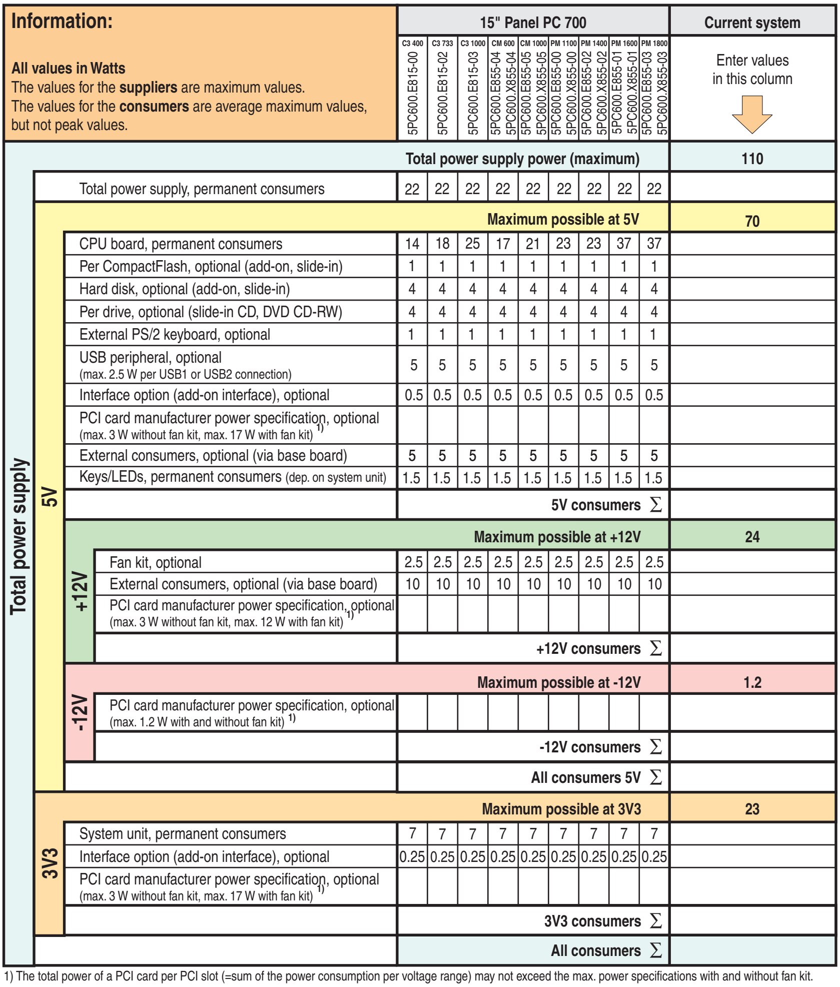
1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

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

2.2.3 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 24: 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.

Total power supply		15" Panel PC 700 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	Current system 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	
5V	**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 1) (max. 3 W without fan kit, max. 17 W with fan kit)										
5V	External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
5V	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	**5V consumers ∑**										
5V / +12V	**Maximum possible at +12V**										**24**
5V / +12V	Fan kit, optional	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
5V / +12V	External consumers, optional (via base board)	10	10	10	10	10	10	10	10	10	
5V / +12V	PCI card manufacturer power specification, optional 1) (max. 3 W without fan kit, max. 12 W with fan kit)										
5V / +12V	**+12V consumers ∑**										
5V / -12V	**Maximum possible at -12V**										**1.2**
5V / -12V	PCI card manufacturer power specification, optional (max. 1.2 W with and without fan kit) 1)										
5V / -12V	**-12V consumers ∑**										
5V	**All consumers 5V ∑**										
3V3	**Maximum possible at 3V3**										**23**
3V3	System unit, permanent consumers	7	7	7	7	7	7	7	7	7	
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 1) (max. 3 W without fan kit, max. 17 W with fan kit)										
3V3	**3V3 consumers ∑**										
	All consumers ∑										

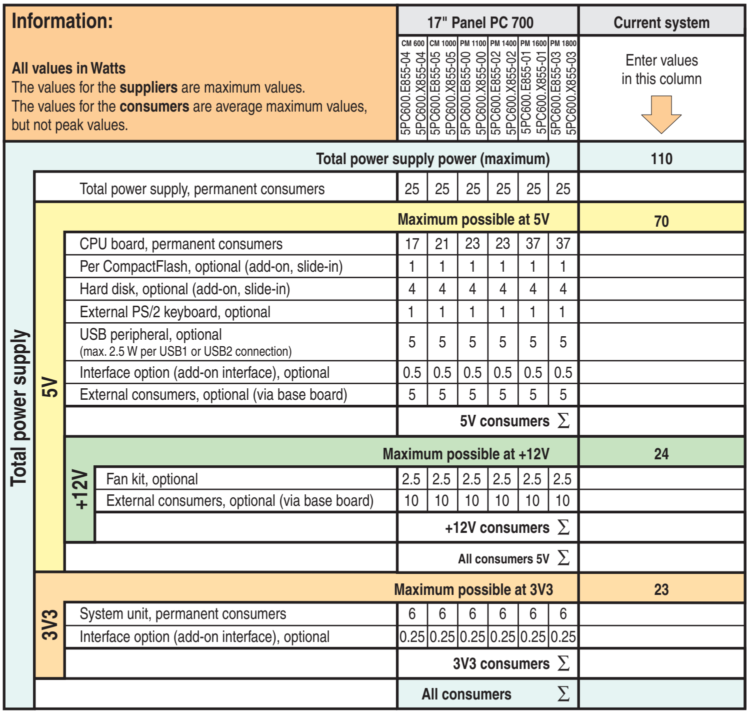
1) The total power of a PCI card per PCI slot (=sum of the power consumption per voltage range) may not exceed the max. power specifications with and without fan kit.

Figure 20: Power calculation for 15" Panel PC 700

2.2.4 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 25: Revision dependent 17" Panel PC 700



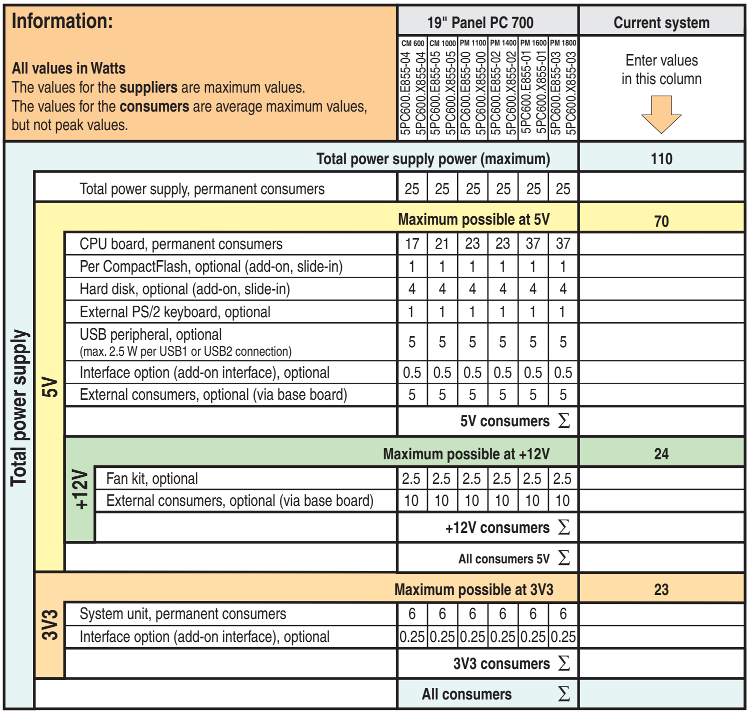
	Information: **All values in Watts** The values for the **suppliers** are maximum values. The values for the **consumers** are average maximum values, but not peak values.	17" Panel PC 700						Current system
		CM 600 5PC600.E855-04 5PC600.X855-04	CM 1000 5PC600.E855-05 5PC600.X855-05	PM 1100 5PC600.E855-00 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	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	
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 ∑							
+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 ∑							
	All consumers 5V ∑							
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 ∑							
	All consumers ∑							

Figure 21: Power calculation for 17" Panel PC 700

2.2.5 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 26: 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 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	Current system 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	
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 ∑							
+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 ∑							
	All consumers 5V ∑							
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 ∑							
	All consumers ∑							

Figure 22: Power calculation for 19" Panel PC 700

2.2.6 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 27: Revision dependent block diagram

If a newer system unit revision is used, it's necessary to read the power management information in section 2.2 "Power management" on page 64.

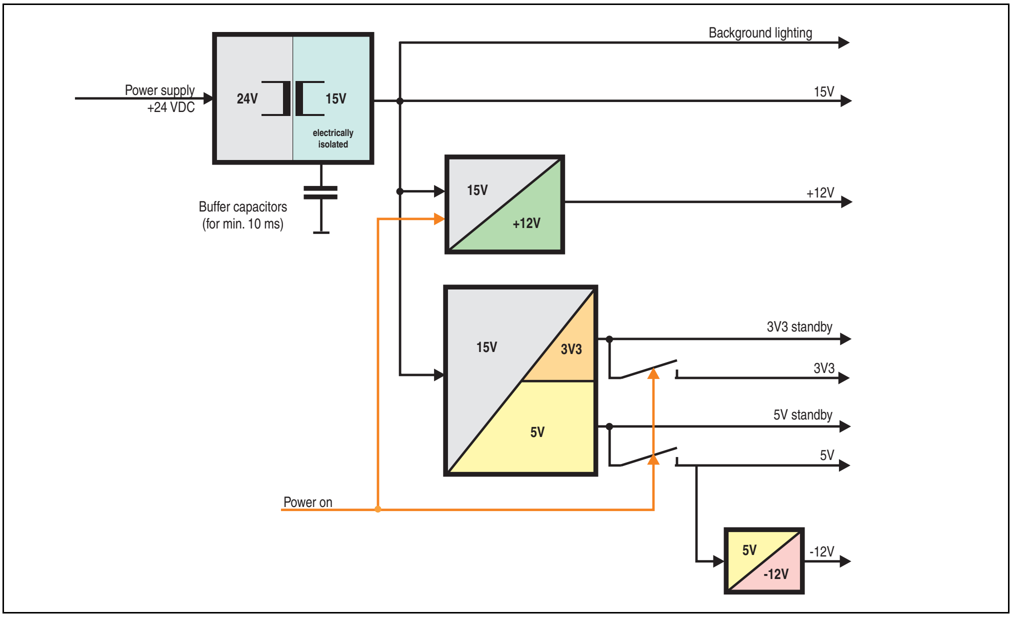


Figure 23: Block diagram - supply voltage

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.

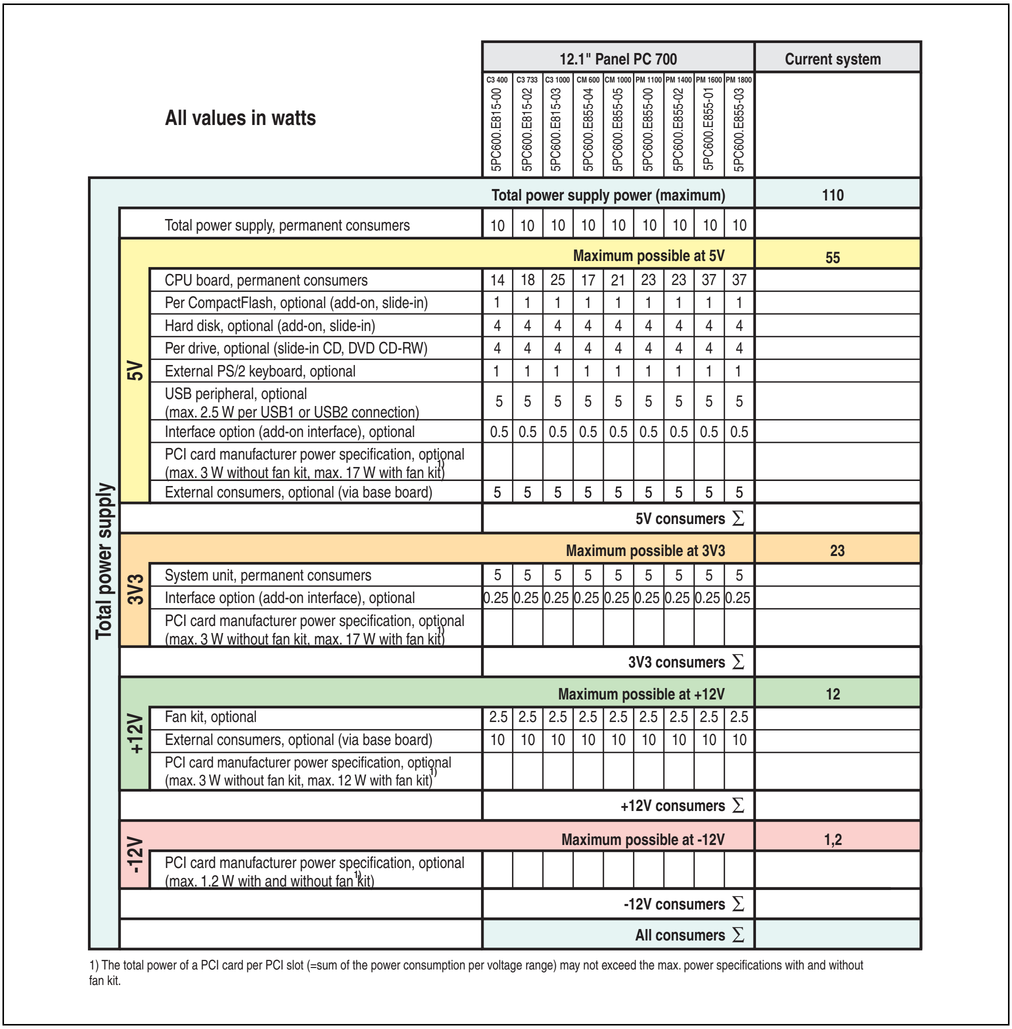
10.4" Panel PC 700

		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	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	
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, 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 ∑										
	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 ∑										
	+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 ∑										
	-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 ∑										
		All consumers ∑										

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	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	
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]										
		External consumers, optional (via base board)	5	5	5	5	5	5	5	5	5	
		5V consumers ∑										
	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 ∑										
	+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 ∑										
	-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 ∑										
		All consumers ∑										

[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

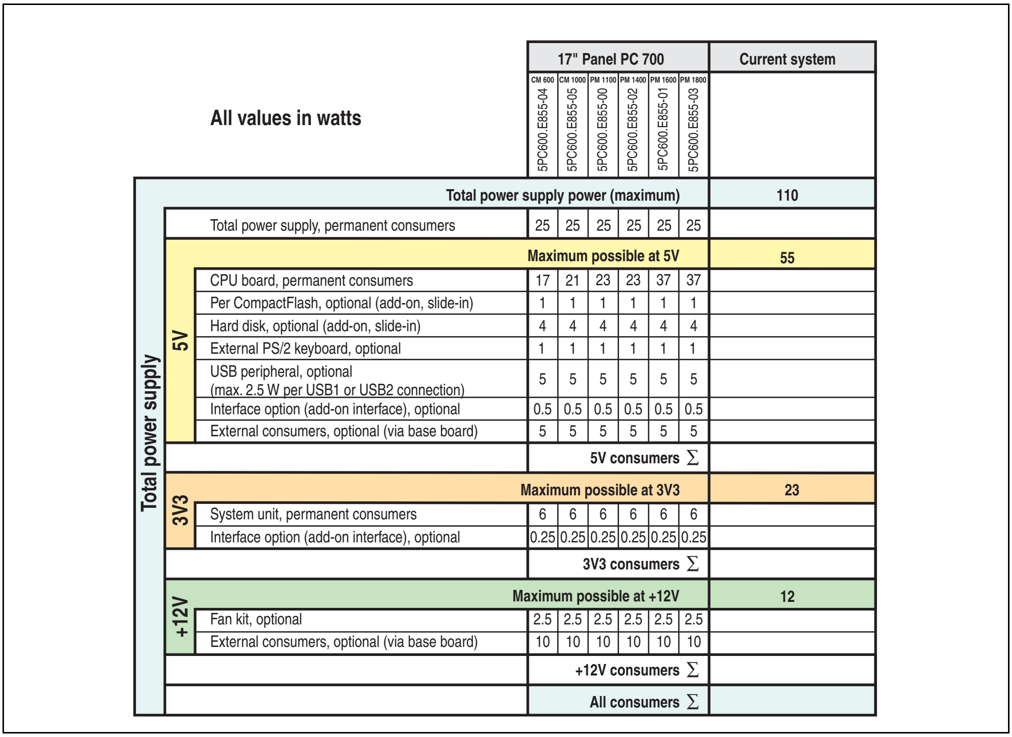
15" Panel PC 700

		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	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	
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 ∑										
	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 ∑										
	+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 ∑										
	-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 ∑										
		All consumers ∑										

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

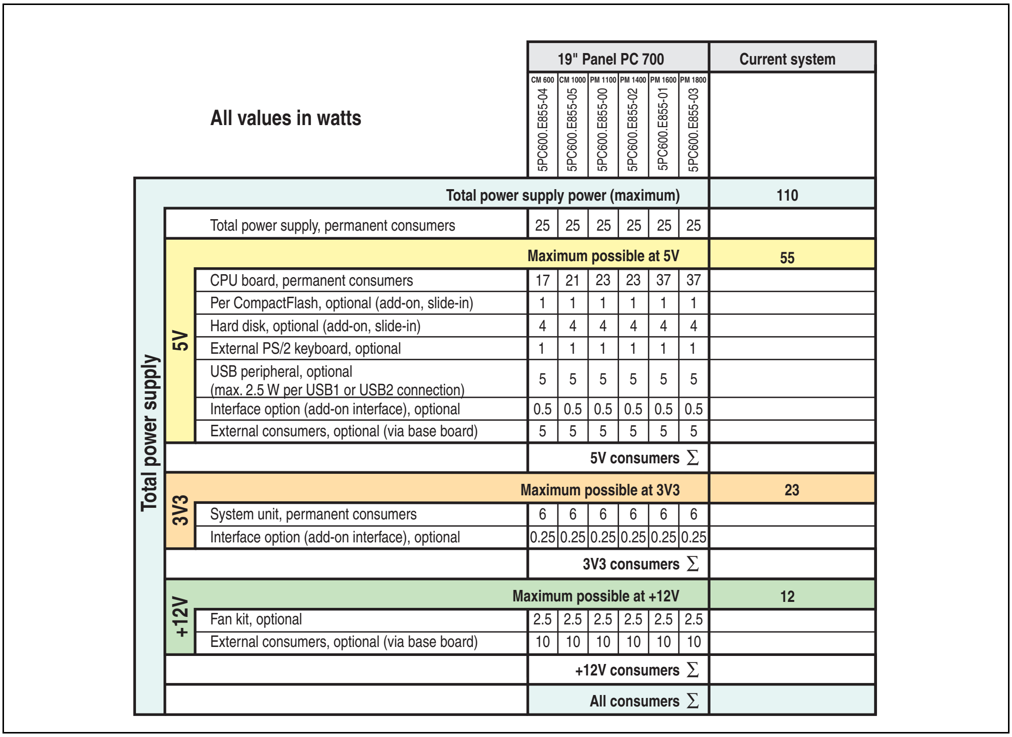


All values in watts

Total power supply		17" Panel PC 700 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	Current system
	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 ∑							
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 ∑							
+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 ∑							
	All consumers ∑							

Figure 27: Power management - 17" Panel PC 700

19" Panel PC 700

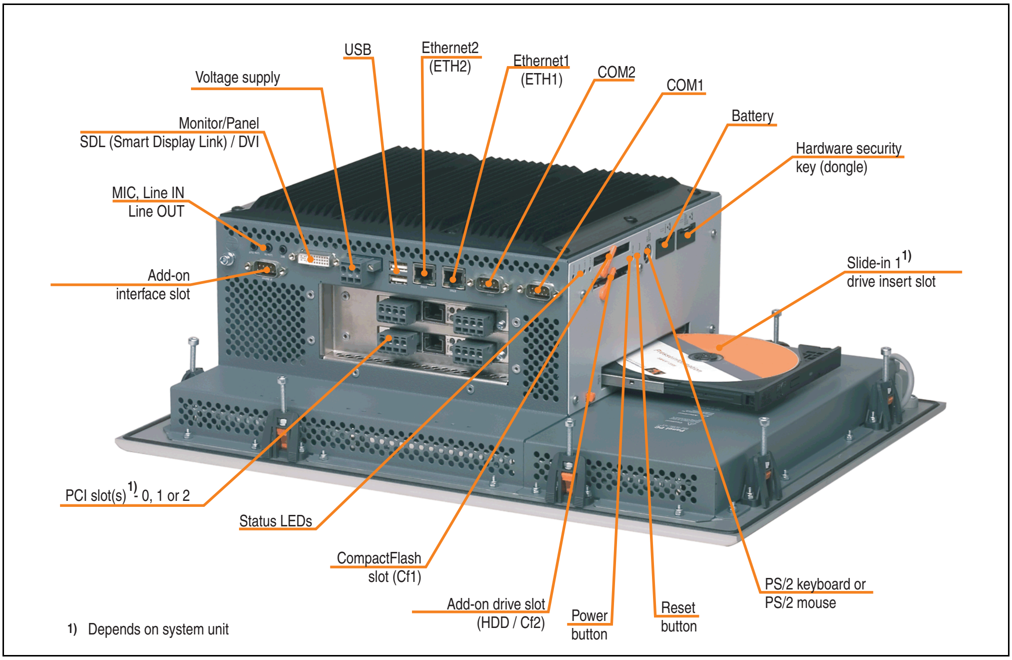


All values in watts			19" Panel PC 700						Current system
			CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800	
			5PC600.E855-04	5PC600.E855-05	5PC600.E855-00	5PC600.E855-02	5PC600.E855-01	5PC600.E855-03	
Total power supply		Total power supply power (maximum)							110
		Total power supply, permanent 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 ∑							
	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 ∑							
	+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 ∑							
		All consumers ∑							

Figure 28: Power management - 19" Panel PC 700

2.3 Device interfaces

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


USB
Ethernet2 (ETH2)
Ethernet1 (ETH1)
COM2
COM1
Voltage supply
Battery
Monitor/Panel SDL (Smart Display Link) / DVI
Hardware security key (dongle)
MIC, Line IN Line OUT
Slide-in 1 1) drive insert slot
Add-on interface slot
PCI slot(s) 1) - 0, 1 or 2
Status LEDs
CompactFlash slot (Cf1)
PS/2 keyboard or PS/2 mouse
Add-on drive slot (HDD / Cf2)
Reset button
Power button

1) Depends on system 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.

2.3.1 Serial interfaces COM1

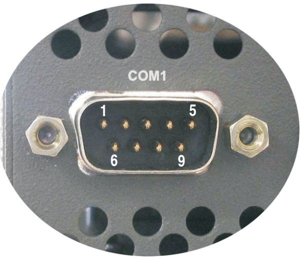
Serial interfaces COM1		
Type	RS232, modem-capable, not electrically isolated	9-pin DSUB male 
UART	16550 compatible, 16 byte FIFO	
Transfer rate	Max. 115 kBaud	
Pin	**Assignment**	
1	DCD	
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

Table 28: 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 29: 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.

2.3.2 Serial interfaces COM2

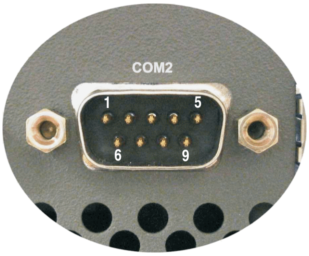
<table>
<tr><th colspan="3">Serial interfaces COM2</th></tr>
<tr><td>Type</td><td>RS232, modem-capable, not electrically isolated</td><td rowspan="12">9-pin DSUB male

</td></tr>
<tr><td>UART</td><td>16550 compatible, 16 byte FIFO</td></tr>
<tr><td>Transfer rate</td><td>Max. 115 kBaud</td></tr>
<tr><th>Pin</th><th>Assignment</th></tr>
<tr><td>1</td><td>DCD</td></tr>
<tr><td>2</td><td>RXD</td></tr>
<tr><td>3</td><td>TXD</td></tr>
<tr><td>4</td><td>DTR</td></tr>
<tr><td>5</td><td>GND</td></tr>
<tr><td>6</td><td>DSR</td></tr>
<tr><td>7</td><td>RTS</td></tr>
<tr><td>8</td><td>CTS</td></tr>
<tr><td>9</td><td>RI</td><td></td></tr>
</table>

Table 30: 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 31: 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.

2.3.3 Ethernet connection ETH1

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

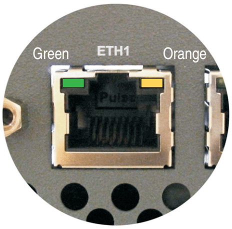
<table>
<tr><th colspan="4">Ethernet connection (ETH1[1])</th></tr>
<tr><td>Controller</td><td colspan="2">Intel 82562</td><td rowspan="7">RJ45 twisted pair (10BaseT/100BaseT), female
 </td></tr>
<tr><td>Cabling</td><td colspan="2">S/STP (Cat5e)</td></tr>
<tr><td>Transfer rate</td><td colspan="2">10/100 MBit/s [2]</td></tr>
<tr><td>Cable length</td><td colspan="2">See table33 "Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards (ETX)" on page 80 and table 34 "Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards" on page 80.</td></tr>
<tr><th>LED</th><th>On</th><th>Off</th></tr>
<tr><td>Green</td><td>100 MBit/s</td><td>10 MBit/s</td></tr>
<tr><td>Orange</td><td>Link (Ethernet network connection available)</td><td>Activity (blinking) (Data transfer in progress)</td></tr>
</table>

Table 32: 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 33: 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 34: 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 34: Ethernet cable length in conjunction with 5PC600.E855-xx CPU boards (cont.)

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.

2.3.4 Ethernet connection ETH2

This Ethernet connection is integrated in the system unit.

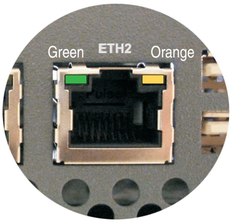
<table>
<tr><th colspan="4">Ethernet connection (ETH1[1])</th></tr>
<tr><td>Controller</td><td colspan="2">Intel 82551ER</td><td rowspan="7">RJ45 twisted pair (10BaseT/100BaseT), female

 </td></tr>
<tr><td>Cabling</td><td colspan="2">S/STP (Cat5e)</td></tr>
<tr><td>Transfer rate</td><td colspan="2">10/100 MBit/s [2]</td></tr>
<tr><td>Cable length</td><td colspan="2">max. 100 m (min. Cat5e)</td></tr>
<tr><th>LED</th><th>On</th><th>Off</th></tr>
<tr><td>Green</td><td>100 MBit/s</td><td>10 MBit/s</td></tr>
<tr><td>Orange</td><td>Link (Ethernet network connection available)</td><td>Activity (blinking) (Data transfer in progress)</td></tr>
</table>

Table 35: 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.

2.3.5 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.

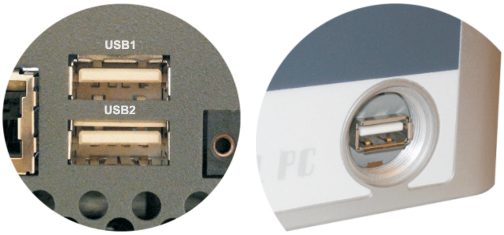
Universal Serial Bus (USB1 und USB2)1)		
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s)	USB type A, female  Back side Front side
Power supply	Max. 500 mA per port2)	
Maximum cable length	5 m (not including hub)	

Table 36: 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 assure the performance of all USB devices that they provide.

Important!

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.

2.3.6 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	23	12	1.2	110

Table 37: 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).

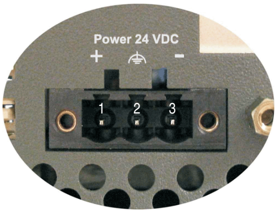
Supply voltage		
Protected against reverse polarity		3-pin, male
Pin	Description	
1	+	
2	Functional ground	
3	-	
Accessories		
0TB103.9	Plug 24 V 5.08 3p screw clamps	
0TB103.91	Plug 24 V 5.08 3p cage clamps	

Figure 29: Supply voltage connection

Ground

Important!

The pin's connection to the functional ground (pin 2, e.g. switching cabinet) should be as short as possible. 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).

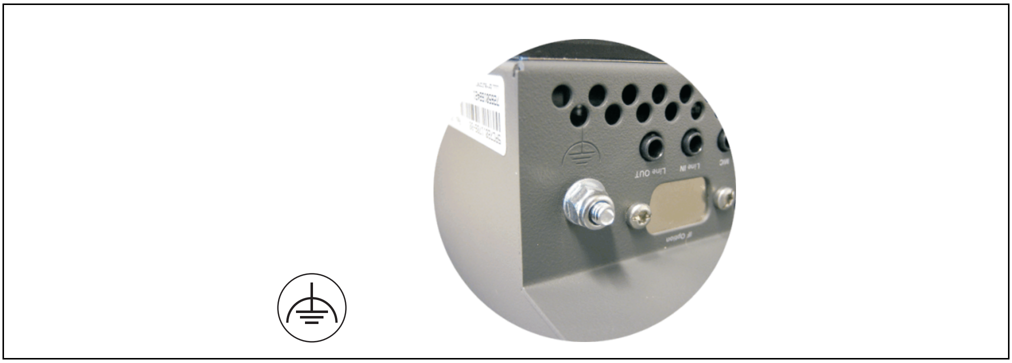


Figure 30: Ground connection

See also Section "Grounding concept" on page 264.

2.3.7 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

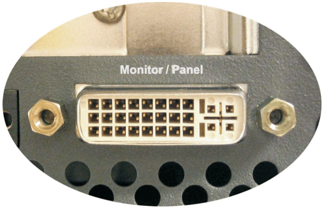
<table>
<tr><th colspan="4">Monitor / Panel</th></tr>
<tr><td colspan="3">The following will provide an overview of the video signals available with different system units and CPU boards.</td><td rowspan="14">24-pin DVI-I with special functions, female
 </td></tr>
<tr><th>System unit</th><th>815E board (ETX)</th><th>855GME board (ETX / XTX)</th></tr>
<tr><td>5PC720.1043-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1043-01</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1214-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1214-01</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1505-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1505-01</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1505-02</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1706-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC720.1906-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC781.1043-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC781.1505-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC782.1043-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
</table>

Figure 31: Monitor / Panel connection

2.3.8 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.

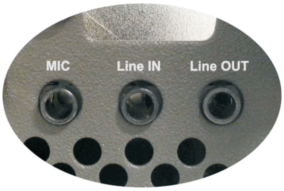
<table>
<tr><th colspan="3">MIC, Line IN and Line OUT</th></tr>
<tr><td>Controller</td><td>Realtek AC97</td><td rowspan="4">3.5 mm socket, female
 </td></tr>
<tr><td>MIC</td><td>Connection of a mono microphone with a 3.5 mm stereo (headphone) jack.</td></tr>
<tr><td>Line IN</td><td>Stereo Line IN signal supplied via 3.5 mm plug.</td></tr>
<tr><td>Line OUT</td><td>Connection of a stereo sound device (e.g. amplifier) via a 3.5 mm jack.</td></tr>
</table>

Table 38: 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.

2.3.9 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 246.

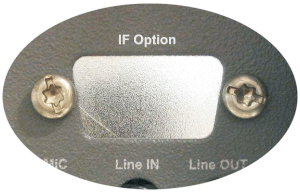
Add-on interface slot		
		
Available add-on interfaces		
5AC600.CANI-00	Add-on CAN interface	
5AC600.485I-00	Add-on RS232/422/485 interface	

Table 39: Add-on interface slot

Information:

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

2.3.10 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.

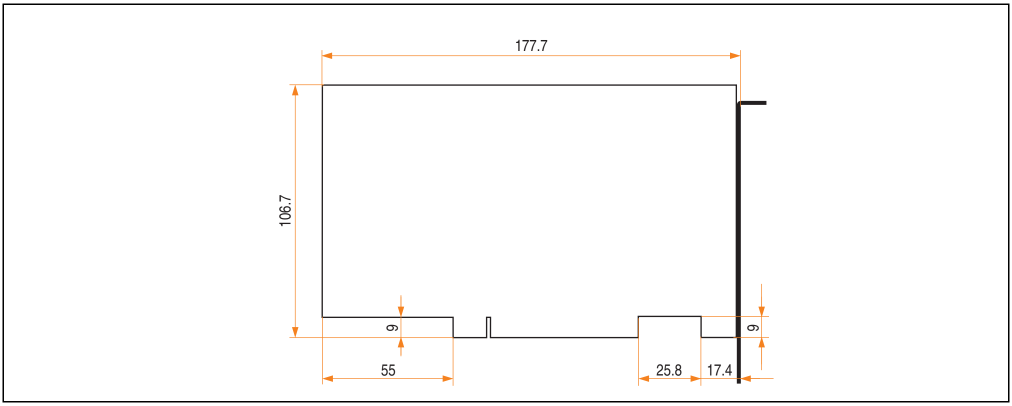


Figure 32: Dimensions - Standard half-size PCI cards

Information:

The total performance of one PCI card per PCI slot should not exceed the limit with or without a fan kit (see section 2.2 "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 40: 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.

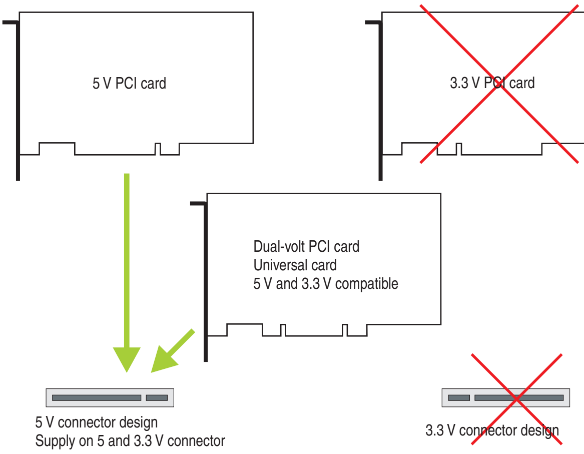


Figure 33: PCI connector type: 5 volt

2.3.11 Status LEDs

The status LEDs are integrated in the system unit.

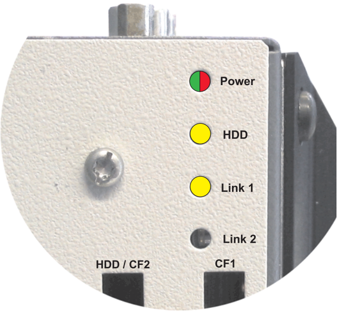
<table>
<tr><th colspan="5">Status LEDs</th></tr>
<tr><th>LED</th><th>Color</th><th></th><th>Meaning</th><td rowspan="7">
</td></tr>
<tr><td>Power</td><td>Green</td><td>On</td><td>Supply voltage OK</td></tr>
<tr><td></td><td>Red</td><td>On</td><td>The system is in standby mode (S5: soft-off mode or S4: hibernate mode -Suspend-to-Disk)</td></tr>
<tr><td>HDD</td><td>Yellow</td><td>On</td><td>Signals IDE drive access (CF, HDD, CD, etc.)</td></tr>
<tr><td>Link 1</td><td>Yellow</td><td>On</td><td>Indicates an active SDL connection on the monitor / panel plug.</td></tr>
<tr><td></td><td></td><td>blinking</td><td>An active SDL connection has been interrupted by a loss of power in the display unit.</td></tr>
<tr><td>Link 2</td><td>-</td><td>-</td><td>No function</td></tr>
</table>

Table 41: Status LEDs

2.3.12 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 14 "Model numbers - CompactFlash cards" on page 32.

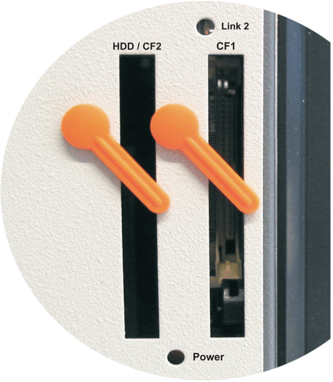
CompactFlash slot (CF1)		
Connection	Primary master IDE device	
CompactFlash Type	Type I	
Accessories	**Short description**	
5CFCRD.0064-03	CompactFlash 64 MB SSI	
5CFCRD.0128-03	CompactFlash 128 MB SSI	
5CFCRD.0256-03	CompactFlash 256 MB SSI	
5CFCRD.0512-03	CompactFlash 512 MB SSI	
5CFCRD.1024-03	CompactFlash 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 42: CompactFlash slot (CF1)

Warning!

Inserting and removing the CompactFlash card can only take place without power applied!

2.3.13 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 (see table 9 "Model numbers - Drives" for available 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.**

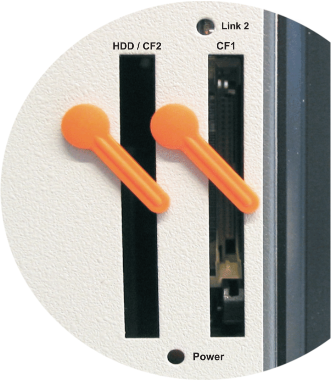
Hard disk / CompactFlash slot (HDD/CF2)		
Connection	Primary slave IDE device	
Add-on hard disks 2.5" drive (internal)		
5AC600.HDDI-00	Add-on hard disk 30 GB, 24/7	
5AC600.HDDI-01	Add-on hard disk 20 GB ET	
5AC600.HDDI-02	Add-on hard disk 40 GB, 24/7	
5AC600.HDDI-03	Add-on hard disk 60 GB, 24/7	
5AC600.HDDI-04	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 80 GB ET, 24/7	
Add-on CompactFlash slot		
5AC600.CFSI-00	Add-on CompactFlash slot	
CompactFlash Type	Type I	
Accessories	**Short description**	
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 43: Hard disk / CompactFlash slot (HDD/CF2)

> ## Warning!
>
> **Inserting and removing the CompactFlash card can only take place without power applied!**

2.3.14 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 338 for 815E CPU boards, or section "Power" on page 389 for 855GME CPU boards) or, for example, in the operating system Windows XP.

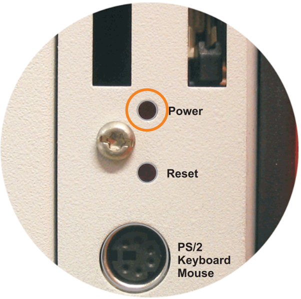
Power button	
The power button can be pressed with a pointed object (i.e. paper clip or tip of a pen). The power button acts like the on/off switch on a normal desktop PC with ATX power supply: **press and release** ... Switches on PPC700 or shuts down operating system and switches off the PPC700. **press 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 44: Power button

2.3.15 Reset button

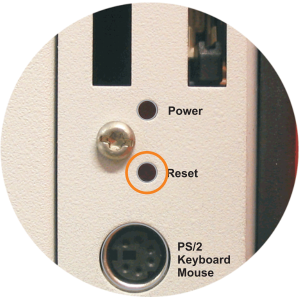
Reset button	
The reset button can be pressed with a pointed object (i.e. paper clip or tip of a pen). Pushing the reset button results in a hardware-reset, PCI-reset. The PPC700 is restarted (cold restart). The MTCX processor is not reset when the reset button is pressed.	

Table 45: Reset button

Warning!

A system reset can cause data to be lost!

2.3.16 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!).

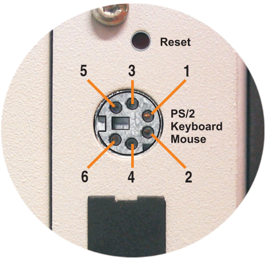
<table>
<tr><th colspan="3">Connection for keyboard/mouse (PS/2)</th></tr>
<tr><th>Pin</th><th>Assignment</th><td>PS/2 socket, female</td></tr>
<tr><td>1</td><td>DATA 0</td><td rowspan="7">
</td></tr>
<tr><td>2</td><td>DATA 1</td></tr>
<tr><td>3</td><td>GND</td></tr>
<tr><td>4</td><td>+5 V1)</td></tr>
<tr><td>5</td><td>CLK 0</td></tr>
<tr><td>6</td><td>CLK 1</td></tr>
<tr><td></td><td></td></tr>
</table>

Table 46: 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").

2.3.17 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 mA 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).

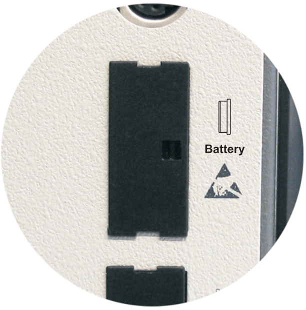
Battery		
Battery Type Removable Lifespan	Renata 950 mAh Yes, accessible from the outside 4 years 1)	
Accessories	**Short description**	
0AC201.9	**Lithium batteries (5x)** Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	**Lithium battery (1x)** Lithium battery, 1 pc., 3 V / 950 mAh, button cell	

Table 47: 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 607.

For technical information on the lithium battery, see chapter 6 "Accessories", section 2 "Replacement CMOS batteries" on page 520.

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 48: 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

2.3.18 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 49: 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 50: 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").

2.3.19 Slide-in slot 1 drive slot

This slide-in slot 1 drive slot exists only in PPC700 system units with 2 PCI slots. It is possible to insert a number of slide-in drives into it. See table for available slide-in drives 9 "Model numbers - Drives" on page 30.

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 are 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.

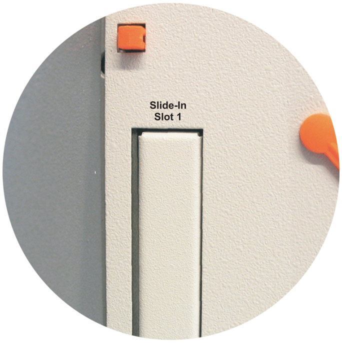
Slide-in slot 1		
Connection	Secondary slave IDE device	
Accessories	**Short description**	
5AC600.CDXS-00	Slide-in CD-ROM	
5AC600.CFSS-00	Slide-in CF 2-slot	
5AC600.DVDS-00	Slide-in DVD-ROM/CD-RW	
5AC600.FDDS-00	Slide-in USB FDD	
5AC600.HDDS-00	Slide-in hard disk 30 GB 24x7	
5AC600.HDDS-01	Slide-in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

Table 51: Slide-in slot 1

Caution!

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

2.4 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).

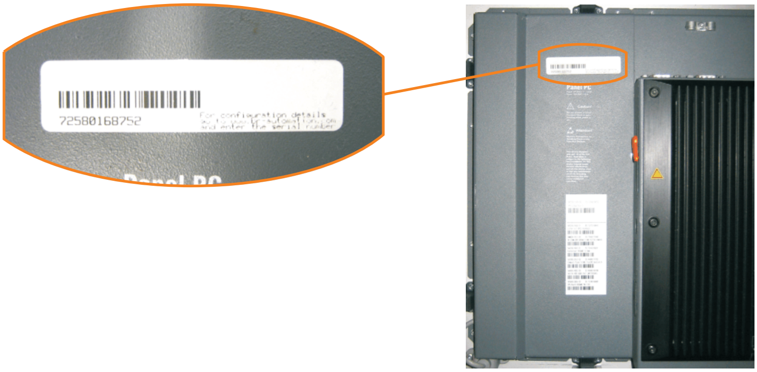


Figure 34: Serial number sticker for PPC700 assembly (back)

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

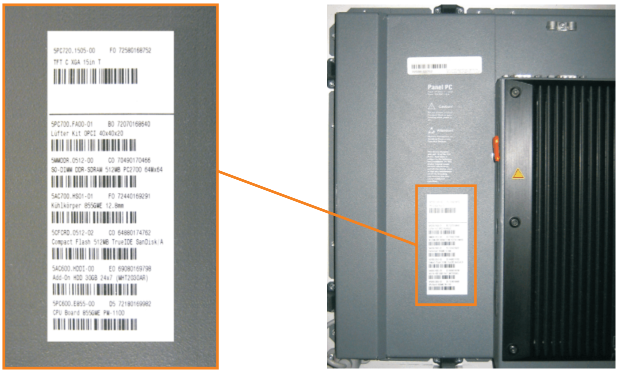
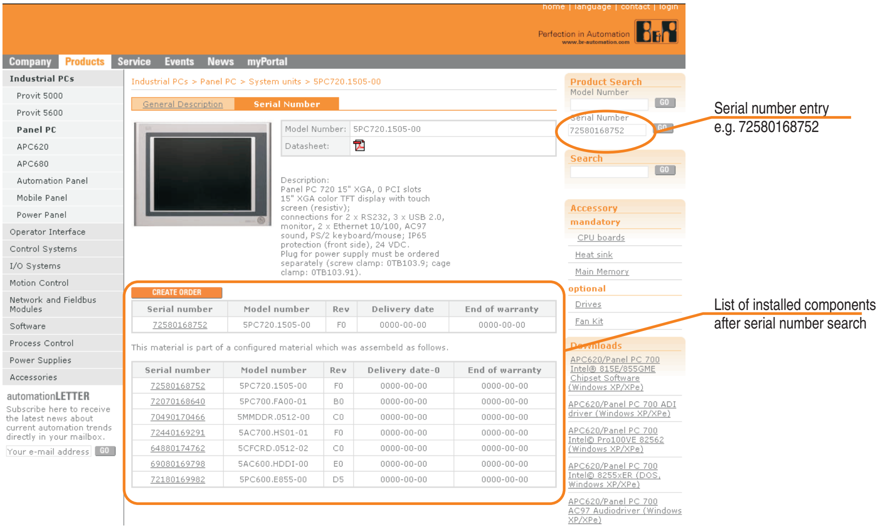

5PC720.1505-00 F0 72580168752
TFT C XGA 15in T
5PC700.FA00-01 B0 72070168640
Lüfter Kit OPCI 40x40x20
5MMDDR.0512-00 C0 70490170466
SO-DIMM DDR-SDRAM 512MB PC2700 64Mx64
5AC700.HS01-01 F0 72440169291
Kühlkörper 855GME 12.8mm
5CFCRD.0512-02 C0 64880174762
Compact Flash 512MB TrueIDE SanDisk/A
5AC600.HDDI-00 E0 69080169798
Add-On HDD 30GB 24x7 (MHT2030AR)
5PC600.E855-00 D5 72180169982
CPU Board 855GME PM-1100
Panel PC

Figure 35: Serial number stickers for individual PPC700 components

This information can also be found on the B&R homepage. Enter the serial number of 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.



Subscribe here to receive the latest news about current automation trends directly in your mailbox.

Serial Number: 72580168752

Model Number: 5PC720.1505-00

Datasheet:

Description:
Panel PC 720 15" XGA, 0 PCI slots
15" XGA color TFT display with touch screen (resistiv);
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 clamp: 0TB103.9; cage clamp: 0TB103.91).

Serial number	Model number	Rev	Delivery date	End of warranty
72580168752	5PC720.1505-00	F0	0000-00-00	0000-00-00

This material is part of a configured material which was assembeld as follows.

Serial number	Model number	Rev	Delivery date-0	End of warranty
72580168752	5PC720.1505-00	F0	0000-00-00	0000-00-00
72070168640	5PC700.FA00-01	B0	0000-00-00	0000-00-00
70490170466	5MMDDR.0512-00	C0	0000-00-00	0000-00-00
72440169291	5AC700.HS01-01	F0	0000-00-00	0000-00-00
64880174762	5CFCRD.0512-02	C0	0000-00-00	0000-00-00
69080169798	5AC600.HDDI-00	E0	0000-00-00	0000-00-00
72180169982	5PC600.E855-00	D5	0000-00-00	0000-00-00

Serial number entry
e.g. 72580168752

List of installed components
after serial number search

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

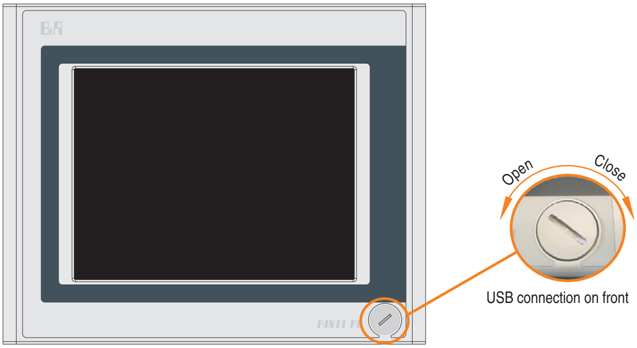


Figure 37: Front view 5PC720.1043-00

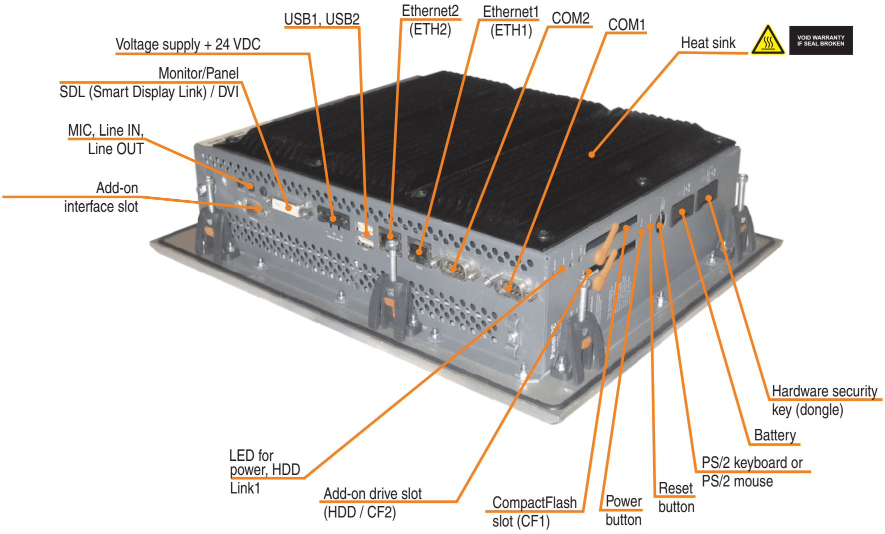


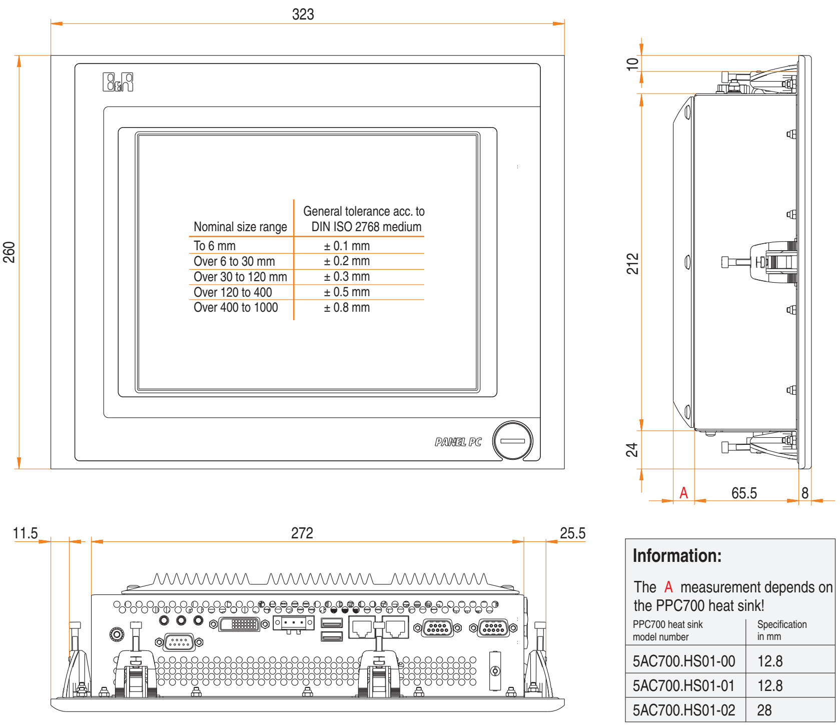
Figure 38: Rear view 5PC720.1043-00

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



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 39: Dimensions - 5PC720.1043-00

Technical data

Features	5PC720.1043-00
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot" on page 97 Secondary slave
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.2 "Fan kit 5PC700.FA02-00" on page 255
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 52: Technical data - 5PC720.1043-00

Features	5PC720.1043-00
Touch screen [3] Technology Controller Degree of transmission	 Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 633) Horizontal Vertical Background lighting Brightness Half-brightness time[4]	 Color TFT 10.4 inch (264 mm) 262144 colors VGA, 640 x 480 pixels 300:1 Direction R / direction L =70° Direction U / direction D = 70° 350 cd/m² 50000 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 84 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "10.4" Panel PC 700" on page 71 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Aluminum, naturally anodized[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 drawing "Dimensions - 5PC720.1043-00" on page 101 323 mm 260 mm 151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 3.6 kg
Environmental characteristics	
Ambient temperature Operation Storage Transport	 See section 2.1.1 "Ambient temperatures with system unit 5PC720.1043-00" on page 48. -30°C .. +70°C -30°C .. +70°C

Table 52: Technical data - 5PC720.1043-00 (cont.)

Environmental characteristics	5PC720.1043-00
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 52: Technical data - 5PC720.1043-00 (cont.)

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% results 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.

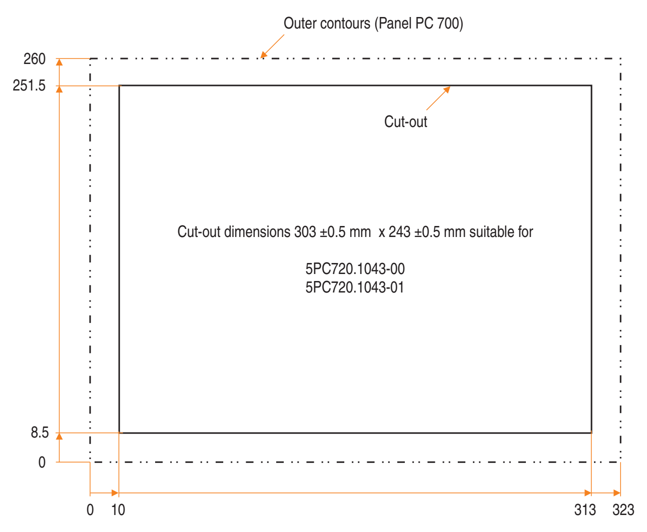

Outer contours (Panel PC 700)
260
251.5
Cut-out
Cut-out dimensions 303 ±0.5 mm x 243 ±0.5 mm suitable for
5PC720.1043-00
5PC720.1043-01
8.5
0
0
10
313
323

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.2 Panel PC 5PC720.1043-01

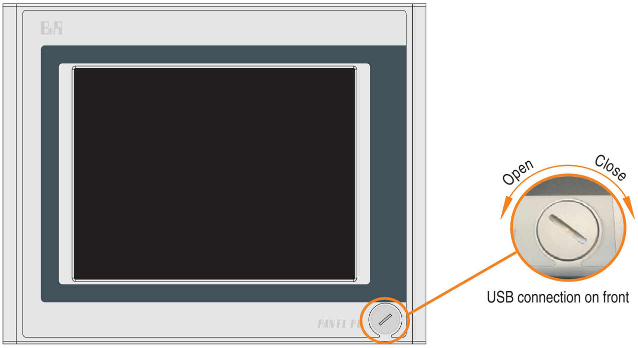
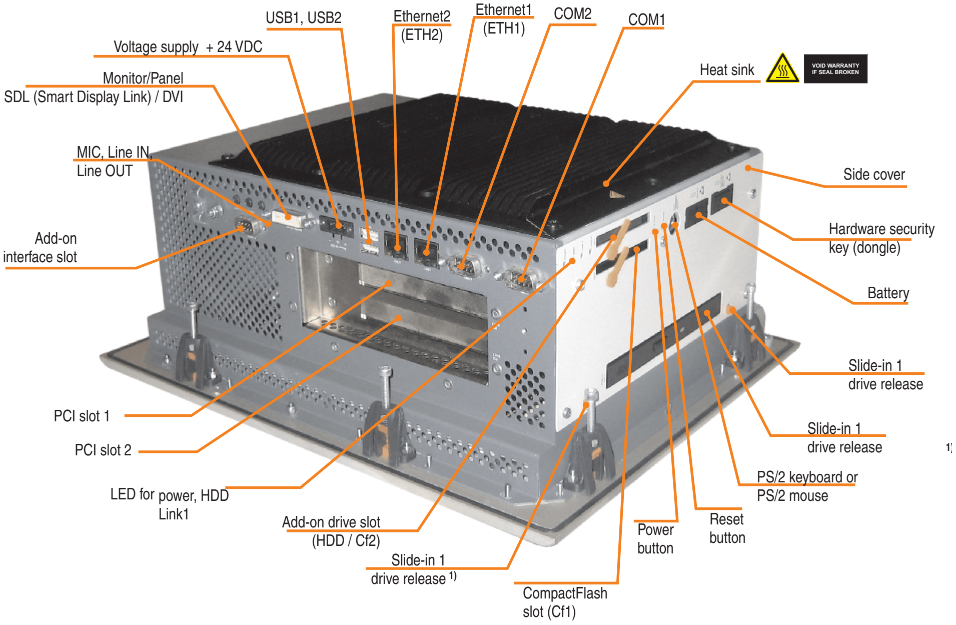


Figure 41: Front view 5PC720.1043-01



1) The side cover of the Panel PC 700 must be removed before releasing the drive!

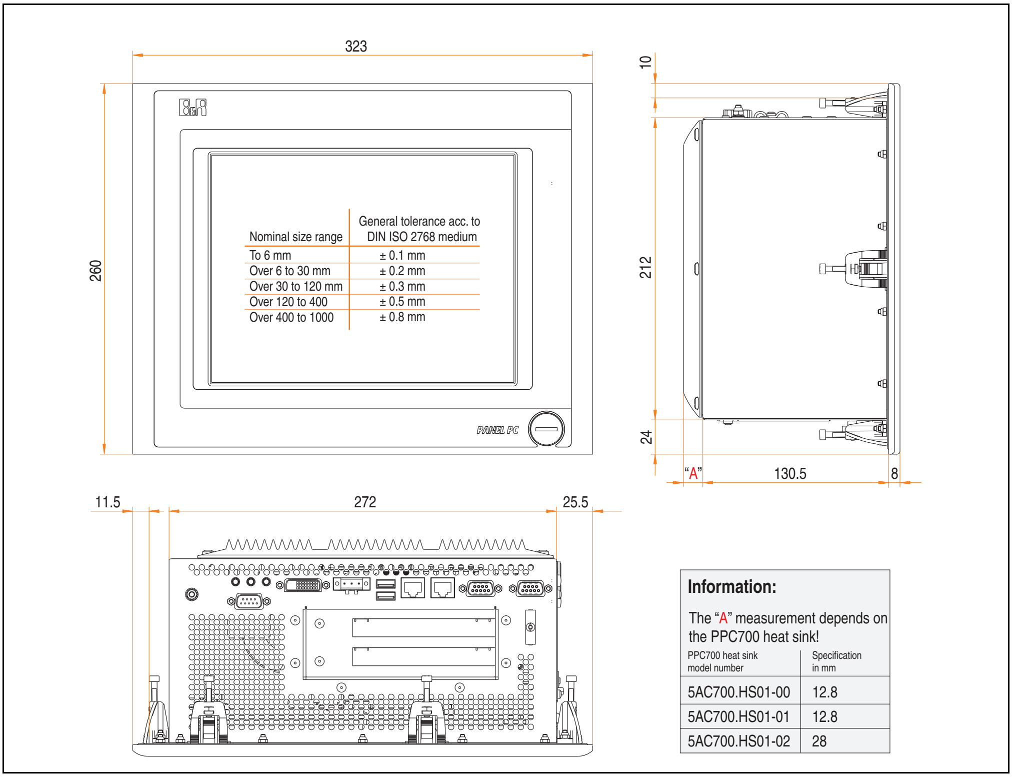
Figure 42: Rear view 5PC720.1043-01

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
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	See also "PCI slots" on page 88 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 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot" on page 97 Secondary slave
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.2 "Fan kit 5PC700.FA02-00" on page 255
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 53: Technical data - 5PC720.1043-01

Features	5PC720.1043-01
Touch screen [3)] Technology Controller Degree of transmission	 Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 633) Horizontal Vertical Background lighting Brightness Half-brightness time[4)]	 Color TFT 10.4 inch (264 mm) 262144 colors VGA, 640 x 480 pixels 300:1 Direction R / direction L =70° Direction U / direction D = 70° 350 cd/m² 50000 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 84 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "10.4" Panel PC 700" on page 71 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Aluminum, naturally anodized[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 drawing "Dimensions - 5PC720.1043-01" on page 107 323 mm 260 mm 151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 4.5 kg
Environmental characteristics	
Ambient temperature Operation Storage Transport	 See section 2.1.2 "Ambient temperatures with system unit 5PC720.1043-01" on page 49. -30°C .. +70°C -30°C .. +70°C

Table 53: Technical data - 5PC720.1043-01 (cont.)

Environmental characteristics	5PC720.1043-01
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 53: Technical data - 5PC720.1043-01 (cont.)

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% results 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.

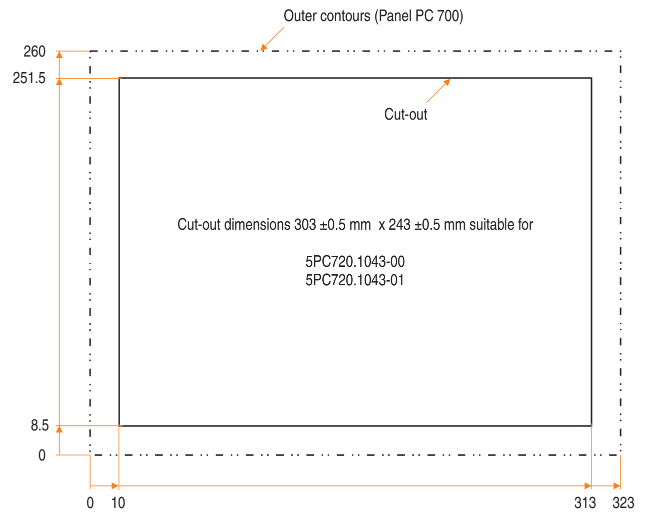

Outer contours (Panel PC 700)
Cut-out
Cut-out dimensions 303 ±0.5 mm x 243 ±0.5 mm suitable for
5PC720.1043-00
5PC720.1043-01
260
251.5
8.5
0
0
10
313
323

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.3 Panel PC 5PC720.1214-00

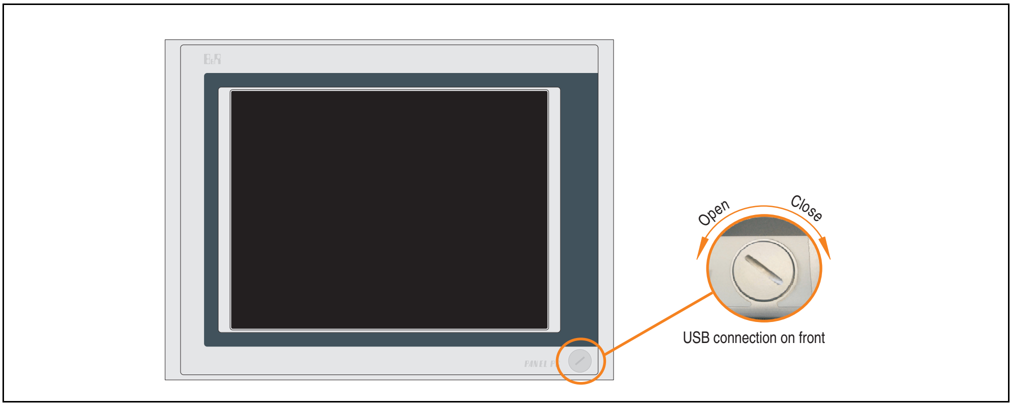


Figure 45: Front view 5PC720.1214-00

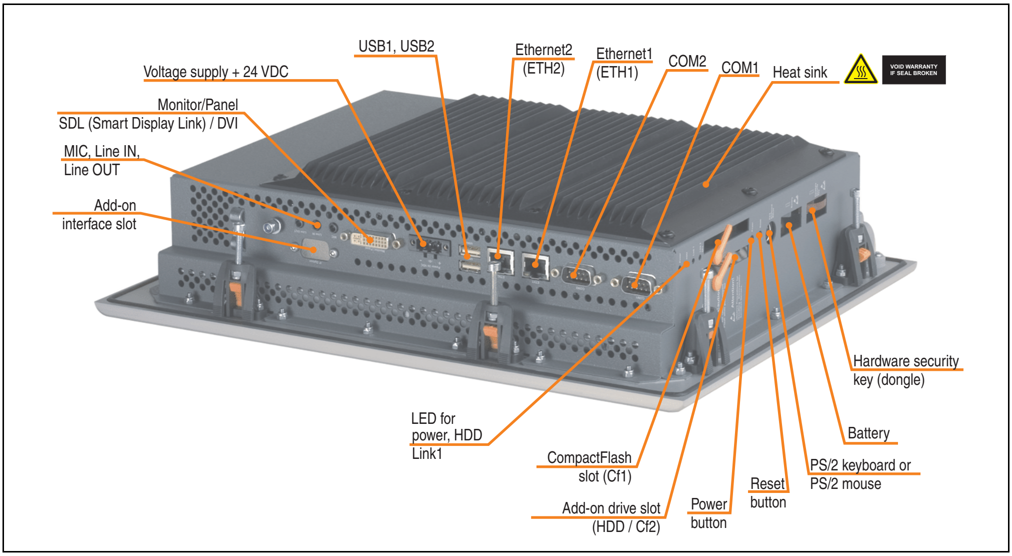


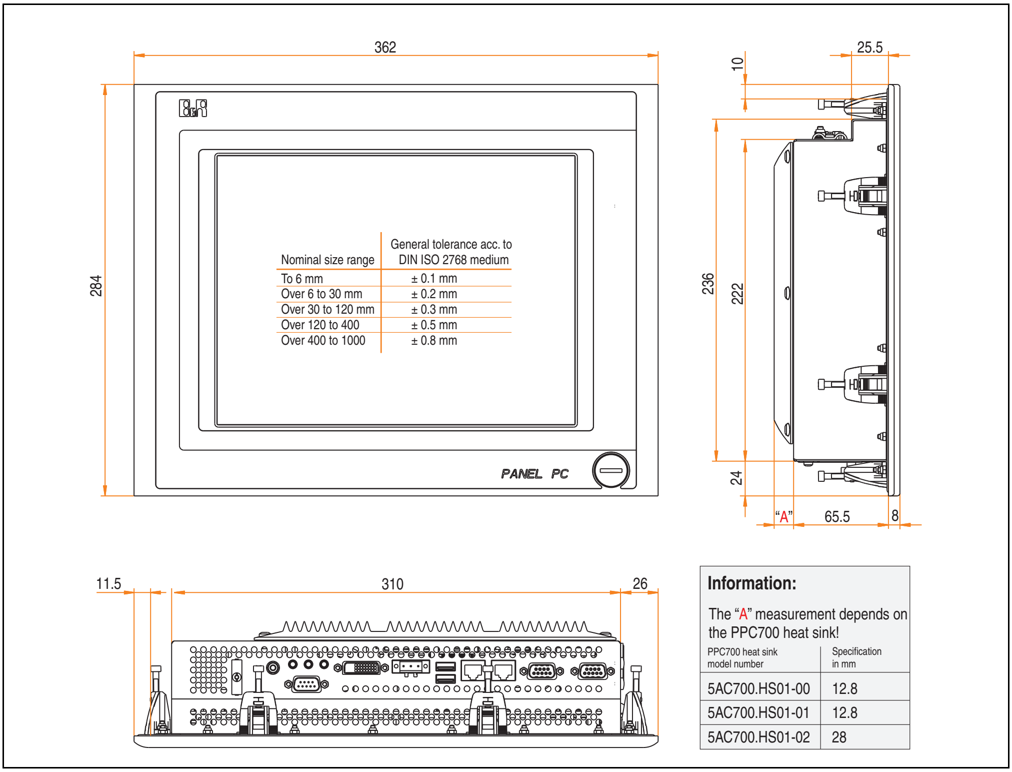
Figure 46: Rear view 5PC720.1214-00

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



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 47: Dimensions - 5PC720.1214-00

Technical data

Features	5PC720.1214-00
Serial interfaces	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78
Type	RS232, modem capable
Amount	2
UART	16550 compatible, 16 byte FIFO
Transfer rate	Max. 115 kBaud
Connection	9-pin DSUB, male
Ethernet	
Controller	See "Ethernet connection ETH1" on page 79 and "Ethernet connection ETH2" on page 82
Transfer rate	10/100 Mbit/s
Connection	RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces	See also "USB port" on page 83
Type	USB 2.0
Amount	3 (2x back side, 1x front side)
Transfer rate	Up to 480 MBit 1) (high speed)
Connection	Type A
Monitor / Panel	See also "Monitor / Panel connection" on page 86
Type	DVI-I, female
AC97 sound	See also "MIC, Line IN and Line OUT ports" on page 86
Inputs	Microphone, Line in
Outputs	Line out
Add-on interface slot	See also "Add-on interface slot" on page 87
Amount	1
PCI slots	-
Amount	
Type	
Default	
CompactFlash slot 1 (CF1)	Yes, see also "CompactFlash slot (CF1)" on page 90
Internal organization	Primary master
CompactFlash slot 2 / hard disk (HDD/CF2)	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91
Type	Combined
Internal organization	Primary slave
Insert for slide-in drive 1	-
Internal organization	
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse	Yes, see also "PS/2 keyboard/mouse" on page 93
Type	Combined, will be automatically detected
Battery	Yes, see also "Battery" on page 94
Type	Renata 950 mAh
Removable	Yes, accessible from the outside
Lifespan	4 years 2)
Hardware security key compartment	Yes, see also "Hardware security key" on page 96
Optimized for	DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED	See also "Status LEDs" on page 89
Amount	3 (Power, HDD, Link 1)

Table 54: Technical data - 5PC720.1214-00

Features	5PC720.1214-00
Touch screen [3)] Technology Controller Degree of transmission	 Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 633) Horizontal Vertical Background lighting Brightness Half-brightness time[4)]	 Color TFT 12.1 inch (307 mm) 262144 colors SVGA, 800 x 600 pixels 300:1 Direction R / direction L =70° Direction U / direction D = 70° 350 cd/m² 50000 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 84 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "12.1" Panel PC 700" on page 72 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Aluminum, naturally anodized[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 drawing "Dimensions - 5PC720.1214-00" on page 113 362 mm 284 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 4.2 kg
Environmental characteristics	
Ambient temperature Operation Storage Transport	 See section 2.1.3 "Ambient temperatures with system unit 5PC720.1214-00" on page 51. -30°C .. +70°C -30°C .. +70°C

Table 54: Technical data - 5PC720.1214-00 (cont.)

Environmental characteristics	5PC720.1214-00
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 54: Technical data - 5PC720.1214-00 (cont.)

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% results 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.

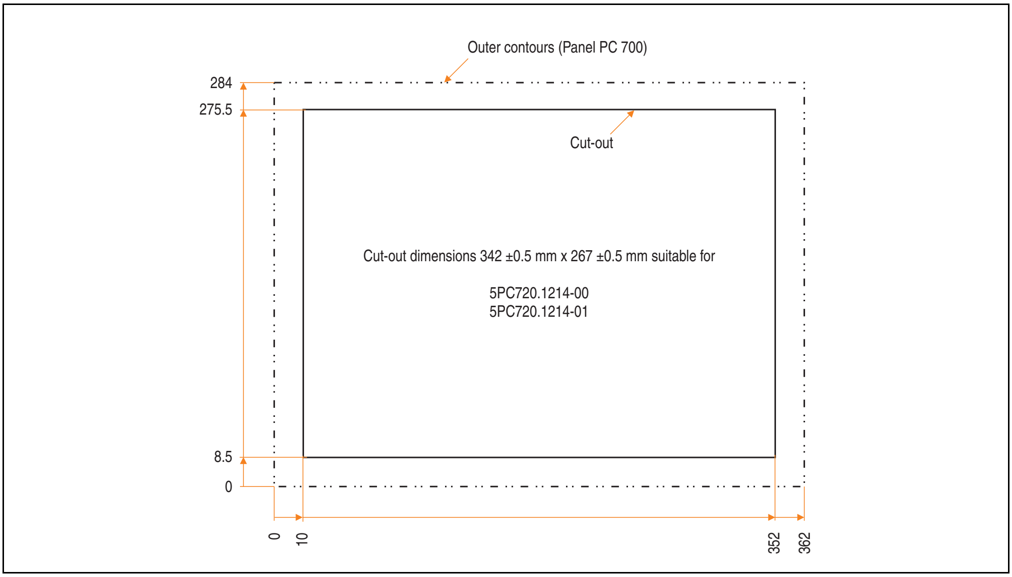

Outer contours (Panel PC 700)
Cut-out
Cut-out dimensions 342 ±0.5 mm x 267 ±0.5 mm suitable for
5PC720.1214-00
5PC720.1214-01
284
275.5
8.5
0
0
10
352
362

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.4 Panel PC 5PC720.1214-01

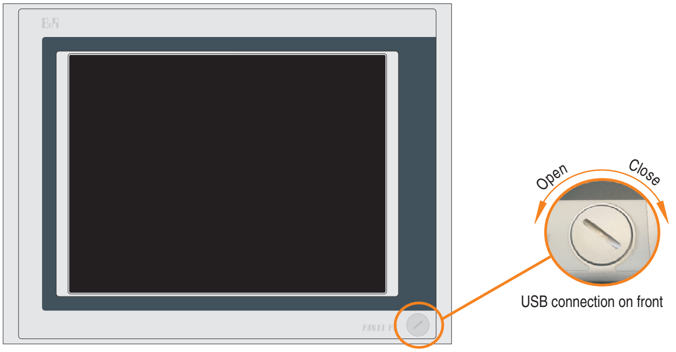
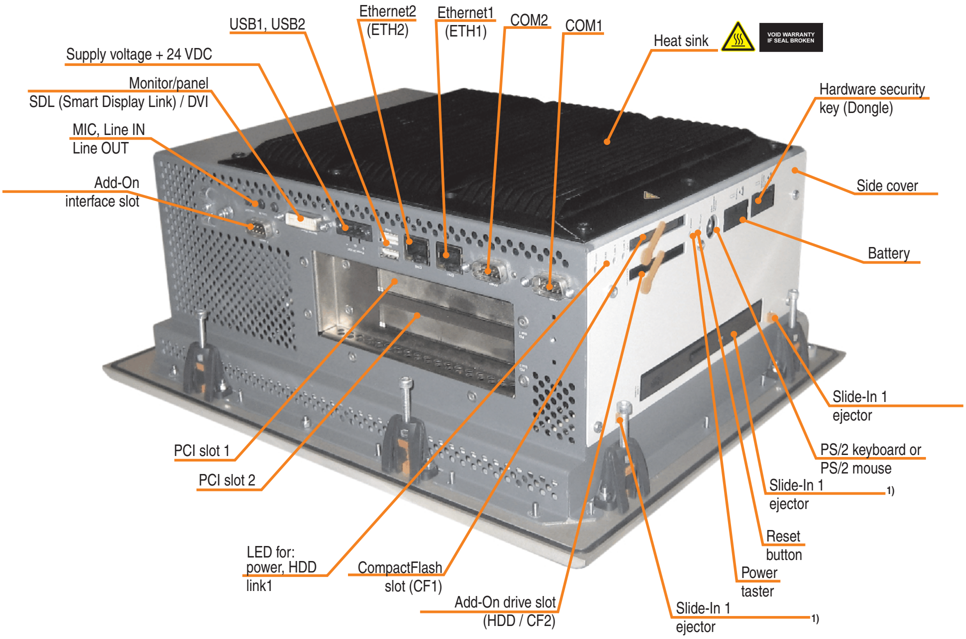


Figure 49: Front view 5PC720.1214-01



[1] Remove the side cover of the Panel PC 700 before ejecting!

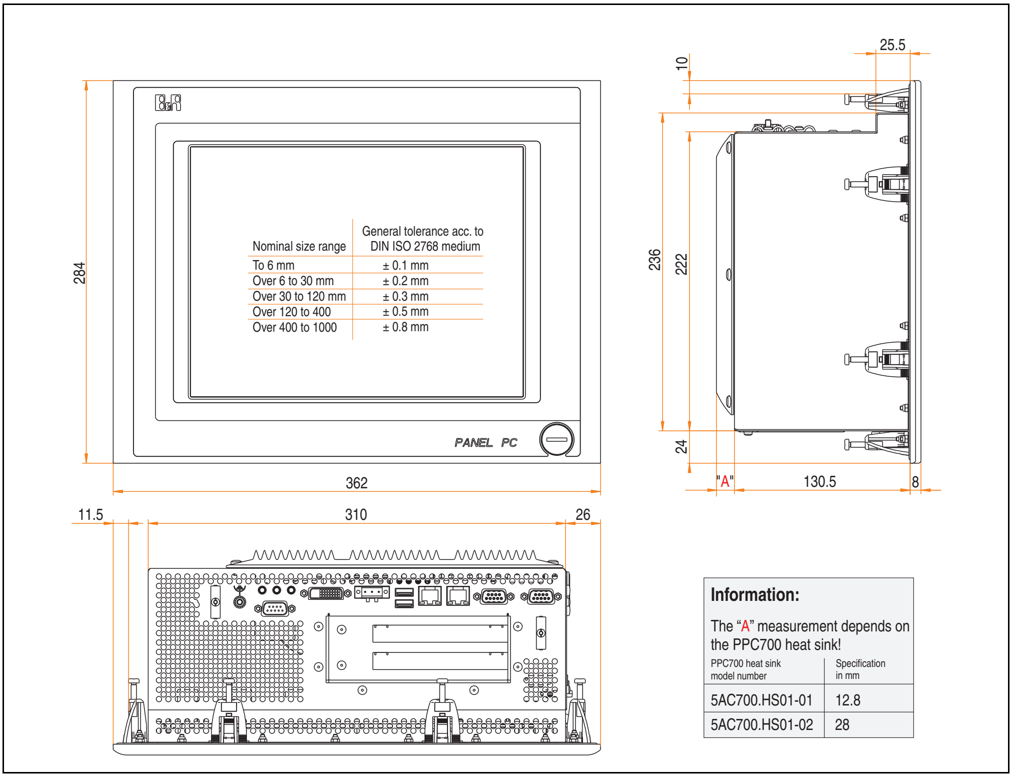
Figure 50: Rear view - 5PC720.1214-01

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



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 51: Dimensions 5PC720.1214-01

Technical data

Features	5PC720.1214-01
Serial interfaces	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78
Type	RS232, modem capable
Amount	2
UART	16550 compatible, 16 byte FIFO
Transfer rate	Max. 115 kBaud
Connection	9-pin DSUB, male
Ethernet	
Controller	See "Ethernet connection ETH1" on page 79 and "Ethernet connection ETH2" on page 82
Transfer rate	10/100 Mbit/s
Connection	RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces	See also "USB port" on page 83
Type	USB 2.0
Amount	3 (2x back side, 1x front side)
Transfer rate	Up to 480 MBit 1) (high speed)
Connection	Type A
Monitor / Panel	See also "Monitor / Panel connection" on page 86
Type	DVI-I, female
AC97 sound	See also "MIC, Line IN and Line OUT ports" on page 86
Inputs	Microphone, Line in
Outputs	Line out
Add-on interface slot	See also "Add-on interface slot" on page 87
Amount	1
PCI slots	2
Amount	
Type	
Default	
CompactFlash slot 1 (CF1)	Yes, see also "CompactFlash slot (CF1)" on page 90
Internal organization	Primary master
CompactFlash slot 2 / hard disk (HDD/CF2)	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91
Type	Combined
Internal organization	Primary slave
Insert for slide-in drive 1	-
Internal organization	
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse	Yes, see also "PS/2 keyboard/mouse" on page 93
Type	Combined, will be automatically detected
Battery	Yes, see also "Battery" on page 94
Type	Renata 950 mAh
Removable	Yes, accessible from the outside
Lifespan	4 years 2)
Hardware security key compartment	Yes, see also "Hardware security key" on page 96
Optimized for	DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED	See also "Status LEDs" on page 89
Amount	3 (Power, HDD, Link 1)

Table 55: Technical data - 5PC720.1214-01

Features	**5PC720.1214-01**
Touch screen 3)	
Technology	Analog, resistive
Controller	Elo, serial, 12-bit
Degree of transmission	Up to 78%
Display	
Type	Color TFT
Diagonal	12.1 inch (307 mm)
Colors	262144 colors
Resolution	SVGA, 800 x 600 pixels
Contrast	300:1
Viewing angle (see page 633)	
Horizontal	Direction R / direction L =70°
Vertical	Direction U / direction D = 70°
Background lighting	
Brightness	350 cd/m^2
Half-brightness time 4)	50000 hours
Keys	-
Function keys	
Soft keys	
Cursor keys	
Number block	
Other keys	
Key lifespan	
LED brightness	
Electrical characteristics	
Power supply	See also "Supply voltage" on page 84
Rated voltage	24 VDC ±25%
Rated current	3.8 A
Starting current	Typ. 10 A, max. 40 A for < 300 µs
Power consumption	See power management section "12.1" Panel PC 700" on page 72
Electrical isolation	Yes
Mechanical characteristics	
Front	
Frame	Aluminum, naturally anodized 5)
Design	Gray 5)
Membrane	Polyester
Dark gray border around display	Similar to Pantone 432CV 5)
Light background	Similar to Pantone 427CV 5)
Gasket	Flat gasket around display front
Housing	Metal
Outer dimensions	Also see drawing "Dimensions 5PC720.1214-01" on page 119
Width	362 mm
Height	284 mm
Depth	151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 5.3 kg
Environmental characteristics	
Ambient temperature	
Operation	See section 2.1.4 "Ambient temperatures with system unit 5PC720.1214-01" on page 52.
Storage	-30°C .. +70°C
Transport	-30°C .. +70°C

Table 55: Technical data - 5PC720.1214-01 (cont.)

Environmental characteristics	**5PC720.1214-01**
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 55: Technical data - 5PC720.1214-01 (cont.)

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% results 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.

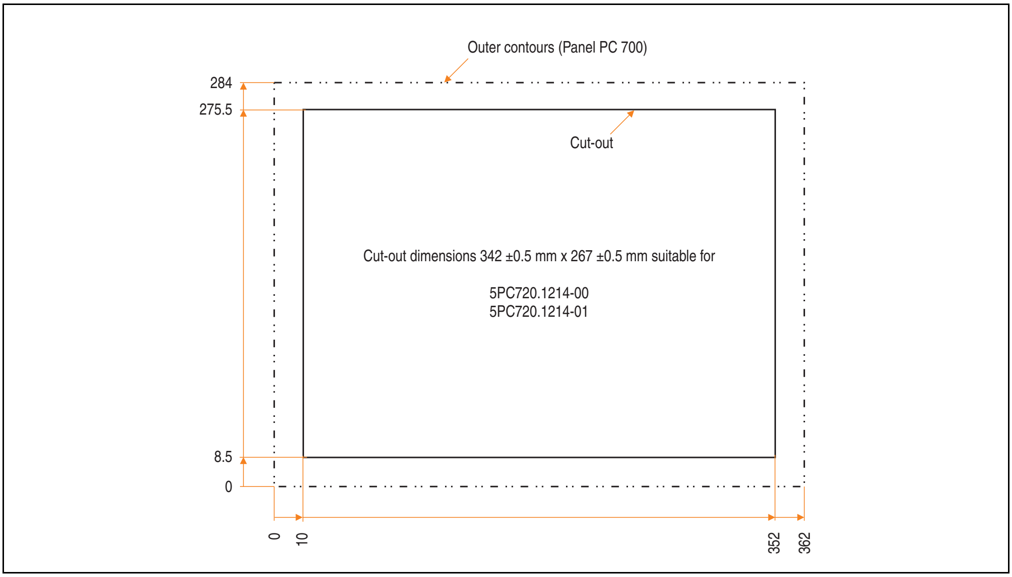

Outer contours (Panel PC 700)
284
275.5
Cut-out
Cut-out dimensions 342 ±0.5 mm x 267 ±0.5 mm suitable for
5PC720.1214-00
5PC720.1214-01
8.5
0
0
10
352
362

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.5 Panel PC 5PC720.1505-00

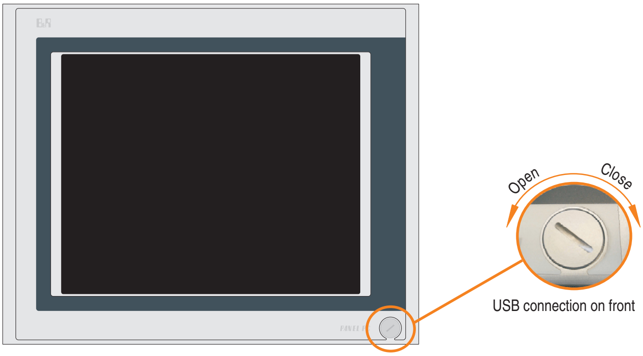


Figure 53: Front view 5PC720.1505-00

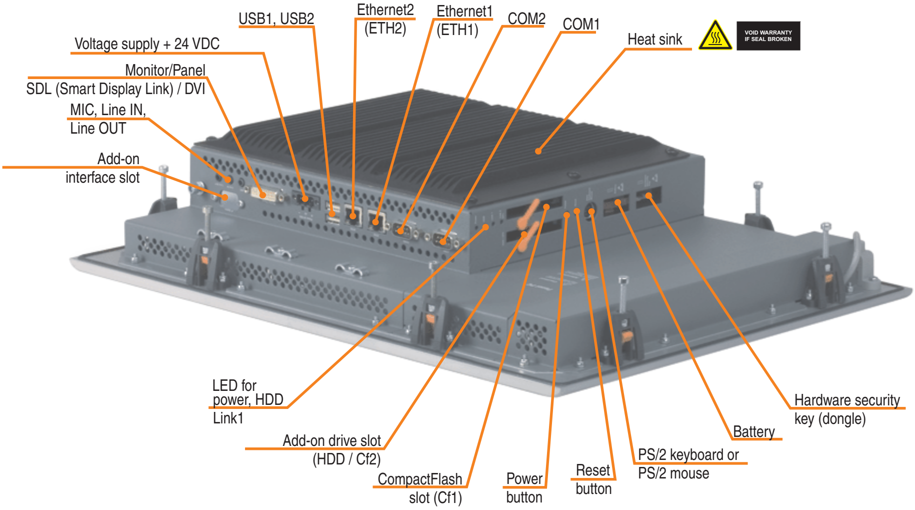


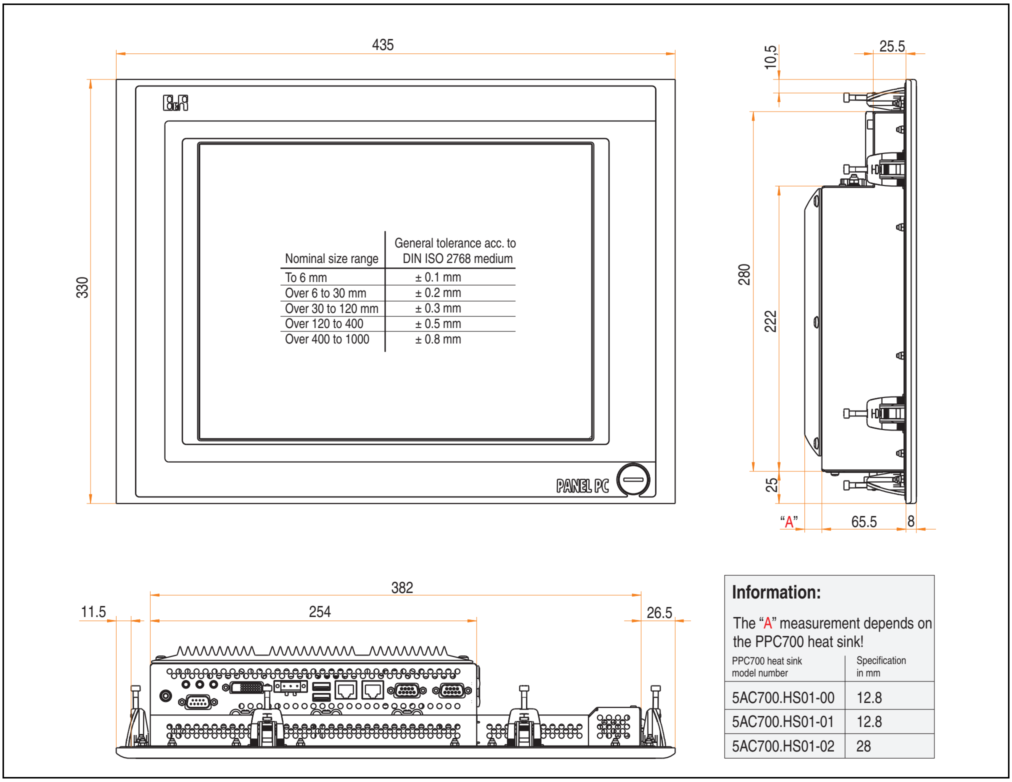
Figure 54: Rear view 5PC720.1505-00

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
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 56: Technical data - 5PC720.1505-00

Features	5PC720.1505-00
Touch screen [3)] Technology Controller Degree of transmission	 Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 633) 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 50000 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 84 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "15" Panel PC 700" on page 73 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Aluminum, naturally anodized[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 drawing "Dimensions - 5PC720.1505-00" on page 125 435 mm 330 mm 86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 6 kg
Environmental characteristics	
Ambient temperature Operation Storage Transport	 See section 2.1.5 "Ambient temperatures with system unit 5PC720.1505-00" on page 53. -20°C .. +60°C -20°C .. +60°C
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing

Table 56: Technical data - 5PC720.1505-00 (cont.)

Environmental characteristics	5PC720.1505-00
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 56: Technical data - 5PC720.1505-00 (cont.)

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% results 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.

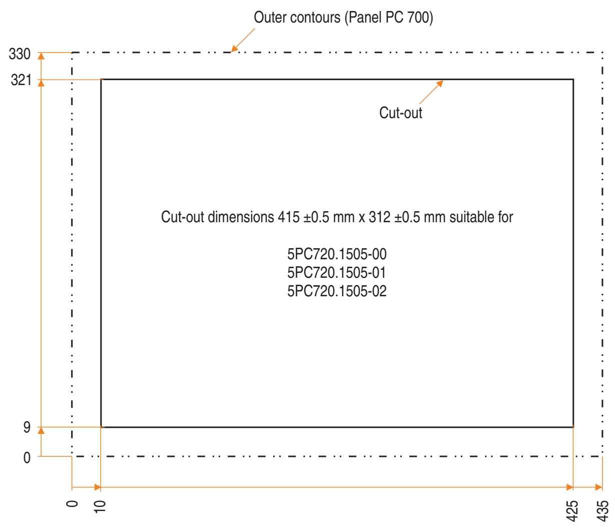

Outer contours (Panel PC 700)
330
321
Cut-out
Cut-out dimensions 415 ±0.5 mm x 312 ±0.5 mm suitable for
5PC720.1505-00
5PC720.1505-01
5PC720.1505-02
9
0
0
10
425
435

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.6 Panel PC 5PC720.1505-01

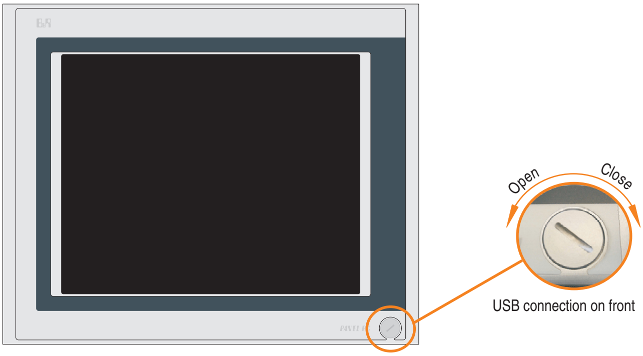
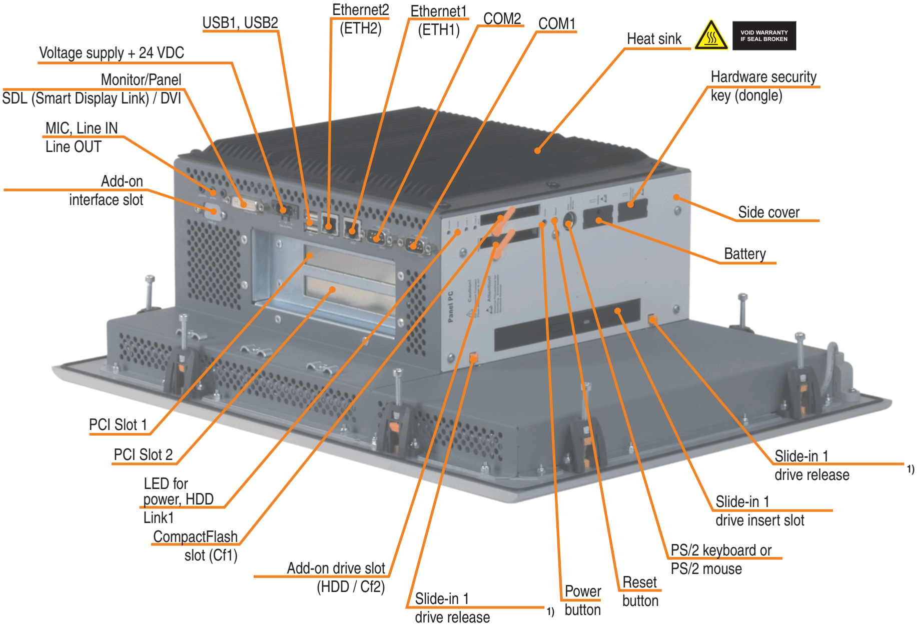


Figure 57: Front view 5PC720.1505-01


USB1, USB2
Ethernet2 (ETH2)
Ethernet1 (ETH1)
COM2
COM1
Heat sink
VOID WARRANTY IF SEAL BROKEN
Voltage supply + 24 VDC
Monitor/Panel SDL (Smart Display Link) / DVI
Hardware security key (dongle)
MIC, Line IN Line OUT
Add-on interface slot
Side cover
Battery
PCI Slot 1
PCI Slot 2
Slide-in 1 drive release 1)
Slide-in 1 drive insert slot
LED for power, HDD Link1
CompactFlash slot (Cf1)
PS/2 keyboard or PS/2 mouse
Add-on drive slot (HDD / Cf2)
Reset button
Power button
Slide-in 1 drive release 1)

1) The side cover of the Panel PC 700 must be removed before releasing the drive!

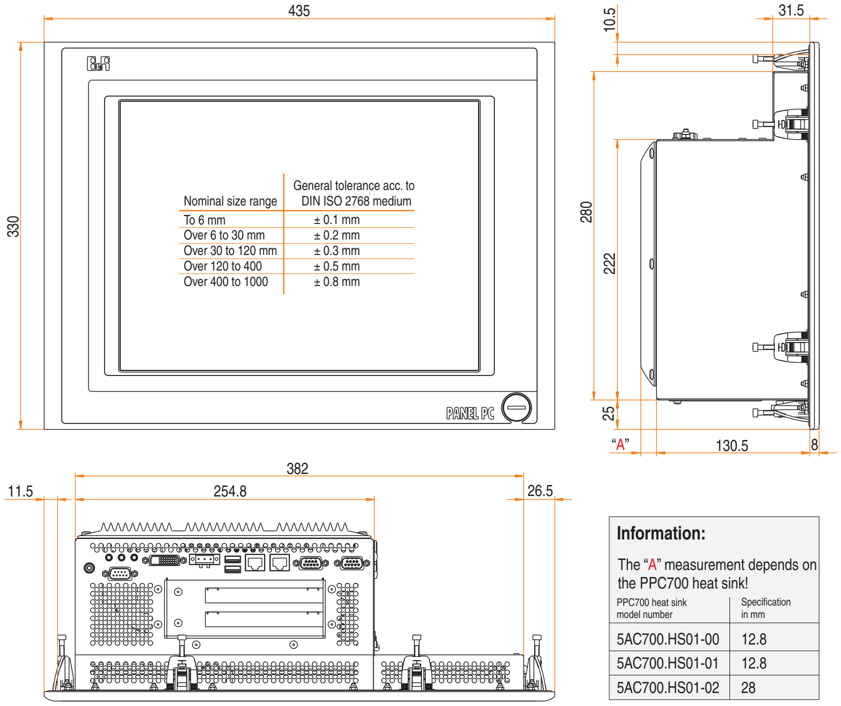
Figure 58: Rear view 5PC720.1505-01

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



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 59: Dimensions - 5PC720.1505-01

Technical data

Features	5PC720.1505-01
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	See also "PCI slots" on page 88 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 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot" on page 97 Secondary slave
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.3 "Fan kit 5PC700.FA02-01" on page 257
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 57: Technical data - 5PC720.1505-01

Features	**5PC720.1505-01**
Touch screen 3)	
Technology	Analog, resistive
Controller	Elo, serial, 12-bit
Degree of transmission	Up to 78%
Display	
Type	Color TFT
Diagonal	15 inch (381 mm)
Colors	16 million
Resolution	XGA, 1024 x 768 pixels
Contrast	400:1
Viewing angle (see page 633)	
Horizontal	Direction R / direction L =85°
Vertical	Direction U / direction D = 85°
Background lighting	
Brightness	250 cd/m²
Half-brightness time 4)	50000 hours
Keys/LED	-
Function keys	
Soft keys	
Cursor keys	
Number block	
Other keys	
Key lifespan	
LED brightness	
Electrical characteristics	
Power supply	See also "Supply voltage" on page 84
Rated voltage	24 VDC ±25%
Rated current	3.8 A
Starting current	Typ. 10 A, max. 40 A for < 300 µs
Power consumption	See power management section "15" Panel PC 700" on page 73
Electrical isolation	Yes
Mechanical characteristics	
Front	
Frame	Aluminum, naturally anodized 5)
Design	Gray 5)
Membrane	Polyester
Dark gray border around display	Similar to Pantone 432CV 5)
Light background	Similar to Pantone 427CV 5)
Gasket	Flat gasket around display front
Housing	Metal
Outer dimensions	Also see drawing "Dimensions - 5PC720.1505-01" on page 130
Width	435 mm
Height	330 mm
Depth	151.3 or 166.5 mm (depending on the heat sink)
Weight	Approx. 6.7 kg
Environmental characteristics	
Ambient temperature	
Operation	See section 2.1.6 "Ambient temperatures with system unit 5PC720.1505-01" on page 54.
Storage	-20°C .. +60°C
Transport	-20°C .. +60°C

Table 57: Technical data - 5PC720.1505-01 (cont.)

