

# Automation PC 620

## User's Manual

Version: **1.6 Preliminary (July 2005)**

Model No.: -

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## **Chapter 1: General information**

## **Chapter 2: Technical data**

## **Chapter 3: Mounting**

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# Chapter 1 • General information

## 1. Manual history

Version	Date	Comment
1.0	21 Jul. 2004	Changes / new features - First version
1.1	12 Nov. 2004	Changes / new features - Drilling templates for the APC620 1 and 2 PCI slot variations added. - New overview images added for the APC620 1 and 2 PCI slot variations. - New dimension diagrams added for the APC620 1 and 2 PCI slot variations. - Model number overview revised. - Interface descriptions added (behind the front cover). - "Software" chapter has been updated. - "Accessories" chapter has been updated. - System unit with 5 PCI slots added. - Technical data for all individual components was expanded.
1.2	23 Nov. 2004	Changes / new features - Pictures of the interfaces from the front have been updated. - General descriptions of device interfaces have been revised. - New CPU boards and system units added. - USB media device and fitting front cover added.
1.3	27 Dec. 2004	Changes / new features - New column "My settings" (815E and 855GME BIOS) added to the BIOS profile settings table. - Chapter 6 "Maintenance / servicing" on page 277 added. - APC620 Interface Cover 5AC600.ICOV-00 added (see section "Interface cover 5AC600.ICOV-00", on page 251). - Information for the maximum color depth for the CPU board added. - Error correction in the BIOS description for Legacy Devices Com D, COM E, LPT.
1.4	7 Mar. 2005	Changes / new features - Image of the slide-in USB diskette drive added (see Figure 35 "Slide-in USB FDD" on page 90). - Chapter 4 (Software) updated for new BIOS versions. (815E BIOS Version 1.15, 855GME BIOS Version V1.14). - Fan kit (5PC600.HS05-00) for the APC620 system with 5 PCI slots (see Section "Fan kit 5 PCI", on page 111) and installation (see Section 2.3 "Procedure for APC620 with 5 PCI slot" on page 285) added. - Mounting orientation described more precisely, see Chapter 3 "Mounting", Section 3 "Mounting orientation" on page 118. - Temperature specifications for the 815E CPU boards added. - Temperature specifications for the 855GME CPU boards added. - Performance management of the APC620 system added (see Section "Performance management for APC620 systems with 1 and 2 PCI slots", on page 43). - RAID system added (see Section "RAID system", on page 97).
1.5	16 Mar. 2005	Changes / new features - Temperature and performance table design changed. - Mounting orientation more precisely specified.

Table 1: Manual history

Version	Date	Comment
1.6	2. February 2006	<p>Changes / new features</p> <ul style="list-style-type: none"> <li>- Weighted system units added.</li> <li>- Add-on interface cards CAN (5AC600.CANI-00) and RS232/422/485 (5AC600.485I-00) added.</li> <li>- Model numbers for Microsoft Windows XP embedded with SP2 added.</li> <li>- Cables (DVI, SDL, USB, RS232) added to accessories chapter.</li> <li>- AP Link cards added.</li> <li>- Slide-in CF 2-slot 5AC600.CFSS-00 added.</li> <li>- Configuration and selection help for APC620 systems added (see chapter 2 "Technical data", section 1.2 "System components / Configuration" on page 26).</li> <li>- Key Editor: brief info section added (see Appendix A, section "B&amp;R Key Editor information", on page 290).</li> <li>- Automation Device Interface (ADI), Control Center, and Development Kit: brief info section added (see Appendix A, from page 292).</li> <li>- Information added: battery compartment, real-time clock (RTC).</li> <li>- Temperature sensor locations for APC620 devices added (see Appendix A, section "Temperature sensor locations", on page 289).</li> <li>- Environmental temperatures for PM 1600 (5PC600.E855-01) and PM 1800 (5PC600.E855-03) added.</li> <li>- Appendix A expanded.</li> <li>- Software chapter.</li> </ul>

Table 1: Manual history

## 2. Safety notices

### 2.1 Introduction

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

The safety precautions applying to industrial control systems (e.g. the provision of safety devices such as emergency stop circuits, etc.) in accordance with applicable national and international regulations must be observed 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 same applies for all other devices connected to the system, such as drives.

All tasks such as installation, commissioning, and service may only 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.

## 2.2 Intended use

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.

## 2.3 Transport and storage

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

## 2.4 Mounting

- Installation must take place according to the documentation using suitable equipment and tools.
- Devices may only 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).

## 2.5 Operation

### 2.5.1 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 operational 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.

### 2.5.2 Programs, viruses and dangerous programs

The system is subject to a potential danger each time data is exchanged or software is installed using data media (e.g. diskette, CD-ROM, USB memory stick, 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.

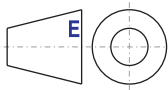
## 3. Organization of safety notices

The safety notices in this manual are organized as follows:

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

Table 2: Organization of safety notices

## 4. Guidelines



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

## 5. Model numbers

### 5.1 System units

Model number	Short description	Note
5PC600.SX01-00	<b>System 1 PCI</b> APC620 system unit 1 PCI slot, connection for 2 x RS232, 2 x USB 2.0, Short Distance Link, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse; 24 VDC	
5PC600.SX02-00	<b>System 2 PCI 1 disk drive Slot, 1 AP Link slot</b> APC620 system unit 2 PCI slots, 1 drive slot, 1 slot for Automation Panel link transmitter, connections for 2 x RS232, 2 x USB 2.0, Short Distance Link, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse; 24 VDC.	
5PC600.SX02-01	<b>System 2 PCI 1 disk drive slot</b> APC620 system unit 2 PCI slots, 1 drive slot; connection for 2 x RS232, 2 x USB 2.0, Short Distance Link, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse; 24 VDC	
5PC600.SX05-00	<b>System 5 PCI 2 disk drive slots, 1 AP Link slot</b> APC620 system unit 5 PCI slots, 2 drive slots, 1 slot for Automation Panel link transmitter; connections for 2 x RS232, 2 x USB 2.0, Short Distance Link, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse; 24 VDC.	
5PC600.SX05-01	<b>System 5 PCI 2 disk drive slots</b> APC620 system unit 5 PCI slots, 2 drive slots; connections for 2 x RS232, 2 x USB 2.0, Short Distance Link, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse; 24 VDC.	

Table 3: Model numbers - system units

### 5.2 CPU boards 815E

Model number	Short description	Note
5PC600.E815-00	<b>CPU board 815E C3-400</b> Intel Celeron 3 CPU board, 400 MHz, 100 MHz FSB, 256 kB L2 cache, chipset 815E, 1 socket for SO-DIMM SDRAM module.	
5PC600.E815-02	<b>CPU board 815E C3-733</b> 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	<b>CPU board 815E C3-1000</b> 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 - CPU boards 815E

### 5.3 CPU boards 855GME

Model number	Short description	Note
5PC600.E855-00	<b>CPU board 855GME PM-1100</b> 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	<b>CPU board 855GME PM-1600</b> 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	<b>CPU board 855GME PM-1400</b> 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	<b>CPU board 855GME PM-1800</b> 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	<b>CPU board 855GME CM-600</b> Intel Celeron M CPU Board, 600 MHz, 400 MHz FSB, 512 kB L2 cache; chipset 855GME, 1 socket for SO-DIMM DDR module.	
5PC600.E855-05	<b>CPU board 855GME CM-1000</b> Intel Celeron 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 - CPU boards 855GME

### 5.4 Heat sink

Model number	Short description	Note
5AC600.HS01-00	<b>Heat sink 815E</b> For APC620 system units with Intel 815E CPU board (5PC600.E815-00, 5PC600.E815-02 and 5PC600.E815-03)	
5AC600.HS01-01	<b>Heat sink 855GME</b> For APC620 system units with Intel 855GME CPU board (5PC600.E855-00, 5PC600.E855-02, 5PC600.E855-04 and 5PC600.E855-05)	
5AC600.HS01-02	<b>Heat sink 855GME/2</b> For APC620 system units with Intel 855GME CPU boards (5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-02, 5PC600.E855-03, 5PC600.E855-04, and 5PC600.E855-05)	

Table 6: Model numbers - heat sinks

### 5.5 Main memory

Model number	Short description	Note
5MMSDR.0128-01	<b>SO-DIMM SDRAM 128 MB PC133</b> SO-DIMM SDRAM 128 MB PC133 for 815E CPU boards.	
5MMSDR.0256-01	<b>SO-DIMM SDRAM 256 MB PC133</b> SO-DIMM SDRAM 256 MB PC133 for 815E CPU boards.	
5MMSDR.0512-01	<b>SO-DIMM SDRAM 512 MB PC133</b> SO-DIMM SDRAM 512 MB PC133 for 815E CPU boards.	

Table 7: Model numbers - main memory



Model number	Short description	Note
5MMDDR.0256-00	<b>SO-DIMM DDR-SDRAM 256 MB PC2700</b> SO-DIMM DDR-SDRAM 256 MB PC2700 for 855GME CPU boards.	
5MMDDR.0512-00	<b>SO-DIMM DDR-SDRAM 512 MB PC2700</b> SO-DIMM DDR-SDRAM 512 MB PC2700 for 855GME CPU boards.	
5MMDDR.1024-00	<b>SO-DIMM DDR-SDRAM 1024 MB PC2700</b> SO-DIMM DDR-SDRAM 1024 MB PC2700 for 855GME CPU boards.	

Table 7: Model numbers - main memory (cont.)

## 5.6 Drives

Model number	Short description	Note
5AC600.CFSI-00	<b>Add-on CompactFlash slot</b> CompactFlash Slot (Add-On); for installation in an APC620 or PPC700.	
5AC600.HDDI-00	<b>Add-on hard disk 30 GB 24/7</b> 30 GB hard disk (add-on); ideal for 24 hour operation. For installation in an APC620 or PPC700.	
5AC600.HDDI-01	<b>Add-on hard disk 20 GB ET</b> 20 GB hard disk (add-on); with expanded temperature range. For installation in an APC620 or PPC700.	
5AC600.CDXS-00	<b>Slide-in CD-ROM</b> CD-ROM drive (slide-in); for operation in a slide-in drive slot in an APC620 or PPC700 system.	
5AC600.CFSS-00	<b>Slide-In CF 2Slot</b> Slide-In CompactFlash Adapter for 2 CompactFlash (via IDE and USB2.0)	
5AC600.DVDS-00	<b>Slide-in DVD-ROM/CD-RW</b> DVD-ROM/CD-RW drive (slide-in); for operation in a slide-in drive slot in an APC620 or PPC700 system.	
5AC600.FDDS-00	<b>Slide-in USB FDD</b> FDD drive (slide-in); for operation in a slide-in drive slot in an APC620 or PPC700 system.	
5AC600.HDDS-00	<b>Slide-in hard disk 30 GB 24x7</b> 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.	
5AC600.HDDS-01	<b>Slide-in hard disk 20 GB ET</b> 20 GB hard disk (slide-in); with expanded temperature range. For use in a slide-in drive slot in an APC620 or PPC700 system.	
5ACPCI.RAIC-00	<b>PCI RAID controller ATA/100</b> PCI Raid controller	
5ACPCI.RAIS-00	<b>PCI RAID storage 2x40GB</b> PCI Raid hard disk 2 x 40 GB;	

Table 8: Model numbers - drives

## 5.7 Interface options

Model number	Short description	Note
5AC600.CANI-00	<b>Add-on CAN interface</b> CAN interface for installation in an APC620 or PPC700.	
5AC600.485I-00	<b>Add-on RS232/422/485 interface</b> Add-On RS232/422/485 interface for installation in an APC620 and PPC700.	