Environmental characteristics	5PC720.1505-01
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 57: Technical data - 5PC720.1505-01 (cont.)

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% results 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.

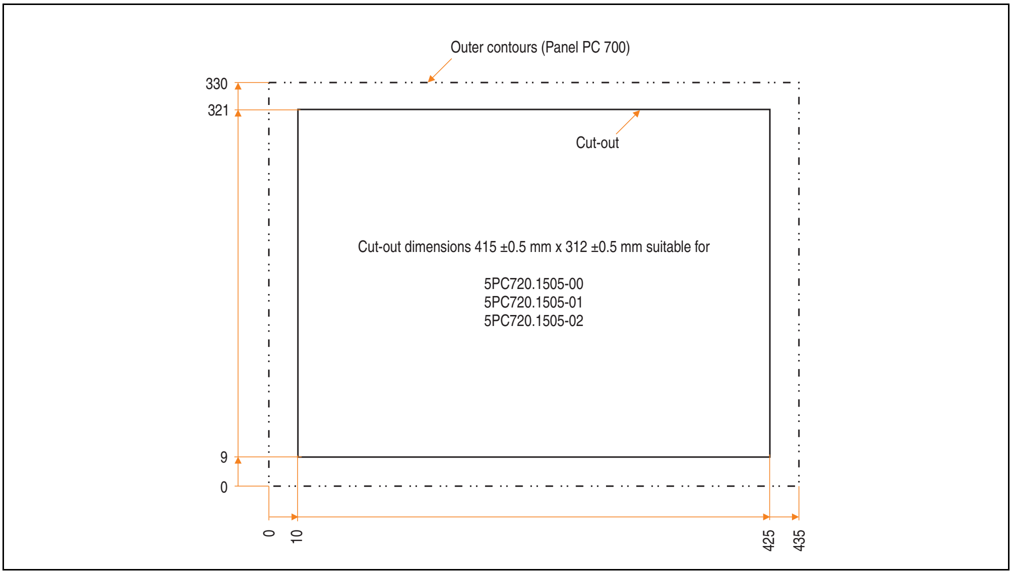

Outer contours (Panel PC 700)
Cut-out
Cut-out dimensions 415 ±0.5 mm x 312 ±0.5 mm suitable for
5PC720.1505-00
5PC720.1505-01
5PC720.1505-02
330
321
9
0
0
10
425
435

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.7 Panel PC 5PC720.1505-02

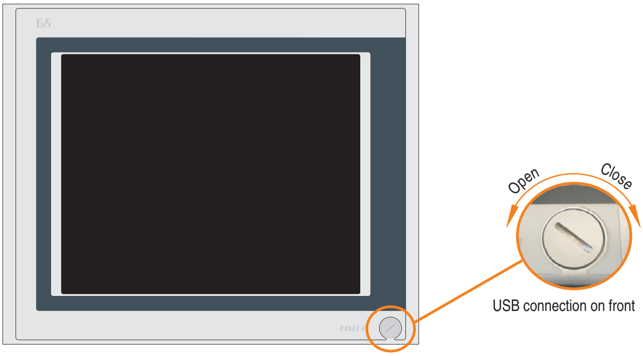
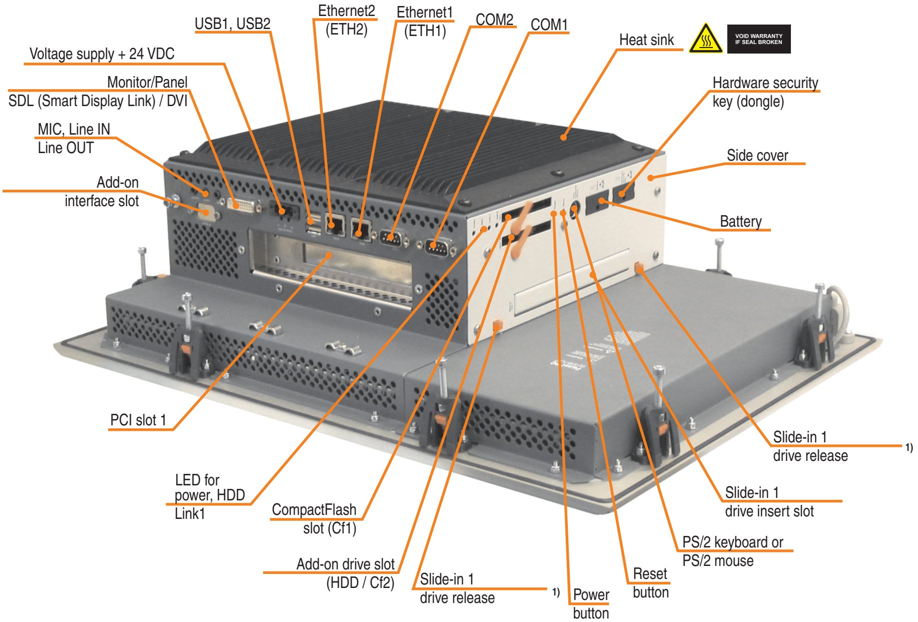


Figure 61: Front view 5PC720.1505-02


USB1, USB2
Ethernet2 (ETH2)
Ethernet1 (ETH1)
COM2
COM1
Heat sink
VOID WARRANTY IF SEAL BROKEN
Voltage supply + 24 VDC
Monitor/Panel SDL (Smart Display Link) / DVI
MIC, Line IN Line OUT
Add-on interface slot
Hardware security key (dongle)
Side cover
Battery
PCI slot 1
Slide-in 1 drive release 1)
LED for power, HDD Link1
CompactFlash slot (Cf1)
Slide-in 1 drive insert slot
PS/2 keyboard or PS/2 mouse
Add-on drive slot (HDD / Cf2)
Slide-in 1 drive release 1)
Power button
Reset button

1) The side cover of the Panel PC 700 must be removed before releasing the drive!

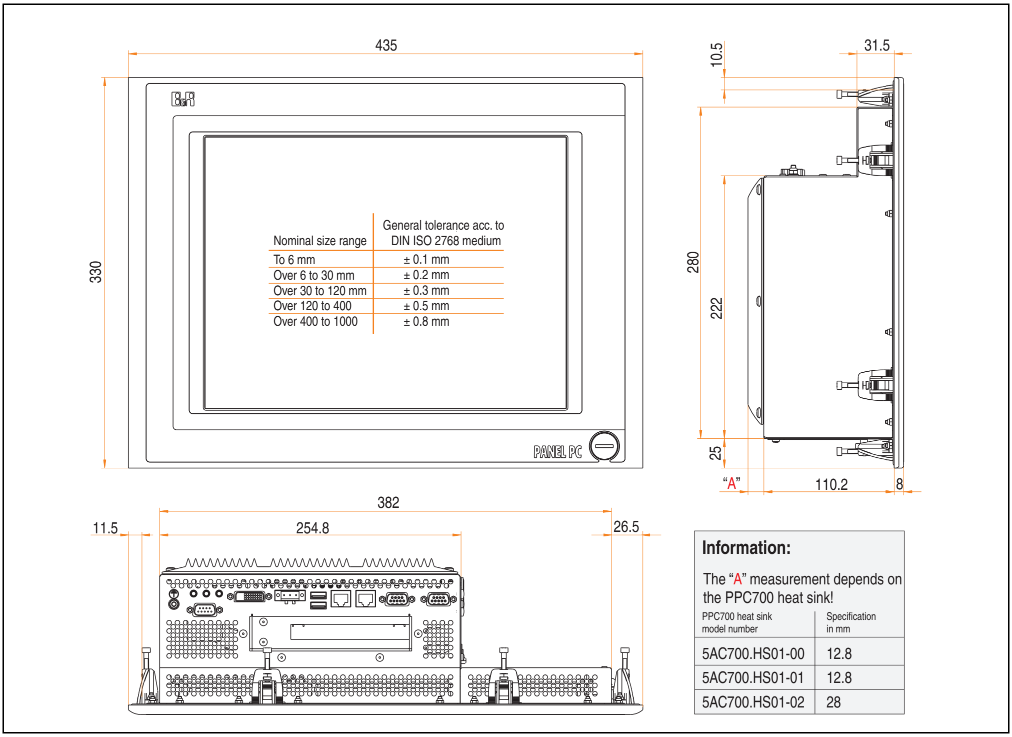
Figure 62: Rear view 5PC720.1505-02

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



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 63: Dimensions - 5PC720.1505-02

Technical data

Features	5PC720.1505-02
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	See also "PCI slots" on page 88 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 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	Yes, see also "Slide-in slot 1 drive slot" on page 97 Secondary slave
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.3 "Fan kit 5PC700.FA02-01" on page 257
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 58: Technical data - 5PC720.1505-02

Features	5PC720.1505-02
Touch screen 3)	
Technology	Analog, resistive
Controller	Elo, serial, 12-bit
Degree of transmission	Up to 78%
Display	
Type	Color TFT
Diagonal	15 inch (381 mm)
Colors	16 million
Resolution	XGA, 1024 x 768 pixels
Contrast	400:1
Viewing angle (see page 633)	
Horizontal	Direction R / direction L =85°
Vertical	Direction U / direction D = 85°
Background lighting	
Brightness	250 cd/m²
Half-brightness time 4)	50000 hours
Keys/LED	-
Function keys	
Soft keys	
Cursor keys	
Number block	
Other keys	
Key lifespan	
LED brightness	
Electrical characteristics	
Power supply	See also "Supply voltage" on page 84
Rated voltage	24 VDC ±25%
Rated current	3.8 A
Starting current	Typ. 10 A, max. 40 A for < 300 µs
Power consumption	See power management section "15" Panel PC 700" on page 73
Electrical isolation	Yes
Mechanical characteristics	
Front	
Frame	Aluminum, naturally anodized 5)
Design	Gray 5)
Membrane	Polyester
Dark gray border around display	Similar to Pantone 432CV 5)
Light background	Similar to Pantone 427CV 5)
Gasket	Flat gasket around display front
Housing	Metal
Outer dimensions	Also see drawing "Dimensions - 5PC720.1505-02" on page 136
Width	435 mm
Height	330 mm
Depth	131 or 146.2 mm (depending on the heat sink)
Weight	Approx. 6.5 kg
Environmental characteristics	
Ambient temperature	
Operation	See section 2.1.7 "Ambient temperatures with system unit 5PC720.1505-02" on page 56
Storage	-20°C .. +60°C
Transport	-20°C .. +60°C
Relative humidity	T <= 40°C: 5% to 90%, non-condensing
Operation / Storage / Transport	T > 40°C: < 90%, non-condensing

Table 58: Technical data - 5PC720.1505-02 (cont.)

Environmental characteristics	5PC720.1505-02
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 58: Technical data - 5PC720.1505-02 (cont.)

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% results 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.

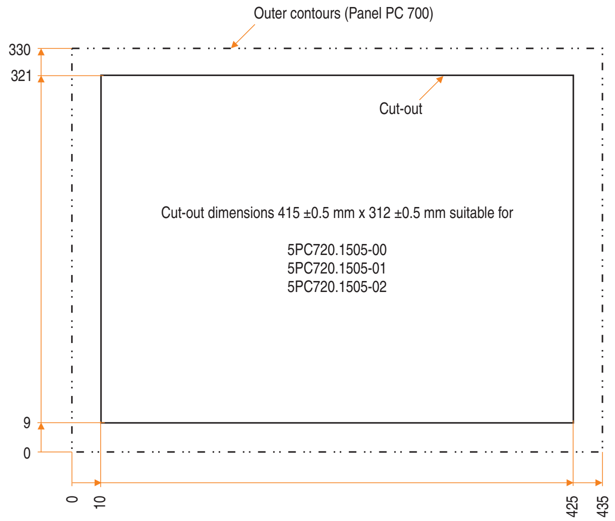

Outer contours (Panel PC 700)
330
321
Cut-out
Cut-out dimensions 415 ±0.5 mm x 312 ±0.5 mm suitable for
5PC720.1505-00
5PC720.1505-01
5PC720.1505-02
9
0
0
10
425
435

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.8 Panel PC 5PC720.1706-00

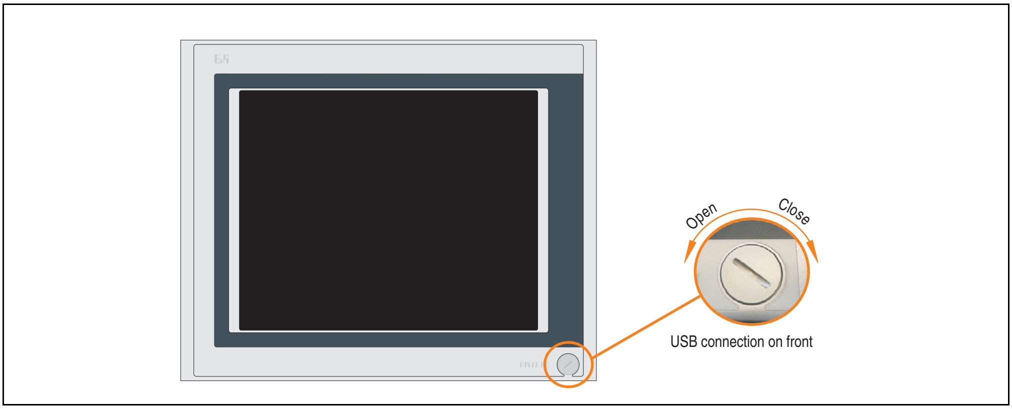


Figure 65: Front view 5PC720.1706-00

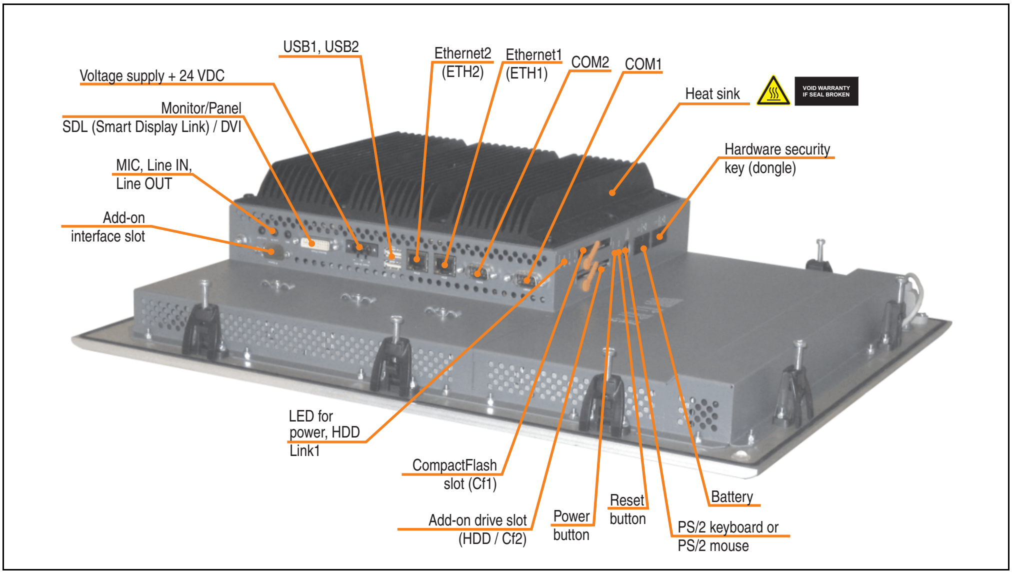


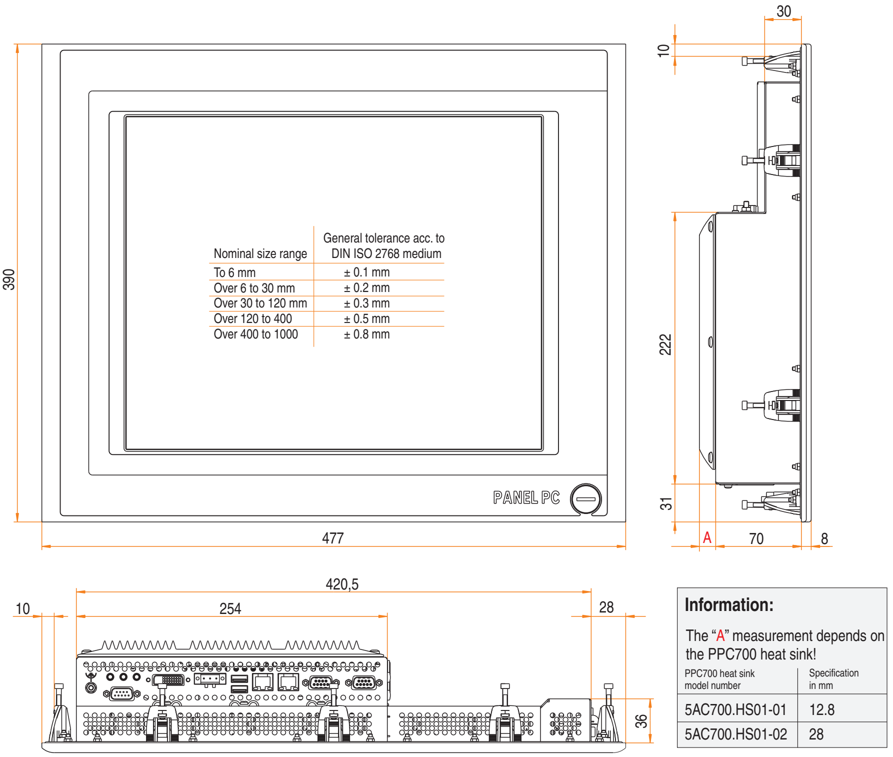
Figure 66: Rear view 5PC720.1706-00

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
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 59: Technical data - 5PC720.1706-00

Features	5PC720.1706-00
Touch screen [3)] Technology Controller Degree of transmission	 Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 633) 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 50000 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 84 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "17" Panel PC 700" on page 74 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Aluminum, naturally anodized[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 drawing "Dimensions - 5PC720.1706-00" on page 141 477 mm 390 mm 90.8 or 106 mm (depending on the heat sink)
Weight	Approx. 7.7 kg
Environmental characteristics	
Ambient temperature Operation Storage Transport	 See section 2.1.8 "Ambient temperatures with system unit 5PC720.1706-00" on page 58. -20°C .. +60°C -20°C .. +60°C
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing

Table 59: Technical data - 5PC720.1706-00 (cont.)

Environmental characteristics	5PC720.1706-00
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 59: Technical data - 5PC720.1706-00 (cont.)

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% results 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.

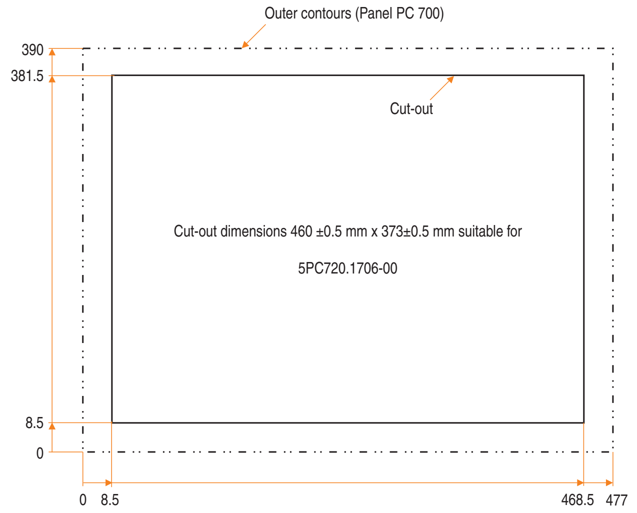

Outer contours (Panel PC 700)
390
381.5
Cut-out
Cut-out dimensions 460 ±0.5 mm x 373±0.5 mm suitable for
5PC720.1706-00
8.5
0
0
8.5
468.5
477

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.9 Panel PC 5PC720.1906-00

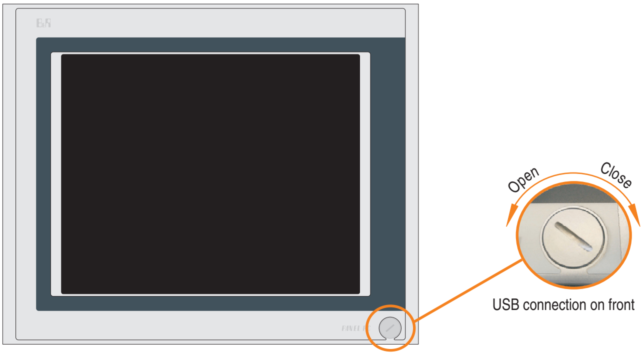


Figure 69: Front view 5PC720.1906-00

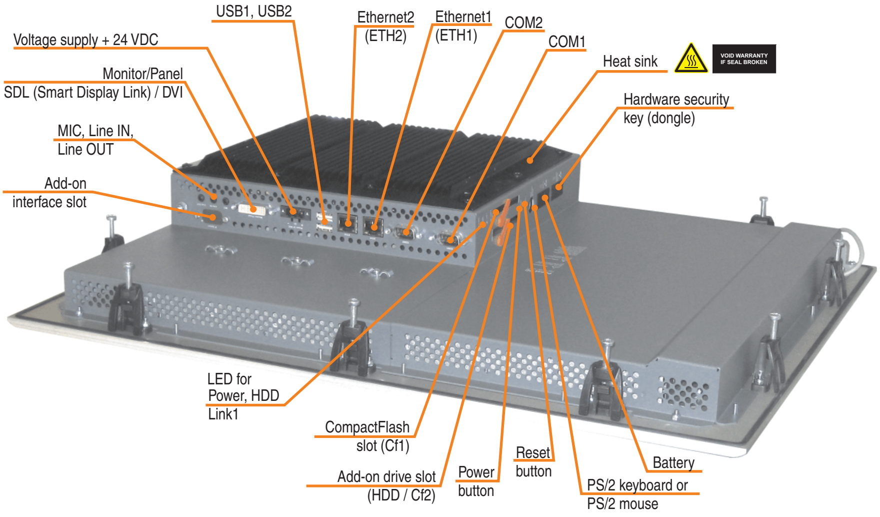


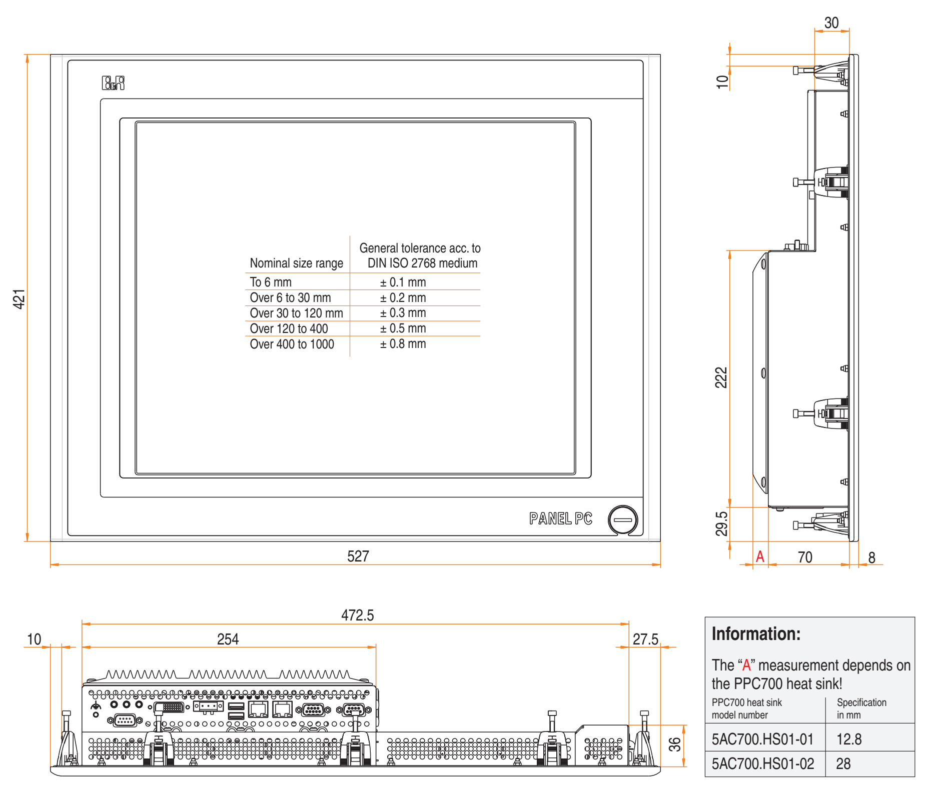
Figure 70: Rear view 5PC720.1906-00

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
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 60: Technical data - 5PC720.1906-00

Features	5PC720.1906-00
Touch screen [3)] Technology Controller Degree of transmission	 Analog, resistive Elo, serial, 12-bit Up to 78%
Display Type Diagonal Colors Resolution Contrast Viewing angle (see page 633) 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 50000 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 84 24 VDC ±25% 3.8 A Typ. 10 A, max. 40 A for < 300 µs See power management section "19" Panel PC 700" on page 75 Yes
Mechanical characteristics	
Front Frame Design Membrane Dark gray border around display Light background Gasket	 Aluminum, naturally anodized[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 drawing "Dimensions - 5PC720.1906-00" on page 146 527 mm 421 mm 90.8 or 106 mm (depending on the heat sink)
Weight	Approx. 9 kg
Environmental characteristics	
Ambient temperature Operation Storage Transport	 See section 2.1.9 "Ambient temperatures with system unit 5PC720.1906-00" on page 59. -20°C .. +60°C -20°C .. +60°C
Relative humidity Operation / Storage / Transport	T <= 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing

Table 60: Technical data - 5PC720.1906-00 (cont.)

Environmental characteristics	5PC720.1906-00
Vibration Operation (continuous) Operation (occasional) Storage 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 Storage 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. 3000 m

Table 60: Technical data - 5PC720.1906-00 (cont.)

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% results 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.

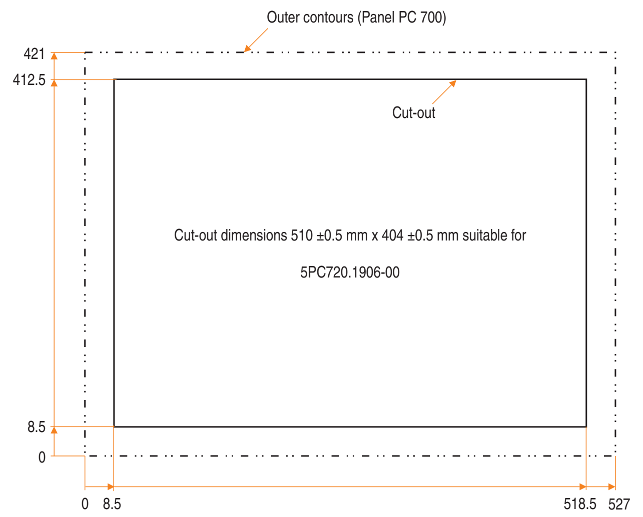

Outer contours (Panel PC 700)
421
412.5
Cut-out
Cut-out dimensions 510 ±0.5 mm x 404 ±0.5 mm suitable for
5PC720.1906-00
8.5
0
0
8.5
518.5
527

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.10 Panel PC 5PC781.1043-00

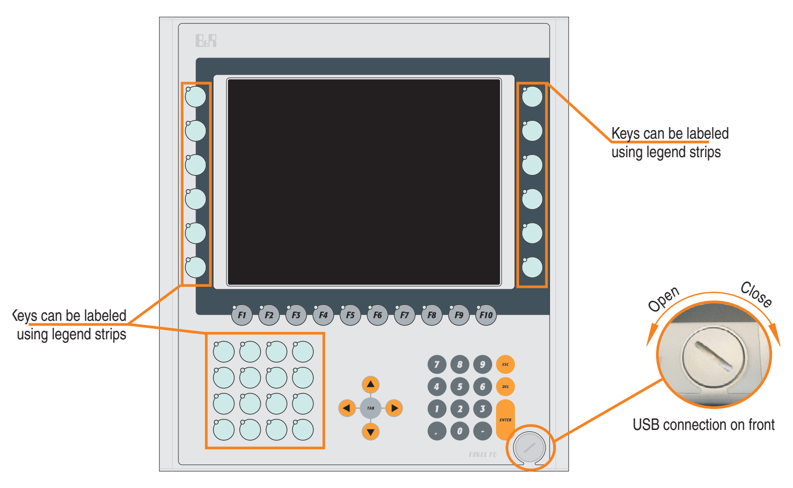

Keys can be labeled using legend strips
Keys can be labeled using legend strips
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
TAB
ESC
DEL
ENTER
Open
Close
USB connection on front

Figure 73: Front view 5PC781.1043-00

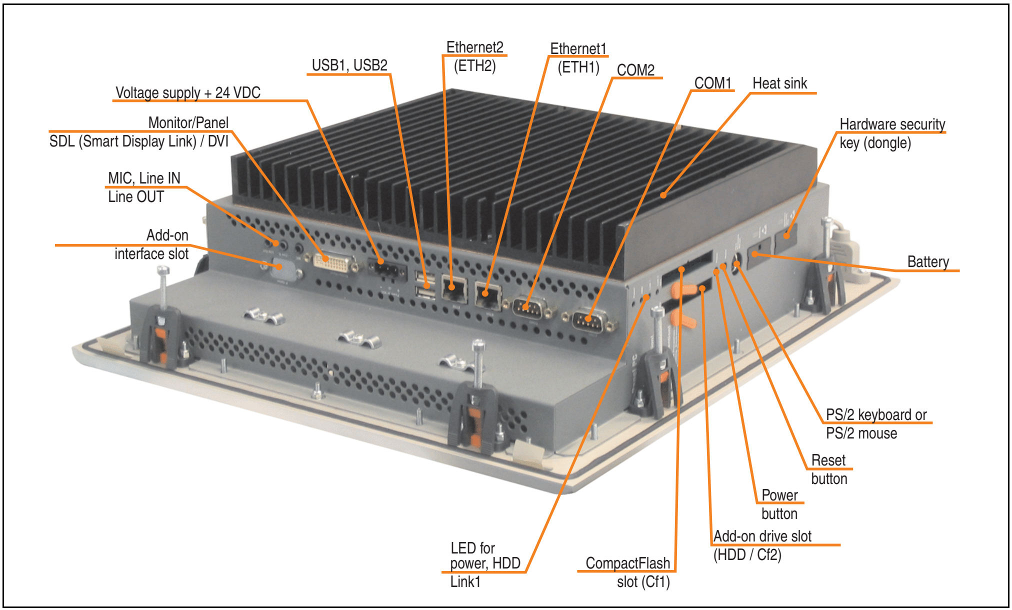


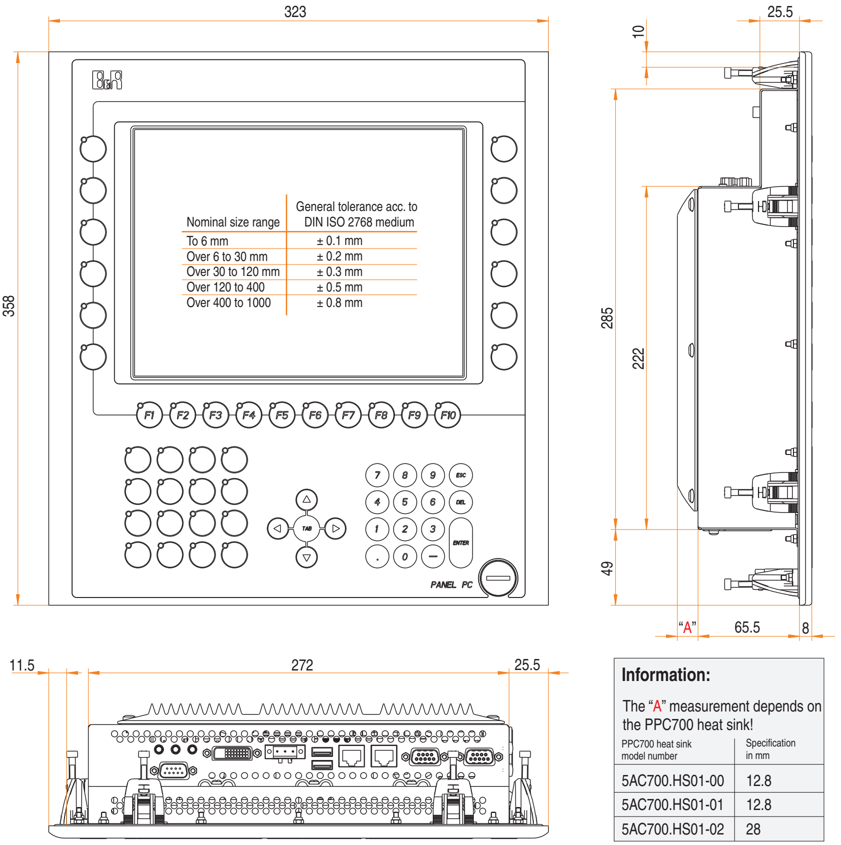
Figure 74: Rear view 5PC781.1043-00

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



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 75: Dimensions - 5PC781.1043-00

Technical data

Features	5PC781.1043-00
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 61: Technical data - 5PC781.1043-00

Features	**5PC781.1043-00**
Touch screen 3)	
Technology	Analog, resistive
Controller	Elo, serial, 12-bit
Degree of transmission	Up to 78%
Display	
Type	Color TFT
Diagonal	10.4 inch (264 mm)
Colors	262144 colors
Resolution	VGA, 640 x 480 pixels
Contrast	300:1
Viewing angle (see page 633)	
Horizontal	Direction R / direction L =70°
Vertical	Direction U / direction D = 70°
Background lighting	
Brightness	350 cd/m²
Half-brightness time 4)	50000 hours
Keys/LED 5)	
Function keys	28 with LED (yellow)
Soft keys	10 with LED (yellow)
Cursor keys	-
Number block	15 without LED
Other keys	5 without LED
Key lifespan	> 1,000,000 actuations with 1 ±0.3 to 3 ±0.3 N operating force
LED brightness	Typically 12 mcd (yellow)

Caution!

Pressing more than 2 keys at the same time can cause phantom keystrokes and trigger unintended actions.

Electrical characteristics	
Power supply	See also "Supply voltage" on page 84
Rated voltage	24 VDC ±25%
Rated current	3.8 A
Starting current	Typ. 10 A, max. 40 A for < 300 µs
Power consumption	See power management section "10.4" Panel PC 700" on page 71
Electrical isolation	Yes
Mechanical characteristics	
Front	
Frame	Aluminum, naturally anodized 6)
Design	Gray 6)
Membrane	Polyester
Dark gray border around display	Similar to Pantone 432CV 6)
Light background	Similar to Pantone 427CV 6)
Orange keys	Similar to Pantone 151CV 6)
Dark gray keys	Similar to Pantone 431CV 6)
Color legend strips	Similar to Pantone 429CV 6)
Gasket	Flat gasket around display front
Outer dimensions	Also see drawing "Dimensions - 5PC781.1043-00" on page 151
Width	323 mm
Height	358 mm
Depth	86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 4.5 kg

Table 61: Technical data - 5PC781.1043-00 (cont.)

Environmental characteristics	5PC781.1043-00
Ambient temperature Operation Storage Transport	 See Section 2.1.10 "Ambient temperatures with system unit 5PC781.1043-00" on page 60 -30°C .. +70°C -30°C .. +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) Storage 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 Storage 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. 3000 m

Table 61: Technical data - 5PC781.1043-00 (cont.)

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% results 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.

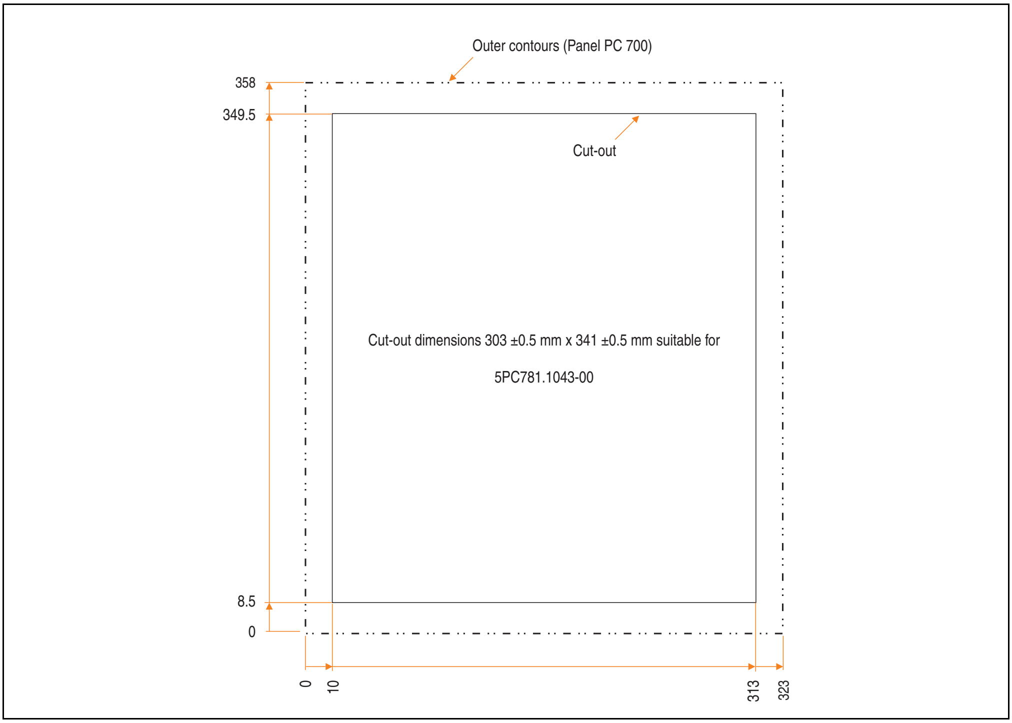

Outer contours (Panel PC 700)
358
349.5
Cut-out
Cut-out dimensions 303 ±0.5 mm x 341 ±0.5 mm suitable for
5PC781.1043-00
8.5
0
0
10
313
323

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.11 Panel PC 5PC781.1505-00

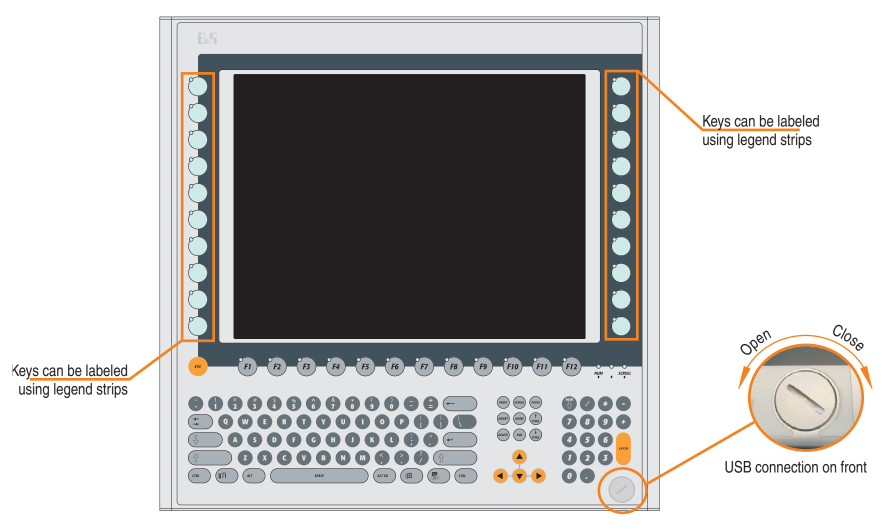

Keys can be labeled using legend strips
Keys can be labeled using legend strips
Open
Close
USB connection on front
ESC
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12

Figure 77: Front view 5PC781.1505-00

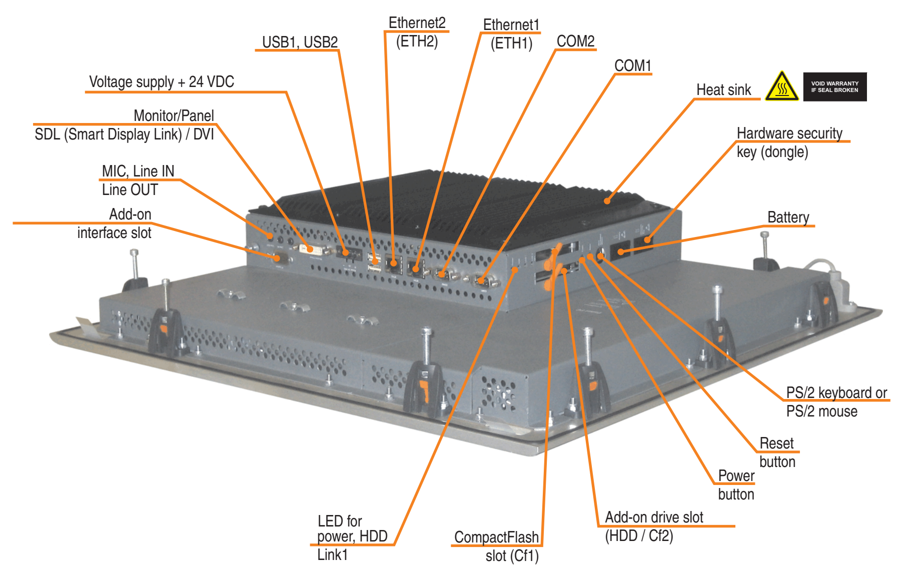


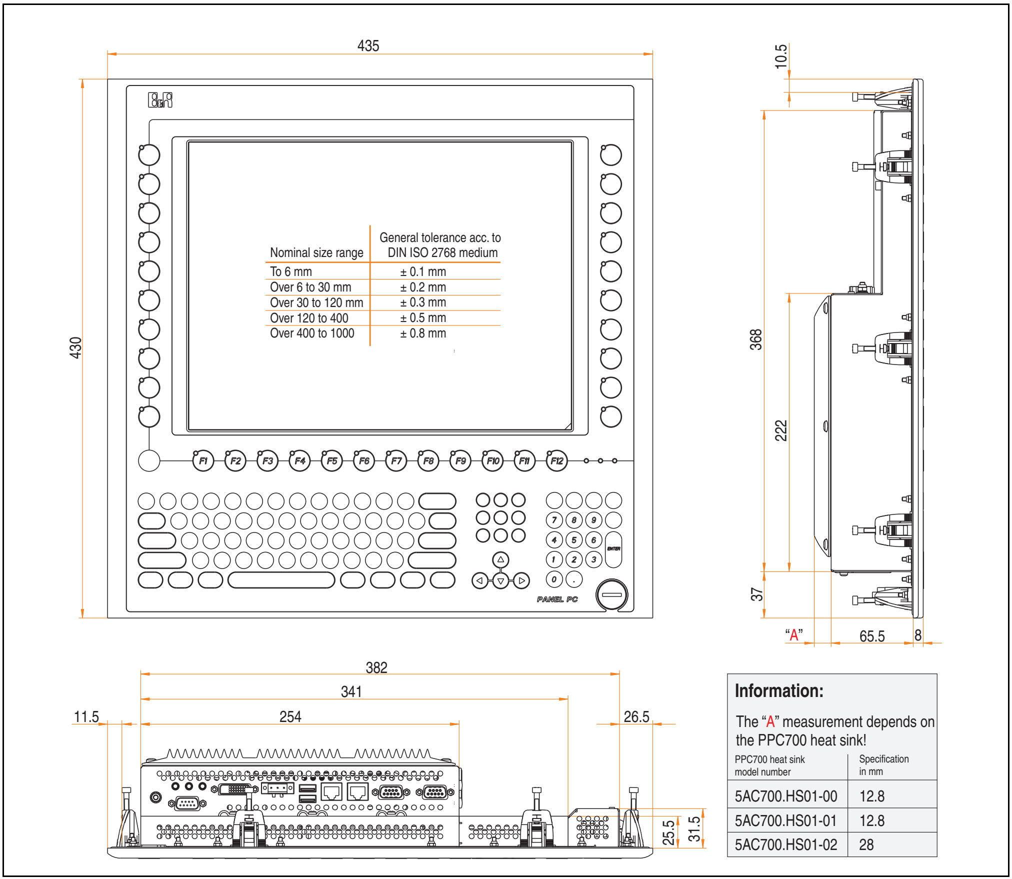
Figure 78: Rear view 5PC781.1505-00

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



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 79: Dimensions - 5PC781.1505-00

Technical data

Features	5PC781.1505-00
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 62: Technical data - 5PC781.1505-00

Features	5PC781.1505-00
Touch screen [3]	
Technology	Analog, resistive
Controller	Elo, serial, 12-bit
Degree of transmission	Up to 78%
Display	
Type	Color TFT
Diagonal	15 inch (381 mm)
Colors	16 million
Resolution	XGA, 1024 x 768 pixels
Contrast	400:1
Viewing angle (see page 633)	
Horizontal	Direction R / direction L =85°
Vertical	Direction U / direction D = 85°
Background lighting	
Brightness	250 cd/m²
Half-brightness time[4]	50000 hours
Keys/LED[5]	
Function keys	20 with LED (yellow)
Soft keys	12 with LED (yellow)
Cursor keys	-
Number block	15 without LED
Other keys	77 without LED
Key lifespan	> 1,000,000 actuations with 1 ±0.3 to 3 ±0.3 N operating force
LED brightness	Typically 12 mcd (yellow)

Caution!

Pressing more than 2 keys at the same time can cause phantom keystrokes and trigger unintended actions.

Electrical characteristics	
Power supply	See also "Supply voltage" on page 84
Rated voltage	24 VDC ±25%
Rated current	3.8 A
Starting current	Typ. 10 A, max. 40 A for < 300 µs
Power consumption	See power management section "15" Panel PC 700" on page 73
Electrical isolation	Yes
Mechanical characteristics	
Front	
Frame	Aluminum, naturally anodized[6]
Design	Gray[6]
Membrane	Polyester
Dark gray border around display	Similar to Pantone 432CV[6]
Light background	Similar to Pantone 427CV[6]
Orange keys	Similar to Pantone 151CV[6]
Dark gray keys	Similar to Pantone 431CV[6]
Color legend strips	Similar to Pantone 429CV[6]
Gasket	Flat gasket around display front
Housing	Metal
Outer dimensions	Also see drawing "Dimensions - 5PC781.1505-00" on page 157
Width	435 mm
Height	430 mm
Depth	86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 7.5 kg

Table 62: Technical data - 5PC781.1505-00 (cont.)

Environmental characteristics	5PC781.1505-00
Ambient temperature Operation Storage Transport	 See section 2.1.11 "Ambient temperatures with system unit 5PC781.1505-00" on page 61. -30°C .. +70°C -30°C .. +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) Storage 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 Storage 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. 3000 m

Table 62: Technical data - 5PC781.1505-00 (cont.)

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% results 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.

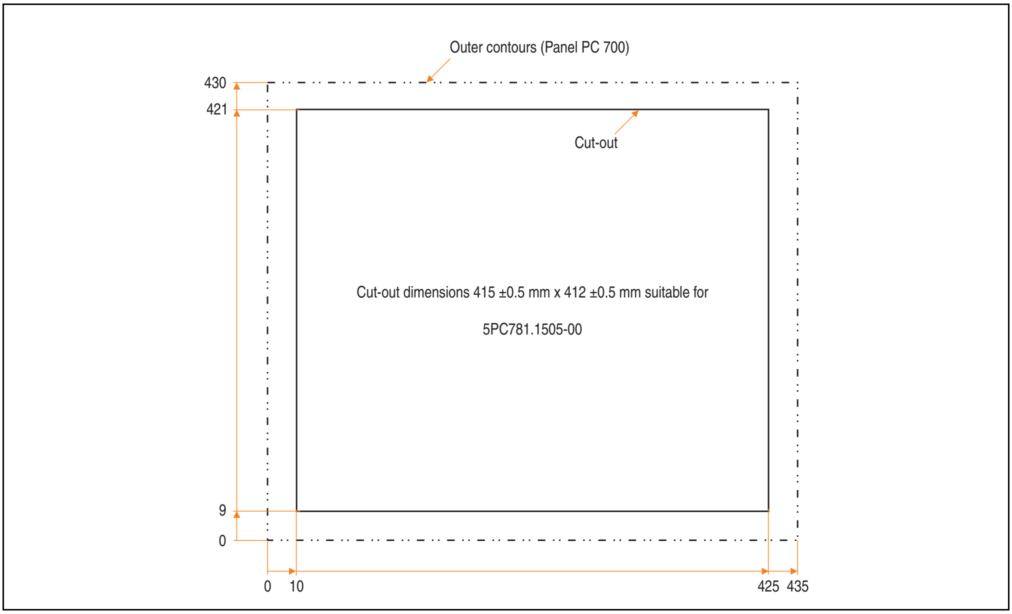

Outer contours (Panel PC 700)
430
421
Cut-out
Cut-out dimensions 415 ±0.5 mm x 412 ±0.5 mm suitable for
5PC781.1505-00
9
0
0
10
425
435

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.1.12 Panel PC 5PC782.1043-00

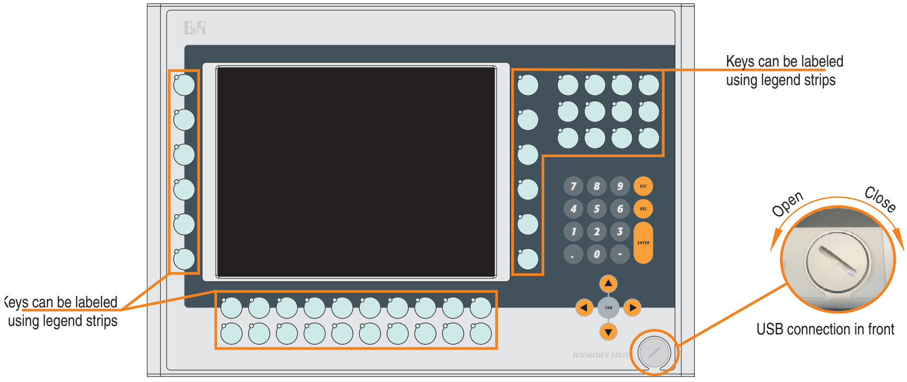

Keys can be labeled using legend strips
Keys can be labeled using legend strips
Open
Close
USB connection in front
7 8 9 ESC
4 5 6 DEL
1 2 3 ENTER
. 0 -
TAB

Figure 81: Front view 5PC782.1043-00

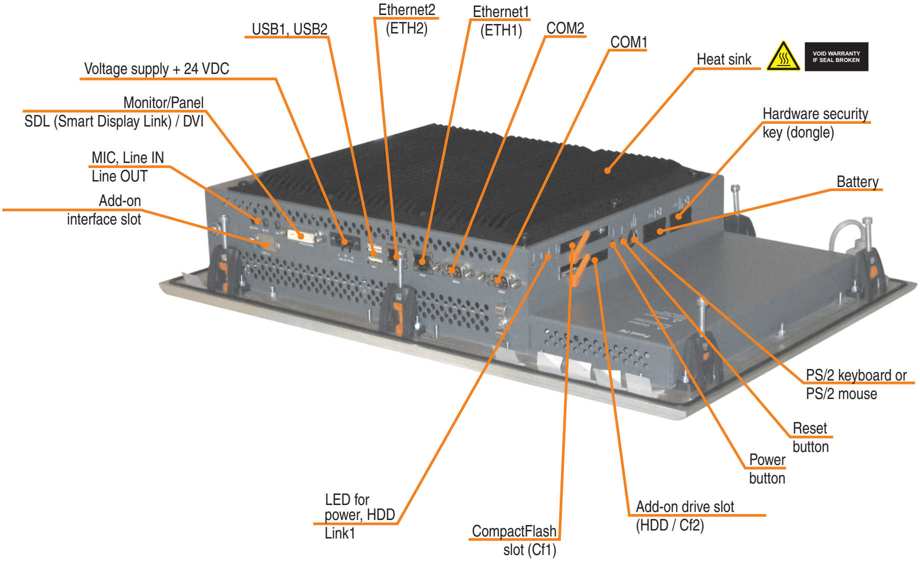


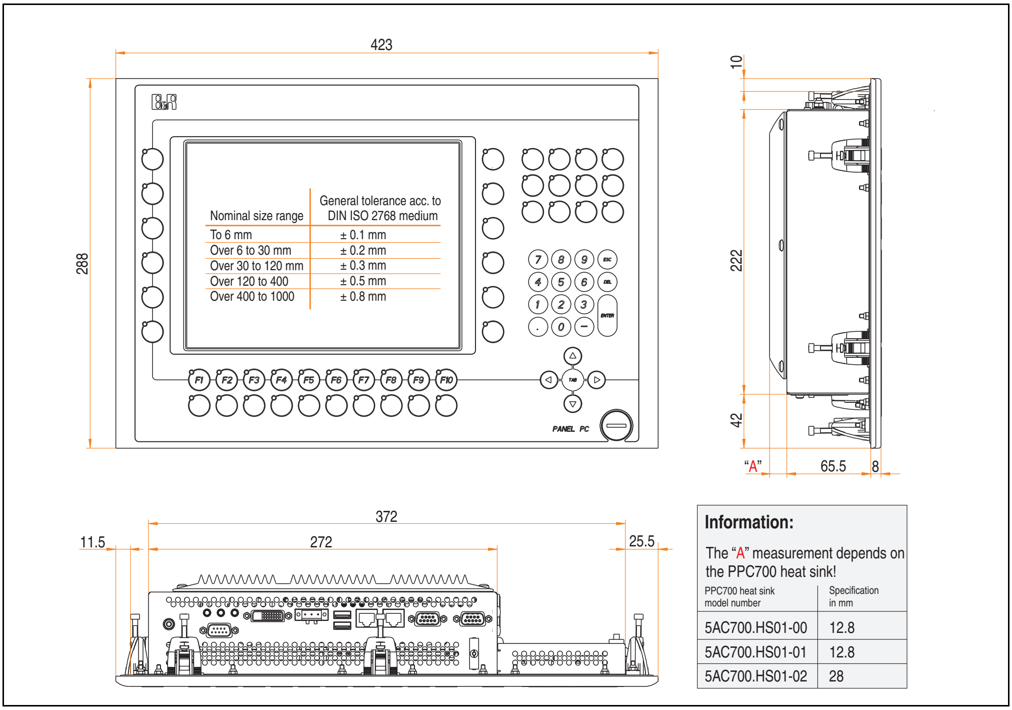
Figure 82: Rear view 5PC782.1043-00

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
Serial interfaces Type Amount UART Transfer rate Connection	See "Serial interfaces COM1" on page 77 and "Serial interfaces COM2" on page 78 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 79 and "Ethernet connection ETH2" on page 82 10/100 Mbit/s RJ45 twisted pair (10 BaseT / 100 BaseT)
USB interfaces Type Amount Transfer rate Connection	See also "USB port" on page 83 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 86 DVI-I, female
AC97 sound Inputs Outputs	See also "MIC, Line IN and Line OUT ports" on page 86 Microphone, Line in Line out
Add-on interface slot Amount	See also "Add-on interface slot" on page 87 1
PCI slots Amount Type Default	-
CompactFlash slot 1 (CF1) Internal organization	Yes, see also "CompactFlash slot (CF1)" on page 90 Primary master
CompactFlash slot 2 / hard disk (HDD/CF2) Type Internal organization	Yes, see also "Hard disk / CompactFlash slot (HDD/CF2)" on page 91 Combined Primary slave
Insert for slide-in drive 1 Internal organization	-
Reset button	Yes, see also "Power button" on page 92
Power button	Yes, see also "Reset button" on page 92
PS/2 keyboard/mouse Type	Yes, see also "PS/2 keyboard/mouse" on page 93 Combined, will be automatically detected
Battery Type Removable Lifespan	Yes, see also "Battery" on page 94 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 96 DS1425 from MAXIM/Dallas)
Fan insert for fan kit	Yes, compatible fan kit - see section 3.9.1 "Fan kit 5PC700.FA00-01" on page 254
LED Amount	See also "Status LEDs" on page 89 3 (Power, HDD, Link 1)

Table 63: Technical data - 5PC782.1043-00

Features	5PC782.1043-00
Touch screen 3)	
Technology	Analog, resistive
Controller	Elo, serial, 12-bit
Degree of transmission	Up to 78%
Display	
Type	Color TFT
Diagonal	10.4 inch (264 mm)
Colors	262144 colors
Resolution	VGA, 640 x 480 pixels
Contrast	300:1
Viewing angle (see page 633)	
Horizontal	Direction R / direction L =70°
Vertical	Direction U / direction D = 70°
Background lighting	
Brightness	350 cd/m²
Half-brightness time 4)	50000 hours
Keys/LED 5)	
Function keys	44 with LED (yellow)
Soft keys	-
Cursor keys	-
Number block	15 without LED
Other keys	5 without LED
Key lifespan	> 1,000,000 actuations with 1 ±0.3 to 3 ±0.3 N operating force
LED brightness	Typically 12 mcd (yellow)

Caution!

Pressing more than 2 keys at the same time can cause phantom keystrokes and trigger unintended actions.

Electrical characteristics	
Power supply	See also "Supply voltage" on page 84
Rated voltage	24 VDC ±25%
Rated current	3.8 A
Starting current	Typ. 10 A, max. 40 A for < 300 µs
Power consumption	See power management section "10.4" Panel PC 700" on page 71
Electrical isolation	Yes
Mechanical characteristics	
Front	
Frame	Aluminum, naturally anodized 6)
Design	Gray 6)
Membrane	Polyester
Dark gray border around display	Similar to Pantone 432CV 6)
Light background	Similar to Pantone 427CV 6)
Orange keys	Similar to Pantone 151CV 6)
Dark gray keys	Similar to Pantone 431CV 6)
Color legend strips	Similar to Pantone 429CV 6)
Gasket	Flat gasket around display front
Housing	Metal
Outer dimensions	Also see drawing "Dimensions - 5PC782.1043-00" on page 163
Width	423 mm
Height	288 mm
Depth	86.3 or 101.5 mm (depending on the heat sink)
Weight	Approx. 7.5 kg

Table 63: Technical data - 5PC782.1043-00 (cont.)

Environmental characteristics	5PC782.1043-00
Ambient temperature Operation Storage Transport	 See section 2.1.12 "Ambient temperatures with system unit 5PC782.1043-00" on page 62. -30°C .. +70°C -30°C .. +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) Storage 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 Storage 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. 3000 m

Table 63: Technical data - 5PC782.1043-00 (cont.)

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% results 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.

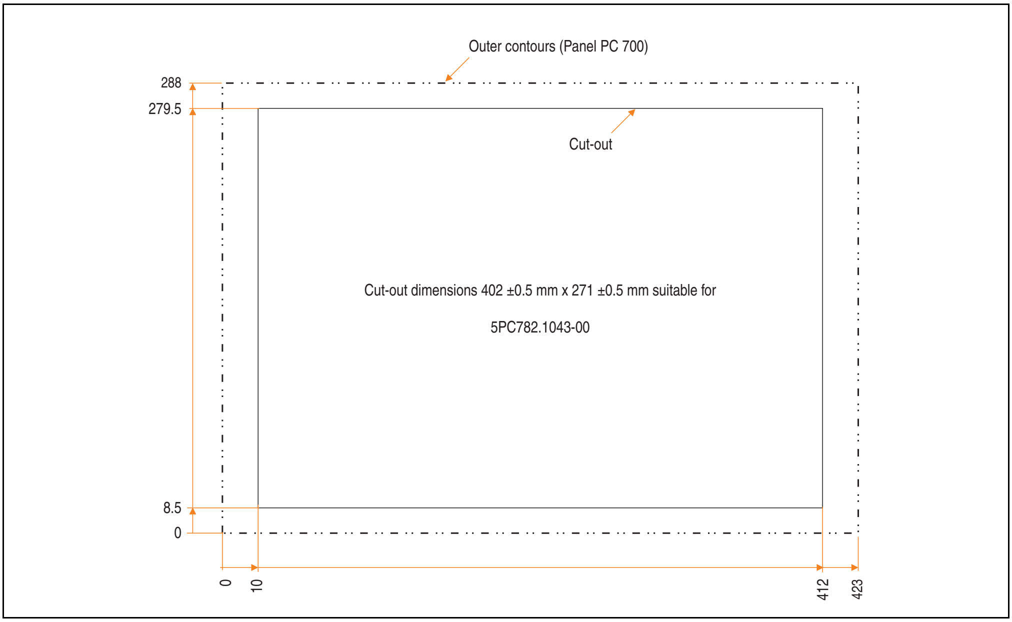

Outer contours (Panel PC 700)
Cut-out
Cut-out dimensions 402 ±0.5 mm x 271 ±0.5 mm suitable for
5PC782.1043-00
288
279.5
8.5
0
0
10
412
423

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

For further information regarding mounting and installation position, see chapter 3 "Commissioning" on page 259.

3.2 CPU boards 815E (ETX)

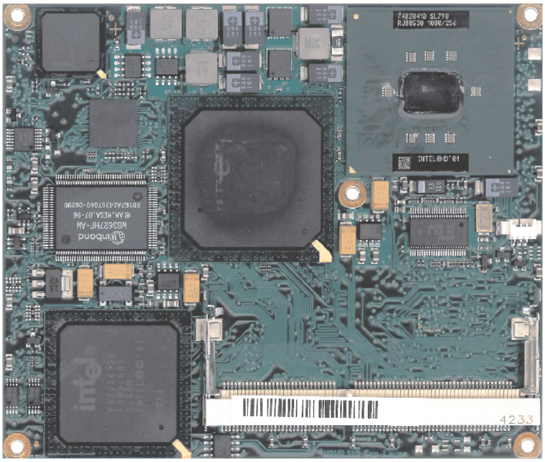


Figure 85: CPU boards 815E (ETX)

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 301)		
Processor Architectures Type 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 64: 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	Support up to SXGA display units Intel 82815 (integrated in the Chipset) 32 MB shared memory (reserved in the main memory) Max. 24 bit		

Table 64: Technical data - 815E CPU boards (ETX) (cont.)

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

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)

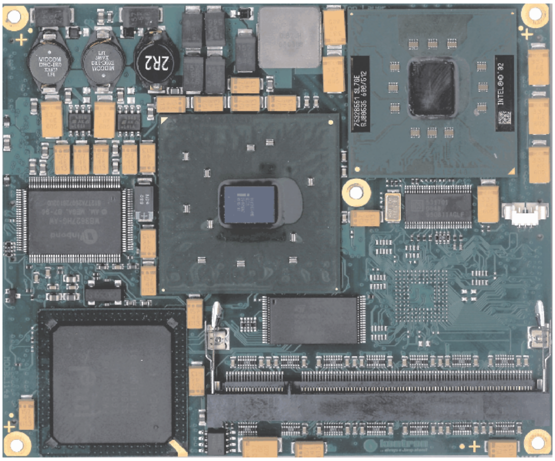


Figure 86: CPU boards 855GME

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 354)					
Processor						
Architectures	0.13 µm	0.13 µm	0.90 nm	0.90 nm	0.13 µm	0.13 µm
Type	Intel Pentium M 1.1 GHz	Intel Pentium M 1.6 GHz	Intel Pentium M 1.4 GHz	Intel Pentium M 1.8 GHz	Intel Celeron M 600 MHz	Intel Celeron M 1000 MHz
Expanded command set	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2
L1 cache	32 KB	32 KB	32 KB	32 KB	32 KB	32 KB
L2 cache	1 MB	1 MB	2 MB	2 MB	512 KB	512 KB
Floating Point Unit (FPU)	Yes	Yes	Yes	Yes	Yes	Yes
Chipset	Intel 82855GME (GMHC) Intel 82801DB (ICH4)					

Table 65: 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
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	Intel Extreme Graphics 2 (integrated in the chipset) 64 MB shared memory (reserved in the main memory) Max. 32 bit					

Table 65: Technical data - CPU boards 855GME (ETX) (cont.)

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

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)

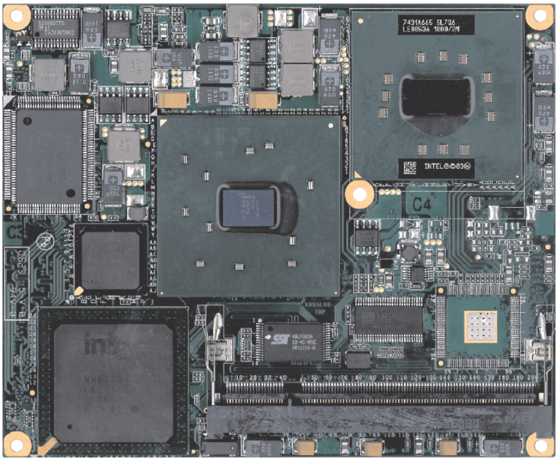


Figure 87: CPU boards 855GME (XTX)

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 404)					
Processor						
Architectures	0.13 µm	0.13 µm	0.90 nm	0.90 nm	0.13 µm	0.13 µm
Type	Intel Pentium M 1.1 GHz	Intel Pentium M 1.6 GHz	Intel Pentium M 1.4 GHz	Intel Pentium M 1.8 GHz	Intel Celeron M 600 MHz	Intel Celeron M 1000 MHz
Expanded command set	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2	MMX technology, streaming SIMD extension 2
L1 cache	32 KB	32 KB	32 KB	32 KB	32 KB	32 KB
L2 cache	1 MB	1 MB	2 MB	2 MB	512 KB	512 KB
Floating Point Unit (FPU)	Yes	Yes	Yes	Yes	Yes	Yes
Chipset	Intel 82855GME (GMHC) Intel 82801DB (ICH4)					

Table 66: 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
Real-time clock (RTC)						
Battery-buffered	Yes					
Accuracy	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	DDRAM					
Quantity	Max. 1 GB					
Socket	SO-DIMM 200-pin					
Graphics						
Controller	Intel Extreme Graphics 2 (integrated in the chipset)					
Memory	64 MB shared memory (reserved in the main memory)					
Color depth	Max. 32 bit					

Table 66: Technical data - CPU boards 855GME (XTX) (cont.)

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

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.

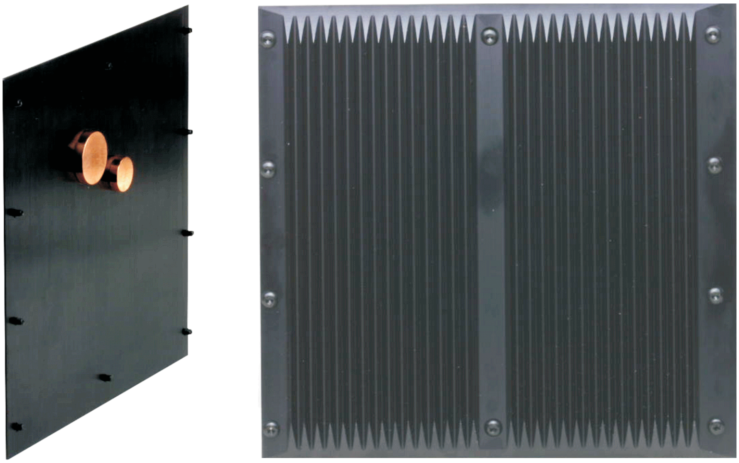


Figure 88: Heat sink

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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
Material	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 67: 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.

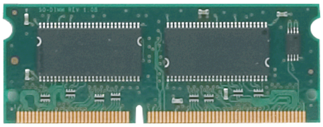


Figure 89: Main memory module

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 68: 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 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.**

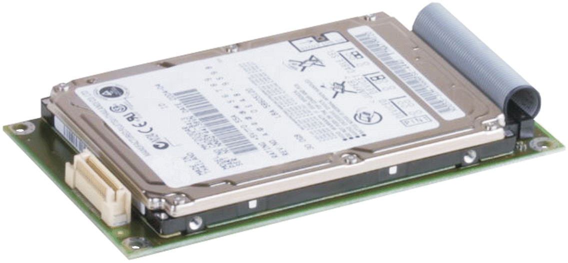


Figure 90: Add-on hard disk 30 GB 24/7 - 5AC600.HDDI-00

Technical data

> ## Information:
>
> **The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 69: Technical data - Add-on hard disk 5AC600.HDDI-00

Features	5AC600.HDDI-00
Positioning time (seek, typical values)	
Minimum (track to track)	1.5 ms
Average (read access)	12 ms
Maximum	22 ms
Starting time (0 rpm to read access)	5 seconds (typically)
Interface	ATA-6
Data transfer rate	
To the medium	26.1 to 36.2 MB/s
To / from host	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 20000 POH (Power-On Hours)
MTBF	300000 hours
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions	
Width	70 mm
Length	100 mm
Height	9.5 mm
Weight	120 g
Environmental characteristics	
Ambient temperature1)	
Operation - Standard 2)	+5°C .. +55°C
Operation - 24-hour 3)	+5°C .. +44°C
Storage	-40°C .. +65°C
Transport	-40°C .. +65°C
Relative humidity	
Operation	8 - 90%, non-condensing
Storage	5 - 95%, non-condensing
Transport	5 - 95%, non-condensing
Vibration	
Operation	5 - 500 Hz: 1 g (9.8 m/s^2 0-peak), no non-recovered errors
Storage	5 - 500 Hz: 5 g (49 m/s^2 0-peak) no damage
Shock	
Operation	Max. 225 g (2207 m/s^2 0-peak) and 2 ms duration, no non-recovered errors
Storage	Max. 900 g (8820 m/s^2 0-peak) and 1 ms duration, no damage
	Max. 120 g (1176 m/s^2 0-peak) and 11 ms duration, no damage
Altitude	
Operation	- 300 to 3000 meters
Storage	- 300 to 12000 meters

Table 69: Technical data - Add-on hard disk 5AC600.HDDI-00 (cont.)

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 - Operation and storage

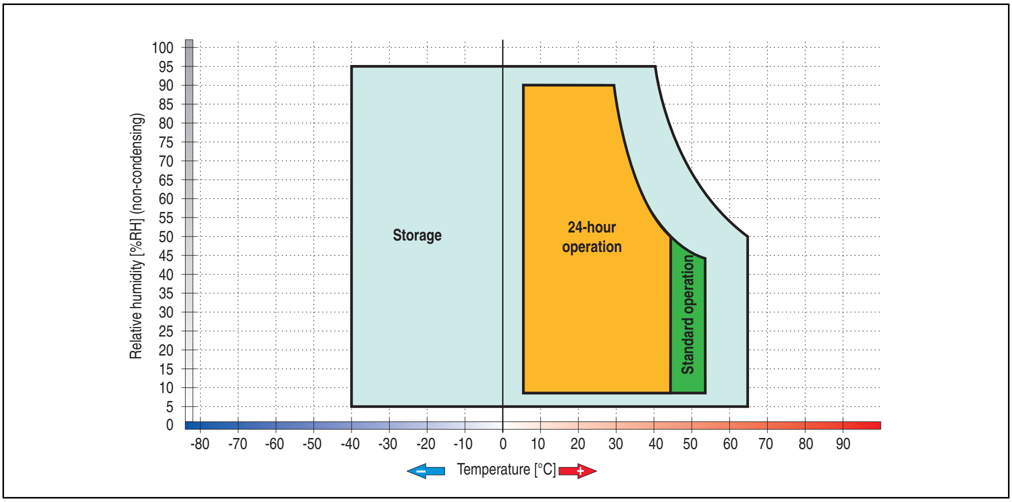


Figure 91: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-00

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).

3.7.2 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.

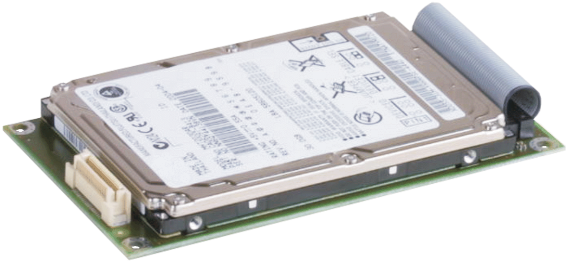


Figure 92: Add-on hard disk 20 GB ET - 5AC600.HDDI-01

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 70: 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 To 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 20000 POH (Power-On Hours)
MTBF	300000 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 temperature1) Operation 2) Storage Transport	 -20°C .. +80°C -40°C .. +85°C -40°C .. +85°C
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 Max. 225 g (2207 m/s^2 0-peak) and 2 ms duration, no non-recovered errors Max. 900 g (8820 m/s^2 0-peak) and 1 ms duration, no damage Max. 120 g (1176 m/s^2 0-peak) and 11 ms duration, no damage
Altitude Operation Storage	 - 300 to 3000 meters - 300 to 12000 meters

Table 70: Technical data - Add-on hard disk 5AC600.HDDI-01 (cont.)

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 - Operation and storage

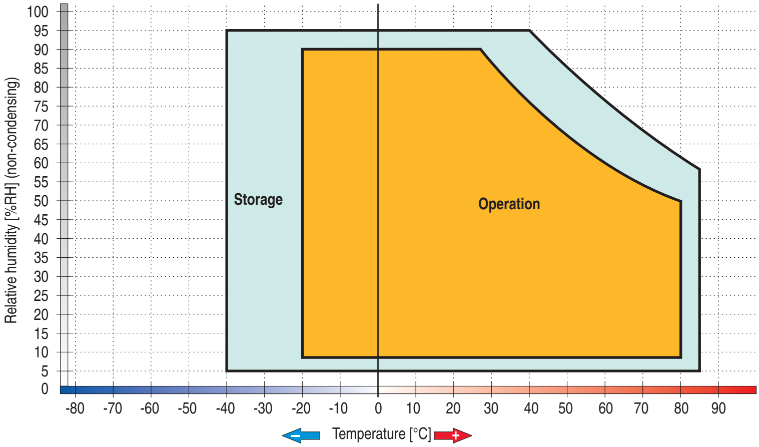


Figure 93: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-01

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).

3.7.3 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.

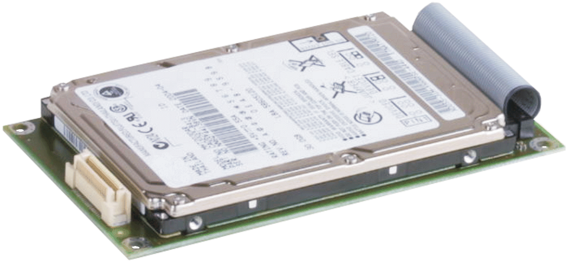


Figure 94: Add-on hard disk 40 GB - 5AC600.HDDI-02

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 71: 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 To the medium To / from host	 236 to 507 MBits/sec Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30000 POH (Power-On Hours)
MTBF	477000 hours1)
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 temperature2) Operation - Standard 3) Operation - 24-hour 4) Storage Transport	 +5°C .. +55°C +5°C .. +40°C -40°C .. +65°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 Max. 200 g (1960 m/s^2 0-peak) and 2 ms duration, no non-recovered errors Max. 15 g (147 m/s^2 0-peak) and 11 ms duration, no non-recovered errors Max. 980 g (9800 m/s^2 0-peak) and 1 ms duration, no damage Max. 120 g (1176 m/s^2 0-peak) and 11 ms duration, no damage
Altitude Operation Storage	 - 300 to 3048 meters - 300 to 12192 meters

Table 71: Technical data - add-on hard disk - 5AC600.HDDI-02 (cont.)

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 - Operation and storage

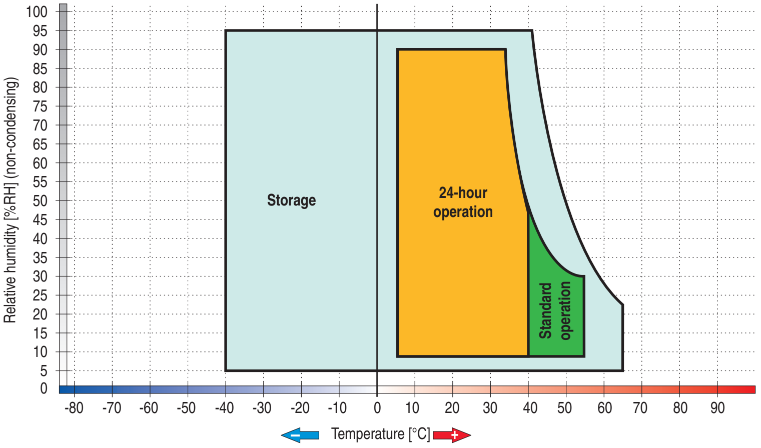


Figure 95: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-02

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).

3.7.4 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.

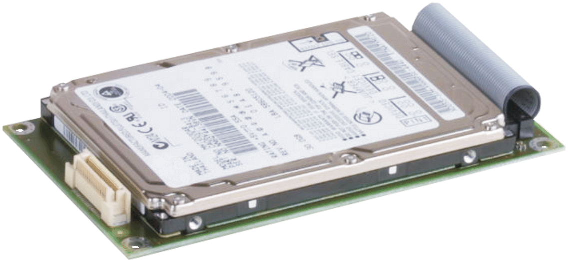


Figure 96: Add-on hard disk 60 GB - 5AC600.HDDI-03

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 72: 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 To the medium To / from host	 267 to 629 MBits/sec Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30000 POH (Power-On Hours)
MTBF	550000 hours1)
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 temperature2) Operation - Standard 3) Operation - 24-hour 4) Storage Transport	 +5°C .. +55°C +5°C .. +40°C -40°C .. +65°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 Max. 160 g (1568 m/s^2 0-peak) and 1 ms duration, no non-recovered errors Max. 300 g (2900 m/s^2 0-peak) and 2 ms duration, no non-recovered errors Max. 15 g (147 m/s^2 0-peak) and 11 ms duration, no non-recovered errors Max. 1000 g (9800 m/s^2 0-peak) and 1 ms duration, no damage Max. 120 g (1176 m/s^2 0-peak) and 11 ms duration, no damage
Altitude Operation Storage	 - 300 to 3048 meters - 300 to 12192 meters

Table 72: Technical data - add-on hard disk - 5AC600.HDDI-03 (cont.)

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 - Operation and storage

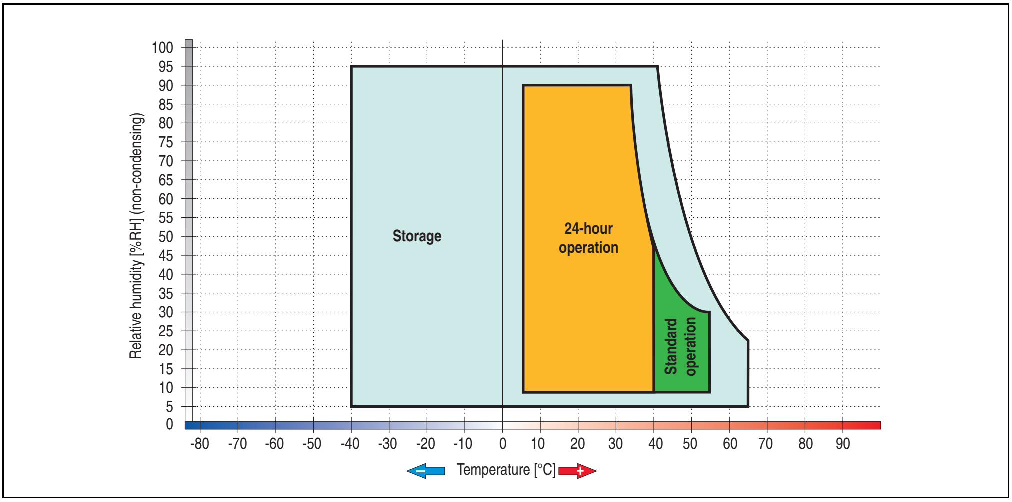


Figure 97: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-03

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).

3.7.5 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.

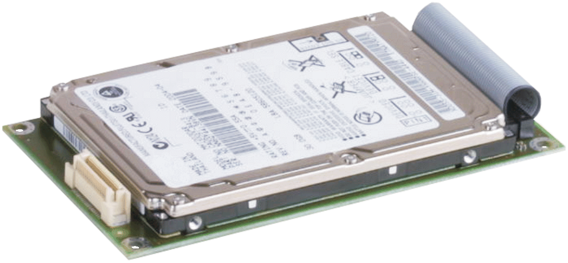


Figure 98: Add-on hard disk 80 GB - 5AC600.HDDI-04

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 73: 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 To the medium To / from host	 267 to 629 MBits/sec Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30000 POH (Power-On Hours)
MTBF	550000 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)] Storage Transport	 +5°C .. +55°C +5°C .. +40°C -40°C .. +65°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 Max. 160 g (1568 m/s^2 0-peak) and 1 ms duration, no non-recovered errors Max. 300 g (2900 m/s^2 0-peak) and 2 ms duration, no non-recovered errors Max. 15 g (147 m/s^2 0-peak) and 11 ms duration, no non-recovered errors Max. 1000 g (9800 m/s^2 0-peak) and 1 ms duration, no damage Max. 120 g (1176 m/s^2 0-peak) and 11 ms duration, no damage
Altitude Operation Storage	 - 300 to 3048 meters - 300 to 12192 meters

Table 73: Technical data - add-on hard disk - 5AC600.HDDI-04 (cont.)

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 - Operation and storage

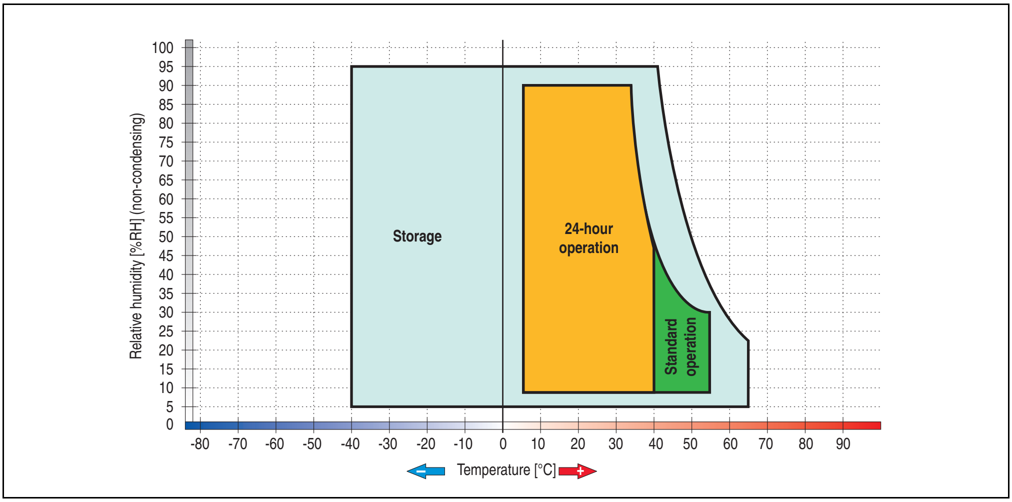


Figure 99: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-04

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).

3.7.6 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.

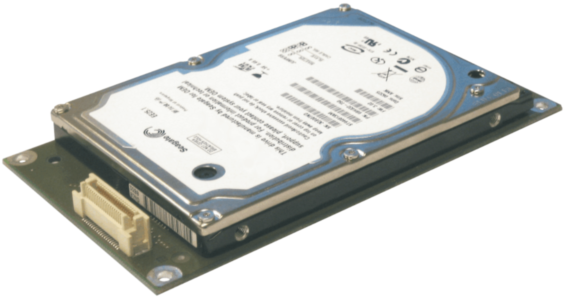


Figure 100: Add-on hard disk 40 GB - 5AC600.HDDI-05

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 74: 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 To the medium To / from host	 Max. 321 MBits/sec Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
S.M.A.R.T. support	Yes
MTBF	550000 hours1)
Mechanical characteristics	
Add-on mounting	Fixed
Outer dimensions Width Length Height	 70 mm 100 mm 9.5 mm
Weight	100 g
Environmental characteristics	
Ambient temperature2) Operation - Standard / 24-hour Storage Transport	 -30°C .. +85°C -40°C .. +95°C -40°C .. +95°C
Relative humidity Operation Storage Transport	 5 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 Max. 200 g (1962 m/s^2 0-peak) and 2 ms duration, no non-recovered errors Max. 110 g (1079 m/s^2 0-peak) and 11 ms duration, no non-recovered errors Max. 800 g (7848 m/s^2 0-peak) and 2 ms duration, no damage Max. 400 g (3924 m/s^2 0-peak) and 0.5 ms duration, no damage
Altitude Operation Storage	 - 300 to 4419 meters - 300 to 12192 meters

Table 74: Technical data - Add-on hard disk 5AC600.HDDI-05 (cont.)

1) With 8760 POH (power on hours) per year and 70°C surface temperature.

2) Temperature values for 305 meter elevation. 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 - Operation and storage

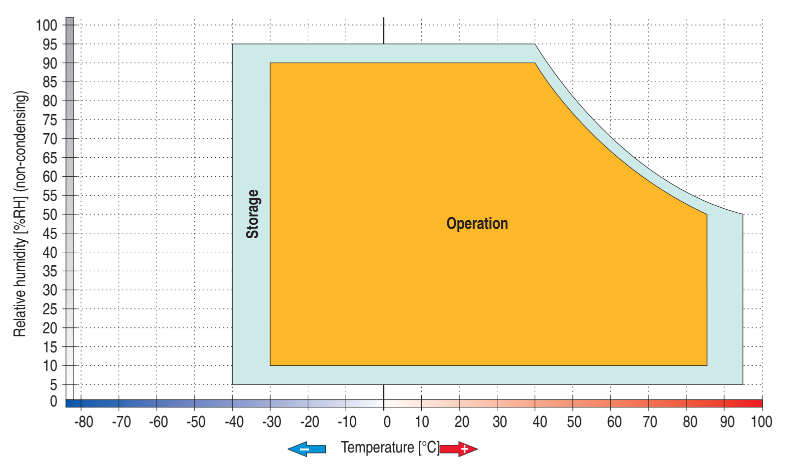


Figure 101: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-05

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).

3.7.7 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.

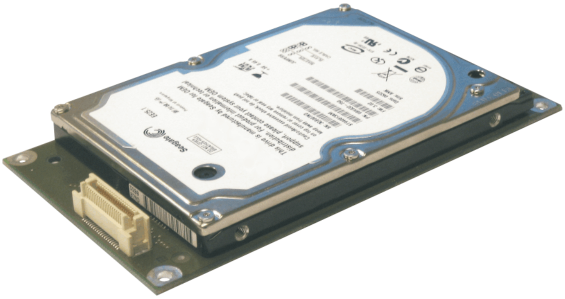


Figure 102: Add-on hard disk 80 GB - 5AC600.HDDI-06

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 75: 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 To the medium To / from host	 Max. 450 MBits/sec Max. 100 MB/s (Ultra-DMA Mode 5)
S.M.A.R.T. support	Yes
Cache	8 MB
MTBF	750000 hours1)
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 temperature2) Operation - Standard / 24-hour Storage Transport	 -30°C .. +85°C -40°C .. +95°C -40°C .. +95°C
Relative humidity Operation Storage Transport	 5 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 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 Storage	 - 300 to 5000 meters - 300 to 12192 meters

Table 75: Technical data - add-on hard disk - 5AC600.HDDI-06 (cont.)

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

2) Temperature values for 305 meter elevation. 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 - Operation and storage

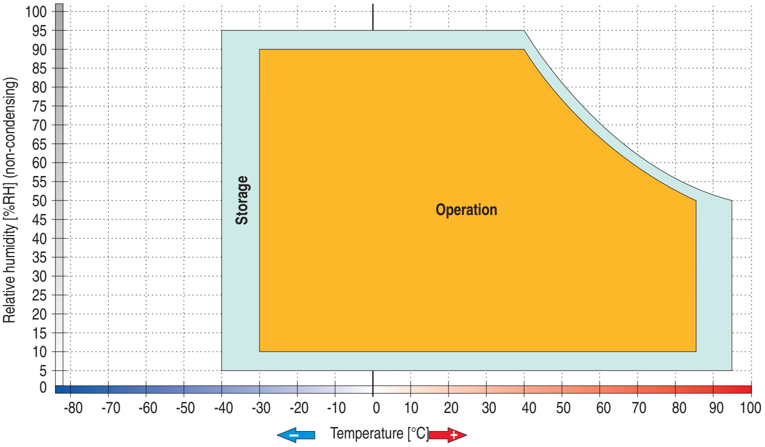


Figure 103: Temperature humidity diagram - Add-on hard disk 5AC600.HDDI-06

Temperature values for 305 meter elevation. 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.

3.7.8 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.

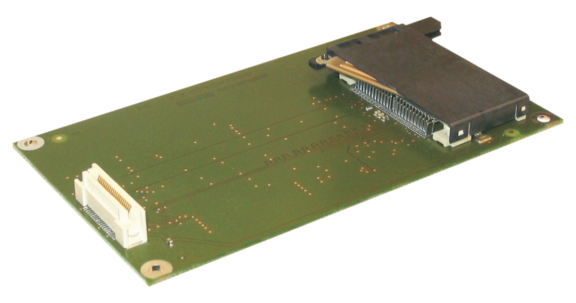


Figure 104: Add-on CompactFlash slot - 5AC600.CFSI-00

Technical data

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

Table 76: Technical data - Add-on CompactFlash slot 5AC600.CFSI-00

Warning!

Inserting and removing the CompactFlash card can only take place without power applied!

3.7.9 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.

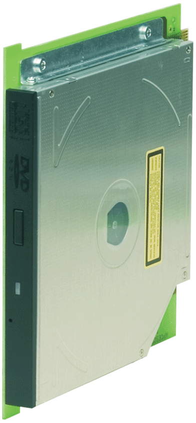


Figure 105: Slide-in CD-ROM - 5AC600.CDXS-00

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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/sec.
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	60000 POH (Power-On Hours) > 10000 times
Environmental characteristics	
Ambient temperature[1)] Operation Storage Transport	 -5°C .. +60°C[2)] -20°C .. +60°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 80%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage 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 Storage 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 77: 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 - Operation and storage

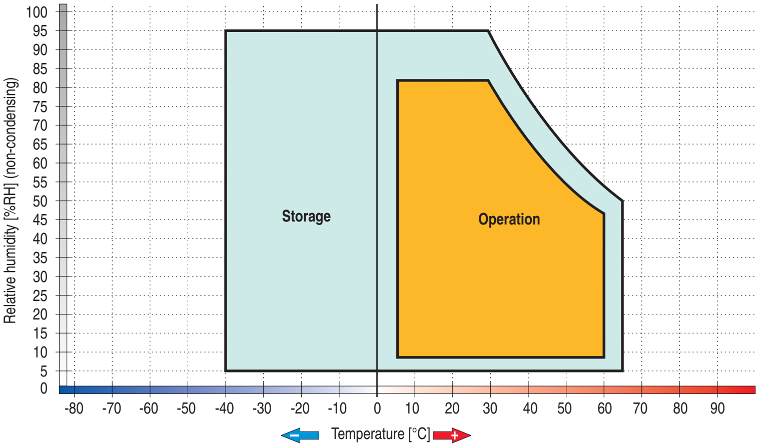


Figure 106: Temperature humidity diagram - Slide-in CD-ROM 5AC600.CDXS-00

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).

3.7.10 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 107: 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 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/sec.
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	60000 POH (Power-On Hours) > 10000 times
Environmental characteristics	
Ambient temperature[1)] Operation Storage Transport	 +5°C .. +50°C[2)] -20°C .. +60°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 80%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage 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 78: 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 length
Storage	max. 60 g (588 m/s^2 0-peak) and 11 ms length max. 200 g (1962 m/s^2 0-peak) and 2 ms length
Transport	max. 60 g (588 m/s^2 0-peak) and 11 ms length max. 200 g (1962 m/s^2 0-peak) and 2 ms length

Table 78: Technical data - slide-in DVD-ROM/CD-RW 5AC600.DVDS-00 (cont.)

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 - Operation and storage

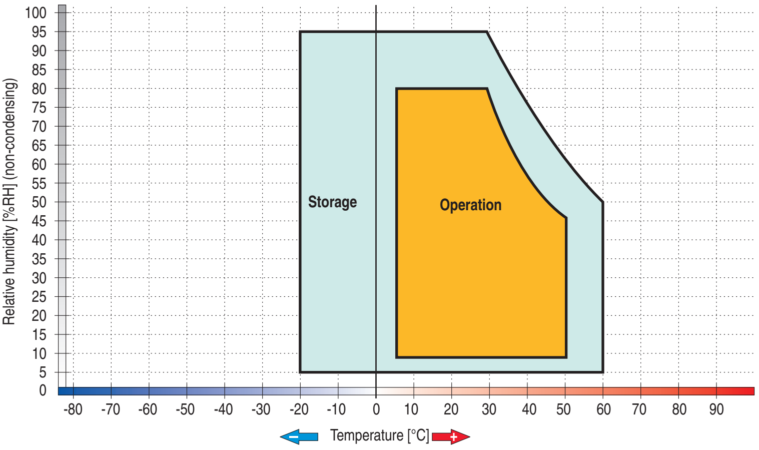


Figure 108: Temperature humidity diagram - Slide-in DVD-ROM/CD-RW 5AC600.DVDS-00

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).

3.7.11 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 109: 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 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 starting with revision D0
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-RAM	3x and 2x
DVD+R	8x, 4x and 2x
DVD+R (double layer)	2x, 4x
DVD+RW	4x and 2x
Reading rate	
CD	24x
DVD	8x
Data transfer rate	Max. 33.3 MB/sec.
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. DVD-RAM, DVD+R, DVD+R (double layer), DVD+RW
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	60000 POH (Power-On Hours)
Opening/closing the drawer	> 10000 times
Environmental characteristics	
Ambient temperature[1]	
Operation	+5°C .. +55°C[2]
Storage	-20°C .. +60°C
Transport	-40°C .. +65°C

Table 79: Technical data - Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 Rev. D0

Features	5AC600.DVRS-00 starting with revision D0
Relative humidity Operation Storage Transport	 8 - 80%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage 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 Storage 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 79: Technical data - Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 Rev. D0 (cont.)

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") D0

Features	5AC600.DVRS-00 Rev. D0
Write speed CD-R CD-RW DVD-R DVD-RW DVD+R DVD+RW	 24x, 16x, 10x and 4x 10x and 4x 8x, 4x and 2x 4x and 2x 8x, 4x and 2x 4x and 2x
Reading rate CD DVD	 24x 8x
Data transfer rate	Max. 33.3 MB/sec.
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
Non-write protected media CD DVD	 CD-R, CD-RW DVD-R/RW, DVD+R/RW

Table 80: Technical data - Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 Rev. D0

Features	5AC600.DVRS-00 Rev. D0
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	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	60000 POH (Power-On Hours)
Opening/closing the drawer	> 10000 times
Environmental characteristics	
Ambient temperature[1]	
Operation	+5°C .. +55°C[2]
Storage	-20°C .. +60°C
Transport	-40°C .. +65°C
Relative humidity	
Operation	8 - 80%, non-condensing
Storage	5 - 95%, non-condensing
Transport	5 - 95%, non-condensing
Vibration	
Operation	At max. 5 - 500 Hz and 0.2 g
Storage	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
Storage	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 80: Technical data - Slide-in DVD-R/RW, DVD+R/RW - 5AC600.DVRS-00 Rev. D0 (cont.)

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 - Operation and storage

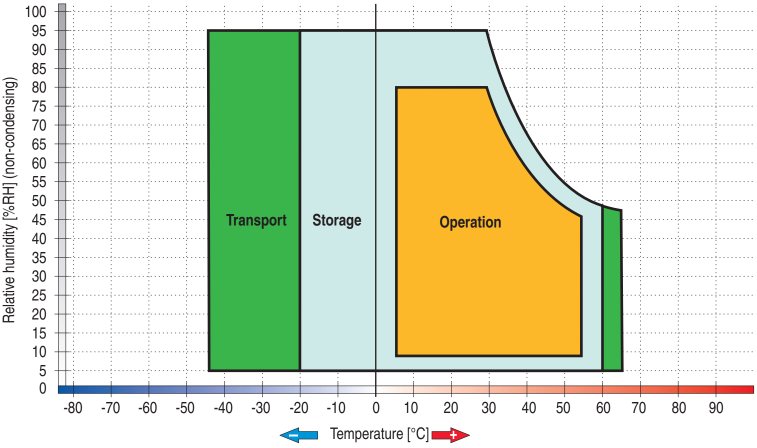


Figure 110: Temperature humidity diagram - Slide-in DVD-R/RW, DVD+R/RW 5AC600.DVRS-00

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).

3.7.12 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!

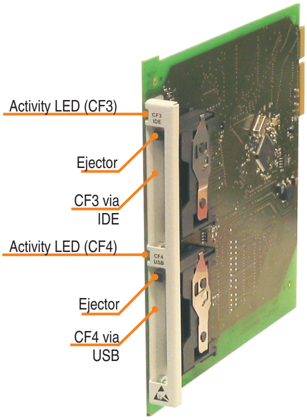


Figure 111: Slide-in CF 2-slot - 5AC600.CFSS-00

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

3.7.13 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.

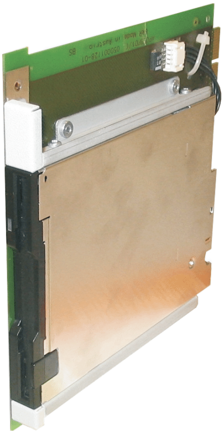


Figure 112: Slide-in USB FDD - 5AC600.FDDS-00

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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	30000 POH (Power-On Hours)
Environmental characteristics	
Ambient temperature[1]	
Operation	+4°C .. +50°C
Storage	-20°C .. +60°C
Transport	-20°C .. +60°C
Relative humidity	
Operation	20 - 80%, non-condensing
Storage	5 - 90%, non-condensing
Transport	5 - 90%, non-condensing
Vibration	
Operation	At max. 5 - 500 Hz and 0.3 g
Storage	At max. 10 - 100 Hz and 2 g
Transport	At max. 10 - 100 Hz and 2 g
Shock (pulse with a sine half-wave)	
Operation	At max. 5 g for 11 ms
Storage	At max. 60 g for 11 ms
Transport	At max. 60 g for 11 ms
Altitude	Max. 3000 meters

Table 82: 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 - Operation and storage

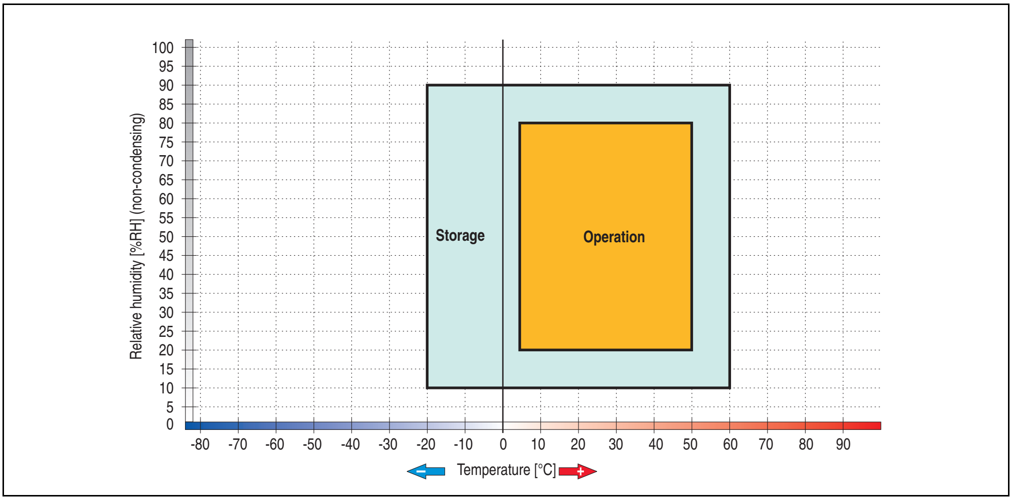


Figure 113: Temperature humidity diagram - Slide-in USB diskette drive 5AC600.FDDS-00

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).

3.7.14 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.

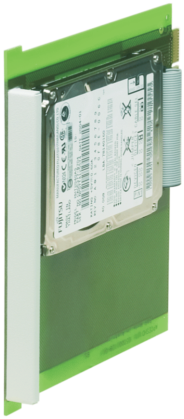


Figure 114: Slide-in hard disk 30 GB - 5AC600.HDDS-00

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 To 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 20000 POH (Power-On Hours)
MTBF	300000 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 83: Technical data - Slide-in hard disk - 5AC600.HDDS-00

Environmental characteristics	5AC600.HDDS-00
Ambient temperature[1] Operation - Standard [2] Operation - 24-hour [3] Storage Transport	 +5°C .. +55°C +5°C .. +44°C -40°C .. +65°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 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 Storage	 - 300 to 3000 meters - 300 to 12000 meters

Table 83: Technical data - Slide-in hard disk - 5AC600.HDDS-00 (cont.)

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 - Operation and storage

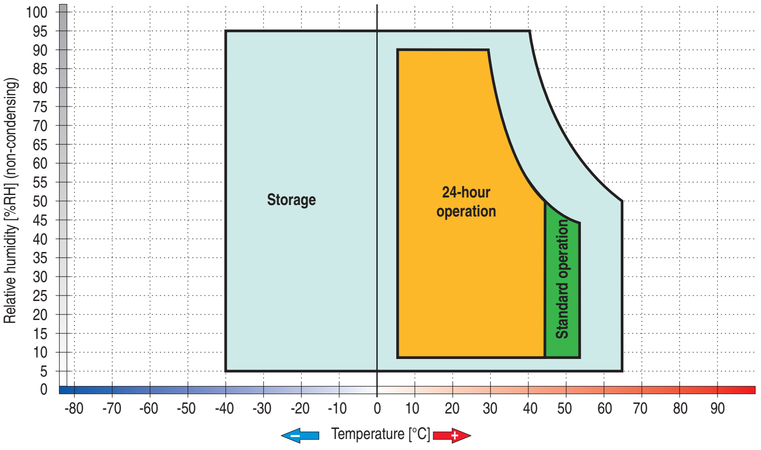


Figure 115: Temperature humidity diagram - Slide-in hard disk 5AC600.HDDS-00

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).

3.7.15 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.

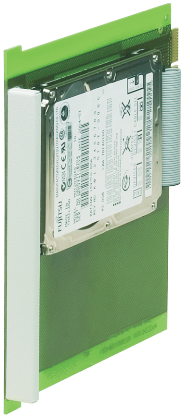


Figure 116: Slide-in hard disk 20 GB - 5AC600.HDDS-01

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 To 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 20000 POH (Power-On Hours)
MTBF	300000 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)] Storage Transport	 -20°C .. +80°C -40°C .. +85°C -40°C .. +85°C

Table 84: Technical data - Slide-in hard disk - 5AC600.HDDS-01

Environmental characteristics	5AC600.HDDS-01
Relative humidity	
Operation	8 - 90%, non-condensing
Storage	5 - 95%, non-condensing
Transport	5 - 95%, non-condensing
Vibration	
Operation	No non-recovered errors at max. 5 - 500 Hz and 1 g (9.8 m/s^2 0-peak)
Storage	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
Storage	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
Storage	- 300 to 12000 meters

Table 84: Technical data - Slide-in hard disk - 5AC600.HDDS-01 (cont.)

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 - Operation and storage

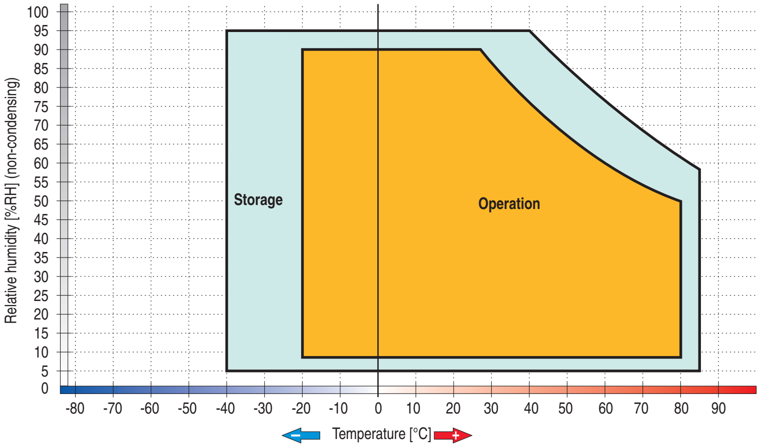


Figure 117: Temperature humidity diagram - Slide-in hard disk 5AC600.HDDS-01

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).

3.7.16 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.

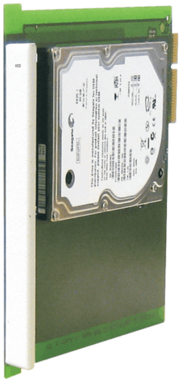


Figure 118: Slide-in hard disk 40 GB - 5AC600.HDDS-02

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 To the medium To / from host	 Max. 321 MBits/sec Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
S.M.A.R.T. support	Yes
MTBF	550000 hours1)
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 temperature2) Operation - Standard / 24-hour Storage Transport	 -30°C .. +85°C -40°C .. +95°C -40°C .. +95°C

Table 85: Technical data - Slide-in hard disk - 5AC600.HDDS-02

Environmental characteristics	5AC600.HDDS-02
Relative humidity Operation Storage Transport	 5 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 Max. 200 g (1962 m/s^2 0-peak) and 2 ms duration, no non-recovered errors Max. 110 g (1079 m/s^2 0-peak) and 11 ms duration, no non-recovered errors Max. 800 g (7848 m/s^2 0-peak) and 2 ms duration, no damage Max. 400 g (3924 m/s^2 0-peak) and 0.5 ms duration, no damage
Altitude Operation Storage	 - 300 to 4419 meters - 300 to 12192 meters

Table 85: Technical data - Slide-in hard disk - 5AC600.HDDS-02 (cont.)

1) With 8760 POH (power on hours) per year and 70°C surface temperature.

2) Temperature values for 305 meter elevation. 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 - Operation and storage

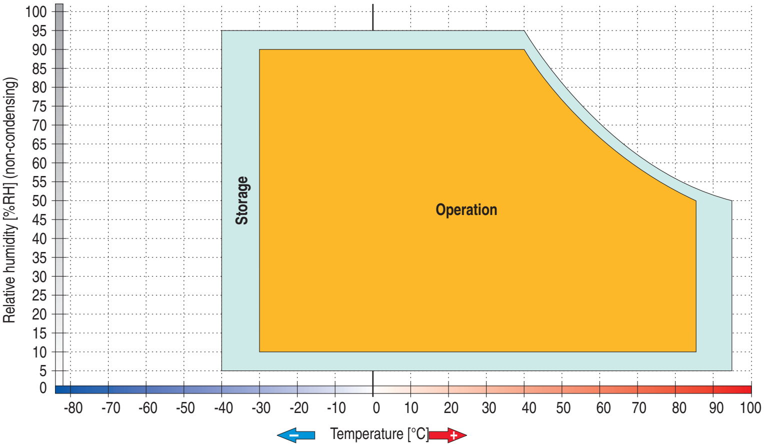


Figure 119: Temperature humidity diagram - Slide-in hard disk 5AC600.HDDS-02

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).

3.7.17 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.

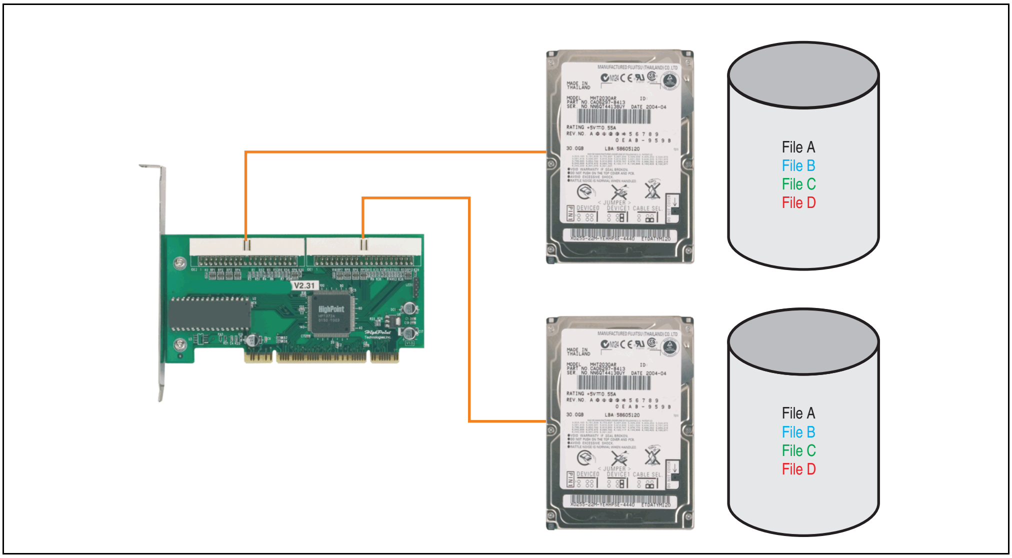


Figure 120: RAID 1 system schematic

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.

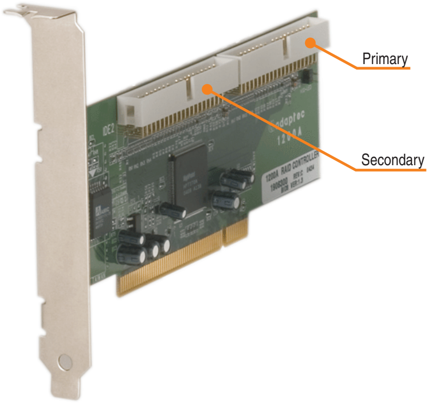


Figure 121: RAID controller 5ACPCI.RAIC-00

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 Storage Transport	 0°C .. +55°C -20°C .. +60°C -20°C .. +60°C

Table 86: 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 87: 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.

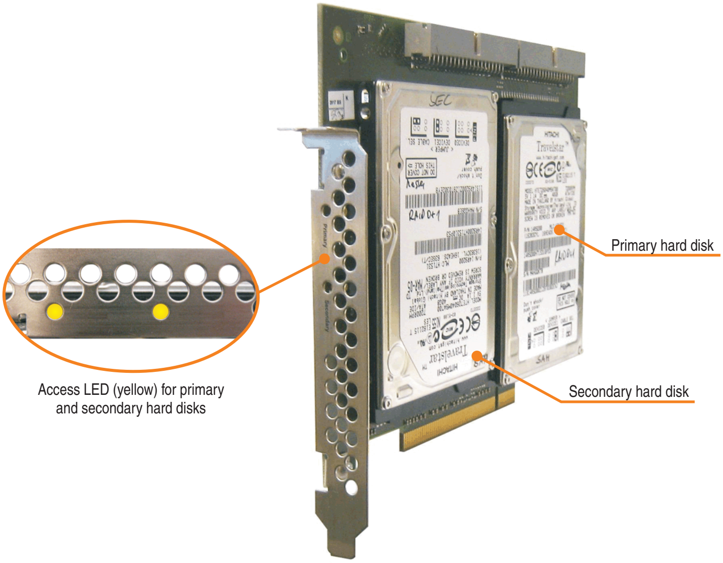


Figure 122: PCI RAID storage 5ACPCI.RAIS-00

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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)	1 ms
Average (read access)	10 ms
Maximum (read access)	16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate	
To the medium	236 to 507 MBits/sec
To / from host	Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30000 POH (Power-On Hours)
MTBF	477000 hours[1)]
Mechanical characteristics	
Mounted on PCI insert	Fixed
Outer dimensions (without PCI card)	
Width	70 mm
Length	100 mm
Height	9.5 mm
Weight	350 g
Environmental characteristics	
Ambient temperature[2)]	
Operation - Standard [3)]	+5°C .. +55°C
Operation - 24-hour [4)]	+5°C .. +40°C
Storage	-40°C .. +65°C
Transport	-40°C .. +65°C

Table 88: Technical data - RAID hard disk - 5ACPCI.RAIS-00

Environmental characteristics	5ACPCI.RAIS-00
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 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 Storage	 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 Storage	 - 300 to 3048 meters - 300 to 12192 meters

Table 88: Technical data - RAID hard disk - 5ACPCI.RAIS-00 (cont.)

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 - Operation and storage

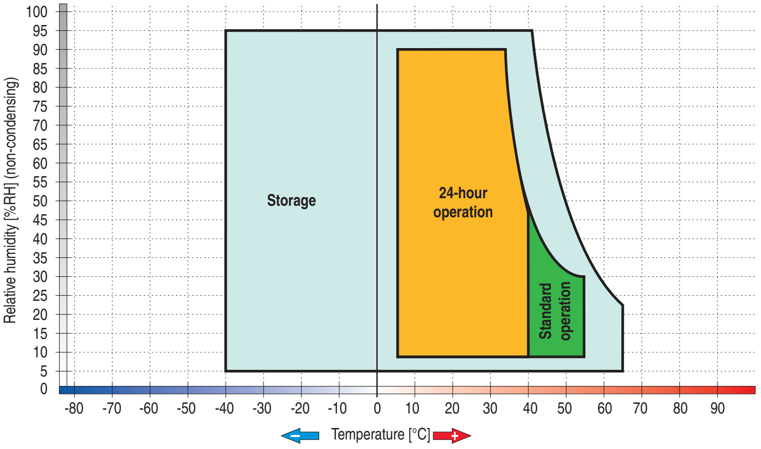


Figure 123: Temperature humidity diagram - RAID hard disk 5ACPCI.RAIS-00

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.

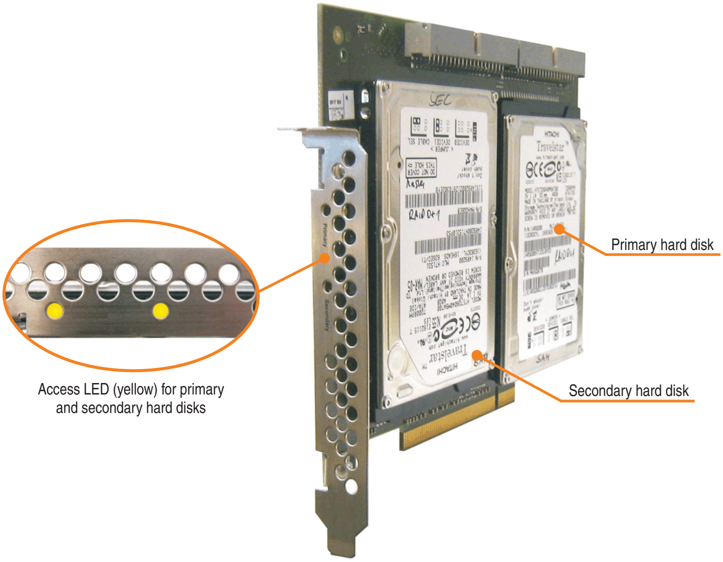


Figure 124: PCI RAID storage - 5ACPCI.RAIS-01

Technical data

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 89: 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 To the medium To / from host	 267 to 629 MBits/sec Max. 100 MB/s (ultra-DMA mode 5)
Cache	8 MB
Electrical characteristics	
Lifespan	5 years or 30000 POH (Power-On Hours)
MTBF	550000 hours1)
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 temperature2) Operation - Standard 3) Operation - 24-hour 4) Storage Transport	 +5°C .. +55°C +5°C .. +40°C -40°C .. +65°C -40°C .. +65°C
Relative humidity Operation Storage Transport	 8 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage	 Max. 5 - 500 Hz and 1 g (9.8 m/s^2 0-peak) 1 oct/min duration, no non-recovered errors Max. 10 - 500 Hz and 5 g (49 m/s^2 0-peak) 0.5 oct/min duration, no damage
Shock (pulse with a sine half-wave) Operation Storage	 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 89: Technical data - RAID hard disk - 5ACPCI.RAIS-01 (cont.)

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

Table 89: Technical data - RAID hard disk - 5ACPCI.RAIS-01 (cont.)

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 - Operation and storage

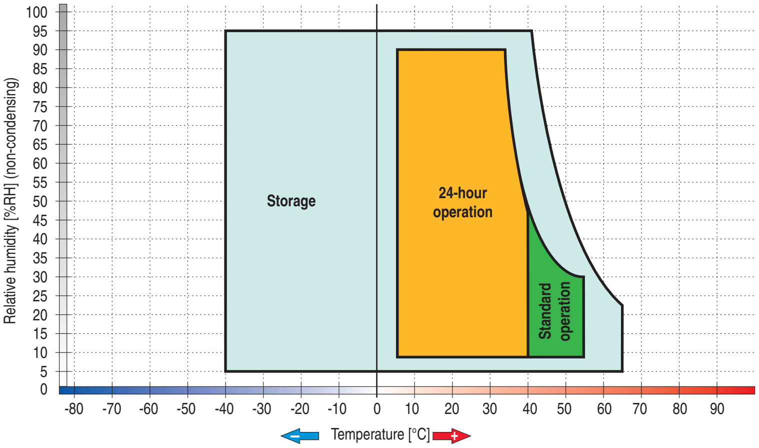


Figure 125: Temperature humidity diagram - RAID hard disk 5ACPCI.RAIS-01

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

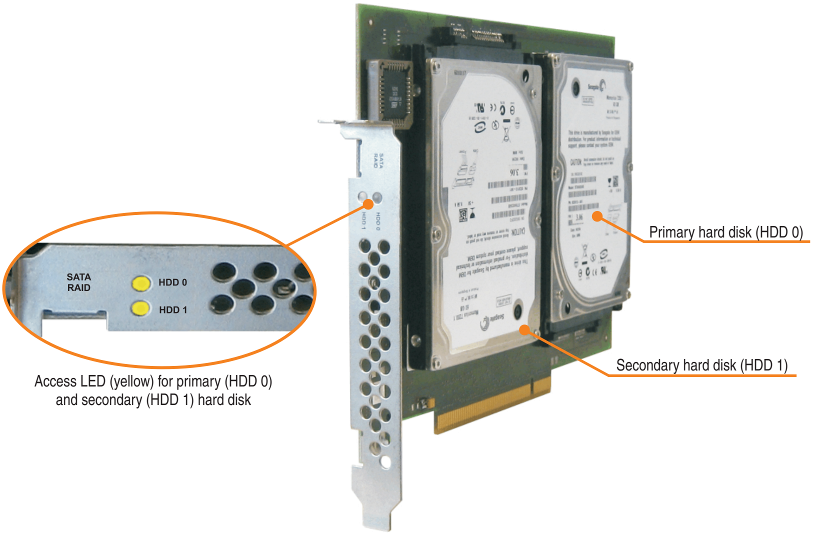

SATA RAID
HDD 0
HDD 1
Access LED (yellow) for primary (HDD 0) and secondary (HDD 1) hard disk
Primary hard disk (HDD 0)
Secondary hard disk (HDD 1)

Figure 126: 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 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 To the medium To / from host	 Max. 539 MBits/sec 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 90: Technical data - RAID hard disk - 5ACPCI.RAIC-01

Environmental characteristics	5ACPCI.RAIC-01
Ambient temperature[1]	
Operation - Standard [2]	+5°C .. +55°C
Operation - 24-hour [3]	+5°C .. +40°C
Storage	-40°C .. +70°C
Transport	-40°C .. +70°C
Relative humidity	
Operation	5 - 90%, non-condensing
Storage	5 - 95%, non-condensing
Transport	5 - 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
Storage	Max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) 0.5 oct/min duration, no damage
Transport	Max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) 0.5 oct/min duration, no damage
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
Storage	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
Storage	- 300 to 12192 meters

Table 90: Technical data - RAID hard disk - 5ACPCI.RAIC-01 (cont.)

1) Temperature values for 305 meter elevation. 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 - Operation and storage

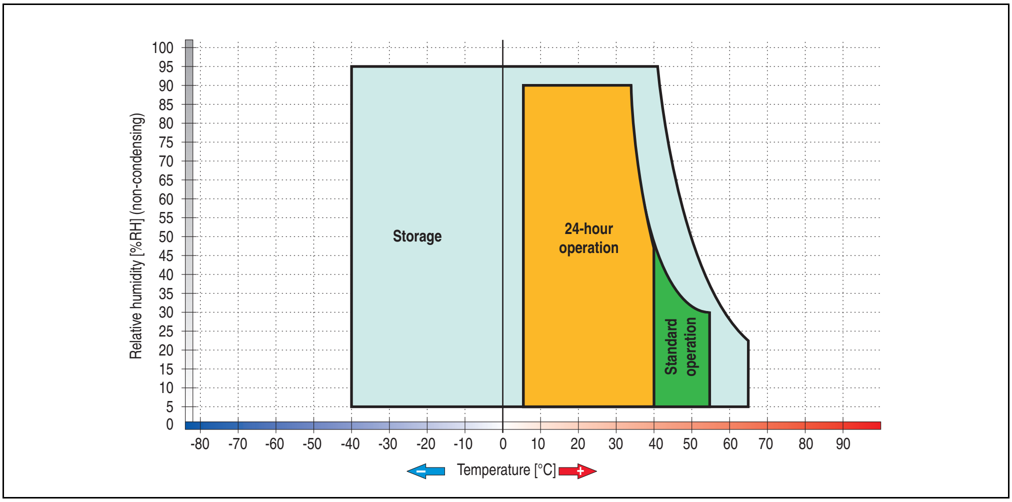


Figure 127: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-01

Temperature values for 305 meter elevation. 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 238 or section "Rebuild Mirrored Set" on page 298) 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 293.

Replacement SATA HDD 60 GB - 5ACPCI.RAIC-02

The hard disk can be used as a replacement part for 5ACPCI.RAIC-01.

Figure 128: 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 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 To the medium To / from host	 Max. 539 MBits/sec Max. 150 MB/s

Table 91: 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)] Storage Transport	 +5°C .. +55°C +5°C .. +40°C -40°C .. +70°C -40°C .. +70°C
Relative humidity Operation Storage Transport	 5 - 90%, non-condensing 5 - 95%, non-condensing 5 - 95%, non-condensing
Vibration[4)] Operation (continuous) Operation (occasional) Storage 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 Max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) 0.5 oct/min duration, no damage Max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak) 0.5 oct/min duration, no damage
Shock [4)] (pulse with a sine half-wave) Operation Storage	 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 Storage	 - 300 to 3048 meters - 300 to 12192 meters

Table 91: Technical data - RAID hard disk - 5ACPCI.RAIC-02 (cont.)

1) Temperature values for 305 meter elevation. 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 - Operation and storage

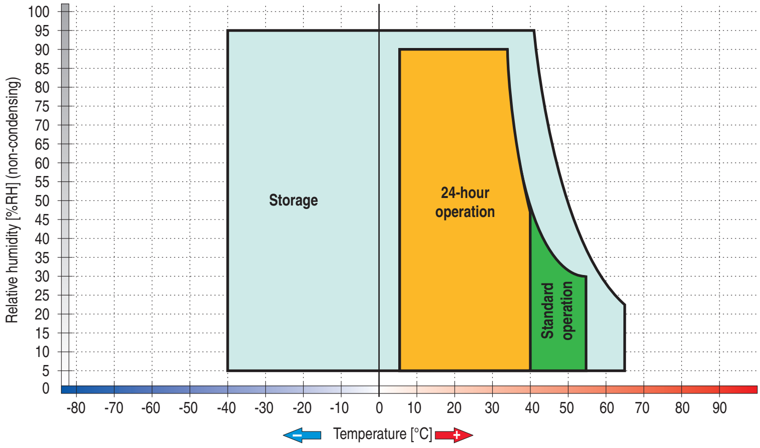


Figure 129: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-02

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 622.

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

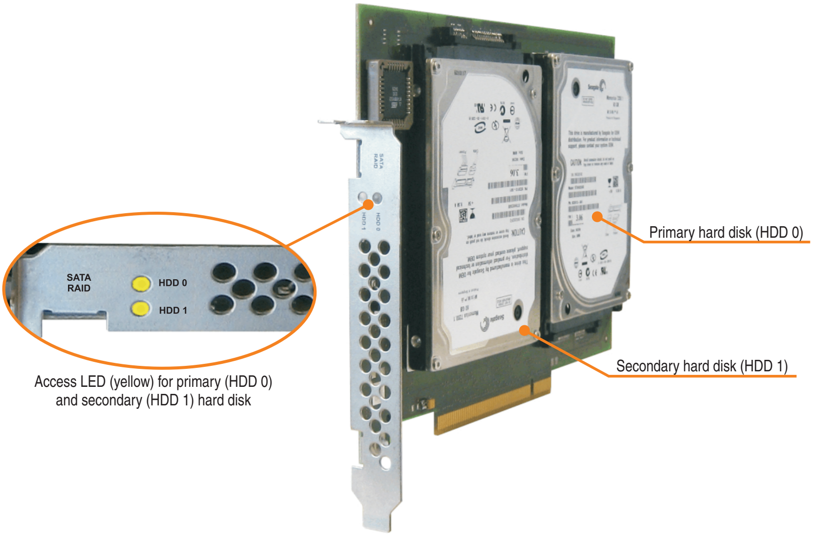

SATA RAID
HDD 0
HDD 1
Access LED (yellow) for primary (HDD 0) and secondary (HDD 1) hard disk
Primary hard disk (HDD 0)
Secondary hard disk (HDD 1)

Figure 130: 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 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 ca. 32 kByte
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 To the medium To / from host	 Max. 84.6 MBits/sec 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 92: Technical data - RAID hard disk - 5ACPCI.RAIC-03

Environmental characteristics	5ACPCI.RAIC-03
Ambient temperature[1]	
Operation - Standard / 24-hour[2]	-15°C .. +80°C
Storage	-40°C .. +95°C
Transport	-40°C .. +95°C
Relative humidity	
Operation	8 - 90% non-condensing (maximum humidity at +29°C)
Storage	5 - 95% non-condensing (maximum humidity at +40°C)
Transport	5 - 95% non-condensing (maximum humidity at +40°C)
Vibration[3]	
Operation (continuous)	5 - 500 Hz: max. 0.125 g; duration 1 octave per minute; no unrecoverable errors
Operation (occasional)	5 - 500 Hz: max. 0.25 g; duration 1 octave per minute; no unrecoverable errors
Storage	5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage
Transport	5 - 500 Hz: max. 5 g; duration 0.5 octaves per minute; no damage
Shock [4] (pulse with a sine half-wave)	
Operation	Max. 125 g, 2 ms; no unrecoverable errors
Storage	Max. 400 g, 2 ms; no damage Max. 450 g, 1 ms; no damage Max. 200 g, 0.5 ms; no damage
Altitude	
Operation	- 300 to 3048 meters
Storage	- 300 to 12192 meters

Table 92: Technical data - RAID hard disk - 5ACPCI.RAIC-03 (cont.)

1) Temperature values for 305 meter elevation. 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 - Operation and storage

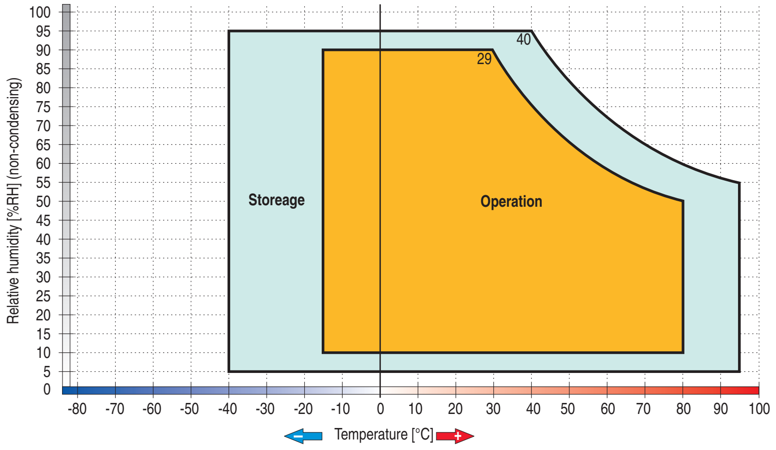


Figure 131: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-03

Temperature values for 305 meter elevation. 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 238 or section "Rebuild Mirrored Set" on page 298) 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 293.

Replacement SATA HDD 160 GB - 5ACPCI.RAIC-04

The hard disk can be used as a replacement part for 5ACPCI.RAIC-03.

Figure 132: 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 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 To the medium To / from host	 Max. 84.6 MBits/sec Max. 150 MB/s
Features	**5ACPCI.RAIC-04**
Cache	8 MB
S.M.A.R.T. support	Yes

Table 93: Technical data - RAID hard disk - 5ACPCI.RAIC-04

Lifespan	5 years
Environmental characteristics	
Ambient temperature1) Operation - Standard / 24-hour2) Storage Transport	-15°C .. +80°C -40°C .. +95°C -40°C .. +95°C
Relative humidity Operation Storage Transport	8 - 90% non-condensing (maximum humidity at +29°C) 5 - 95% non-condensing (maximum humidity at +40°C) 5 - 95% non-condensing (maximum humidity at +40°C)
Vibration3) 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. 450 g, 1 ms; no damage Max. 200 g, 0.5 ms; no damage
Altitude Operation Storage	- 300 to 3048 meters - 300 to 12192 meters

Table 93: Technical data - RAID hard disk - 5ACPCI.RAIC-04 (cont.)

1) Temperature values for 305 meter elevation. 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 - Operation and storage

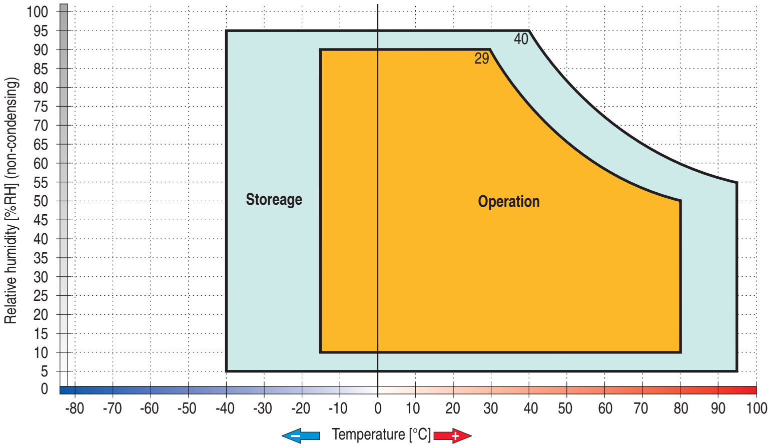


Figure 133: Temperature humidity diagram - SATA RAID hard disk 5ACPCI.RAIC-04

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 622.

3.8 Interface options

An optional interface (CAN or combined RS232/422/485) can be inserted.

Information:

It is possible to add or remove an optional interface at any time.

Caution!

Turn off power before adding or removing an optional 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

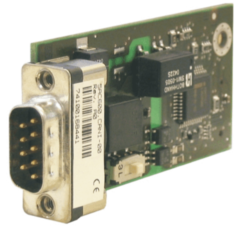
Model number	Description	Figure
5AC600.CANI-00	**Add-on CAN interface** CAN interface for installation in an APC620 or PPC700.	

Table 94: 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 95: Technical data - Add-on CAN interface - 5AC600.CANI-00

Pin assignments

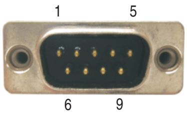
Add-on CAN		
Type	Electrically isolated	9-pin DSUB plug 
Transfer rate	Max. 500 kBit/s	
Bus length	Max. 1000 Meter	
Pin	**Assignment**	
1	n.c.	
2	CAN low	
3	GND	
4	n.c.	
5	n.c.	
6	Reserved	
7	CAN high	
8	n.c.	
9	n.c.	

Table 96: Pin assignments - CAN

I/O address and IRQ

Resource	Default setting	Additional setting options
I/O address	384h / 385h	-
IRQ	IRQ10	NMI [1]

Table 97: Add-on CAN - I/O address and 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 98: 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 99: 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	PU
Conductor resistance	≤ 82 Ohm / 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	PU
Conductor resistance	≤ 59 Ohm / km
Outer sheathing	
Material	PUR mixture
Properties	Halogen free
Entire shielding	From tinned cu wires

Table 100: 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").

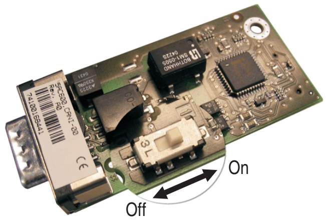


Figure 134: Terminating resistor - Add-on CAN interface 5AC600.CANI-00

Contents of the delivery / mounting material

The screws included in the mounting kit are to be used for installation.

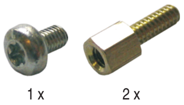


Figure 135: Contents of the delivery / mounting material - 5AC600.CANI-00

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

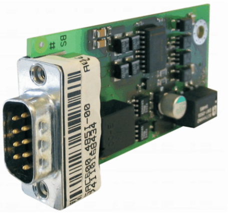
Model number	Description	Figure
5AC600.485I-00	**Add-on RS232/422/485 interface** Add-on RS232/422/485 interface for installation in an APC620 and PPC700.	

Table 101: Add-on RS232/422/485 interface - 5AC600.485I-00

Pin assignments

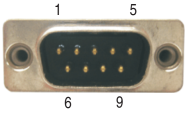
Add-on RS232/422/485			
	RS232	**RS422/485**	9-pin DSUB plug 
Type	RS232 not modem compatible; electrically isolated		
UART	16550 compatible, 16 byte FIFO		
Transfer rate	Max. 115 kBit/s		
Bus length	Max. 15 meters	Max. 1200 meters	
Pin	**Assignments (RS232)**	**Assignments (RS422)**	
1	n.c.	$\overline{TXD}$	
2	RXD	n.c.	
3	TXD	n.c.	
4	n.c.	TXD	
5	GND	GND	
6	n.c.	$\overline{RXD}$	
7	RTS	n.c.	
8	CTS	n.c.	
9	n.c.	RXD	

Table 102: 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 103: 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 "Baseboard/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 104: Bus length and transfer rate - RS232

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 PU ≤ 82 Ohm / 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 PU ≤ 59 Ohm / km
Outer sheathing Material Properties Entire shielding	 PUR mixture Halogen free From tinned cu wires

Table 105: RS232 cable requirements

Bus length and cable type RS422

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 106: Bus length and transfer rate - RS422

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	4 x 0.25 mm² (24AWG/19), tinned Cu wire
Wire insulation	PU
Conductor resistance	≤ 82 Ohm / 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	PU
Conductor resistance	≤ 59 Ohm / km
Outer sheathing	
Material	PUR mixture
Properties	Halogen free
Entire shielding	From tinned cu wires

Table 107: 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.

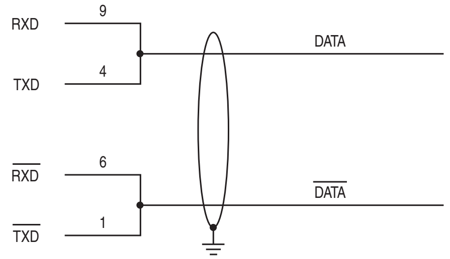


Figure 136: Add-on RS232/422/485 interface - operated in RS485 mode

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.

Bus length and cable type RS485

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 108: Bus length and transfer rate - RS485

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	PU
Conductor resistance	≤ 82 Ohm / 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	PU
Conductor resistance	≤ 59 Ohm / km
Outer sheathing	
Material	PUR mixture
Properties	Halogen free
Entire shielding	From tinned cu wires

Table 109: RS485 cable requirements

Contents of the delivery / mounting material

The screws included in the mounting kit are to be used for installation.

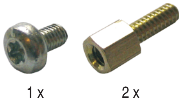


Figure 137: Contents of the delivery / mounting material 5AC600.485I-00

3.9 Fan kit

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).

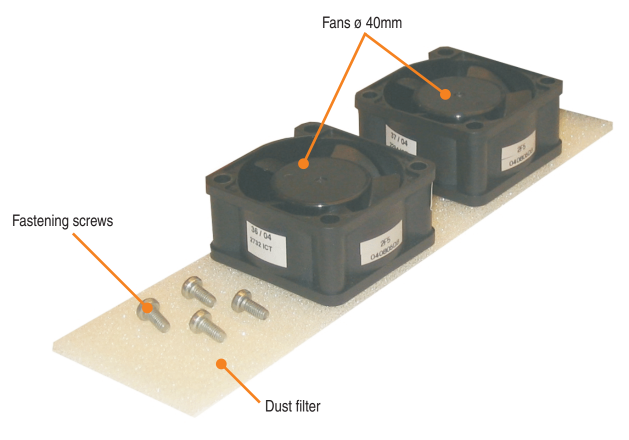


Figure 138: Fan kit 5PC700.FA00-01

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 110: 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 section "Procedure - PPC700 without PCI slots" on page 610.

Table 110: Technical data - 5PC700.FA00-01 (cont.)

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 2 "Fan kit installation and replacement", starting on page 610.

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).

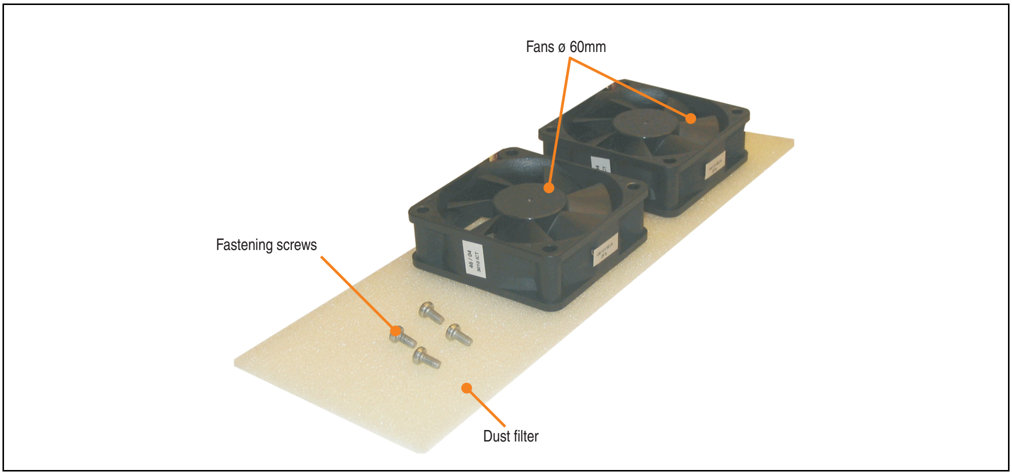


Figure 139: Fan kit 5PC700.FA02-00

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 613

Table 111: 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 2 "Fan kit installation and replacement", starting on page 613.

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).

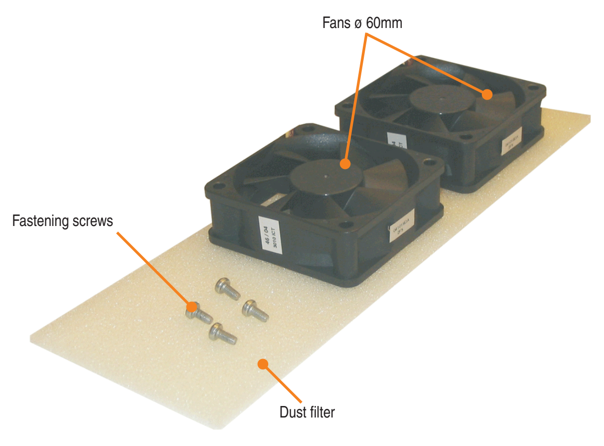


Figure 140: Fan kit 5PC700.FA02-01

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 613

Table 112: 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 2 "Fan kit installation and replacement", starting on page 613.

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 41).

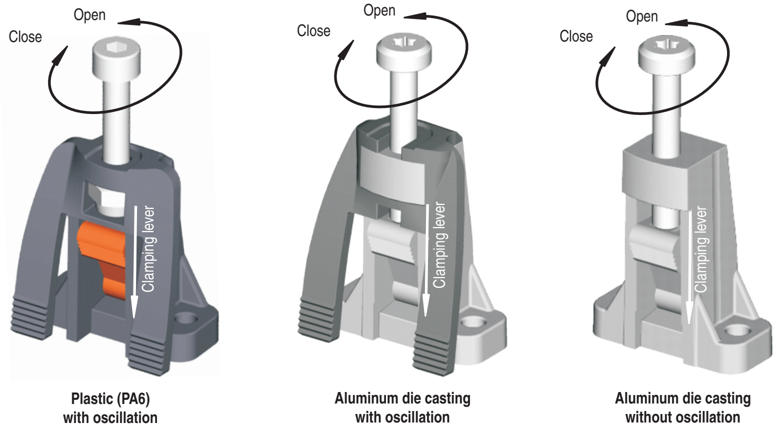


Figure 141: Terminal block

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 46).
- 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 262).
- 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.

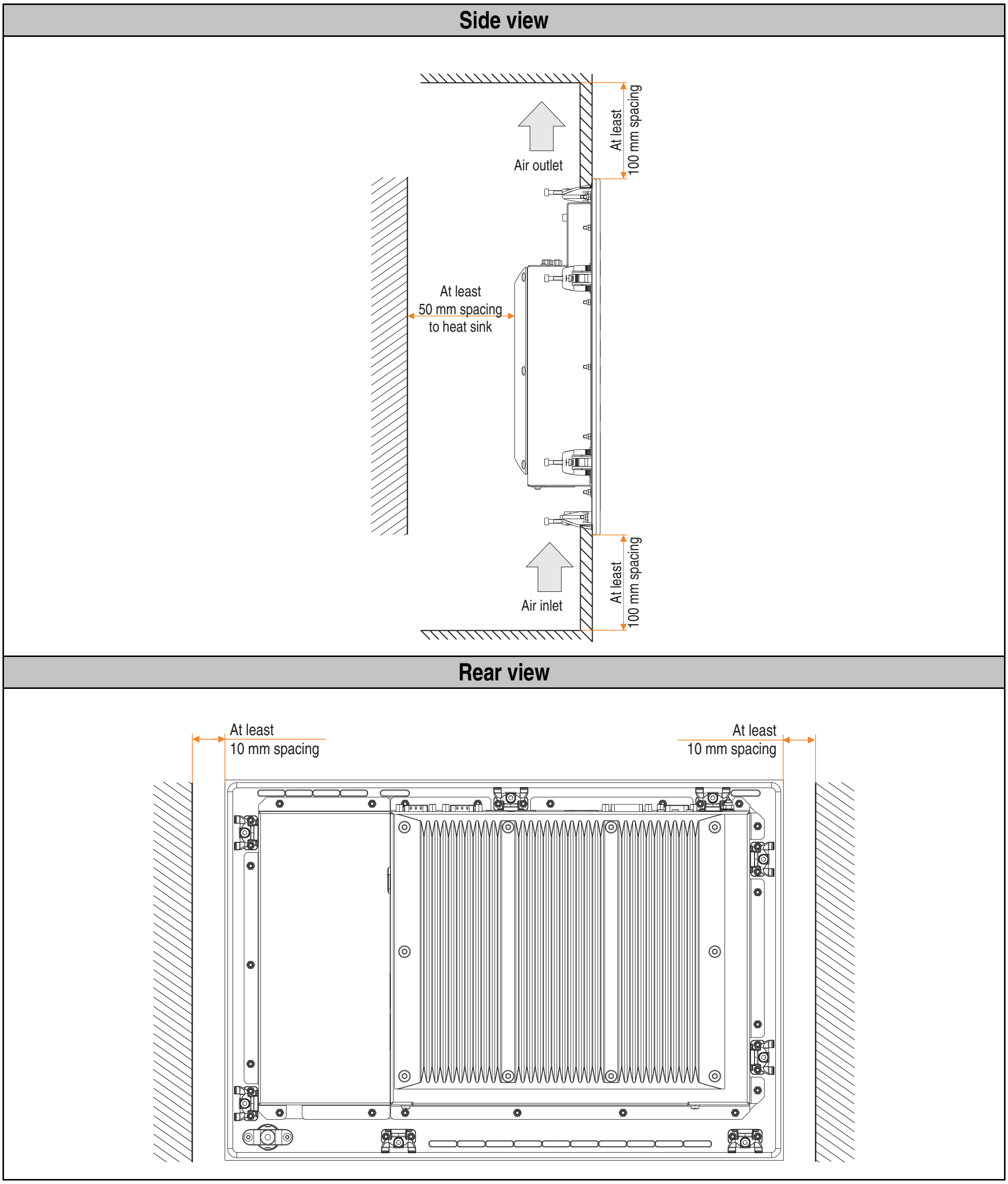


Figure 142: Spaces for air circulation

1.3 Mounting orientation

The following diagram displays the specified mounting orientation for the Panel PC 700 device.

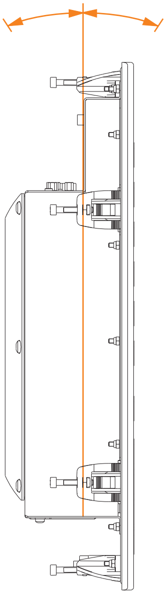


Figure 143: Mounting orientation

2. Cable connections

When making cable connections and installing cables, it is not permitted to have a bending radius smaller than the minimum value specified.

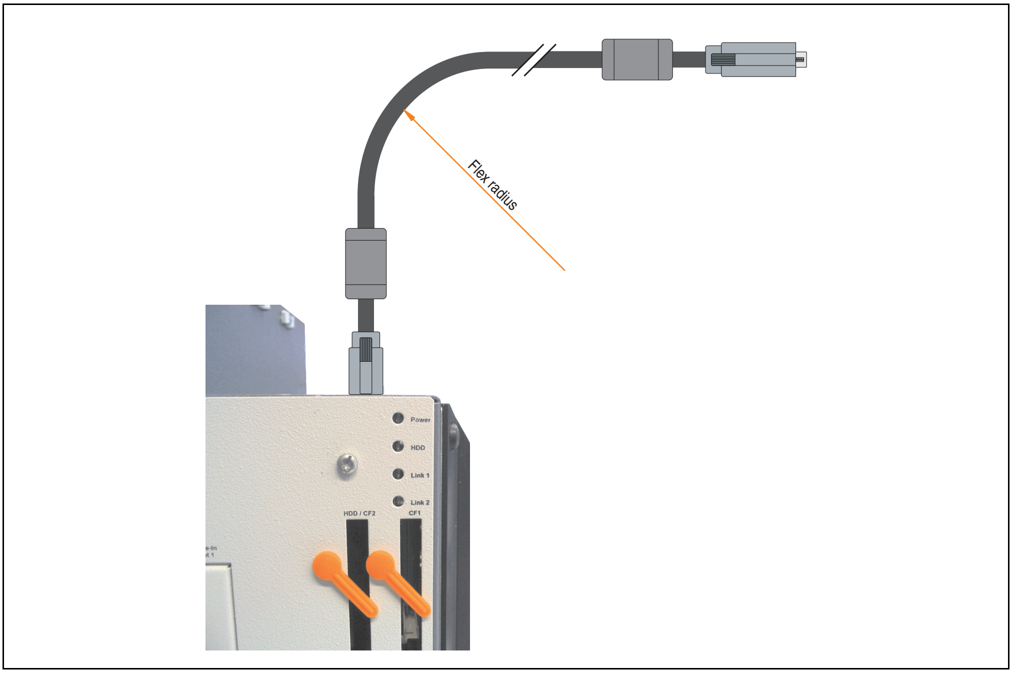


Figure 144: Flex radius - Cable connection

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 79.

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.

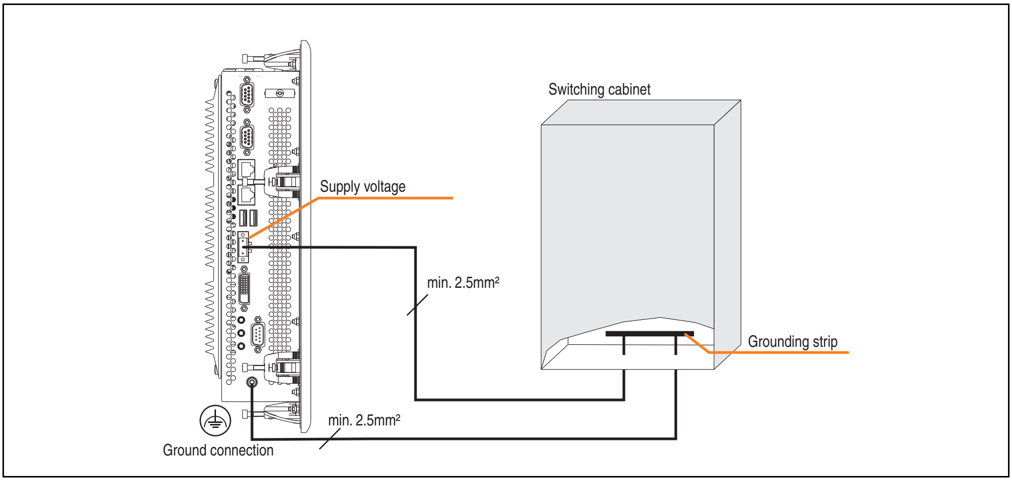


Figure 145: Grounding concept

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 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 113: 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.

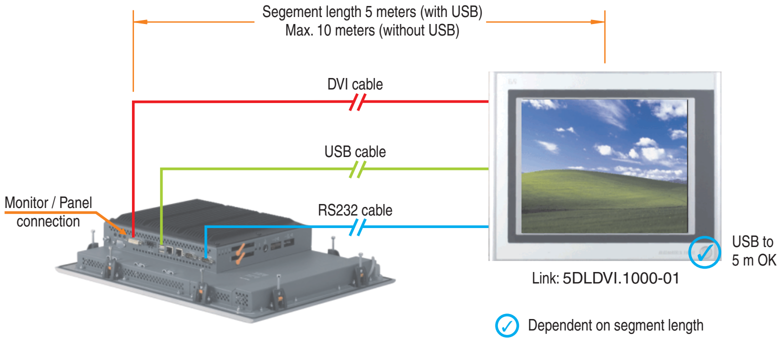

Segement length 5 meters (with USB)
Max. 10 meters (without USB)
DVI cable
USB cable
RS232 cable
Monitor / Panel connection
USB to 5 m OK
Link: 5DLDVI.1000-01
✓ Dependent on segment length

Figure 146: 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 114: 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 114: Possible combinations of system unit and CPU board

5.2.2 Link modules

Model number	Description	Comment
5DLDVI.1000-01	**Automation Panel Link DVI receiver**	For Automation Panel 900

Table 115: Link module for the 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 m1)
9A0014.02	Touch screen	1.8 m
9A0014.05	Touch screen	5 m
9A0014.10	Touch screen	10 m1)
5CAUSB.0018-00	USB	1.8 m
5CAUSB.0050-00	USB	5 m

Table 116: Cable 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)]
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 117: 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.

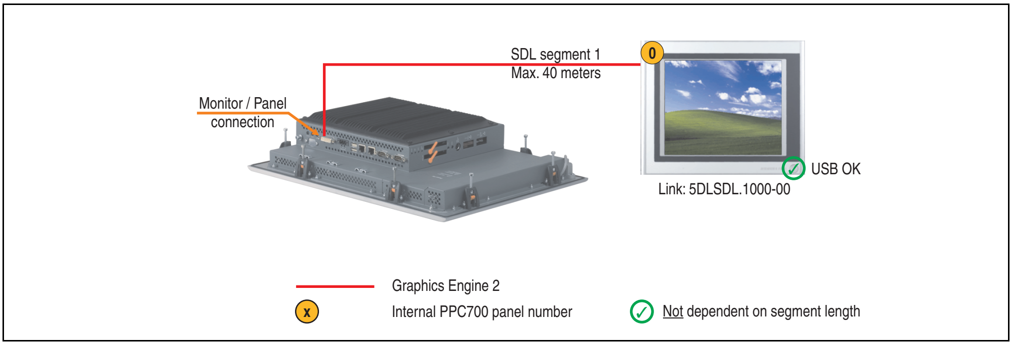

SDL segment 1
Max. 40 meters
0
Monitor / Panel connection
✓ USB OK
Link: 5DLSDL.1000-00
Graphics Engine 2
x Internal PPC700 panel number
✓ Not dependent on segment length

Figure 147: Configuration - An Automation Panel 800 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
	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 118: Possible combinations of system unit and CPU board

5.3.2 Link modules

Model number	Description	Comment
5DLSDL.1000-00	**Automation Panel Link SDL receiver**	For Automation Panel 900

Table 119: Link module for the 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 120: 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 121: Segment lengths, resolutions and SDL cables

1) See table 122 "Requirements for SDL cable with automatic cable adjustment (equalizer)"

2) See table 123 "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	Comment
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**	**Comment**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 122: 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	Comment
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**	**Comment**
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 123: 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.

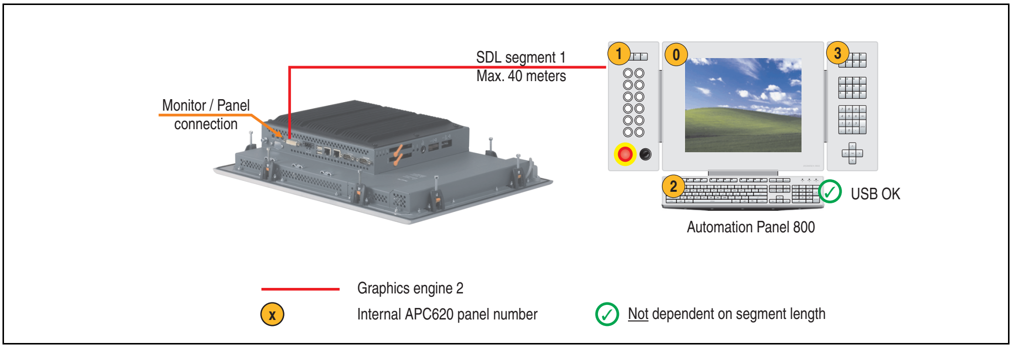

SDL segment 1
Max. 40 meters
Monitor / Panel connection
1
0
3
2
USB OK
Automation Panel 800
Graphics engine 2
x
Internal APC620 panel number
Not dependent on segment length

Figure 148: 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
	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 124: 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 125: 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	Resolution
Segment length [m]	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 126: Segment lengths, resolutions and SDL cables

1) See table 127 "Requirements for SDL cable with automatic cable adjustment (equalizer)"

2) See table 128 "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	Comment
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**	**Comment**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 127: 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	Comment
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**	**Comment**
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 128: 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.

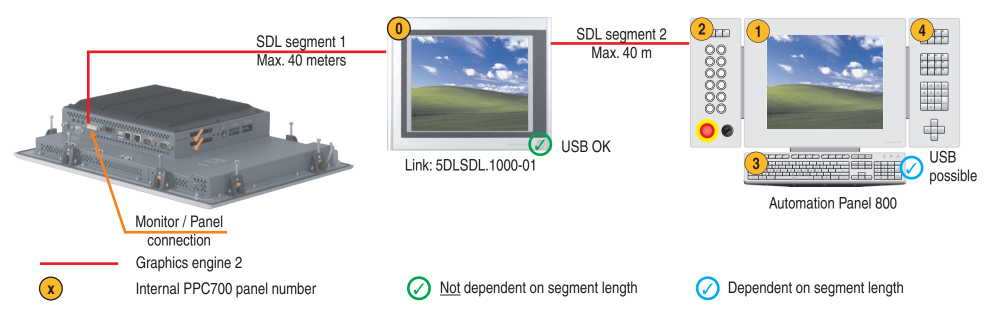


Figure 149: Configuration - An AP900 and an AP800 via SDL (onboard)

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 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 129: 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 270.

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 274.

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	Resolution
Segment length [m]	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 130: Segment lengths, resolutions and SDL cables

1) See table 131 "Requirements for SDL cable with automatic cable adjustment (equalizer)"

2) See table 132 "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	Comment
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**	**Comment**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 131: 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	Comment
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**	**Comment**
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 132: 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.

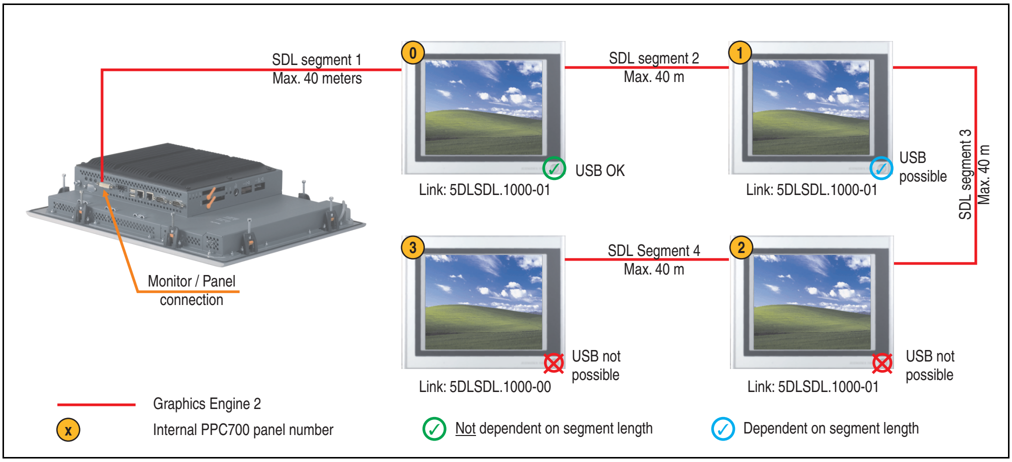


Figure 150: Configuration - Four Automation Panel 900 units via SDL (onboard)

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
	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

Table 133: 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
5PC720.1706-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 133: Possible combinations of system unit and CPU board

5.6.2 Link modules

Model number	Description	Comment
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 134: 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 135: 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	Resolution				
Segment length [m]	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 136: Segment lengths, resolutions and SDL cables

1) See table 137 "Requirements for SDL cable with automatic cable adjustment (equalizer)" on page 284

2) See table 138 "Requirements for SDL cable with extender and automatic cable adjustment (equalizer)" on page 285

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	Comment
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**	**Comment**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 137: 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	Comment
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**	**Comment**
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 138: 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.

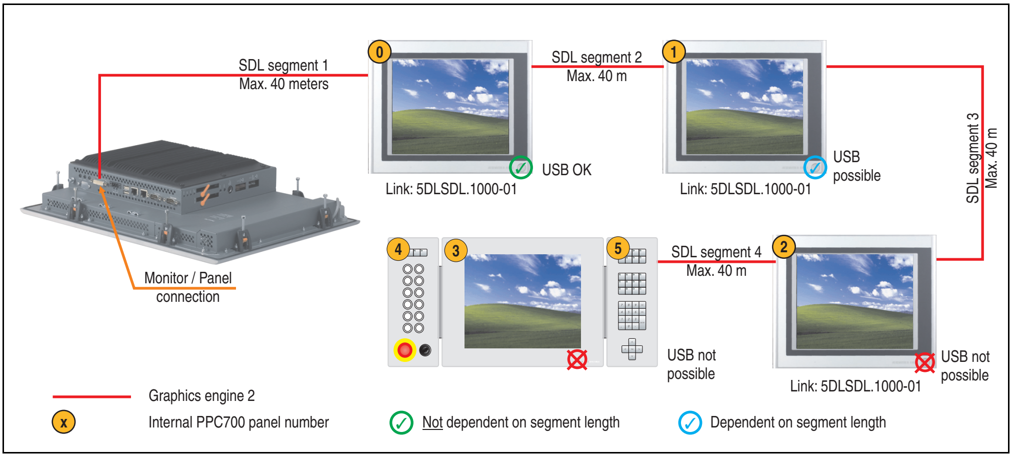


Figure 151: Three Automation Panel 900 devices and an Automation Panel 800 via SDL (onboard)

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
	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

Table 139: 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	
5PC720.1906-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC781.1505-00	✓	✓	✓	✓	✓	✓	Max. UXGA
5PC782.1043-00	✓	✓	✓	✓	✓	✓	Max. UXGA

Table 139: Possible combinations of system unit and CPU board

5.7.2 Link modules

Model number	Description	Comment
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 140: 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 270.

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 274.

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 141: Segment lengths, resolutions and SDL cables

1) See table 142 "Requirements for SDL cable with automatic cable adjustment (equalizer)"
2) See table 143 "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	Comment
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**	**Comment**
5DLSDL.1000-00	AP Link SDL receiver	Rev. E0	
5DLSDL.1000-01	AP Link SDL transceiver	Rev. E0	

Table 142: 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	Comment
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**	**Comment**
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 143: Requirements for SDL cable with extender and automatic cable adjustment (equalizer)

Firmware	Name	Version	Comment
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 143: Requirements for SDL cable with extender and automatic cable adjustment (equalizer) (cont.)

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 assure 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.

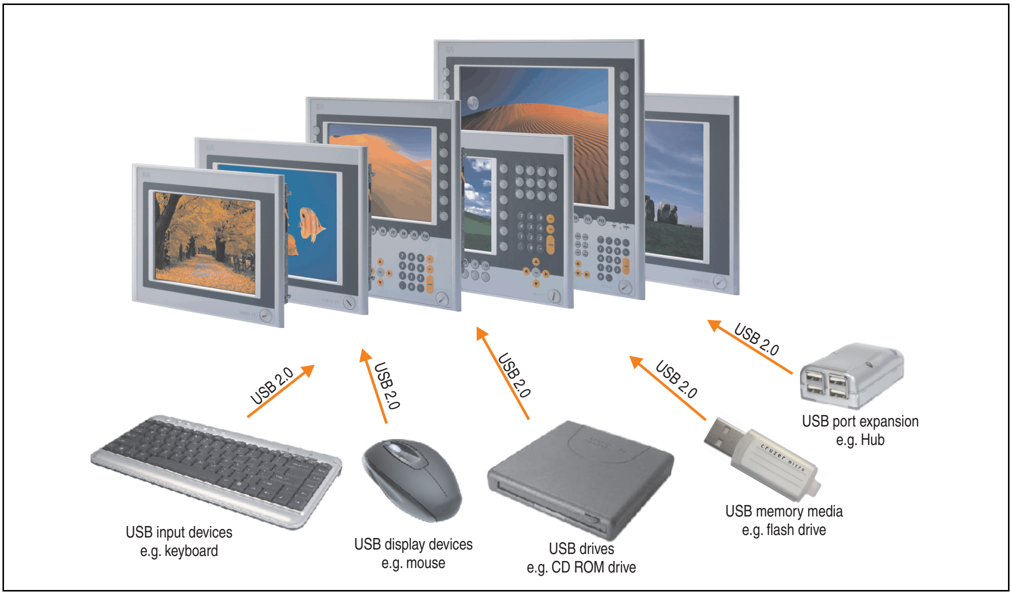


Figure 152: Local connection of USB peripheral devices on the PPC 700

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.

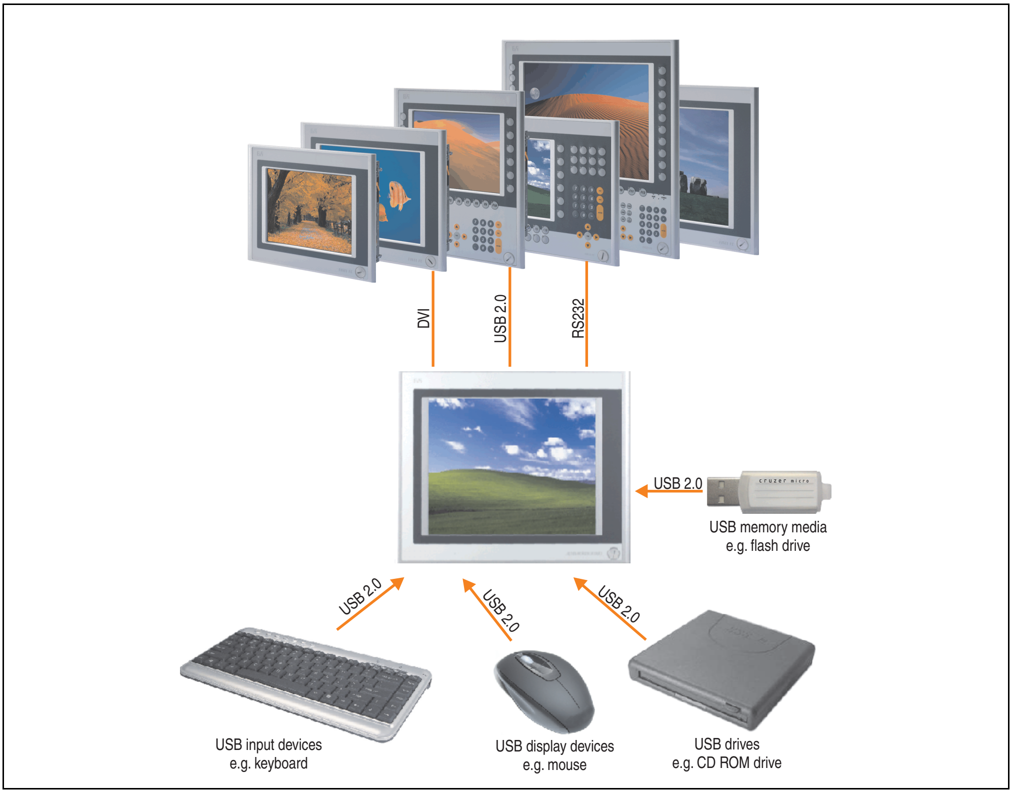


Figure 153: Remote connection of USB peripheral devices to the APC900 via DVI

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.

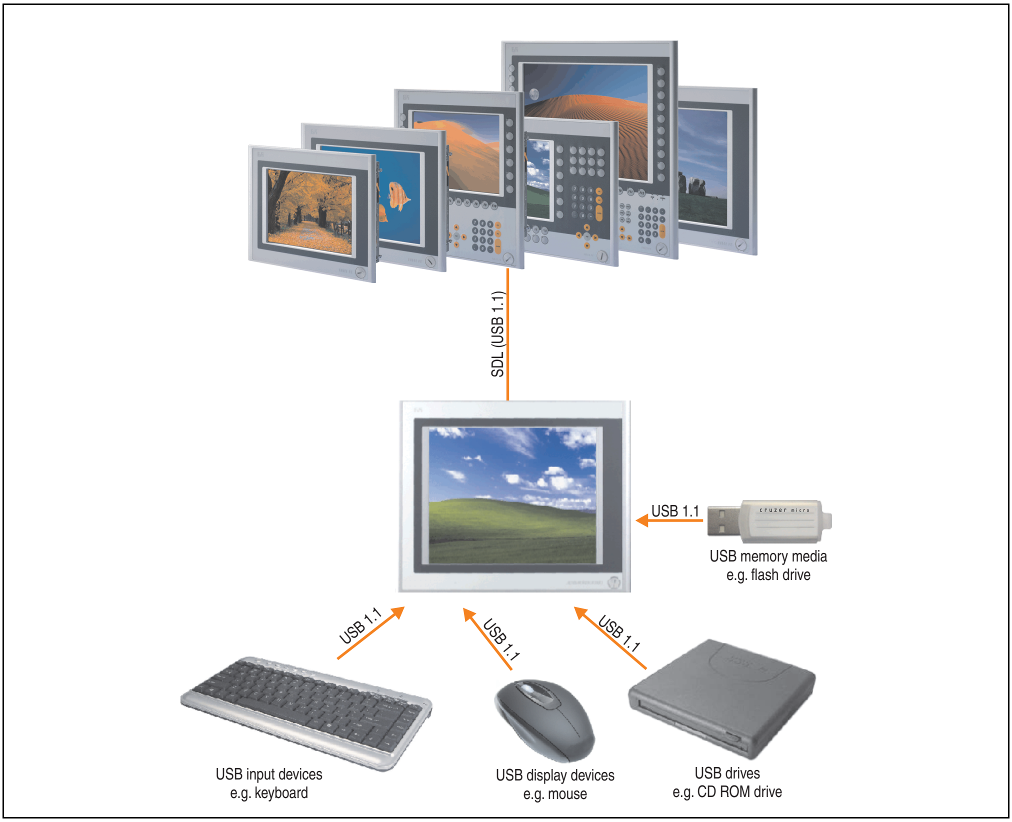
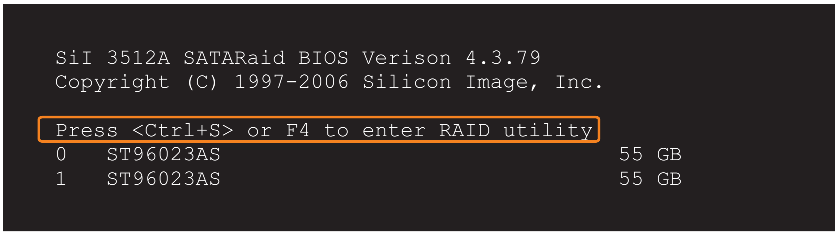


Figure 154: Remote connection of USB peripheral devices to the APC800/900 via SDL

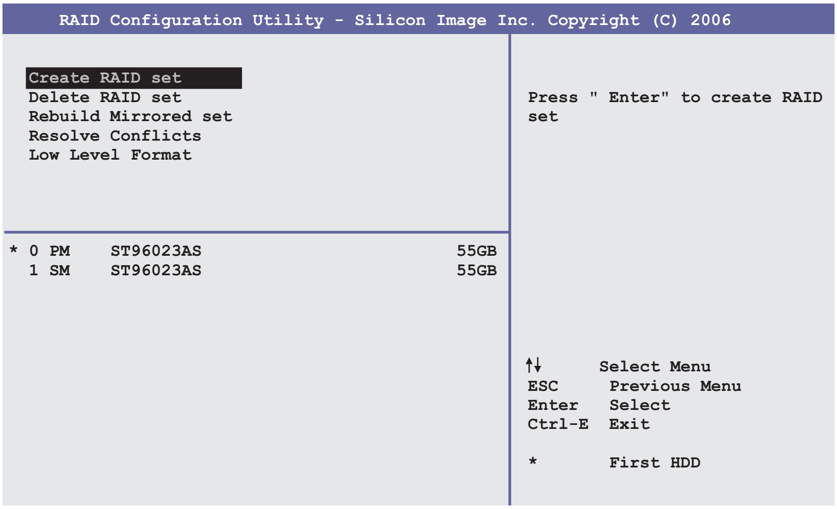
7. Configuration of a SATA RAID array

For the configuration, it's necessary to use the "RAID Configuration Utility" in BIOS. After the POST, enter <Ctrl+S> or <F4> to open RAID BIOS.



```
SiI 3512A SATARaid BIOS Verison 4.3.79
Copyright (C) 1997-2006 Silicon Image, Inc.

Press <Ctrl+S> or F4 to enter RAID utility
0   ST96023AS                               55 GB
1   ST96023AS                               55 GB
```

Figure 155: Open the RAID Configuration Utility



```
   RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

  Create RAID set
  Delete RAID set                          Press " Enter" to create RAID
  Rebuild Mirrored set                     set
  Resolve Conflicts
  Low Level Format

* 0 PM    ST96023AS                  55GB
  1 SM    ST96023AS                  55GB

                                           ↑↓      Select Menu
                                           ESC      Previous Menu
                                           Enter    Select
                                           Ctrl-E   Exit

                                           *        First HDD
```

Figure 156: RAID Configuration Utility - Menu

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

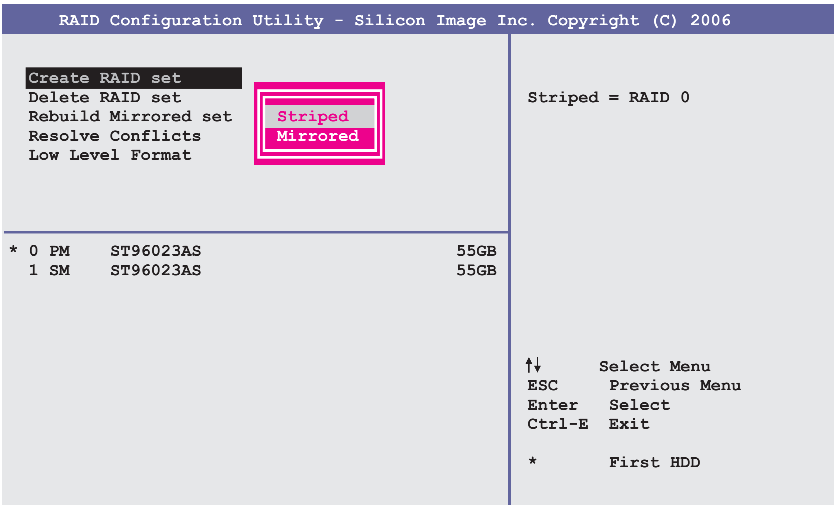
Key	Function
Cursor ↑	Go to previous item.
Cursor ↓	Go to the next item.
Enter	Select an item or open a submenu.
ESC	Go back to previous menu.

Table 144: BIOS-relevant keys in the RAID Configuration Utility

Key	Function
Ctrl+E	Exit setup and save the changed settings.

Table 144: BIOS-relevant keys in the RAID Configuration Utility

7.1 Create RAID Set

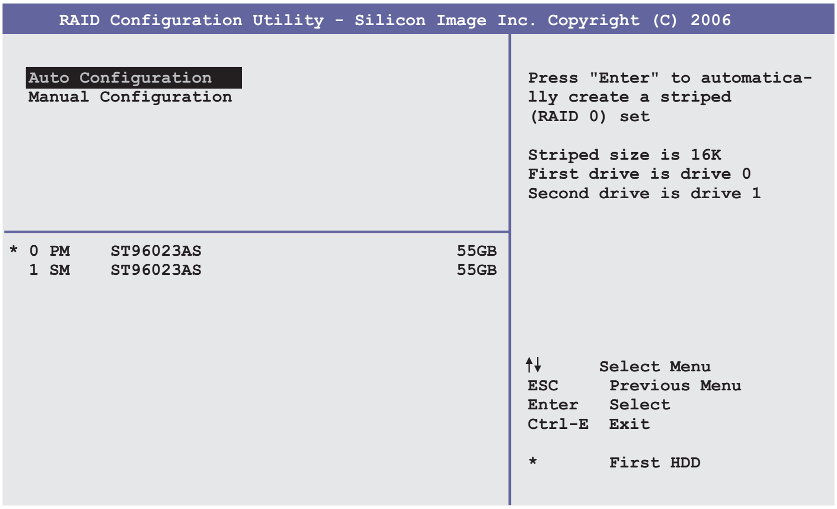


```
   RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

  Create RAID set                                   Striped = RAID 0
  Delete RAID set
  Rebuild Mirrored set     Striped
  Resolve Conflicts        Mirrored
  Low Level Format

* 0 PM    ST96023AS                        55GB
  1 SM    ST96023AS                        55GB

                                                    ↑↓       Select Menu
                                                    ESC      Previous Menu
                                                    Enter    Select
                                                    Ctrl-E   Exit

                                                    *        First HDD
```

Figure 157: RAID Configuration Utility - Menu

Using the menu "Create RAID set", it's possible to recreate the RAID system as "Striped" = RAID0 or "Mirrored" = RAID1.

7.2 Create RAID Set - striped



```
   RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

 Auto Configuration                                  Press "Enter" to automatica-
 Manual Configuration                                lly create a striped
                                                     (RAID 0) set

                                                     Striped size is 16K
                                                     First drive is drive 0
                                                     Second drive is drive 1

* 0 PM    ST96023AS                         55GB
  1 SM    ST96023AS                         55GB

                                                     ↑↓      Select Menu
                                                     ESC      Previous Menu
                                                     Enter    Select
                                                     Ctrl-E   Exit

                                                     *        First HDD
```

Figure 158: RAID Configuration Utility - Create RAID set - striped

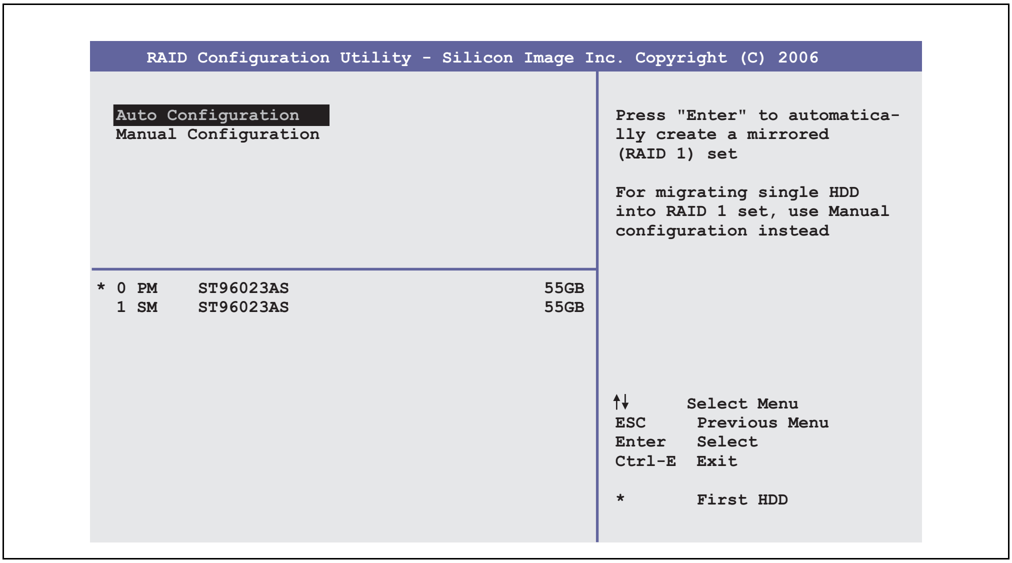
Auto Configuration

Auto Configuration optimizes all settings.

Manual Configuration

It's possible to specify the first and second HDD as well as the "Chunk Size" (= block size, application-dependent).

7.3 Create RAID Set - Mirrored



```
RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

Auto Configuration                   Press "Enter" to automatica-
Manual Configuration                 lly create a mirrored
                                     (RAID 1) set

                                     For migrating single HDD
                                     into RAID 1 set, use Manual
                                     configuration instead

* 0 PM    ST96023AS            55GB
  1 SM    ST96023AS            55GB

                                     ↑↓       Select Menu
                                     ESC      Previous Menu
                                     Enter    Select
                                     Ctrl-E   Exit

                                     *        First HDD
```

Figure 159: RAID Configuration Utility - Create RAID set - Mirrored

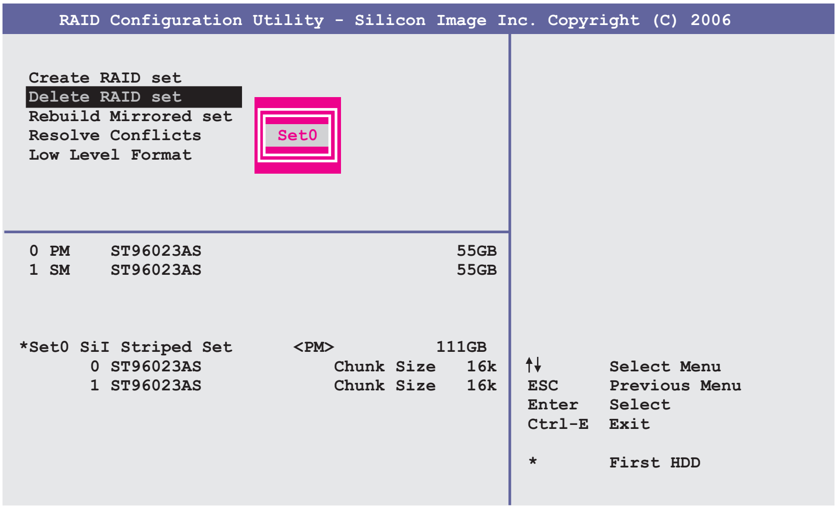
Auto Configuration

Auto Configuration optimizes all settings.

Manual Configuration

It's possible to specify the "Source" and "Target" HDD, and also to specify if a rebuild (mirror) should be done immediately (approx. 50 minutes).

7.4 Delete RAID set

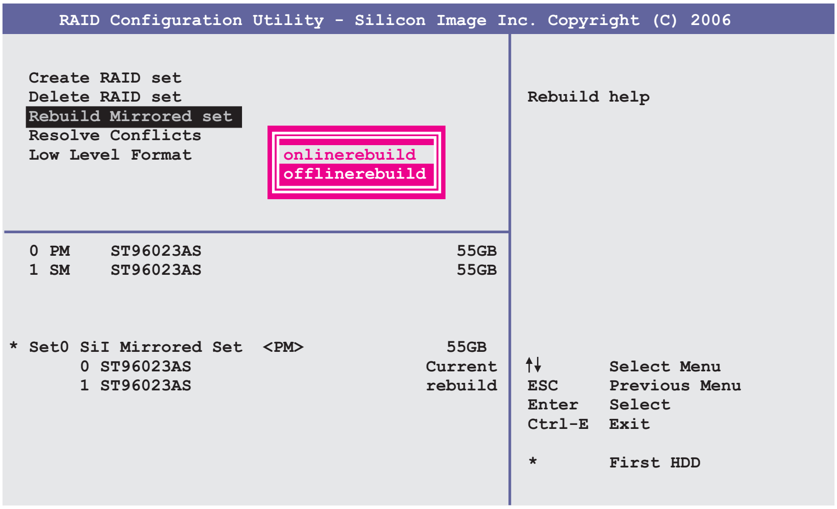


```
   RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

 Create RAID set
 Delete RAID set
 Rebuild Mirrored set      Set0
 Resolve Conflicts
 Low Level Format

 0 PM    ST96023AS                               55GB
 1 SM    ST96023AS                               55GB

*Set0 SiI Striped Set       <PM>            111GB
       0 ST96023AS             Chunk Size    16k     ↑↓       Select Menu
       1 ST96023AS             Chunk Size    16k     ESC      Previous Menu
                                                     Enter    Select
                                                     Ctrl-E   Exit

                                                     *        First HDD
```

Figure 160: RAID Configuration Utility - Delete RAID set

Using the menu "Delete RAID set", it's possible to delete an existing RAID set.

7.5 Rebuild Mirrored Set



```
    RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

  Create RAID set
  Delete RAID set                                  Rebuild help
  Rebuild Mirrored set
  Resolve Conflicts       onlinerebuild
  Low Level Format        offlinerebuild

  0 PM    ST96023AS                      55GB
  1 SM    ST96023AS                      55GB


* Set0 SiI Mirrored Set  <PM>           55GB
       0 ST96023AS                   Current    ↑↓      Select Menu
       1 ST96023AS                   rebuild    ESC     Previous Menu
                                                Enter   Select
                                                Ctrl-E  Exit

                                                *       First HDD
```

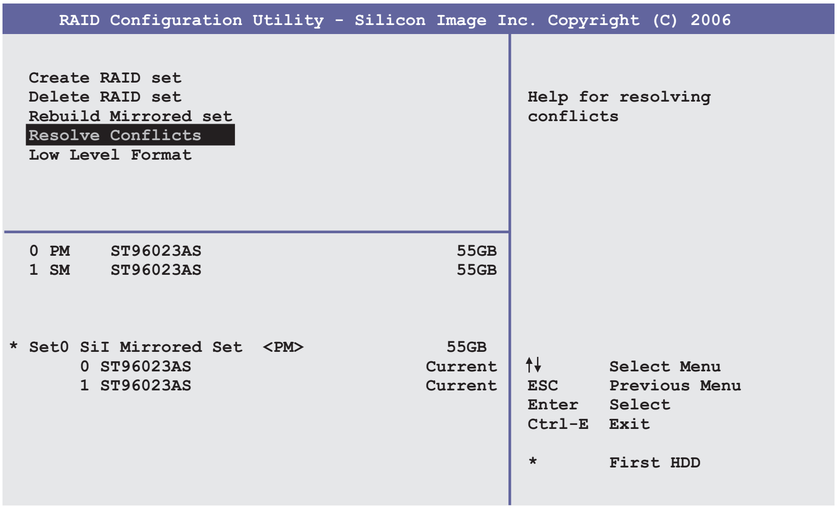
Figure 161: RAID Configuration Utility - Rebuild Mirrored set

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

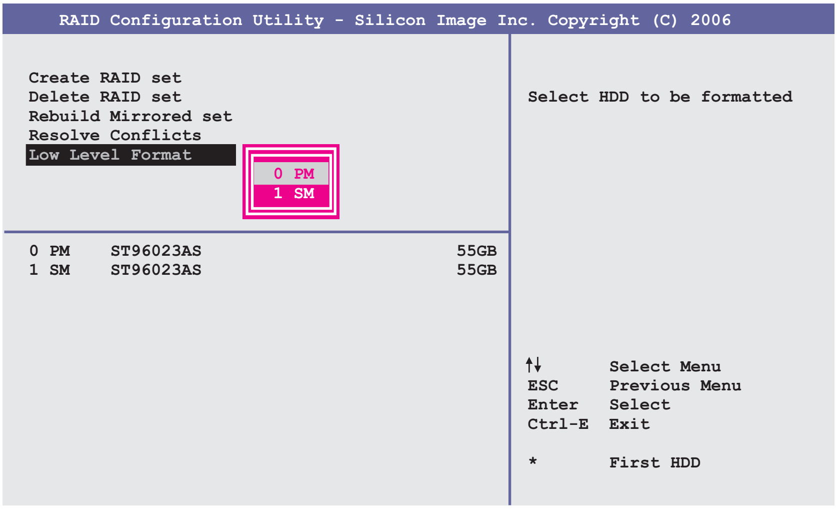


```
   RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

  Create RAID set
  Delete RAID set                                  Help for resolving
  Rebuild Mirrored set                             conflicts
  Resolve Conflicts
  Low Level Format

  0 PM    ST96023AS                        55GB
  1 SM    ST96023AS                        55GB

* Set0 SiI Mirrored Set  <PM>             55GB
       0 ST96023AS                      Current    ↑↓      Select Menu
       1 ST96023AS                      Current    ESC     Previous Menu
                                                   Enter   Select
                                                   Ctrl-E  Exit

                                                   *       First HDD
```

Figure 162: RAID Configuration Utility - Resolve Conflicts

Using the menu "Resolve Conflicts", it's possible to resolve RAID set conflicts. This function is only available if the status of the hard disk is "conflict".

7.7 Low Level Format



```
RAID Configuration Utility - Silicon Image Inc. Copyright (C) 2006

Create RAID set                                  Select HDD to be formatted
Delete RAID set
Rebuild Mirrored set
Resolve Conflicts
Low Level Format
                  0  PM
                  1  SM

0  PM    ST96023AS                        55GB
1  SM    ST96023AS                        55GB

                                                 ↑↓       Select Menu
                                                 ESC      Previous Menu
                                                 Enter    Select
                                                 Ctrl-E   Exit

                                                 *        First HDD
```

Figure 163: RAID Configuration Utility - Low Level Format

Using the menu "Low Level Format", it's possible to format individual hard disks. This can only be done if a RAID set is not configured. A low level format of a hard disk takes approx. 40 minutes.

Chapter 4 • Software

1. Panel PC 700 with BIOS

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 345).**

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.

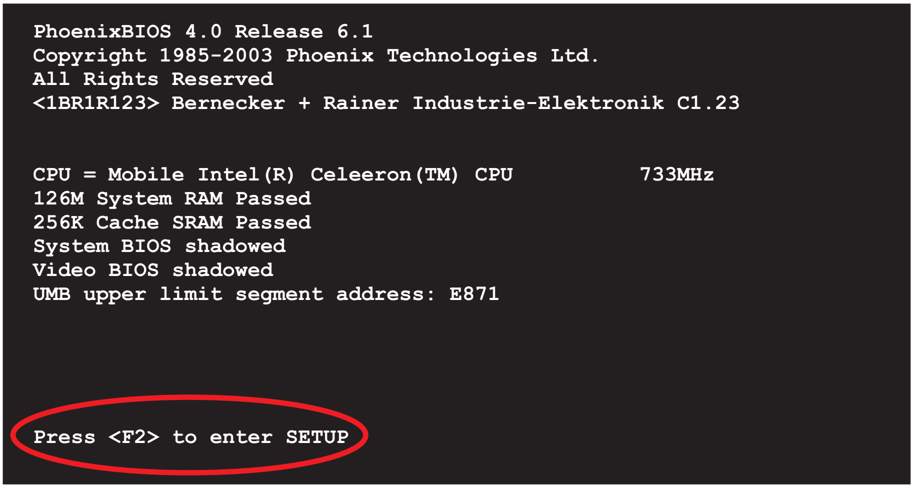
1.1.2 BIOS setup

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"

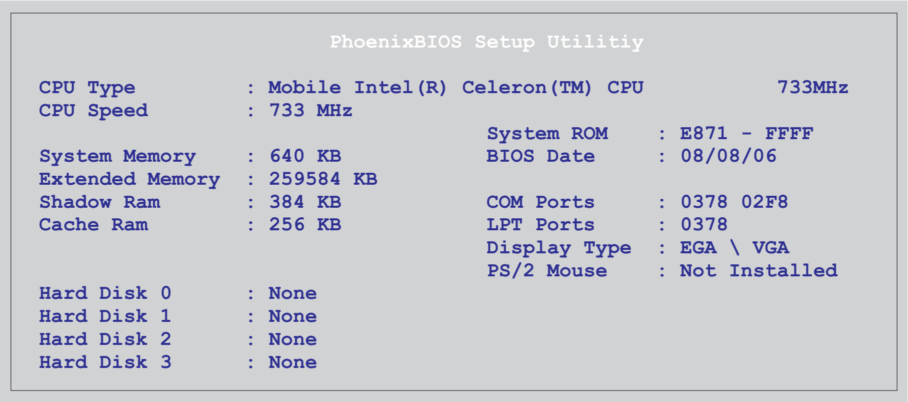


```
PhoenixBIOS 4.0 Release 6.1
Copyright 1985-2003 Phoenix Technologies Ltd.
All Rights Reserved
<1BR1R123> Bernecker + Rainer Industrie-Elektronik C1.23


CPU = Mobile Intel(R) Celeeron(TM) CPU          733MHz
126M System RAM Passed
256K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
UMB upper limit segment address: E871





Press <F2> to enter SETUP
```

Figure 164: 815E (ETX) BIOS diagnostic screen

Summary screen

After the POST, the summary screen displays the most important system characteristics.



```
                    PhoenixBIOS Setup Utilitiy

CPU Type           : Mobile Intel(R) Celeron(TM) CPU           733MHz
CPU Speed          : 733 MHz
                                        System ROM     : E871 - FFFF
System Memory      : 640 KB             BIOS Date      : 08/08/06
Extended Memory    : 259584 KB
Shadow Ram         : 384 KB             COM Ports      : 0378 02F8
Cache Ram          : 256 KB             LPT Ports      : 0378
                                        Display Type   : EGA \ VGA
                                        PS/2 Mouse     : Not Installed
Hard Disk 0        : None
Hard Disk 1        : None
Hard Disk 2        : None
Hard Disk 3        : None
```

Figure 165: 815E (ETX) BIOS diagnostic 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 145: 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.
PgUp↑	Moves the cursor to the top of the current BIOS setup page.
PgDn ↓	Moves the cursor to the bottom of the current BIOS setup page.

Table 146: 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.

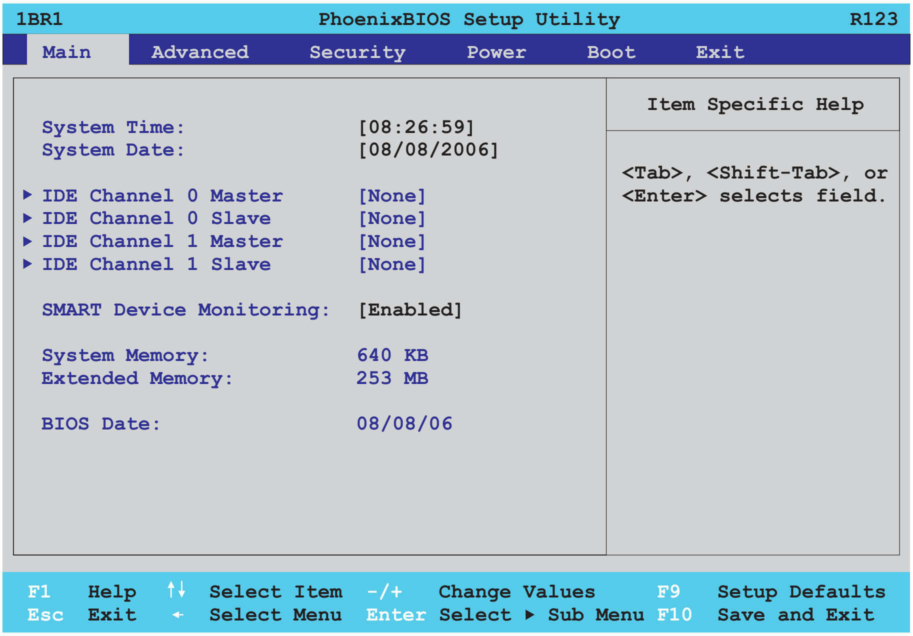
Table 146: Keys relevant to BIOS 815E (ETX)

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.	305
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.	312
Security	For setting up the system's security functions.	336
Power	Setup of various APM (Advanced Power Management) options.	338
Boot	The boot order can be set here.	342
Exit	To end the BIOS setup.	343

Table 147: BIOS 815E (ETX) - Overview of BIOS menu items

1.1.4 Main



```
1BR1                PhoenixBIOS Setup Utility                R123
   Main     Advanced     Security     Power     Boot     Exit

                                                    Item Specific Help
   System Time:                [08:26:59]
   System Date:                [08/08/2006]
                                                   <Tab>, <Shift-Tab>, or
 ▶ IDE Channel 0 Master        [None]              <Enter> selects field.
 ▶ IDE Channel 0 Slave         [None]
 ▶ IDE Channel 1 Master        [None]
 ▶ IDE Channel 1 Slave         [None]

   SMART Device Monitoring:    [Enabled]

   System Memory:              640 KB
   Extended Memory:            253 MB

   BIOS Date:                  08/08/06

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 166: 815E (ETX)- main menu

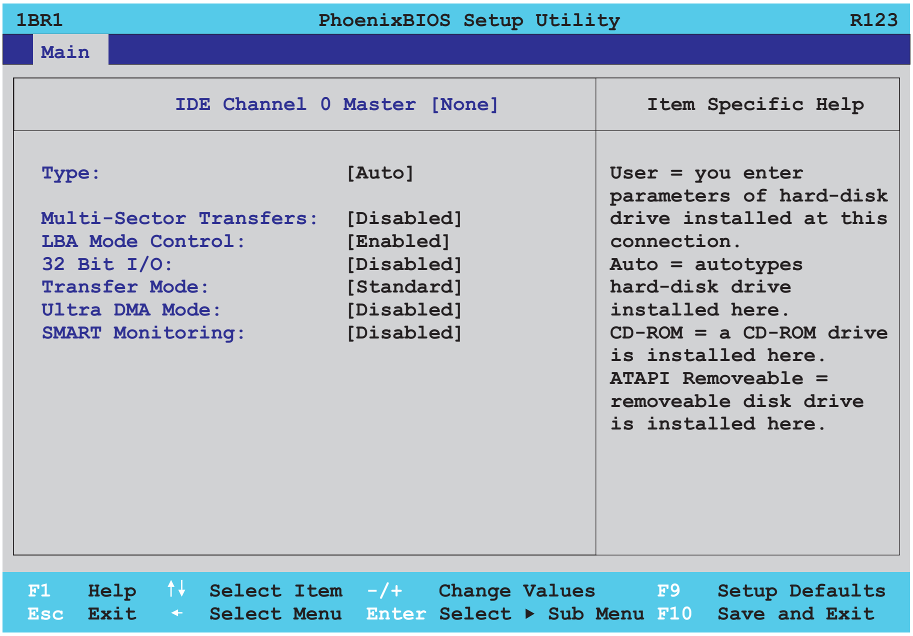
BIOS setting	Meaning	Setting options	Effect
System time	This is the current system time setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Adjustment of the system time	Set the system time in the format (hh:mm:ss).
System date	This is the current system date setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Changes to 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 submenu see "IDE channel 0 master" on page 306.
IDE channel 0 slave	The drive in the system that is connected to the IDE primary slave port is configured here.	Enter	Opens submenu see "IDE Channel 0 Slave" on page 308.
IDE channel 1 master	The drive in the system that is connected to the IDE secondary master port is configured here.	Enter	Opens submenu see "IDE channel 1 master" on page 309.
IDE channel 1 slave	The drive in the system that is connected to the IDE secondary slave port is configured here.	Enter	Opens submenu see "IDE channel 1 slave" on page 311.

Table 148: 815E (ETX)- main menu - 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 148: 815E (ETX)- main menu - setting options (cont.)

IDE channel 0 master



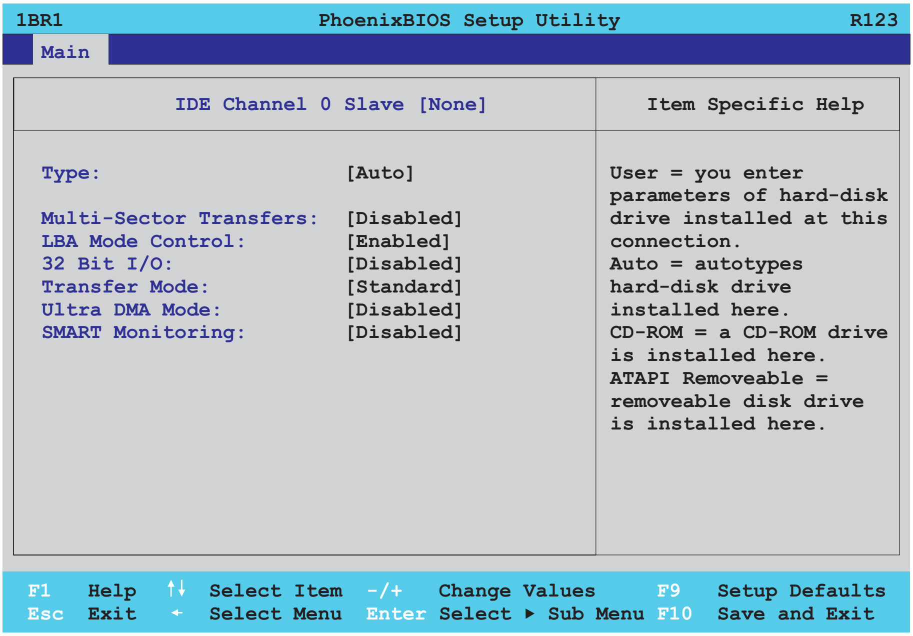
```
          IDE Channel 0 Master [None]                 Item Specific Help

  Type:                           [Auto]            User = you enter
                                                    parameters of hard-disk
  Multi-Sector Transfers:         [Disabled]        drive installed at this
  LBA Mode Control:               [Enabled]         connection.
  32 Bit I/O:                     [Disabled]        Auto = autotypes
  Transfer Mode:                  [Standard]        hard-disk drive
  Ultra DMA Mode:                 [Disabled]        installed here.
  SMART Monitoring:               [Disabled]        CD-ROM = a CD-ROM drive
                                                    is installed here.
                                                    ATAPI Removeable =
                                                    removeable disk drive
                                                    is installed here.
```

Figure 167: 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 149: 815E (ETX) IDE Channel 0 Master - setting options

IDE Channel 0 Slave



```
1BR1                  PhoenixBIOS Setup Utility                  R123
 Main

          IDE Channel 0 Slave [None]              Item Specific Help

  Type:                          [Auto]           User = you enter
                                                  parameters of hard-disk
  Multi-Sector Transfers:        [Disabled]       drive installed at this
  LBA Mode Control:              [Enabled]        connection.
  32 Bit I/O:                    [Disabled]       Auto = autotypes
  Transfer Mode:                 [Standard]       hard-disk drive
  Ultra DMA Mode:                [Disabled]       installed here.
  SMART Monitoring:              [Disabled]       CD-ROM = a CD-ROM drive
                                                  is installed here.
                                                  ATAPI Removeable =
                                                  removeable disk drive
                                                  is installed here.