Table 9: Model numbers - interface

## 5.8 Fan kit

Model number	Short description	Note
5PC600.FA01-00	<b>Fan kit 1PCI</b> APC620 fan kit, for system units with 1 PCI slot.	
5PC600.FA02-00	<b>Fan kit 2PCI</b> APC620 fan kit, for system units with 2 PCI slots.	
5PC600.FA05-00	<b>Fan kit 5PCI</b> APC620 fan kit, for system units with 5 PCI slots.	

Table 10: Model numbers - fan kit

## 5.9 AP Link cards

Model number	Short description	Note
5AC600.TDVI-00	AP Link DVI transmitter	In preparation
5AC600.SDL0-00	AP Link SDL transmitter	

Table 11: Model numbers - AP Link graphics adapter

## 5.10 Accessories

### 5.10.1 Batteries

Model number	Short description	Note
0AC201.9	<b>Lithium batteries (5x)</b> Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	<b>Lithium battery (1x)</b> Lithium battery, 1 piece, 3 V / 950 mAh, button cell	

Table 12: Model numbers - batteries

### 5.10.2 Supply voltage connector

Model number	Short description	Note
0TB103.9	<b>Plug 24V 5.08 3p screw clamps</b> 24 VDC 3-pin connector, female. Screw clamp, 1.5 mm <sup>2</sup> , protected against vibration by the screw flange.	
0TB103.91	<b>Plug 24V 5.08 3p cage clamps</b> 24 VDC 3-pin connector, female. Cage clamps, 2.5 mm <sup>2</sup> , protected against vibration by the screw flange.	

Table 13: Model numbers - supply voltage connectors

### 5.10.3 CompactFlash cards

Model number	Short description	Note
5CFCRD.0032-02	<b>CompactFlash 32 MB True IDE SanDisk/A</b> CompactFlash card with 32 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0064-02	<b>CompactFlash 64 MB True IDE SanDisk/A</b> CompactFlash card with 64 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0128-02	<b>CompactFlash 128 MB True IDE SanDisk/A</b> CompactFlash card with 128 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0256-02	<b>CompactFlash 256 MB True IDE SanDisk/A</b> CompactFlash card with 256 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0512-02	<b>CompactFlash 512 MB True IDE SanDisk/A</b> CompactFlash card with 512 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.1024-02	<b>CompactFlash 1024 MB True IDE SanDisk/A</b> CompactFlash card with 1024 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.2048-02	<b>CompactFlash 2048 MB True IDE SanDisk/A</b> CompactFlash card with 2048 MB Flash PROM, and true IDE/ATA interface	

Table 14: Model numbers - CompactFlash cards

### 5.10.4 USB memory sticks

Model number	Short description	Note
5MMUSB.0128-00	<b>USB memory stick 128 MB SanDisk</b> USB 2.0 memory stick 128 MB	
5MMUSB.0256-00	<b>USB memory stick 256 MB SanDisk</b> USB 2.0 memory stick 256 MB	
5MMUSB.0512-00	<b>USB memory stick 512 MB SanDisk</b> USB 2.0 memory stick 512 MB	

Table 15: Model numbers - USB memory sticks

### 5.10.5 Cable

Model number	Description	Note
5CADVI.0018-00	<b>DVI-D cable 1.8 m / single</b> Cable single DVI-D/m:DVI-D/m 1.8 m	
5CADVI.0050-00	<b>DVI-D cable 5 m / single</b> Cable single DVI-D/m:DVI-D/m 5 m	
5CADVI.0100-00	<b>DVI-D cable 10 m / single</b> Cable single DVI-D/m:DVI-D/m 10 m	
5CASDL.0018-00	<b>SDL cable (1.8 m)</b> Cable SDL DVI-D/m:DVI-D/m 1.8 m	
5CASDL.0050-00	<b>SDL cable (5 m)</b> Cable SDL DVI-D/m:DVI-D/m 5 m	
5CASDL.0100-00	<b>SDL cable (10 m)</b> Cable SDL DVI-D/m:DVI-D/m 10 m	
5CASDL.0150-00	<b>SDL cable (15 m)</b> Cable SDL DVI-D/m:DVI-D/m 15 m	
5CAUSB.0018-00	<b>Cable USB 2.0 A/m:B/m 1.8 m</b> USB 2.0 connection cable; Type A - Type B; 1.8 m	
5CAUSB.0050-00	<b>Cable USB 2.0 A/m:B/m 5 m</b> USB 2.0 connection cable; Type A - Type B; 5 m	
9A0014.02	<b>Cable RS232 DB9/f:DB9/m 1.8 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 1.8 m.	
9A0014.05	<b>Cable RS232 DB9/f:DB9/m 5 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 5 m.	
9A0014.10	<b>Cable RS232 DB9/f:DB9/m 10 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 10 m.	

Table 16: Model numbers - cables

### 5.10.6 Other

Model number	Short description	Note
5A5003.03	<b>Front cover</b> Front cover appropriate for the USB 2.0 Media Drive 5MD900.USB2-00.	

Table 17: Model numbers - other items

Model number	Short description	Note
5AC600.ICOV-00	<b>Interface covers</b> Interface covers for APC620 and PPC700 devices; 5 pieces	
5AC900.1000-00	<b>Adapter DVI-A/m to CRT DB15HD/f</b> Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	
5MD900.USB2-00	<b>USB 2.0 drive DVD-ROM/CD-RW FDD CF USB</b> 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.	

Table 17: Model numbers - other items (cont.)

## 5.11 Software

Model number	Short description	Note
9S0000.01-010	<b>OEM MS-DOS 6.22 German (disk)</b> OEM MS-DOS 6.22 German disks Only delivered with a new PC.	
9S0000.01-020	<b>OEM MS-DOS 6.22 English (disk)</b> OEM MS-DOS 6.22 English disks Only delivered with a new PC.	
9S0000.08-010	<b>OEM Microsoft Windows XP Professional</b> CD, German; Only delivered with a new PC.	
9S0000.08-020	<b>OEM Microsoft Windows XP Professional</b> CD, English; Only delivered with a new PC.	
9S0000.09-090	<b>OEM Microsoft Windows XP Professional Multilanguage</b> CDs; Only delivered with a new PC.	
9S0001.19-020	<b>OEM Microsoft Windows XP embedded APC620 815E w/CF, English</b> 512 MB CompactFlash with Windows XP embedded image for APC620 systems with a 815E CPU board. Only delivered with a new PC.	
9S0001.20-020	<b>OEM Microsoft Windows XP embedded APC620 855GME w/CF, English</b> 512 MB CompactFlash with Windows XP embedded image for APC620 systems with a 855GME CPU board. Only delivered with a new PC.	
9S0001.27-020	<b>OEM Microsoft Windows XP embedded (incl. SP2) APC620 815E w/CF, English</b> 512 MB CompactFlash with Windows XP embedded image including SP2 for APC620 systems with a 815E CPU board. Only delivered with a new PC.	
9S0001.28-020	<b>OEM Microsoft Windows XP embedded (incl. SP2) APC620 855GME w/CF, English</b> 512 MB CompactFlash with Windows XP embedded image including SP2 for APC620 systems with a 855GME CPU board. Only delivered with a new PC.	

Table 18: Model numbers - software



## Chapter 2 • Technical data

### 1. Introduction

Structure, many slots and well thought-out placement of interfaces and drives - the APC620 provides optimal adaptability and ergonomics. The APC620 saves space in the switching cabinet. Drive inserts (HDD, CD-ROM, DVD, etc.) and up to two CompactFlash slots are hidden behind a cover on the front of the device.



Figure 1: Automation PC 620 system overview

Automation PC620s are available in two chipset versions. As a result, the Automation PC 620 covers a wide range of processor performance.

The APC620 with an Intel® Pentium® M processor and Intel® 855GME chipset is available for high-performance applications that require a powerful processor. These processors, developed specially for mobile computing, offer many advantages for industrial applications as well. They combine a high computing capacity with low power consumption. The chipset contains an integrated graphic solution which provides optimal use of memory for the system and graphics.

As a second variation, the APC620 is also available with Intel® 815E chipset. Here, Intel® Celeron® processors ranging from 400 MHz to 1 GHz are used. As with the 855GME chipset, the 815E chipset also has integrated graphics.

### 1.1 Features

- Processors up to Pentium M 1.8 GHz
- CompactFlash slot (type I)
- Half-size PCI slots
- AC97 sound
- USB 2.0
- 24 VDC supply voltage
- 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 operation<sup>1)</sup>
- BIOS (Phoenix)
- Real-time clock, RTC (battery-buffered)
- Up to 1 GB central memory
- Connection of various display devices to the "Monitor/Panel" video output (supports RGB, DVI, and SDL signals)

### 1.2 System components / Configuration

The APC620 system can be assembled to meet individual requirements and operational conditions.









The following components are absolutely essential for operation:

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

<sup>1)</sup> Dependant on the device configuration and the environmental temperature.



## 1.2.1 Selection guide - basic system

Configuration - basic system			
System unit		Select 1	
<p>The system unit is comprised of a housing and a main board.</p> <p>Variants:</p> <p>PCI slots (1,2 or 5)</p> <p>Slide-in slots (0,1 or 2)</p> <p>AP Link slot (0 or 1)</p> <p>Example: 2 / 1 / 1 = 2 PCI, 1 slide-in, 1 AP Link</p>			
	5PC600.SX01-00 (1 / 0 / 0)	5PC600.SX02-01 (2 / 1 / 0) 5PC600.SX02-00 (2 / 1 / 1)	5PC600.SX05-01 (5 / 2 / 0) 5PC600.SX05-00 (5 / 2 / 1)
System selection - CPU board - main memory - heat sink			
select 1 of each component (CPU board dependent)			
	815E CPU board		855GME CPU board
	 5PC600.E815-00 - C3-400 5PC600.E815-02 - C3 733 5PC600.E815-03 - C3 1000		5PC600.E855-00 - PM 1100 5PC600.E855-01 - PM 1600 5PC600.E855-02 - PM 1400 5PC600.E855-03 - PM 1800 5PC600.E855-04 - CM 600 5PC600.E855-05 - CM 1000
Main memory	 5MMSDR.0128-01 - 128MB 5MMSDR.0256-01 - 256MB 5MMSDR.0512-01 - 512MB		5MMDDR.0256-00 - 256MB 5MMDDR.0512-00 - 512MB 5MMDDR.1024-00 - 1GB
Heat sink	 5AC600.HS01-00		5AC600.HS01-01 5AC600.HS01-02 <sup>1)</sup>
Add-on drive	Select 1		
	5AC600.HDDI-00 (24-hour hard disk) 5AC600.HDDI-01 (hard disk - extended temperature range) 5AC600.CFSI-00 (CompactFlash slot)		
Slide-in drives	not possible	Select max. 1	Select max. 2
		5AC600.CFSS-00 (2 CompactFlash slots) 5AC600.CDXS-00 (CD-ROM) 5AC600.DVDS-00 (DVD-ROM/CD-RW) 5AC600.FDDS-00 (USB floppy) 5AC600.HDDS-00 (24-hour hard disk) 5AC600.HDDS-01 (hard disk - extended temperature range) 5ACPCI.RAIC-00 / 5ACPCI.RAIS-00 (combination, occupies 2 PCI slots)	