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 168: 815E (ETX) IDE Channel 0 Slave setup

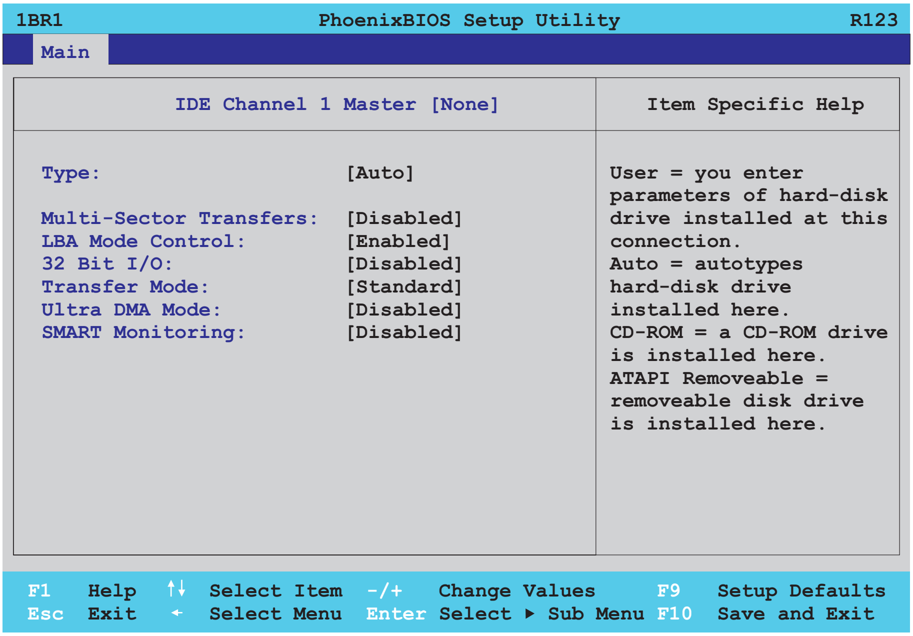
BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the primary slave is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for 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 150: 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 150: 815E (ETX) IDE Channel 0 Slave - setting options (cont.)

IDE channel 1 master



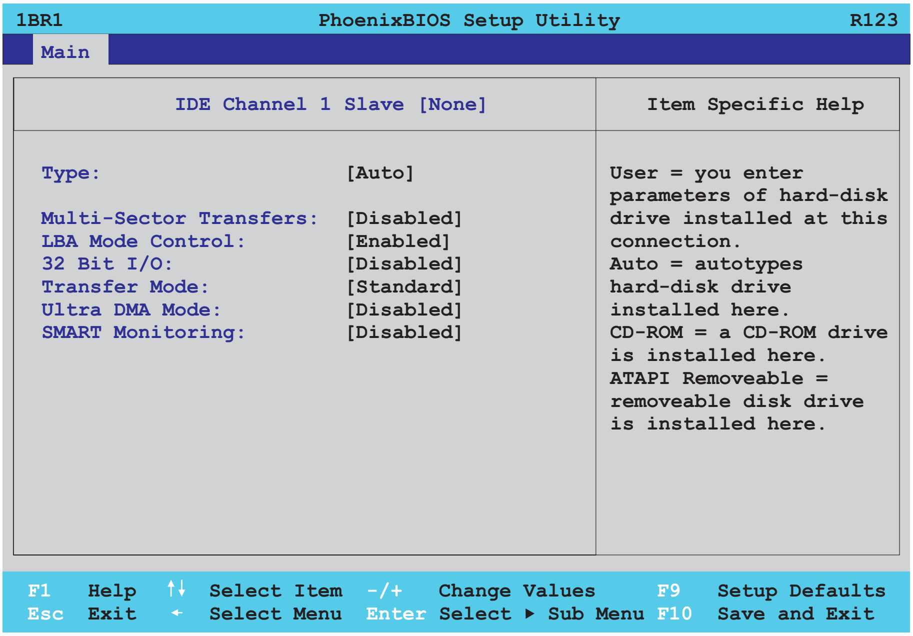
```
1BR1                   PhoenixBIOS Setup Utility                   R123
 Main

          IDE Channel 1 Master [None]                Item Specific Help

   Type:                      [Auto]               User = you enter
                                                   parameters of hard-disk
   Multi-Sector Transfers:    [Disabled]           drive installed at this
   LBA Mode Control:          [Enabled]            connection.
   32 Bit I/O:                [Disabled]           Auto = autotypes
   Transfer Mode:             [Standard]           hard-disk drive
   Ultra DMA Mode:            [Disabled]           installed here.
   SMART Monitoring:          [Disabled]           CD-ROM = a CD-ROM drive
                                                   is installed here.
                                                   ATAPI Removeable =
                                                   removeable disk drive
                                                   is installed here.

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▸ Sub Menu    F10  Save and Exit
```

Figure 169: 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.
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 151: 815E (ETX) IDE Channel 1 Master - setting options

IDE channel 1 slave



```
1BR1                    PhoenixBIOS Setup Utility                    R123
 Main

            IDE Channel 1 Slave [None]              Item Specific Help

  Type:                          [Auto]              User = you enter
                                                     parameters of hard-disk
  Multi-Sector Transfers:        [Disabled]          drive installed at this
  LBA Mode Control:              [Enabled]           connection.
  32 Bit I/O:                    [Disabled]          Auto = autotypes
  Transfer Mode:                 [Standard]          hard-disk drive
  Ultra DMA Mode:                [Disabled]          installed here.
  SMART Monitoring:              [Disabled]          CD-ROM = a CD-ROM drive
                                                     is installed here.
                                                     ATAPI Removeable =
                                                     removeable disk drive
                                                     is installed here.

 F1   Help  ↑↓  Select Item  -/+    Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▶ Sub Menu  F10  Save and Exit
```

Figure 170: 815E (ETX) IDE Channel 1 Slave setup

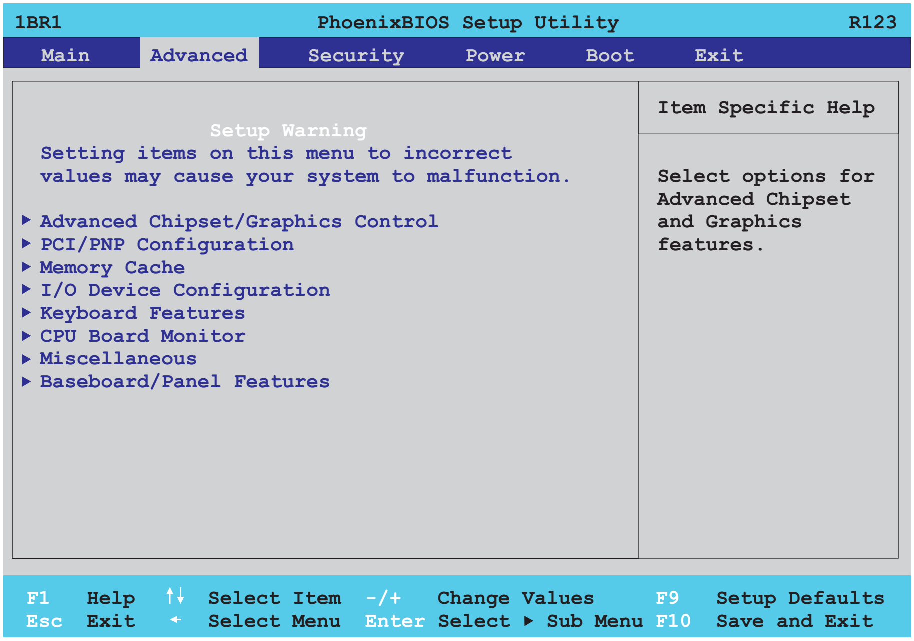
BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the secondary slave is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		Other ATAPI	Use this option for 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 152: 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 152: 815E (ETX) IDE Channel 1 Slave - setting options (cont.)

1.1.5 Advanced



```
1BR1                    PhoenixBIOS Setup Utility                     R123
   Main      Advanced     Security     Power     Boot     Exit

                Setup Warning                         Item Specific Help
  Setting items on this menu to incorrect
  values may cause your system to malfunction.        Select options for
                                                      Advanced Chipset
 ▸ Advanced Chipset/Graphics Control                  and Graphics
 ▸ PCI/PNP Configuration                              features.
 ▸ Memory Cache
 ▸ I/O Device Configuration
 ▸ Keyboard Features
 ▸ CPU Board Monitor
 ▸ Miscellaneous
 ▸ Baseboard/Panel Features

 F1   Help  ↑↓  Select Item  -/+    Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▸ Sub Menu  F10  Save and Exit
```

Figure 171: 815E (ETX)- main menu

BIOS setup menu	Meaning	Setting options	Effect
Advanced chipset/graphics control	Setup of advanced chipset and graphics functions.	Enter	Opens submenu see "Advanced chipset/graphics control" on page 313.
PCI/PNP configuration	Configures PCI devices.	Enter	Opens submenu see "PCI/PNP configuration" on page 315.
Memory cache	Configuration of the memory cache resources.	Enter	Opens submenu see "Memory cache" on page 322.
I/O device configuration	Configuration of the I/O devices.	Enter	Opens submenu see "I/O device configuration" on page 324.
Keyboard features	Configuration of the keyboard options.	Enter	Opens submenu see "Keyboard features" on page 327.
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu see "CPU board monitor" on page 328.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc.).	Enter	Opens submenu see "Miscellaneous" on page 329.
Baseboard/panel features	Displays device specific information and setup of device specific values.	Enter	Opens submenu see "Baseboard/panel features" on page 330.

Table 153: 815E (ETX)- main menu - setting options

Advanced chipset/graphics control

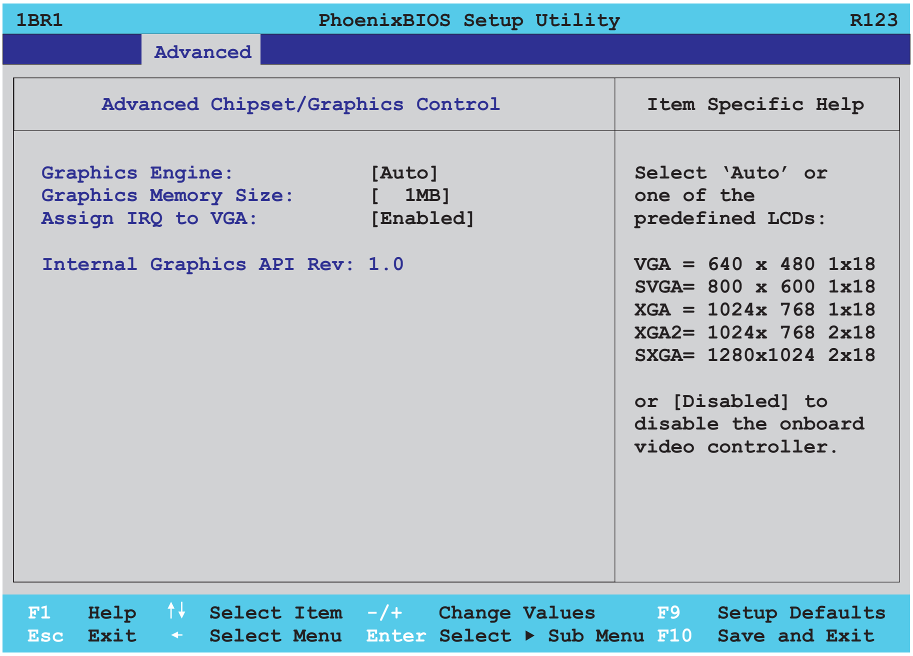

```
1BR1              PhoenixBIOS Setup Utility              R123
                Advanced

     Advanced Chipset/Graphics Control          Item Specific Help

  Graphics Engine:             [Auto]           Select 'Auto' or
  Graphics Memory Size:        [  1MB]          one of the
  Assign IRQ to VGA:           [Enabled]        predefined LCDs:

  Internal Graphics API Rev: 1.0                VGA = 640 x 480 1x18
                                                SVGA= 800 x 600 1x18
                                                XGA = 1024x 768 1x18
                                                XGA2= 1024x 768 2x18
                                                SXGA= 1280x1024 2x18

                                                or [Disabled] to
                                                disable the onboard
                                                video controller.

F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
Esc  Exit  ←   Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 172: 815E (ETX) - advanced chipset/graphics control

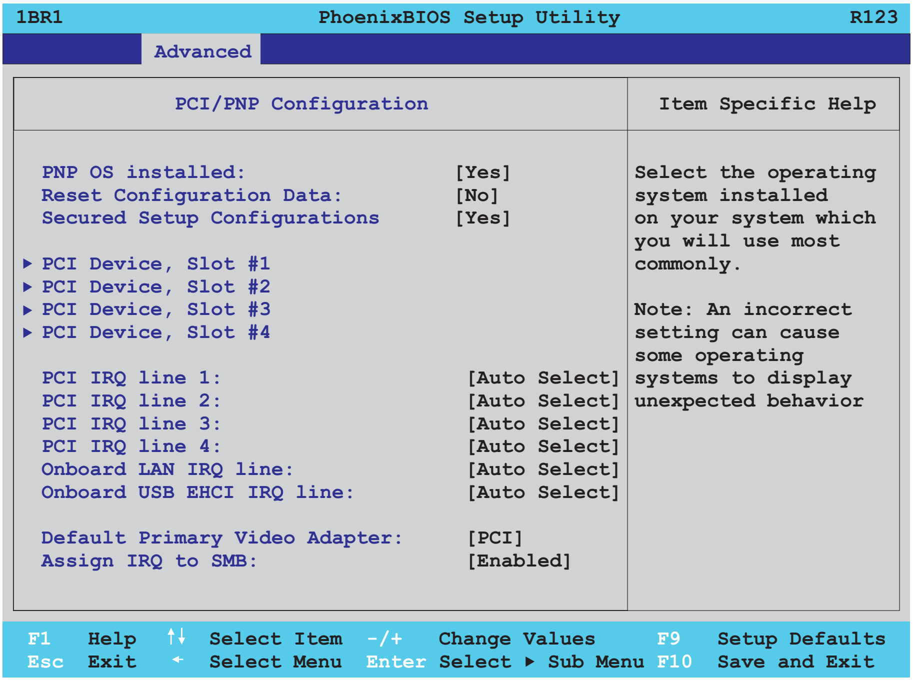
BIOS setting	Meaning	Setting options	Effect
Graphics engine	Settings can be made for the onboard video controller.	Auto	Automatic setting of the resolution (using a read-out of the connected panel's EDID data).

		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	**Important!** **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.
Internal graphics API Rev	Displays the internal graphics API version number.	None	-

Table 154: 815E (ETX) - advanced chipset/graphics control - setting options

PCI/PNP configuration



```
1BR1                  PhoenixBIOS Setup Utility                       R123
            Advanced

          PCI/PNP Configuration                     Item Specific Help

  PNP OS installed:                  [Yes]          Select the operating
  Reset Configuration Data:          [No]           system installed
  Secured Setup Configurations       [Yes]          on your system which
                                                    you will use most
▶ PCI Device, Slot #1                               commonly.
▶ PCI Device, Slot #2
▶ PCI Device, Slot #3                               Note: An incorrect
▶ PCI Device, Slot #4                               setting can cause
                                                    some operating
  PCI IRQ line 1:                     [Auto Select] systems to display
  PCI IRQ line 2:                     [Auto Select] unexpected behavior
  PCI IRQ line 3:                     [Auto Select]
  PCI IRQ line 4:                     [Auto Select]
  Onboard LAN IRQ line:               [Auto Select]
  Onboard USB EHCI IRQ line:          [Auto Select]

  Default Primary Video Adapter:      [PCI]
  Assign IRQ to SMB:                  [Enabled]

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu    F10  Save and Exit
```

Figure 173: 815E (ETX) - PCI/PNP configuration

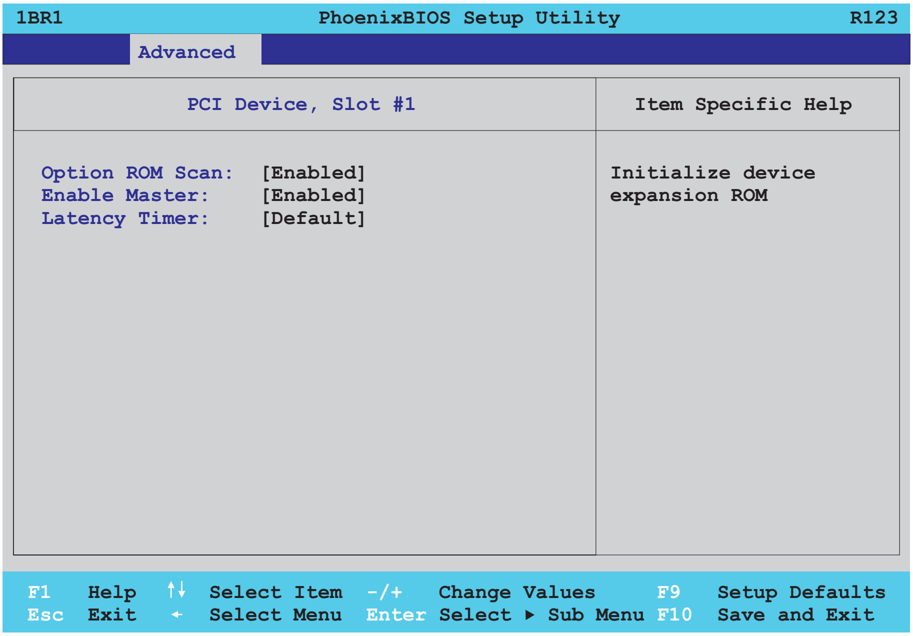
BIOS setting	Meaning	Setting options	Effect
PNP OS installed	If the operating system is plug & play capable, then this option informs BIOS that the operating system will handle the distribution of resources in the future.	Yes	The ISA PnP resources are not assigned. The resource assignment sequence is 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 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.

Table 155: 815E (ETX) - PCI/PNP configuration - setting options

BIOS setting	Meaning	Setting options	Effect
PCI device, slot #1	Advanced configuration of the PCI slot number 1.	Enter	Opens submenu See "PCI device, slot #1" on page 317
PCI device, slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens submenu See "PCI device, slot #2" on page 318
PCI device, slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens submenu See "PCI device, slot #3" on page 319
PCI device, slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens submenu See "PCI device, slot #4" on page 320
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 155: 815E (ETX) - PCI/PNP configuration - setting options (cont.)

PCI device, slot #1



1BR1
PhoenixBIOS Setup Utility
R123
Advanced

PCI Device, Slot #1

Item Specific Help

```
Option ROM Scan:   [Enabled]
Enable Master:     [Enabled]
Latency Timer:     [Default]
```

Initialize device expansion ROM

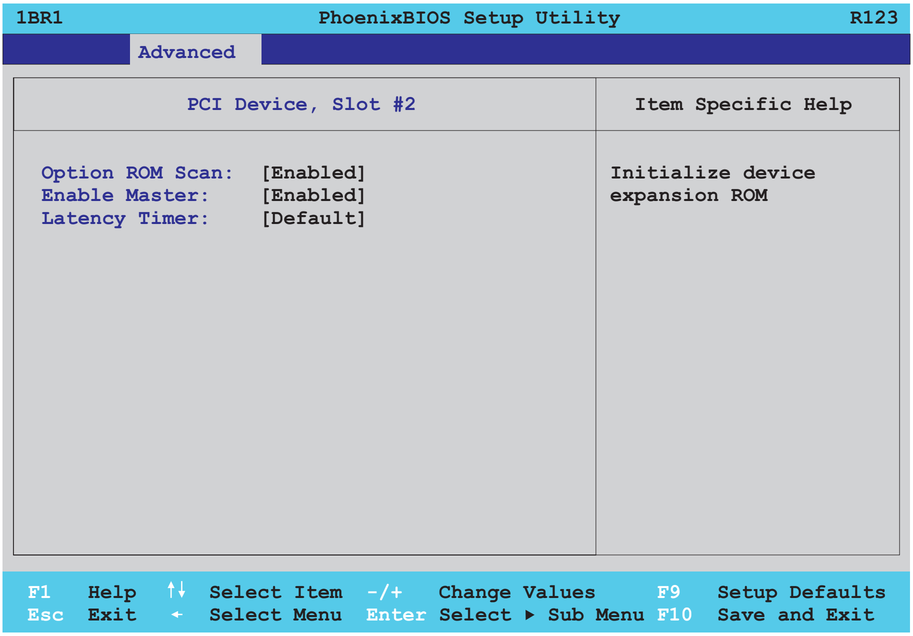
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub Menu F10 Save and Exit

Figure 174: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 156: 815E (ETX) - PCI device, slot #1 - setting options

PCI device, slot #2



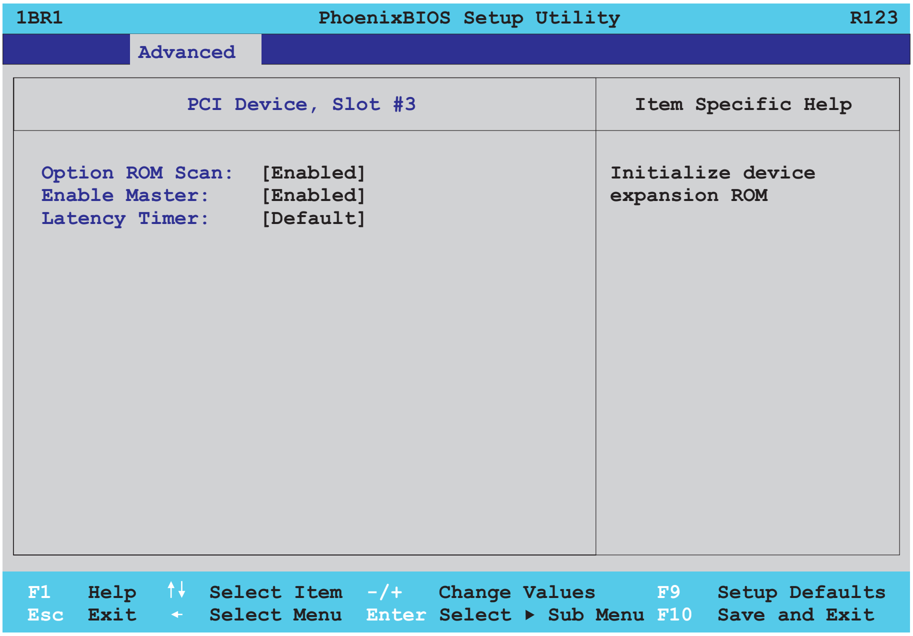
```
1BR1                 PhoenixBIOS Setup Utility                 R123
           Advanced

              PCI Device, Slot #2                   Item Specific Help

  Option ROM Scan:    [Enabled]                   Initialize device
  Enable Master:      [Enabled]                   expansion ROM
  Latency Timer:      [Default]

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 175: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 157: 815E (ETX) - PCI device, slot #2 - setting options

PCI device, slot #3



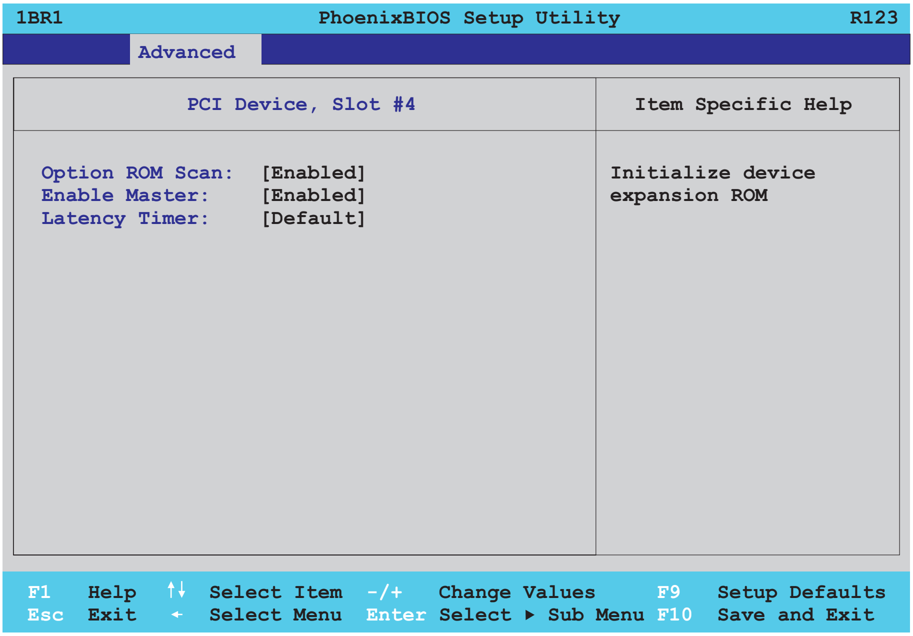
```
1BR1                 PhoenixBIOS Setup Utility                    R123
          Advanced

            PCI Device, Slot #3                  Item Specific Help

  Option ROM Scan:   [Enabled]                 Initialize device
  Enable Master:     [Enabled]                 expansion ROM
  Latency Timer:     [Default]

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 176: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 158: 815E (ETX) - PCI device, slot #3 - setting options

PCI device, slot #4



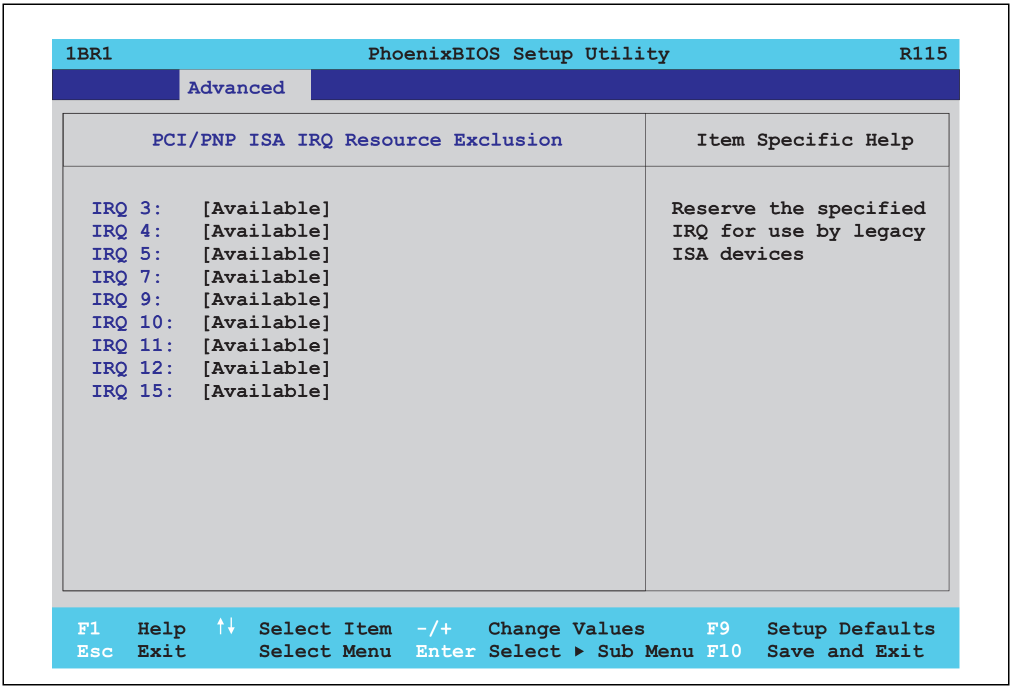
```
1BR1                  PhoenixBIOS Setup Utility                  R123
          Advanced

             PCI Device, Slot #4                   Item Specific Help

  Option ROM Scan:    [Enabled]                 Initialize device
  Enable Master:      [Enabled]                 expansion ROM
  Latency Timer:      [Default]

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ► Sub Menu    F10  Save and Exit
```

Figure 177: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 159: 815E (ETX) - PCI device, slot #4 - setting options

PCI/PNP ISA IRQ resource exclusion



```
1BR1                PhoenixBIOS Setup Utility                R115
        Advanced

    PCI/PNP ISA IRQ Resource Exclusion      Item Specific Help

 IRQ 3:   [Available]                   Reserve the specified
 IRQ 4:   [Available]                   IRQ for use by legacy
 IRQ 5:   [Available]                   ISA devices
 IRQ 7:   [Available]
 IRQ 9:   [Available]
 IRQ 10:  [Available]
 IRQ 11:  [Available]
 IRQ 12:  [Available]
 IRQ 15:  [Available]

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit      Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 178: 815E (ETX) - PCI/PNP ISA IRQ resource exclusion

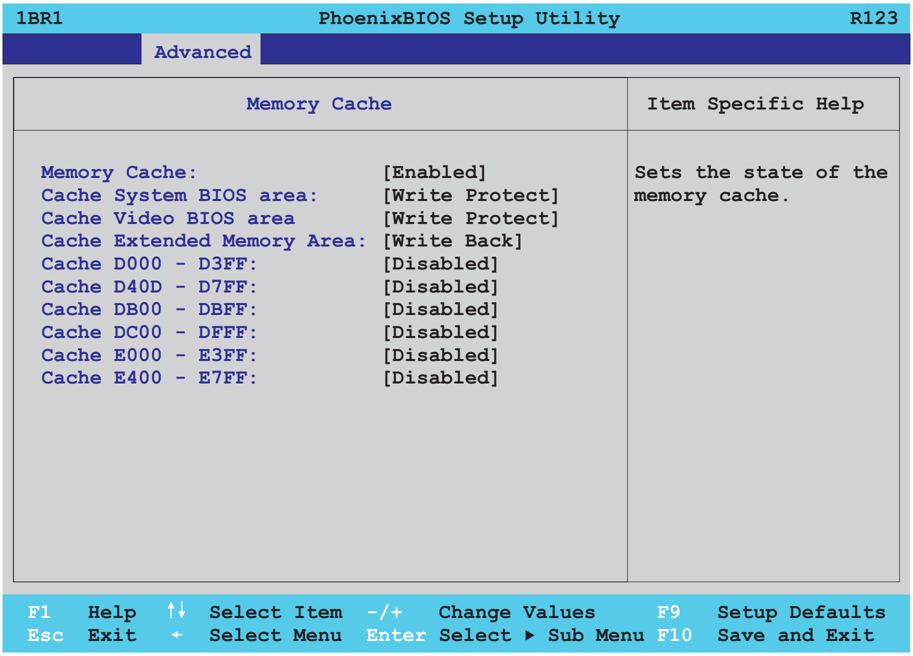
BIOS setting	Meaning	Setting options	Effect
IRQ 3	This setting determines whether the IRQ 3 is reserved for legacy ISA devices.	Available	It is available for PCI devices.
		Reserved	It is reserved for ISA devices.
IRQ 4	This setting determines whether the IRQ 4 is reserved for legacy ISA devices.	Available	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 160: 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 160: 815E (ETX) - PCI/PNP ISA IRQ resource exclusion - setting options (cont.)

Memory cache



```
1BR1                 PhoenixBIOS Setup Utility                  R123
          Advanced

              Memory Cache                    Item Specific Help

  Memory Cache:                 [Enabled]      Sets the state of the
  Cache System BIOS area:       [Write Protect] memory cache.
  Cache Video BIOS area         [Write Protect]
  Cache Extended Memory Area:   [Write Back]
  Cache D000 - D3FF:            [Disabled]
  Cache D40D - D7FF:            [Disabled]
  Cache DB00 - DBFF:            [Disabled]
  Cache DC00 - DFFF:            [Disabled]
  Cache E000 - E3FF:            [Disabled]
  Cache E400 - E7FF:            [Disabled]

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu   F10  Save and Exit
```

Figure 179: 815E (ETX) - memory cache

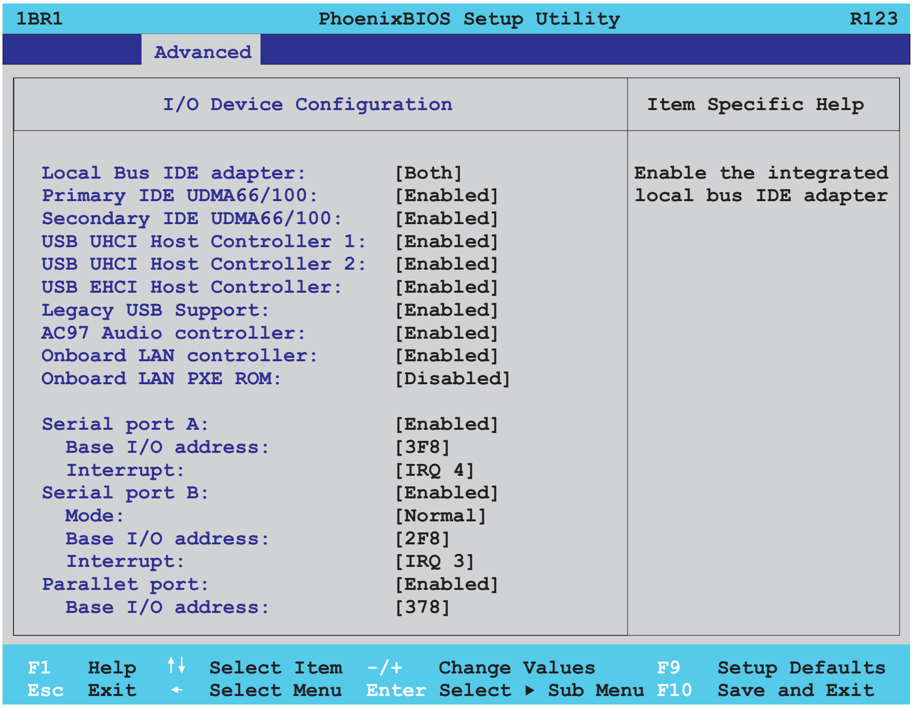
BIOS setting	Meaning	Setting options	Effect
Memory cache	Enable/ disable utilization of the L2 cache.	Enabled	Enables this function.
		Disabled	Disables this function.
Cache system BIOS area	Set whether or not the system BIOS should be buffered.	Write protect	System BIOS is mapped in the cache.
		Uncached	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.

Table 161: 815E (ETX) - memory cache - setting options

BIOS setting	Meaning	Setting options	Effect
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.
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 161: 815E (ETX) - memory cache - setting options (cont.)

I/O device configuration



```
1BR1                    PhoenixBIOS Setup Utility                    R123
                Advanced

                I/O Device Configuration                 Item Specific Help

  Local Bus IDE adapter:          [Both]                Enable the integrated
  Primary IDE UDMA66/100:         [Enabled]             local bus IDE adapter
  Secondary IDE UDMA66/100:       [Enabled]
  USB UHCI Host Controller 1:     [Enabled]
  USB UHCI Host Controller 2:     [Enabled]
  USB EHCI Host Controller:       [Enabled]
  Legacy USB Support:             [Enabled]
  AC97 Audio controller:          [Enabled]
  Onboard LAN controller:         [Enabled]
  Onboard LAN PXE ROM:            [Disabled]

  Serial port A:                  [Enabled]
    Base I/O address:             [3F8]
    Interrupt:                    [IRQ 4]
  Serial port B:                  [Enabled]
    Mode:                         [Normal]
    Base I/O address:             [2F8]
    Interrupt:                    [IRQ 3]
  Parallel port:                  [Enabled]
    Base I/O address:             [378]

 F1   Help  ↑↓ Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ↔  Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 180: 815E (ETX) - I/O device configuration

BIOS setting	Meaning	Setting options	Effect
Local bus IDE adapter	Enable or disable one or both of 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 162: 815E (ETX) - I/O device configuration - setting options

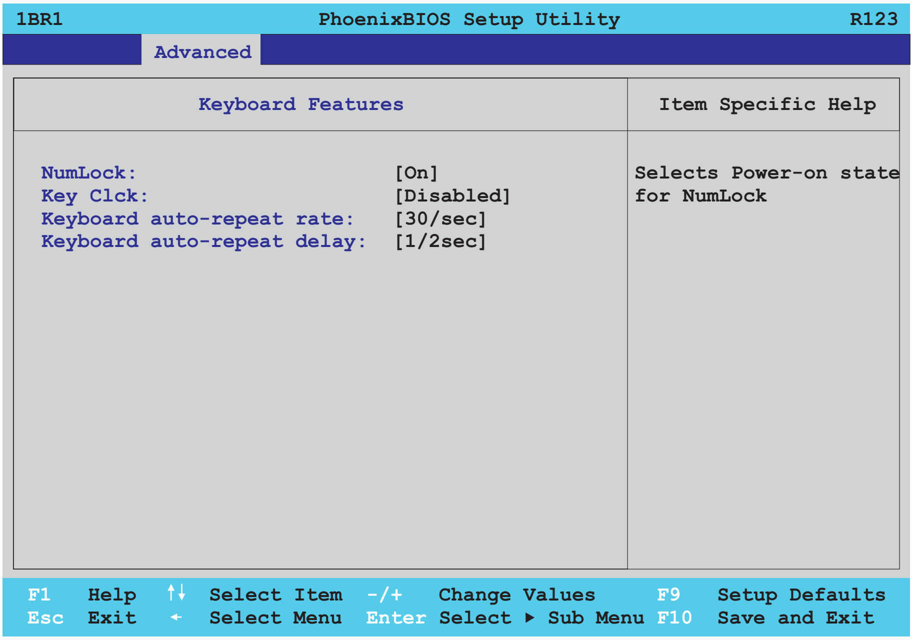
BIOS setting	Meaning	Setting options	Effect
USB UHCI host controller 1	Configuration of USB UHCI controller 1 for USB port 0 und 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller 2	Configuration of the USB UHCI controller 1 for USB port 2 and 3. Can 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 162: 815E (ETX) - I/O device configuration - setting options (cont.)

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 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 162: 815E (ETX) - I/O device configuration - setting options (cont.)

Keyboard features



```
1BR1                 PhoenixBIOS Setup Utility                 R123
            Advanced
                  Keyboard Features                Item Specific Help

  NumLock:                        [On]            Selects Power-on state
  Key Clck:                       [Disabled]      for NumLock
  Keyboard auto-repeat rate:      [30/sec]
  Keyboard auto-repeat delay:     [1/2sec]

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ► Sub Menu F10  Save and Exit
```

Figure 181: 815E (ETX) - keyboard features

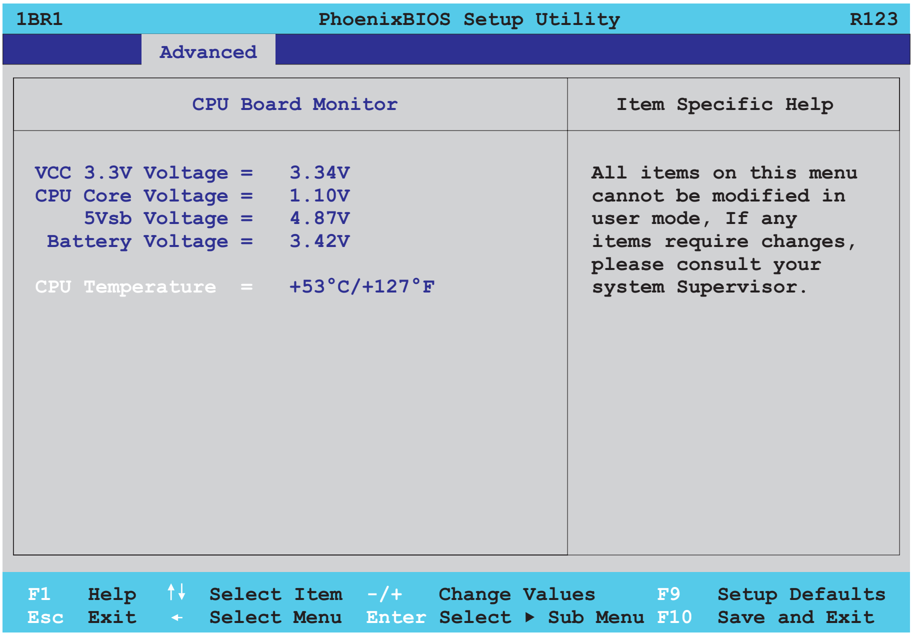
BIOS setting	Meaning	Setting options	Effect
NumLock	This option sets the status of the numeric keypad when the the system is booted.	On	Numeric keypad is enabled.
		Off	Only the cursor functions of the numerical keypad are activated.
		Auto	Numeric keypad is activated, if present.
Key click	Using this 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 163: 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.



```
VCC 3.3V Voltage =   3.34V
CPU Core Voltage =   1.10V
    5Vsb Voltage =   4.87V
 Battery Voltage =   3.42V

CPU Temperature  =   +53°C/+127°F
```

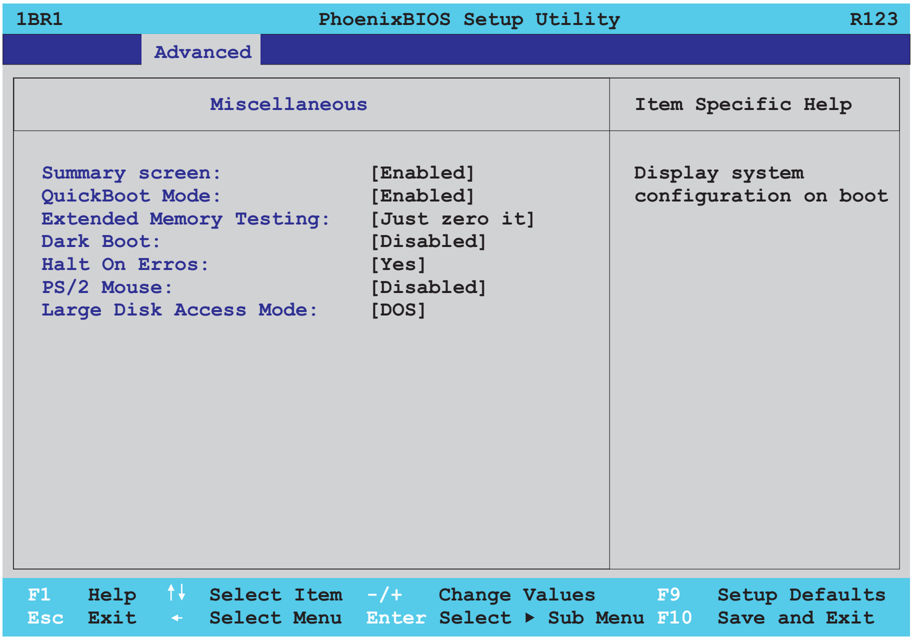
All items on this menu cannot be modified in user mode, If any items require changes, please consult your system Supervisor.

Figure 182: 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 164: 815E (ETX) - CPU board monitor - setting options

Miscellaneous



```
1BR1                    PhoenixBIOS Setup Utility                  R123
             Advanced
                  Miscellaneous                    Item Specific Help

  Summary screen:             [Enabled]          Display system
  QuickBoot Mode:             [Enabled]          configuration on boot
  Extended Memory Testing:    [Just zero it]
  Dark Boot:                  [Disabled]
  Halt On Erros:              [Yes]
  PS/2 Mouse:                 [Disabled]
  Large Disk Access Mode:     [DOS]

 F1   Help  ↑↓ Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←  Select Menu  Enter Select ► Sub Menu   F10  Save and Exit
```

Figure 183: 815E (ETX) miscellaneous

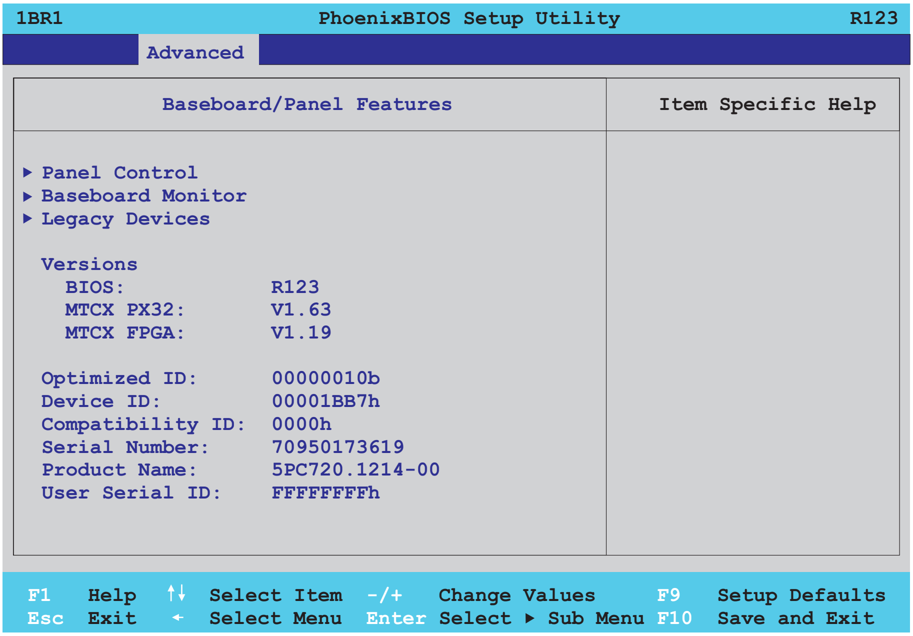
BIOS setting	Meaning	Setting options	Effect
Summary screen	Set whether or not the system summary screen should open when the system is started (see figure 165 "815E (ETX) BIOS diagnostic screen" on page 303).	Enabled	Enables this function.
		Disabled	Disables this function.
QuickBoot mode	Speeds up the 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 164 "815E (ETX) BIOS diagnostic screen" on page 302) should be displayed when the system is started.	Enabled	Enables this function. The diagnostics screen is displayed.
		Disabled	Disables this function. The diagnostics screen is not displayed.

Table 165: 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 165: 815E (ETX)- miscellaneous - setting options (cont.)

Baseboard/panel features



```
1BR1                  PhoenixBIOS Setup Utility                  R123
           Advanced

            Baseboard/Panel Features            Item Specific Help

▶ Panel Control
▶ Baseboard Monitor
▶ Legacy Devices

  Versions
    BIOS:              R123
    MTCX PX32:         V1.63
    MTCX FPGA:         V1.19

  Optimized ID:        00000010b
  Device ID:           00001BB7h
  Compatibility ID:    0000h
  Serial Number:       70950173619
  Product Name:        5PC720.1214-00
  User Serial ID:      FFFFFFFFh

F1   Help  ↑↓ Select Item  -/+   Change Values       F9   Setup Defaults
Esc  Exit  ←  Select Menu  Enter Select ▶ Sub Menu   F10  Save and Exit
```

Figure 184: 815E (ETX) - baseboard / panel features

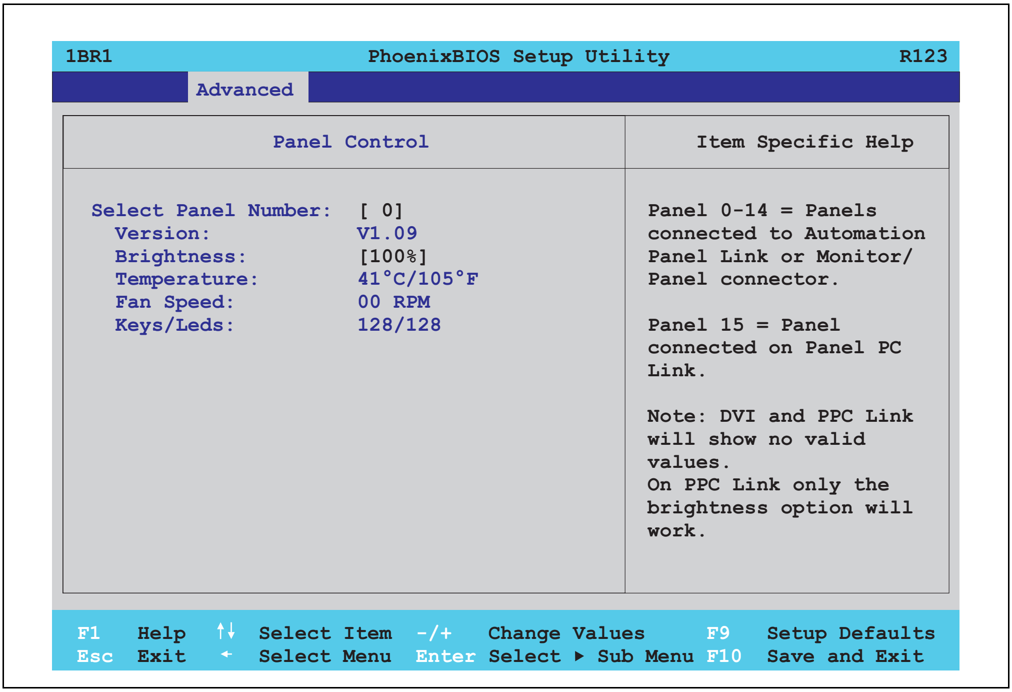
BIOS setting	Meaning	Setting options	Effect
Panel control	For special setup of connected panels (display units).	Enter	Opens submenu See "Panel control" on page 332
Baseboard monitor	Display of various temperatures and fan speeds.	Enter	Opens submenu See "Baseboard monitor" on page 333

Table 166: 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 submenu See "Legacy devices" on page 334
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 166: 815E (ETX) - baseboard / panel features - setting options

Panel control



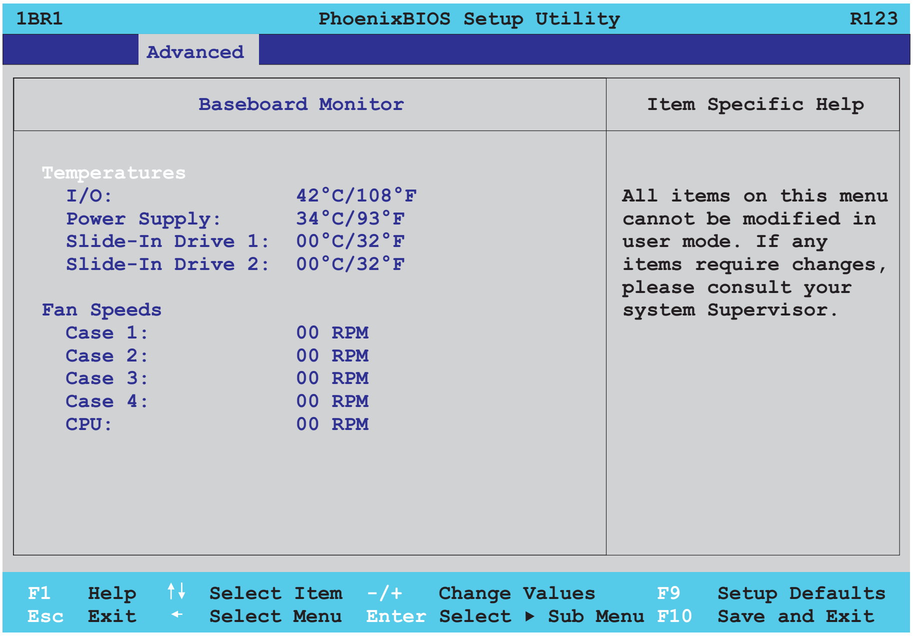
```
1BR1                  PhoenixBIOS Setup Utility                      R123
                Advanced

                Panel Control                    Item Specific Help

  Select Panel Number:   [ 0]                 Panel 0-14 = Panels
    Version:             V1.09                connected to Automation
    Brightness:          [100%]               Panel Link or Monitor/
    Temperature:         41°C/105°F           Panel connector.
    Fan Speed:           00 RPM
    Keys/Leds:           128/128              Panel 15 = Panel
                                              connected on Panel PC
                                              Link.

                                              Note: DVI and PPC Link
                                              will show no valid
                                              values.
                                              On PPC Link only the
                                              brightness option will
                                              work.

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu    F10  Save and Exit
```

Figure 185: 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 167: 815E (ETX) panel control - setting options

Baseboard monitor



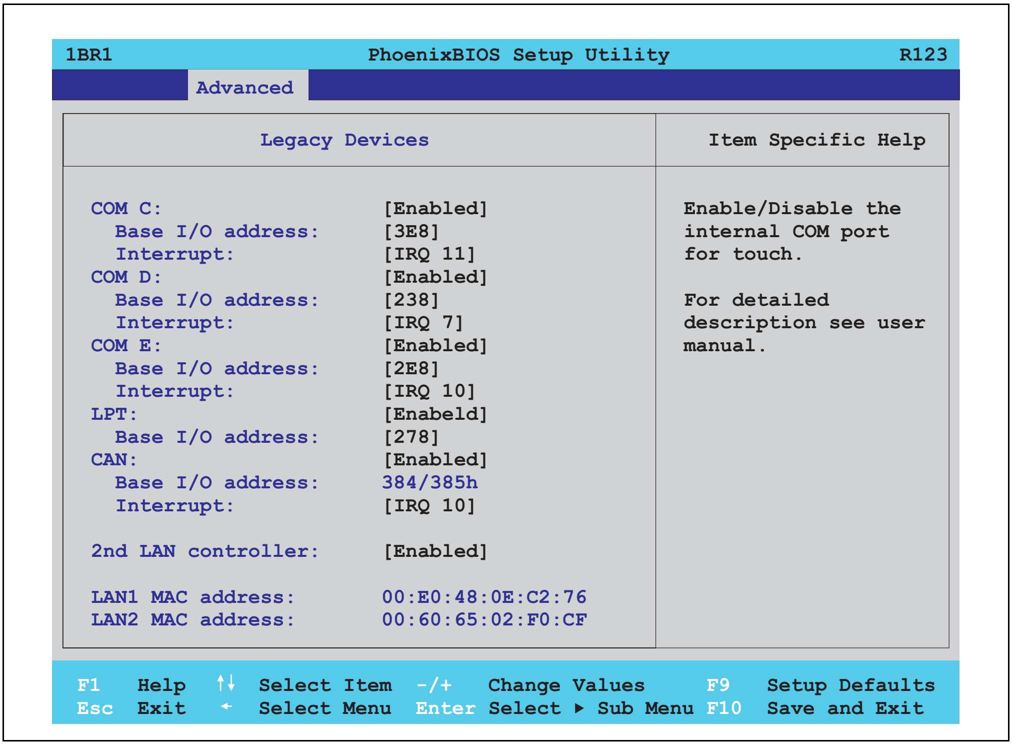
```
1BR1                     PhoenixBIOS Setup Utility                     R123
           Advanced

              Baseboard Monitor                      Item Specific Help

  Temperatures                                     All items on this menu
    I/O:                 42°C/108°F                cannot be modified in
    Power Supply:        34°C/93°F                 user mode. If any
    Slide-In Drive 1:    00°C/32°F                 items require changes,
    Slide-In Drive 2:    00°C/32°F                 please consult your
                                                   system Supervisor.
  Fan Speeds
    Case 1:              00 RPM
    Case 2:              00 RPM
    Case 3:              00 RPM
    Case 4:              00 RPM
    CPU:                 00 RPM

F1   Help  ↑↓ Select Item  -/+   Change Values      F9   Setup Defaults
Esc  Exit  ↔  Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 186: 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 25.40 mm 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 168: 815E (ETX) - baseboard monitor - setting options

Legacy devices



```
1BR1                    PhoenixBIOS Setup Utility                    R123
            Advanced

            Legacy Devices                        Item Specific Help

  COM C:                       [Enabled]       Enable/Disable the
    Base I/O address:          [3E8]           internal COM port
    Interrupt:                 [IRQ 11]        for touch.
  COM D:                       [Enabled]
    Base I/O address:          [238]           For detailed
    Interrupt:                 [IRQ 7]         description see user
  COM E:                       [Enabled]       manual.
    Base I/O address:          [2E8]
    Interrupt:                 [IRQ 10]
  LPT:                         [Enabeld]
    Base I/O address:          [278]
  CAN:                         [Enabled]
    Base I/O address:          384/385h
    Interrupt:                 [IRQ 10]

  2nd LAN controller:          [Enabled]

  LAN1 MAC address:            00:E0:48:0E:C2:76
  LAN2 MAC address:            00:60:65:02:F0:CF

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu   F10  Save and Exit
```

Figure 187: 815E (ETX) - Legacy devices

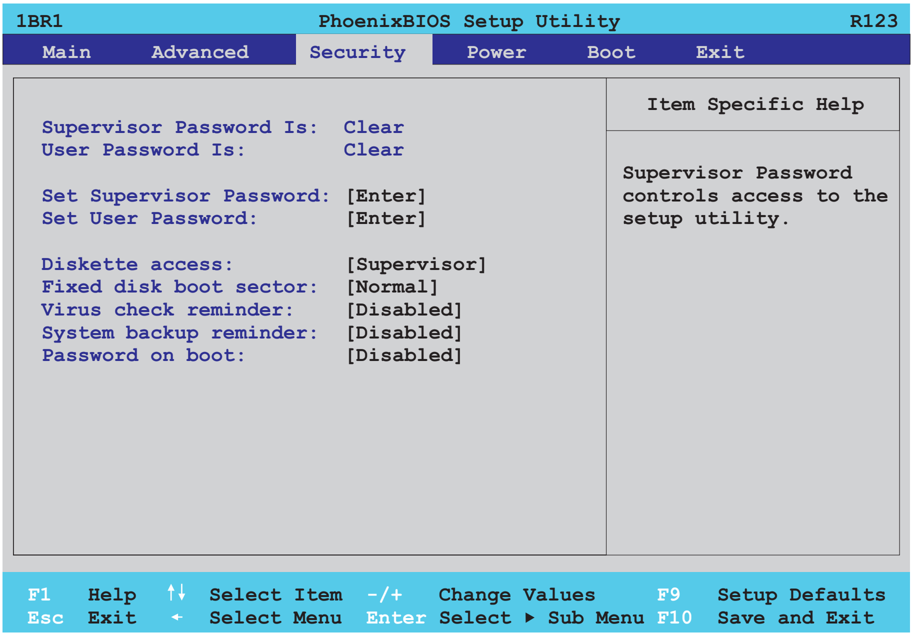
BIOS setting	Meaning	Setting options	Effect
COM C	Settings for the internal serial interfaces in the system. This setting activates the touch screen in panel PC 700 systems, and, using SDL and LDL transfer technology, also in Automation Panel 900 display units.	Disabled	Disables the interface.
		Enabled	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 169: 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 of a B&R add-on interface option (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 169: 815E (ETX) - Legacy devices - setting options (cont.)

1.1.6 Security



```
1BR1                    PhoenixBIOS Setup Utility                    R123
   Main      Advanced      Security      Power      Boot      Exit

  Supervisor Password Is:   Clear               Item Specific Help
  User Password Is:         Clear
                                               Supervisor Password
  Set Supervisor Password:  [Enter]            controls access to the
  Set User Password:        [Enter]            setup utility.

  Diskette access:          [Supervisor]
  Fixed disk boot sector:   [Normal]
  Virus check reminder:     [Disabled]
  System backup reminder:   [Disabled]
  Password on boot:         [Disabled]

 F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 188: 815E (ETX)- security menu

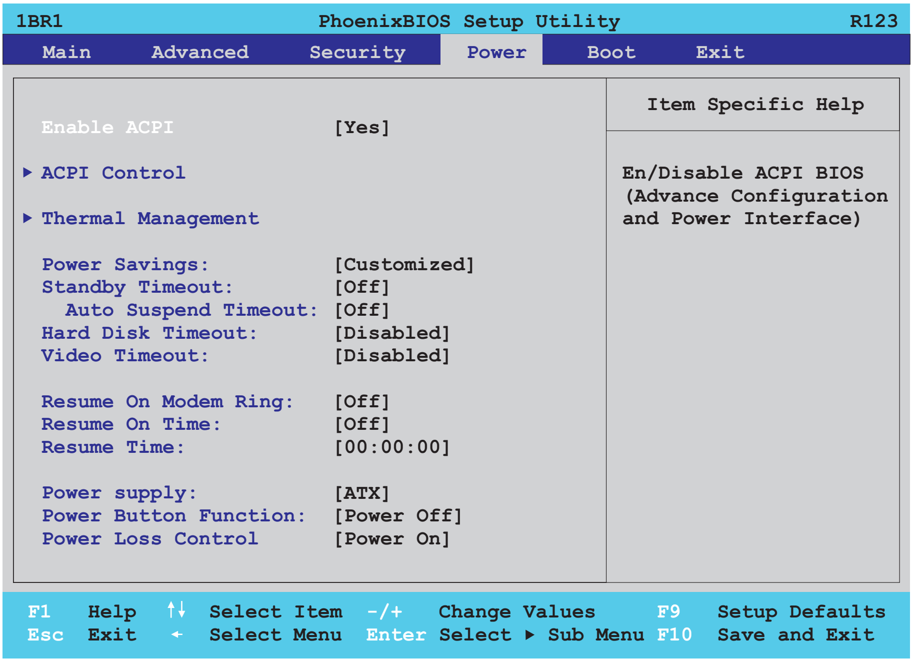
BIOS setting	Meaning	Setting options	Effect
Supervisor password is	Displays whether or not a supervisor password has been set.	None	Display **set**: A supervisor password has been set. Display **clear**: No supervisor password has been set.
User password is	Displays whether or not a user password has 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 170: 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 170: 815E (ETX)- security - setting options (cont.)

1.1.7 Power



```
1BR1                    PhoenixBIOS Setup Utility                    R123
    Main       Advanced      Security      Power      Boot       Exit

                                                   Item Specific Help

  Enable ACPI                [Yes]
                                                 En/Disable ACPI BIOS
▶ ACPI Control                                   (Advance Configuration
                                                 and Power Interface)
▶ Thermal Management

  Power Savings:             [Customized]
  Standby Timeout:           [Off]
    Auto Suspend Timeout:    [Off]
  Hard Disk Timeout:         [Disabled]
  Video Timeout:             [Disabled]

  Resume On Modem Ring:      [Off]
  Resume On Time:            [Off]
  Resume Time:               [00:00:00]

  Power supply:              [ATX]
  Power Button Function:     [Power Off]
  Power Loss Control         [Power On]

 F1   Help   ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit   ←   Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 189: 815E (ETX)- power menu

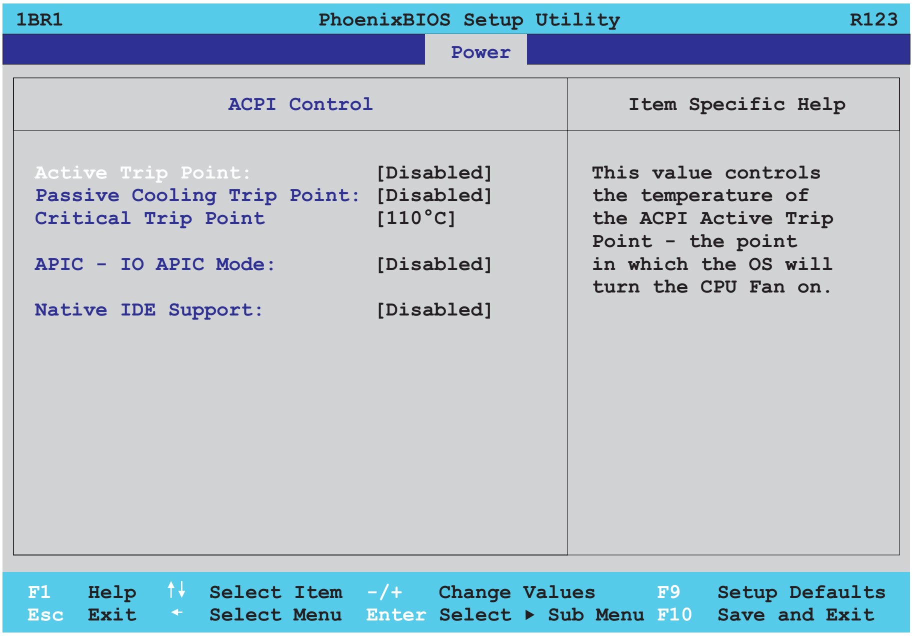
BIOS setting	Meaning	Setting options	Effect
Enable ACPI	This option turns the ACPI function (Advanced Configuration and Power Interface) on or off. This is an advanced plug & play and power management functionality.	Yes	Enables this function.
		No	Disables this function.
ACPI control	Configuration of specific limits.	Enter	Opens submenu See "ACPI control" on page 340
Thermal management	Configuration of specific CPU limits.	Enter	Opens submenu See "Thermal management" on page 341
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 171: 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. **Note:** **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. **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 171: 815E (ETX)- power - setting options (cont.)

ACPI control



```
1BR1                 PhoenixBIOS Setup Utility                    R123
                                   Power

                 ACPI Control                      Item Specific Help

 Active Trip Point:            [Disabled]      This value controls
 Passive Cooling Trip Point:   [Disabled]      the temperature of
 Critical Trip Point           [110°C]         the ACPI Active Trip
                                               Point - the point
 APIC - IO APIC Mode:          [Disabled]      in which the OS will
                                               turn the CPU Fan on.
 Native IDE Support:           [Disabled]

 F1   Help  ↑↓  Select Item  -/+    Change Values        F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▸ Sub Menu    F10  Save and Exit
```

Figure 190: 815E (ETX) ACPI control

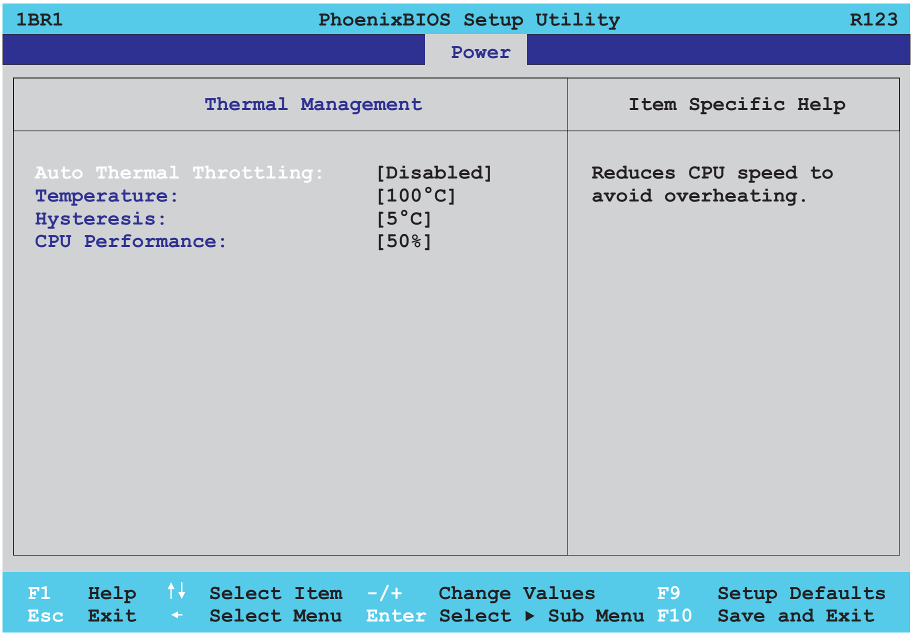
BIOS setting	Meaning	Setting options	Effect
Active trip point	With this function, an optional CPU fan above the operating system can be set to turn on when the CPU reaches the set temperature.	Disabled	Disables this function.
		40°... 100°C	Temperature setting for the active trip point. Can be set in 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 172: 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 172: 815E (ETX) ACPI control - setting options (cont.)

Thermal management



```
1BR1                  PhoenixBIOS Setup Utility                    R123
                                  Power

         Thermal Management                  Item Specific Help

  Auto Thermal Throttling:      [Disabled]   Reduces CPU speed to
  Temperature:                  [100°C]      avoid overheating.
  Hysteresis:                   [5°C]
  CPU Performance:              [50%]

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu   F10  Save and Exit
```

Figure 191: 815E (ETX) - thermal management

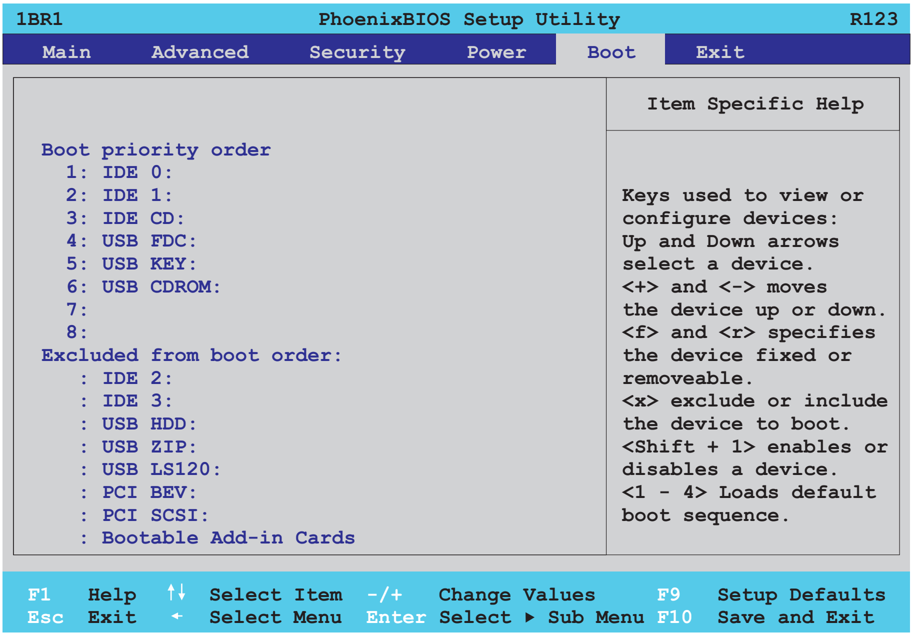
BIOS setting	Meaning	Setting options	Effect
Auto thermal throttling	Reduces the CPU speed when it exceeds the limit set in the "temperature" option by the amount set in the "CPU performance" option.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 173: 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 173: 815E (ETX) - thermal management (cont.)

1.1.8 Boot



```
Boot priority order
  1: IDE 0:
  2: IDE 1:
  3: IDE CD:
  4: USB FDC:
  5: USB KEY:
  6: USB CDROM:
  7:
  8:
Excluded from boot order:
   : IDE 2:
   : IDE 3:
   : USB HDD:
   : USB ZIP:
   : USB LS120:
   : PCI BEV:
   : PCI SCSI:
   : Bootable Add-in Cards
```

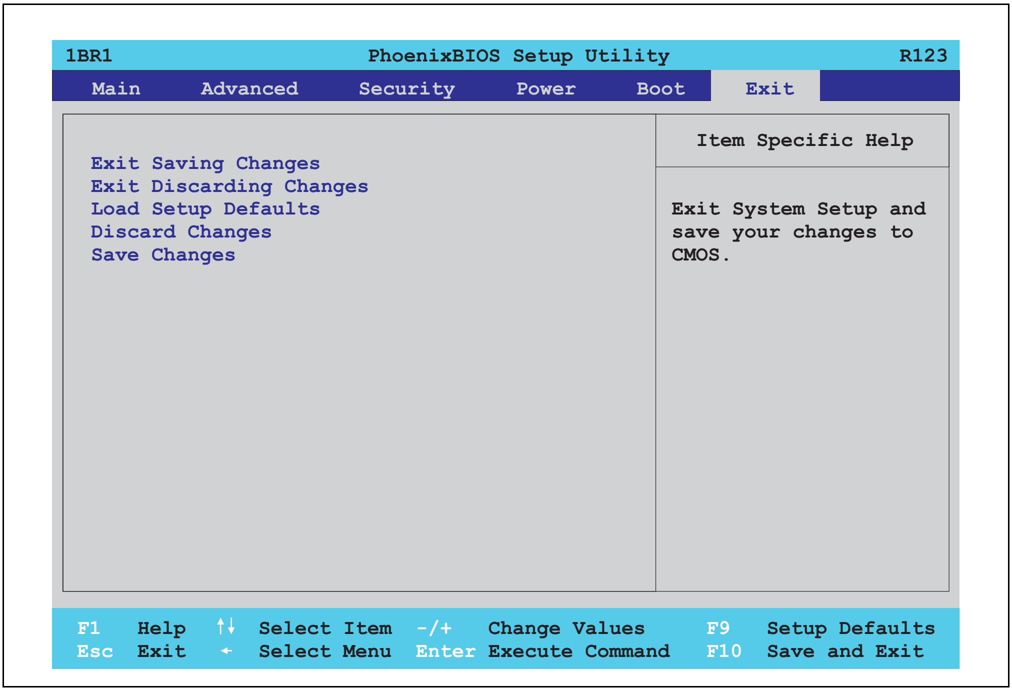
```
Keys used to view or
configure devices:
Up and Down arrows
select a device.
<+> and <-> moves
the device up or down.
<f> and <r> specifies
the device fixed or
removeable.
<x> exclude or include
the device to boot.
<Shift + 1> enables or
disables a device.
<1 - 4> Loads default
boot sequence.
```

Figure 192: 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 174: 815E (ETX)- boot menu - setting options

1.1.9 Exit



```
1BR1                 PhoenixBIOS Setup Utility                R123
   Main     Advanced     Security     Power     Boot     Exit

  Exit Saving Changes                     Item Specific Help
  Exit Discarding Changes
  Load Setup Defaults                  Exit System Setup and
  Discard Changes                      save your changes to
  Save Changes                         CMOS.

F1   Help  ↑↓ Select Item  -/+   Change Values    F9   Setup Defaults
Esc  Exit  ←  Select Menu  Enter Execute Command  F10  Save and Exit
```

Figure 193: 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 175: 815E (ETX)- exit menu - 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 175: 815E (ETX)- exit menu - setting options (cont.)

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.

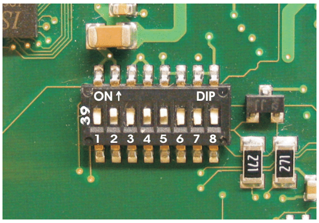


Figure 194: DIP switch on system unit

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 176: 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 177: 815E (ETX)- main - profile setting 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 178: 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 179: 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 179: 815E (ETX) - PCI/PNP configuration - profile settings overview (cont.)

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 180: 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 181: 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 181: 815E (ETX) - I/O device configuration - profile settings overview (cont.)

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 182: 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 183: 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 184: 815E (ETX)- miscellaneous - profile settings overview

Baseboard/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	-	-	-	-	-	
Baseboard 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 185: 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 185: 815E (ETX) - baseboard / panel features - profile settings overview (cont.)

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 186: 815E (ETX)- security menu - 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 187: 815E (ETX)- power menu - 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 188: 815E (ETX)- boot menu - profile settings overview

1.2 855GME (ETX) BIOS description

Information:

- **The following diagrams and BIOS menu items including descriptions refer to BIOS version 1.26. 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 395).**

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

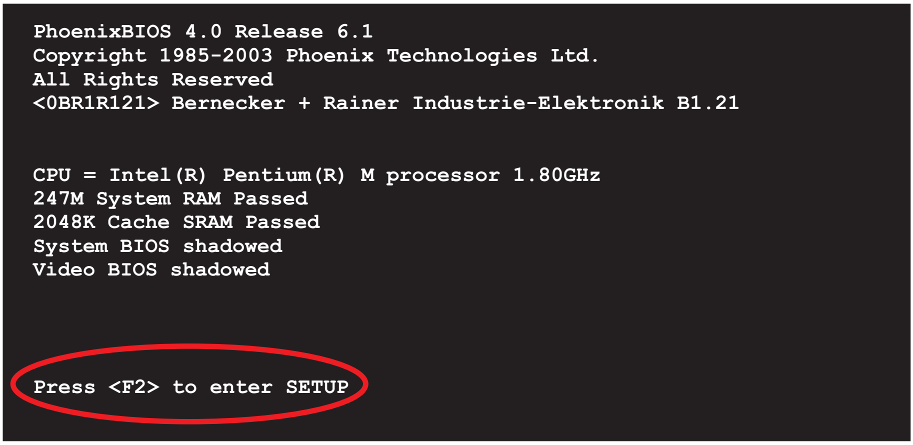
BIOS is immediately activated when switching on the power supply of the Panel PC 700 system or pressing the power button. The system checks if the setup data from the EEPROM is "OK". If the data is "OK", then it is transferred to the CMOS. If the data is "not OK", then the CMOS data is checked for validity. 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"

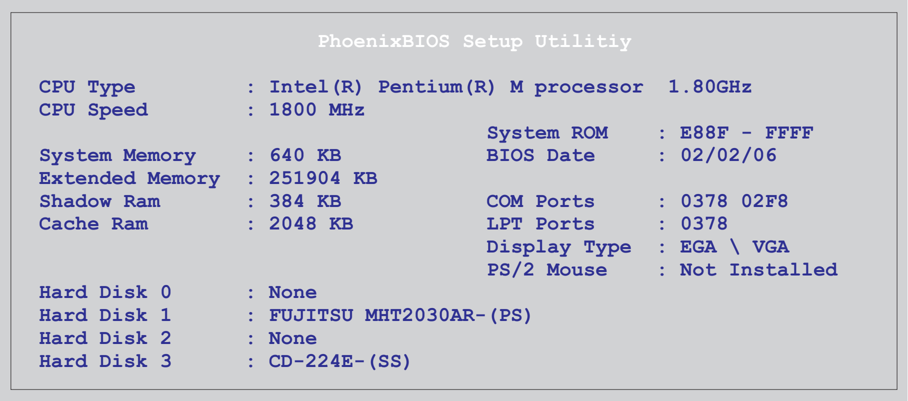


```
PhoenixBIOS 4.0 Release 6.1
Copyright 1985-2003 Phoenix Technologies Ltd.
All Rights Reserved
<0BR1R121> Bernecker + Rainer Industrie-Elektronik B1.21


CPU = Intel(R) Pentium(R) M processor 1.80GHz
247M System RAM Passed
2048K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed




Press <F2> to enter SETUP
```

Figure 195: 855GME (ETX) - BIOS diagnostics screen

Summary screen

After the POST, the summary screen displays the most important system characteristics.



```
                      PhoenixBIOS Setup Utilitiy

CPU Type           : Intel(R) Pentium(R) M processor  1.80GHz
CPU Speed          : 1800 MHz
                                        System ROM     : E88F - FFFF
System Memory      : 640 KB             BIOS Date      : 02/02/06
Extended Memory    : 251904 KB
Shadow Ram         : 384 KB             COM Ports      : 0378 02F8
Cache Ram          : 2048 KB            LPT Ports      : 0378
                                        Display Type   : EGA \ VGA
                                        PS/2 Mouse     : Not Installed
Hard Disk 0        : None
Hard Disk 1        : FUJITSU MHT2030AR-(PS)
Hard Disk 2        : None
Hard Disk 3        : CD-224E-(SS)
```

Figure 196: 855GME (ETX) - BIOS diagnostics 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 189: 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.
PgUp↑	Moves the cursor to the top of the current BIOS setup page.
PgDn ↓	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.
<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.

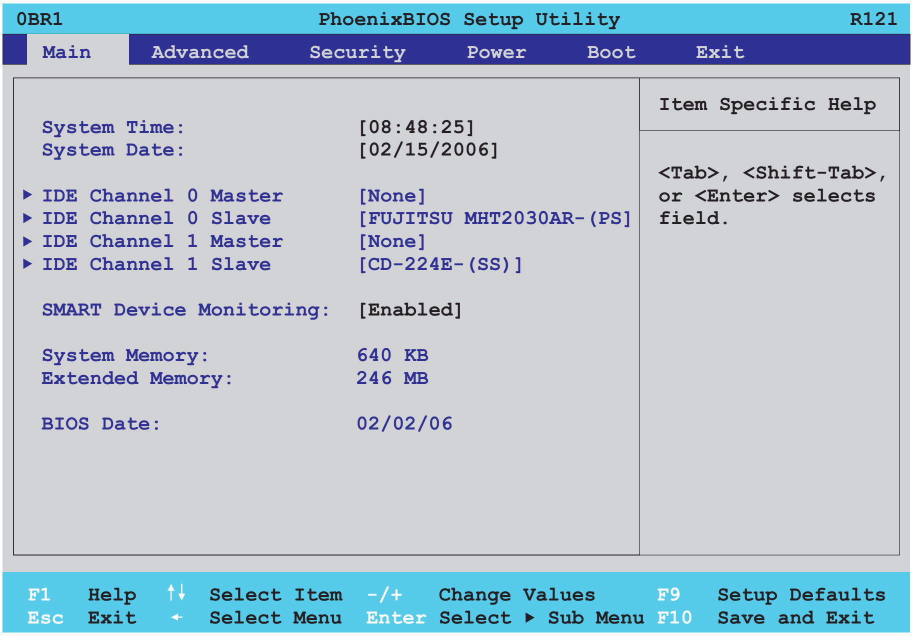
Table 190: 855GME (ETX) - relevant keys

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.	357
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.	364
Security	For setting up the system's security functions.	387
Power	Setup of various APM (Advanced Power Management) options.	389
Boot	The boot order can be set here.	393
Exit	To end the BIOS setup.	394

Table 191: Overview of 855GME (ETX) BIOS menu items

1.2.4 Main



```
0BR1                PhoenixBIOS Setup Utility                    R121
  Main    Advanced    Security    Power    Boot    Exit

                                                   Item Specific Help

  System Time:               [08:48:25]
  System Date:               [02/15/2006]          <Tab>, <Shift-Tab>,
                                                   or <Enter> selects
▶ IDE Channel 0 Master       [None]                field.
▶ IDE Channel 0 Slave        [FUJITSU MHT2030AR-(PS]
▶ IDE Channel 1 Master       [None]
▶ IDE Channel 1 Slave        [CD-224E-(SS)]

  SMART Device Monitoring:   [Enabled]

  System Memory:             640 KB
  Extended Memory:           246 MB

  BIOS Date:                 02/02/06

 F1   Help  ↑↓ Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←  Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 197: 855GME (ETX) main menu

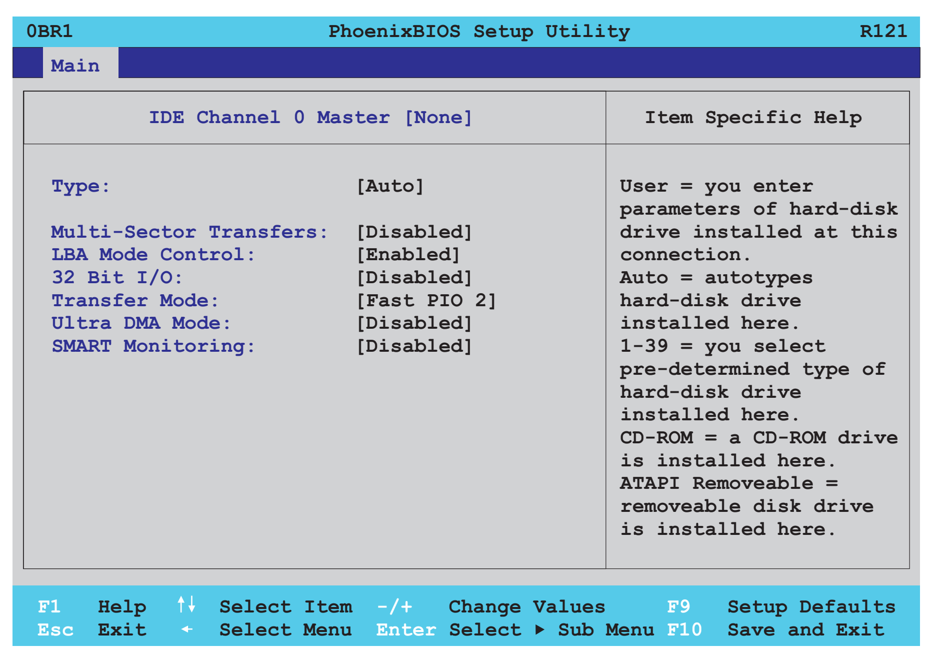
BIOS setting	Meaning	Setting options	Effect
System time	This is the current system time setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Adjustment of the system time	Set the system time in the format (hh:mm:ss).
System date	This is the current system date setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Changes to 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 submenu see "IDE channel 0 master" on page 358.
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 submenu see "IDE channel 0 slave" on page 360.
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 submenu see "IDE channel 1 master" on page 361.

Table 192: 855GME (ETX) main menu - setting options

BIOS setting	Meaning	Setting options	Effect
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 submenu see "IDE channel 1 slave" on page 363.
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 192: 855GME (ETX) main menu - setting options (cont.)

IDE channel 0 master



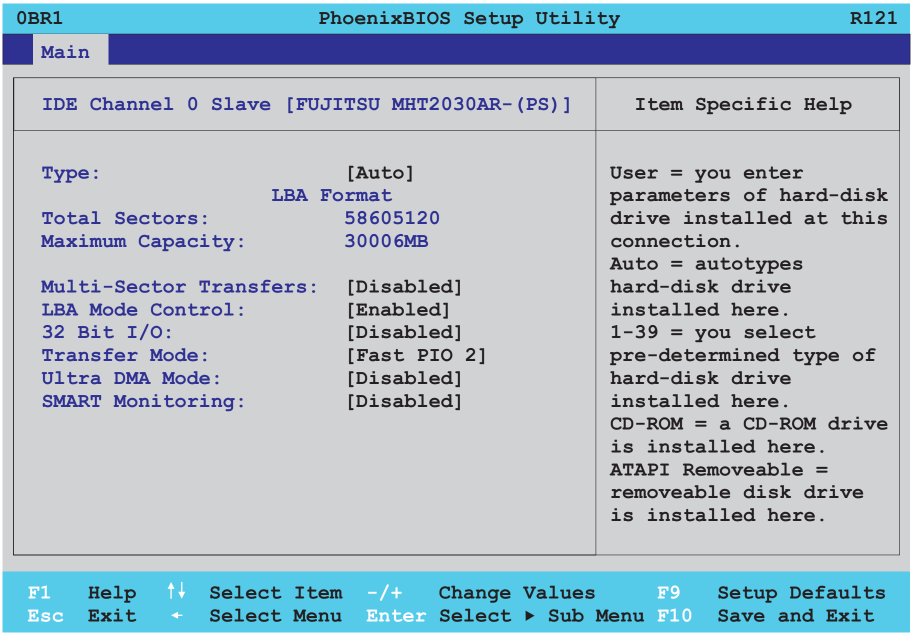
```
0BR1                     PhoenixBIOS Setup Utility                      R121
  Main

            IDE Channel 0 Master [None]              Item Specific Help

  Type:                        [Auto]                User = you enter
                                                     parameters of hard-disk
  Multi-Sector Transfers:      [Disabled]            drive installed at this
  LBA Mode Control:            [Enabled]             connection.
  32 Bit I/O:                  [Disabled]            Auto = autotypes
  Transfer Mode:               [Fast PIO 2]          hard-disk drive
  Ultra DMA Mode:              [Disabled]            installed here.
  SMART Monitoring:            [Disabled]            1-39 = you select
                                                     pre-determined type of
                                                     hard-disk drive
                                                     installed here.
                                                     CD-ROM = a CD-ROM drive
                                                     is installed here.
                                                     ATAPI Removeable =
                                                     removeable disk drive
                                                     is installed here.

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 198: 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.
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 193: 815E (ETX) IDE Channel 0 Master - setting options

IDE channel 0 slave



```
0BR1                  PhoenixBIOS Setup Utility                    R121
  Main
 IDE Channel 0 Slave [FUJITSU MHT2030AR-(PS)]   Item Specific Help

 Type:                          [Auto]          User = you enter
                          LBA Format            parameters of hard-disk
 Total Sectors:                 58605120        drive installed at this
 Maximum Capacity:              30006MB         connection.
                                                Auto = autotypes
 Multi-Sector Transfers:        [Disabled]      hard-disk drive
 LBA Mode Control:              [Enabled]       installed here.
 32 Bit I/O:                    [Disabled]      1-39 = you select
 Transfer Mode:                 [Fast PIO 2]    pre-determined type of
 Ultra DMA Mode:                [Disabled]      hard-disk drive
 SMART Monitoring:              [Disabled]      installed here.
                                                CD-ROM = a CD-ROM drive
                                                is installed here.
                                                ATAPI Removeable =
                                                removeable disk drive
                                                is installed here.

F1   Help  ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
Esc  Exit  ←   Select Menu  Enter Select ► Sub Menu   F10  Save and Exit
```

Figure 199: 855GME (ETX) IDE channel 0 slave setup

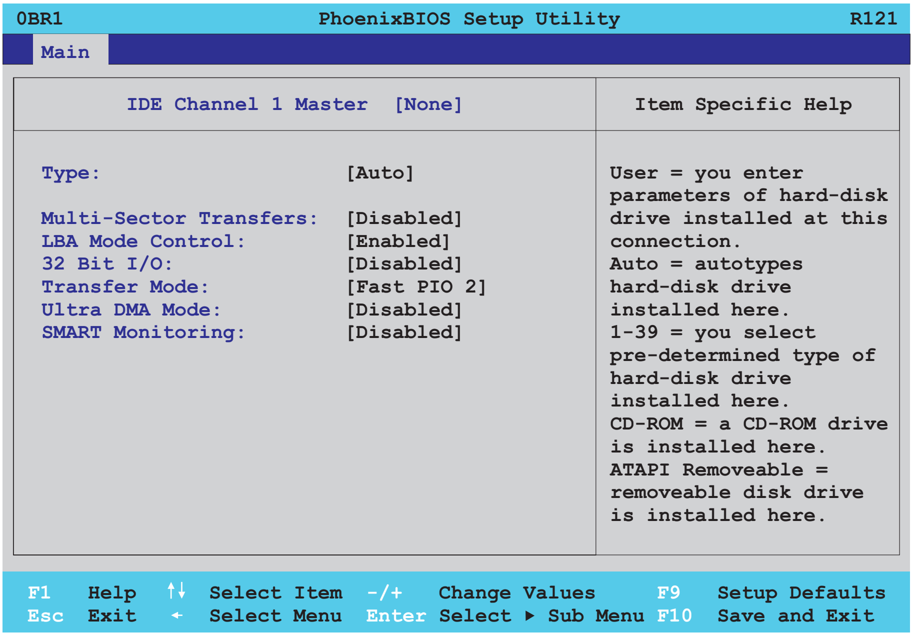
BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the IDE channel 0 slave (previously "primary slave") is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		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 194: 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 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 194: 815E (ETX) IDE Channel 0 slave - setting options (cont.)

IDE channel 1 master



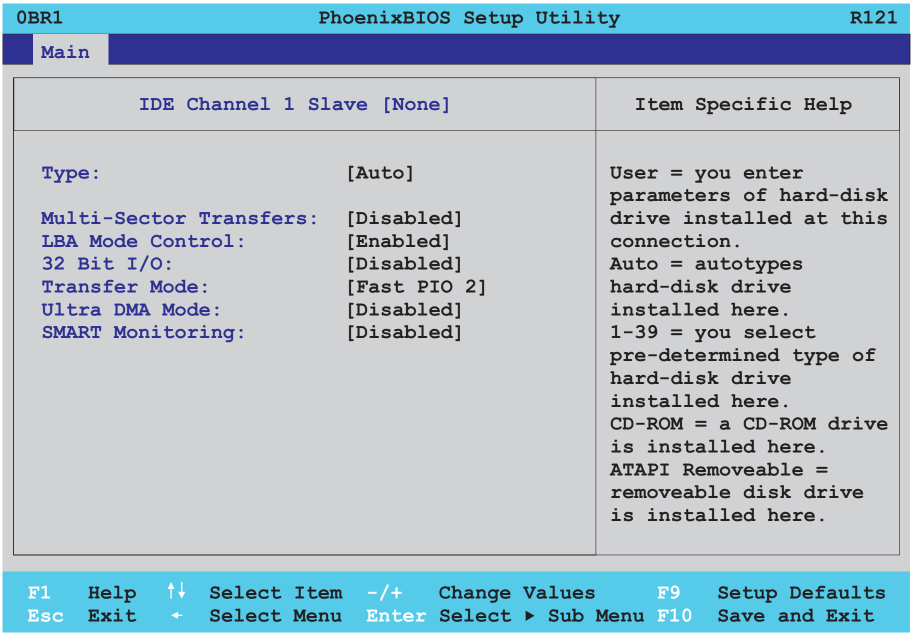
```
0BR1                  PhoenixBIOS Setup Utility                   R121
  Main

        IDE Channel 1 Master   [None]          Item Specific Help

  Type:                        [Auto]          User = you enter
                                               parameters of hard-disk
  Multi-Sector Transfers:      [Disabled]      drive installed at this
  LBA Mode Control:            [Enabled]       connection.
  32 Bit I/O:                  [Disabled]      Auto = autotypes
  Transfer Mode:               [Fast PIO 2]    hard-disk drive
  Ultra DMA Mode:              [Disabled]      installed here.
  SMART Monitoring:            [Disabled]      1-39 = you select
                                               pre-determined type of
                                               hard-disk drive
                                               installed here.
                                               CD-ROM = a CD-ROM drive
                                               is installed here.
                                               ATAPI Removeable =
                                               removeable disk drive
                                               is installed here.

 F1   Help  ↑↓  Select Item  -/+    Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▸ Sub Menu  F10  Save and Exit
```

Figure 200: 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.
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 195: 815E (ETX) IDE Channel 1 Master - setting options

IDE channel 1 slave



```
0BR1                     PhoenixBIOS Setup Utility                     R121
  Main

          IDE Channel 1 Slave [None]                 Item Specific Help

  Type:                          [Auto]           User = you enter
                                                  parameters of hard-disk
  Multi-Sector Transfers:        [Disabled]       drive installed at this
  LBA Mode Control:              [Enabled]        connection.
  32 Bit I/O:                    [Disabled]       Auto = autotypes
  Transfer Mode:                 [Fast PIO 2]     hard-disk drive
  Ultra DMA Mode:                [Disabled]       installed here.
  SMART Monitoring:              [Disabled]       1-39 = you select
                                                  pre-determined type of
                                                  hard-disk drive
                                                  installed here.
                                                  CD-ROM = a CD-ROM drive
                                                  is installed here.
                                                  ATAPI Removeable =
                                                  removeable disk drive
                                                  is installed here.

  F1   Help  ↑↓ Select Item  -/+   Change Values      F9   Setup Defaults
  Esc  Exit  ←  Select Menu  Enter Select ► Sub Menu  F10  Save and Exit
```

Figure 201: 855GME (ETX) IDE channel 1 slave setup

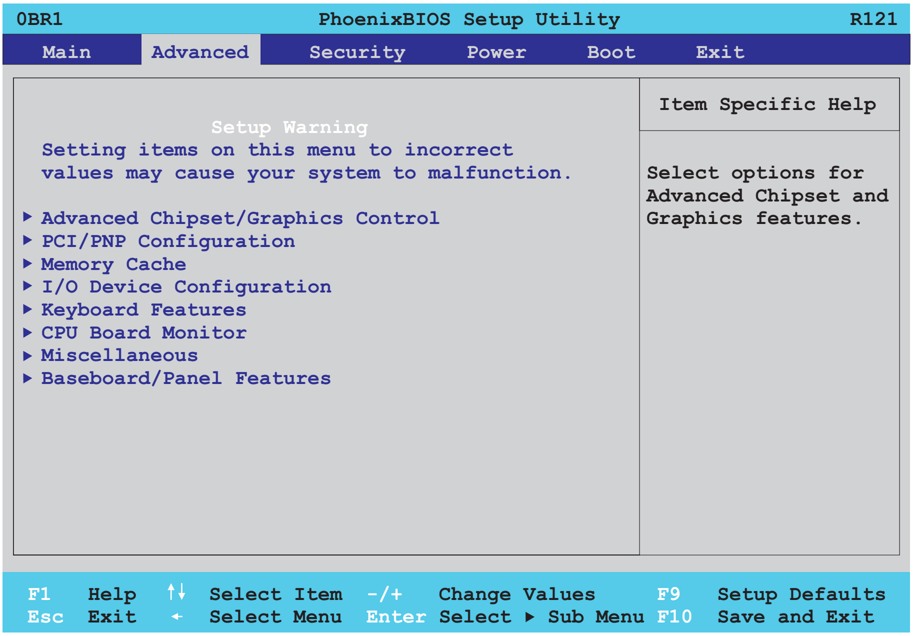
BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the IDE channel 1 slave (previously "secondary slave") is configured here.	Auto	Automatic recognition of the drive and setup of appropriate values.
		User	Manual setup of the drive (number of cylinders, heads, and sectors).
		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 196: 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 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 196: 815E (ETX) IDE Channel 1 slave - setting options (cont.)