1) Must be used when using 855GME CPU boards 5PC600.E855-01 and 5PC600.E855-03.

Figure 2: Configuration - basic system

Explanation:

- 1) Select one system unit.
- 2) System selection - choose CPU board variant (8155E or 855GME).
- 3) Select one each of main memory and heat sink, based on selected CPU board.
- 4) Select optional components, based on selected system unit (see next page).

## 1.2.2 Selection guide - optional components















Configuration - optional			
System units			
<p>The system unit is composed of a housing and a main board.</p> <p>Variants:</p> <p>PCI slots (1, 2 or 5)</p> <p>Slide-in slots (0, 1 or 2)</p> <p>AP Link slot (0 or 1)</p> <p>Example: 2 / 1 / 1</p> <p>= 2 PCI, 1 slide-in, 1 AP Link</p>			
	5PC600.SX01-00 (1 / 0 / 0)	5PC600.SX02-01 (2 / 1 / 0) 5PC600.SX02-00 (2 / 1 / 1)	5PC600.SX05-01 (5 / 2 / 0) 5PC600.SX05-00 (5 / 2 / 1)
Fan kit (select 1)			
<p>A fan kit is required for certain system configurations.</p>			
	5PC600.FA01-00	5PC600.FA02-00	5PC600.FA05-00
Add-on drive		Select 1	
	5AC600.HDDI-00 (24-hour hard disk) 5AC600.HDDI-01 (hard disk - extended temperature range) 5AC600.CFSI-00 (CompactFlash slot)		
Slide-in drive		not possible	Select max. 1
			5AC600.CFSS-00 (2 CompactFlash slots) 5AC600.CDXS-00 (CD-ROM) 5AC600.DVDS-00 (DVD-ROM/CD-RW) 5AC600.FDDS-00 (USB floppy) 5AC600.HDDS-00 (24-hour hard disk) 5AC600.HDDS-01 (hard disk - extended temperature range)
AP Link cards		not possible	Select 1
			5AC600.TDVI-00 5AC600.SDL0-00 Only an option with 5PC600.SX02-00 or 5PC600.SX05-00 and with an 855GME CPU board.
RAID system		not possible	Select 1
			5ACPCI.RAIC-00 / 5ACPCI.RAIS-00 (combination, occupies 2 PCI slots)
Interface options		Select 1	
	5AC600.CANI-00 (CAN) 5AC600.485I-00 (combined RS232/RS422/RS485)		
Supply voltage plug		Select 1	
		0TB103.9 (screw clamp) 0TB103.91 (cage clamp)	

Figure 3: Configuration of optional components

### Information:

- Depending on the system unit, a compatible fan kit can be installed in the APC620. Required for certain system configurations and environmental temperatures (see also sections 2.4 "Environmental temperature for systems with an 815E CPU board" on

page 39 and 2.5 "Environmental temperature for systems with an 855GME CPU board" on page 41)

- Select optional drive(s) (add-on / slide-in), based on the system unit. One add-on drive can be installed in each system unit. Slide-in drives (1 or 2) are only available in certain system units.
- AP Link cards create a second graphics line (extended desktop, dual clone operation) on the APC620. Only possible with system units 5PC600.SX02-00, 5PC600.SX05-00 and with an 855GME CPU board.
- An optional interface adds an additional connection possibility.
- The appropriate power supply plugs ensure simple connection to the power supply.