Advanced



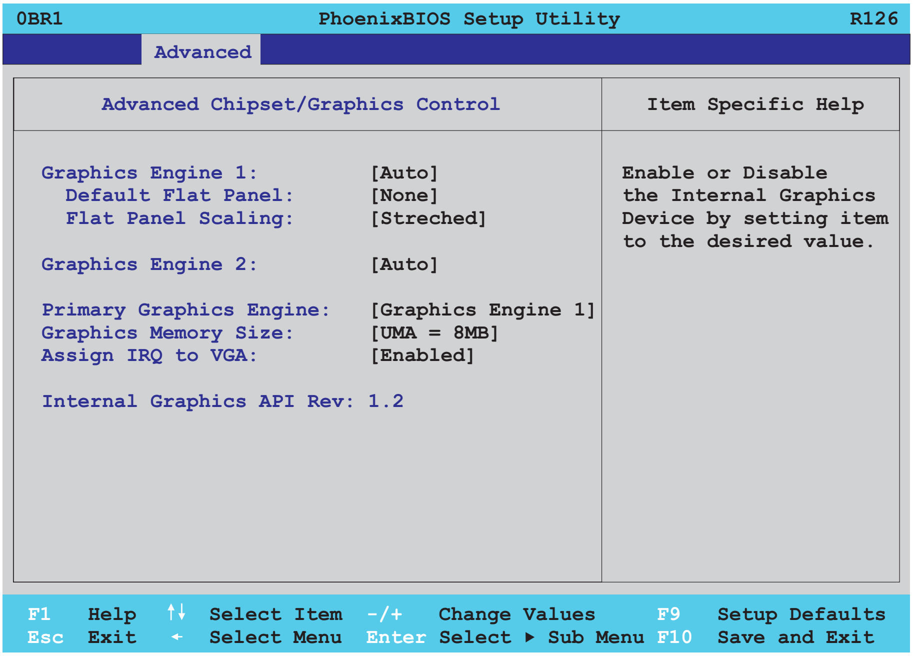
```
0BR1                    PhoenixBIOS Setup Utility                   R121
   Main    Advanced    Security    Power    Boot    Exit

                 Setup Warning                          Item Specific Help
  Setting items on this menu to incorrect
  values may cause your system to malfunction.         Select options for
                                                       Advanced Chipset and
▶ Advanced Chipset/Graphics Control                    Graphics features.
▶ PCI/PNP Configuration
▶ Memory Cache
▶ I/O Device Configuration
▶ Keyboard Features
▶ CPU Board Monitor
▶ Miscellaneous
▶ Baseboard/Panel Features

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 202: 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 submenu see "Advanced chipset/graphics control" on page 365.
PCI/PNP configuration	Configures PCI devices.	Enter	Opens submenu see "PCI/PNP configuration" on page 367.
Memory cache	Configuration of the memory cache resources.	Enter	Opens submenu see "Memory cache" on page 373.
I/O device configuration	Configuration of the I/O devices.	Enter	Opens submenu see "I/O device configuration" on page 375.
Keyboard features	Configuration of the keyboard options.	Enter	Opens submenu see "Keyboard features" on page 378.
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu see "CPU board monitor" on page 379.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc.).	Enter	Opens submenu see "Miscellaneous" on page 380.
Baseboard/panel features	Displays device specific information and setup of device specific values.	Enter	Opens submenu see "Baseboard/panel features" on page 381.

Table 197: 855GME (ETX) - advanced menu - setting options

Advanced chipset/graphics control



```
0BR1                    PhoenixBIOS Setup Utility                   R126
                  Advanced

        Advanced Chipset/Graphics Control          Item Specific Help

  Graphics Engine 1:           [Auto]               Enable or Disable
    Default Flat Panel:        [None]               the Internal Graphics
    Flat Panel Scaling:        [Streched]           Device by setting item
                                                    to the desired value.
  Graphics Engine 2:           [Auto]

  Primary Graphics Engine:     [Graphics Engine 1]
  Graphics Memory Size:        [UMA = 8MB]
  Assign IRQ to VGA:           [Enabled]

  Internal Graphics API Rev: 1.2

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ↔   Select Menu  Enter Select ▸ Sub Menu  F10  Save and Exit
```

Figure 203: 855GME (ETX) - advanced chipset control

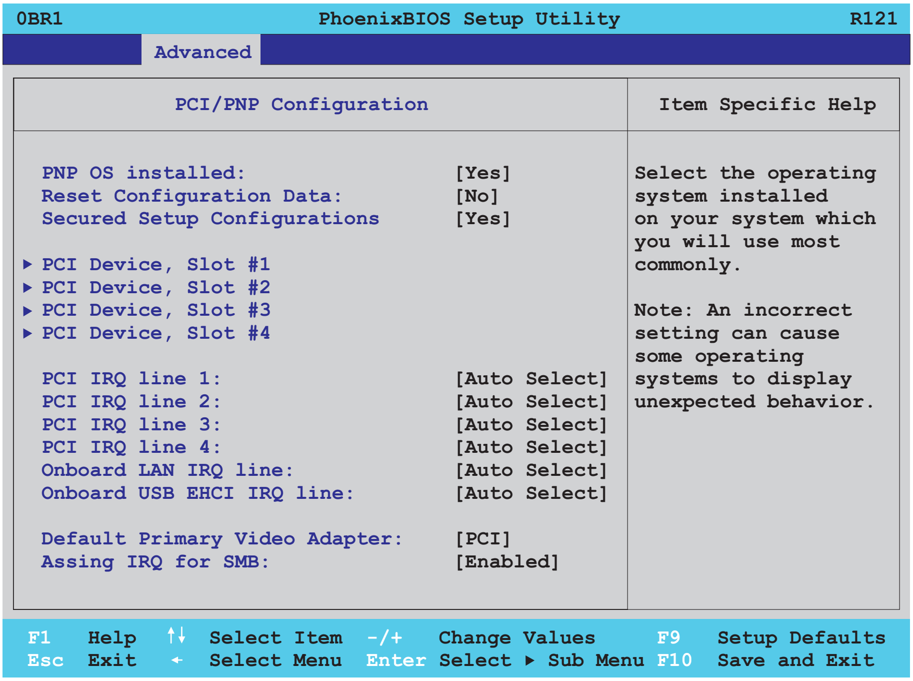
BIOS setting	Meaning	Setting options	Effect
Graphics engine 1	Settings can be made for the onboard video controller (internal graphics device).	Auto	Automatic setting of the graphics engine 1. The resolution is set using a read-out of the panel's EDID data. **Information:** **If EDID data older than V1.1 is read, it is not passed on to the VGA BIOS.**
		Disabled	Disable graphics controller. **Important!** **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 the graphics engine 2. The resolution is set using a read-out of the 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.
Internal graphics API Rev	Displays the internal graphics API version number.	None	-

Table 198: 855GME (ETX) - advanced chipset control - setting options

PCI/PNP configuration



```
0BR1                    PhoenixBIOS Setup Utility                   R121
           Advanced
 
           PCI/PNP Configuration                     Item Specific Help

  PNP OS installed:                 [Yes]          Select the operating
  Reset Configuration Data:         [No]           system installed
  Secured Setup Configurations      [Yes]          on your system which
                                                   you will use most
▶ PCI Device, Slot #1                              commonly.
▶ PCI Device, Slot #2
▶ PCI Device, Slot #3                              Note: An incorrect
▶ PCI Device, Slot #4                              setting can cause
                                                   some operating
  PCI IRQ line 1:                   [Auto Select]  systems to display
  PCI IRQ line 2:                   [Auto Select]  unexpected behavior.
  PCI IRQ line 3:                   [Auto Select]
  PCI IRQ line 4:                   [Auto Select]
  Onboard LAN IRQ line:             [Auto Select]
  Onboard USB EHCI IRQ line:        [Auto Select]

  Default Primary Video Adapter:    [PCI]
  Assing IRQ for SMB:               [Enabled]

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu   F10  Save and Exit
```

Figure 204: 815GME (ETX) - PCI/PNP configuration

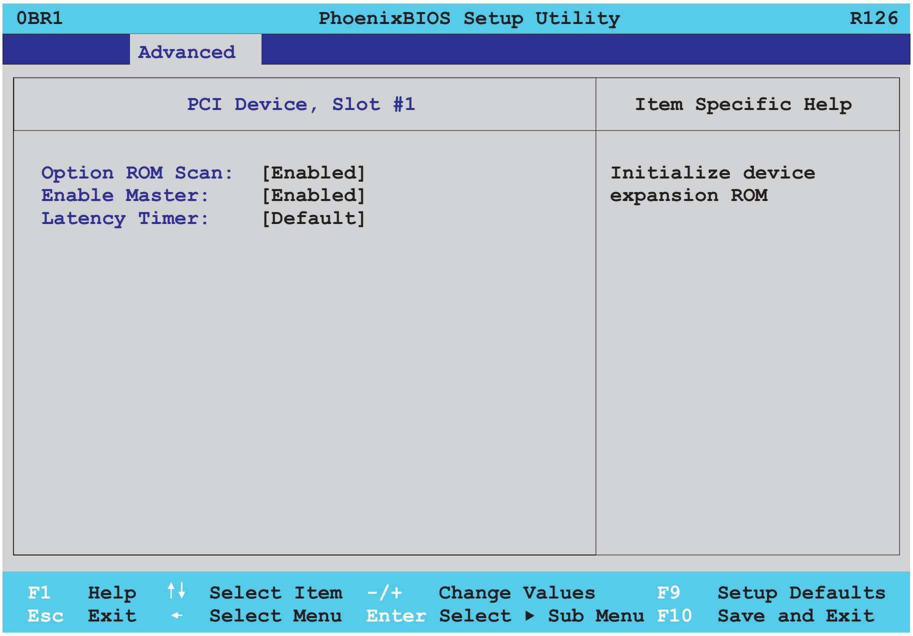
BIOS setting	Meaning	Setting options	Effect
PNP OS installed	If the operating system is plug & play capable, then this option informs BIOS that the operating system will handle the distribution of resources in the future.	Yes	The ISA PnP resources are not assigned. The resource assignment sequence is 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 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.

Table 199: 815GME (ETX) - PCI/PNP configuration - setting options

BIOS setting	Meaning	Setting options	Effect
PCI device, slot #1	Advanced configuration of the PCI slot number 1.	Enter	Opens submenu See "PCI device, slot #1" on page 369
PCI device, slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens submenu See "PCI device, slot #2" on page 370
PCI device, slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens submenu See "PCI device, slot #3" on page 371
PCI device, slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens submenu See "PCI device, slot #4" on page 372
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 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 199: 815GME (ETX) - PCI/PNP configuration - setting options (cont.)

PCI device, slot #1



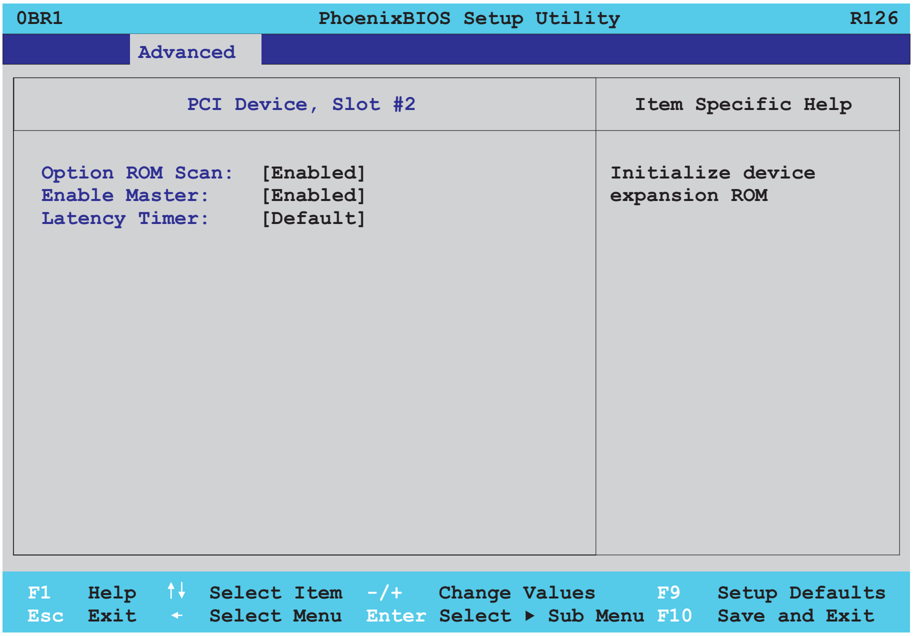
```
0BR1                     PhoenixBIOS Setup Utility                     R126
           Advanced

                 PCI Device, Slot #1                   Item Specific Help

  Option ROM Scan:   [Enabled]                  Initialize device
  Enable Master:     [Enabled]                  expansion ROM
  Latency Timer:     [Default]

 F1   Help  ↑↓  Select Item  -/+    Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ► Sub Menu   F10  Save and Exit
```

Figure 205: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 200: 855GME (ETX) - PCI device, slot #1 - setting options

PCI device, slot #2


0BR1
PhoenixBIOS Setup Utility
R126
Advanced
PCI Device, Slot #2
Item Specific Help

Option ROM Scan: [Enabled]
Enable Master: [Enabled]
Latency Timer: [Default]

Initialize device expansion ROM

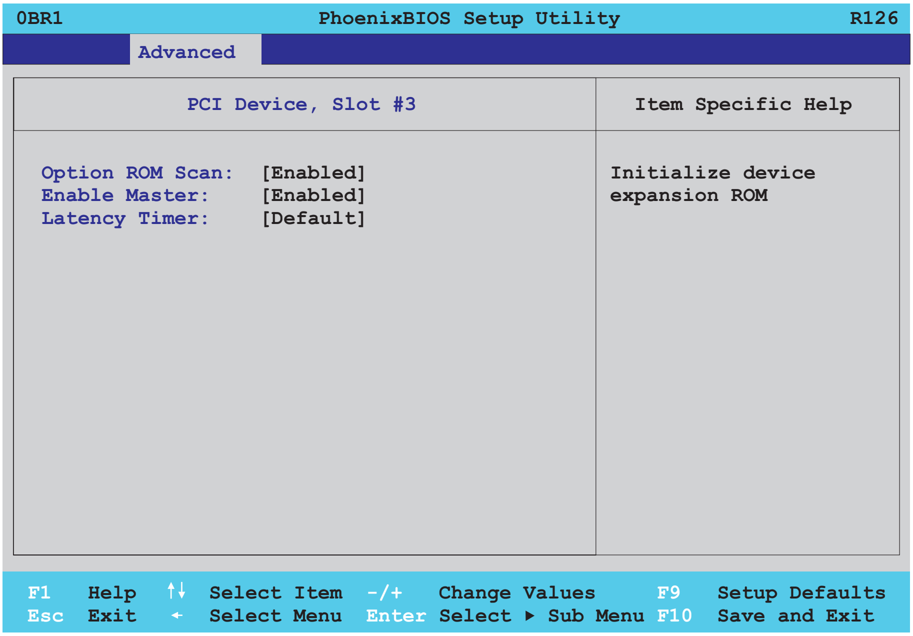
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ► Sub Menu F10 Save and Exit

Figure 206: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 201: 855GME (ETX) - PCI device, slot #2 - setting options

PCI device, slot #3



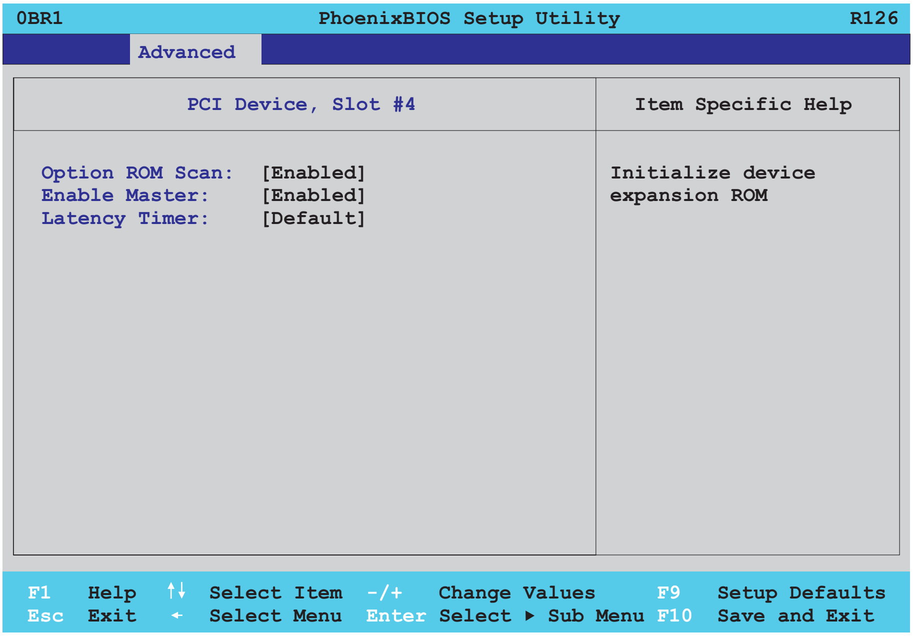
```
0BR1                 PhoenixBIOS Setup Utility                    R126
           Advanced
         PCI Device, Slot #3                   Item Specific Help

  Option ROM Scan:    [Enabled]              Initialize device
  Enable Master:      [Enabled]              expansion ROM
  Latency Timer:      [Default]

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▸ Sub Menu F10  Save and Exit
```

Figure 207: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 202: 855GME (ETX) - PCI device, slot #3 - setting options

PCI device, slot #4


0BR1
PhoenixBIOS Setup Utility
R126
Advanced
PCI Device, Slot #4
Item Specific Help

```
Option ROM Scan:    [Enabled]
Enable Master:      [Enabled]
Latency Timer:      [Default]
```

Initialize device expansion ROM

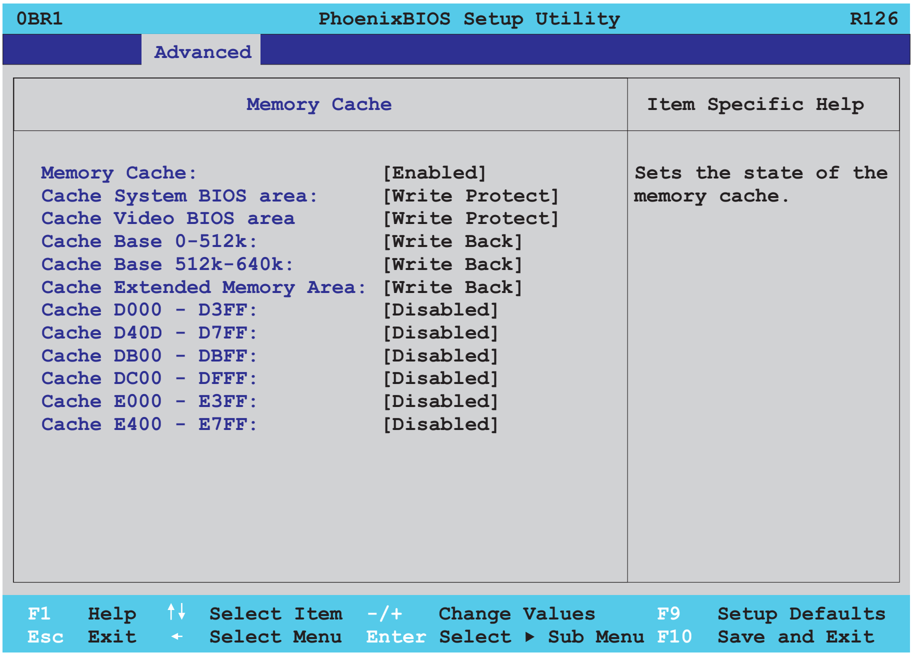
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub Menu F10 Save and Exit

Figure 208: 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. Standard.
		0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h	Manually setting the value.

Table 203: 855GME (ETX) - PCI device, slot #4 - setting options

Memory cache


0BR1
PhoenixBIOS Setup Utility
R126
Advanced
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub Menu F10 Save and Exit

```
Memory Cache                                   Item Specific Help

Memory Cache:                 [Enabled]        Sets the state of the
Cache System BIOS area:       [Write Protect]  memory cache.
Cache Video BIOS area         [Write Protect]
Cache Base 0-512k:            [Write Back]
Cache Base 512k-640k:         [Write Back]
Cache Extended Memory Area:   [Write Back]
Cache D000 - D3FF:            [Disabled]
Cache D40D - D7FF:            [Disabled]
Cache DB00 - DBFF:            [Disabled]
Cache DC00 - DFFF:            [Disabled]
Cache E000 - E3FF:            [Disabled]
Cache E400 - E7FF:            [Disabled]
```

Figure 209: 855GME (ETX) - memory cache

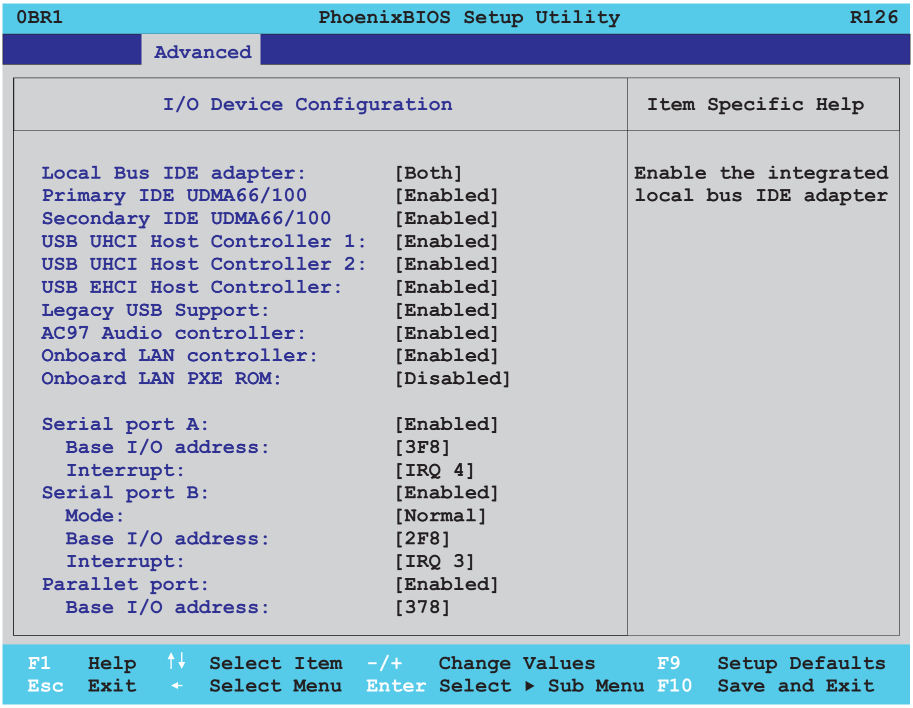
BIOS setting	Meaning	Setting options	Effect
Memory cache	Enable/ disable utilization of the L2 cache.	Enabled	Enables this function.
		Disabled	Disables this function.
Cache system BIOS area	Set whether or not the system BIOS should be buffered.	Write protect	System BIOS is mapped in the cache.
		Uncached	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 204: 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 204: 855GME (ETX) - memory cache - setting options (cont.)

I/O device configuration



```
0BR1                    PhoenixBIOS Setup Utility                  R126
            Advanced

          I/O Device Configuration               Item Specific Help

  Local Bus IDE adapter:         [Both]          Enable the integrated
  Primary IDE UDMA66/100         [Enabled]       local bus IDE adapter
  Secondary IDE UDMA66/100       [Enabled]
  USB UHCI Host Controller 1:    [Enabled]
  USB UHCI Host Controller 2:    [Enabled]
  USB EHCI Host Controller:      [Enabled]
  Legacy USB Support:            [Enabled]
  AC97 Audio controller:         [Enabled]
  Onboard LAN controller:        [Enabled]
  Onboard LAN PXE ROM:           [Disabled]

  Serial port A:                 [Enabled]
    Base I/O address:            [3F8]
    Interrupt:                   [IRQ 4]
  Serial port B:                 [Enabled]
    Mode:                        [Normal]
    Base I/O address:            [2F8]
    Interrupt:                   [IRQ 3]
  Parallel port:                 [Enabled]
    Base I/O address:            [378]

 F1   Help  ↑↓  Select Item  -/+    Change Values      F9   Setup Defaults
 Esc  Exit  ↔   Select Menu  Enter  Select ▸ Sub Menu  F10  Save and Exit
```

Figure 210: 855GME (ETX) - I/O device configuration

BIOS setting	Meaning	Setting options	Effect
Local bus IDE adapter	Enable or disable one or both of 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 205: 855GME (ETX) - I/O device configuration - setting options

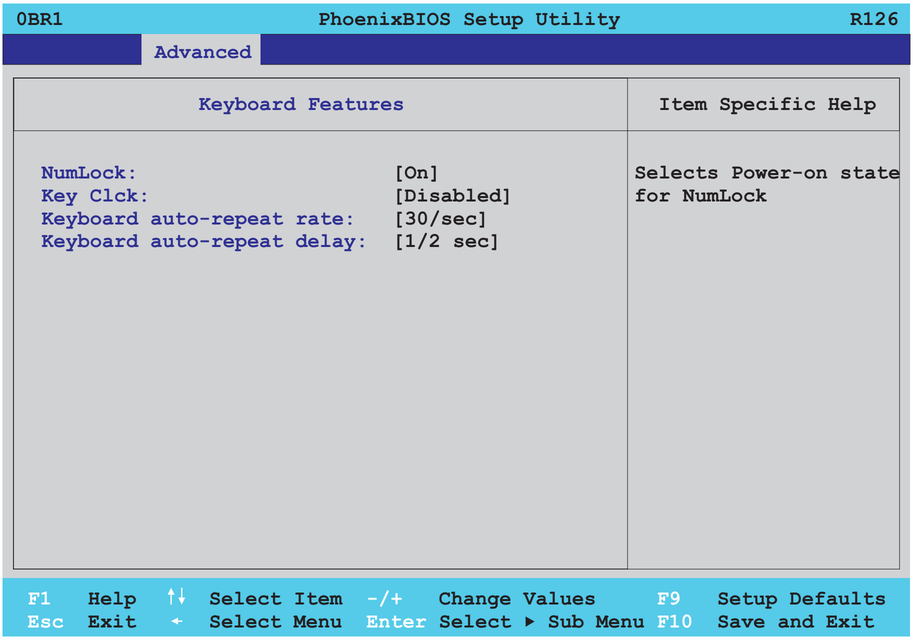
BIOS setting	Meaning	Setting options	Effect
USB UHCI host controller 1	Configuration of USB UHCI controller 1 for USB port 0 und 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller 2	Configuration of the USB UHCI controller 1 for USB port 2 and 3. Can 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 205: 855GME (ETX) - I/O device configuration - setting options (cont.)

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 205: 855GME (ETX) - I/O device configuration - setting options (cont.)

Keyboard features



```
0BR1                PhoenixBIOS Setup Utility                R126
             Advanced
            Keyboard Features                  Item Specific Help

  NumLock:                       [On]          Selects Power-on state
  Key Clck:                      [Disabled]    for NumLock
  Keyboard auto-repeat rate:     [30/sec]
  Keyboard auto-repeat delay:    [1/2 sec]

F1   Help  ↑↓ Select Item  -/+   Change Values        F9   Setup Defaults
Esc  Exit  ←  Select Menu  Enter Select ▶ Sub Menu    F10  Save and Exit
```

Figure 211: 855GME (ETX) - keyboard features

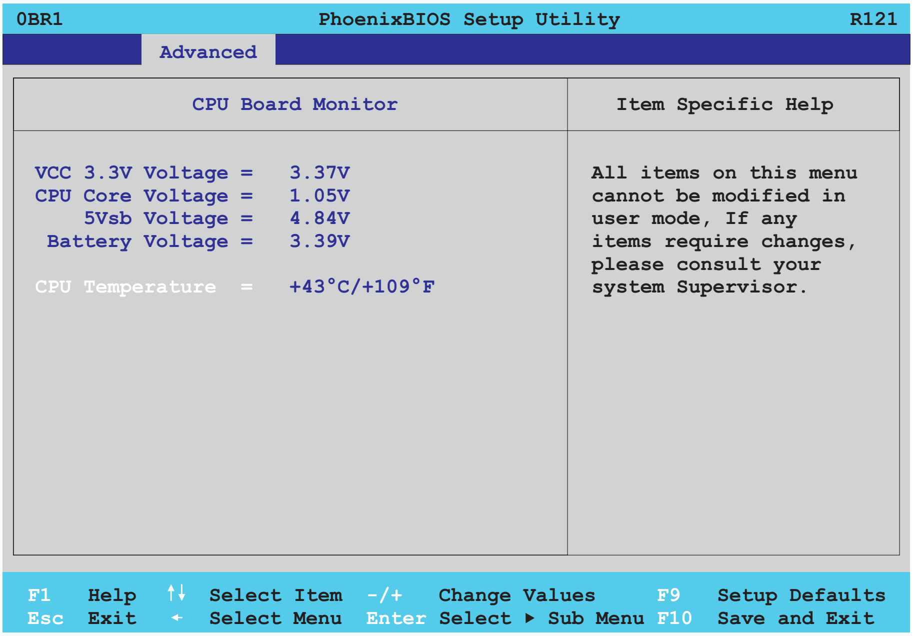
BIOS setting	Meaning	Setting options	Effect
NumLock	This option sets the status of the numeric keypad when the the system is booted.	On	Numeric keypad is enabled.
		Off	Only the cursor functions of the numerical keypad are activated.
		Auto	Numeric keypad is activated, if present.
Key click	Using this 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 206: 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.



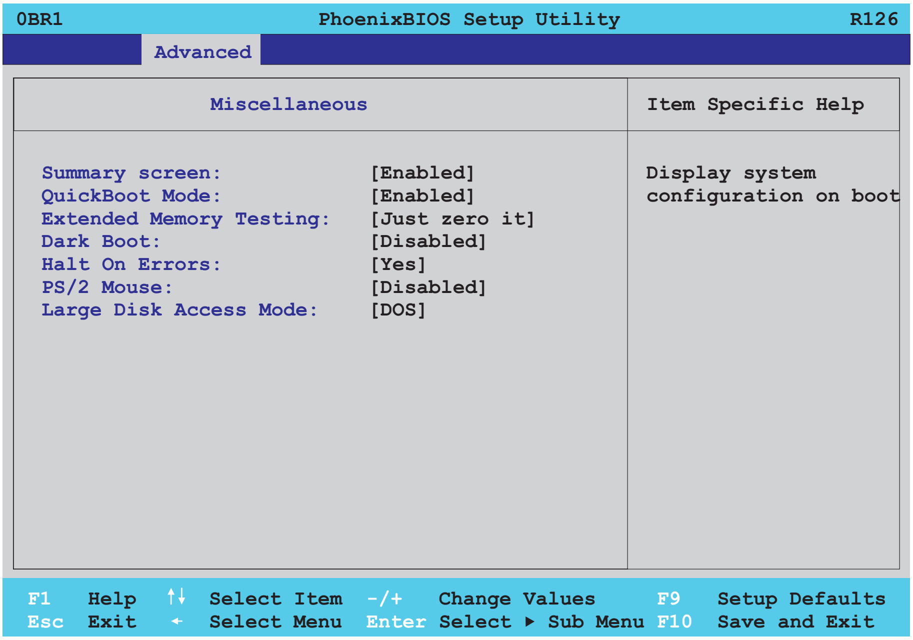
```
0BR1                    PhoenixBIOS Setup Utility                    R121
             Advanced

               CPU Board Monitor                   Item Specific Help

 VCC 3.3V Voltage =   3.37V                     All items on this menu
 CPU Core Voltage =   1.05V                     cannot be modified in
     5Vsb Voltage =   4.84V                     user mode, If any
  Battery Voltage =   3.39V                     items require changes,
                                                please consult your
 CPU Temperature  =   +43°C/+109°F              system Supervisor.

F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
Esc  Exit  ←   Select Menu  Enter Select ► Sub Menu  F10  Save and Exit
```

Figure 212: 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 207: 855GME (ETX) - CPU board monitor - setting options

Miscellaneous



```
Summary screen:                [Enabled]
QuickBoot Mode:                [Enabled]
Extended Memory Testing:       [Just zero it]
Dark Boot:                     [Disabled]
Halt On Errors:                [Yes]
PS/2 Mouse:                    [Disabled]
Large Disk Access Mode:        [DOS]
```

Display system configuration on boot

Figure 213: 855GME (ETX) miscellaneous

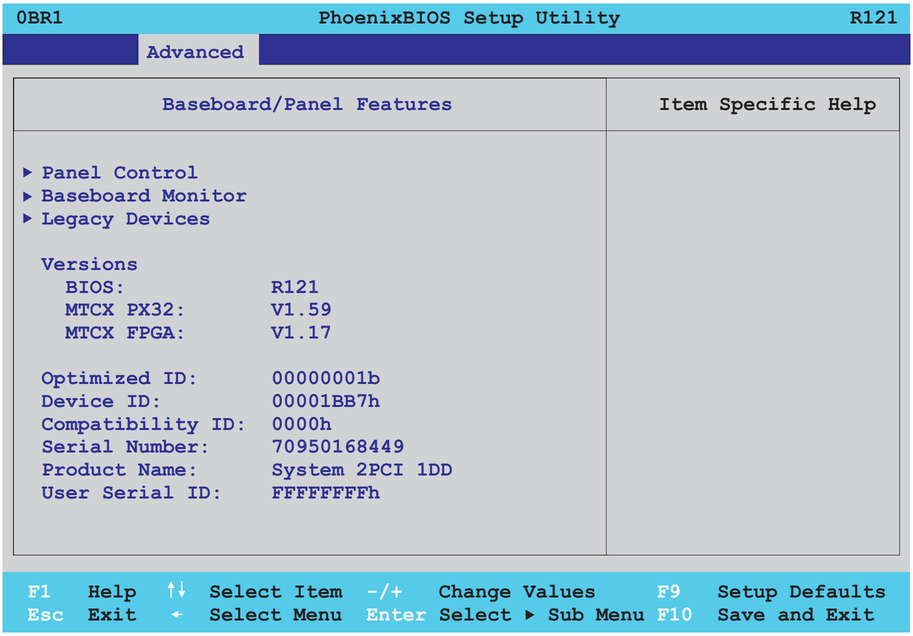
BIOS setting	Meaning	Setting options	Effect
Summary screen	Set whether or not the system summary screen should open when the system is started (see figure 196 "855GME (ETX) - BIOS diagnostics screen" on page 355).	Enabled	Enables this function.
		Disabled	Disables this function.
QuickBoot mode	Speeds 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 195 "855GME (ETX) - BIOS diagnostics screen" on page 355) should be displayed when the system is started.	Enabled	Enables this function. The diagnostics screen is displayed.
		Disabled	Disables this function. The diagnostics screen is not displayed.

Table 208: 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 208: 855GME (ETX) - miscellaneous setting options (cont.)

Baseboard/panel features



```
0BR1                  PhoenixBIOS Setup Utility                  R121
          Advanced

          Baseboard/Panel Features              Item Specific Help

 ▶ Panel Control
 ▶ Baseboard Monitor
 ▶ Legacy Devices

   Versions
     BIOS:               R121
     MTCX PX32:          V1.59
     MTCX FPGA:          V1.17

   Optimized ID:         00000001b
   Device ID:            00001BB7h
   Compatibility ID:     0000h
   Serial Number:        70950168449
   Product Name:         System 2PCI 1DD
   User Serial ID:       FFFFFFFFh

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu   F10  Save and Exit
```

Figure 214: 855GME (ETX) - baseboard/panel features

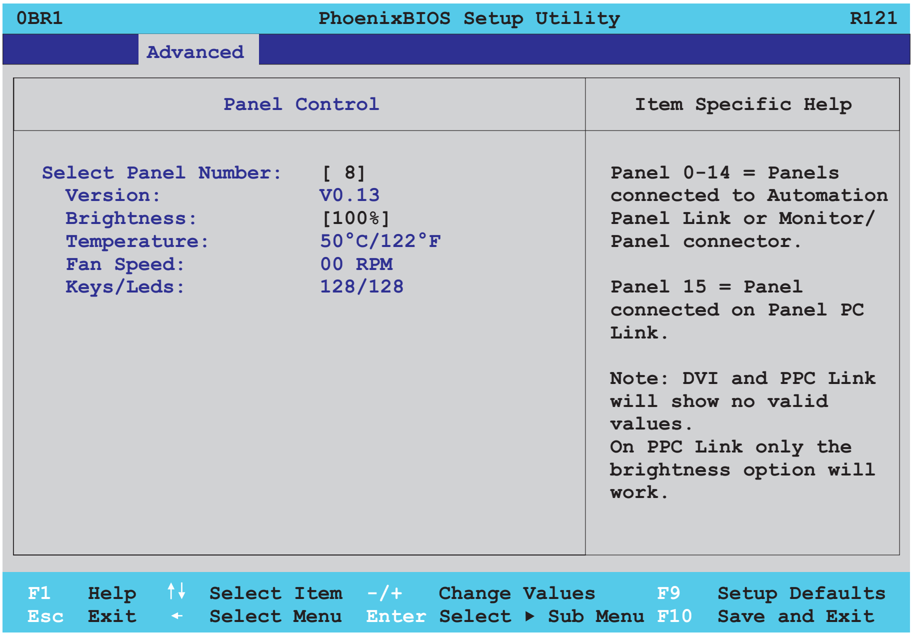
BIOS setting	Meaning	Setting options	Effect
Panel control	For special setup of connected panels.	Enter	Opens submenu see "Panel control" on page 383.
Baseboard monitor	Display of various temperatures and fan speeds.	Enter	Opens submenu see "Baseboard monitor" on page 384.

Table 209: 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 submenu see "Legacy devices" on page 385.
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 209: 855GME (ETX) - baseboard/panel features - setting options (cont.)

Panel control



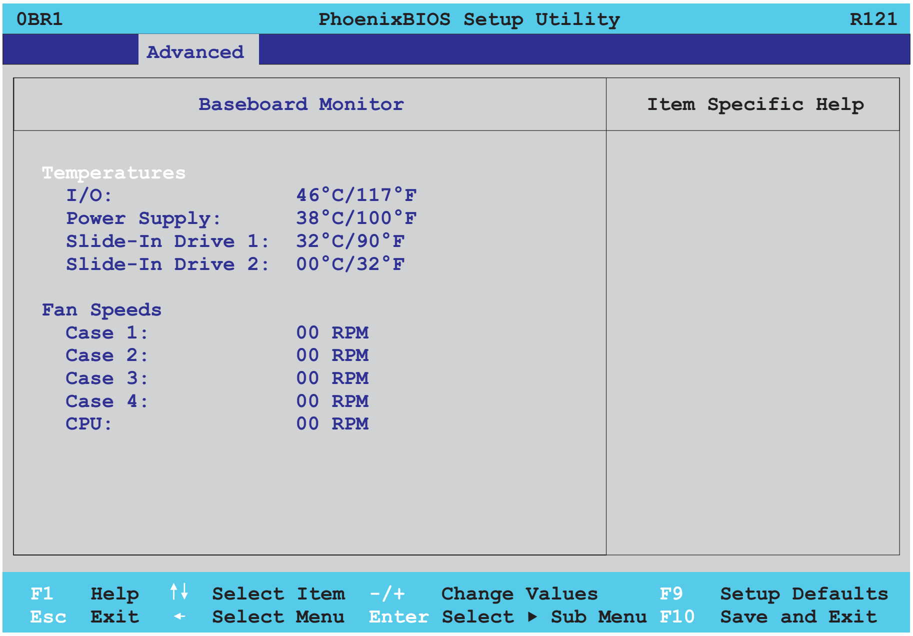
```
0BR1                PhoenixBIOS Setup Utility                 R121
           Advanced
           Panel Control                      Item Specific Help

  Select Panel Number:    [ 8]              Panel 0-14 = Panels
    Version:              V0.13             connected to Automation
    Brightness:           [100%]            Panel Link or Monitor/
    Temperature:          50°C/122°F        Panel connector.
    Fan Speed:            00 RPM
    Keys/Leds:            128/128           Panel 15 = Panel
                                            connected on Panel PC
                                            Link.

                                            Note: DVI and PPC Link
                                            will show no valid
                                            values.
                                            On PPC Link only the
                                            brightness option will
                                            work.

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 215: 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 210: 855GME (ETX) - panel control - setting options

Baseboard monitor



```
0BR1                    PhoenixBIOS Setup Utility                    R121
                Advanced

              Baseboard Monitor                      Item Specific Help

  Temperatures
    I/O:                  46°C/117°F
    Power Supply:         38°C/100°F
    Slide-In Drive 1:     32°C/90°F
    Slide-In Drive 2:     00°C/32°F

  Fan Speeds
    Case 1:               00 RPM
    Case 2:               00 RPM
    Case 3:               00 RPM
    Case 4:               00 RPM
    CPU:                  00 RPM
```

F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▶ Sub Menu F10 Save and Exit

Figure 216: 855GME (ETX) - baseboard monitor

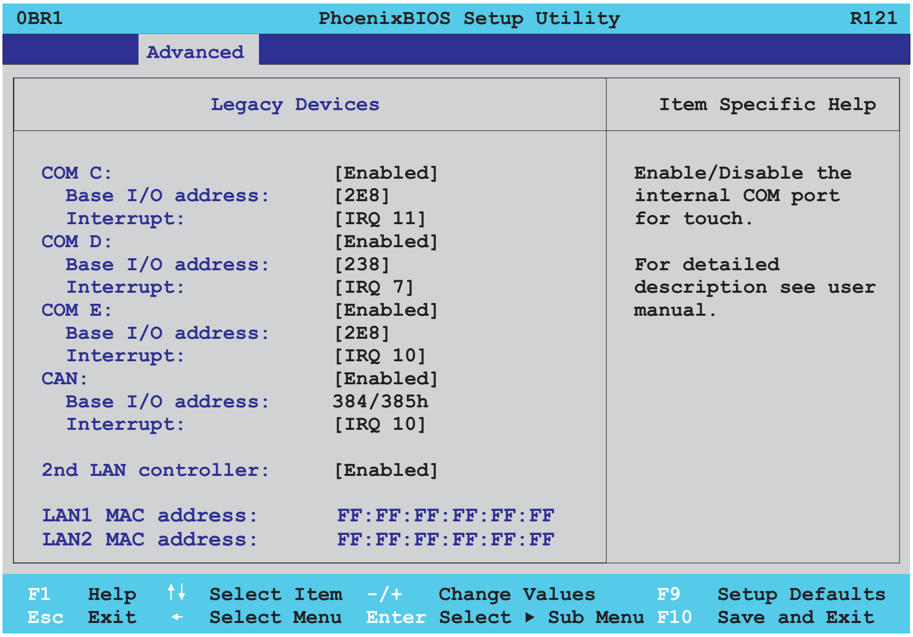
BIOS setting	Meaning	Setting options	Effect
CMOS battery	Displays the battery status. **N/A** - not available, either MTCX does not support the firmware (starting with these versions "Baseboard/panel features" on page 434) or the hardware is too old. **Good** - battery ok. **Bad** - battery is damaged.	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 25.40 mm 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	-

Table 211: 855GME (ETX) - baseboard monitor - setting options

BIOS setting	Meaning	Setting options	Effect
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 211: 855GME (ETX) - baseboard monitor - setting options

Legacy devices



```
0BR1                 PhoenixBIOS Setup Utility                  R121
           Advanced

                    Legacy Devices                 Item Specific Help

  COM C:                       [Enabled]          Enable/Disable the
    Base I/O address:          [2E8]              internal COM port
    Interrupt:                 [IRQ 11]           for touch.
  COM D:                       [Enabled]
    Base I/O address:          [238]              For detailed
    Interrupt:                 [IRQ 7]            description see user
  COM E:                       [Enabled]          manual.
    Base I/O address:          [2E8]
    Interrupt:                 [IRQ 10]
  CAN:                         [Enabled]
    Base I/O address:          384/385h
    Interrupt:                 [IRQ 10]

  2nd LAN controller:          [Enabled]

  LAN1 MAC address:             FF:FF:FF:FF:FF:FF
  LAN2 MAC address:             FF:FF:FF:FF:FF:FF

 F1   Help  ↑↓ Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ↔  Select Menu  Enter Select ▶ Sub Menu  F10  Save and Exit
```

Figure 217: 855GME (ETX) - Legacy devices

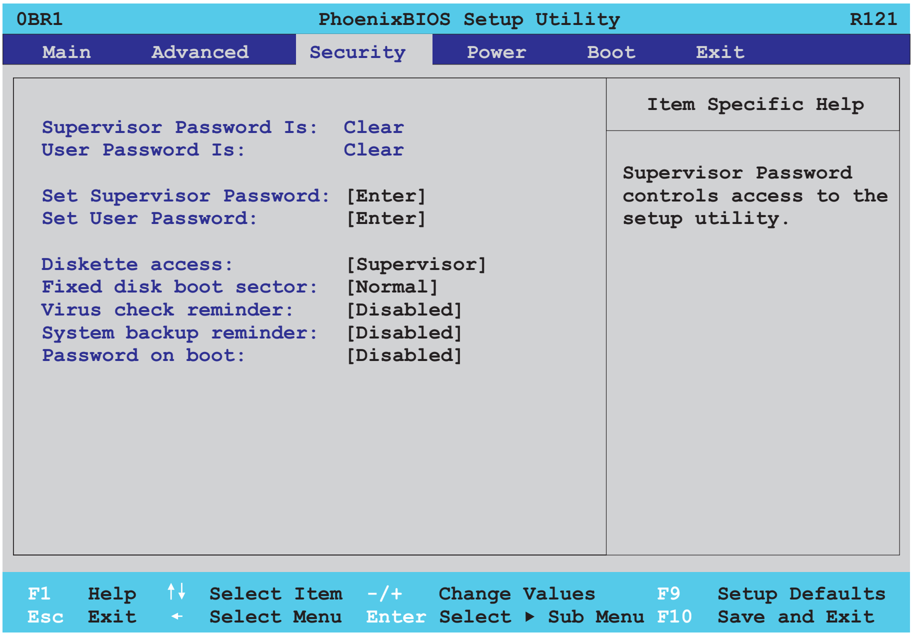
BIOS setting	Meaning	Setting options	Effect
COM C	Settings for the internal serial interfaces in the system. This setting activates the touch screen in panel PC 700 systems, and, using SDL transfer technology, also in Automation Panel 900 display units.	Disabled	Disables the interface.
		Enabled	Enables 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 212: 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 of a B&R add-on interface option (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.	-	-
LAN2 MAC address	Displays the MAC addresses for the ETH2 network controller.	-	-

Table 212: 855GME (ETX) - Legacy devices - setting options (cont.)

1.2.5 Security



```
0BR1                     PhoenixBIOS Setup Utility                    R121
   Main       Advanced      Security      Power      Boot      Exit

   Supervisor Password Is:   Clear                   Item Specific Help
   User Password Is:         Clear
                                                  Supervisor Password
   Set Supervisor Password:  [Enter]              controls access to the
   Set User Password:        [Enter]              setup utility.

   Diskette access:          [Supervisor]
   Fixed disk boot sector:   [Normal]
   Virus check reminder:     [Disabled]
   System backup reminder:   [Disabled]
   Password on boot:         [Disabled]

 F1   Help   ↑↓  Select Item  -/+   Change Values        F9   Setup Defaults
 Esc  Exit   ←   Select Menu  Enter Select ▸ Sub Menu   F10  Save and Exit
```

Figure 218: 855GME (ETX) - security menu

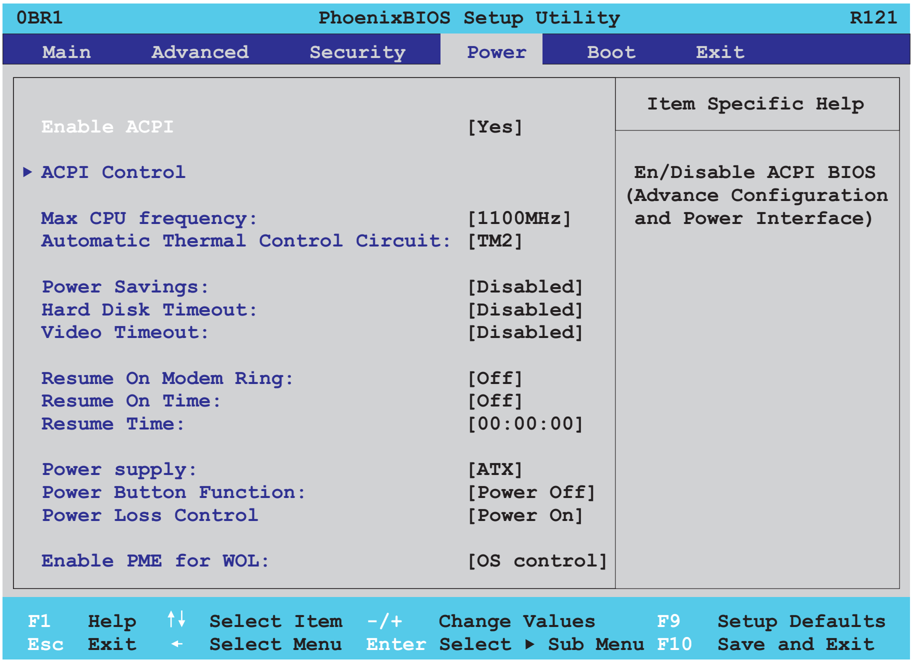
BIOS setting	Meaning	Setting options	Effect
Supervisor password is	Displays whether or not a supervisor password has been set.	None	Display **set**: A supervisor password has been set. Display **clear**: No supervisor password has been set.
User password is	Displays whether or not a user password has 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 213: 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 213: 855GME (ETX) security - setting options (cont.)

1.2.6 Power



```
0BR1                    PhoenixBIOS Setup Utility                    R121
   Main      Advanced      Security      Power      Boot      Exit

                                                   Item Specific Help
   Enable ACPI                       [Yes]
                                                 En/Disable ACPI BIOS
 ► ACPI Control                                 (Advance Configuration
                                                 and Power Interface)
   Max CPU frequency:                [1100MHz]
   Automatic Thermal Control Circuit: [TM2]

   Power Savings:                    [Disabled]
   Hard Disk Timeout:                [Disabled]
   Video Timeout:                    [Disabled]

   Resume On Modem Ring:             [Off]
   Resume On Time:                   [Off]
   Resume Time:                      [00:00:00]

   Power supply:                     [ATX]
   Power Button Function:            [Power Off]
   Power Loss Control                [Power On]

   Enable PME for WOL:               [OS control]

 F1   Help  ↑↓  Select Item  -/+   Change Values      F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ► Sub Menu  F10  Save and Exit
```

Figure 219: 855GME (ETX) - power menu

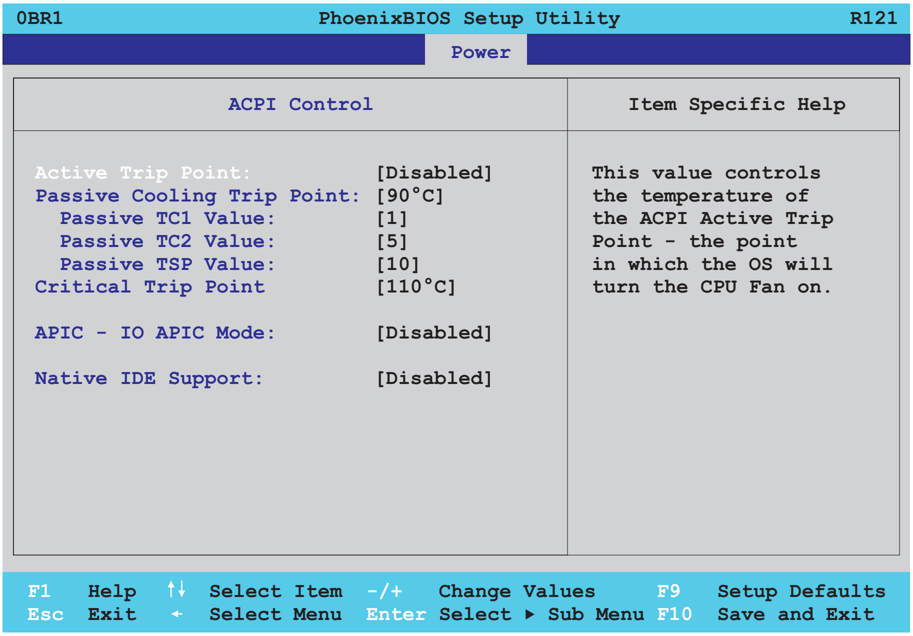
BIOS setting	Meaning	Setting options	Effect
Enable ACPI	This option turns the ACPI function (Advanced Configuration and Power Interface) on or off. This is an advanced plug & play and power management functionality.	Yes	Enables this function.
		No	Disables this function.
ACPI control	Configuration of specific limits.	Enter	Opens submenu See "ACPI control" on page 391
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 214: 855GME (ETX) - power - 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. **Note:** **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	This option enables the PME (Power Management Event) signal 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 214: 855GME (ETX) - power - setting options (cont.)

ACPI control



```
0BR1                    PhoenixBIOS Setup Utility                    R121
                                  Power

                ACPI Control                          Item Specific Help

  Active Trip Point:               [Disabled]       This value controls
  Passive Cooling Trip Point:      [90°C]           the temperature of
     Passive TC1 Value:            [1]              the ACPI Active Trip
     Passive TC2 Value:            [5]              Point - the point
     Passive TSP Value:            [10]             in which the OS will
  Critical Trip Point              [110°C]          turn the CPU Fan on.

  APIC - IO APIC Mode:             [Disabled]

  Native IDE Support:              [Disabled]

 F1   Help  ↑↓  Select Item  -/+    Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter  Select ▸ Sub Menu  F10  Save and Exit
```

Figure 220: 855GME (ETX) - ACPI control

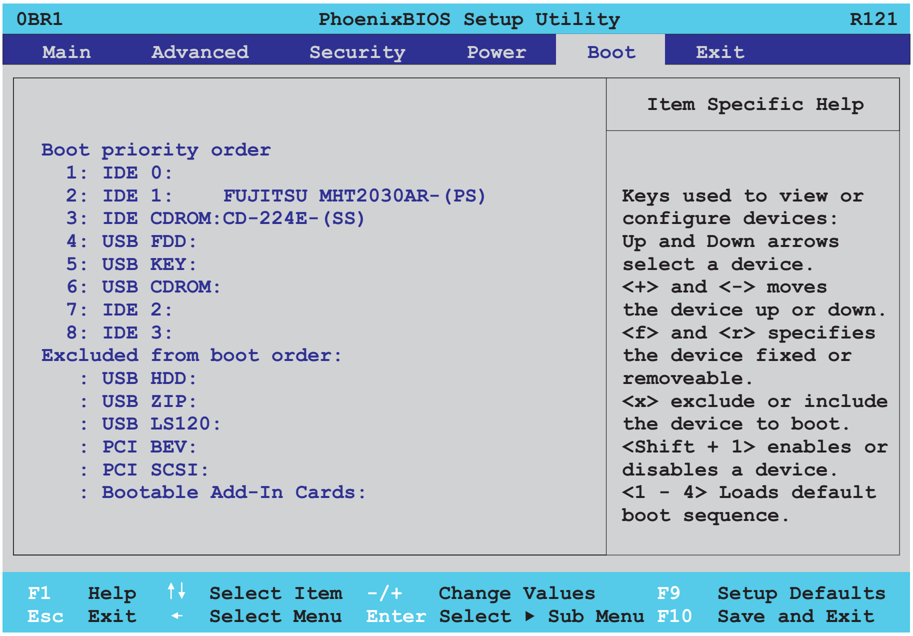
BIOS setting	Meaning	Setting options	Effect
Active trip point	With this function, an optional CPU fan above the operating system can be set to turn on when the CPU reaches the set temperature. **Information:** **This function is not supported by MS-DOS.**	Disabled	Disables this function.
		40°C .. 100°C	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 215: 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 215: 855GME (ETX) - ACPI control - setting options (cont.)

1.2.7 Boot



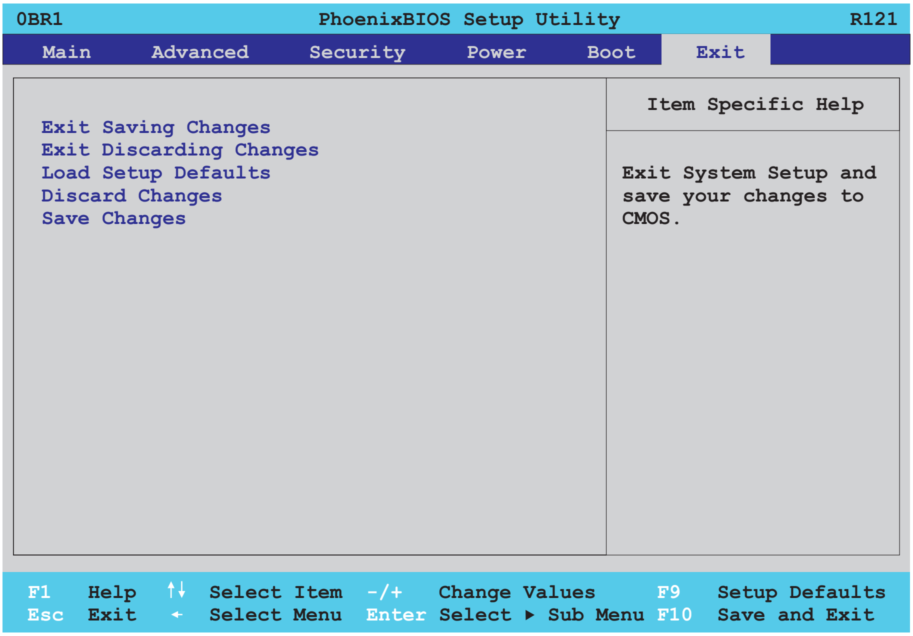
```
0BR1                  PhoenixBIOS Setup Utility                 R121
   Main     Advanced     Security     Power     Boot     Exit

                                               Item Specific Help

  Boot priority order
    1: IDE 0:
    2: IDE 1:     FUJITSU MHT2030AR-(PS)      Keys used to view or
    3: IDE CDROM:CD-224E-(SS)                 configure devices:
    4: USB FDD:                               Up and Down arrows
    5: USB KEY:                               select a device.
    6: USB CDROM:                             <+> and <-> moves
    7: IDE 2:                                 the device up or down.
    8: IDE 3:                                 <f> and <r> specifies
  Excluded from boot order:                   the device fixed or
     : USB HDD:                               removeable.
     : USB ZIP:                               <x> exclude or include
     : USB LS120:                             the device to boot.
     : PCI BEV:                               <Shift + 1> enables or
     : PCI SCSI:                              disables a device.
     : Bootable Add-In Cards:                 <1 - 4> Loads default
                                              boot sequence.

 F1   Help  ↑↓  Select Item  -/+   Change Values       F9   Setup Defaults
 Esc  Exit  ←   Select Menu  Enter Select ► Sub Menu  F10  Save and Exit
```

Figure 221: 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 216: 855GME (ETX) - boot menu - setting options

1.2.8 Exit



Exit System Setup and save your changes to CMOS.

Figure 222: 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	-
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 217: 855GME (ETX) - exit menu - 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.

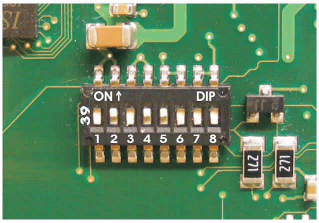


Figure 223: DIP switch on system unit

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 218: 855GME (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	
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 219: 855GME (ETX) - main - profile setting 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 220: 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 221: 815GME (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 221: 815GME (ETX) - PCI/PNP configuration - profile settings overview (cont.)

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 222: 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 223: 855GME (ETX) - I/O device configuration - profile setting 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 224: 855GME (ETX) - keyboard features - profile setting 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 225: 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 226: 855GME (ETX) - miscellaneous - profile setting overview

Baseboard/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 227: 855GME (ETX) - baseboard/panel features -profile setting overview

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Temperature	-	-	-	-	-	
Fan speed	-	-	-	-	-	
Keys/LEDs	-	-	-	-	-	
Baseboard 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 227: 855GME (ETX) - baseboard/panel features -profile setting overview (cont.)

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 228: 855GME (ETX) security - profile setting 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 229: 855GME (ETX) - power - profile setting 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 230: 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 448).**

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

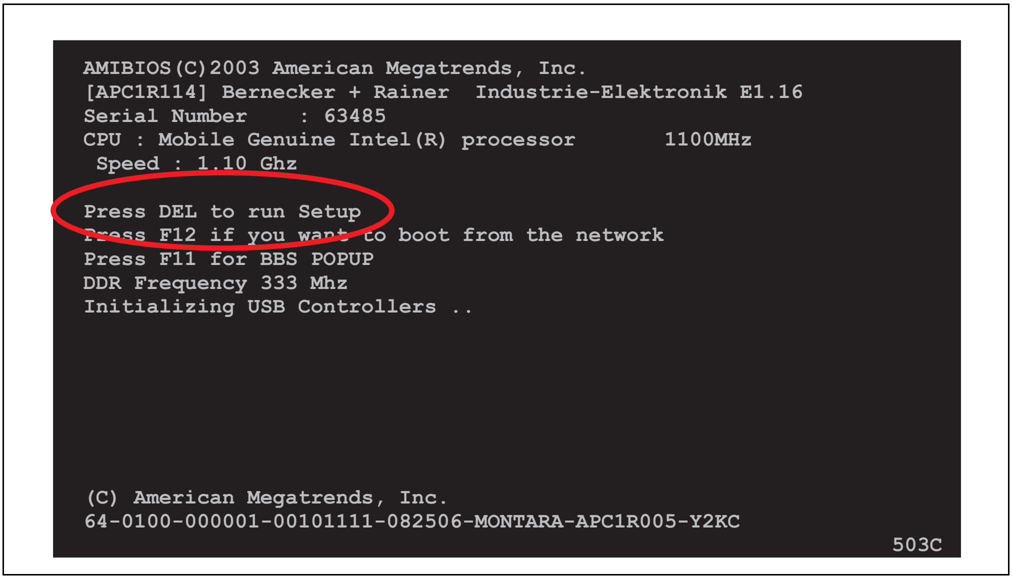
BIOS is immediately activated when switching on the power supply of the PPC700 system or pressing the power button. The system checks if the setup data from the EEPROM is "OK". If the data is "OK", then it is transferred to the CMOS. If the data is "not OK", then the CMOS data is checked for validity. 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"



```
AMIBIOS(C)2003 American Megatrends, Inc.
[APC1R114] Bernecker + Rainer  Industrie-Elektronik E1.16
Serial Number     : 63485
CPU : Mobile Genuine Intel(R) processor       1100MHz
 Speed : 1.10 Ghz

Press DEL to run Setup
Press F12 if you want to boot from the network
Press F11 for BBS POPUP
DDR Frequency 333 Mhz
Initializing USB Controllers ..






(C) American Megatrends, Inc.
64-0100-000001-00101111-082506-MONTARA-APC1R005-Y2KC
                                                                503C
```

Figure 224: 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 231: 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 232: 855GME (XTX) - keys relevant to BIOS in the BIOS menu

Key	Function
Enter	Changes to the selected menu.
PgUp↑	Change to the previous page.
PgDn ↓	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 232: 855GME (XTX) - keys relevant to BIOS in the BIOS menu (cont.)

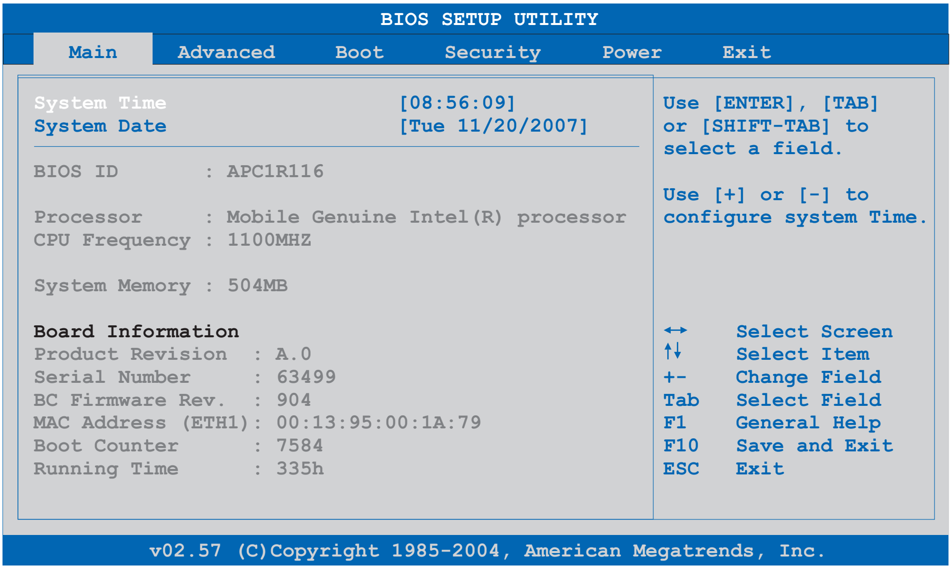
The following sections explain the individual BIOS main menu items in detail.

BIOS setup menu item	Function	From page
Main	You can configure the ground configuration time and date in this menu.	407
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
Boot	The boot order can be set here.	440
Security	For setting up the system's security functions.	442
Power	Setup of various APM (Advanced Power Management) options.	445
Exit	To end the BIOS setup.	447

Table 233: Overview of 855GME (XTX) BIOS menu items

1.3.4 Main

The BIOS setup main menu appears immediately after pressing the DEL button while the system is booting:



```
                              BIOS SETUP UTILITY
  Main      Advanced     Boot     Security     Power     Exit

System Time                    [08:56:09]          Use [ENTER], [TAB]
System Date                    [Tue 11/20/2007]    or [SHIFT-TAB] to
                                                   select a field.
BIOS ID         : APC1R116
                                                   Use [+] or [-] to
Processor       : Mobile Genuine Intel(R) processor configure system Time.
CPU Frequency   : 1100MHZ

System Memory   : 504MB

Board Information                                  ↔     Select Screen
Product Revision   : A.0                           ↑↓    Select Item
Serial Number      : 63499                         +-    Change Field
BC Firmware Rev.   : 904                           Tab   Select Field
MAC Address (ETH1) : 00:13:95:00:1A:79             F1    General Help
Boot Counter       : 7584                          F10   Save and Exit
Running Time       : 335h                          ESC   Exit

        v02.57 (C)Copyright 1985-2004, American Megatrends, Inc.
```

Figure 225: 855GME (XTX) BIOS main menu

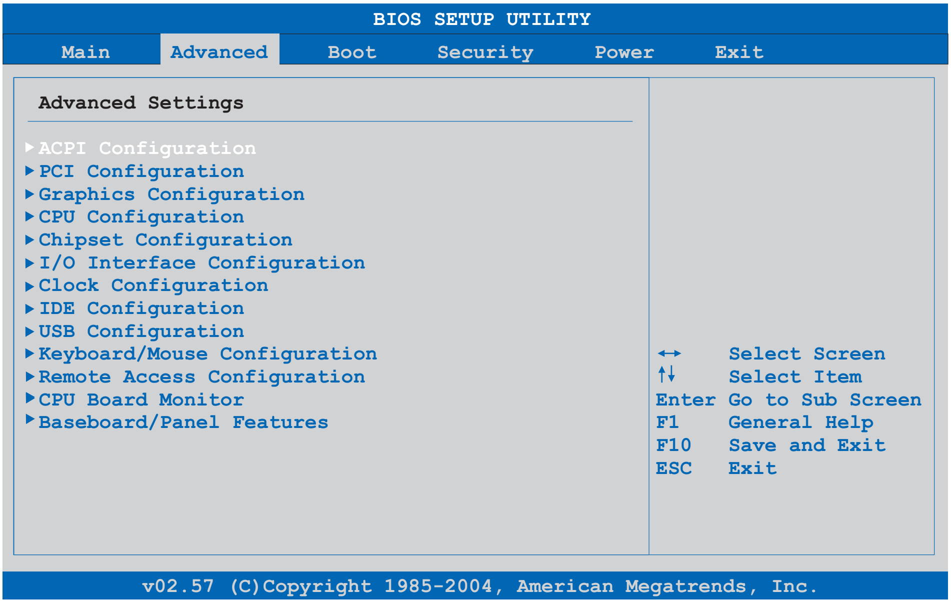
BIOS setting	Meaning	Setting options	Effect
System time	This is the current system time setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Adjustment of the system time	Set the system time in the format (hh:mm:ss).
System date	This is the current system date setting. The time is buffered by a battery (CMOS battery) after the system has been switched off.	Changes to 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	-

Table 234: 855GME (XTX) main menu - setting options

BIOS setting	Meaning	Setting options	Effect
MAC Address (ETH1)	Displays the assigned MAC address.	None	-
Boot counter	Boot counter display.	None	-
Running time	Runtime display.	None	-

Table 234: 855GME (XTX) main menu - setting options (cont.)

1.3.5 Advanced



```
                          BIOS SETUP UTILITY
     Main      Advanced      Boot     Security      Power      Exit

  Advanced Settings

 ▸ACPI Configuration
 ▸PCI Configuration
 ▸Graphics Configuration
 ▸CPU Configuration
 ▸Chipset Configuration
 ▸I/O Interface Configuration
 ▸Clock Configuration
 ▸IDE Configuration
 ▸USB Configuration
 ▸Keyboard/Mouse Configuration                       ↔      Select Screen
 ▸Remote Access Configuration                        ↑↓     Select Item
 ▸CPU Board Monitor                                  Enter  Go to Sub Screen
 ▸Baseboard/Panel Features                           F1     General Help
                                                     F10    Save and Exit
                                                     ESC    Exit

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```

Figure 226: 855GME (XTX) - advanced menu

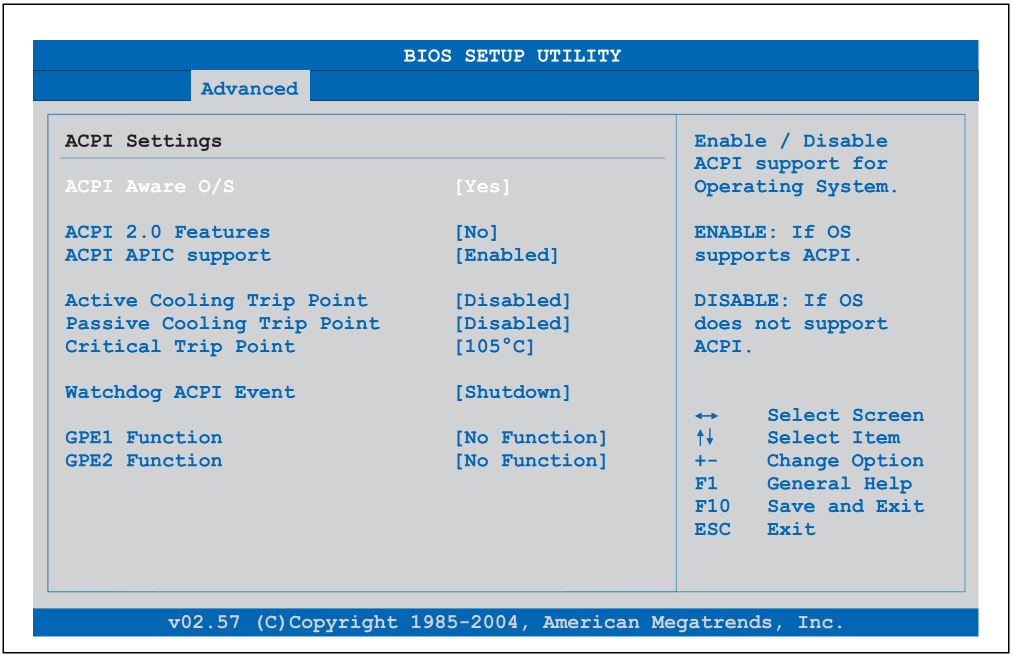
BIOS setting	Meaning	Setting options	Effect
ACPI configuration	Configures APCI devices.	Enter	Opens submenu See "ACPI configuration" on page 409
PCI configuration	Configures PCI devices.	Enter	Opens submenu See "PCI configuration" on page 411
Graphics configuration	Configures the graphic settings.	Enter	Opens submenu See "Graphics configuration" on page 413
CPU configuration	Configures CPU settings.	Enter	Opens submenu See "CPU configuration" on page 415
Chipset configuration	Configures the chipset functions.	Enter	Opens submenu See "Chipset configuration" on page 416

Table 235: 855GME (XTX) - advanced menu - setting options

BIOS setting	Meaning	Setting options	Effect
I/O interface configuration	Configuration of the I/O devices.	Enter	Opens submenu See "I/O interface configuration" on page 417
Clock configuration	Configures clock settings.	Enter	Opens submenu See "Clock configuration" on page 418
IDE Configuration	Configures the IDE functions.	Enter	Opens submenu See "IDE Configuration" on page 419
USB configuration	Configures USB settings	Enter	Opens submenu See "USB configuration" on page 427
Keyboard/mouse configuration	Configuration of the keyboard/mouse options.	Enter	Opens submenu See "Keyboard/mouse configuration" on page 430
Remote access configuration	Configures the remote access settings	Enter	Opens submenu See "Remote access configuration" on page 431
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu See "CPU board monitor" on page 433
Baseboard/panel features	Displays device specific information and setup of device specific values.	Enter	Opens submenu See "Baseboard/panel features" on page 434

Table 235: 855GME (XTX) - advanced menu - setting options (cont.)

ACPI configuration



```
ACPI Settings

ACPI Aware O/S                  [Yes]

ACPI 2.0 Features               [No]
ACPI APIC support               [Enabled]

Active Cooling Trip Point       [Disabled]
Passive Cooling Trip Point      [Disabled]
Critical Trip Point             [105°C]

Watchdog ACPI Event             [Shutdown]

GPE1 Function                   [No Function]
GPE2 Function                   [No Function]
```

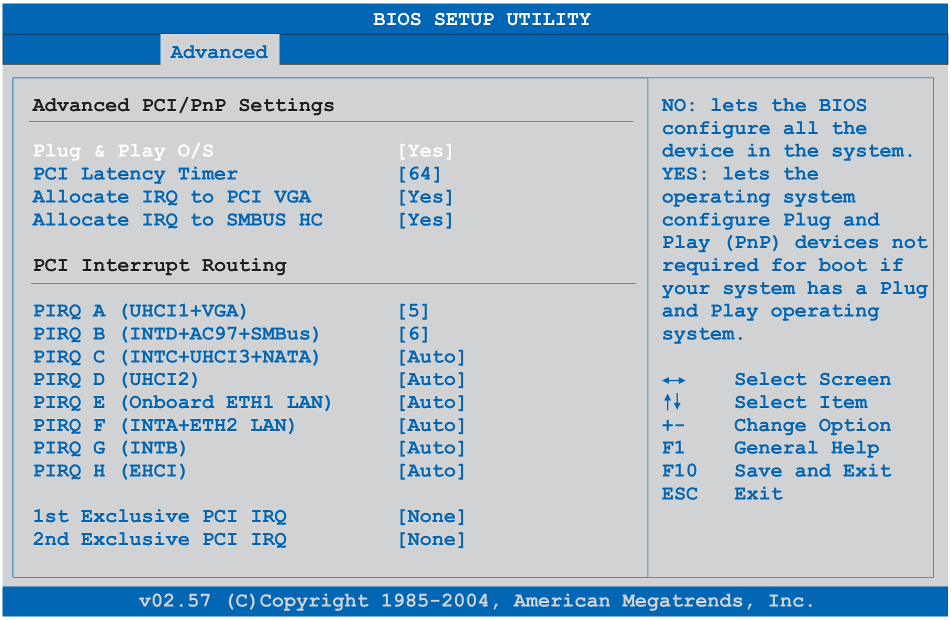
```
Enable / Disable
ACPI support for
Operating System.

ENABLE: If OS
supports ACPI.

DISABLE: If OS
does not support
ACPI.
```

Figure 227: 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 is activated by the operating system when the CPU reaches the set temperature. Temperature reached.	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 operating 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 236: 855GME (XTX) - advanced ACPI configuration - setting options

PCI configuration



```
                         BIOS SETUP UTILITY
              Advanced
 Advanced PCI/PnP Settings                   NO: lets the BIOS
                                              configure all the
 Plug & Play O/S              [Yes]           device in the system.
 PCI Latency Timer            [64]            YES: lets the
 Allocate IRQ to PCI VGA      [Yes]           operating system
 Allocate IRQ to SMBUS HC     [Yes]           configure Plug and
                                              Play (PnP) devices not
 PCI Interrupt Routing                        required for boot if
                                              your system has a Plug
 PIRQ A (UHCI1+VGA)           [5]             and Play operating
 PIRQ B (INTD+AC97+SMBus)     [6]             system.
 PIRQ C (INTC+UHCI3+NATA)     [Auto]
 PIRQ D (UHCI2)               [Auto]          ←→    Select Screen
 PIRQ E (Onboard ETH1 LAN)    [Auto]          ↑↓    Select Item
 PIRQ F (INTA+ETH2 LAN)       [Auto]          +-    Change Option
 PIRQ G (INTB)                [Auto]          F1    General Help
 PIRQ H (EHCI)                [Auto]          F10   Save and Exit
                                              ESC   Exit
 1st Exclusive PCI IRQ        [None]
 2nd Exclusive PCI IRQ        [None]

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```

Figure 228: 855GME (XTX) - advanced PCI configuration

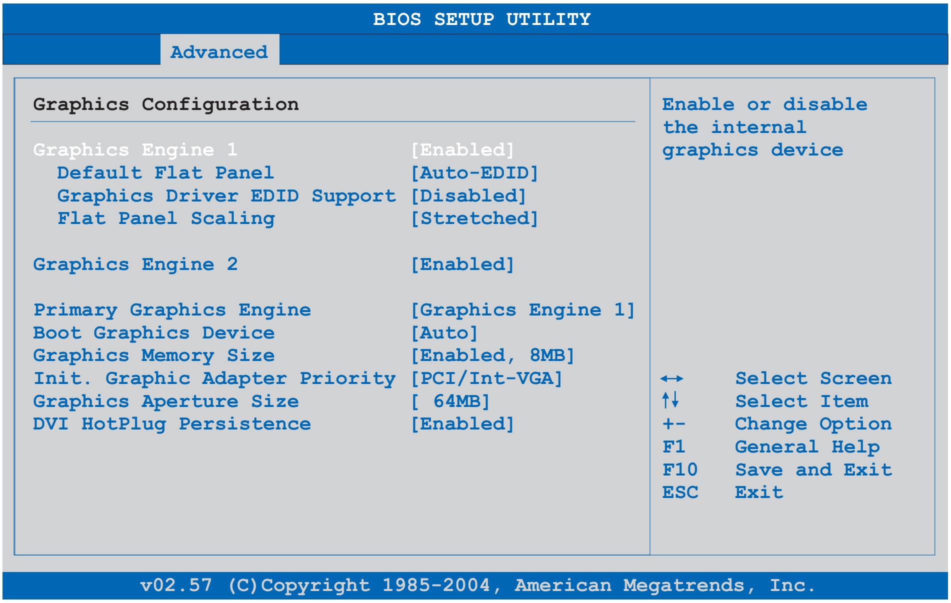
BIOS setting	Meaning	Setting options	Effect
Plug & Play O/S	BIOS is informed if Plug & Play is capable on the operating system.	Yes	The operating system handles the distribution of resources.
		No	The operating system handles the distribution of resources.
PCI latency timer	This option controls how long 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	Manually setting the value.
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 Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.

Table 237: 855GME (XTX) - advanced PCI configuration - setting options

BIOS setting	Meaning	Setting options	Effect
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 Plug & Play guidelines.
		5, 6, 7, 8, 9, 10, 11, 12	Manual configuration of the IRQ.
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 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 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 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 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 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 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). **Note:** **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). **Note:** **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 237: 855GME (XTX) - advanced PCI configuration - setting options (cont.)

Graphics configuration



```
                              BIOS SETUP UTILITY
          Advanced
 Graphics Configuration                                     Enable or disable
                                                            the internal
 Graphics Engine 1                 [Enabled]                graphics device
   Default Flat Panel              [Auto-EDID]
   Graphics Driver EDID Support    [Disabled]
   Flat Panel Scaling              [Stretched]

 Graphics Engine 2                 [Enabled]

 Primary Graphics Engine           [Graphics Engine 1]
 Boot Graphics Device              [Auto]
 Graphics Memory Size              [Enabled, 8MB]
 Init. Graphic Adapter Priority    [PCI/Int-VGA]            ←→     Select Screen
 Graphics Aperture Size            [ 64MB]                  ↑↓     Select Item
 DVI HotPlug Persistence           [Enabled]                +-     Change Option
                                                            F1     General Help
                                                            F10    Save and Exit
                                                            ESC    Exit

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```

Figure 229: 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

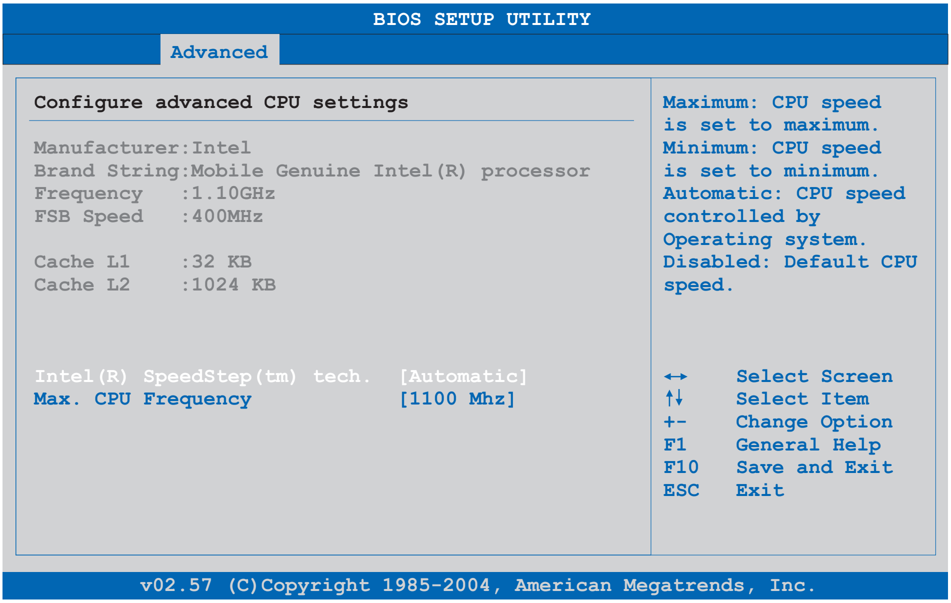
		Customized EDID 1	Graphics card reads the EDID 1 data.
		Customized EDID 2	Graphics card reads the EDID 2 data.
		Customized EDID 3	Graphics card reads the EDID 3 data.
Graphics driver EDID support	If this function is enabled, the following operating system graphics driver can read EDID data on its own. When disabled, the VGA data is taken over by BIOS.	Enabled	Enables this function.
		Disabled	Disables this function.

Table 238: 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. Controller reserved.
		Enabled, 4MB	4 MB main memory is reserved for the onboard video controller. Controller reserved.
		Enabled, 8MB	8 MB main memory is reserved for the onboard video controller. Controller reserved.
		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. **Note:** **The size with the best performance is the same size as the application memory.**	64MB, 128MB, 256MB	Manually setting the value.
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 238: 855GME (XTX) - advanced graphics configuration - setting options (cont.)

CPU configuration



```
                        BIOS SETUP UTILITY
            Advanced
 Configure advanced CPU settings              Maximum: CPU speed
                                              is set to maximum.
 Manufacturer:Intel                           Minimum: CPU speed
 Brand String:Mobile Genuine Intel(R) processor is set to minimum.
 Frequency    :1.10GHz                        Automatic: CPU speed
 FSB Speed    :400MHz                         controlled by
                                              Operating system.
 Cache L1     :32 KB                          Disabled: Default CPU
 Cache L2     :1024 KB                        speed.



 Intel(R) SpeedStep(tm) tech.  [Automatic]    ↔     Select Screen
 Max. CPU Frequency            [1100 Mhz]     ↑↓    Select Item
                                              +-    Change Option
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit

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```
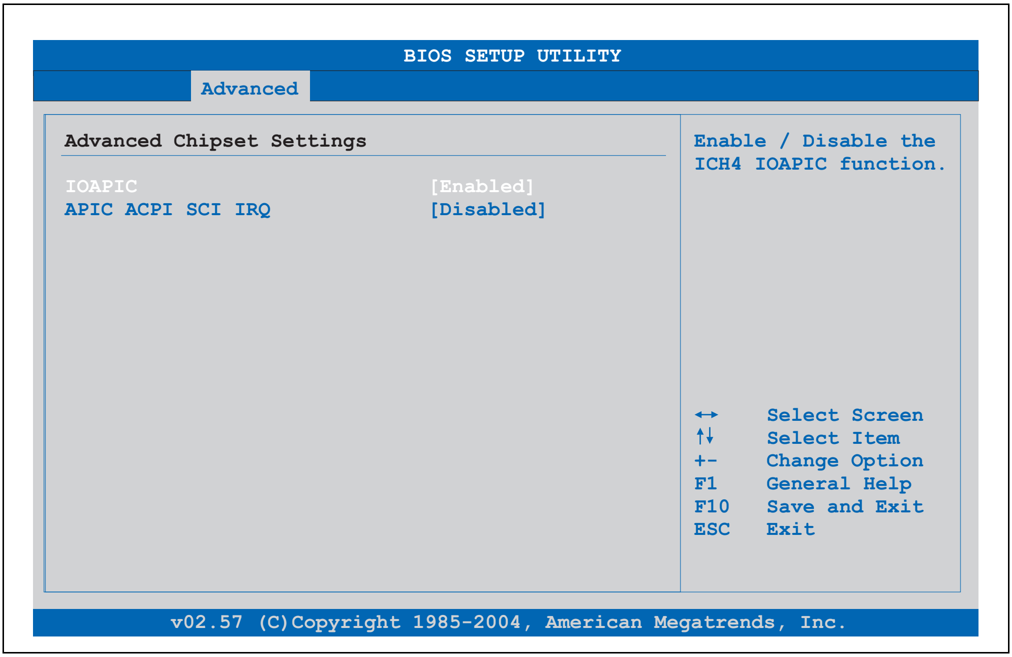

Figure 230: 855GME (XTX) - advanced CPU configuration

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	Display of first level cache memory area.	None	-
L2 cache	Display of 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. **Note:** **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;	Manually setting the value.

Table 239: 855GME (XTX) - advanced CPU configuration - setting options

Chipset configuration



BIOS SETUP UTILITY

Advanced

Advanced Chipset Settings

```
IOAPIC                        [Enabled]
APIC ACPI SCI IRQ             [Disabled]
```

Enable / Disable the ICH4 IOAPIC function.

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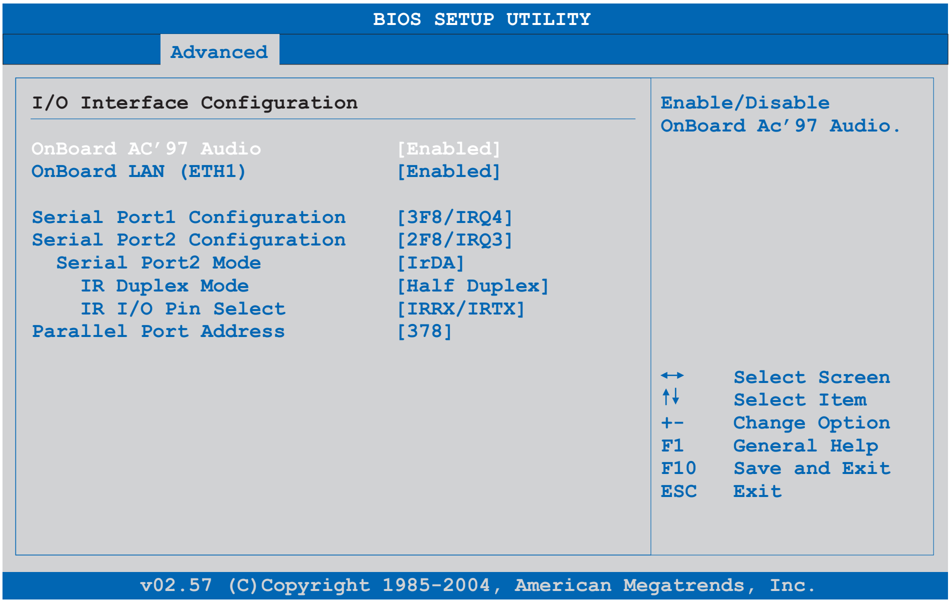
Figure 231: 855GME (XTX) - advanced chipset configuration

BIOS setting	Meaning	Setting options	Effect
IOAPIC	This option is used to activate or deactivate the APIC (Advanced Programmable Interrupt Controller). **Note:** **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). **Note:** **The IRQ resources available to the system are expanded when the APIC mode is enabled.**	Disabled	Deactivates this function.
		Enabled	Activates this function.

Table 240: 855GME (XTX) - advanced chipset - setting options

I/O interface configuration



```
                     BIOS SETUP UTILITY
          Advanced
 I/O Interface Configuration              | Enable/Disable
                                          | OnBoard Ac'97 Audio.
 OnBoard AC'97 Audio          [Enabled]   |
 OnBoard LAN (ETH1)           [Enabled]   |
                                          |
 Serial Port1 Configuration   [3F8/IRQ4]  |
 Serial Port2 Configuration   [2F8/IRQ3]  |
   Serial Port2 Mode          [IrDA]      |
     IR Duplex Mode           [Half Duplex]
     IR I/O Pin Select        [IRRX/IRTX] |
 Parallel Port Address        [378]       |
                                          | ↔     Select Screen
                                          | ↑↓    Select Item
                                          | +-    Change Option
                                          | F1    General Help
                                          | F10   Save and Exit
                                          | ESC   Exit

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```

Figure 232: 855GME (XTX) - I/O interface configuration

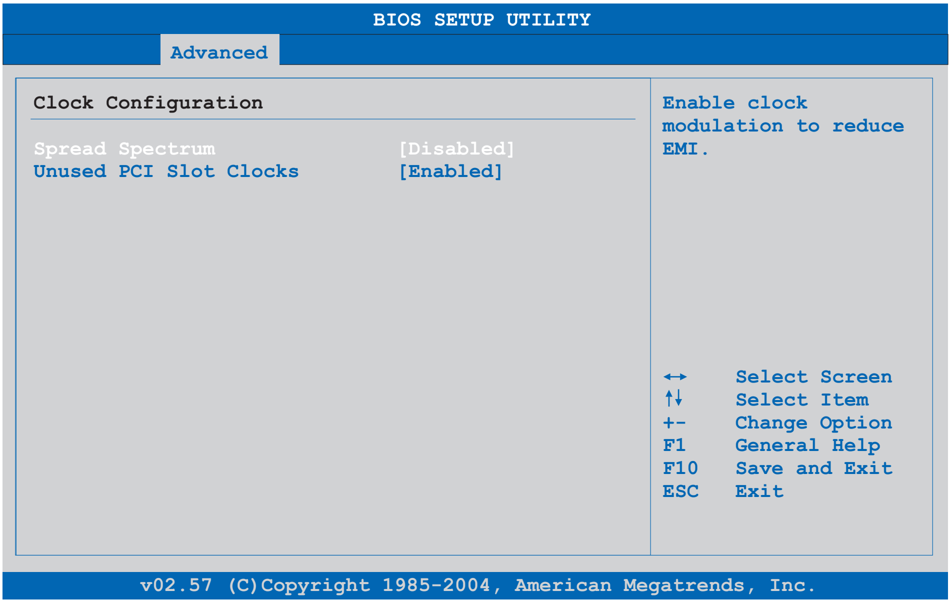
BIOS setting	Meaning	Setting options	Effect
Onboard AC'97 Audio	For turning the Onboard AC97 audio controller on and off.	Enabled	Enables AC'97 sound.
		Disabled	Disables AC'97 sound.
OnBoard LAN (ETH1)	For turning the on-board LAN controller (for ETH1) on and off. .	Disabled	Deactivates the LAN controller or the ETH1 interface. ETH1 interface.
		Enabled	Deactivates the LAN controller or the ETH1 interface. 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 241: 855GME (XTX) - 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. **Note:** **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. **Note:** **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. **Note:** **Address is automatically set, even if the function is disabled.**	Disabled	Deactivates the port.
		378, 278, 3BC	Manual assignment of the port address.

Table 241: 855GME (XTX) - I/O interface configuration - setting options (cont.)

Clock configuration



```
                    BIOS SETUP UTILITY
           Advanced

 Clock Configuration                          Enable clock
                                              modulation to reduce
 Spread Spectrum              [Disabled]      EMI.
 Unused PCI Slot Clocks       [Enabled]



                                              ←→    Select Screen
                                              ↑↓    Select Item
                                              +-    Change Option
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit

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```
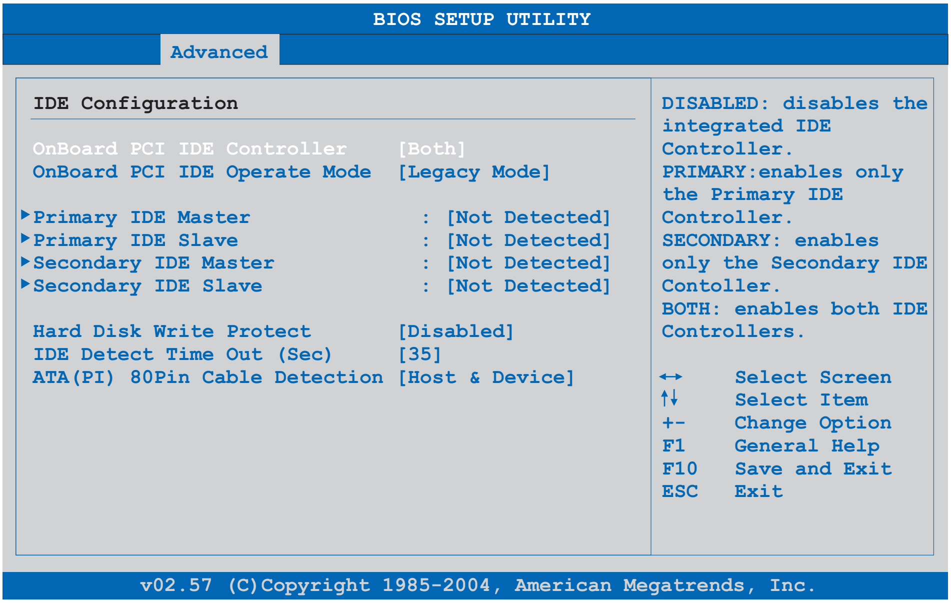

Figure 233: 855GME (XTX) - advanced clock configuration

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 242: 855GME (XTX) - advanced clock configuration - setting options

IDE Configuration



```
                     BIOS SETUP UTILITY
              Advanced
 IDE Configuration                                 DISABLED: disables the
                                                   integrated IDE
 OnBoard PCI IDE Controller   [Both]               Controller.
 OnBoard PCI IDE Operate Mode [Legacy Mode]        PRIMARY:enables only
                                                   the Primary IDE
▶Primary IDE Master             : [Not Detected]   Controller.
▶Primary IDE Slave              : [Not Detected]   SECONDARY: enables
▶Secondary IDE Master           : [Not Detected]   only the Secondary IDE
▶Secondary IDE Slave            : [Not Detected]   Contoller.
                                                   BOTH: enables both IDE
 Hard Disk Write Protect      [Disabled]           Controllers.
 IDE Detect Time Out (Sec)    [35]
 ATA(PI) 80Pin Cable Detection [Host & Device]     ↔      Select Screen
                                                   ↑↓     Select Item
                                                   +-     Change Option
                                                   F1     General Help
                                                   F10    Save and Exit
                                                   ESC    Exit

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```

Figure 234: 855GME (XTX) - advanced IDE configuration

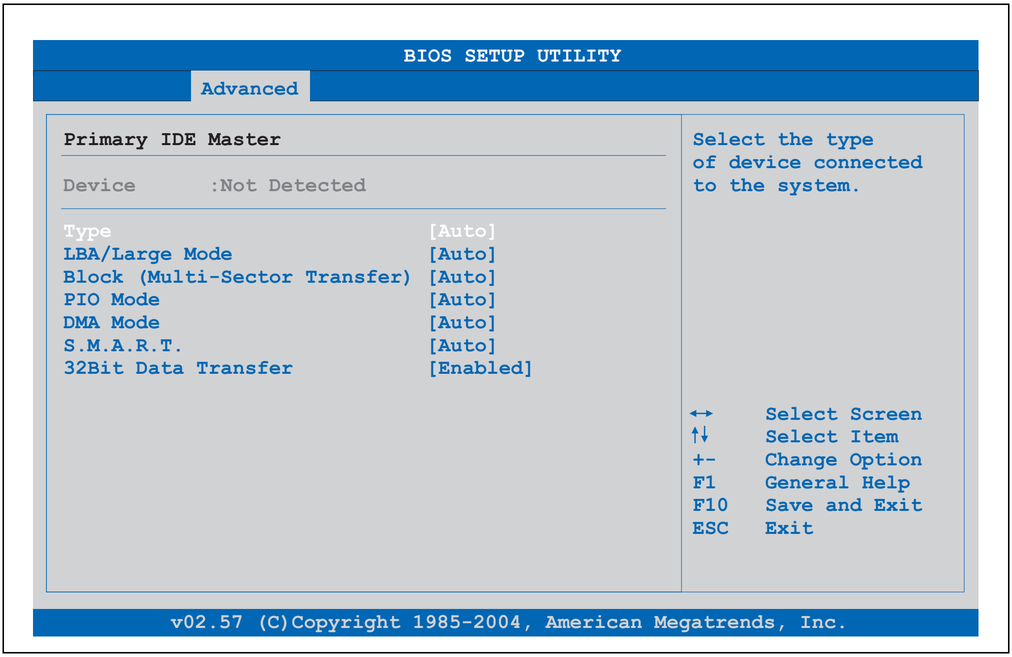
BIOS setting	Meaning	Setting options	Effect
OnBoard PCI IDE controller	Both the IDE controllers found on the board can be configured here.	Disabled	Disables this function.
		Primary	Activates the primary IDE channel.
		Secondary	Activates the secondary IDE channel.
		Both	Activates both IDE channels (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).

Table 243: 855GME (XTX) - advanced IDE configuration - setting options

BIOS setting	Meaning	Setting options	Effect
Primary IDE master	The drive in the system that is connected to the IDE primary master is configured here.	Enter	Opens submenu See "Primary IDE master" on page 421
Primary IDE slave	The drive in the system that is connected to the IDE primary slave port is configured here.	Enter	Opens submenu See "Primary IDE slave" on page 422
Secondary IDE master	The drive in the system that is connected to the IDE secondary master port is configured here.	Enter	Opens submenu See "Secondary IDE master" on page 424
Secondary IDE slave	The drive in the system that is connected to the IDE secondary slave port is configured here.	Enter	Opens submenu See "Secondary IDE slave" on page 425
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	Manually setting the value.
ATA (PI) 80 pin cable detection	Detects whether an 80 pin cable is connected to the drive, the controller or to both. **Note:** **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 243: 855GME (XTX) - advanced IDE configuration - setting options (cont.)

Primary IDE master



```
BIOS SETUP UTILITY
Advanced

Primary IDE Master                                 Select the type
                                                   of device connected
Device        :Not Detected                        to the system.

Type                            [Auto]
LBA/Large Mode                  [Auto]
Block (Multi-Sector Transfer)   [Auto]
PIO Mode                        [Auto]
DMA Mode                        [Auto]
S.M.A.R.T.                      [Auto]
32Bit Data Transfer             [Enabled]

                                                   ↔     Select Screen
                                                   ↑↓    Select Item
                                                   +-    Change Option
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

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```

Figure 235: 855GME (XTX) - primary IDE master

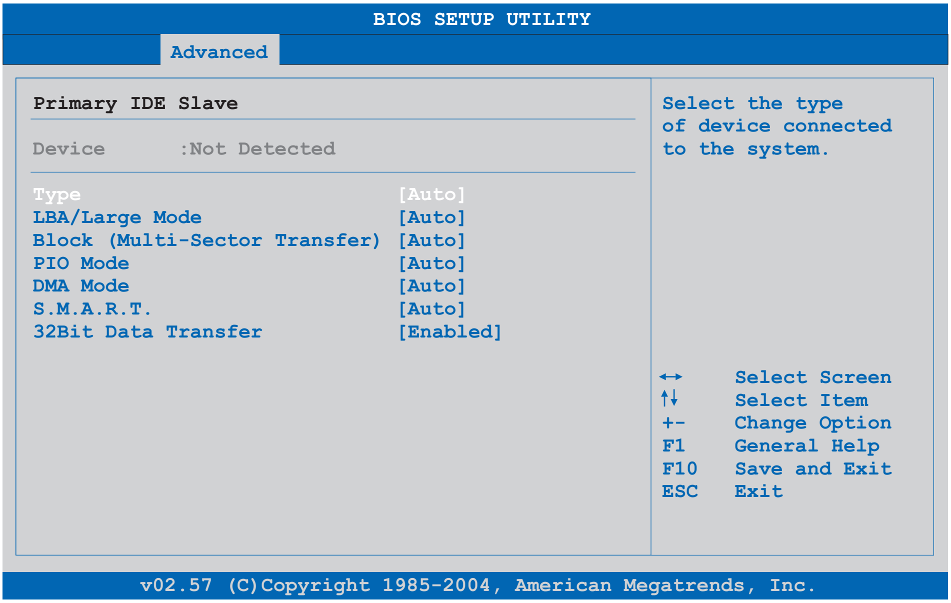
BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the primary master is configured here.	Not installed	No drive installed.
		Auto	Automatic recognition of the drive and setup of appropriate values.
		CD/DVD	CD -/ DVD drive.
		ARMD	ARMD - drive (zip drive)
LBA/Large mode	This option enables 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. **Note:** **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 244: 855GME (XTX) - primary IDE master - setting options

BIOS setting	Meaning	Setting options	Effect
DMA mode	The data transfer rate to and from the primary master drive is defined here. The DMA mode must be enabled 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. Data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 244: 855GME (XTX) - primary IDE master - setting options (cont.)

Primary IDE slave



Primary IDE Slave

Device :Not Detected

Type [Auto]
LBA/Large Mode [Auto]
Block (Multi-Sector Transfer) [Auto]
PIO Mode [Auto]
DMA Mode [Auto]
S.M.A.R.T. [Auto]
32Bit Data Transfer [Enabled]

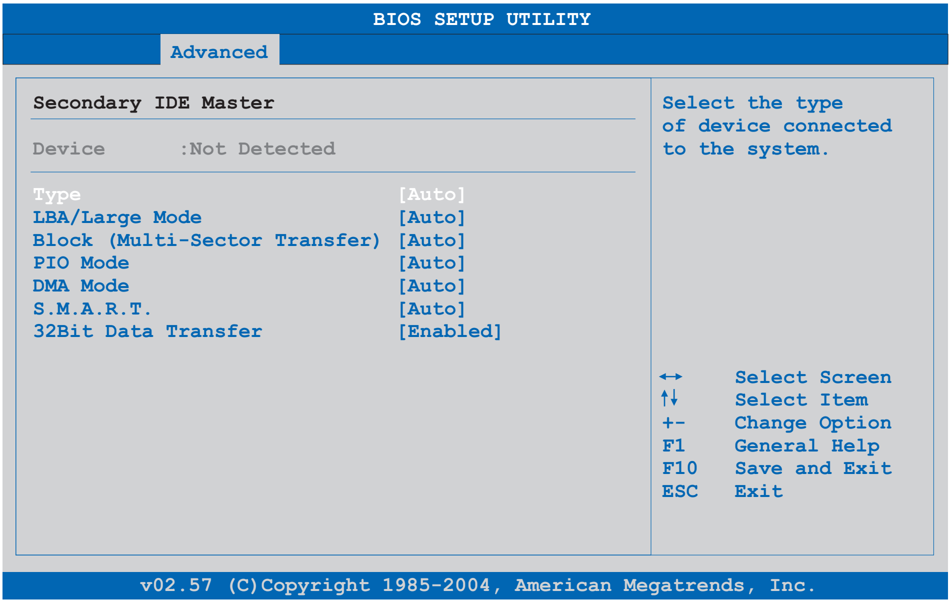
Select the type of device connected to the system.

Figure 236: 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 enables 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. **Note:** **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 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. Data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 245: 855GME (XTX) - primary IDE slave - setting options

Secondary IDE master



Secondary IDE Master

Device :Not Detected

Type [Auto]
LBA/Large Mode [Auto]
Block (Multi-Sector Transfer) [Auto]
PIO Mode [Auto]
DMA Mode [Auto]
S.M.A.R.T. [Auto]
32Bit Data Transfer [Enabled]

Select the type of device connected to the system.

Figure 237: 855GME (XTX) - secondary IDE master

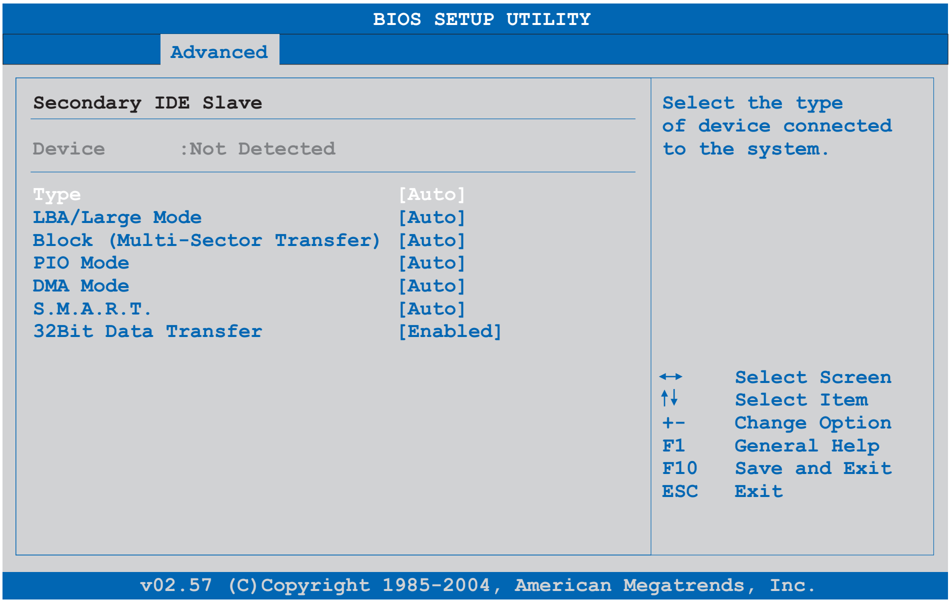
BIOS setting	Meaning	Setting options	Effect
Type	The type of drive connected to the secondary master is configured here.	Not installed	No drive installed.
		Auto	Automatic recognition of the drive and setup of appropriate values.
		CD/DVD	CD -/ DVD drive
		ARMD	ARMD - drive (zip drive)
LBA/Large mode	This option enables 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. **Note:** **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 246: 855GME (XTX) - secondary IDE master - setting options

BIOS setting	Meaning	Setting options	Effect
DMA mode	The data transfer rate to and from the secondary master drive is defined here. The DMA mode must be enabled 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. Data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 246: 855GME (XTX) - secondary IDE master - setting options (cont.)

Secondary IDE slave



```
                    BIOS SETUP UTILITY
            Advanced

 Secondary IDE Slave                           Select the type
                                               of device connected
 Device       :Not Detected                    to the system.

 Type                          [Auto]
 LBA/Large Mode                [Auto]
 Block (Multi-Sector Transfer) [Auto]
 PIO Mode                      [Auto]
 DMA Mode                      [Auto]
 S.M.A.R.T.                    [Auto]
 32Bit Data Transfer           [Enabled]

                                               ↔      Select Screen
                                               ↑↓     Select Item
                                               +-     Change Option
                                               F1     General Help
                                               F10    Save and Exit
                                               ESC    Exit

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```
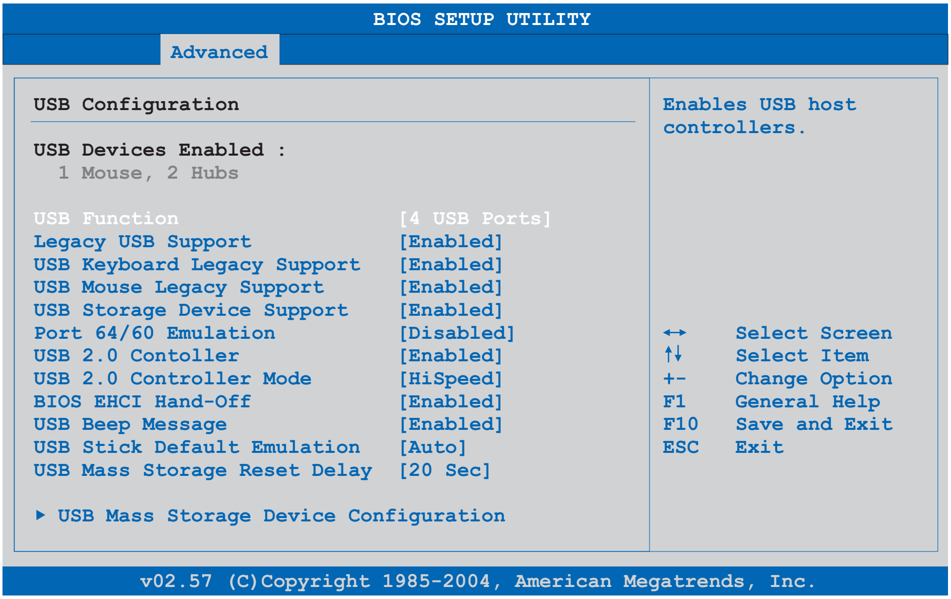

Figure 238: 855GME (XTX) - secondary IDE slave

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 enables 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. **Note:** **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 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. Data transfer.	Disabled	Disables this function.
		Enabled	Enables this function.

Table 247: 855GME (XTX) - secondary IDE slave - setting options

USB configuration



```
                           BIOS SETUP UTILITY
                  Advanced
 USB Configuration                                     Enables USB host
                                                       controllers.
 USB Devices Enabled :
   1 Mouse, 2 Hubs

 USB Function                  [4 USB Ports]
 Legacy USB Support            [Enabled]
 USB Keyboard Legacy Support   [Enabled]
 USB Mouse Legacy Support      [Enabled]
 USB Storage Device Support    [Enabled]
 Port 64/60 Emulation          [Disabled]              ←→    Select Screen
 USB 2.0 Contoller             [Enabled]               ↑↓    Select Item
 USB 2.0 Controller Mode       [HiSpeed]               +-    Change Option
 BIOS EHCI Hand-Off            [Enabled]               F1    General Help
 USB Beep Message              [Enabled]               F10   Save and Exit
 USB Stick Default Emulation   [Auto]                  ESC   Exit
 USB Mass Storage Reset Delay  [20 Sec]

 ▶ USB Mass Storage Device Configuration

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```

Figure 239: 855GME (XTX) - advanced USB configuration

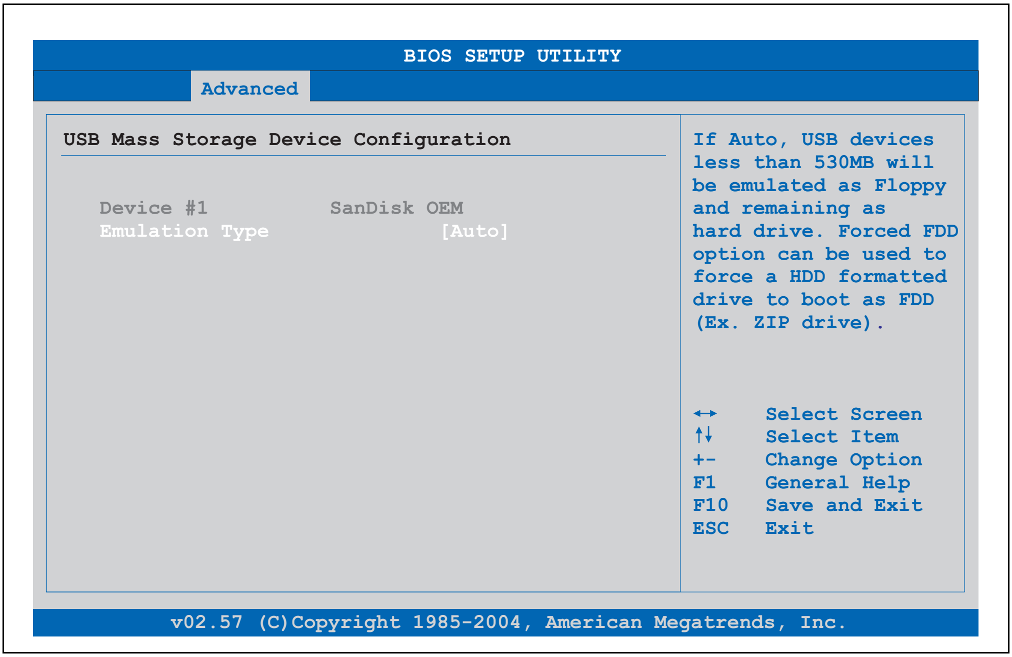
BIOS setting	Meaning	Setting options	Effect
USB function	USB ports can be enabled/disabled here.	Disabled	Disables the USB port.
		2 USB ports, 4 USB ports, 6 USB ports (not supported by APC620 / PPC700).	Manual selection of the USB port.
Legacy USB support	Legacy USB support can be enabled/disabled 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. **Note:** **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.

Table 248: 855GME (XTX) - advanced USB configuration - setting options

BIOS setting	Meaning	Setting options	Effect
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 other 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.
USB mass storage reset delay	The waiting time that the USB device POST requires after the device start command can be set. **Note:** **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	Manually setting the value.
USB mass storage device configuration	This is where the USB mass memory device is configured. **Note:** **Is only visible when the "USB stick default emulation" function is set to AUTO.**	Enter	Opens submenu See "USB mass storage device configuration" on page 429

Table 248: 855GME (XTX) - advanced USB configuration - setting options (cont.)

USB mass storage device configuration



BIOS SETUP UTILITY

Advanced

USB Mass Storage Device Configuration

```
Device #1            SanDisk OEM
Emulation Type                 [Auto]
```

If Auto, USB devices less than 530MB will be emulated as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD (Ex. ZIP drive).

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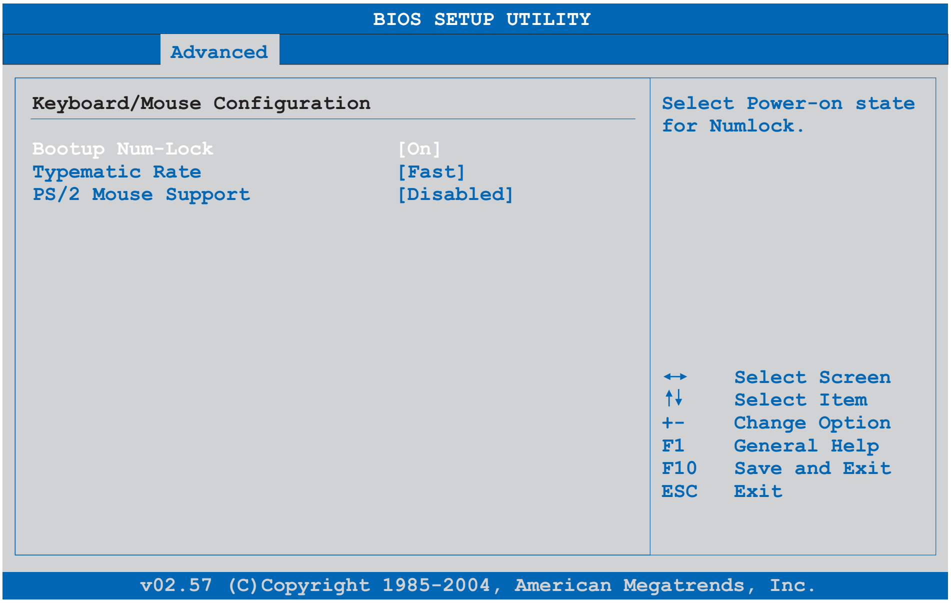
Figure 240: 855GME (XTX) USB mass storage device configuration

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 249: 855GME (XTX) USB mass storage device configuration

Keyboard/mouse configuration



```
                         BIOS SETUP UTILITY
             Advanced
  Keyboard/Mouse Configuration                    Select Power-on state
                                                  for Numlock.
  Bootup Num-Lock               [On]
  Typematic Rate                [Fast]
  PS/2 Mouse Support            [Disabled]




                                                  ←→    Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```
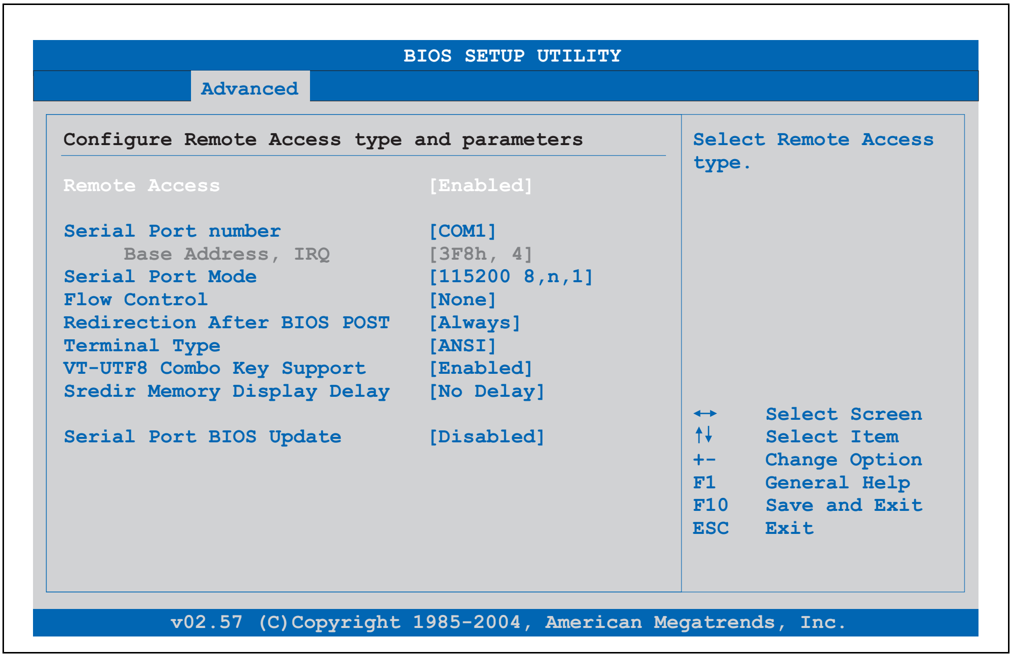

Figure 241: 855GME (XTX) - advanced keyboard/mouse configuration

BIOS setting	Meaning	Setting options	Effect
Bootup Num-lock	This option sets the status of the numeric keypad when the the system is booted.	Off	Only the cursor functions of the numerical keypad are enabled.
		On	Numeric keypad is enabled.
Typematic rate	The key repeat function is set here.	Slow	Slow key repeat.
		Fast	Fast key repeat.
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 250: 855GME (XTX) - advanced keyboard/mouse configuration - setting options

Remote access configuration



```
                         BIOS SETUP UTILITY
          Advanced
 Configure Remote Access type and parameters     Select Remote Access
                                                 type.
 Remote Access                 [Enabled]

 Serial Port number            [COM1]
      Base Address, IRQ        [3F8h, 4]
 Serial Port Mode              [115200 8,n,1]
 Flow Control                  [None]
 Redirection After BIOS POST   [Always]
 Terminal Type                 [ANSI]
 VT-UTF8 Combo Key Support     [Enabled]
 Sredir Memory Display Delay   [No Delay]
                                                 ↔     Select Screen
 Serial Port BIOS Update       [Disabled]        ↑↓    Select Item
                                                 +-    Change Option
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit

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```

Figure 242: 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	-
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	Manually setting the value.
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. **Note:** **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.

Table 251: 855GME (XTX) - advanced remote access configuration - setting options

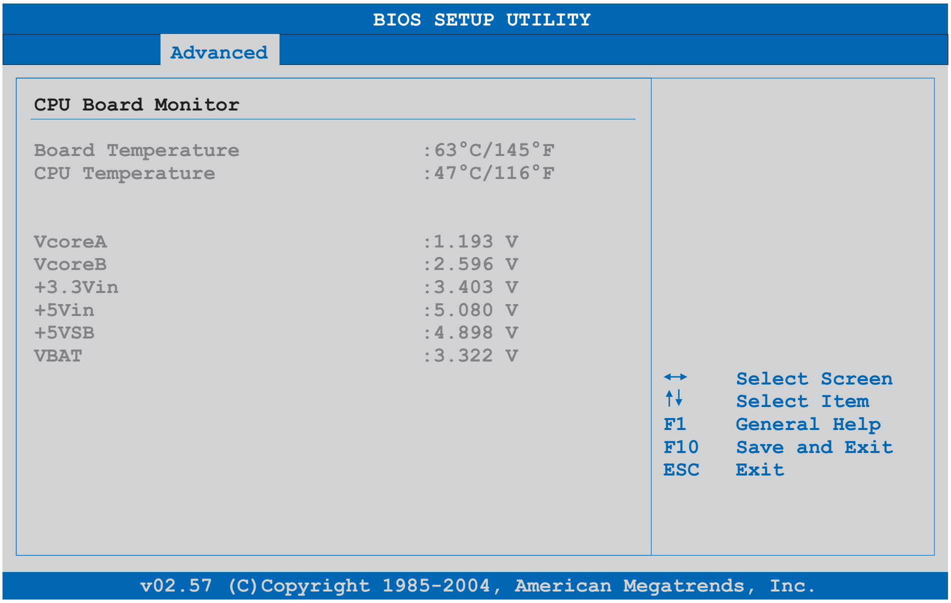
BIOS setting	Meaning	Setting options	Effect
Redirection after BIOS POST	The redirection after start up can be set here, as long as disabled is not entered in the remote access field.	Disabled	The redirection is switched off after start up.
		Boot loader	Redirection is enabled during system start up and 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	Manually setting the value.
Serial port BIOS update	During system start up, the update is loaded via the serial interface in the processor. **Note:** **If this option is disabled, the boot time is reduced.**	Disabled	Disables this function.
		Enabled	Enables this function.

Table 251: 855GME (XTX) - advanced remote access configuration - setting options (cont.)

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.



```
                         BIOS SETUP UTILITY
              Advanced

 CPU Board Monitor

 Board Temperature              :63°C/145°F
 CPU Temperature                :47°C/116°F


 VcoreA                         :1.193 V
 VcoreB                         :2.596 V
 +3.3Vin                        :3.403 V
 +5Vin                          :5.080 V
 +5VSB                          :4.898 V
 VBAT                           :3.322 V
                                                  ↔     Select Screen
                                                  ↑↓    Select Item
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit

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```

Figure 243: 855GME (XTX) - advanced CPU board monitor

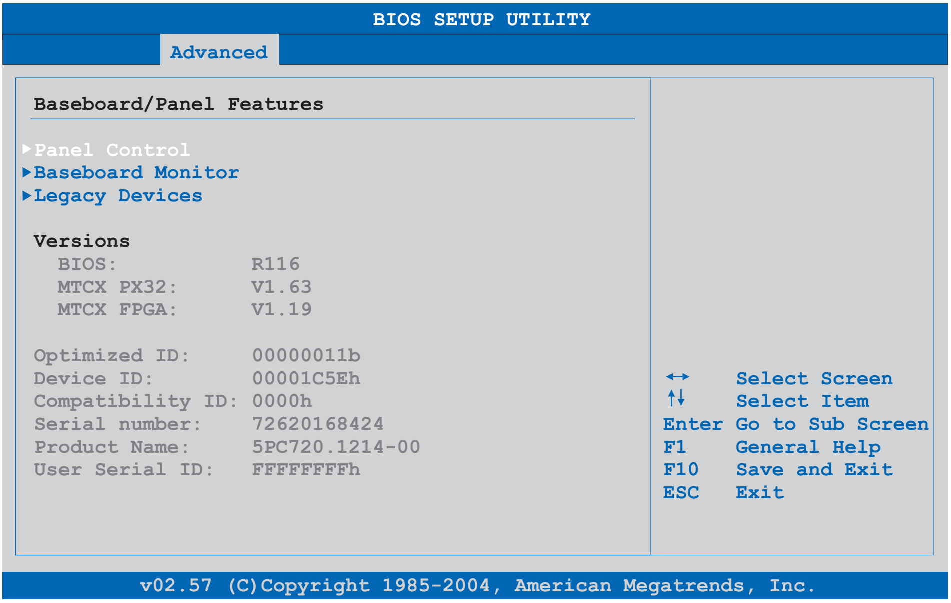
BIOS setting	Meaning	Setting options	Effect
Board temperature	Displays the selected panel's temperature (in degrees Celsius and Fahrenheit).	None	-
CPU temperature	Displays the processor's temperature (in degrees Celsius and Fahrenheit).	None	-
VcoreA	Displays the processor's core voltage (in volts).	None	-
VcoreB	Displays the DDR's core voltage (in volts).	None	-
+3.3Vin	Displays the current voltage of the 3.3 volt supply.	None	-

Table 252: 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 252: 855GME (XTX) - advanced remote access configuration - setting options

Baseboard/panel features



```
                         BIOS SETUP UTILITY
            Advanced

 Baseboard/Panel Features

▶Panel Control
▶Baseboard Monitor
▶Legacy Devices

 Versions
   BIOS:            R116
   MTCX PX32:       V1.63
   MTCX FPGA:       V1.19

 Optimized ID:      00000011b
 Device ID:         00001C5Eh                    ↔      Select Screen
 Compatibility ID:  0000h                        ↑↓     Select Item
 Serial number:     72620168424                  Enter  Go to Sub Screen
 Product Name:      5PC720.1214-00               F1     General Help
 User Serial ID:    FFFFFFFFh                    F10    Save and Exit
                                                 ESC    Exit

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```

Figure 244: 855GME (XTX) - advanced baseboard/panel features

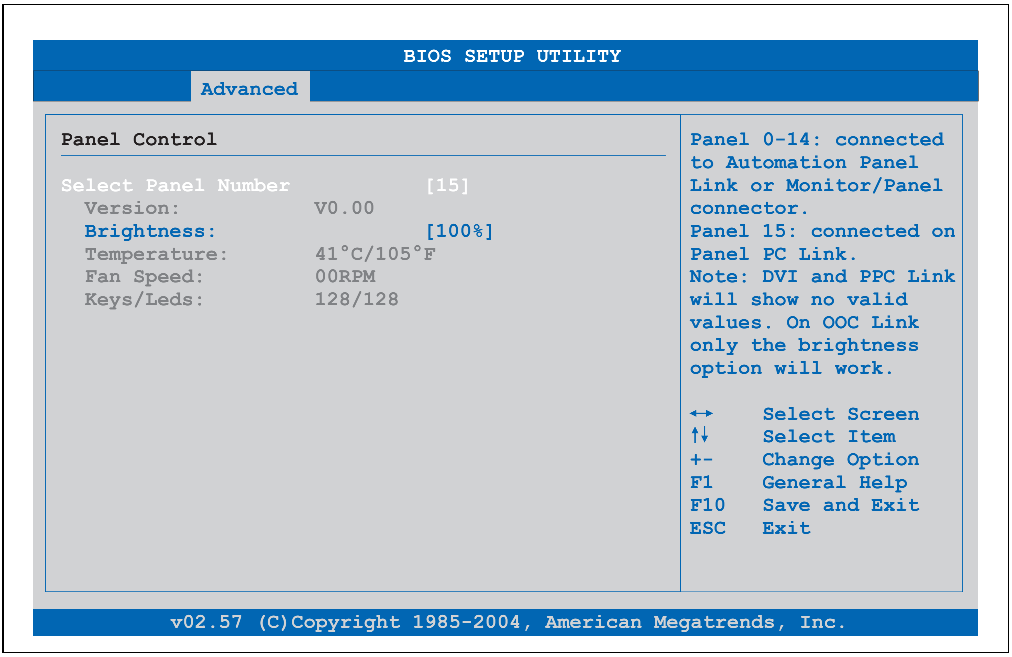
BIOS setting	Meaning	Setting options	Effect
Panel control	Special settings for connected panels (display units) can be made here.	Enter	Opens submenu See "Panel control" on page 435
Baseboard monitor	Displays different temperature values and fan speeds.	Enter	Opens submenu See "Baseboard monitor" on page 436
Legacy devices	Special settings for the interface can be changed here.	Enter	Opens submenu See "Legacy devices" on page 438
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 253: 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 253: 855GME (XTX) - advanced baseboard/panel features - setting options (cont.)

Panel control



```
Panel Control

Select Panel Number            [15]
  Version:           V0.00
  Brightness:                  [100%]
  Temperature:       41°C/105°F
  Fan Speed:         00RPM
  Keys/Leds:         128/128
```

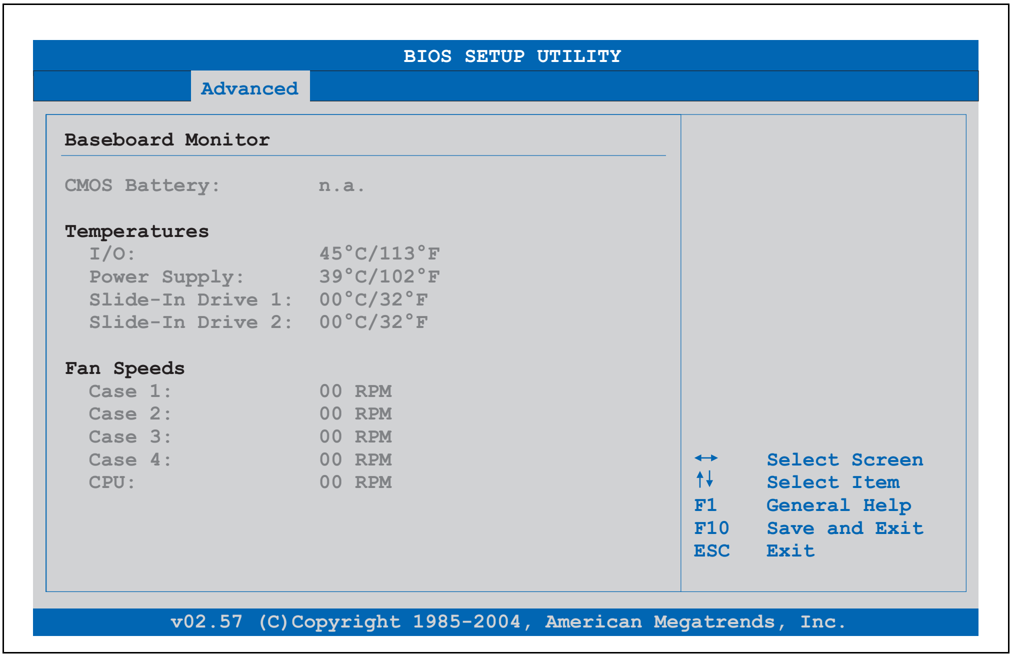
Panel 0-14: connected to Automation Panel Link or Monitor/Panel connector.
Panel 15: connected on Panel PC Link.
Note: DVI and PPC Link will show no valid values. On OOC Link only the brightness option will work.

Figure 245: 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	Display of the firmware version of the SDLR controllers.	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 254: 855GME (XTX) - panel control - setting options

Baseboard monitor



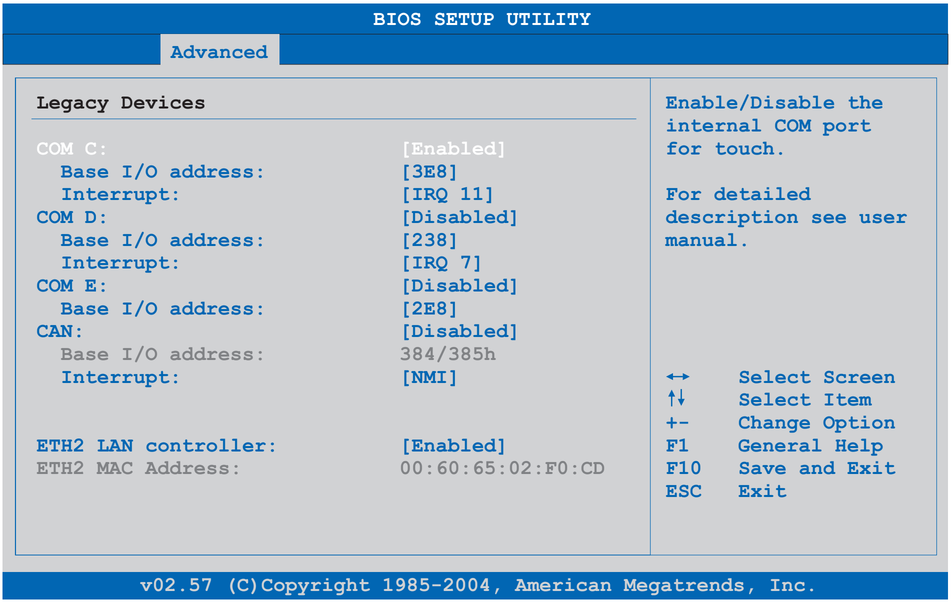
```
Baseboard Monitor

CMOS Battery:          n.a.

Temperatures
  I/O:                 45°C/113°F
  Power Supply:        39°C/102°F
  Slide-In Drive 1:    00°C/32°F
  Slide-In Drive 2:    00°C/32°F

Fan Speeds
  Case 1:              00 RPM
  Case 2:              00 RPM
  Case 3:              00 RPM
  Case 4:              00 RPM
  CPU:                 00 RPM
```

Figure 246: 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 "Baseboard/panel features" on page 434) or the hardware is too old. **Good** - battery ok. **Bad** - battery is damaged.	None	-
I/O	Displays the temperature of 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 5.08 cm 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 255: 855GME (XTX) - baseboard monitor setting options

Legacy devices



```
                         BIOS SETUP UTILITY
              Advanced
  Legacy Devices                                    Enable/Disable the
                                                    internal COM port
  COM C:                        [Enabled]           for touch.
    Base I/O address:           [3E8]
    Interrupt:                  [IRQ 11]            For detailed
  COM D:                        [Disabled]          description see user
    Base I/O address:           [238]               manual.
    Interrupt:                  [IRQ 7]
  COM E:                        [Disabled]
    Base I/O address:           [2E8]
  CAN:                          [Disabled]
    Base I/O address:           384/385h
    Interrupt:                  [NMI]               ↔     Select Screen
                                                    ↑↓    Select Item
                                                    +-    Change Option
  ETH2 LAN controller:          [Enabled]           F1    General Help
  ETH2 MAC Address:             00:60:65:02:F0:CD   F10   Save and Exit
                                                    ESC   Exit

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```

Figure 247: 855GME (XTX) - Legacy devices

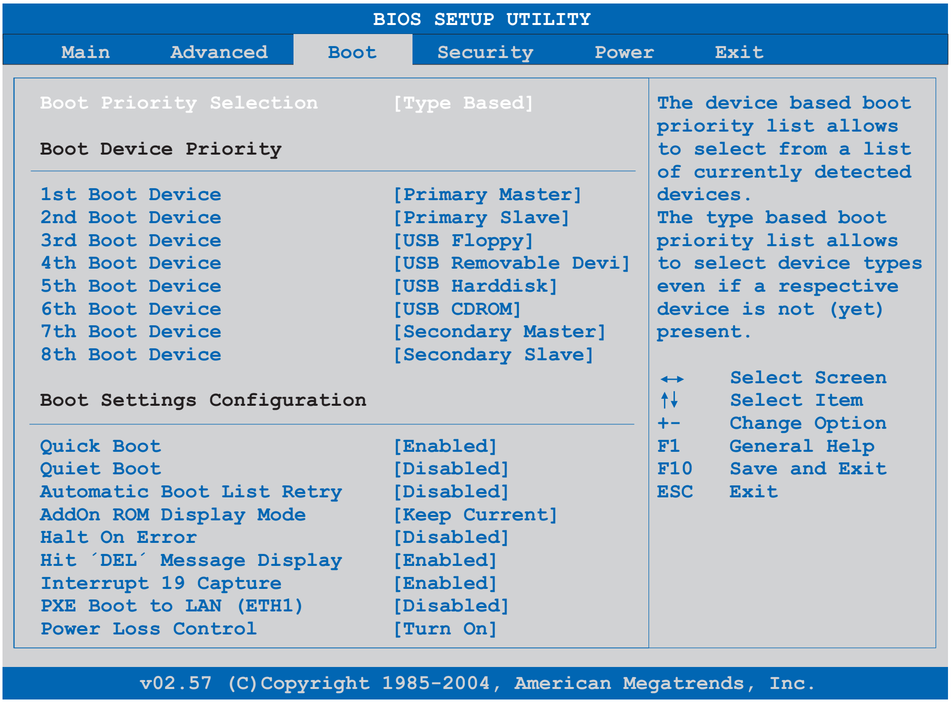
BIOS setting	Meaning	Setting options	Effect
COM C	Settings for the internal serial interfaces in the system. Using this setting, the touch screen on Panel PC 700 systems as well display units in Automation Panel 900 data transfer are activated.	Disabled	Disables the interface.
		Enabled	Enables the interface.
Base I/O address	Selection of the base I/O address for the COM C port. A conflict with another device is marked with a yellow "star".	328, 338, 3E8	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM C port. A conflict with another device is marked with a yellow "star".	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.

Table 256: 855GME (XTX) - Legacy devices - setting options

BIOS setting	Meaning	Setting options	Effect
Base I/O address	Selection of the base I/O address for the COM D port. A conflict with another device is marked with a yellow "star".	238, 328, 338	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM D port. A conflict with another device is marked with a yellow "star".	IRQ 5, IRQ 6, IRQ 7, IRQ 12	Selected interrupt is assigned.
COM E	Configuration of the optional COM E port of a B&R add-on interface option (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 conflict with another device is marked with a yellow "star".	2E8, 328, 338	Selected base I/O address is assigned.
Interrupt	Selection of the interrupt for the COM E port. A conflict with another device is marked with a yellow "star".	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 conflict with another device is marked with a yellow "star".	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 256: 855GME (XTX) - Legacy devices - setting options (cont.)

1.3.6 Boot



```
                         BIOS SETUP UTILITY
    Main     Advanced     Boot     Security     Power     Exit

  Boot Priority Selection      [Type Based]           The device based boot
                                                      priority list allows
  Boot Device Priority                                to select from a list
                                                      of currently detected
  1st Boot Device              [Primary Master]       devices.
  2nd Boot Device              [Primary Slave]        The type based boot
  3rd Boot Device              [USB Floppy]           priority list allows
  4th Boot Device              [USB Removable Devi]   to select device types
  5th Boot Device              [USB Harddisk]         even if a respective
  6th Boot Device              [USB CDROM]            device is not (yet)
  7th Boot Device              [Secondary Master]     present.
  8th Boot Device              [Secondary Slave]
                                                      ↔      Select Screen
  Boot Settings Configuration                         ↑↓     Select Item
                                                      +-     Change Option
  Quick Boot                   [Enabled]              F1     General Help
  Quiet Boot                   [Disabled]             F10    Save and Exit
  Automatic Boot List Retry    [Disabled]             ESC    Exit
  AddOn ROM Display Mode       [Keep Current]
  Halt On Error                [Disabled]
  Hit ´DEL´ Message Display    [Enabled]
  Interrupt 19 Capture         [Enabled]
  PXE Boot to LAN (ETH1)       [Disabled]
  Power Loss Control           [Turn On]

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```

Figure 248: 855GME (XTX) - boot menu

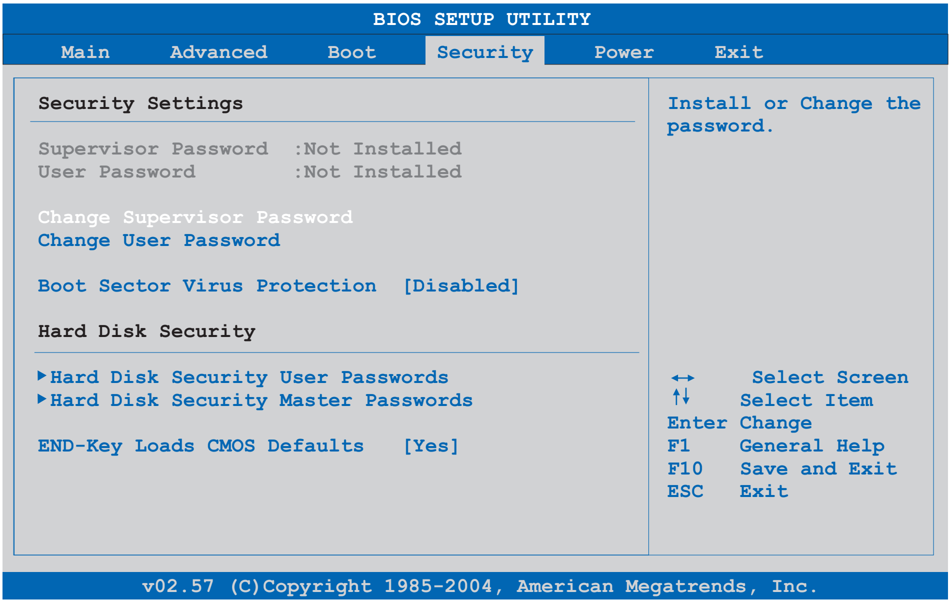
BIOS setting	Meaning	Setting options	Effect
Boot priority selection	The priority for when the drives should be booted can be set here.	Device based	Selection from a list of determined equipment.
		Type based	Allows the selection of unavailable equipment.
1st boot device	The boot drive can be set using 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 257: 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.
AddOn 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.
Hold on errors	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. **Note:** **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 257: 855GME (XTX) Boot menu - setting options (cont.)

1.3.7 Security



```
                         BIOS SETUP UTILITY
   Main     Advanced     Boot     Security     Power     Exit

 Security Settings                          Install or Change the
                                            password.
 Supervisor Password  :Not Installed
 User Password        :Not Installed

 Change Supervisor Password
 Change User Password

 Boot Sector Virus Protection  [Disabled]

 Hard Disk Security

▶Hard Disk Security User Passwords          ↔      Select Screen
▶Hard Disk Security Master Passwords        ↑↓     Select Item
                                            Enter  Change
 END-Key Loads CMOS Defaults    [Yes]       F1     General Help
                                            F10    Save and Exit
                                            ESC    Exit

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```

Figure 249: 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. **Note:** **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 submenu See "Hard disk security user password" on page 443

Table 258: 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 submenu See "Hard disk security master password" on page 444
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 258: 855GME (XTX) - security menu - setting options (cont.)

Hard disk security user password

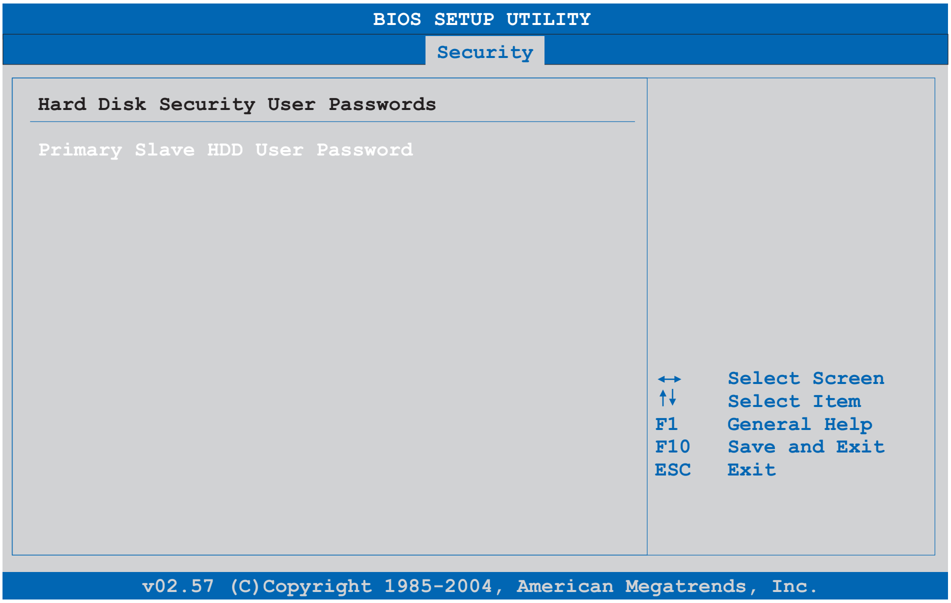
BIOS SETUP UTILITY
Security
Hard Disk Security User Passwords
Primary Slave HDD User Password
↔ Select Screen
↑↓ Select Item
F1 General Help
F10 Save and Exit
ESC Exit
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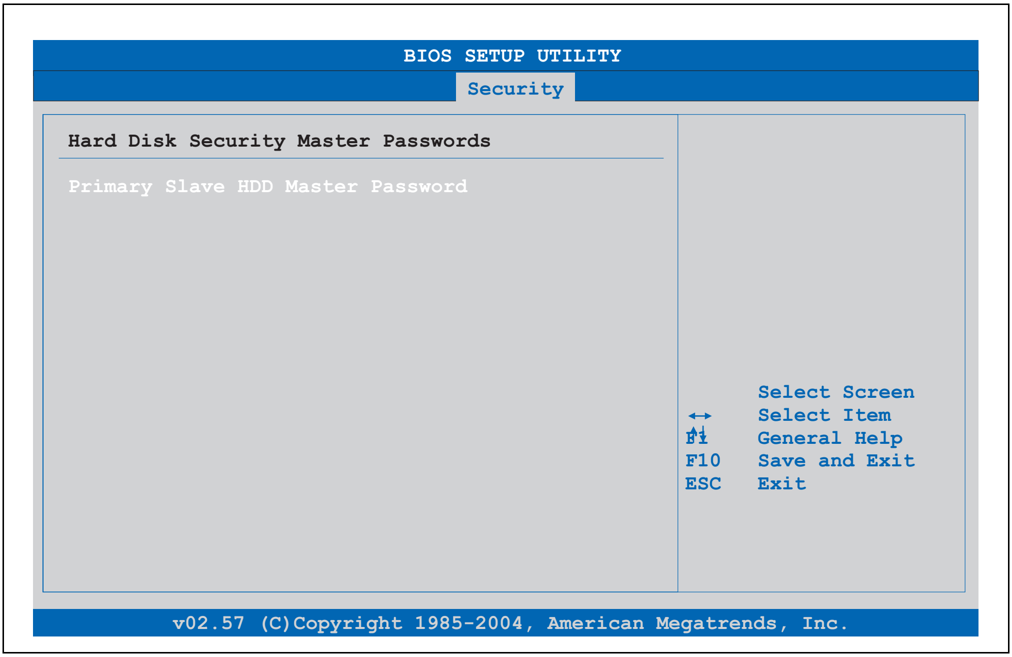
Figure 250: 855GME (XTX) Hard disk security user password

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 259: 855GME (XTX) Hard disk security user password

Hard disk security master password



Hard Disk Security Master Passwords

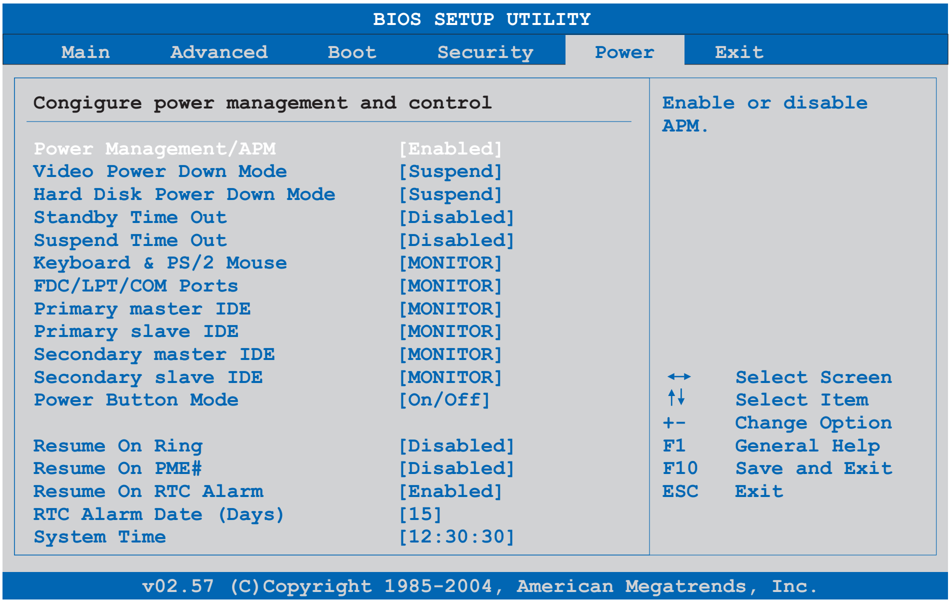
Primary Slave HDD Master Password

Figure 251: 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 260: 855GME (XTX) Hard disk security master password

1.3.8 Power



```
                          BIOS SETUP UTILITY
    Main     Advanced     Boot     Security     Power     Exit

 Congigure power management and control        Enable or disable
                                               APM.
 Power Management/APM          [Enabled]
 Video Power Down Mode         [Suspend]
 Hard Disk Power Down Mode     [Suspend]
 Standby Time Out              [Disabled]
 Suspend Time Out              [Disabled]
 Keyboard & PS/2 Mouse         [MONITOR]
 FDC/LPT/COM Ports             [MONITOR]
 Primary master IDE            [MONITOR]
 Primary slave IDE             [MONITOR]
 Secondary master IDE          [MONITOR]
 Secondary slave IDE           [MONITOR]       ↔      Select Screen
 Power Button Mode             [On/Off]        ↑↓     Select Item
                                               +-     Change Option
 Resume On Ring                [Disabled]      F1     General Help
 Resume On PME#                [Disabled]      F10    Save and Exit
 Resume On RTC Alarm           [Enabled]       ESC    Exit
 RTC Alarm Date (Days)         [15]
 System Time                   [12:30:30]

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```

Figure 252: 855GME (XTX) - power menu

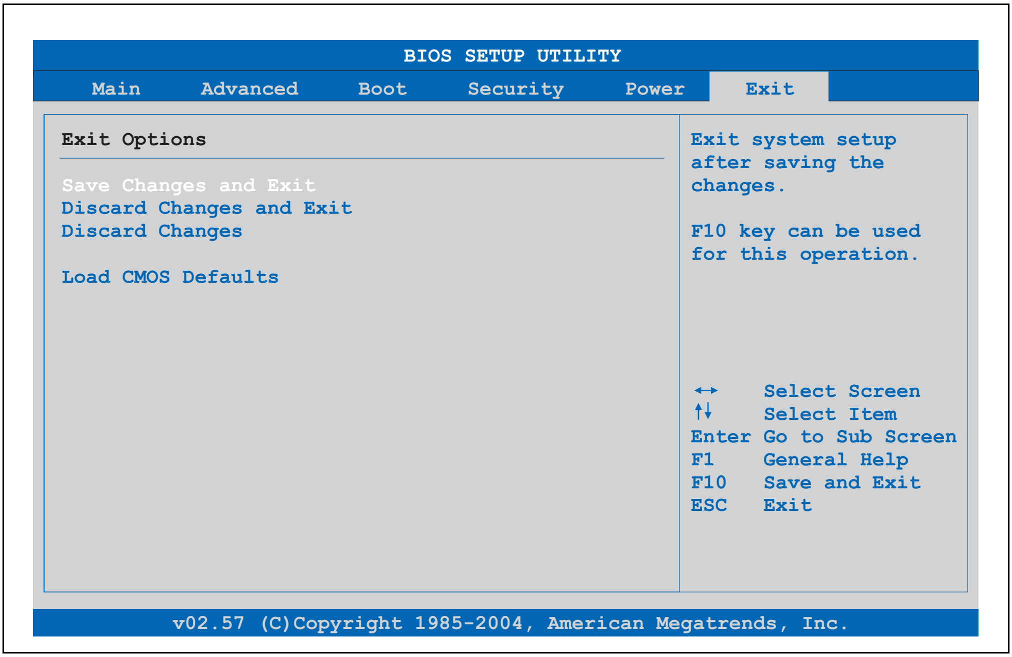
BIOS setting	Meaning	Setting options	Effect
Power management/APM	This option switches the APM function on or off. This is an advanced plug & play and power management functionality.	Disabled	Disables this function.
		Enabled	Enables this function.
Video power down mode	This option allows you to set the 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;	Manually setting the value.
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;	Manually setting the value.

Table 261: 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. **Note:** **Setting with "+"/"-".**	Every day	System starts daily.
		01-31	System start takes place on the manually set date.
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 261: 855GME (XTX) power menu - setting options (cont.)

1.3.9 Exit



BIOS SETUP UTILITY

Exit Options

Save Changes and Exit
Discard Changes and Exit
Discard Changes

Load CMOS Defaults

Exit system setup after saving the changes.

F10 key can be used for this operation.

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Figure 253: 855GME (XTX) - Exit menu

BIOS setting	Meaning	Setting options	Effect
Save changes and exit	This item closes BIOS setup. Changes made are saved in CMOS after confirmation, and the system is rebooted.	OK / cancel	
Discard changes and exit	This item closes BIOS setup. without saving the changes made. The system is then rebooted.	OK / cancel	
Discard changes	If it is not known which changes have been made, these can be restored as long as they have not been saved.	OK / cancel	
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 262: 855GME (XTX) Exit menu - setting options

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.

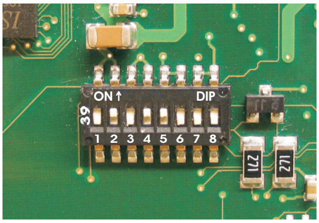


Figure 254: DIP switch on system unit

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 263: 855GME (XTX) - profile overview

1) Reserved

The following pages provide an overview of the BIOS default settings for the different DIP switch configurations. Yellow highlighted settings are variations in 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 264: 855GME (XTX) - main - profile setting 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 265: 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 266: 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 267: 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 268: 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 269: 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 270: 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 271: 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 272: 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 272: 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 273: 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
Bootup Num-lock	On	On	On	On	On	
Typematic rate	Fast	Fast	Fast	Fast	Fast	
PS/2 mouse support	Disabled	**Enabled**	Disabled	Disabled	Disabled	

Table 274: 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 275: 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 276: 855GME (XTX) - CPU board monitor - profile setting overview

Baseboard/panel features

Baseboard/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	-	-	-	-	-	
Baseboard monitor						
CMOS battery	-	-	-	-	-	
I/O	-	-	-	-	-	
Power supply	-	-	-	-	-	
Slide-in drive 1	-	-	-	-	-	
Slide-in drive 2	-	-	-	-	-	
Case 1	-	-	-	-	-	
Case 2	-	-	-	-	-	

Table 277: 855GME (XTX) - baseboard/panel features -profile setting overview

Baseboard 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 277: 855GME (XTX) - baseboard/panel features -profile setting 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	
AddOn ROM display mode	Keep current	Keep current	Keep current	Keep current	Keep current	
Hold on errors	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 278: 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 279: 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 280: 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 281: BIOS post code messages BIOS 815E (ETX) and 855GME (ETX)

1.4.2 BIOS 855GME (XTX)

Beeping code	Meaning	Necessary user action
1 x short	Memory refresh failed.	Load BIOS defaults. In the event that the error persists, send industrial PC to B&R for testing.
2 x 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.
3 x short	Base 64 KB memory failure: Basic memory defect, RAM error within the initial 64 KB.	Send industrial PC to B&R for checking.
4 x short	Timer not operational: System timer.	Send industrial PC to B&R for checking.
5 x short	Processor error: Processor defect.	Send industrial PC to B&R for checking.
6 x 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.
7 x short	Processor exception interrupt error: Virtual mode exception error (CPU generated an interrupt error.	Send industrial PC to B&R for checking.
8 x 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.
9 x 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 282: BIOS post code messages BIOS 855GME (XTX)

Beeping code	Meaning	Necessary user action
10 x short	CMOS shutdown register read/write error: CMOS cannot be read/written.	Send industrial PC to B&R for checking.
11 x short	Cache Error / external Cache bad: L2 - Cache on the mainboard is defected.	Send industrial PC to B&R for checking.

Table 282: BIOS post code messages BIOS 855GME (XTX) (cont.)

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 283: 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 284: 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 285: 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 286: 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 287: IRQ interrupt assignments in APIC mode

Chapter 4
Software

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.

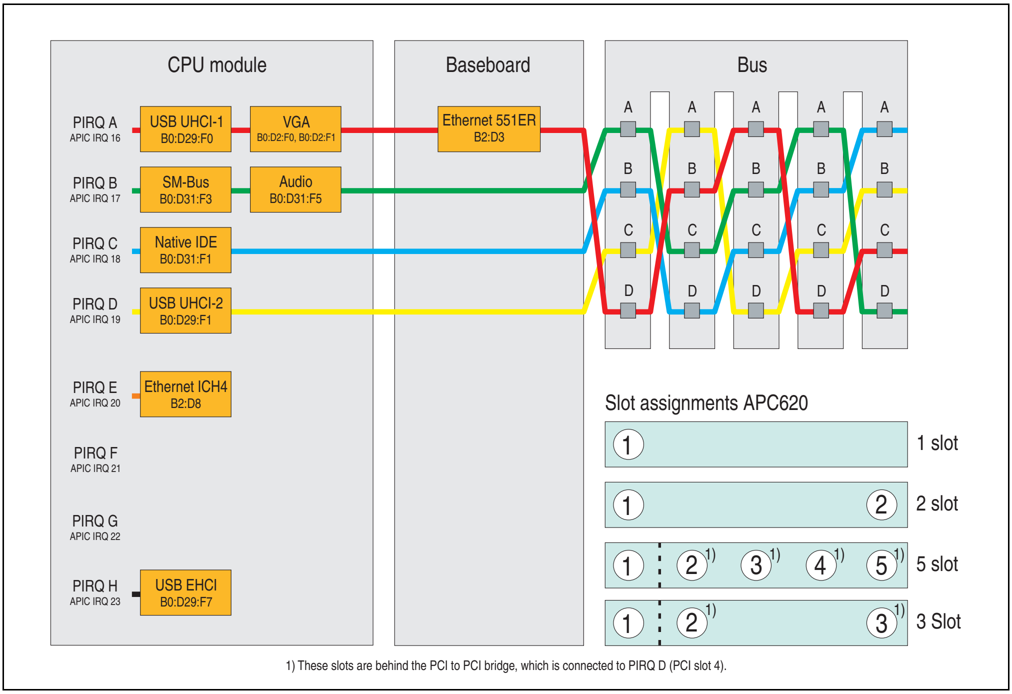
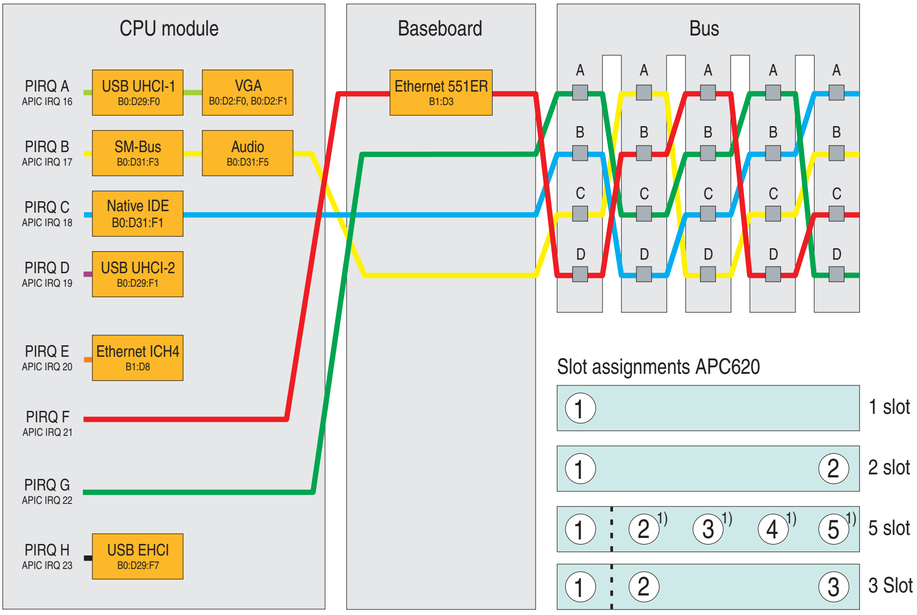


Figure 255: PCI routing with activated APIC CPU boards 815E (ETX), 855GME (ETX)



1) These slots are behind the PCI to PCI bridge, which is connected to PIRQ D (PCI slot 4).

Figure 256: PCI routing with activated APIC CPU boards 855GME (XTX)

1.5.6 Inter-IC (I²C) bus

I²C address	Resource	Comment
A0h	EEPROM	EEPROM for CMOS data - cannot be used
B0h	Reserved	Cannot be used
58h	Reserved	Cannot be used

Table 288: Inter-IC (I²C) bus resources

1.5.7 System Management (SM) bus

SM Bus address	SM device	Comment
12h	SMART_CHARGER	
14h	SMART_SELECTOR	
16h	SMART_BATTERY	
D2h	Clock Generator	

Table 289: Inter-IC (I²C) bus resources

1.6 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 290: CPU board software versions

Automation Panel Link	Transceiver (5DLSDL.1000-01)	Receiver (5DLSDL.1000-00)
SDLR version	< V0.03	< V0.03

Table 291: Automation panel link software versions

1.6.1 Requirements

The following peripheral devices are needed for a software upgrade:

- USB floppy drive or USB flash drive
- 1.44 MB HDD diskette(s) (max. 3 diskettes)
- PS/2 or USB keyboard
- B&R upgrade software (www.br-automation.com)

1.6.2 What information do I need?

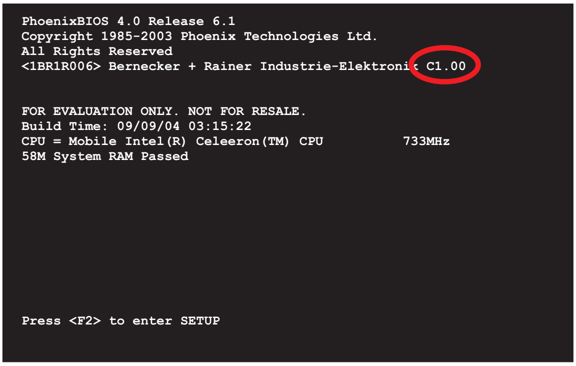
Information:

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".



```
PhoenixBIOS 4.0 Release 6.1
Copyright 1985-2003 Phoenix Technologies Ltd.
All Rights Reserved
<1BR1R006> Bernecker + Rainer Industrie-Elektronik C1.00


FOR EVALUATION ONLY. NOT FOR RESALE.
Build Time: 09/09/04 03:15:22
CPU = Mobile Intel(R) Celeeron(TM) CPU          733MHz
58M System RAM Passed









Press <F2> to enter SETUP
```

Figure 257: Differentiating between 815E and 855GME CPU boards

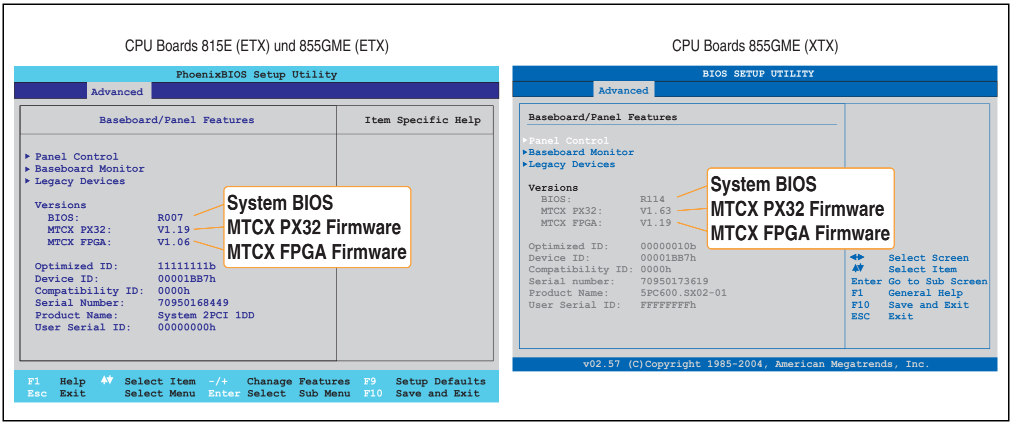
Letter	CPU board	Model number
B	855GME (ETX)	5PC600.E855-00 5PC600.E855-01 5PC600.E855-02 5PC600.E855-03 5PC600.E855-04 5PC600.E855-05
C	815E (ETX)	5PC600.E815-00 5PC600.E815-02 5PC600.E815-03
E	855GME (XTX)	5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04 5PC600.X855-05

Table 292: 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):



CPU Boards 815E (ETX) und 855GME (ETX)

```
                 PhoenixBIOS Setup Utility
        Advanced

        Baseboard/Panel Features                Item Specific Help

 ▸ Panel Control
 ▸ Baseboard Monitor
 ▸ Legacy Devices

   Versions
     BIOS:              R007
     MTCX PX32:         V1.19
     MTCX FPGA:         V1.06

   Optimized ID:        11111111b
   Device ID:           00001BB7h
   Compatibility ID:    0000h
   Serial Number:       70950168449
   Product Name:        System 2PCI 1DD
   User Serial ID:      00000000h

 F1   Help  ↑↓  Select Item  -/+   Chanage Features  F9   Setup Defaults
 Esc  Exit      Select Menu  Enter Select  Sub Menu  F10  Save and Exit
```

CPU Boards 855GME (XTX)

```
                          BIOS SETUP UTILITY
           Advanced

 Baseboard/Panel Features

▸Panel Control
▸Baseboard Monitor
▸Legacy Devices

 Versions
   BIOS:              R114
   MTCX PX32:         V1.63
   MTCX FPGA:         V1.19

 Optimized ID:        00000010b
 Device ID:           00001BB7h
 Compatibility ID:    0000h                       ←→     Select Screen
 Serial number:       70950173619                 ↑↓     Select Item
 Product Name:        5PC600.SX02-01              Enter  Go to Sub Screen
 User Serial ID:      FFFFFFFFh                   F1     General Help
                                                  F10    Save and Exit
                                                  ESC    Exit

        v02.57 (C)Copyright 1985-2004, American Megatrends, Inc.
```

Figure 258: Software versions

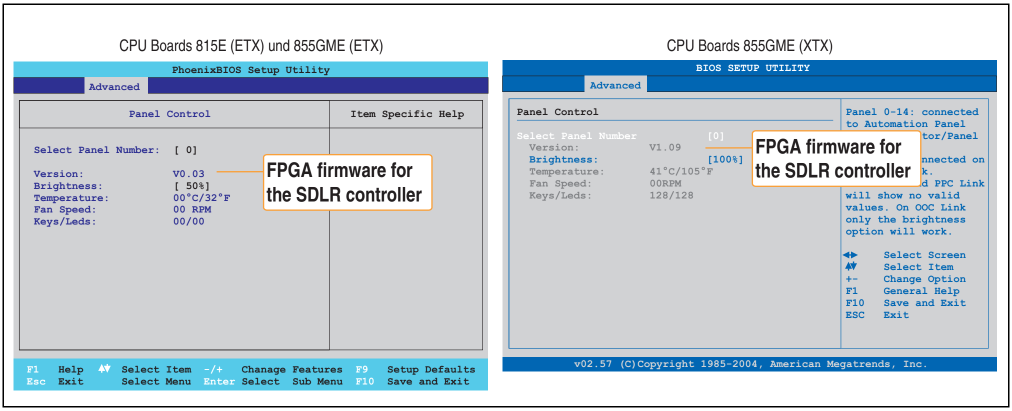
Which firmware is installed on the Automation Panel Link transceiver/receiver?

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.



CPU Boards 815E (ETX) und 855GME (ETX)

```
PhoenixBIOS Setup Utility
Advanced
Panel Control                                  Item Specific Help

Select Panel Number:   [ 0]

Version:               V0.03
Brightness:            [ 50%]
Temperature:           00°C/32°F
Fan Speed:             00 RPM
Keys/Leds:             00/00

F1   Help  ↑↓ Select Item  -/+   Chanage Features  F9   Setup Defaults
Esc  Exit     Select Menu  Enter Select   Sub Menu  F10  Save and Exit
```

CPU Boards 855GME (XTX)

```
BIOS SETUP UTILITY
Advanced
Panel Control                               Panel 0-14: connected
                                            to Automation Panel
Select Panel Number          [0]                        tor/Panel
  Version:            V1.09
  Brightness:                [100%]                     nnected on
  Temperature:        41°C/105°F                        k.
  Fan Speed:          00RPM                             d PPC Link
  Keys/Leds:          128/128               will show no valid
                                            values. On OOC Link
                                            only the brightness
                                            option will work.

                                            ←→    Select Screen
                                            ↑↓    Select Item
                                            +-    Change Option
                                            F1    General Help
                                            F10   Save and Exit
                                            ESC   Exit

v02.57 (C)Copyright 1985-2004, American Megatrends, Inc.
```

FPGA firmware for the SDLR controller
FPGA firmware for the SDLR controller

Figure 259: Firmware version of Automation Panel Link SDL transceiver/receiver

1.6.3 Upgrade BIOS for 815E (ETX)

- Download and unzip the zip file from the B&R homepage.
- Copy the files to an MS-DOS startup disk (information about creating a bootable disk can be found in section 1.7.3 "Creating a DOS boot diskette in Windows XP" on page 478).
- Place the diskette in the USB floppy drive and reboot the PPC700.
- The following boot menu will be shown after startup:

```
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:
Return 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.

1.6.4 Upgrade BIOS for 855GME (ETX)

- Download and unzip the zip file from the B&R homepage.
- Copy the files to a MS-DOS startup disk or USB stick (see the section 1.7.3 "Creating a DOS boot diskette in Windows XP" on page 478 for information about creating a bootable disk or section "Creating a bootable USB flash drive" on page 569 about creating a bootable USB Memory stick).
- Insert the diskette in the USB floppy drive or the USB stick in the USB port and reboot the PPC700.
- The following boot menu will be shown after startup:

```
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:
Return 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).