## 2. Device

### 2.1 APC620, 1 PCI slot variant

#### 2.1.1 Interfaces

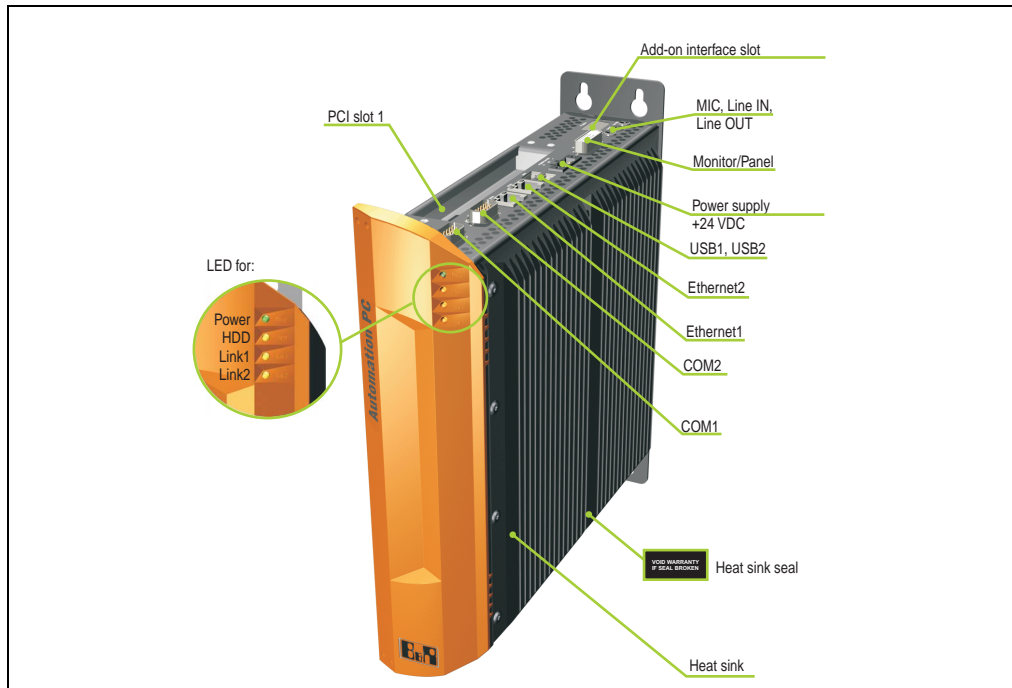


Figure 4: APC620, 1 PCI slot variant interface overview top

## Warning!

Do not remove mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. Should this connection be broken, the APC620 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").

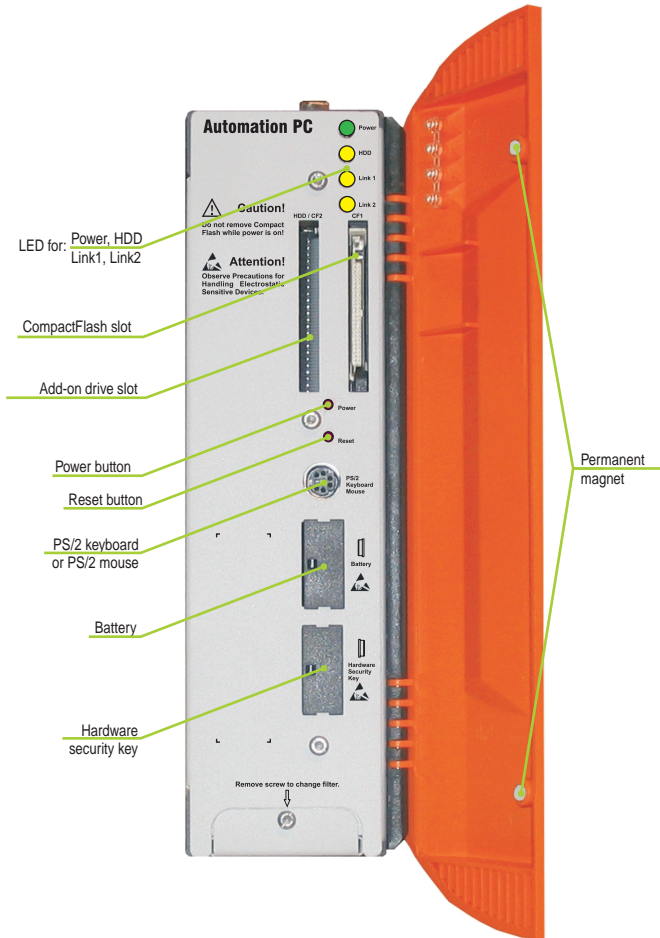


Figure 5: APC620, 1 PCI slot variant interface overview front

## Information:

The front doors contain two permanent magnets. Contact between a data carrier that saves data magnetically (hard disk, diskette, the magnetic strip of a credit card, etc.) and a magnet can cause loss of data.