1.6.5 Upgrade BIOS for 855GME (XTX)

- Download and unzip the zip file from the B&R homepage.
- Copy the files to a MS-DOS startup disk or USB stick (see the section 1.7.3 "Creating a DOS boot diskette in Windows XP" on page 478 for information about creating a bootable disk or section "Creating a bootable USB flash drive" on page 569 about creating a bootable USB Memory stick).
- Insert the diskette in the USB floppy drive or the USB stick in the USB port and reboot the PPC700.
- The following boot menu will be shown after startup:

```
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:
Return 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".

1.6.6 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.

1.7 Upgrading 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.

1.7.1 Procedure

- Download and unzip the zip file from the B&R homepage.
- Copy the files to a MS-DOS startup disk (see the section 1.7.3 "Creating a DOS boot diskette in Windows XP" on page 478 for information about creating a bootable disk or section "Creating a bootable USB flash drive" on page 569 about creating a bootable USB Memory stick).
- Insert the diskette in the USB floppy drive or the USB stick in the USB port and reboot the PPC700.
- The boot menu is shown after startup

Information:

- **The following boot menu options including descriptions are based on version 1.25 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 SDR (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:
A submenu is opened for upgrading the SDLR controller on the Monitor/Panel plug.

3.1. Upgrade SDLR on AP 0 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 0.

3.2 Upgrade SDLR on AP 1 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 1.

3.3 Upgrade SDLR on AP 2 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 2.

3.4 Upgrade SDLR on AP 3 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 3.

3.5. Upgrade all SDLR (AP800/AP900)
All SDLR controllers are automatically updated on all Automation Panels on the Monitor/Panel.
(by default, after 5 seconds).

3.6. Return to main menu
Returns to the main menu.

Concerning point 4:
A submenu is opened for upgrading the SDLR controller on the AP Link slot.

4.1. Upgrade SDLR on AP 8 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 8.

4.2. Upgrade SDLR on AP 9 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 9.

4.3 Upgrade SDLR on AP 10 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 10.

4.4 Upgrade SDLR on AP 11 (AP800/AP900)
The SDLR controller is automatically updated on Automation Panel 11.

4.5 Upgrade all SDLR (AP800/AP900)
All SDLR controllers are automatically updated on all Automation Panels on the AP Link slot (by default, after 5 seconds).

4.6 Return to main menu
Returns to the main menu.

Concerning point 5:
The submenu for the add-on UPS firmware and upgrade and the battery settings upgrade is opened - this is irrelevant for PPC700 systems.

Concerning point 6:
Return to the shell (MS-DOS).

Information:

The system must be powered off and on again after a successful controller upgrade.

1.7.2 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).

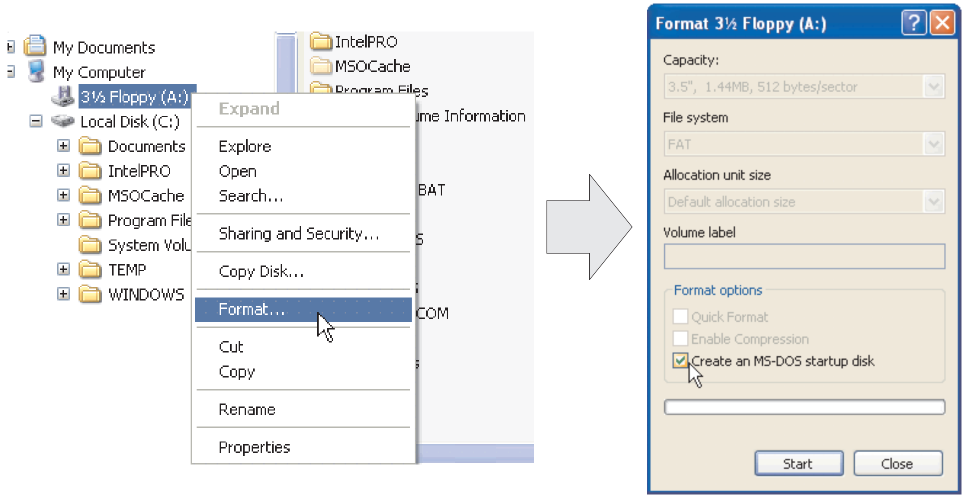
13. If a UPS (e.g.5AC600.UPSI-00) + battery unit (e.g. 5AC600.UPSB-00) is connected to the system and operable, then after an upgrade of the MTCX or SDLT you must either disconnect the battery or push the Power button (to put the system in Standby mode), before executing the required power off/on. If 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).

1.7.3 Creating a DOS boot diskette in Windows XP

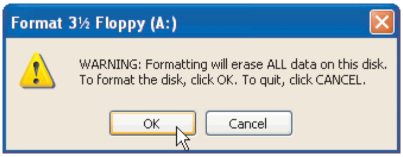
- Place an empty 1.44MB HDD diskette in the disk drive.
- Open Windows Explorer.
- Right-click on the 3½" floppy icon and select **"Format..."**.



Capacity: 3.5", 1.44MB, 512 bytes/sector
File system: FAT
Allocation unit size: Default allocation size
Volume label:
Format options
☐ Quick Format
☐ Enable Compression
☑ Create an MS-DOS startup disk

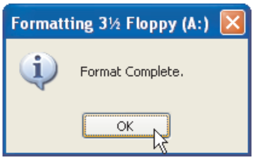
Figure 260: Creating a bootable diskette in Windows XP - step 1

- Then select the checkbox **"Create an MS-DOS startup disk"**, press **"Start"** and acknowledge the warning message with "OK".



WARNING: Formatting will erase ALL data on this disk.
To format the disk, click OK. To quit, click CANCEL.

Figure 261: Creating a bootable diskette in Windows XP - step 2



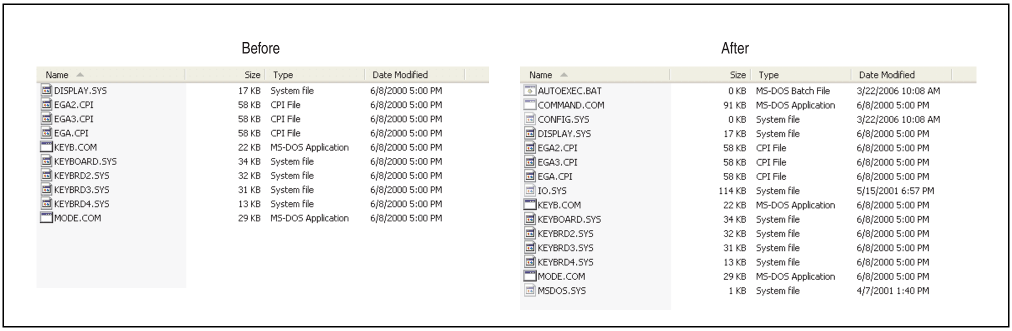
Format Complete.

Figure 262: 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 as default) and deactivate the option "show hidden files and folders".



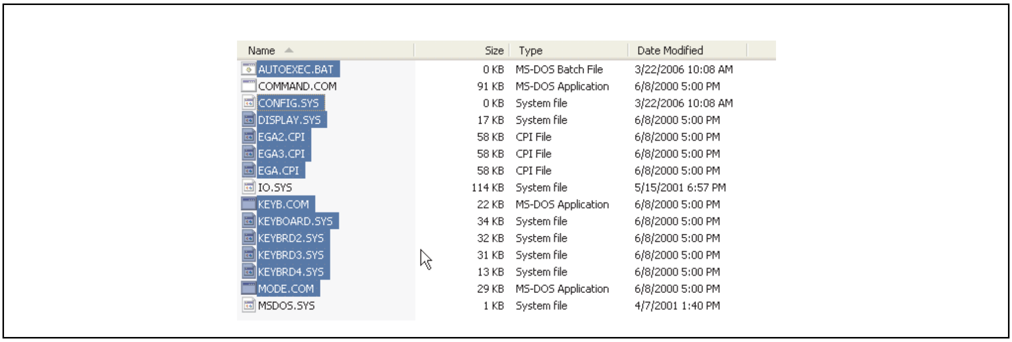
Before

Name	Size	Type	Date Modified
DISPLAY.SYS	17 KB	System file	6/8/2000 5:00 PM
EGA2.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA3.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA.CPI	58 KB	CPI File	6/8/2000 5:00 PM
KEYB.COM	22 KB	MS-DOS Application	6/8/2000 5:00 PM
KEYBOARD.SYS	34 KB	System file	6/8/2000 5:00 PM
KEYBRD2.SYS	32 KB	System file	6/8/2000 5:00 PM
KEYBRD3.SYS	31 KB	System file	6/8/2000 5:00 PM
KEYBRD4.SYS	13 KB	System file	6/8/2000 5:00 PM
MODE.COM	29 KB	MS-DOS Application	6/8/2000 5:00 PM

After

Name	Size	Type	Date Modified
AUTOEXEC.BAT	0 KB	MS-DOS Batch File	3/22/2006 10:08 AM
COMMAND.COM	91 KB	MS-DOS Application	6/8/2000 5:00 PM
CONFIG.SYS	0 KB	System file	3/22/2006 10:08 AM
DISPLAY.SYS	17 KB	System file	6/8/2000 5:00 PM
EGA2.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA3.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA.CPI	58 KB	CPI File	6/8/2000 5:00 PM
IO.SYS	114 KB	System file	5/15/2001 6:57 PM
KEYB.COM	22 KB	MS-DOS Application	6/8/2000 5:00 PM
KEYBOARD.SYS	34 KB	System file	6/8/2000 5:00 PM
KEYBRD2.SYS	32 KB	System file	6/8/2000 5:00 PM
KEYBRD3.SYS	31 KB	System file	6/8/2000 5:00 PM
KEYBRD4.SYS	13 KB	System file	6/8/2000 5:00 PM
MODE.COM	29 KB	MS-DOS Application	6/8/2000 5:00 PM
MSDOS.SYS	1 KB	System file	4/7/2001 1:40 PM

Figure 263: Creating a bootable diskette in Windows XP - step 4



Name	Size	Type	Date Modified
AUTOEXEC.BAT	0 KB	MS-DOS Batch File	3/22/2006 10:08 AM
COMMAND.COM	91 KB	MS-DOS Application	6/8/2000 5:00 PM
CONFIG.SYS	0 KB	System file	3/22/2006 10:08 AM
DISPLAY.SYS	17 KB	System file	6/8/2000 5:00 PM
EGA2.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA3.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA.CPI	58 KB	CPI File	6/8/2000 5:00 PM
IO.SYS	114 KB	System file	5/15/2001 6:57 PM
KEYB.COM	22 KB	MS-DOS Application	6/8/2000 5:00 PM
KEYBOARD.SYS	34 KB	System file	6/8/2000 5:00 PM
KEYBRD2.SYS	32 KB	System file	6/8/2000 5:00 PM
KEYBRD3.SYS	31 KB	System file	6/8/2000 5:00 PM
KEYBRD4.SYS	13 KB	System file	6/8/2000 5:00 PM
MODE.COM	29 KB	MS-DOS Application	6/8/2000 5:00 PM
MSDOS.SYS	1 KB	System file	4/7/2001 1:40 PM

Figure 264: 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. Panel PC 700 with Windows XP Professional

Figure 265: Windows XP Professional Logo

Model number	Short description	Comment
9S0000.08-010	**OEM Microsoft Windows XP Professional German** CD, German; Only delivered with a new PC.	
9S0000.08-020	**OEM Microsoft Windows XP Professional English** CD, English; Only delivered with a new PC.	
9S0000.09-090	**OEM Microsoft Windows XP Professional Multilanguage** CDs; Only delivered with a new PC.	
5SWWXP.0600-GER	**WinXP Professional with SP3, GER** OEM Windows XP Professional including Service Pack 3, CD, German, only supplied together with a new PC.	
5SWWXP.0600-ENG	**WinXP Professional with SP3, ENG** OEM Windows XP Professional including Service Pack 3, CD, English, only supplied together with a new PC.	
5SWWXP.0600-MUL	**WinXP Professional with SP3, MUL** OEM Windows XP Professional including Service Pack 3, CD, Multi-language, only supplied together with a new PC.	

Table 293: Model numbers - Windows XP Professional

2.1 Installation

Generally, the required Windows XP Professional version is already pre-installed by B&R 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.

2.2 Drivers

The latest drivers for all released operating systems can be found in the download area (Service - Product 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.

3. Panel PC 700 with Windows XP Embedded

Figure 266: Windows XP Embedded Logo

Model number	Short description	Comment
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.	Cancelled 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.	Cancelled 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.	Cancelled 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.	Cancelled since 10/2007 Replacement type 5SWWXP.0415-ENG
5SWWXP.0415-ENG	**WinXPe FP2007 PPC700 E855GME** Order Microsoft Windows XP embedded English, Feature Pack 2007, for PPC700 with CPU boards 5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, 5PC600.E855-05; CompactFlash separately (at least 512 MB). Only delivered with a new PC.	
5SWWXP.0416-ENG	**WinXPe FP2007 PPC700 X855GME** Order Microsoft Windows XP embedded English, Feature Pack 2007, 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 512 MB). Only delivered with a new PC.	

Table 294: Model numbers - Windows XP Embedded

3.1 General information

Windows XP embedded is the most modular version of the Windows XP Professional desktop operating system and makes it possible to quickly develop reliable and advanced embedded devices. 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.

3.2 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 295: Device functions in Windows XP embedded with FP2007

3.3 Installation

Windows XP embedded is usually preinstalled at B&R Austria on a suitable CompactFlash card (at least 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**).

3.4 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**).

4. Panel PC 700 with Windows CE

Microsoft®
Windows® CE™

Model number	Short description	Comment
5SWWCE.0515-ENG	**WinCE5.0 Pro PPC700 E855GME** Order Microsoft 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; CompactFlash separately (at least 128 MB).	
5SWWCE.0516-ENG	**WinCE5.0 Pro PPC700 X855GME** Order Microsoft 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** Order Microsoft 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; CompactFlash separately (at least 128 MB).	
5SWWCE.0616-ENG	**WinCE5.0 ProPlus PPC700 X855GME** Order Microsoft 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).	

Table 296: Model numbers - Windows CE

4.1 General information

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.

4.1.1 Advantages

- Internet Explorer 6.0 for Windows® CE - standard components
- Fonts for attractive text display
- TCP/IP for network and Internet communication
- Remote Desktop Protocol (RDP) for thin clients
- ActiveSync for synchronization with the PC
- Windows® Media Player application

- Compact Framework V1.0 Service Pack 2
- Network utilities
- VBScript 6.0
- JScript 6.0
- Viewers for Excel, Word, images, PDFs, PowerPoint (only in Windows CE 5.0 ProPlus)
- Windows CE is also less expensive than other Windows licenses.

4.2 Properties in connection with PPC700 devices

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 for PPC700
Supported screen resolutions	VGA, SVGA, XGA
Color depth	16 bit or 65536 colors
Graphics card driver	Intel® embedded graphics driver
Main memory	Automatic detection and use of up to 512 MB
Boot time / Startup time	Approx. 39 seconds 1)
Included web browser	Internet Explorer 6 for Windows CE
.NET	Compact Framework V2.0
Image size	Approx. 29 MByte 2) (not compressed)
Custom keys	Supported
PVI	Supported

Table 297: Properties for Windows CE 5.0 and PPC700

1) Measured with a 32 MByte SanDisk 5CFCRD.0032-02, 2 partitions, no USB mass memory inserted, all servers disabled, BIOS options Summary Screen=Disabled, Extended Memory Testing=None and Dark Boot=Enabled, both network cards connected with one network and enabled, USB keyboard and USB mouse plugged-in.

2) Use the function "Compress Windows CE Image" in the B&R eMbedded OS Installer to reduce the image size.

4.3 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)

4.4 Installation

Windows CE is usually preinstalled at B&R Austria.

4.4.1 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 for free 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.

4.5 Known problems

- USB 2.0 (EHCI) fails sporadically.
- The SNTP service isn't working.
- USB mouse not detected on USB port 2.
- RDP device change notification only works during the first RDP connection.
- If the display is rotated 90°, the TAB control navigation buttons disappear.
- The image viewer can't display CMYK JPEG files.

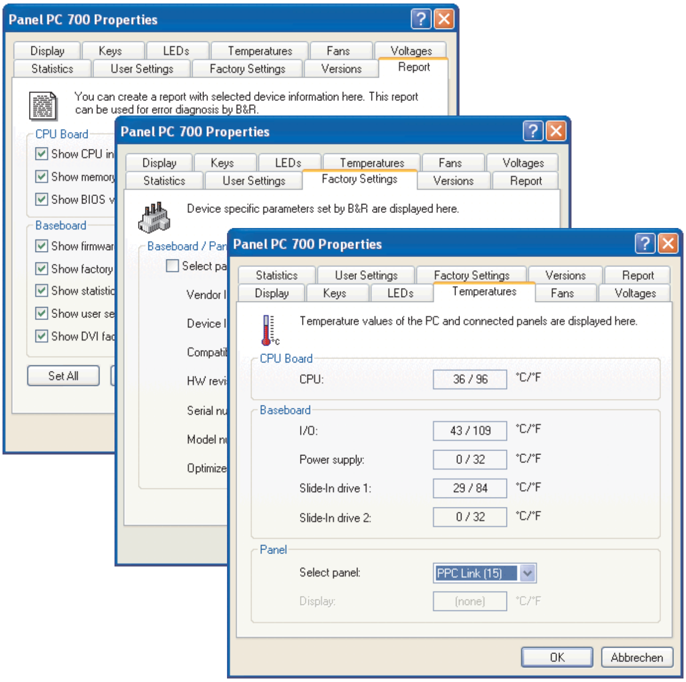
5. Panel PC 700 with Automation Runtime

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.

6. B&R Automation Device Interface (ADI) driver - Control Center

The ADI (Automation Device Interface) driver 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.



You can create a report with selected device information here. This report can be used for error diagnosis by B&R.

☑ Show CPU in
☑ Show memory
☑ Show BIOS v
☑ Show firmwar
☑ Show factory
☑ Show statistic
☑ Show user se
☑ Show DVI fac

Device specific parameters set by B&R are displayed here.

☐ Select pa

Temperature values of the PC and connected panels are displayed here.

CPU: 36 / 96 °C/°F

I/O: 43 / 109 °C/°F

Power supply: 0 / 32 °C/°F

Slide-In drive 1: 29 / 84 °C/°F

Slide-In drive 2: 0 / 32 °C/°F

Select panel: PPC Link (15)

Display: (none) °C/°F

Figure 267: ADI Control Center screenshots (Version 1.50) - example

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. Features (device dependent).

Features (device dependent)

- Adjusting the display brightness of connected Panels
- Reading of device-specific keys
- Activation of device specific LEDs on a foil keypad
- Reading temperatures, fan speeds, and statistical data
- 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
- Change the user serial ID.

Supports following systems:

A detailed description of the Control Center can be found in the integrated online help.

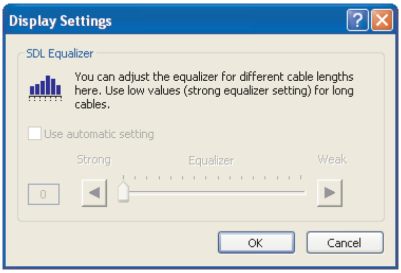
system	Operating system	Comment
Automation PC 620	Windows XP Professional	Installation using its own setup
	Windows XP embedded	Content of B&R Windows XP embedded image
	Windows CE	Content of B&R Windows CE image
Automation PC 810	Windows XP Professional	Installation using its own setup
	Windows XP embedded	Content of B&R Windows XP embedded image
Panel PC 700	Windows XP Professional	Installation using its own setup
	Windows XP embedded	Content of B&R Windows XP embedded image
	Windows CE	Content of B&R Windows CE image
Power Panel 100 BIOS devices	Windows XP embedded	Content of B&R Windows XP embedded image
	Windows CE 4.x, 5.0	Content of B&R Windows CE image
Power Panel 300 BIOS devices	Windows XP embedded	Content of B&R Windows XP embedded image
	Windows CE 4.x, 5.0	Content of B&R Windows CE image
	Windows CE 6.0	Content of B&R Windows CE image
Mobile Panel BIOS devices	Windows XP embedded	Content of B&R Windows XP embedded image
	Windows CE 4.x	Content of B&R Windows CE image
Automation Panel 900	-	Together with Automation PC 620 / Panel PC 700 and Automation PC810

Table 298: System support - ADI driver

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).

6.1 SDL equalizer setting

The equalizer makes it possible to adjust the strength of the video signal to the SDL cable length. This allows you to improve the visual representation on the display.



You can adjust the equalizer for different cable lengths here. Use low values (strong equalizer setting) for long cables.

☐ Use automatic setting

0

Figure 268: SDL equalizer setting in the B&R Control Center

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) and if MTCX PX32 version 1.54 or higher is installed. Otherwise, the dialog fields are disabled.

6.2 Installation

The latest version of the ADI driver for the existing target system can be found in the download area (Service - Product Related Downloads - BIOS / Drivers / Updates) on the B&R homepage (**www.br-automation.com**).

1) Download and unpack the ZIP archive.

2) Close all applications.

3) Start BrSetup.exe (e.g. by double clicking in Explorer) or right click on BrSetup.inf in explorer and select "Install".

Information:

The ADI driver and B&R control center are already included in the Windows XP Embedded operating system. 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.

Chapter 5 • Standards and certifications

1. Applicable European guidelines

- EMC guidelines 2004/108/EG
- Low-voltage guidelines 2006/95/EG
- Machine guidelines 98/37/EG beginning 12/29/2009: 2006/42/EG

2. Overview of standards

The Panel PC 700 as an entire device meets the following 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 55024 Class A	Electromagnetic compatibility (EMC), immunity 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 68068-2-2	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

Table 299: Overview of standards

Standard	Description
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
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 (EN 50082-2)	Electromagnetic compatibility (EMC), generic immunity standard - part 2: industrial environments (EN 50082-2 has been replaced by EN 61000-6-2)
EN 61000-6-4 (EN 50081-2)	Electromagnetic compatibility (EMC), generic emission standard - part 2: industrial environments (EN 50081-2 has been replaced by EN 61000-6-4)
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 299: Overview of standards (cont.)

3. Requirements for emissions

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 300: 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) and 53 - 43 dB (µA) Quasi-peak value 84 - 74 dB (µV) and 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
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**	
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 301: Test requirements - Network-related emissions for industrial areas

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 301: Test requirements - Network-related emissions for industrial areas (cont.)

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 302: : Test requirements - Electromagnetic emissions for industrial areas

4. Requirements for immunity to disturbances

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
		EN 55024: Information technology equipment (ITE devices)
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
		EN 55024: Information technology equipment (ITE devices)
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
		EN 55024: Information technology equipment (ITE devices)
Immunity to surge voltages	EN 61000-4-5	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
		EN 55024: Information technology equipment (ITE devices)
Immunity to conducted disturbances	EN 61000-4-6	EN 61000-6-2: Generic standard (industrial areas)
		EN 61131-2: Programmable logic controllers
		EN 55024: Information technology equipment (ITE devices)
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
		EN 55024: Information technology equipment (ITE devices)
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
		EN 55024: Information technology equipment (ITE devices)
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
		EN 55024: Information technology equipment (ITE devices)

Table 303: 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 intended **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 when 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	Limits according to EN 55024
Contact discharge to powder-coated and bare metal housing parts	± 4 kV, 10 discharges, criteria B	± 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	± 8 kV, 10 discharges, criteria B

Table 304: 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	Limits according to EN 55024
Housing, completely wired	80 MHz - 1 GHz, 10 V/m, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A	80 MHz - 1 GHz, 1.4 - 2 GHz, 10 V/m, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A 800-960 MHz (GSM), 10 V/m, pulse modulation with 50% duty cycle, criteria A	80 MHz - 1 GHz, 1.4 - 2 GHz, 3 V/m, 80% amplitude modulation with 1 kHz, length 3 seconds, criteria A

Table 305: 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	Limits according to EN 55024
AC power I/O	± 2 kV, criteria B	-	± 1 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	-	± 0.5 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	± 0.5 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 306: Test requirements - High-speed transient electrical disturbances (burst)

1) For EN 55024 without length limitation.

4.4 Surge voltages (Surge)

Test carried out according to EN 61000-4-5	Limits according to EN 61000-6-2	Limits according to EN 61131-2	Limits according to EN 55024
AC power I/O, L to L	± 1 kV, criteria B	± 1 kV, criteria B	± 1 kV, criteria B
AC power I/O, L to PE	± 2 kV, criteria B	± 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	-	± 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	± 1 kV, criteria B
All shielded cables	-	± 1 kV, criteria B	-

Table 307: 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	Limits according to EN 55024
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	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, criteria A

Table 308: 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	Limits according to EN 55024
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	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, 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	150 kHz - 80 MHz, 3 V, 80% amplitude modulation with 1 kHz, criteria A

Table 308: Test requirements - Conducted disturbances (cont.)

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	Limits according to EN 55024
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	50 Hz, 1 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	50 Hz, 1 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	50 Hz, 1 A/m, criteria A

Table 309: 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	Limits according to EN 55024
AC power inputs	Voltage dip 70% (30% reduction), 0.5 periods, criteria B	-	Voltage dip < 5% (> 95% reduction), 0.5 half-oscillations, criteria B
AC power inputs	Voltage dip 40% (60% reduction), 5 periods, criteria C	-	Voltage dip 70% (30% reduction), 25 half-oscillations, 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	-	Voltage interruptions < 5% (> 95% reduction), 250 half-oscillations, 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 310: Test requirements - Voltage dips, fluctuations, and short-term interruptions

4.8 Damped oscillations

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 311: 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 312: Overview of limits and testing guidelines for vibration

5.1 Vibration during 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 313: 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 314: 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 315: Test requirements - Shock during operation

5.4 Shock 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 316: 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 317: 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 318: 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 319: Overview of limits and testing guidelines for temperature and humidity

6.1 Worst case during 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 320: 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 321: 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 322: 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 323: 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 324: Test requirements - Temperature fluctuations in operation

6.6 Humid heat, cyclical

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 325: 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 326: 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 327: 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 Ohm
	1.0 mm^2	3.3 V	
	1.5 mm^2	2.6 V	
	2.5 mm^2	1.9 V	
	4.0 mm^2	1.4 V	
	> 6.0 mm^2	1.0 V	

Table 328: 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 MOhm at 500 VDC voltage		

Table 329: 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 330: Test requirements - High voltage

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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 331: 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 332: 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 333: 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 334: 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 335: Overview of limits and testing guidelines for other tests

8.1 Protection

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 336: Test requirements - Protection

9. SDL flex cable - test description

9.1 Torsion

9.1.1 Structure of the test

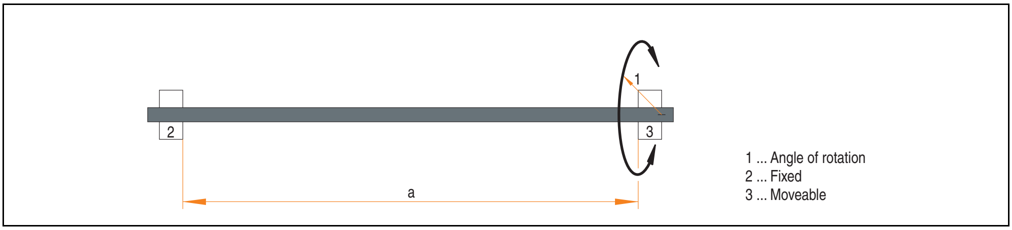


Figure 269: Test structure - torsion

9.1.2 Test conditions

- Distance a: 450 mm
- Rotation angle: ± 85°
- Speed: 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 Structure of the test

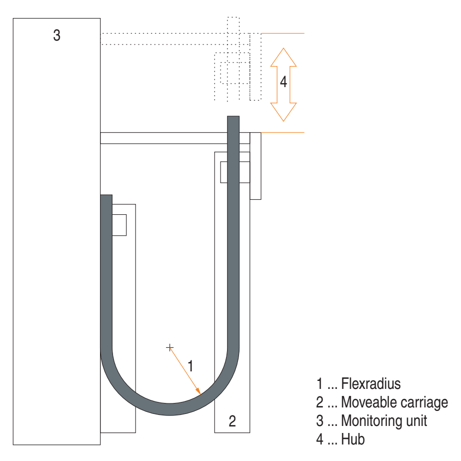


Figure 270: Test structure - Cable drag chain

9.2.2 Test conditions

- Flex radius: 180 mm (= 15 x cable diameter)
- Hub: 460 mm
- Speed: 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 30000 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 c UL US	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 CE	All harmonized EN standards for the applicable guidelines are met.

Table 337: International certifications

Chapter 6 • Accessories

1. Overview

Model number	Short description	Comment
0AC201.9	**Lithium batteries (5x)** Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	See page 520
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	See page 521
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	See page 521
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 523
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 523
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 523
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 523
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 523
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 523
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 523
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 523
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 523
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 523
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 523

Table 338: Model numbers - Accessories

Model number	Short description	Comment
9A0100.11	**UPS 24 VDC** 24 VDC input, 24 VDC output, serial interface	See page 525
9A0100.14	**UPS battery unit type B** 24 V; 2.2 Ah; including battery cage	See page 525
9A0100.15	**UPS battery unit type B (replacement part)** 2 x 12 V; 2.2 Ah; for battery unit 9A0100.14	See page 525
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 525
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 525
4A0006.00-000	**Lithium battery (1x)** Lithium battery, 1 pc., 3 V / 950 mAh, button cell	See page 520
5A5003.03	**Front cover** Front cover for the USB 2.0 Media Drive 5MD900.USB2-00.	See page 556 and Page 564
5AC600.ICOV-00	**Interface covers** Interface covers for APC620 and PPC700 devices; 5 pieces	See page 527
5AC900.1000-00	**Adapter DVI-A/m to CRT DB15HD/f** Adapter DVI (plug) to CRT (socket), for connecting a standard monitorto a DVI-I interface.	See page 528
5AC900.104X-00	**Legend strip template 10.4"** For Panel PC 5PC781.1043-00. For 1 device.	See page 599
5AC900.104X-01	**Legend strip template 10.4"** For Panel PC 5PC782.1043-00. For 1 device	See page 599
5AC900.150X-01	**Legend strip template 15"** For Panel PC 5PC781.1505-00. For 4 devices.	See page 599
5AC900.1200-00	**USB interface cover (attached)** Front side USB interface cover (attached) for Automation Panel 900 and Panel PC 700 devices.	See page 529
5CADVI.0018-00	**DVI-D cable 1.8 m / single** Single cable, DVI-D/m:DVI-D/m; length: 1.8m	See page 573
5CADVI.0050-00	**DVI-D cable 5 m / single** Single cable, DVI-D/m:DVI-D/m; length: 5 m	See page 573
5CADVI.0100-00	**DVI-D cable 10 m / single** Single cable, DVI-D/m:DVI-D/m; length: 10 m	See page 573
5CASDL.0018-00	**SDL cable 1.8 m** SDL cable for a fixed type of layout; length: 1.8 m	See page 576
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 579
5CASDL.0018-03	**SDL flex cable 1.8 m** SDL cable for fixed and flexible type of layout; length: 1.8 m	See page 585
5CASDL.0050-00	**SDL cable 5 m** SDL cable for a fixed type of layout; length: 5 m	See page 576
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 579
5CASDL.0050-03	**5 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 5 m	See page 585

Table 338: Model numbers - Accessories

Model number	Short description	Comment
5CASDL.0100-00	**SDL cable 10 m** SDL cable for a fixed type of layout; length: 10 m	See page 576
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 579
5CASDL.0100-03	**10 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 10 m	See page 585
5CASDL.0150-00	**SDL cable 15 m** SDL cable for a fixed type of layout; length: 15 m	See page 576
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 579
5CASDL.0150-03	**15 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 15 m	See page 585
5CASDL.0200-00	**SDL cable 20 m** SDL cable for a fixed type of layout; length: 20 m	See page 576
5CASDL.0200-03	**20 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 20 m	See page 585
5CASDL.0250-00	**SDL cable 25 m** SDL cable for a fixed type of layout; length: 25 m	See page 576
5CASDL.0250-03	**25 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 25 m	See page 585
5CASDL.0300-00	**SDL cable 30 m** SDL cable for a fixed type of layout; length: 30 m	See page 576
5CASDL.0300-03	**30 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 30 m	See page 585
5CASDL.0300-10	**30 m SDL cable with extender** SDL cable with extender for a fixed type of layout; length 30 m	Cancelled since 12/2006 Replaced by 5CASDL.0300-13 See page 582
5CASDL.0300-13	**30 m SDL flex cable with extender** SDL cable with extender for fixed and flexible type of layout; length: 30 m	See page 590
5CASDL.0400-10	**40 m SDL cable with extender** SDL cable with extender for a fixed type of layout; length 40 m	Cancelled since 12/2006 Replaced by 5CASDL.0400-13 See page 582
5CASDL.0400-13	**40 m SDL flex cable with extender** SDL cable with extender for fixed and flexible type of layout; length: 40 m	See page 590
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 597
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 597
5CFCRD.0032-02	**CompactFlash 32 MB SanDisk/A** CompactFlash card with 32 MB flash PROM and IDE/ATA interface.	Cancelled since 12/2005 Replaced by 5CFCRD.0064-03 See page 530
5CFCRD.0064-02	**CompactFlash 64 MB SanDisk/A** CompactFlash card with 64 MB flash PROM and IDE/ATA interface.	Cancelled since 12/2005 Replaced by 5CFCRD.0064-03 See page 530
5CFCRD.0128-02	**CompactFlash 128 MB SanDisk/A** CompactFlash card with 128 MB flash PROM and IDE/ATA interface	Cancelled since 12/2005 Replaced by 5CFCRD.0128-03 See page 530

Table 338: Model numbers - Accessories

Model number	Short description	Comment
5CFCRD.0256-02	**CompactFlash 256 MB SanDisk/A** CompactFlash card with 256 MB flash PROM and IDE/ATA interface	Cancelled since 12/2005 Replaced by 5CFCRD.0256-03 See page 530
5CFCRD.0512-02	**CompactFlash 512 MB SanDisk/A** CompactFlash card with 512 MB flash PROM and IDE/ATA interface	Cancelled since 12/2005 Replaced by 5CFCRD.0512-03 See page 530
5CFCRD.1024-02	**CompactFlash 1024 MB SanDisk/A** CompactFlash card with 1024 MB flash PROM and IDE/ATA interface	Cancelled since 12/2005 Replaced by 5CFCRD.1024-03 See page 530
5CFCRD.2048-02	**CompactFlash 2048 MB SanDisk/A** CompactFlash card with 2048 MB flash PROM and IDE/ATA interface	Cancelled since 12/2005 Replaced by 5CFCRD.2048-03 See page 530
5CFCRD.0064-03	**CompactFlash 64 MB SSI** CompactFlash card with 64 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.0128-03	**CompactFlash 128 MB SSI** CompactFlash card with 128 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.0256-03	**CompactFlash 256 MB SSI** CompactFlash card with 256 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.0512-03	**CompactFlash 512 MB SSI** CompactFlash card with 512 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.1024-03	**CompactFlash 1024 MB SSI** CompactFlash card with 1024 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.2048-03	**CompactFlash 2048 MB SSI** CompactFlash card with 2048 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.4096-03	**CompactFlash 4096 MB SSI** CompactFlash card with 4096 MB SLC NAND flash and IDE/ATA interface	See page 538
5CFCRD.8192-03	**CompactFlash 8192 MB SSI** CompactFlash card with 8192 MB SLC NAND flash and IDE/ATA interface	See page 538
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).	Cancelled since 10/2006 Replacement type 5MD900.USB-01 See page 550
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 558
5MMUSB.0128-00	**USB flash drive 128 MB SanDisk** USB 2.0 flash drive 128 MB	Cancelled since 12/2005 Replaced by 5MMUSB.2048-00 See page 566
5MMUSB.0256-00	**USB flash drive 256 MB SanDisk** USB 2.0 flash drive 256 MB	Cancelled since 03/2007 Replaced by 5MMUSB.2048-00 See page 566
5MMUSB.0512-00	**USB flash drive 512 MB SanDisk** USB 2.0 flash drive 512 MB	Cancelled since 07/2007 Replaced by 5MMUSB.2048-00 See page 566
5MMUSB.1024-00	**USB flash drive 1 GB SanDisk** USB 2.0 flash drive 1 GB	Cancelled since 03/2007 Replaced by 5MMUSB.2048-00 See page 566

Table 338: Model numbers - Accessories

Model number	Short description	Comment
5MMUSB.2048-00	**USB flash drive 2 GB SanDisk** USB 2.0 flash drive 2 GB	See page 566
5SWHMI.0000-00	**HMI Drivers & Utilities DVD**	See page 570
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 595
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 595
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 595
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 601
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 601
5ACPCI.ETH1-01	**PCI Ethernet card 10/100** half size PCI Ethernet card, 1 Ethernet connection	See page 602
5ACPCI.ETH3-01	**PCI Ethernet card 10/100 3port** half size PCI Ethernet card, 3 Ethernet connections	See page 604

Table 338: 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 607).

2.1 Order data

Model number	Description	Figure
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh button cell	
4A0006.00-000	Lithium battery, 1 piece, 3 V / 950 mAh button cell	

Table 339: Order data - Lithium batteries

2.2 Technical data

Information:

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

Features	0AC201.9	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	
Environment		
Storage temperature	-20°C to +60°C	
Relative humidity	0 to 95%, non-condensing	

Table 340: Technical data - Lithium batteries

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

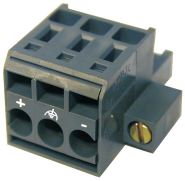
Model number	Description	Figure
0TB103.9	Plug for the 24 V supply voltage (screw clamps)	 0TB103.9  0TB103.91
0TB103.91	Plug for the 24 V supply voltage (cage clamps)	

Table 341: Order data - TB103

3.3 Technical data

> **Information:**
>
> **The following characteristics, features and limit values only apply to this accessory and can deviate from 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	
Resistance between contacts	≤ 5 mΩ	

Table 342: Technical data - TB103

Name	0TB103.9	0TB103.91
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 342: Technical data - TB103 (cont.)

4. Power supplies

In order to meet demands for complete, comprehensive system solutions, power supplies are available for mounting rail installation in the B&R product line. 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 271: 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 demounting. Wiring is essentially performed in seconds thanks to the the cage clamp terminals 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 343: 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 344: Three-phase power supplies

5. External UPS

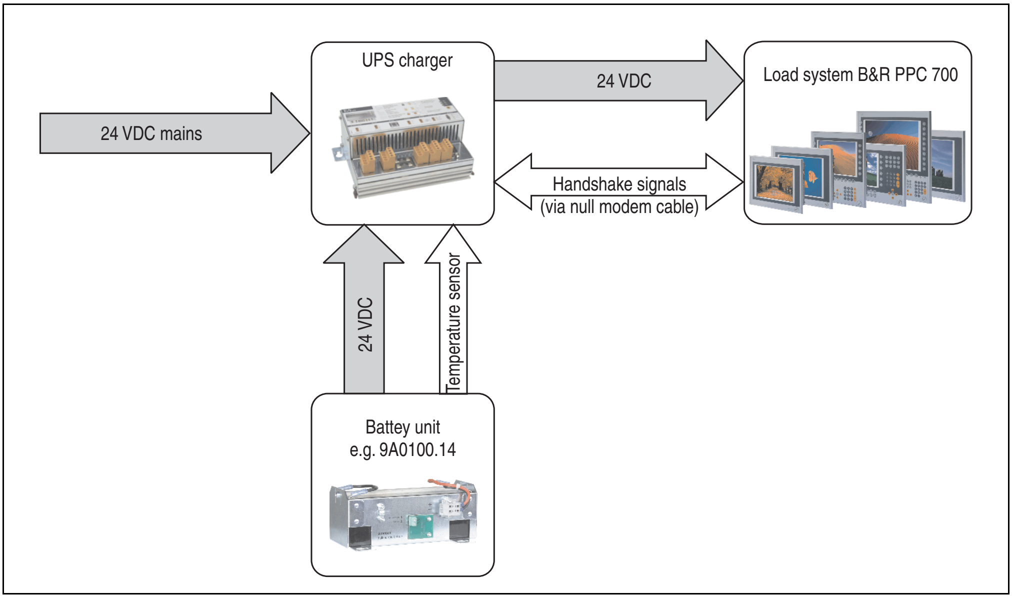


Figure 272: Block diagram of the UPS

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	Comment
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 345: 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

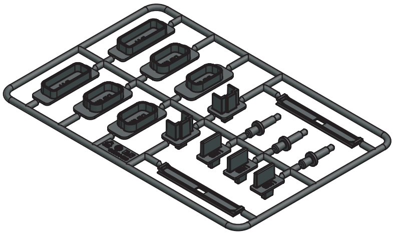
Model number	Description	Figure
5AC600.ICOV-00	**Interface covers** Interface covers for APC620 and PPC700 devices; 5 pieces	

Table 346: Order data - PPC700 interface cover

6.2 Contents of delivery

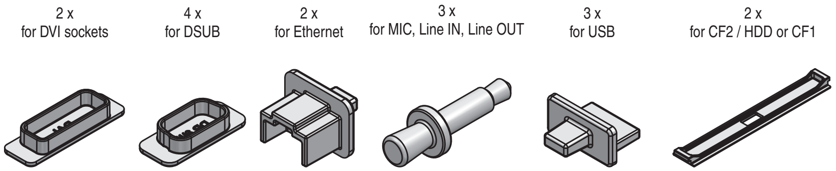


Figure 273: Interface cover - contents of delivery

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

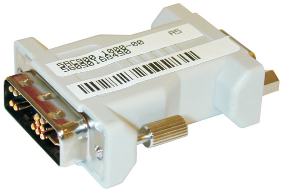
Model number	Description	Figure
5AC900.1000-00	**Adapter DVI-A/m to CRT DB15HD/f** Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	

Table 347: Order data - DVI - CRT adapter

8. USB interface cover (attached)

Front side USB interface cover (attached) for Automation Panel 900 and Panel PC 700 devices.

8.1 Order data

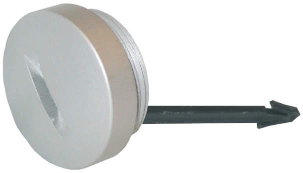
Model number	Description	Figure
5AC900.1200-00	**USB interface cover (attached)** Front side USB interface cover (attached) for Automation Panel 900 and Panel PC 700 devices.	

Table 348: Order data - USB interface cover (attached)

8.2 Installation

- Remove old cover.
- Feed the USB interface cover through the small opening (see red markings).

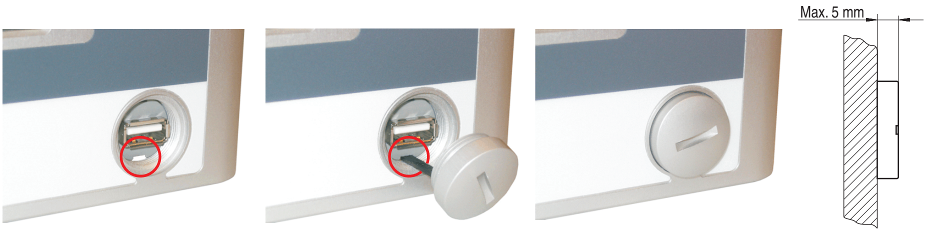


Figure 274: Front side USB interface cover - installation

- With the cover screwed on, the front side of the display is raised a maximum of 5 mm.

9. CompactFlash cards 5CFCRD.xxxx-02

9.1 General information

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

9.2 Order data

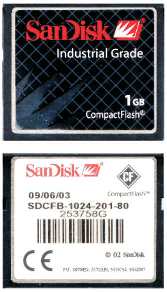
Model number	Description	Figure
5CFCRD.0032-02	CompactFlash 32 MB SanDisk/A	
5CFCRD.0064-02	CompactFlash 64 MB SanDisk/A	
5CFCRD.0128-02	CompactFlash 128 MB SanDisk/A	
5CFCRD.0256-02	CompactFlash 256 MB SanDisk/A	
5CFCRD.0512-02	CompactFlash 512 MB SanDisk/A	
5CFCRD.1024-02	CompactFlash 1024 MB SanDisk/A	
5CFCRD.2048-02	CompactFlash 2048 MB SanDisk/A	

Table 349: CompactFlash cards - Order data

9.3 Technical data

Information:

The following characteristics, features and limit values only apply to this accessory and can deviate from 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 (@ 25°C)	> 3000000 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

Table 350: Technical data - CompactFlash cards 5CFCRD.xxxx-02

Mechanical characteristics	5CFCRD.xxxx-02
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 Storage Transport	 0°C to +70°C -25°C to +85°C -25°C 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	24000 meters

Table 350: Technical data - CompactFlash cards 5CFCRD.xxxx-02 (cont.)

9.4 Dimensions

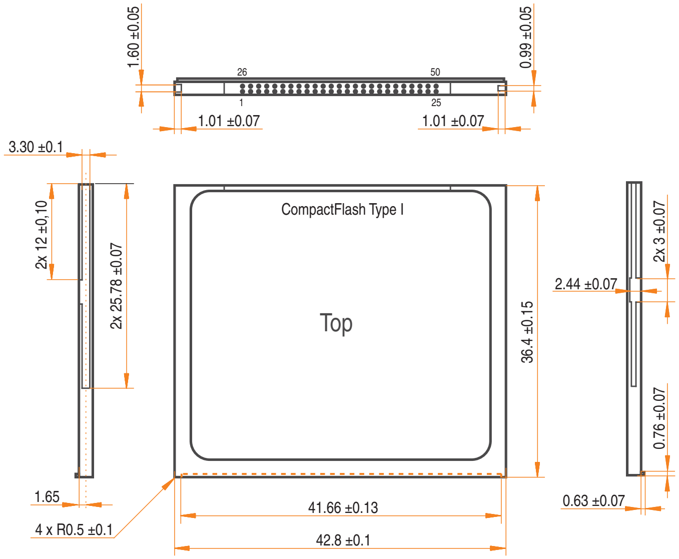
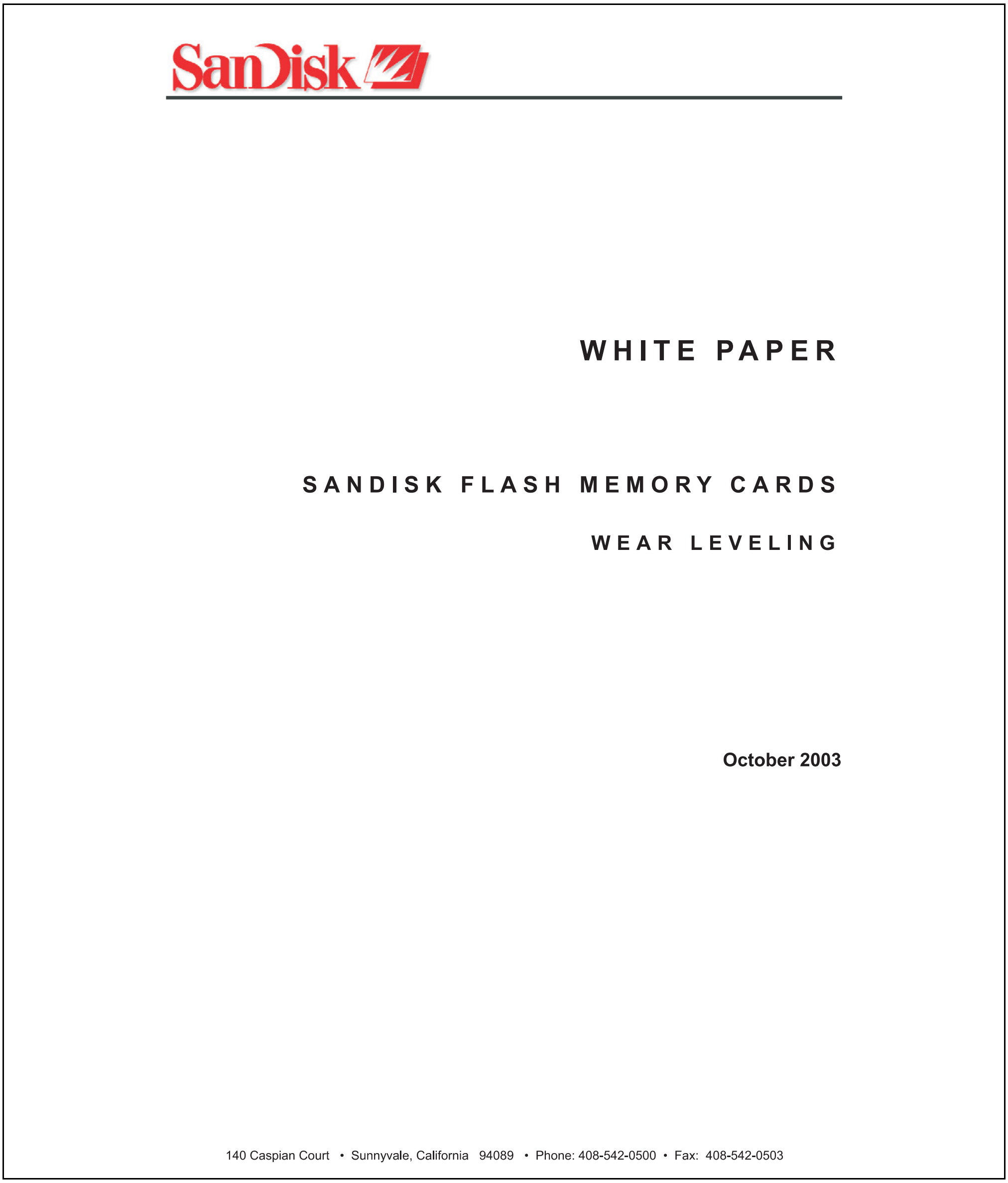


Figure 275: Dimensions - CompactFlash card Type I

9.5 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

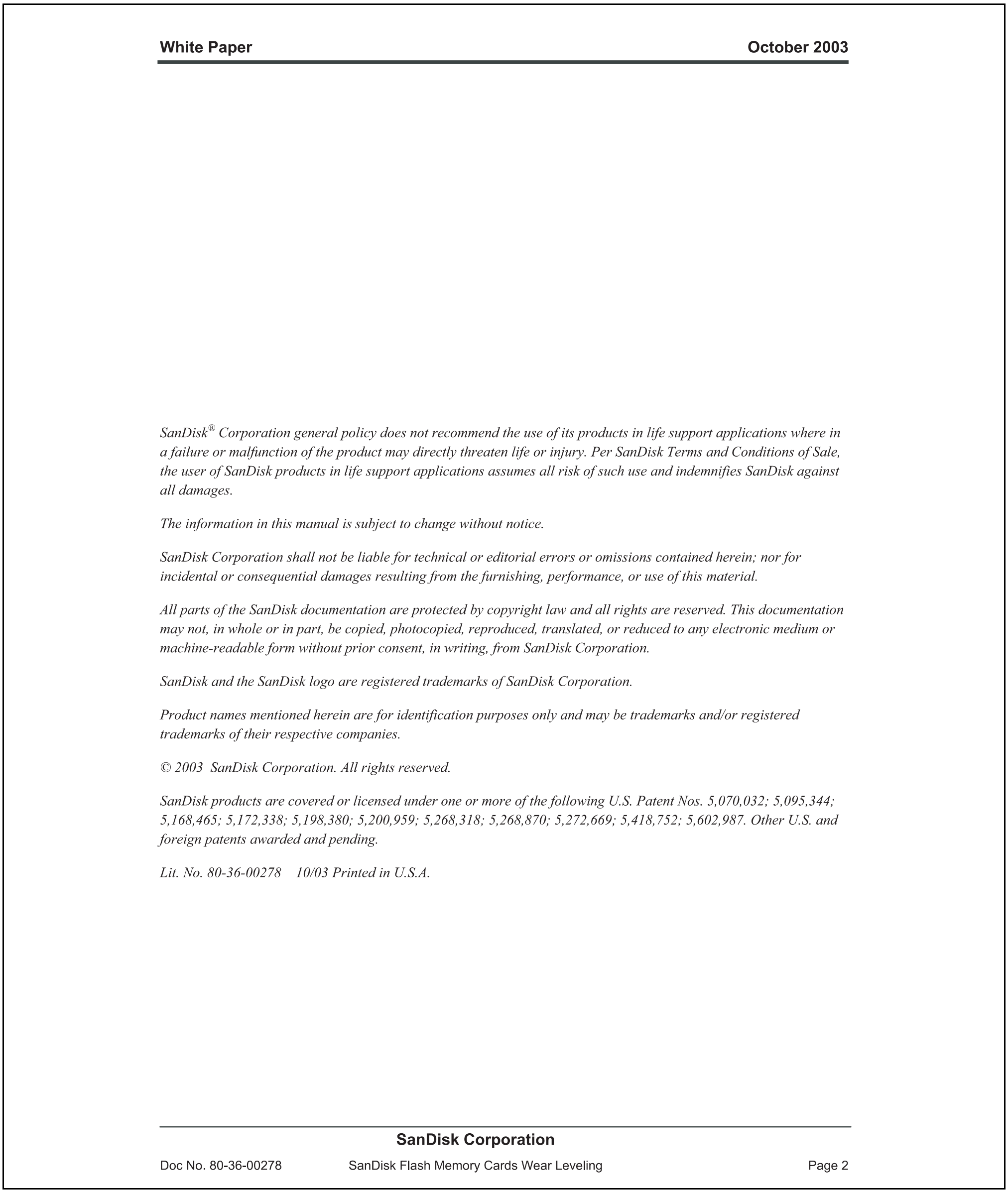
SANDISK FLASH MEMORY CARDS

WEAR LEVELING

October 2003

140 Caspian Court • Sunnyvale, California 94089 • Phone: 408-542-0500 • Fax: 408-542-0503

Figure 276: SanDisk white paper - page 1 of 6



White Paper **October 2003**

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Lit. No. 80-36-00278 10/03 Printed in U.S.A.

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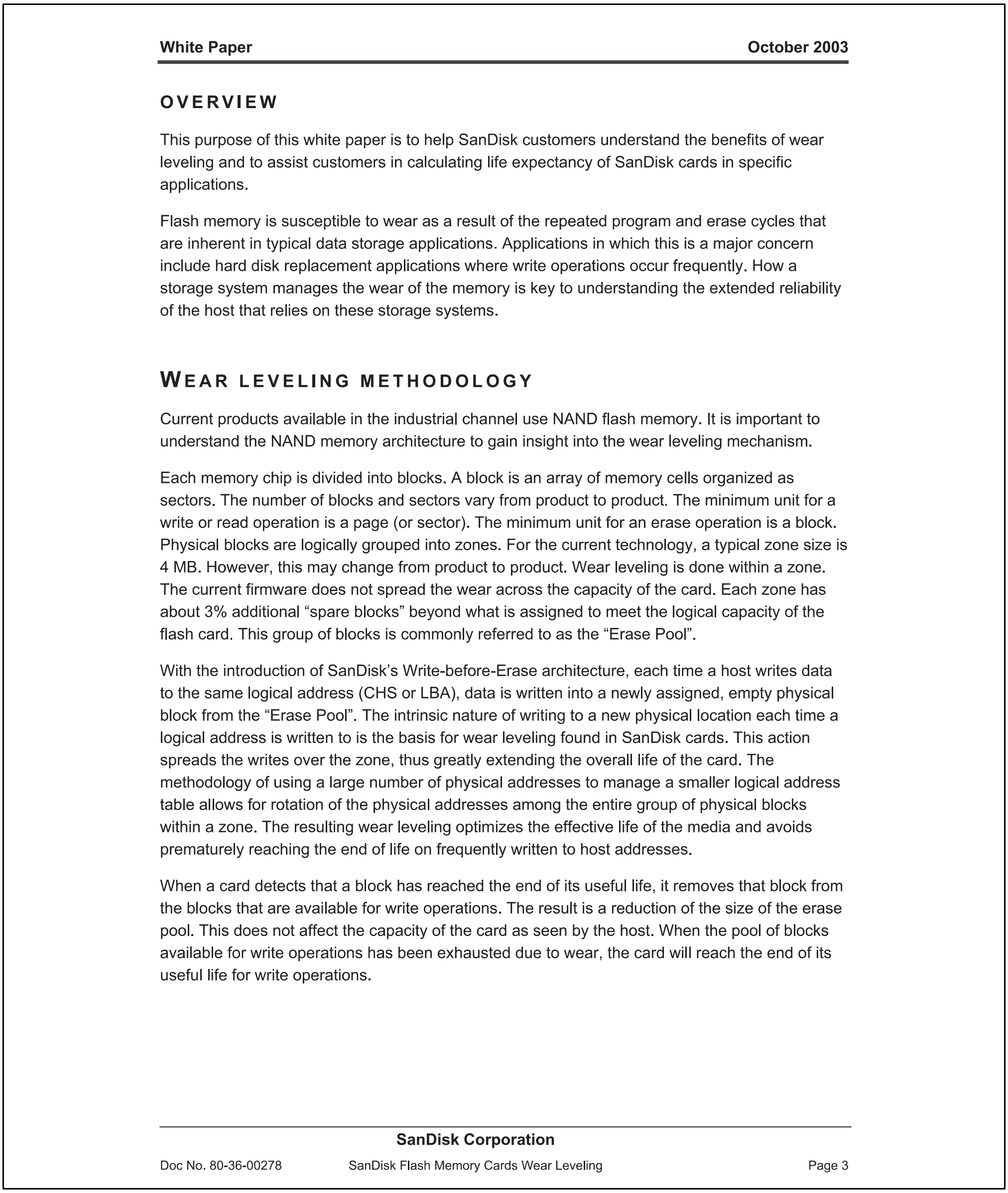
Figure 277: SanDisk white paper - page 2 of 6



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

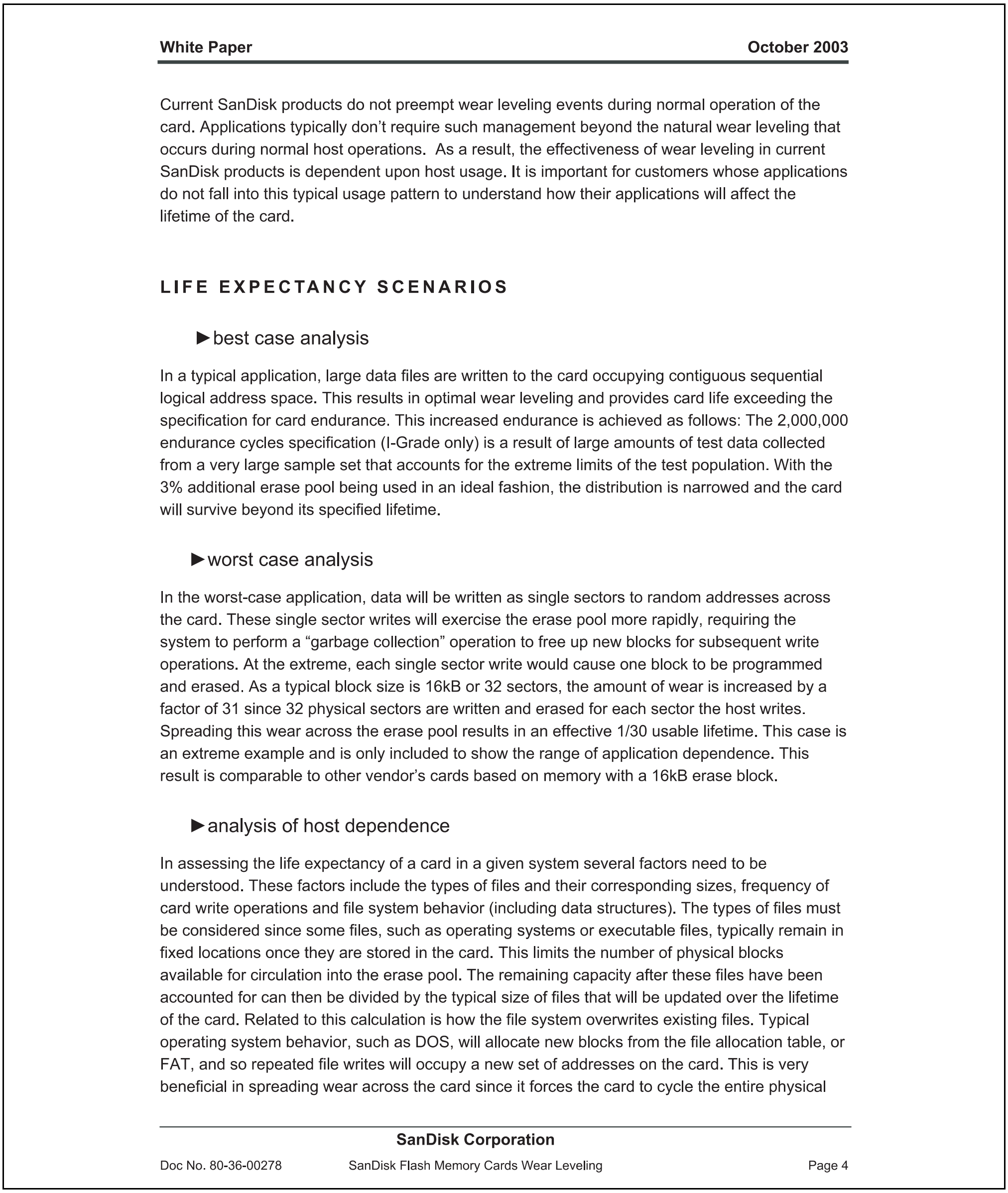
Current products available in the industrial channel use NAND flash memory. It is important to understand the NAND memory architecture to gain insight into the wear leveling mechanism.

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 278: 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.

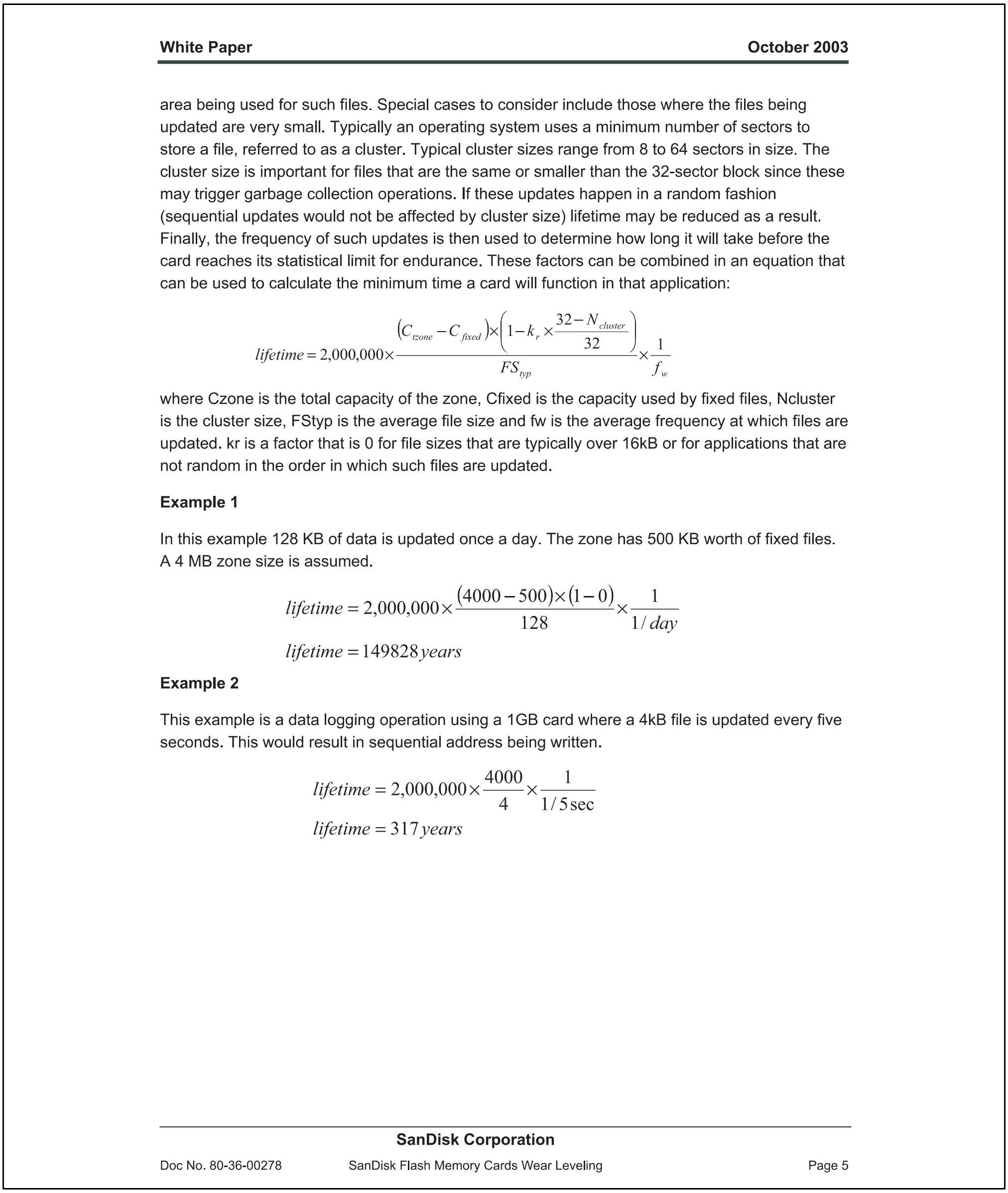
►worst case analysis

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 279: SanDisk white paper - page 4 of 6



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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:

$$lifetime = 2{,}000{,}000 \times \frac{\left(C_{tzone} - C_{fixed}\right) \times \left(1 - k_r \times \frac{32 - N_{cluster}}{32}\right)}{FS_{typ}} \times \frac{1}{f_w}$$

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.

$$lifetime = 2{,}000{,}000 \times \frac{4000}{4} \times \frac{1}{1/5\sec}$$

$$lifetime = 317\,years$$

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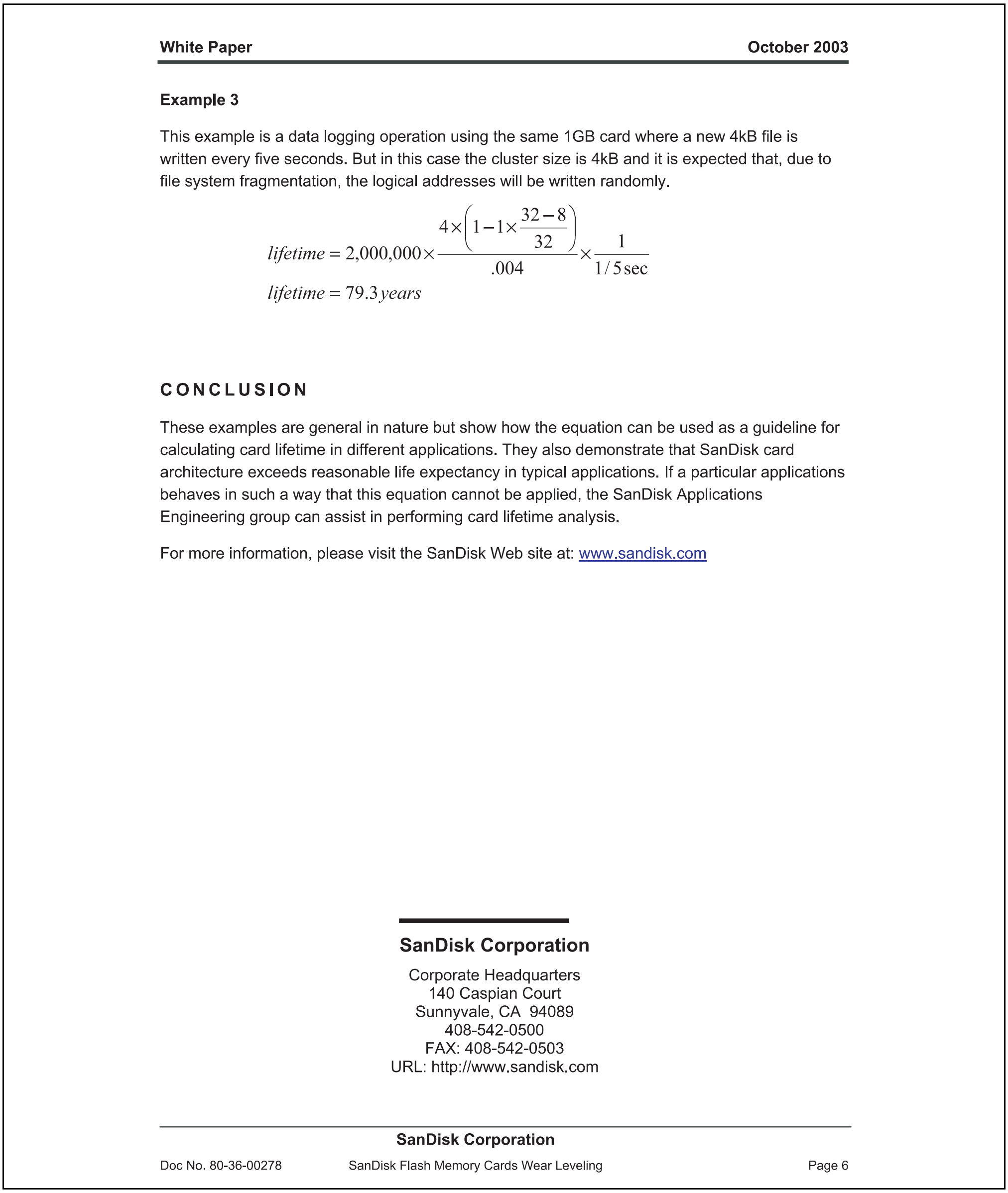
Figure 280: SanDisk white paper - page 5 of 6



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

SanDisk Corporation

Corporate Headquarters
140 Caspian Court
Sunnyvale, CA 94089
408-542-0500
FAX: 408-542-0503
URL: http://www.sandisk.com

Figure 281: SanDisk white paper - page 6 of 6

10. CompactFlash cards 5CFCRD.xxxx-03

10.1 General information

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

10.2 Order data

Model number	Description	Figure
5CFCRD.0064-03	CompactFlash 64 MB SSI	 Example: 8 GB 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 351: Order data - CompactFlash cards

10.3 Technical data

Information:

The following characteristics, features and limit values only apply to this accessory and can deviate from 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-03
MTBF (at 25°C)	> 4000000 hours
Maintenance	None
Data reliability	< 1 unrecoverable error in 10^{14} bit read accesses
Write/erase procedures	> 2,000,000 times
Data retention	10 years
Mechanical characteristics	
Dimensions Length Width Thickness	 36.4 ± 0.15 mm 42.8 ± 0.10 mm 3.3 ± 0.10 mm
Weight	11.4 grams
Environmental characteristics	
Ambient temperature Operation Storage Transport	 0°C to +70°C -50°C to +100°C -50°C to +100°C
Relative humidity Operation / Storage	 8% to 95%, non-condensing
Vibration Operation Storage / Transport	 Maximum 16.3 g (point to point) Maximum 30 g (point to point)
Shock Operation Storage / Transport	 Maximum 1000 g Maximum 3,000 g
Altitude	Maximum 80,000 feet (24,383 meters)

Table 352: Technical data - CompactFlash cards 5CFCRD.xxxx-03

10.3.1 Temperature humidity diagram - Operation and storage

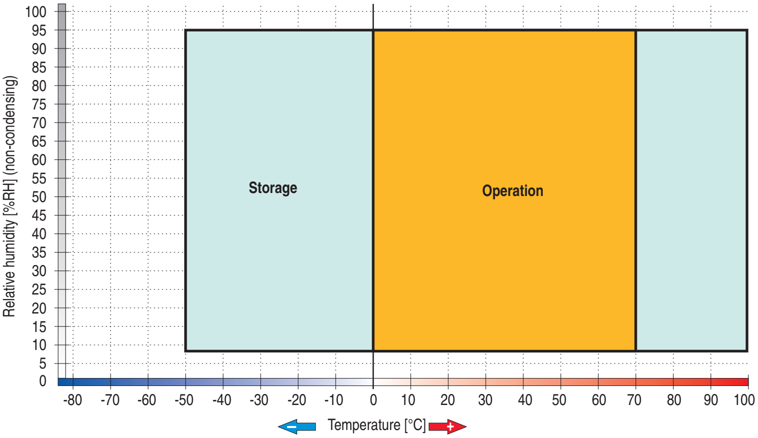


Figure 282: Temperature humidity diagram - CompactFlash cards 5CFCRD.xxxx-03

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).

10.4 Dimensions

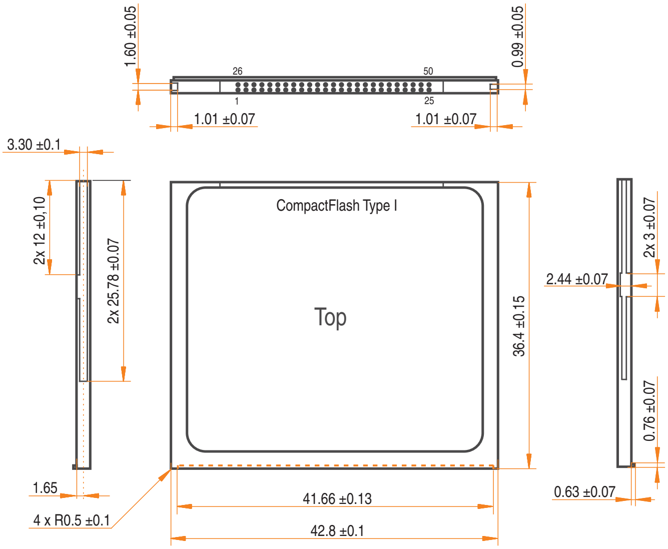


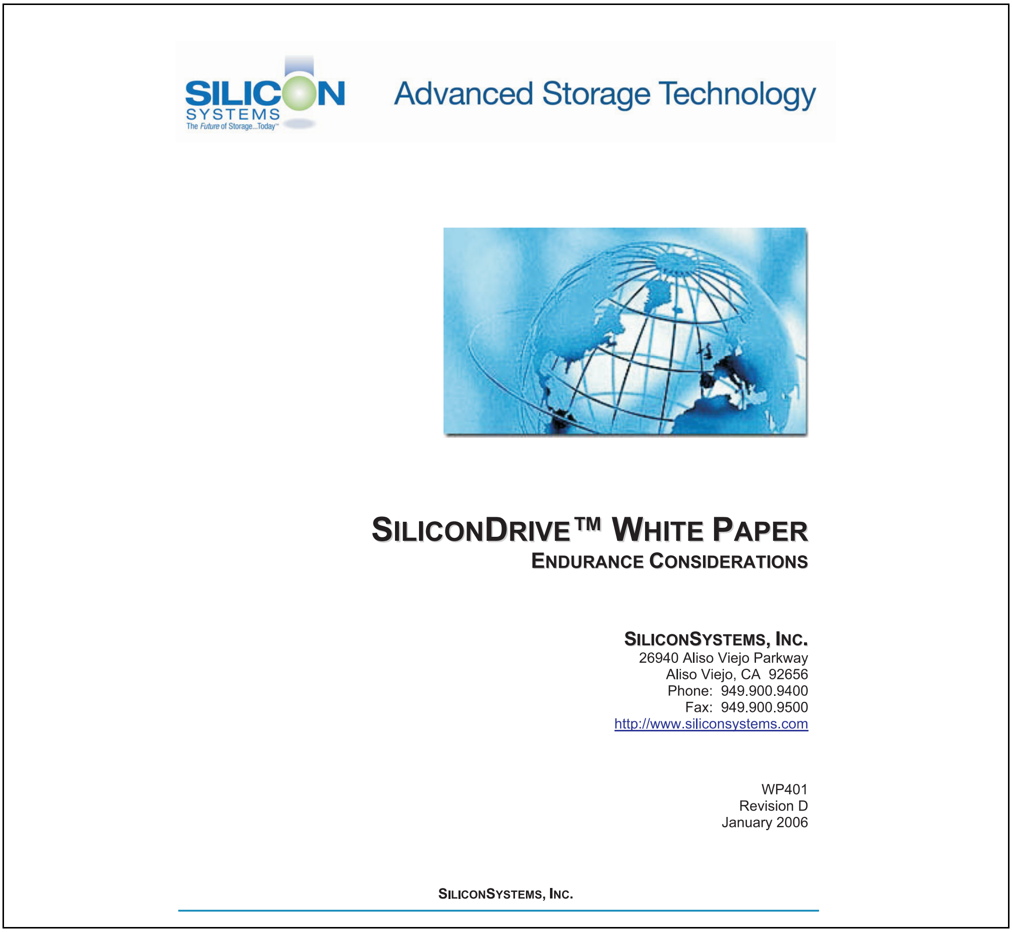
Figure 283: Dimensions - CompactFlash card Type I

10.5 Calculating the lifespan

Silicon Systems provides a 9-page "white paper" for the lifespan calculation for CompactFlash cards (see following pages). This document can also be found on the Silicon Systems homepage (www.siliconsystems.com).

Information:

A software tool for calculating the statistical lifespan of the Silicon Systems CompactFlash cards in various settings can be downloaded from the B&R Homepage (www.br-automation.com).



Advanced Storage Technology

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SILICONSYSTEMS, INC.
26940 Aliso Viejo Parkway
Aliso Viejo, CA 92656
Phone: 949.900.9400
Fax: 949.900.9500
http://www.siliconsystems.com

WP401
Revision D
January 2006

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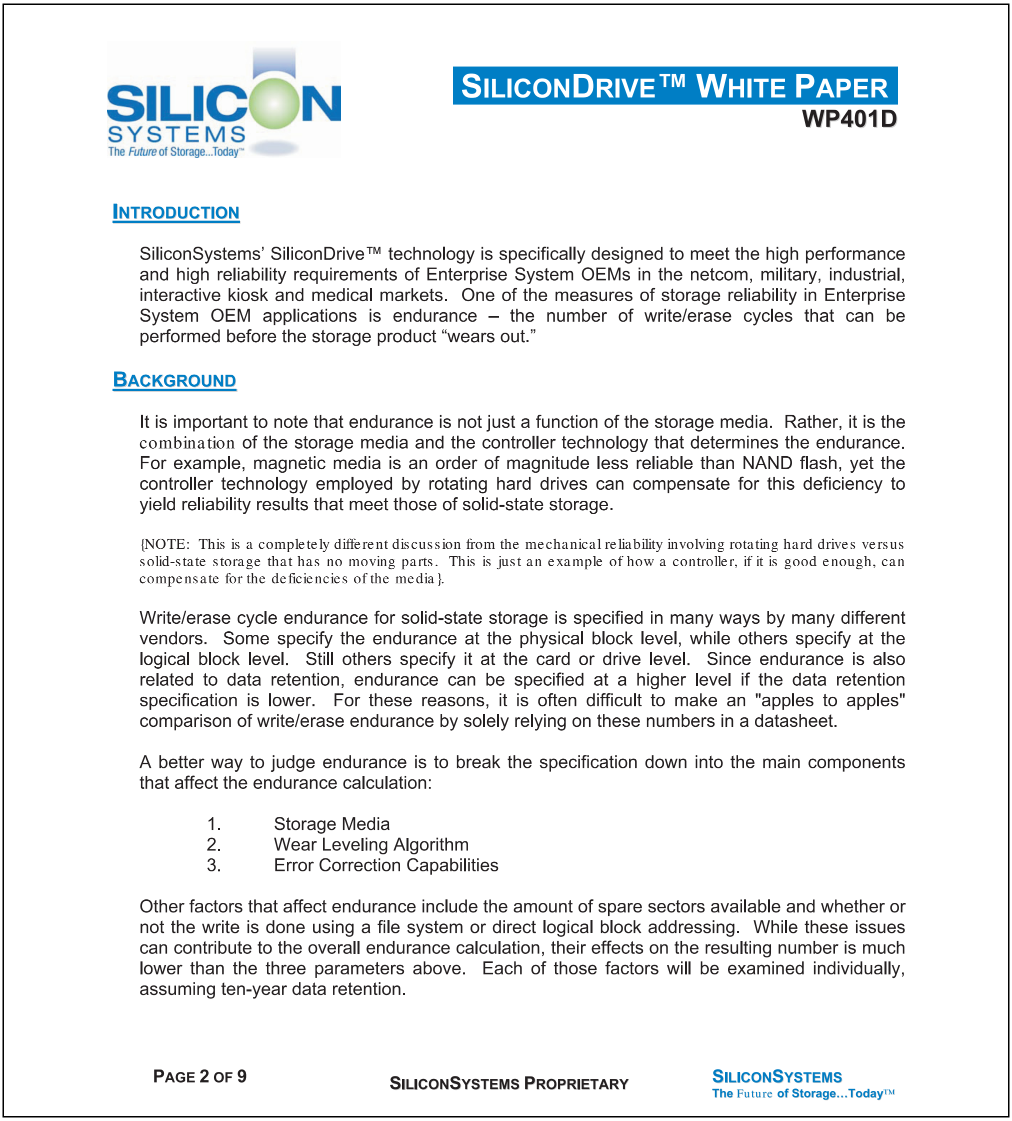

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INTRODUCTION

SiliconSystems' SiliconDrive™ technology is specifically designed to meet the high performance and high reliability requirements of Enterprise System OEMs in the netcom, military, industrial, interactive kiosk and medical markets. One of the measures of storage reliability in Enterprise System OEM applications is endurance – the number of write/erase cycles that can be performed before the storage product "wears out."

BACKGROUND

It is important to note that endurance is not just a function of the storage media. Rather, it is the combination of the storage media and the controller technology that determines the endurance. For example, magnetic media is an order of magnitude less reliable than NAND flash, yet the controller technology employed by rotating hard drives can compensate for this deficiency to yield reliability results that meet those of solid-state storage.

{NOTE: This is a completely different discussion from the mechanical reliability involving rotating hard drives versus solid-state storage that has no moving parts. This is just an example of how a controller, if it is good enough, can compensate for the deficiencies of the media}.

Write/erase cycle endurance for solid-state storage is specified in many ways by many different vendors. Some specify the endurance at the physical block level, while others specify at the logical block level. Still others specify it at the card or drive level. Since endurance is also related to data retention, endurance can be specified at a higher level if the data retention specification is lower. For these reasons, it is often difficult to make an "apples to apples" comparison of write/erase endurance by solely relying on these numbers in a datasheet.

A better way to judge endurance is to break the specification down into the main components that affect the endurance calculation:

1. Storage Media
2. Wear Leveling Algorithm
3. Error Correction Capabilities

Other factors that affect endurance include the amount of spare sectors available and whether or not the write is done using a file system or direct logical block addressing. While these issues can contribute to the overall endurance calculation, their effects on the resulting number is much lower than the three parameters above. Each of those factors will be examined individually, assuming ten-year data retention.

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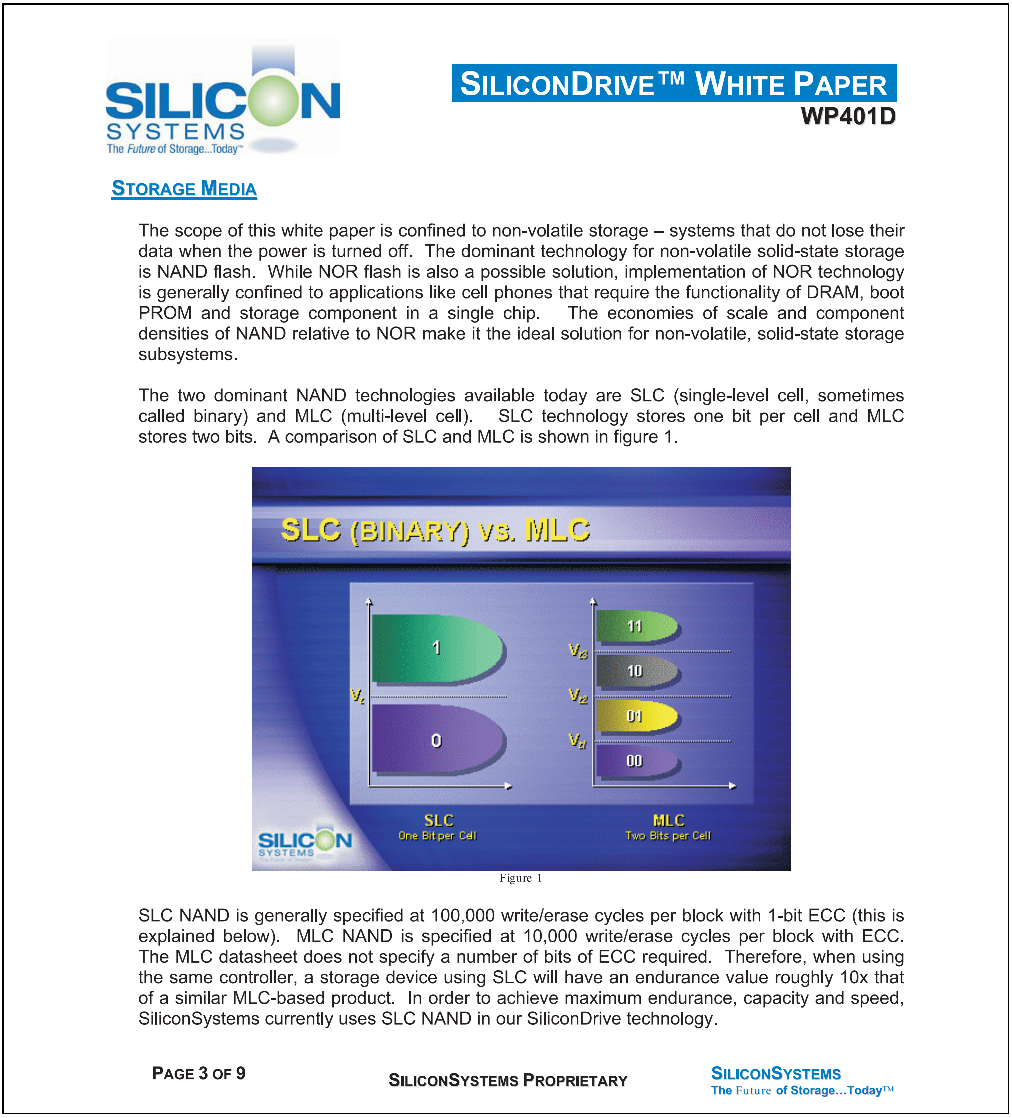

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STORAGE MEDIA

The scope of this white paper is confined to non-volatile storage – systems that do not lose their data when the power is turned off. The dominant technology for non-volatile solid-state storage is NAND flash. While NOR flash is also a possible solution, implementation of NOR technology is generally confined to applications like cell phones that require the functionality of DRAM, boot PROM and storage component in a single chip. The economies of scale and component densities of NAND relative to NOR make it the ideal solution for non-volatile, solid-state storage subsystems.

The two dominant NAND technologies available today are SLC (single-level cell, sometimes called binary) and MLC (multi-level cell). SLC technology stores one bit per cell and MLC stores two bits. A comparison of SLC and MLC is shown in figure 1.

Figure 1

SLC NAND is generally specified at 100,000 write/erase cycles per block with 1-bit ECC (this is explained below). MLC NAND is specified at 10,000 write/erase cycles per block with ECC. The MLC datasheet does not specify a number of bits of ECC required. Therefore, when using the same controller, a storage device using SLC will have an endurance value roughly 10x that of a similar MLC-based product. In order to achieve maximum endurance, capacity and speed, SiliconSystems currently uses SLC NAND in our SiliconDrive technology.

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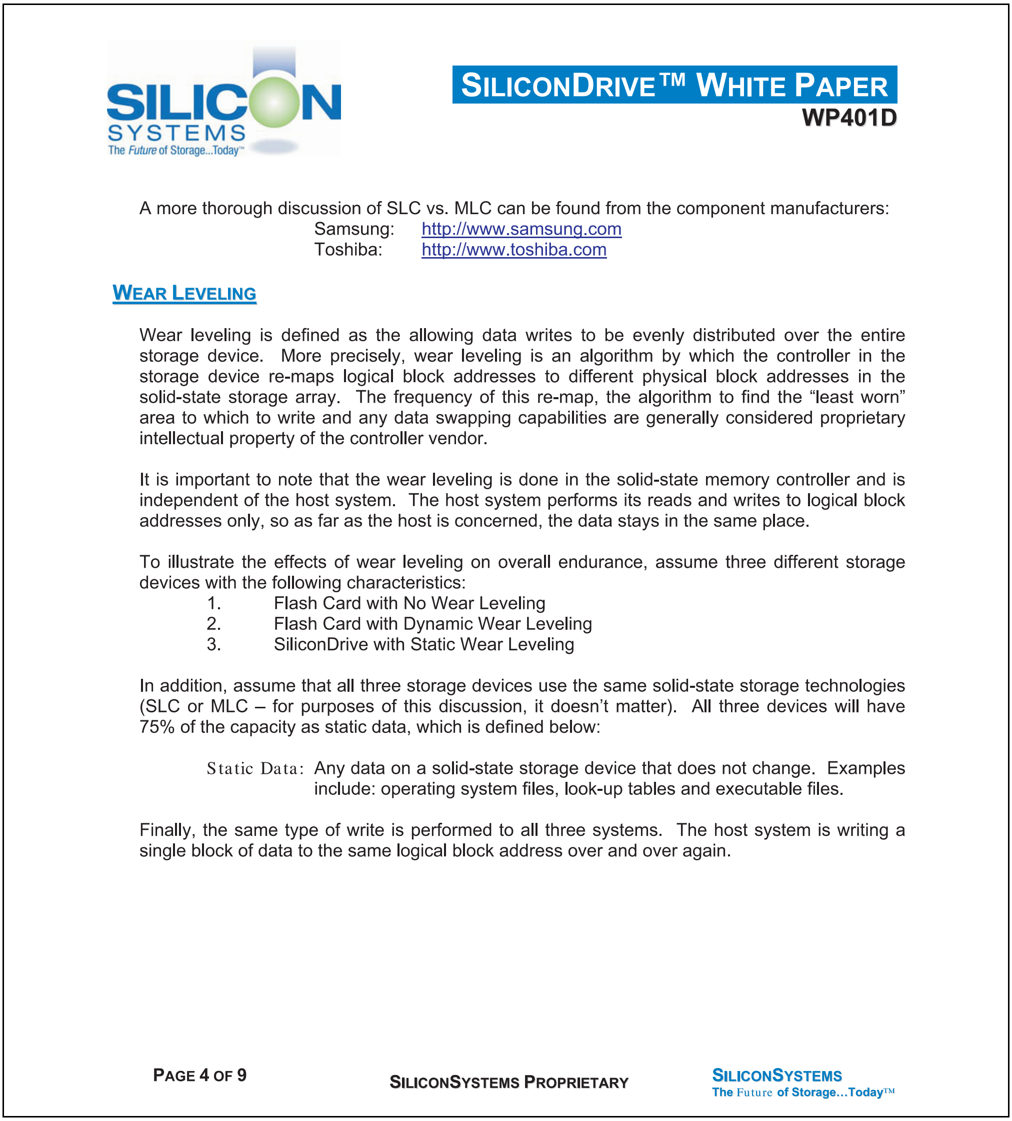

A more thorough discussion of SLC vs. MLC can be found from the component manufacturers:

Samsung:	http://www.samsung.com
Toshiba:	http://www.toshiba.com

WEAR LEVELING

Wear leveling is defined as the allowing data writes to be evenly distributed over the entire storage device. More precisely, wear leveling is an algorithm by which the controller in the storage device re-maps logical block addresses to different physical block addresses in the solid-state storage array. The frequency of this re-map, the algorithm to find the "least worn" area to which to write and any data swapping capabilities are generally considered proprietary intellectual property of the controller vendor.

It is important to note that the wear leveling is done in the solid-state memory controller and is independent of the host system. The host system performs its reads and writes to logical block addresses only, so as far as the host is concerned, the data stays in the same place.