2.1.2 Dimensions

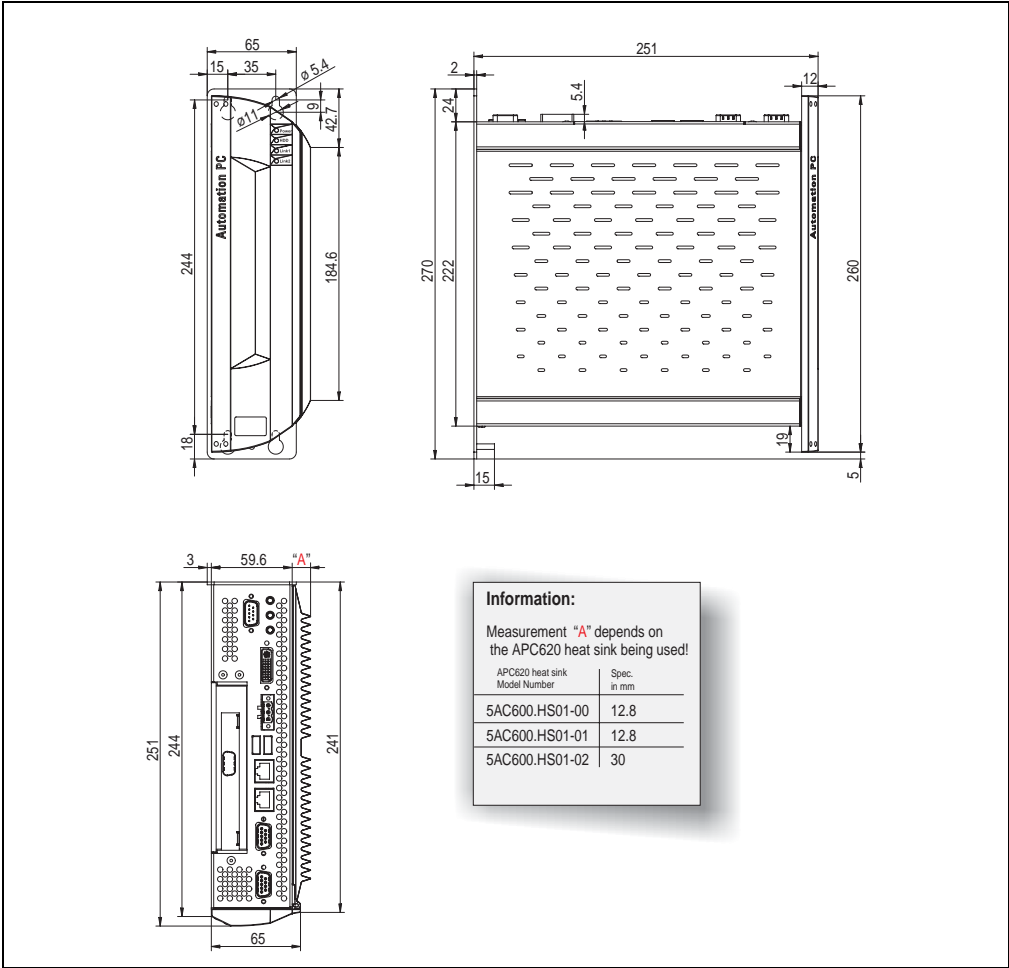


Figure 6: APC620 1PCI slot variant dimensions

## 2.2 APC620, 2 PCI slot variant

### 2.2.1 Interfaces

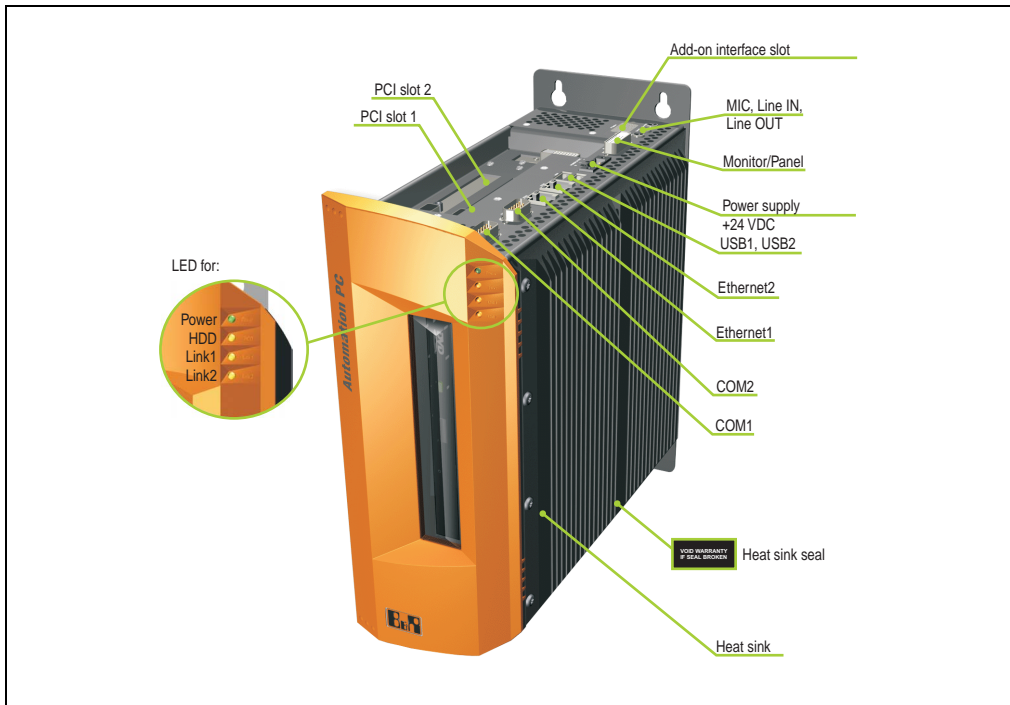


Figure 7: APC620, 2 PCI slot variant interface overview top

## Warning!

Do not remove mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. Should this connection be broken, the APC620 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").