To illustrate the effects of wear leveling on overall endurance, assume three different storage devices with the following characteristics:

1. Flash Card with No Wear Leveling
2. Flash Card with Dynamic Wear Leveling
3. SiliconDrive with Static Wear Leveling

In addition, assume that all three storage devices use the same solid-state storage technologies (SLC or MLC – for purposes of this discussion, it doesn't matter). All three devices will have 75% of the capacity as static data, which is defined below:

Static Data: Any data on a solid-state storage device that does not change. Examples include: operating system files, look-up tables and executable files.

Finally, the same type of write is performed to all three systems. The host system is writing a single block of data to the same logical block address over and over again.

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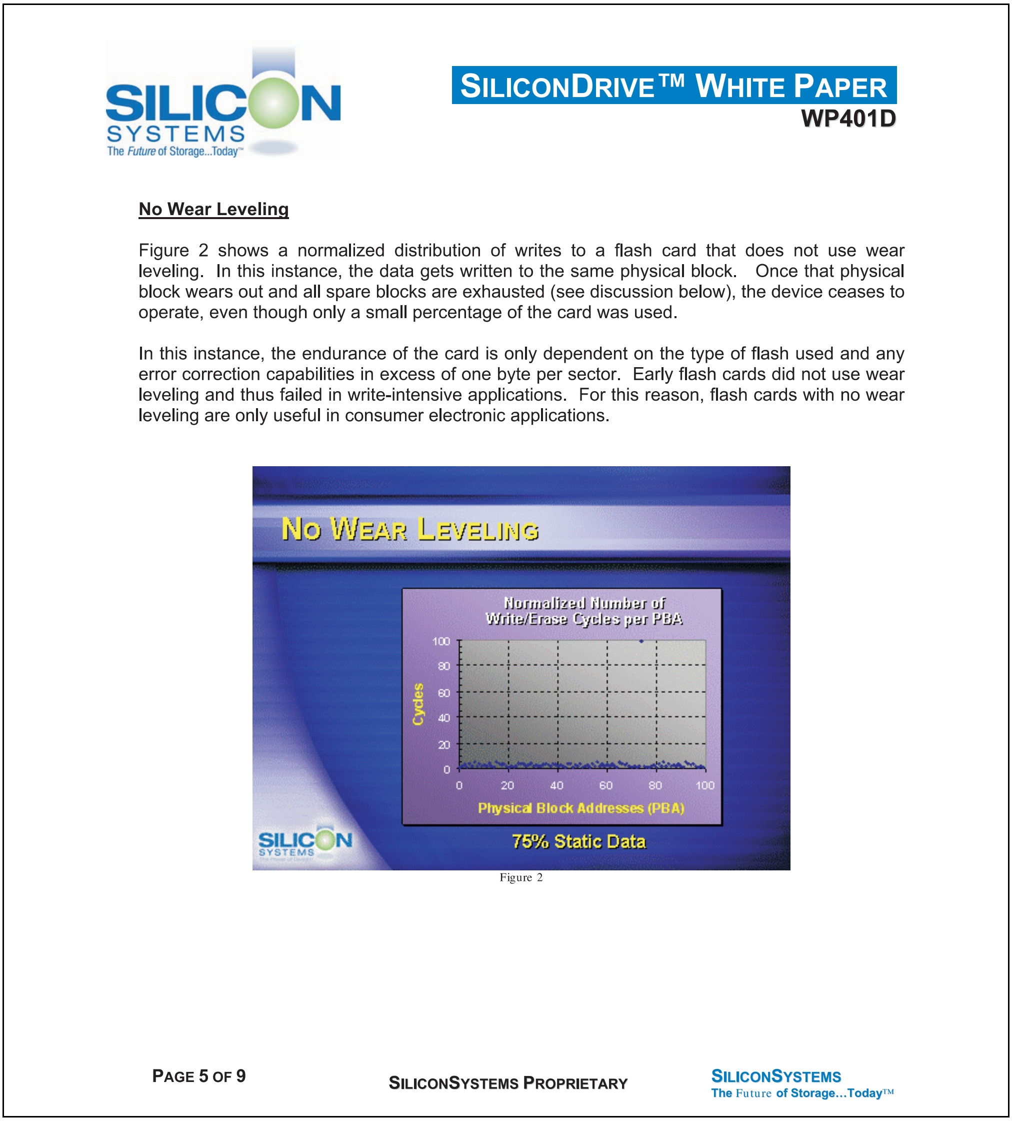

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No Wear Leveling

Figure 2 shows a normalized distribution of writes to a flash card that does not use wear leveling. In this instance, the data gets written to the same physical block. Once that physical block wears out and all spare blocks are exhausted (see discussion below), the device ceases to operate, even though only a small percentage of the card was used.

In this instance, the endurance of the card is only dependent on the type of flash used and any error correction capabilities in excess of one byte per sector. Early flash cards did not use wear leveling and thus failed in write-intensive applications. For this reason, flash cards with no wear leveling are only useful in consumer electronic applications.

NO WEAR LEVELING

Normalized Number of Write/Erase Cycles per PBA

75% Static Data

Figure 2

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Dynamic Wear Leveling

Figure 3 shows a normalized distribution of writes to a flash card that employs dynamic wear leveling. This algorithm only wear levels over "free" or "dynamic" data areas. That is to say, if there is static data as defined above, this area is never involved in the wear leveling process. In the current example, since 75% of the flash card is used for static data, only 25% of the card is available for wear leveling. The endurance of the card is calculated to be 25 times better than for the card with no wear leveling, but only one-fourth that of static wear leveling.

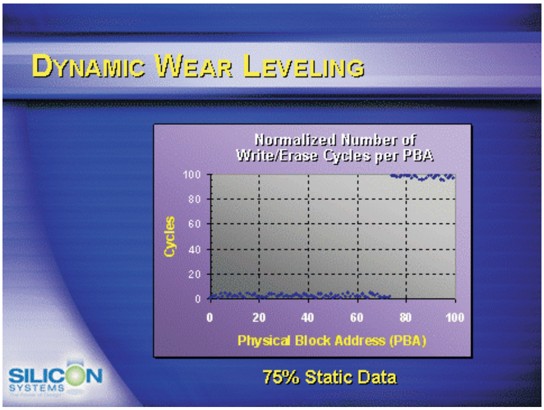

Figure 3

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Static Wear Leveling

Figure 4 shows a normalized distribution of writes to a SiliconDrive that employs static wear leveling. This algorithm evenly distributes the data over the entire SiliconDrive. The algorithm searches for the least-used physical blocks and writes the data to that location. If that location is empty, the write occurs normally. If that location contains static data, the static data is moved to a more heavily-used location prior to the new data being written. The endurance of the SiliconDrive is calculated to be 100 times better than for the card with no wear leveling and four times the endurance of the card that uses dynamic wear leveling.

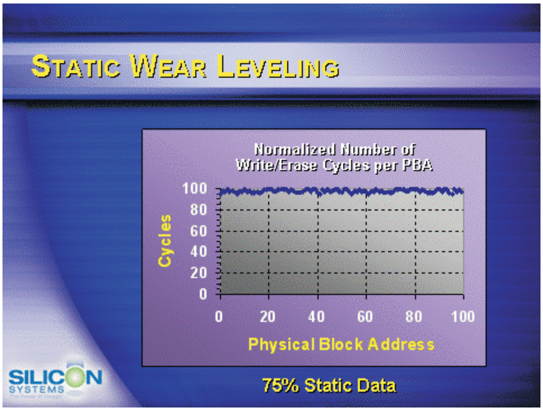

Figure 4

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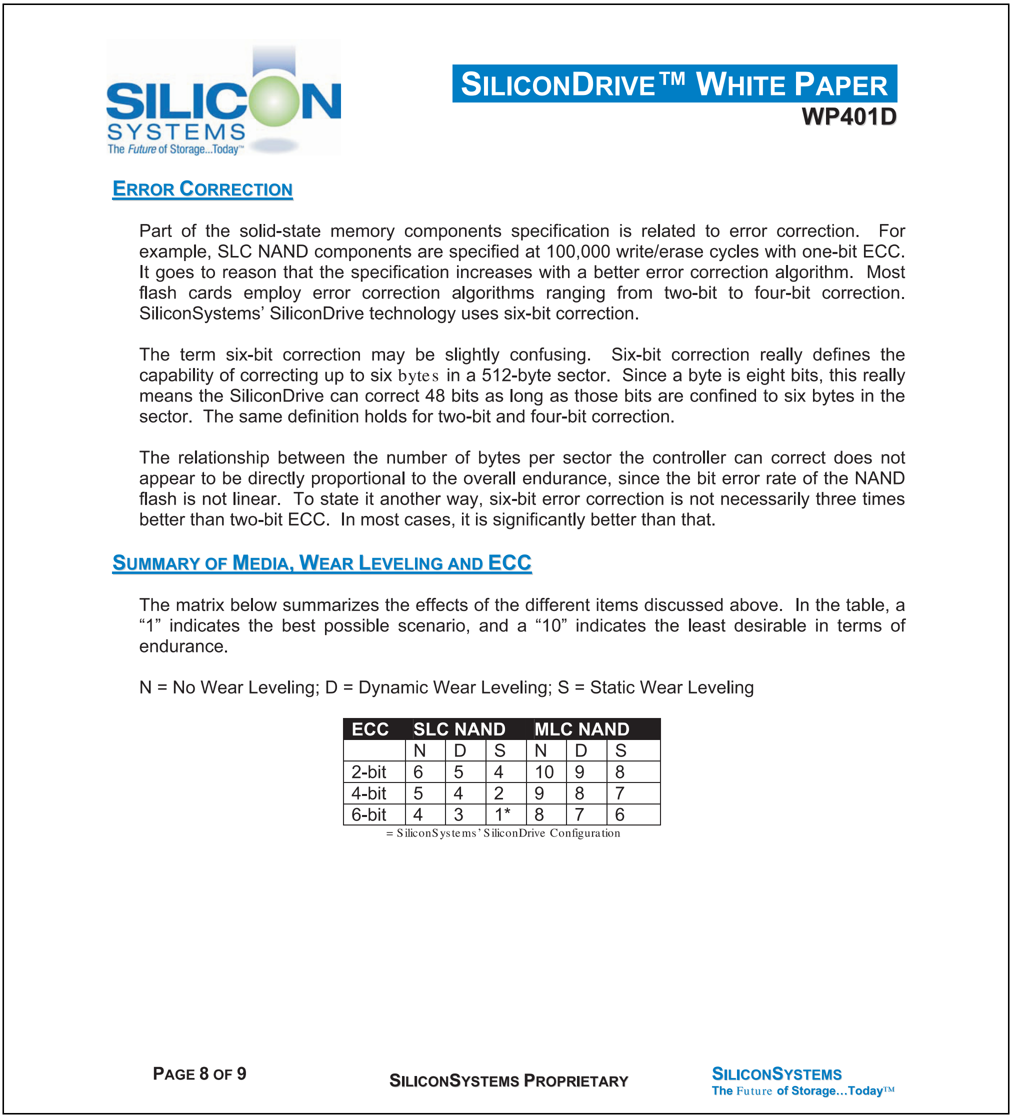

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ERROR CORRECTION

Part of the solid-state memory components specification is related to error correction. For example, SLC NAND components are specified at 100,000 write/erase cycles with one-bit ECC. It goes to reason that the specification increases with a better error correction algorithm. Most flash cards employ error correction algorithms ranging from two-bit to four-bit correction. SiliconSystems' SiliconDrive technology uses six-bit correction.

The term six-bit correction may be slightly confusing. Six-bit correction really defines the capability of correcting up to six bytes in a 512-byte sector. Since a byte is eight bits, this really means the SiliconDrive can correct 48 bits as long as those bits are confined to six bytes in the sector. The same definition holds for two-bit and four-bit correction.

The relationship between the number of bytes per sector the controller can correct does not appear to be directly proportional to the overall endurance, since the bit error rate of the NAND flash is not linear. To state it another way, six-bit error correction is not necessarily three times better than two-bit ECC. In most cases, it is significantly better than that.

SUMMARY OF MEDIA, WEAR LEVELING AND ECC

The matrix below summarizes the effects of the different items discussed above. In the table, a "1" indicates the best possible scenario, and a "10" indicates the least desirable in terms of endurance.

N = No Wear Leveling; D = Dynamic Wear Leveling; S = Static Wear Leveling

ECC	SLC NAND			MLC NAND		
	N	D	S	N	D	S
2-bit	6	5	4	10	9	8
4-bit	5	4	2	9	8	7
6-bit	4	3	1*	8	7	6

= SiliconSystems' SiliconDrive Configuration

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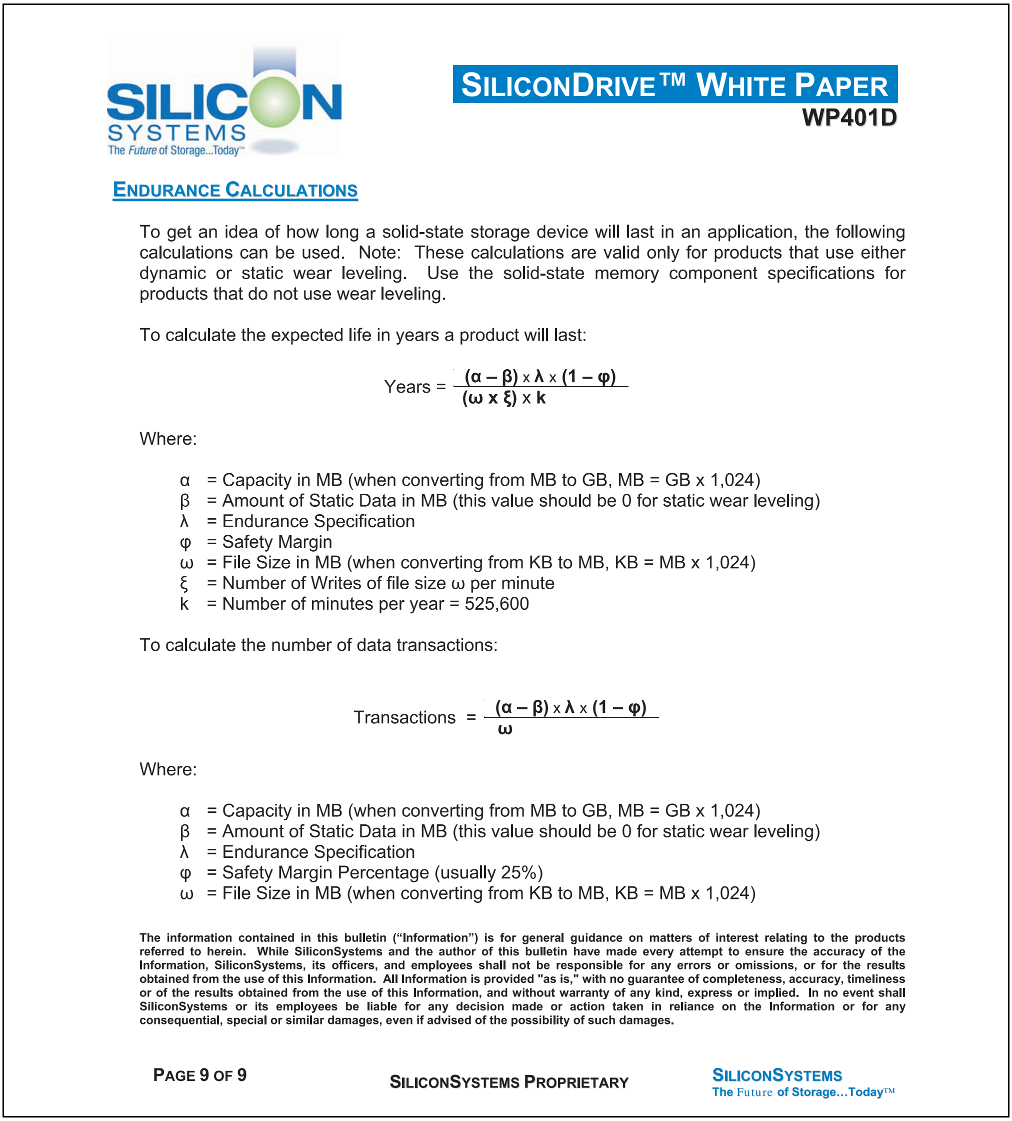

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ENDURANCE CALCULATIONS

To get an idea of how long a solid-state storage device will last in an application, the following calculations can be used. Note: These calculations are valid only for products that use either dynamic or static wear leveling. Use the solid-state memory component specifications for products that do not use wear leveling.

To calculate the expected life in years a product will last:

$$\text{Years} = \frac{(\alpha - \beta) \times \lambda \times (1 - \varphi)}{(\omega \times \xi) \times k}$$

Where:

α = Capacity in MB (when converting from MB to GB, MB = GB x 1,024)
β = Amount of Static Data in MB (this value should be 0 for static wear leveling)
λ = Endurance Specification
φ = Safety Margin
ω = File Size in MB (when converting from KB to MB, KB = MB x 1,024)
ξ = Number of Writes of file size ω per minute
k = Number of minutes per year = 525,600

To calculate the number of data transactions:

$$\text{Transactions} = \frac{(\alpha - \beta) \times \lambda \times (1 - \varphi)}{\omega}$$

Where:

α = Capacity in MB (when converting from MB to GB, MB = GB x 1,024)
β = Amount of Static Data in MB (this value should be 0 for static wear leveling)
λ = Endurance Specification
φ = Safety Margin Percentage (usually 25%)
ω = File Size in MB (when converting from KB to MB, KB = MB x 1,024)

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11. USB Media Drive - 5MD900.USB2-00

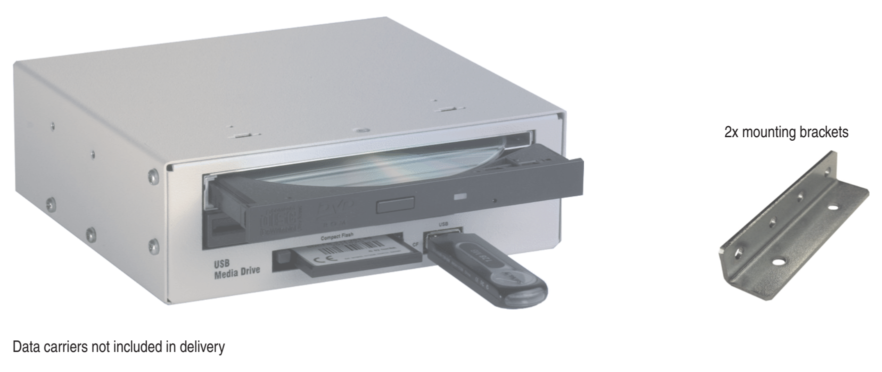


Figure 293: USB Media Drive - 5MD900.USB2-00

11.1 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 11.8 "Front cover 5A5003.03 for the USB Media Drive" on page 556)

11.2 Technical data

Information:

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

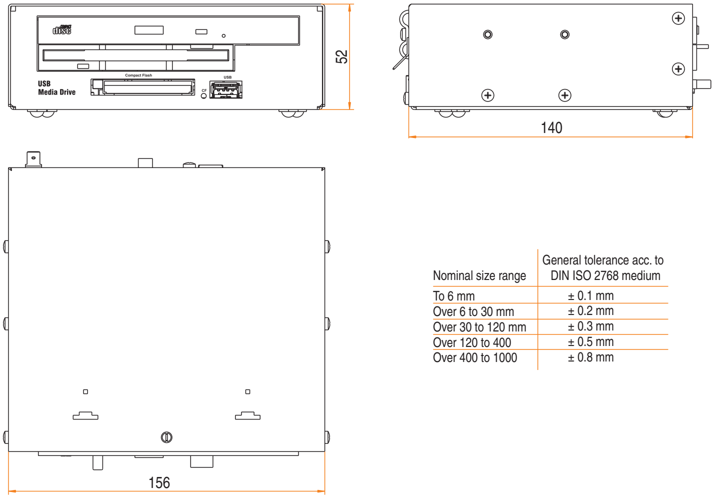
Features - entire device	**5MD900.USB2-00**
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s)
Maximum cable length	5 m (not including hub)
Power supply Rated voltage	 24 VDC ±25%
Features - diskette drive	
Data capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
Data 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	30000 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/sec.
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
Features - DVD-ROM/CD-RW drive	**5MD900.USB2-00**

Table 353: Technical data - USB Media 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	60000 POH (Power-On Hours) > 10000 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 Storage Transport	 +5°C .. +45°C -20°C .. +60°C -40°C .. +60°C
Relative humidity Operation Storage Transport	 20 - 80%, non-condensing 5 - 90%, non-condensing 5 - 95%, non-condensing
Vibration Operation Storage 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 Storage Transport	 max. 5 g (49 m/s^2 0-peak) and 11 ms length max. 60 g (588 m/s^2 0-peak) and 11 ms length max. 60 g (588 m/s^2 0-peak) and 11 ms length
Altitude	Max. 3000 meters

Table 353: Technical data - USB Media Drive 5MD900.USB2-00 (cont.)

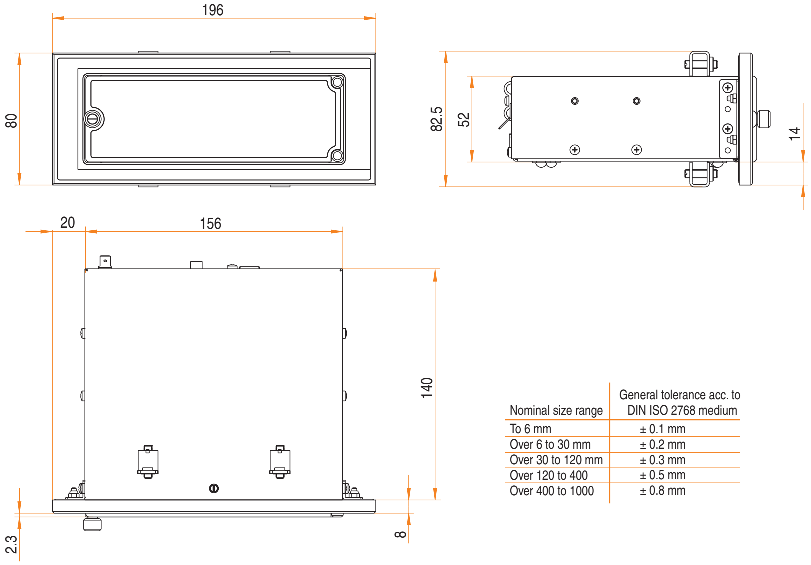
11.3 Dimensions



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 294: Dimensions - 5MD900.USB2-00

11.4 Dimensions with front cover



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 295: Dimensions - USB Media Drive with front cover

11.5 Contents of delivery

Amount	Component
1	USB Media Drive complete unit
2	Mounting rail brackets

Table 354: Contents of delivery - USB Media Drive 5MD900.USB2-00

11.6 Interfaces

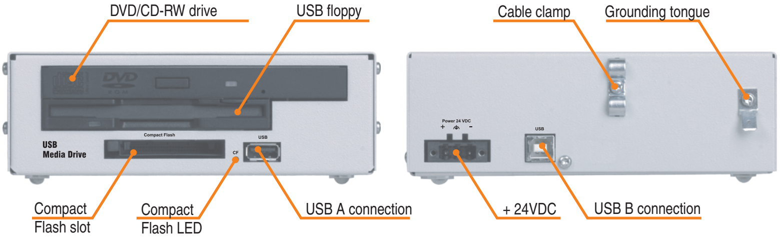


Figure 296: Interfaces - 5MD900.USB2-00

11.7 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).

11.7.1 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.

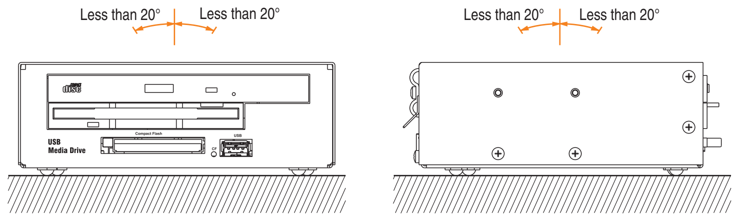


Figure 297: Mounting orientation - 5MD900.USB2-00

11.8 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.

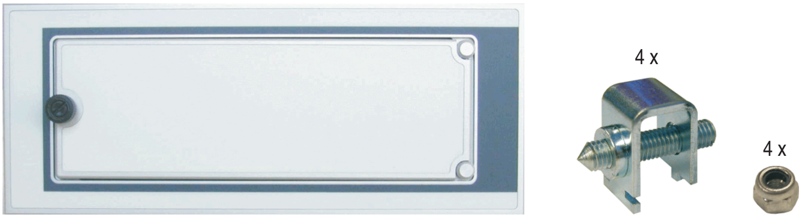


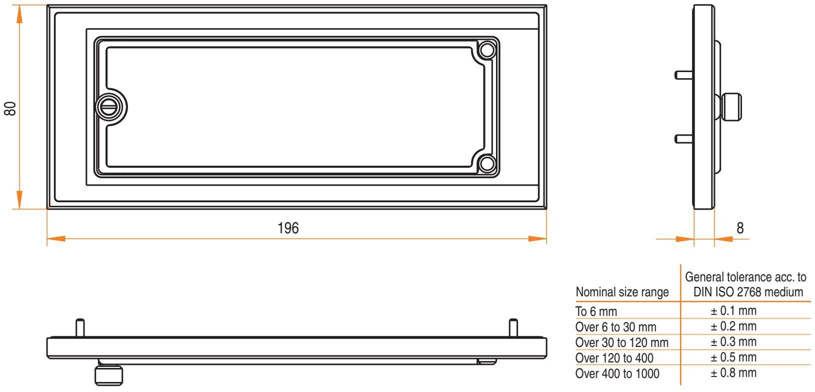
Figure 298: Front cover 5A5003.03

11.8.1 Technical data

Features	5A5003.03
Front cover design / colors Dark gray border around the cover Light gray background	 Pantone 432CV Pantone 427CV

Table 355: Technical data - 5A5003.03

11.8.2 Dimensions

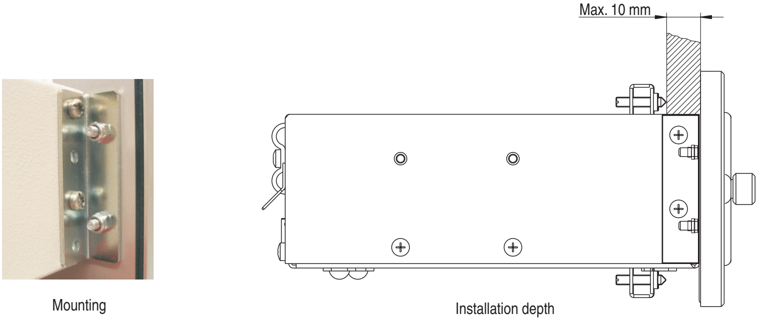


Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Figure 299: Dimensions - 5A5003.03

11.8.3 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.



Mounting

Installation depth

Figure 300: Front cover mounting and installation depth

12. USB Media Drive - 5MD900.USB2-01

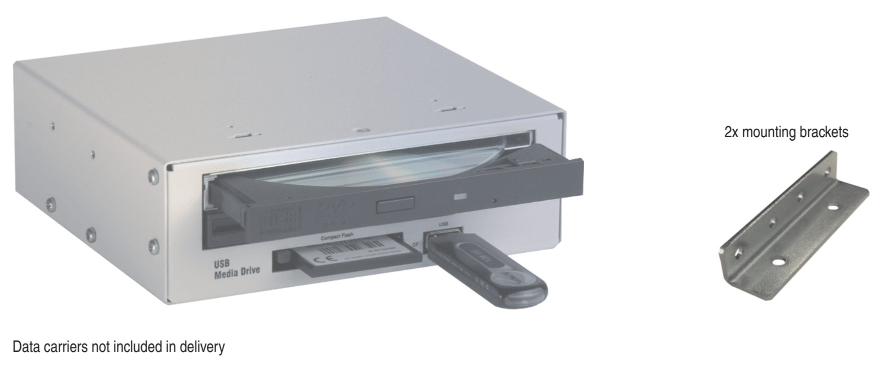


Figure 301: USB Media Drive - 5MD900.USB2-01

12.1 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 12.9 "Front cover 5A5003.03 for the USB Media Drive" on page 564)

12.2 Technical data

Information:

The following characteristics, features and limit values only apply to this accessory and can deviate from 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	30000 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/sec.
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 356: Technical data - USB Media Drive 5MD900.USB2-01

Features - DVD-RW/CD-RW drive	5MD900.USB2-01
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	60000 POH (Power-On Hours) > 10000 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 Type Transfer rate	Connection of further peripheral devices Max. 500 mA 2.0 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 Length Height	 70 mm 100 mm 9.5 mm
Weight	Approx. 1.1 kg (without front cover)
Environmental characteristics	
Ambient temperature Operation Storage Transport	 +5°C .. +45°C -20°C .. +60°C -40°C .. +60°C
Relative humidity Operation Storage Transport	 20 - 80%, non-condensing 5 - 90%, non-condensing 5 - 95%, non-condensing

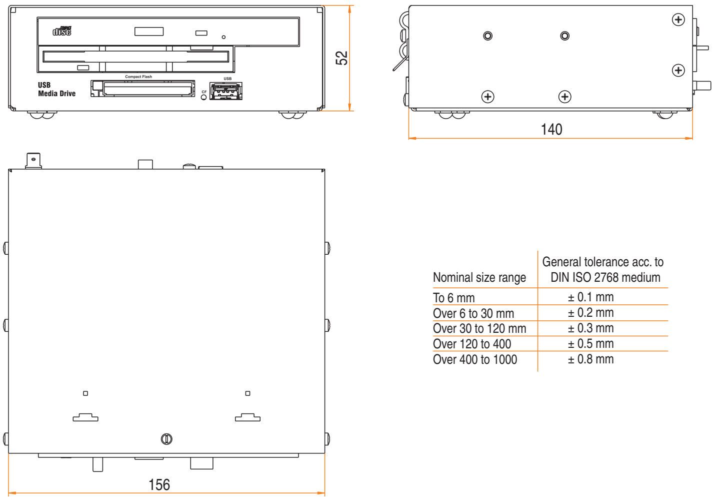
Table 356: Technical data - USB Media Drive 5MD900.USB2-01 (cont.)

Environmental characteristics	5MD900.USB2-01
Vibration Operation Storage 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 Storage Transport	max. 5 g (49 m/s^2 0-peak) and 11 ms length max. 60 g (588 m/s^2 0-peak) and 11 ms length max. 60 g (588 m/s^2 0-peak) and 11 ms length
Altitude	Max. 3000 meters

Table 356: Technical data - USB Media Drive 5MD900.USB2-01 (cont.)

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.

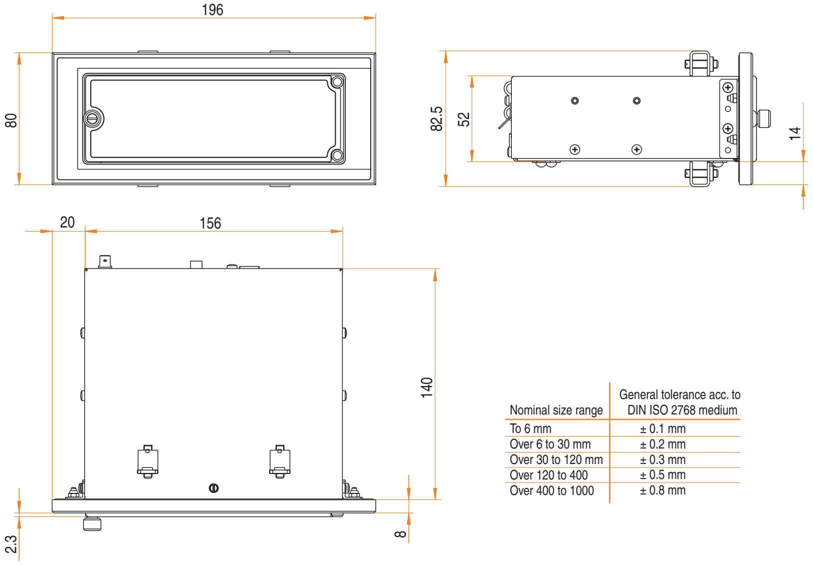
12.3 Dimensions



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 302: Dimensions - 5MD900.USB2-01

12.4 Dimensions with front cover



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 303: Dimensions - USB Media Drive with front cover

12.5 Cutout installation

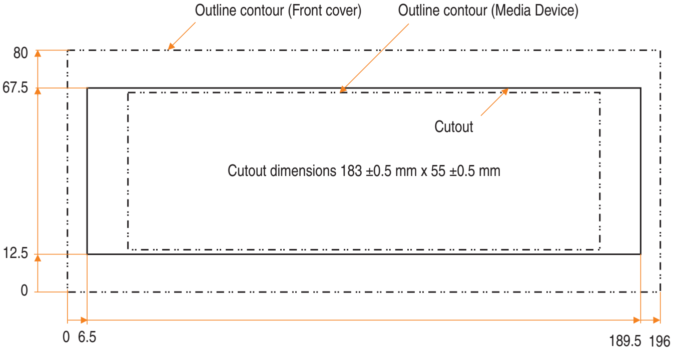

Outline contour (Front cover)
Outline contour (Media Device)
80
67.5
Cutout
Cutout dimensions 183 ±0.5 mm x 55 ±0.5 mm
12.5
0
0
6.5
189.5
196

Figure 304: Installation cutout - USB Media Drive with front cover

12.6 Contents of delivery

Amount	Component
1	USB Media Drive complete unit
2	Mounting rail brackets

Table 357: Contents of delivery - USB Media Drive - 5MD900.USB2-01

12.7 Interfaces

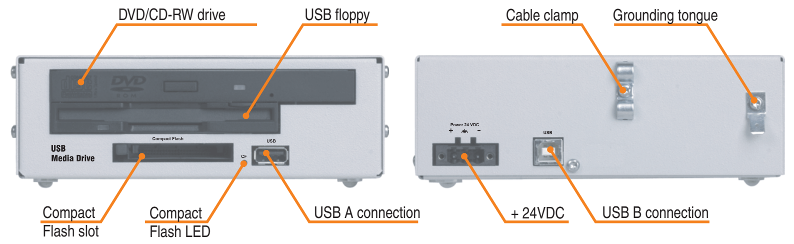


Figure 305: Interfaces - 5MD900.USB2-01

12.8 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).

12.8.1 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.

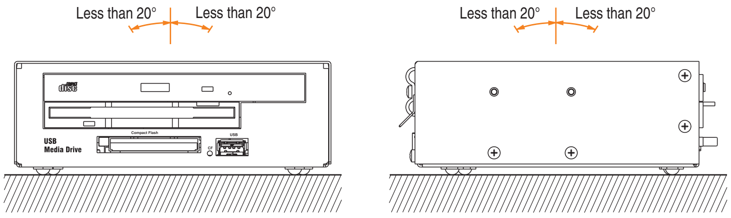


Figure 306: Mounting orientation - 5MD900.USB2-01

12.9 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.

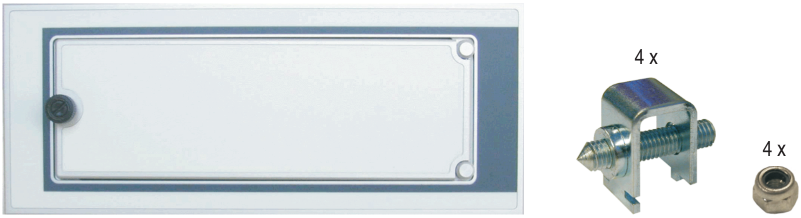


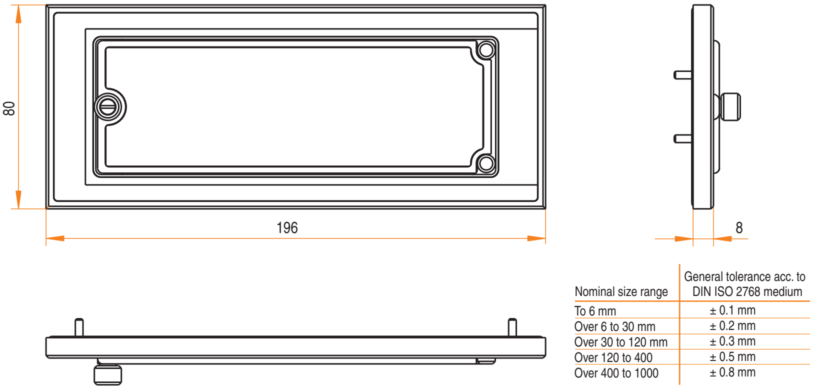
Figure 307: Front cover 5A5003.03

12.9.1 Technical data

Features	5A5003.03
Front cover design / colors Dark gray border around the cover Light gray background	 Pantone 432CV Pantone 427CV

Table 358: Technical data - 5A5003.03

12.9.2 Dimensions

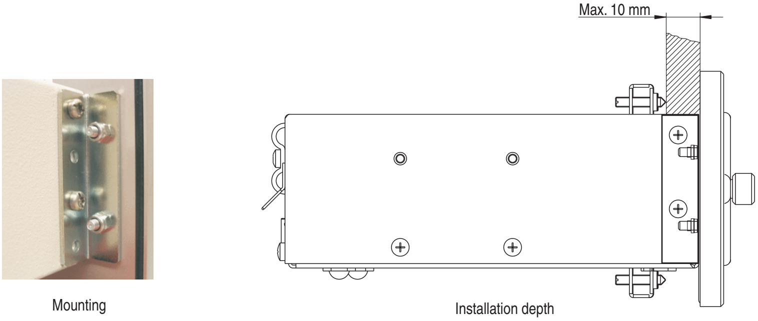


Nominal size range	General tolerance acc. to DIN ISO 2768 medium
To 6 mm	± 0.1 mm
Over 6 to 30 mm	± 0.2 mm
Over 30 to 120 mm	± 0.3 mm
Over 120 to 400	± 0.5 mm
Over 400 to 1000	± 0.8 mm

Figure 308: Dimensions - 5A5003.03

12.9.3 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.



Mounting

Installation depth

Figure 309: Front cover mounting and installation depth

13. 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. As a result, the following measures may be necessary (e.g. using the SanDisk Cruzer Micro flash drive with 512 MB) to take the following measures in order to boot from these flash drives:

- **The flash drive must be reformatted or in some cases even re-partitioned (set active partition).**
- **The flash drive must be at the top of the BIOS boot order, or alternatively the IDE controllers can also be deactivated in the BIOS. This can be avoided in most cases if a "`fdisk /mbr`" command is also executed on the USB flash drive.**

13.1 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. Only USB flash drives from the memory specialists SanDisk are used.

13.2 Order data

Model number	Description	Figure
5MMUSB.2048-00	USB flash drive 2 GB SanDisk Cruzer Micro	

Table 359: Order data - USB flash drives

13.3 Technical data

Information:

The following characteristics, features and limit values only apply to this accessory and can deviate from 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 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)	100000 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 Storage Transport	 0°C .. +45°C -20°C .. +60°C -20°C .. +60°C
Relative humidity Operation Storage Transport	 10% .. 90%, non-condensing 5% .. 90%, non-condensing 5% .. 90%, non-condensing
Vibration Operation Storage 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 Storage Transport	 Max. 40 g (392 m/s^2 0-peak) and 11 ms length 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
Altitude Operation Storage Transport	 3048 meters 12192 meters 12192 meters

Table 360: Technical data - USB flash drive 5MMUSB.2048-00

13.3.1 Temperature humidity diagram - Operation and storage

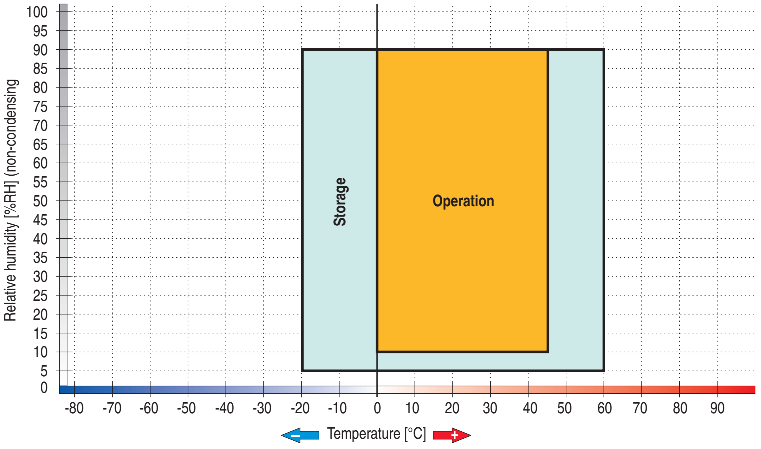


Figure 310: Temperature humidity diagram - USB flash drive - 5MMUSB.2048-00

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).

13.4 Contents of delivery

SanDisk Cruzer Micro
1 USB flash drive in desired size + 2 replacement covers (blue and pink) + 1 strap[1] + +

Table 361: Contents of delivery - USB flash drive 5MMUSB.2048-00

[1] Due to a change in the contents of delivery from the manufacturer, it is possible that the USB flash drive (with white cap) is delivered without the replacement covers or strap.

13.5 Creating a bootable USB flash drive

When used in connection with an Automation PC 810 / Automation PC 620 / Panel PC 700, it is possible to boot the system from one of the 5MMUSB.2048-00 flash drives available from B&R. The flash drive must be specially prepared for this.

13.5.1 Requirements

The following peripherals are required for creating a bootable flash drive:

- B&R USB flash drive (see model numbers for USB flash drives in chapter 1, section 5.7)
- Automation PC 810, Automation PC 620 or Panel PC 700
- USB floppy drive (external or slide-in USB floppy 5AC600.FDDS-00)
- PS/2 or USB keyboard
- A start disk created using MS-DOS 6.22 or Windows 98 - 1.44MB HDD (Windows Millennium, NT4.0, 2000, XP start disks cannot be used).
  The tools "`format.com`" and "`fdisk.exe`" must be located on the diskette!

13.5.2 Procedure

- Plug in the flash drive and boot from the start disk.
- Set active partition on the flash drive using "`fdisk`" and follow the further instructions.
- Reboot the system from the start disk.
- Format and simultaneously transfer the system files to the flash drive with the command "`format c: /s`".

14. HMI Drivers & Utilities DVD 5SWHMI.0000-00

Figure 311: HMI Drivers & Utilities DVD 5SWHMI.0000-00

Model number	Short description	Comment
5SWHMI.0000-00	**HMI Drivers & Utilities DVD**	

Table 362: 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 – Industrial PCs, Visualization and Operation).
Information in detail:

BIOS upgrades for the products

- Automation PC 620
- Panel PC 700
- Automation PC 680
- Provit 2000 product family - IPC2000/2001/2002
- Provit 5000 product family - 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

Drivers for the devices

- Automation Device Interface (ADI)
- Audio
- Chipset
- CD-ROM
- LS120
- Graphics
- Network
- PCI RAID controller
- Touch screen
- Touchpad
- Interface board

Updates

- Firmware upgrades (e.g. MTCX, SMXC)

Utilities/Tools

- Automation Device Interface (ADI)
- Miscellaneous
- MTC utilities
- Key editor
- MTC & Mkey utilities
- Mkey utilities
- UPS configuration software
- ICU ISA configuration
- Intel PCI NIC boot ROM
- Diagnostics
- CompactFlash lifespan calculation for Silicon Systems CompactFlash cards 5CFCRD.xxxx-03

Windows and embedded operating systems

- Thin client
- Windows CE
- Windows NT Embedded
- Windows XP Embedded

MCAD templates for

- Industrial PCs
- Visualization and operating devices
- Legend strip templates

Documentation for

- B&R Windows CE
- Automation PC 620
- Automation PC 680
- Automation Panel 900
- Panel PC 700
- Power Panel 15/21/35/41
- Power Panel 100/200
- Provit 2000
- Provit 3030
- Provit 4000
- Provit 5000
- Provit Benchmark
- Provit Mkey
- Windows NT Embedded application guide
- Windows XP Embedded application guide
- Uninterruptible power supply

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)

15. Cables

15.1 DVI cable 5CADVI.0xxx-00

The DVI cables 5CADVI.0xxx-00 are designed for fixed layout.

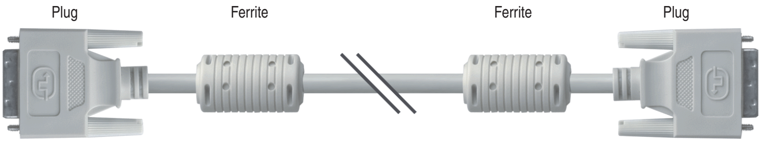


Figure 312: DVI extension cable - 5CADVI.0xxx-00 (similar)

Caution!

The DVI cable can only be plugged in and unplugged when the device is turned off.

15.1.1 Order data

Model number	Description	Comment
5CADVI.0018-00	**DVI-D cable 1.8 m / single** Single cable, DVI-D/m:DVI-D/m; length: 1.8m	
5CADVI.0050-00	**DVI-D cable 5 m / single** Single cable, DVI-D/m:DVI-D/m; length: 5 m	
5CADVI.0100-00	**DVI-D cable 10 m / single** Single cable, DVI-D/m:DVI-D/m; length: 10 m	

Table 363: Model numbers - DVI cables

15.1.2 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. 237Ω/km		
Insulation resistance	Min. 100 MΩ/km		
Flexibility	limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5 x cable diameter, 20 cycles / minute)		
Flex radius Fixed layout	See figure "Flex radius specification" on page 574 ≥ 5 x cable diameter (plug - ferrite magnet and ferrite magnet - ferrite magnet)		
Weight	Approx. 300 g	Approx. 590 g	Approx. 2100 g

Table 364: Technical data - DVI cable 5CADVI.0xxx-00

15.1.3 Flex radius specification

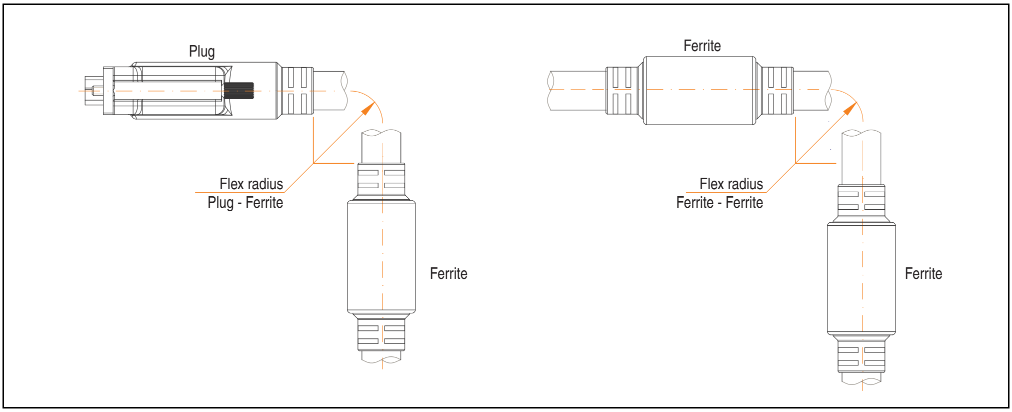


Figure 313: Flex radius specification

15.1.4 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.

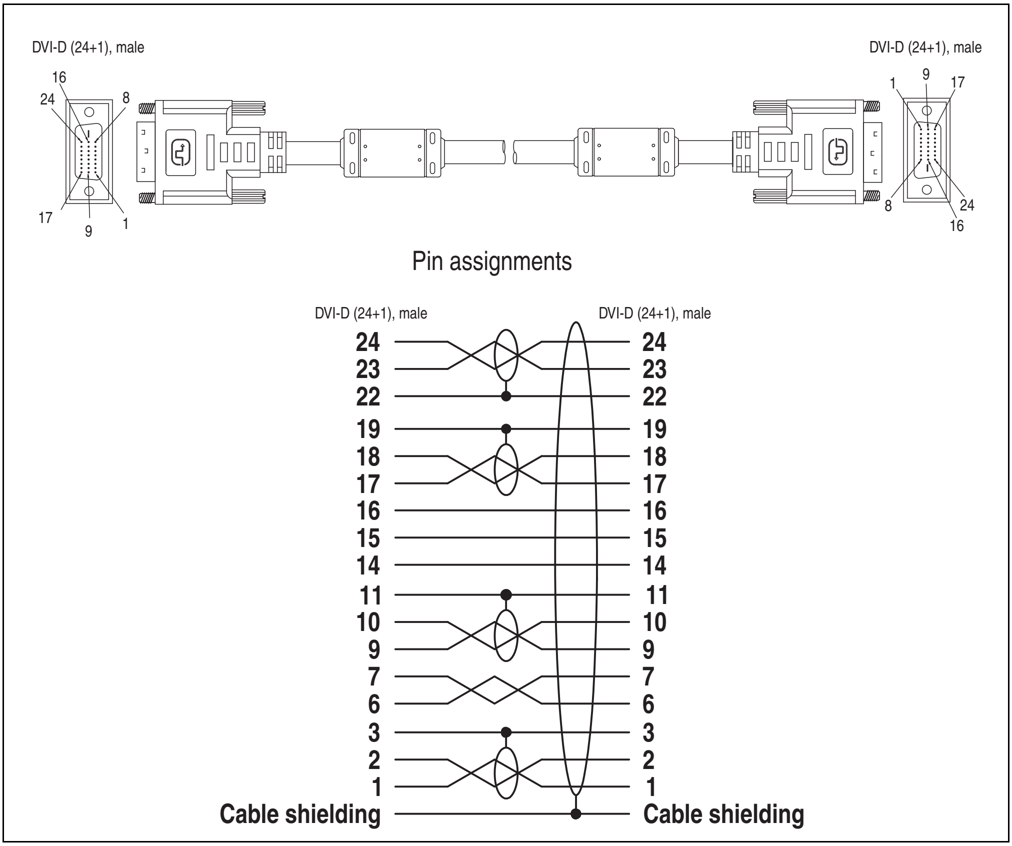


Figure 314: Pin assignments - DVI cable

15.2 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).

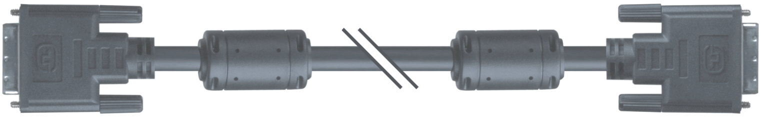


Figure 315: SDL extension cable (similar)

Caution!

The SDl cable can only be plugged in and unplugged when the device is turned off.

15.2.1 Order data

Model number	Description	Comment
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 365: Model numbers - SDL cables

15.2.2 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. 237Ω/km		Max. 93Ω/km				
Insulation resistance	Min. 10 MΩ/km						
Flexibility	limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5 x cable diameter, 20 cycles / minute)						
Flex radius Fixed layout	See figure "Flex radius specification" on page 577 ≥ 5 x 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 366: Technical data - SDL cables 5CASDL.0xxx-00

15.2.3 Flex radius specification

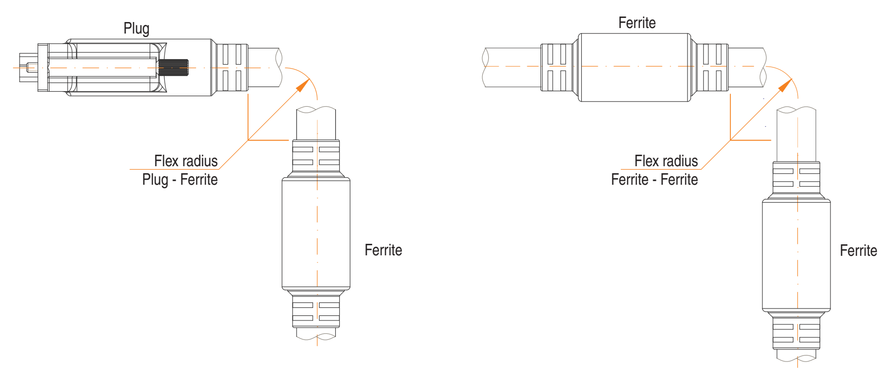


Figure 316: Flex radius specification

15.2.4 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.

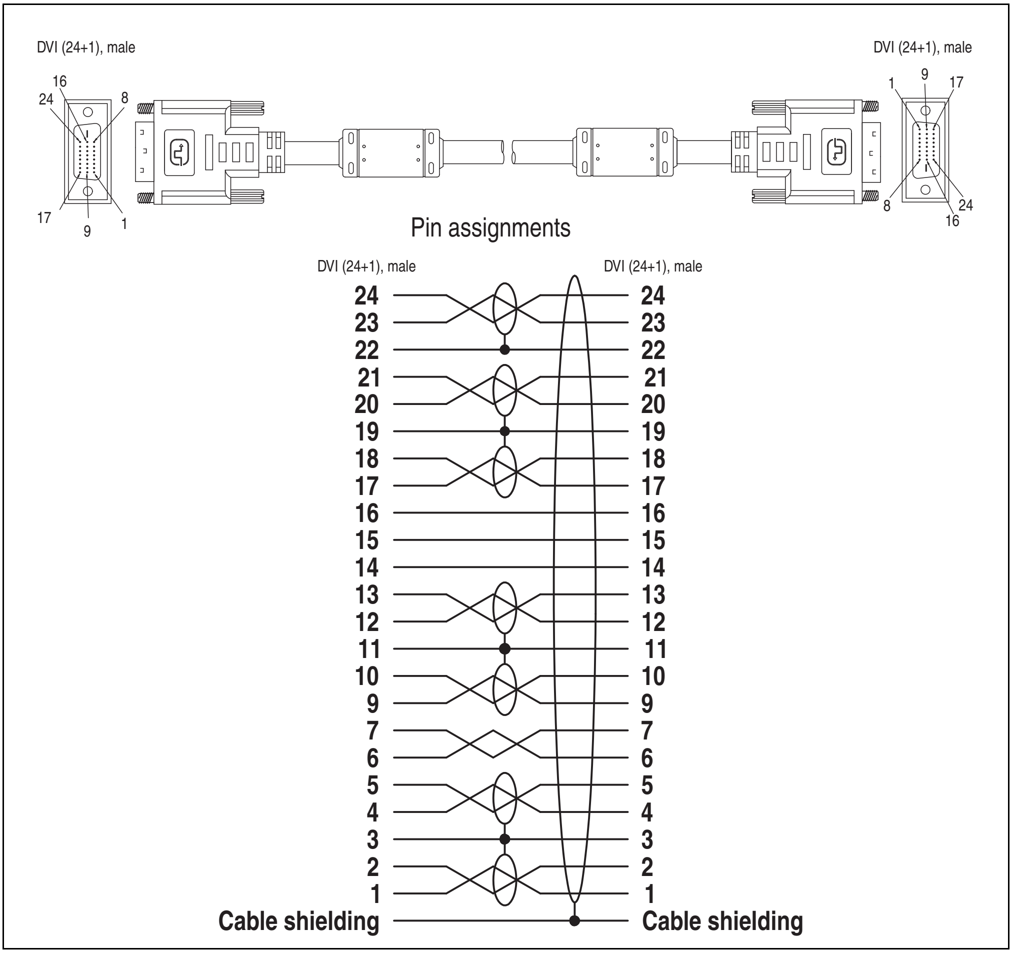


Figure 317: Pin assignments - SDL cable 5CASDL.0xxx-00

15.3 SDL cable with 45° plug 5CASDL.0xxx-01

The SDL cables 5CASDL.0xxx-01 are designed for fixed layout.

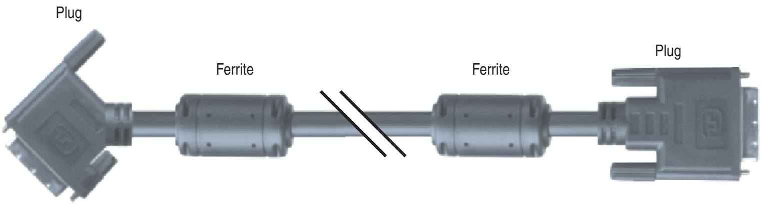


Figure 318: SDL cable with 45° plug (similar)

Caution!

The SDl cable can only be plugged in and unplugged when the device is turned off.

15.3.1 Order data

Model number	Description	Comment
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 367: Model numbers - SDL cables with 45° plug

15.3.2 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. 237Ω/km		Max. 93Ω/km	
Insulation resistance	Min. 10 MΩ/km			
Flexibility	limited flexibility; valid for ferrite magnet - ferrite magnet (tested 100 cycles with 5 x cable diameter, 20 cycles / minute)			
Flex radius Fixed layout	See figure "Flex radius specification" on page 580 ≥ 5 x cable diameter (plug - ferrite magnet and ferrite magnet - ferrite magnet)			
Weight	Approx. 300 g	Approx. 590 g	Approx. 2100 g	Approx. 3000 g

Table 368: Technical data - SDL cable with 45° plug 5CASDL.0xxx-01

15.3.3 Flex radius specification

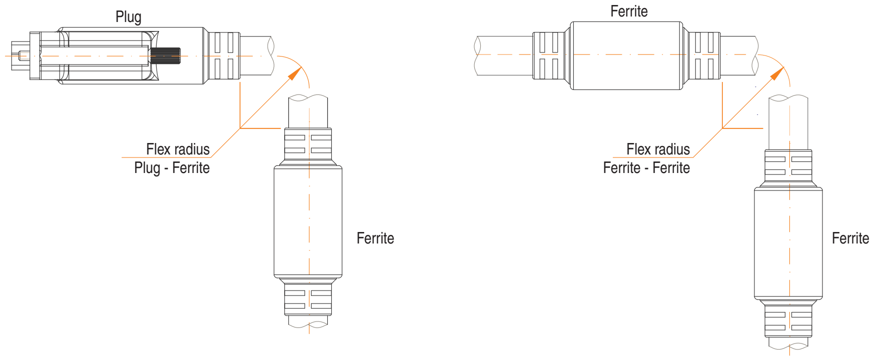


Figure 319: Flex radius specification

15.3.4 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.

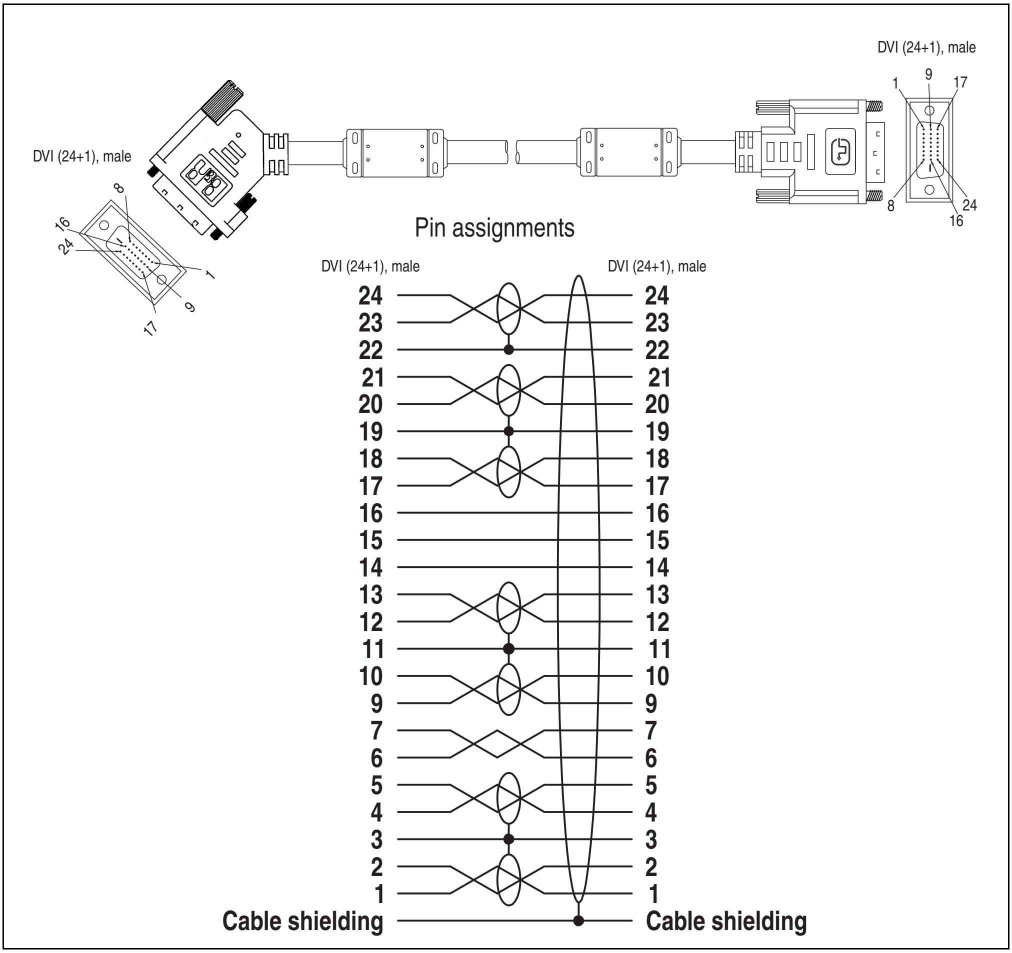


Figure 320: Pin assignments - SDL cable with 45° plug 5CASDL.0xxx-01

15.4 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).

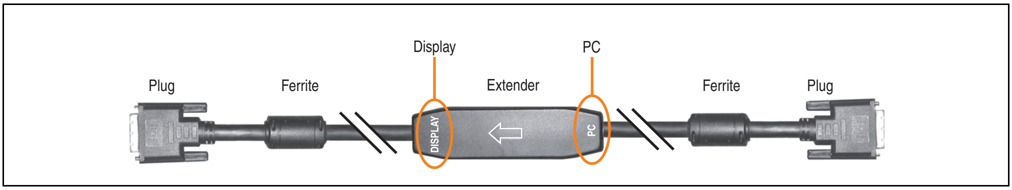


Figure 321: SDL cable with extender - 5CASDL.0x00-10 (similar)

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.

15.4.1 Order data

Model number	Description	Comment
5CASDL.0300-10	**30 m SDL cable with extender** SDL cable with extender for a fixed type of layout; length 30 m	Cancelled since 12/2006 Replaced by 5CASDL.0300-13
5CASDL.0400-10	**40 m SDL cable with extender** SDL cable with extender for a fixed type of layout; length 40 m	Cancelled since 12/2006 Replaced by 5CASDL.0400-13

Table 369: Model numbers - SDL cable with extender

15.4.2 Technical data

Features	5CASDL.0300-10	5CASDL.0400-10
Length Tolerance	30 m ±200 mm	40 m ±200 mm
Dimensions of 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. 93Ω/km	
Insulation resistance	Min. 10 MΩ/km	

Table 370: 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 5 x cable diameter, 20 cycles / minute)	
Flex radius Fixed layout	See figure "Flex radius specification" on page 583 ≥ 5 x cable diameter (from plug - ferrite magnet and ferrite magnet - extender)	
Weight	Approx. 6100 g	Approx. 8100 g

Table 370: Technical data - SDL cable with extender 5CASDL.0x00-10 (cont.)

15.4.3 Flex radius specification

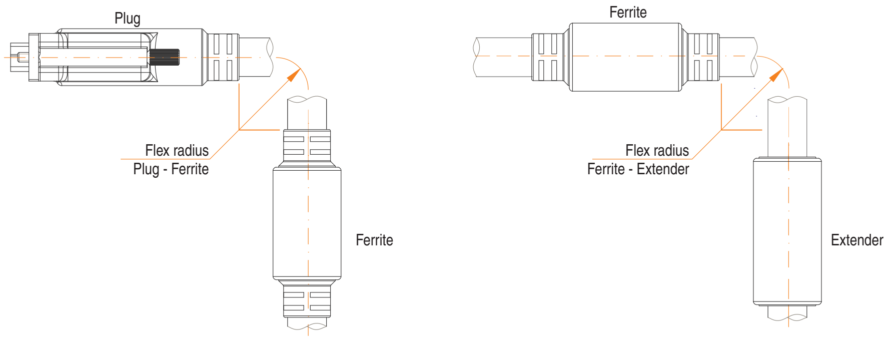


Figure 322: Flex radius specification

15.4.4 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.

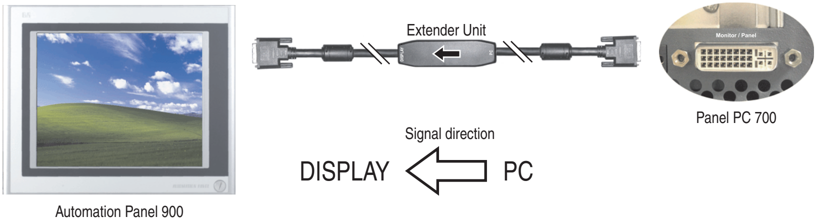


Figure 323: Example of the signal direction for the SDL cable with extender - PPC700

15.4.5 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.

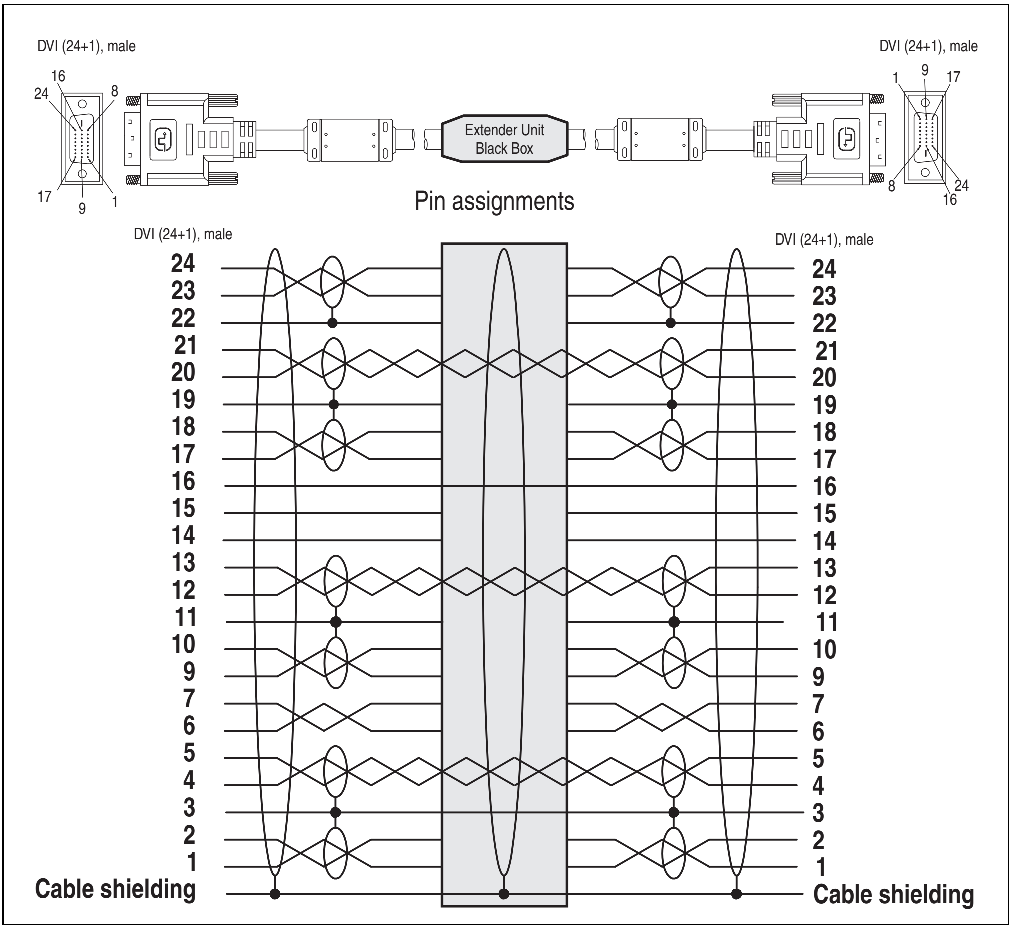


Figure 324: Pin assignments - SDL cable with extender 5CASDL.0x00-10

15.5 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).

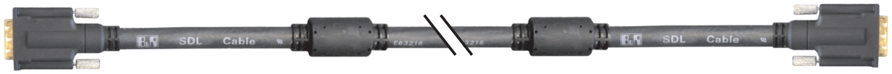


Figure 325: SDL cable 5CASDL.0xxx-03 (similar)

Caution!

The SDI cable can only be plugged in and unplugged when the device is turned off.

15.5.1 Order data

Model number	Description	Comment
5CASDL.0018-03	**1.8 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 1.8 m	
5CASDL.0050-03	**5 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 5 m	
5CASDL.0100-03	**10 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 10 m	
5CASDL.0150-03	**15 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 15 m	
5CASDL.0200-03	**20 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 20 m	
5CASDL.0250-03	**25 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 25 m	
5CASDL.0300-03	**30 m flex SDL cable** SDL cable for fixed and flexible type of layout; length: 30 m	

Table 371: Model numbers - SDL cable 5CASDL.0xxx-03

15.5.2 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 ±230 mm	30 m ±280 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 shielding Color	RoHS compliant Aluminum foil clad + tinned copper mesh Black (similar to RAL 9005)						
Flexibility	flexible; valid for ferrite magnet - ferrite magnet (tested 300000 cycles with 15 x cable diameter, 4800 cycles / hour)						
Flex radius Fixed layout flexible installation	See figure "Flex radius specification" on page 587 ≥ 6 x cable diameter (from plug - ferrite magnet) ≥ 10 x cable diameter (from ferrite magnet - ferrite magnet) ≥ 15 x cable diameter (from 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 Storage	-20°C .. +80°C -5°C .. +60°C -20°C .. +80°C						
Standards and certifications							
Torsion load	100000 cycles (tested angle of rotation: ± 85°; speed: 50 cycles / minute)						

Table 372: Technical data - SDL cable 5CASDL.0xxx-03

Cable drag chain	300000 cycles Tested flex radius: 180 mm;15 x cable diameter; hub: 460 mm; speed: 4800 cycles / hour						
Standards and certifications	**5CASDL.0018-03**	**5CASDL.0050-03**	**5CASDL.0100-03**	**5CASDL.0150-03**	**5CASDL.0200-03**	**5CASDL.0250-03**	**5CASDL.0300-03**
Approbation	UL AWM 20236 80°C 30 V						
Oil and hydrolysis resistance	According to VDE 0282-10						

Table 372: Technical data - SDL cable 5CASDL.0xxx-03 (cont.)

15.5.3 Flex radius specification

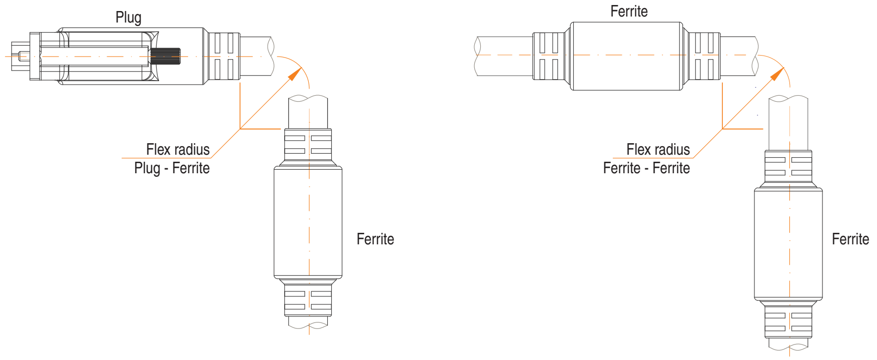


Figure 326: Flex radius specification

15.5.4 Dimensions

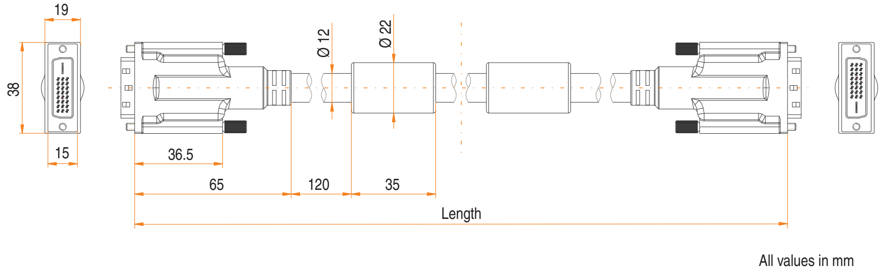


Figure 327: Dimensions - SDL cable 5CASDL.0xxx-03

15.5.5 Construction

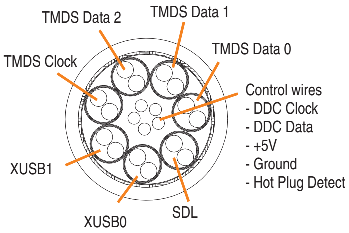
Element	Assignment	Cross section	
DVI	TMDS data 0	26 AWG	 TMDS Data 2 TMDS Data 1 TMDS Data 0 TMDS Clock Control wires - DDC Clock - DDC Data - +5V - Ground - Hot Plug Detect XUSB1 XUSB0 SDL Schematic display
	TMDS data 1	26 AWG	
	TMDS data 2	26 AWG	
	TMDS cycle	26 AWG	
USB	XUSB0	26 AWG	
	XUSB1	26 AWG	
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	

Table 373: Structure - SDL cable 5CASDL.0xxx-03

15.5.6 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.

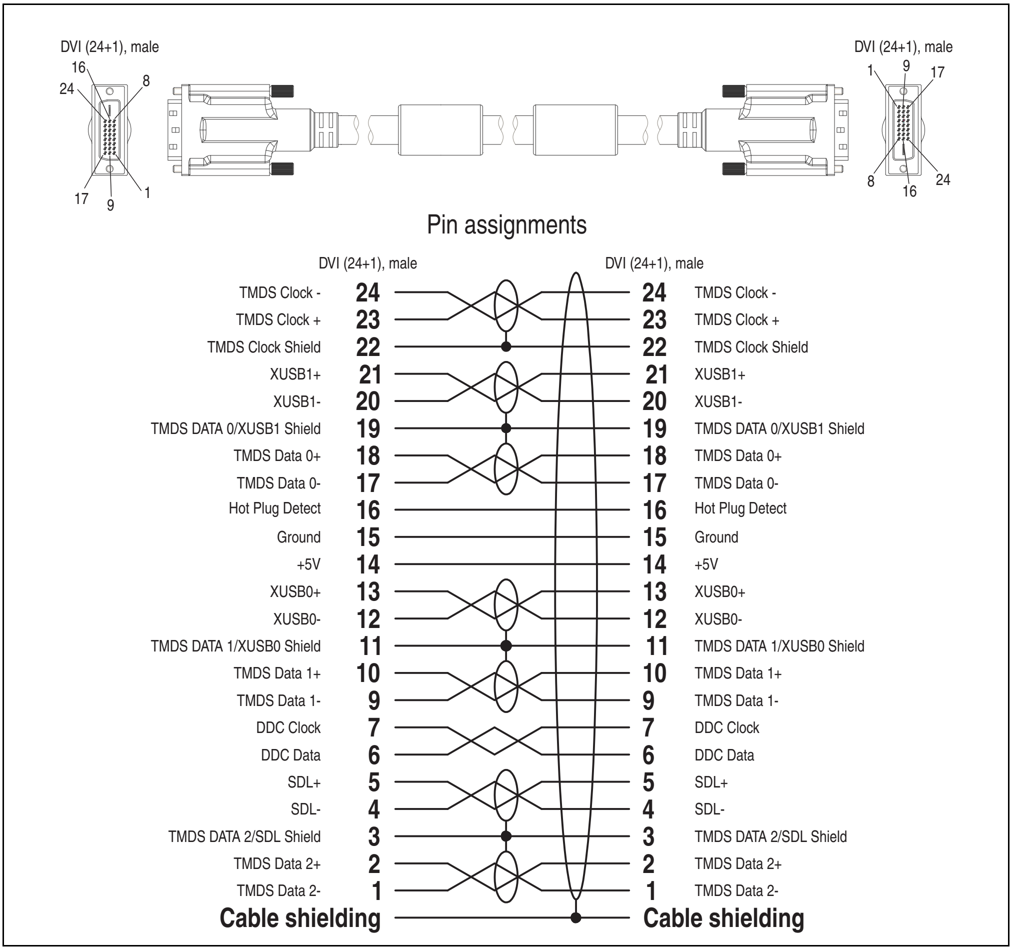

DVI (24+1), male
16
24
8
17
9
1
DVI (24+1), male
1
9
17
8
16
24
Pin assignments
DVI (24+1), male
DVI (24+1), male
TMDS Clock - 24 — 24 TMDS Clock -
TMDS Clock + 23 — 23 TMDS Clock +
TMDS Clock Shield 22 — 22 TMDS Clock Shield
XUSB1+ 21 — 21 XUSB1+
XUSB1- 20 — 20 XUSB1-
TMDS DATA 0/XUSB1 Shield 19 — 19 TMDS DATA 0/XUSB1 Shield
TMDS Data 0+ 18 — 18 TMDS Data 0+
TMDS Data 0- 17 — 17 TMDS Data 0-
Hot Plug Detect 16 — 16 Hot Plug Detect
Ground 15 — 15 Ground
+5V 14 — 14 +5V
XUSB0+ 13 — 13 XUSB0+
XUSB0- 12 — 12 XUSB0-
TMDS DATA 1/XUSB0 Shield 11 — 11 TMDS DATA 1/XUSB0 Shield
TMDS Data 1+ 10 — 10 TMDS Data 1+
TMDS Data 1- 9 — 9 TMDS Data 1-
DDC Clock 7 — 7 DDC Clock
DDC Data 6 — 6 DDC Data
SDL+ 5 — 5 SDL+
SDL- 4 — 4 SDL-
TMDS DATA 2/SDL Shield 3 — 3 TMDS DATA 2/SDL Shield
TMDS Data 2+ 2 — 2 TMDS Data 2+
TMDS Data 2- 1 — 1 TMDS Data 2-
Cable shielding — Cable shielding

Figure 328: Pin assignments - SDL cable 5CASDL.0xxx-03

15.6 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).

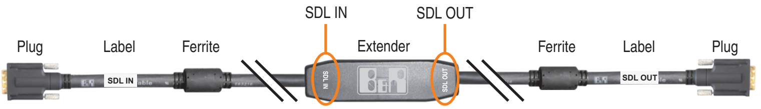


Figure 329: SDL flex cable with extender - 5CASDL.0x00-13 (similar)

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).

15.6.1 Order data

Model number	Description	Comment
5CASDL.0300-13	**30 m SDL flex cable with extender** SDL cable with extender for fixed and flexible type of layout; length: 30 m	
5CASDL.0400-13	**40 m SDL flex cable with extender** SDL cable with extender for fixed and flexible type of layout; length: 40 m	

Table 374: Model numbers - SDL flex cable with extender

15.6.2 Technical data

Features	5CASDL.0300-13	5CASDL.0400-13
Length Tolerance	30 m ±200 mm	40 m ±200 mm
Dimensions of 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 375: Technical data - SDL flex cable with extender 5CASDL.0x00-13

Features	5CASDL.0300-13	5CASDL.0400-13
Materials	RoHS compliant	
Cable shielding	Aluminum foil clad + tinned copper mesh	
Color	Black (similar to RAL 9005)	
Flexibility	flexible; valid for ferrite magnet - ferrite magnet (tested 300000 cycles with 15 x cable diameter, 4800 cycles / hour)	
Flex radius	See figure "Flex radius specification" on page 592	
Fixed layout	≥ 6 x cable diameter (from plug - ferrite magnet) ≥ 10 x cable diameter (from ferrite magnet - extender)	
flexible installation	≥ 15 x cable diameter (from 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	≤ 95 Ω/km	
26 AWG	≤ 145 Ω/km	
Insulation resistance	> 200 MΩ/km	
Wave impedance	100 ± 10 Ω	
Test voltage		
Wire/wire	1 kV_{eff}	
Wire/shield	0.5 kV_{eff}	
Operating voltage	≤ 30 V	
Environmental characteristics		
Temperature resistance		
Fixed installation	-20°C .. +60°C	
Moving	-5°C .. +60°C	
Storage	-20°C .. +60°C	
Standards and certifications		
Torsion load	100000 cycles (tested angle of rotation: ± 85°; speed: 50 cycles / minute)	
Cable drag chain	300000 cycles Tested flex radius: 180 mm;15 x 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 375: Technical data - SDL flex cable with extender 5CASDL.0x00-13 (cont.)

15.6.3 Flex radius specification

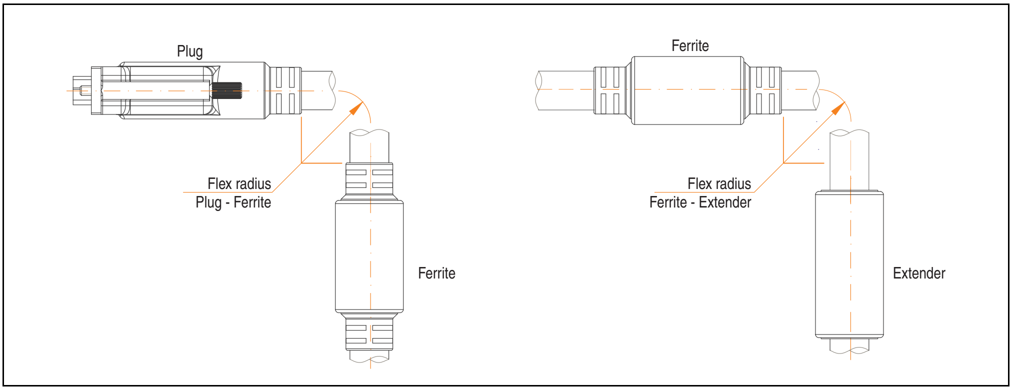


Figure 330: Flex radius specification

15.6.4 Dimensions

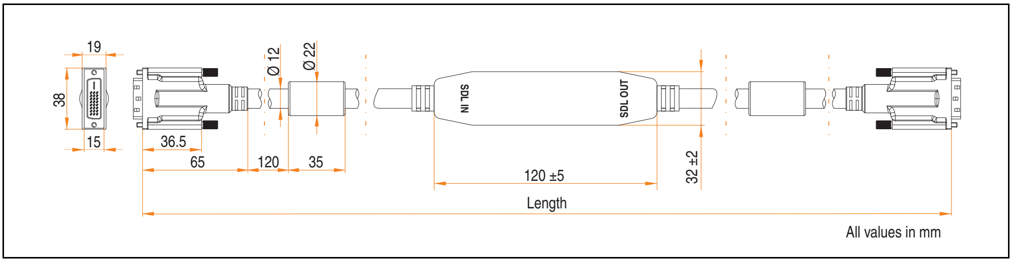


Figure 331: Dimensions - SDL flex cable with extender 5CASDL.0x00-13

15.6.5 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).

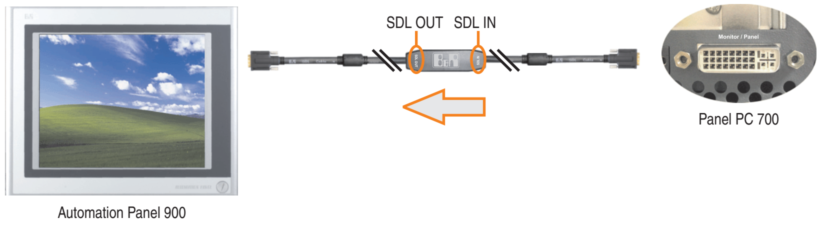


Figure 332: Example of the signal direction for the SDL flex cable with extender - PPC700

15.6.6 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.

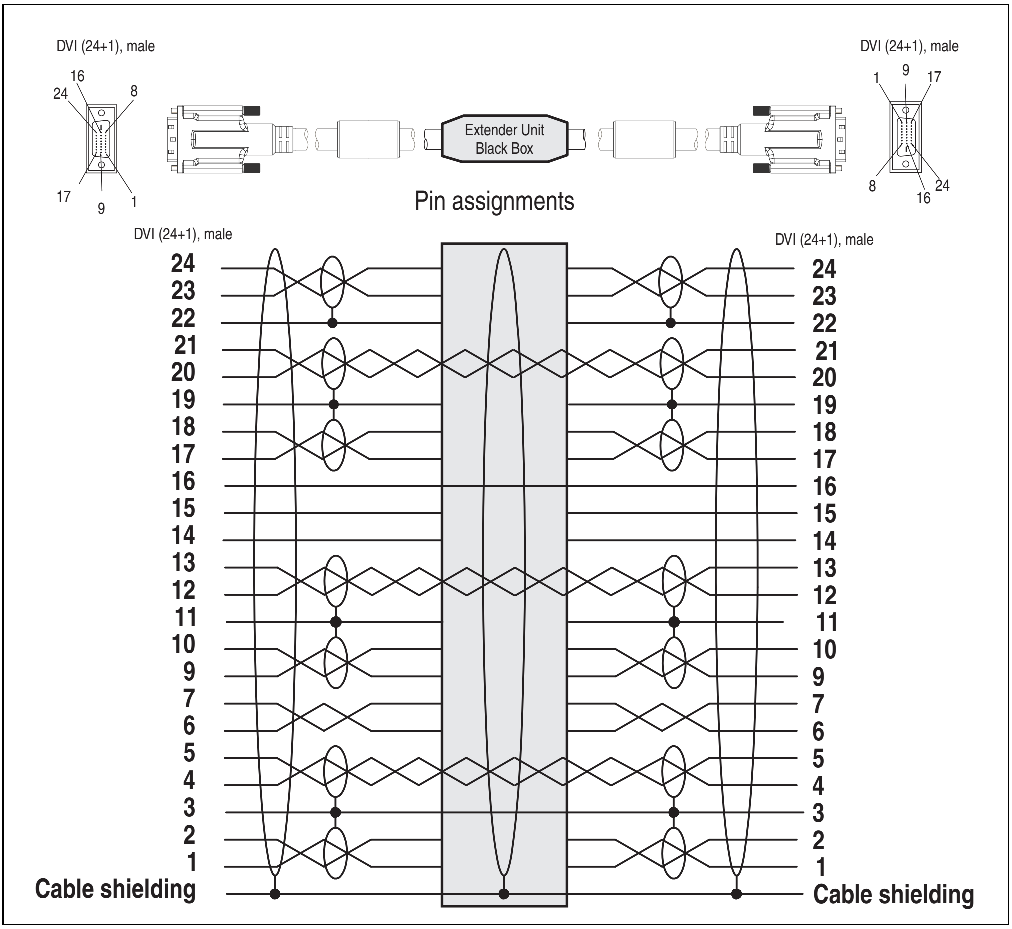


Figure 333: Pin assignments - SDL flex cable with extender 5CASDL.0x00-13

15.7 RS232 cable

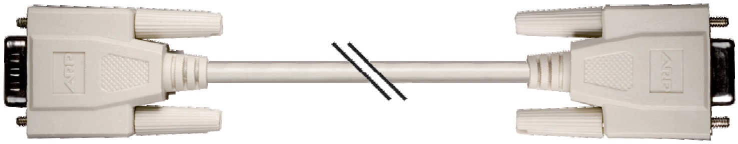


Figure 334: RS232 extension cable (similar)

15.7.1 Order data

Model number	Description	Comment
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 376: Model numbers - RS232 cables

15.7.2 Technical data

Features	9A0014.02	9A0014.05	9A0014.10
Length	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 377: Technical data - RS232 cables

15.7.3 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.

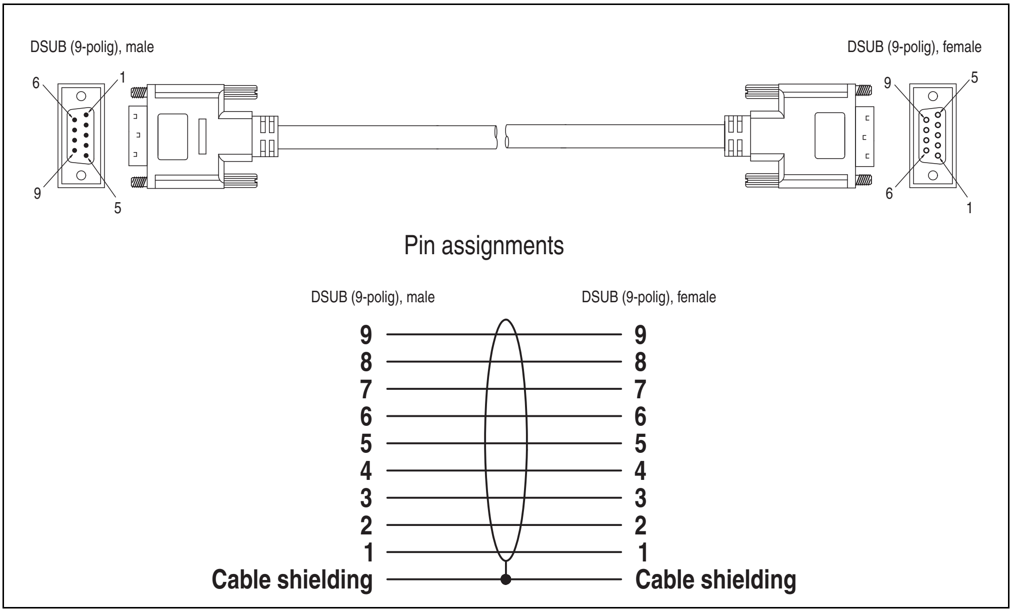


Figure 335: Pin assignments - RS232 cable

15.8 USB cable

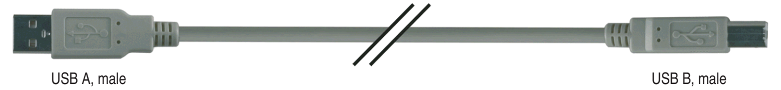


Figure 336: USB extension cable (similar)

15.8.1 Order data

Model number	Description	Comment
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 378: Model numbers - USB cables

15.8.2 Technical data

Features	5CAUSB.0018-00	5CAUSB.0050-00
Length	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 379: Technical data - USB cables

15.8.3 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.

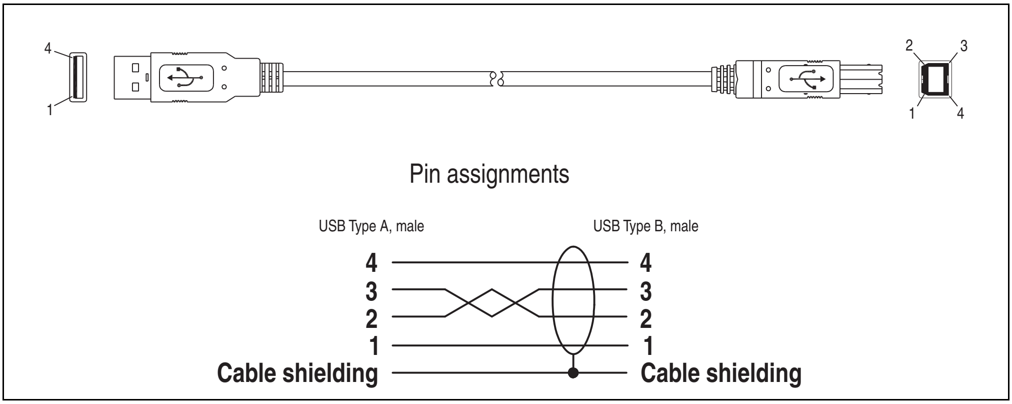


Figure 337: Pin assignments - USB cable

16. 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).

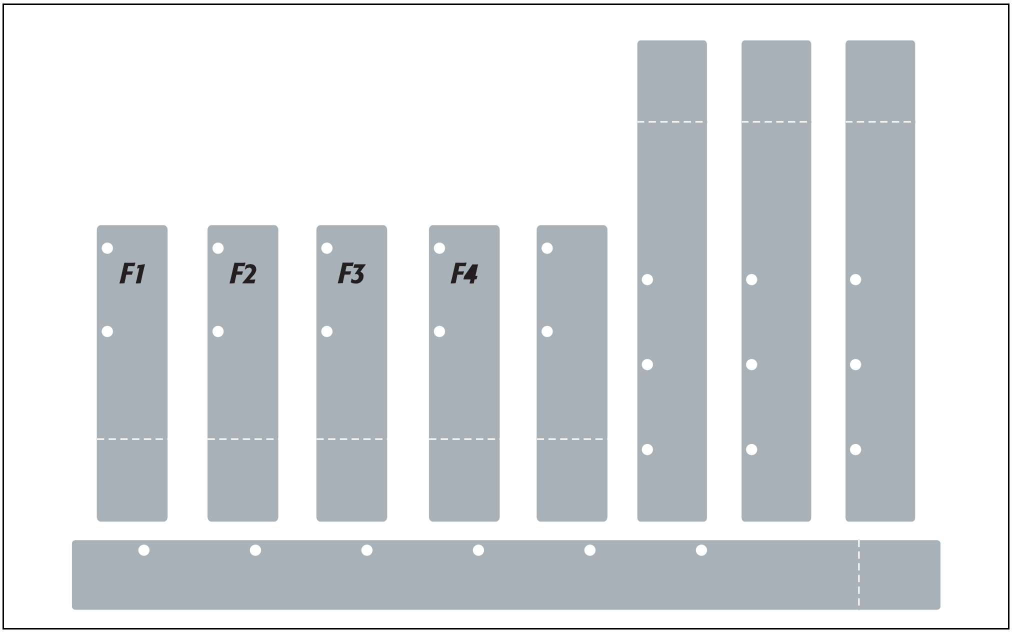


Figure 338: Legend strip templates

Printable legend strips (A4 format) can be ordered from B&R (see table 19 "Model numbers - Other items" on page 36). 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).

16.1 Order data

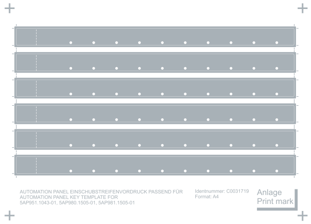
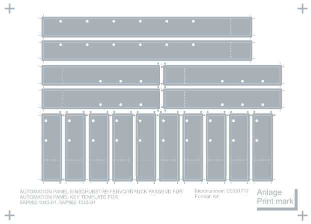
Model number	Description	Figure
5AC900.104X-00	**Legend strip template 10.4" portrait format** Legend strip template for Panel PC 700 system unit 5PC781.1043-00. For 1 device.	Examples of legend strip templates  AUTOMATION PANEL EINSCHUBSTREIFENVORDRUCK PASSEND FÜR AUTOMATION PANEL KEY TEMPLATE FOR 5AP951.1043-01, 5AP980.1505-01, 5AP981.1505-01 Identnummer: C0031719 Format: A4 Anlage Print mark  AUTOMATION PANEL EINSCHUBSTREIFENVORDRUCK PASSEND FÜR AUTOMATION PANEL KEY TEMPLATE FOR 5AP952.1043-01, 5AP982.1043-01 Identnummer: C0031717 Format: A4 Anlage Print mark
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 380: Order data - Legend strip templates

17. Replacement fan filter

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.

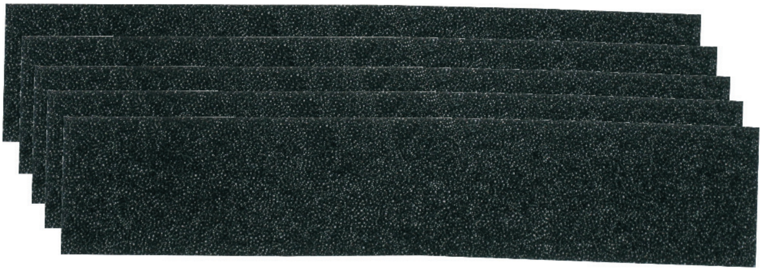


Figure 339: Replacement fan

17.1 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).

17.2 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).

18. Ethernet PCI interface cards

18.1 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.

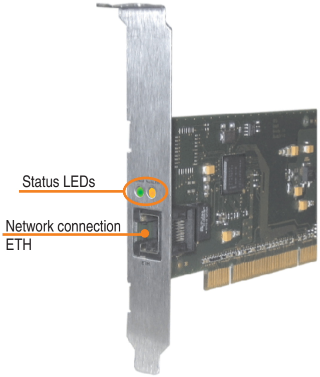


Figure 340: PCI Ethernet card 10/100 - 5ACPCI.ETH1-01

18.1.1 Technical data

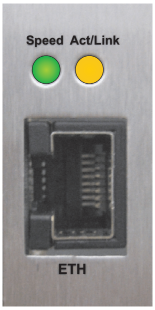
Ethernet connection			
Controller	Intel 82551ER		RJ45 twisted pair (10BaseT/100BaseT), female 
Power supply	Universal card (2 notches) for 3.3 V or 5 V		
Cabling	S/STP (Cat5e)		
Transfer rate	10/100 MBit/s 1)		
Cable length	max. 100 m (min. Cat5e)		
LED	**On**	**Off**	
Green	100 MBit/s	10 MBit/s	
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)	

Table 381: Ethernet connection ETH

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

18.1.2 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.

18.1.3 Dimensions

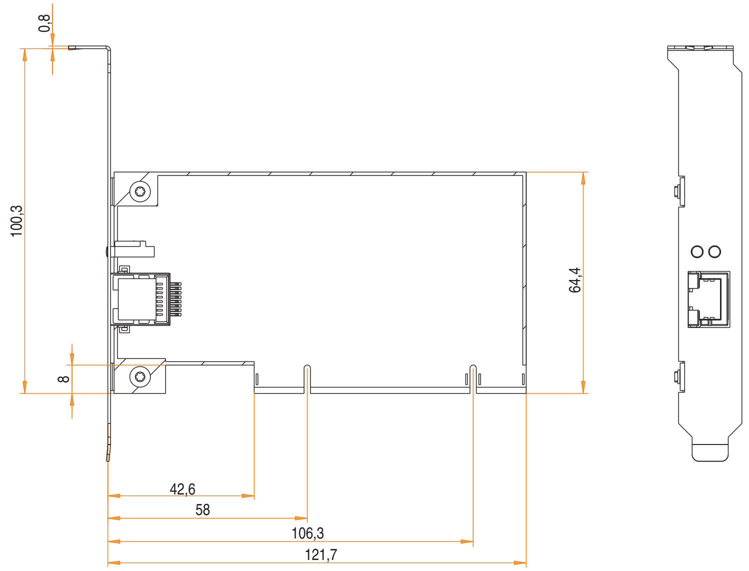


Figure 341: Dimensions - 5ACPCI.ETH1-01

18.2 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.

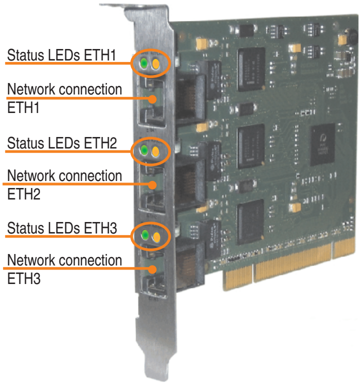


Figure 342: PCI Ethernet card 10/100 - 5ACPCI.ETH3-01

18.2.1 Technical data

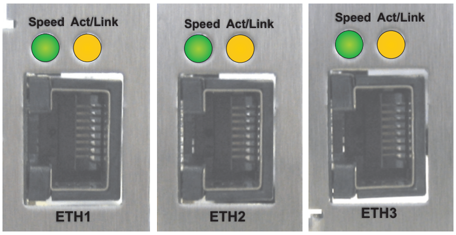
<table>
<tr><th colspan="4">Ethernet connections</th></tr>
<tr><td>Controller</td><td colspan="2">each with Intel 82551ER</td><td rowspan="8">3 x RJ45 twisted pair (10BaseT/100BaseT), female
 </td></tr>
<tr><td>Power supply</td><td colspan="2">Universal card (2 notches)
for 3.3 V or 5 V</td></tr>
<tr><td>Cabling</td><td colspan="2">each S/STP (Cat5e)</td></tr>
<tr><td>Transfer rate</td><td colspan="2">each 10/100 MBit/s 1)</td></tr>
<tr><td>Cable length</td><td colspan="2">each max. 100 m (min. Cat5e)</td></tr>
<tr><th>LED</th><th>On</th><th>Off</th></tr>
<tr><td>Green</td><td>100 MBit/s</td><td>10 MBit/s</td></tr>
<tr><td>Orange</td><td>Link
(Ethernet network connection available)</td><td>Activity (blinking)
(Data transfer in progress)</td></tr>
</table>

Table 382: Ethernet connections ETH1, ETH2, ETH3

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

18.2.2 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.

18.2.3 Dimensions

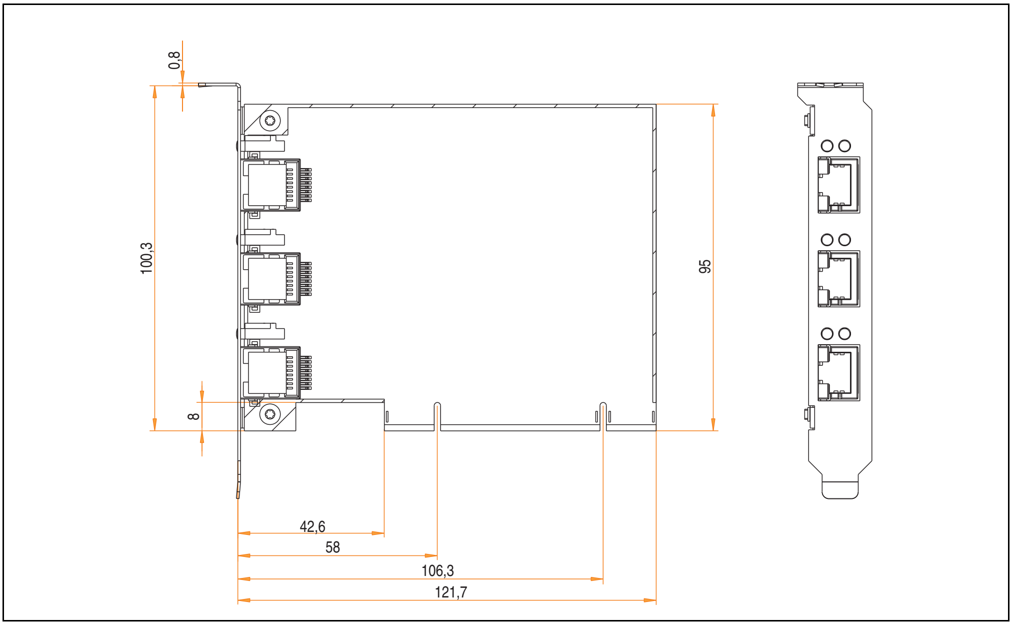


Figure 343: Dimensions - 5ACPCI.ETH3-01

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 of the supplied components and a self discharge of 40%).

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 383: 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)
- 0AC201.9 (5 pieces)

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.**

1.2 Procedure

- Disconnect the power supply to the Panel PC 700 (also see information on page 607).
- 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.

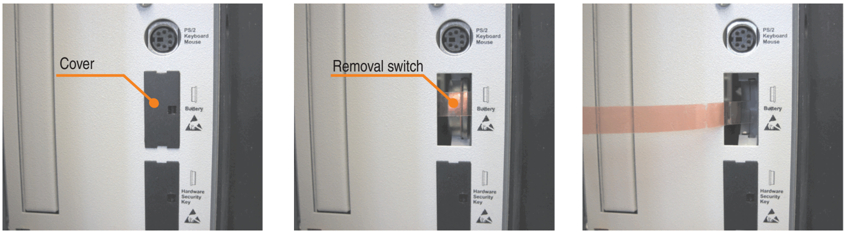


Figure 344: Battery removal

- 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.

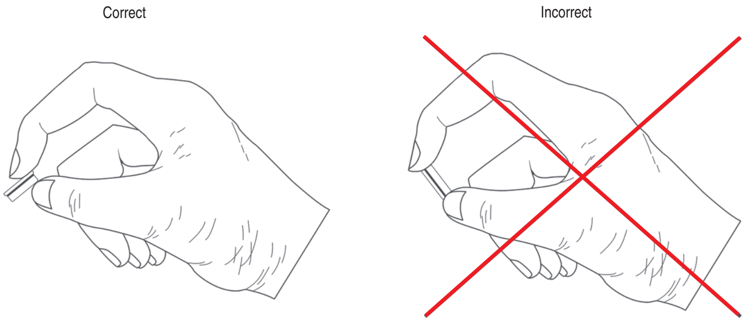


Figure 345: Battery handling

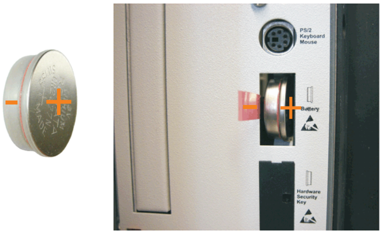


Figure 346: Battery polarity

- 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 607).
- Reset the data and time in BIOS (see information on page 607).

Warning!

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

2. Fan kit installation and replacement

2.1 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.

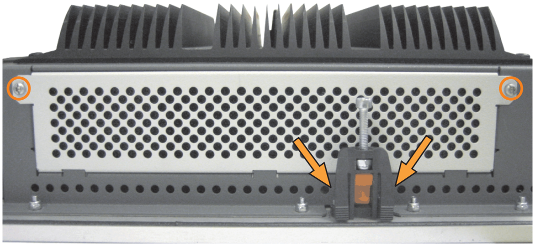


Figure 347: Removing the fan kit cover

- There are two arrows on the fans that indicate the direction of air flow and the direction of fan rotation.

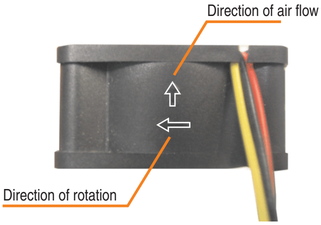


Figure 348: Marking for direction of airflow / fan rotation

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.

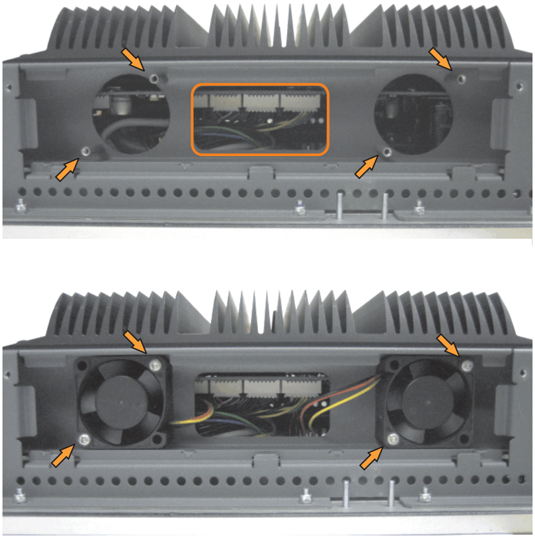


Figure 349: Fan Installation

- 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).

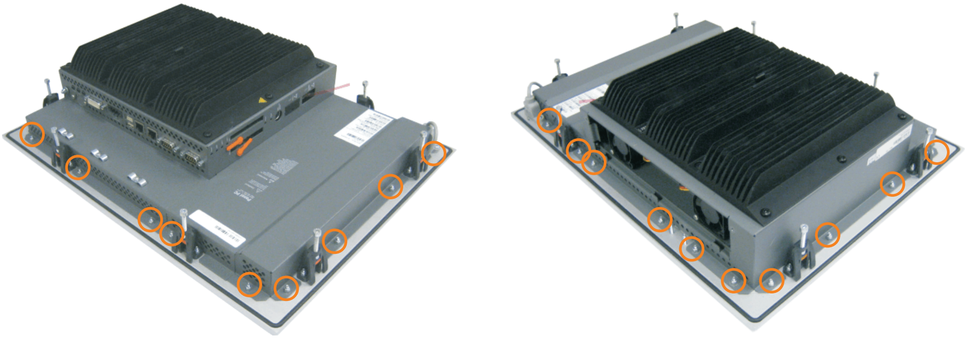


Figure 350: Removing the cover

- 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).

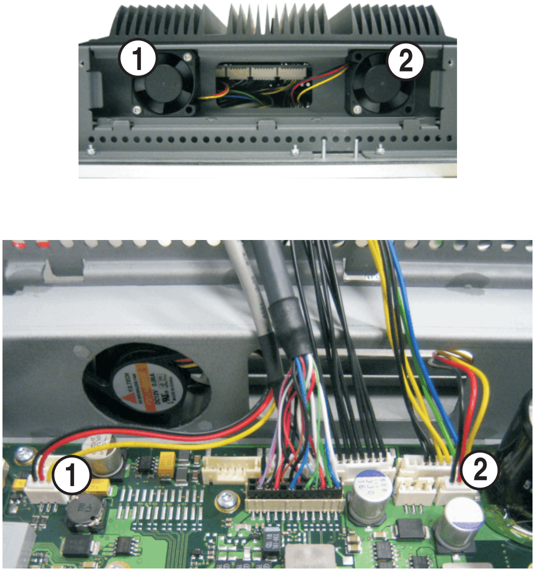


Figure 351: Fan cable connection on the main board

- Place dust filter in the fan kit cover and replace removed components (cover, filter kit cover) in reverse order.

2.2 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.

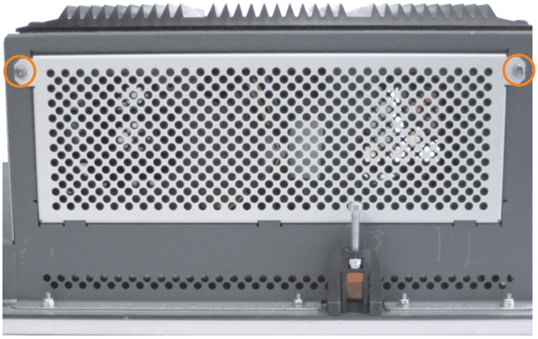


Figure 352: Removing the fan kit cover

- 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.

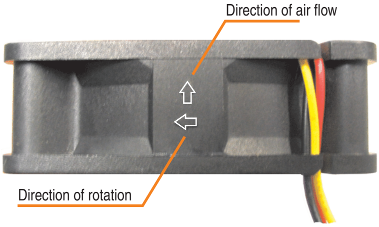


Figure 353: Marking for direction of airflow / fan rotation

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.

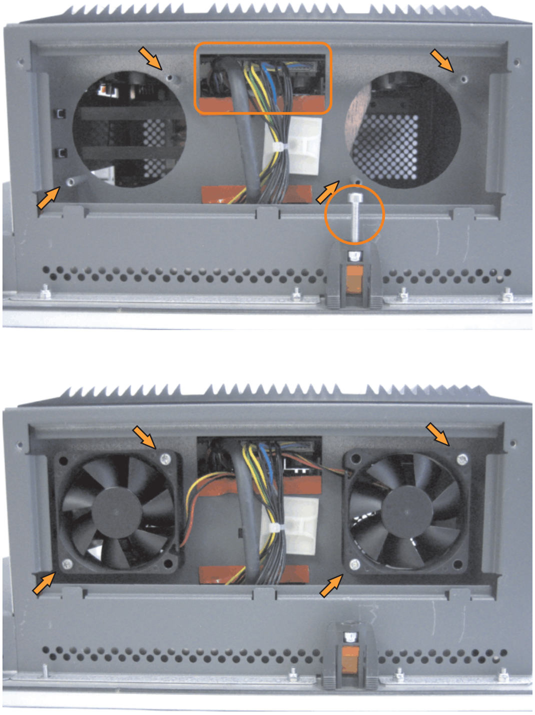


Figure 354: Fan Installation

- 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.

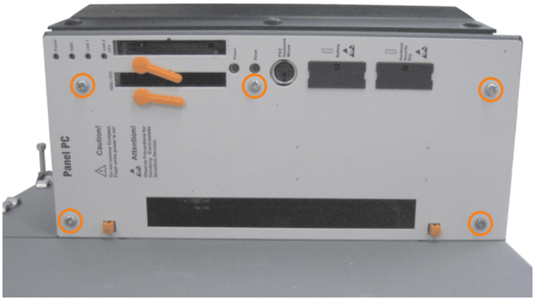


Figure 355: Removing the side cover

- 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).

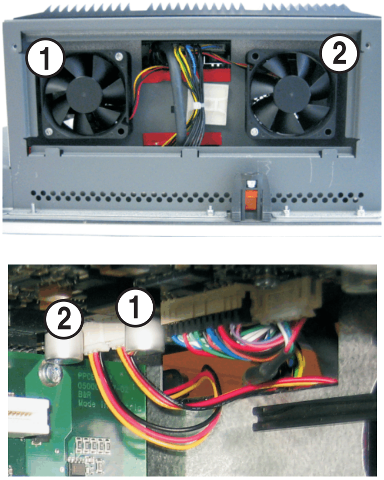


Figure 356: Fan cable connection on the main board

- 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.

3. Slide-in drive - installation and exchange

A slide-in drive can be installed and exchanged in system units with 1 or 2 PCI slots.

3.1 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).

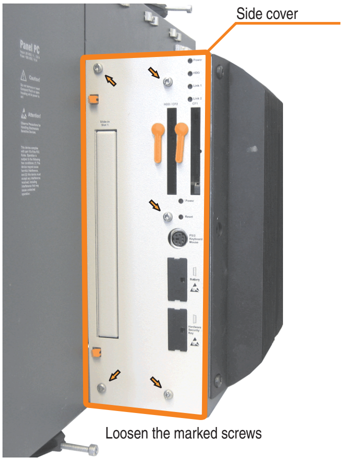


Figure 357: Example - Side cover removal on the system unit 5PC720.1505-02

- Remove the slide-in dummy module.

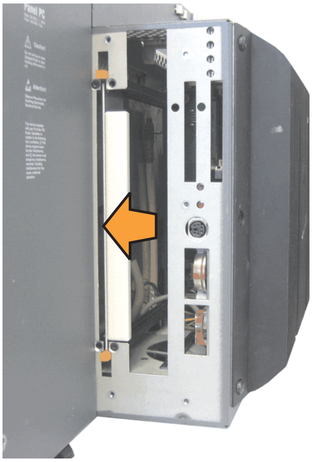


Figure 358: Removing the slide-in dummy module

- Insert the slide-in drive.

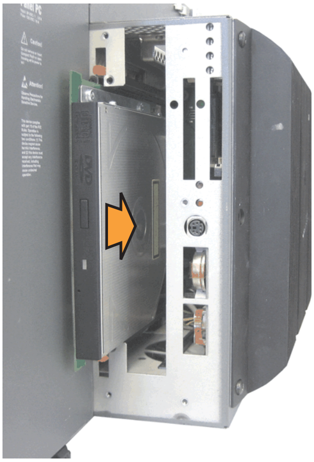


Figure 359: Installing the slide-in drive

- Attach the side cover.

3.2 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).

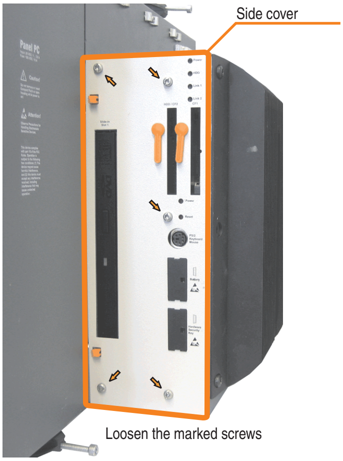


Figure 360: Example - Side cover removal on the system unit 5PC720.1505-02

- Remove both slide-in slot releasing mechanisms outwards. The slide-in drive is pushed a few mm upwards for easy removal.

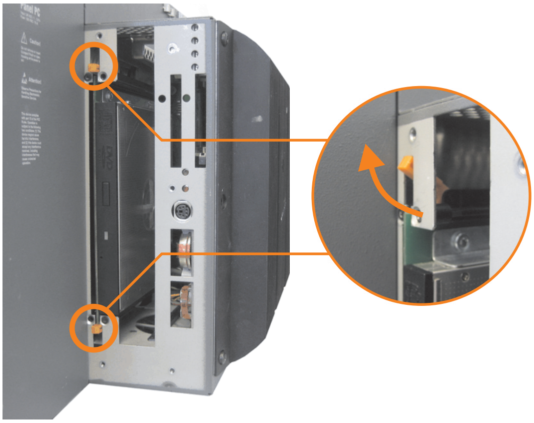


Figure 361: Release the slide-in slot releasing mechanisms

- Removing the slide-in drive.
- Move the slide-in slot releasing mechanism to the start position and insert the new slide-in drive.

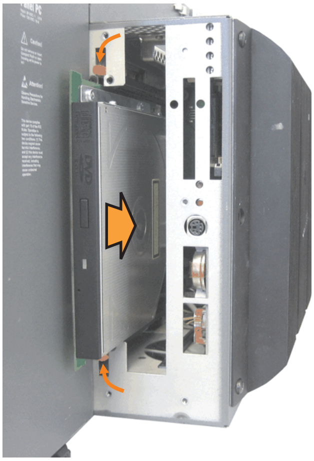


Figure 362: Installing the slide-in drive

- Attach the side cover.

4. Exchanging the legend strips

The function keys can be individually labeled by simply exchanging the legend strips (see "Legend strip templates" on page 599). The designated slots for the legend strips can be accessed on the back of the PPC700 device.

4.1 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.

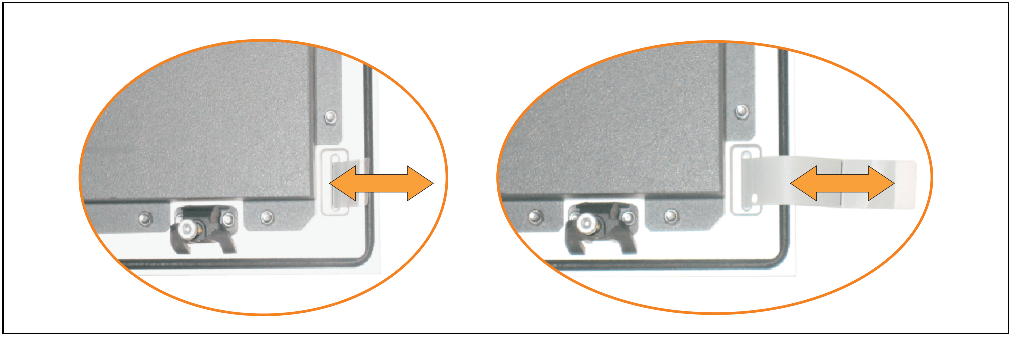


Figure 363: Exchange legend strips

5. Preventing burn-in effect in LCD/TFT monitors

Burn-in effect (after images, display memory effect, image retention or also image sticking) occurs in LCD/TFT monitors when a static image is displayed for a long period of time. This static screen content causes the build-up of parasitic capacities within the LCD components that prevent the liquid crystal molecules from returning to their original states. This condition may arise, is not predictable and depends on the following factors:

- Type of image displayed
- Color composition of the image
- Length of image output
- Ambient temperature

5.1 What measures can be taken against this?

There is no total solution, however, measures can be taken to significantly reduce this effect:

- Avoid static pictures or screen content
- Use screen savers (moving) when the display is not in use
- Frequent picture change
- Shut off the display when not in use

Turning off the background lighting (backlight) does not influence the prevention of the burn-in effect.

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 364 "Screw assignment on the back side of the SATA RAID controller" on page 622.

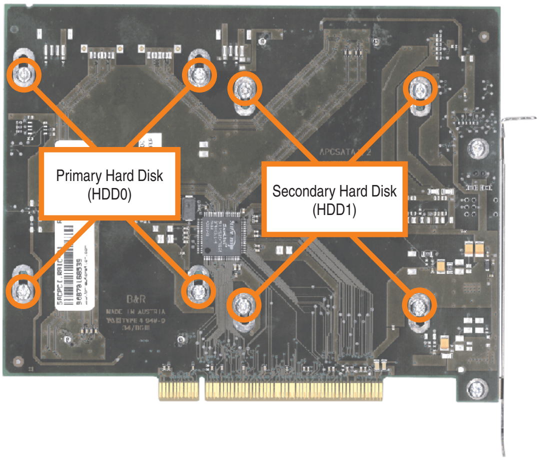


Figure 364: Screw assignment on the back side of the SATA RAID controller

- On the front side, slide the hard disk down and away (image 1).
- Carefully plug the new hard disk into the connector (image 2).

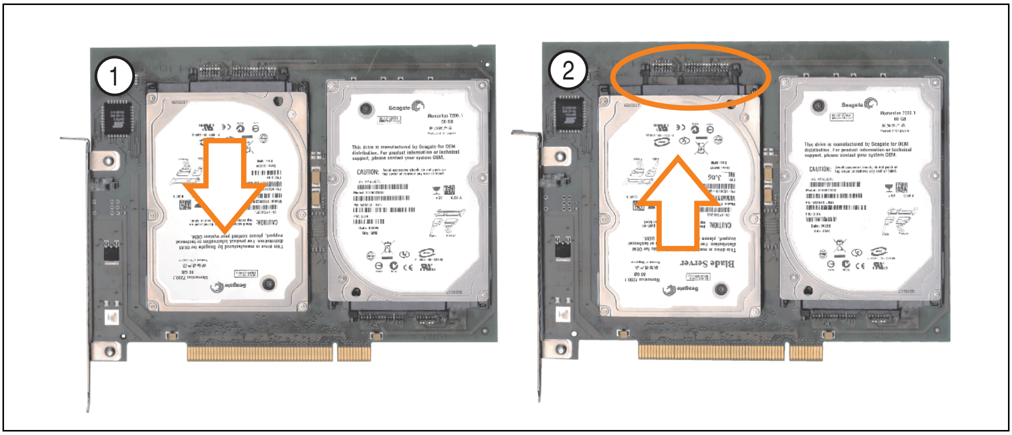


Figure 365: Hard disk exchange

- 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 298.

Appendix A

1. Temperature sensor locations

The PPC700 has temperature sensors in various places (CPU, 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] .

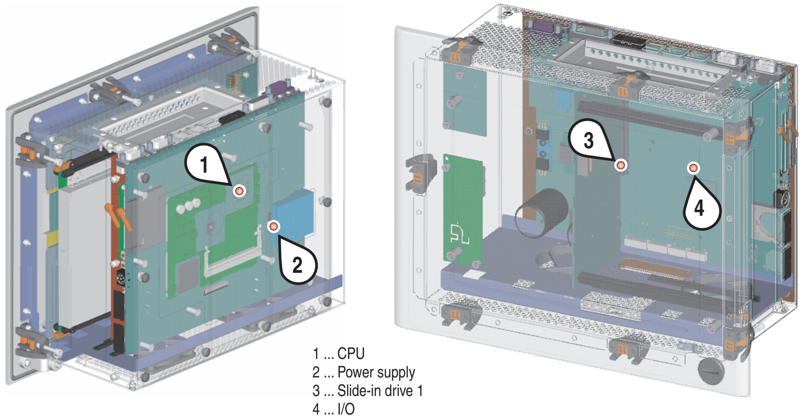


Figure 366: Temperature sensor locations

Section		Position
1	CPU	Processor temperature (sensor integrated on the CPU board)
2	Power supply	Power supply temperature (maximum 95°C)
3	Slide-in drive 1/2	Temperature of a slide-in drive (the sensor is integrated on the slide-in drive)
4	I/O	Temperature under an add-on drive

Table 384: Temperature sensor locations

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[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.

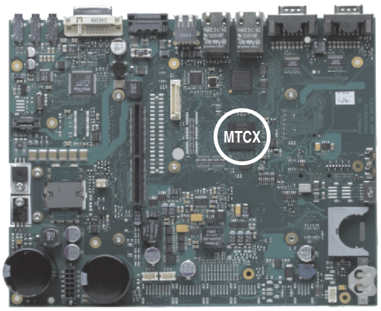


Figure 367: MTCX controller location

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)

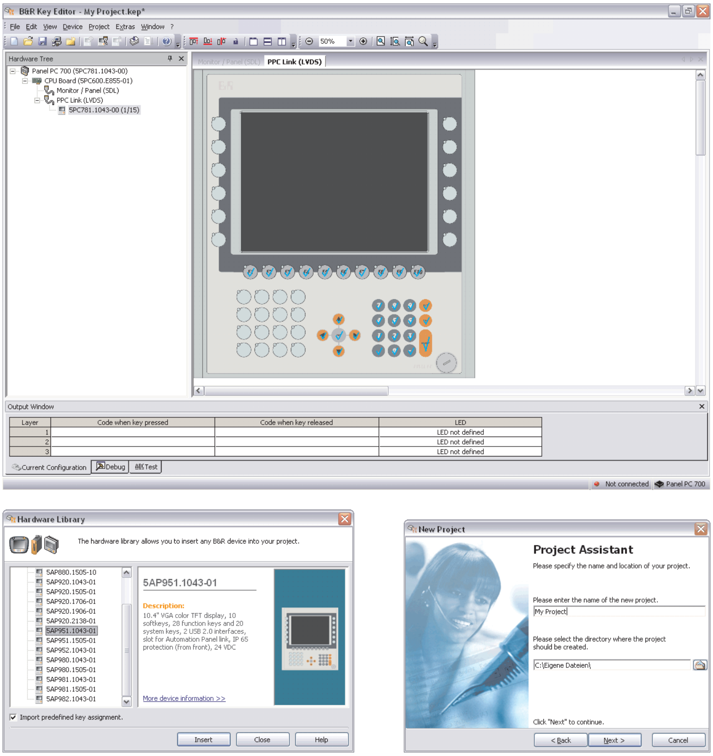
The functions of the MTCX can be expanded via Firmware upgrade[1] . The version can be read in BIOS (menu item "advanced" - baseboard/panel features) or in Microsoft Windows XP/embedded, using B&R Control Center.

---

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

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. With the B&R Key Editor, it is possible to quickly and easily set up the application individually.



Layer	Code when key pressed	Code when key released	LED
1			LED not defined
2			LED not defined
3			LED not defined

The hardware library allows you to insert any B&R device into your project.

5AP951.1043-01

Description:
10.4" VGA color TFT display, 10 softkeys, 28 function keys and 20 system keys, 2 USB 2.0 interfaces, slot for Automation Panel link, IP 65 protection (from front), 24 VDC

☑ Import predefined key assignment.

Project Assistant

Please specify the name and location of your project.

Please enter the name of the new project.
My Project

Please select the directory where the project should be created.
C:\Eigene Dateien\

Click "Next" to continue.

Figure 368: B&R Key Editor screenshots (Version 2.70)

Features:

- Configuration of normal keys like on a keyboard (A, B, C, etc.)
- Key combinations/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 PC 620 and Panel PC 700 devices

Supports following systems (Version 2.70):

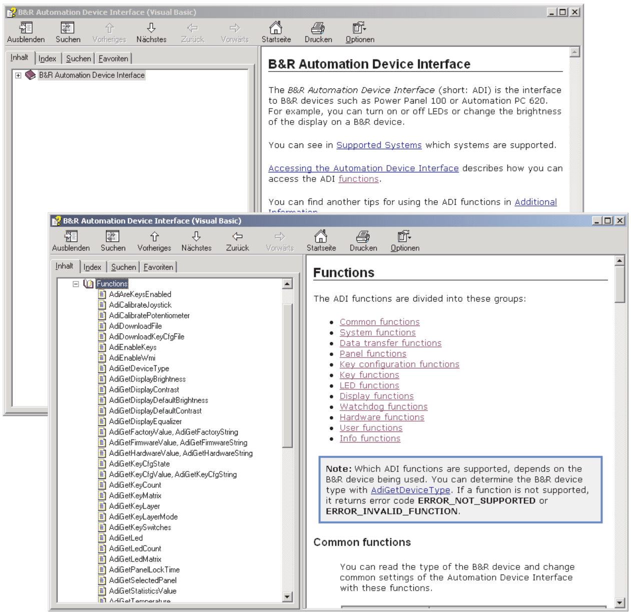
- Automation PC 800
- Automation PC 620 (ETX, XTX, Embedded)
- Panel PC 300
- Panel PC 700 (ETX, XTX)
- Power Panel 100, 200
- Power Panel 300/400
- Mobile Panel 40/50
- Mobile Panel 100, 200
- Provit 2000
- Provit 5000

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

The ADI development kit is used to access the functions of the ADI driver. The programming languages C (with import libraries for Microsoft Visual C++ 6.0 and Microsoft eMbedded Visual C++ 4.0) and Visual Basic (for Microsoft Visual Basic 6.0) are supported.



B&R Automation Device Interface

The *B&R Automation Device Interface* (short: ADI) is the interface to B&R devices such as Power Panel 100 or Automation PC 620. For example, you can turn on or off LEDs or change the brightness of the display on a B&R device.

You can see in Supported Systems which systems are supported.

Accessing the Automation Device Interface describes how you can access the ADI functions.

You can find another tips for using the ADI functions in Additional

Functions

The ADI functions are divided into these groups:

- Common functions
- System functions
- Data transfer functions
- Panel functions
- Key configuration functions
- Key functions
- LED functions
- Display functions
- Watchdog functions
- Hardware functions
- User functions
- Info functions

Note: Which ADI functions are supported, depends on the B&R device being used. You can determine the B&R device type with AdiGetDeviceType. If a function is not supported, it returns error code **ERROR_NOT_SUPPORTED** or **ERROR_INVALID_FUNCTION**.

Common functions

You can read the type of the B&R device and change common settings of the Automation Device Interface with these functions.

Figure 369: ADI development kit screenshots (Version 2.20)

Features:

- Extensive library of API functions
- Supported programming languages: Visual Basic, Visual C++
- Online documentation (German, English)
- Installation using its own setup

Supports following systems:

- Automation PC 800
- Automation PC 620
- 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

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**).

4.1 Installation

The latest version of the B&R Automation Device Interface (ADI) Development Kit can be found in the download area (Service - Product Related Downloads - BIOS / Drivers / Updates) on the B&R homepage (**www.br-automation.com**).

Install by starting the Setup.exe file (e.g. double-click in Explorer).

5. Touch Screen - Elo Accu Touch

Information:

The following characteristics, features, and limit values only apply to this individual component and can deviate from those 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 < 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 Storage Transport	- 10°C to + 50°C - 40°C to + 71°C - 40°C to + 71°C
Relative humidity Operation Storage 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 contacts 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 Driver and Utilities DVD (Mod. No. 5SWHMI.0000-00).

Table 385: 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.

5.1 Temperature humidity diagram - Operation and storage

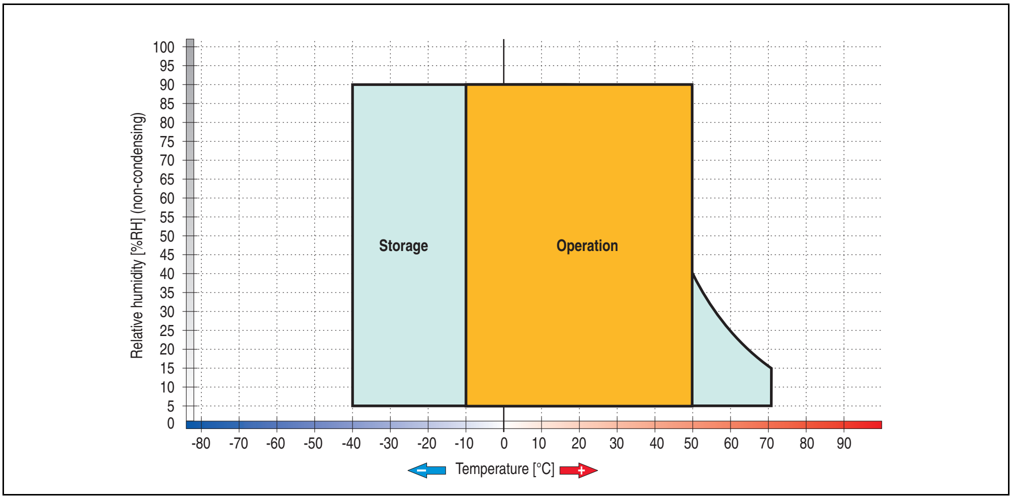


Figure 370: Temperature humidity diagram - Elo Accu touch screen 5-wire

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).

5.2 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.

6. 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.

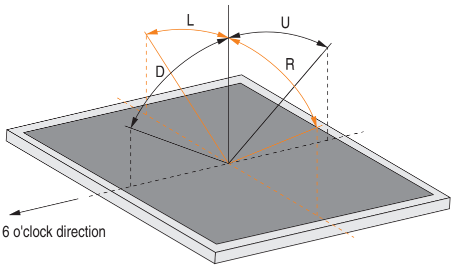


Figure 371: Viewing angle definition

7. 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

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: unlimited in theory, up to 64 with real-time capability in practice, i.e. defined maximum delay 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. Using this technology it is possible to encode video, audio and computer data on CD. DVDs can 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.

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 200µs and it actually occurs every 198 to 203µs, then the jitter is 5µs. 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 generation. 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 ... -30 V, low level: +3 ... +30 V. Cable lengths up to 15 m, transfer rates up to 20 kBit/s. For point-to-point connections between 2 participants.

RS422

Recommended **S**tandard **N**umber **422**. Interface standard, balanced operation, increased immunity to disturbances. High level: 2 ... -6 V, low level: +2 ... +6 V. 4-wire connection [inverted/not inverted], cable lengths up to 1200 m, transfer rates up to 10 Mbit/s, 1 sender can carry out simplex communication with up to 10 receivers.

RS485

Recommended **S**tandard **N**umber **485**. Interface standard upgraded from RS422. High level: 1.5 ... -6 V, low level: +1.5 ... +6 V; 2-wire connection [half duplex operation] or 4-wire connection [full duplex operation. Cable lengths up to 1200 m, transfer rates up to 10 Mbit/s. Up to 32 participants can be connected to an RS485 bus [sender/receiver].

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**x**tended **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 activating an item with 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, printer, 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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