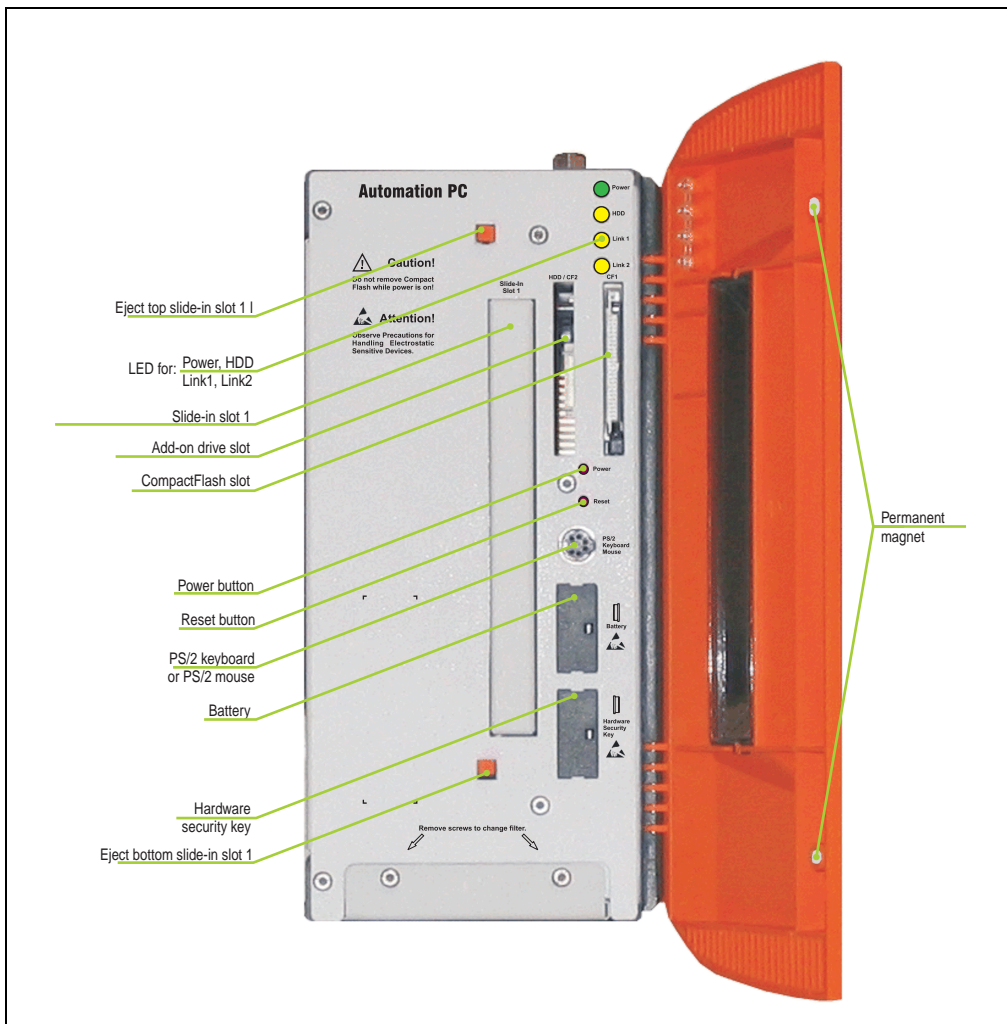


Figure 8: APC620, 2 PCI slot variant interface overview front

## Information:

The front doors contain two permanent magnets. Contact between a data carrier that saves data magnetically (hard disk, diskette, the magnetic strip of a credit card, etc.) and a magnet can cause loss of data.



## 2.2.2 Dimensions

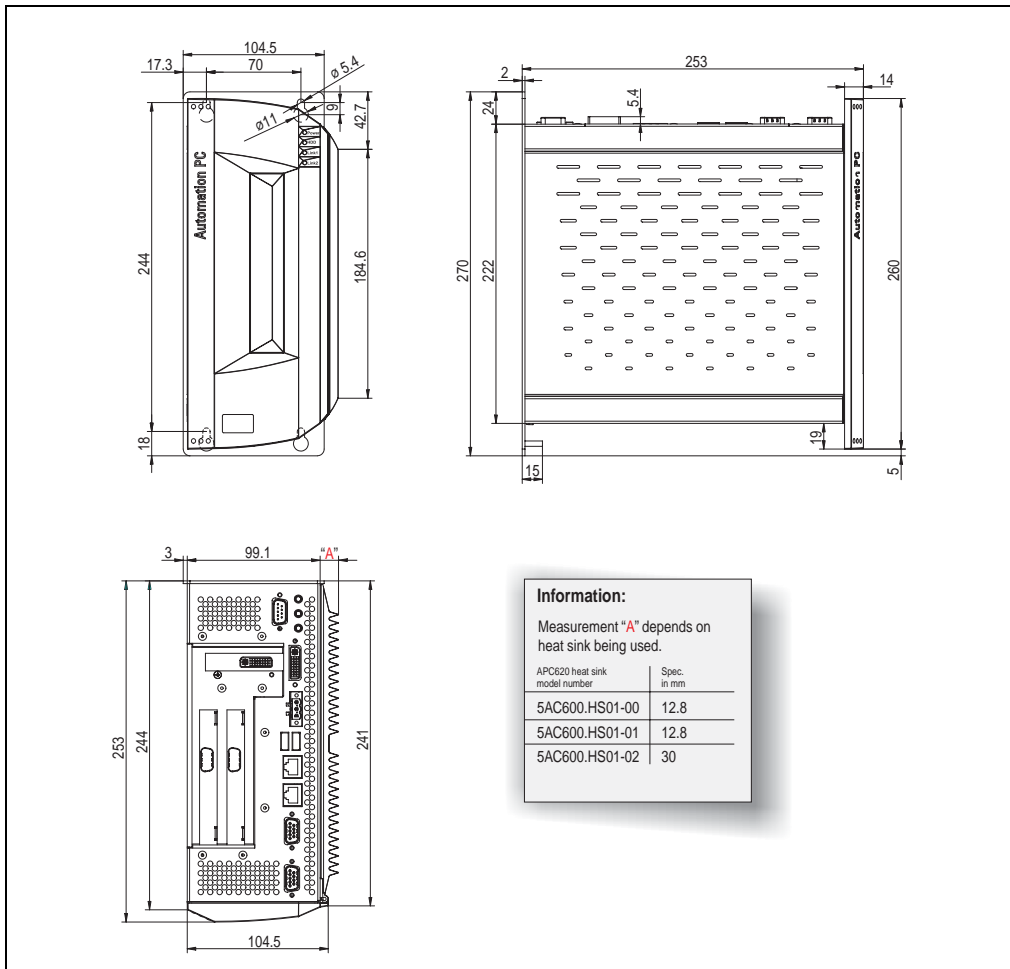


Figure 9: APC620, 2 PCI slot variant dimensions

## 2.3 APC620, 5 PCI slot variant

### 2.3.1 Interfaces

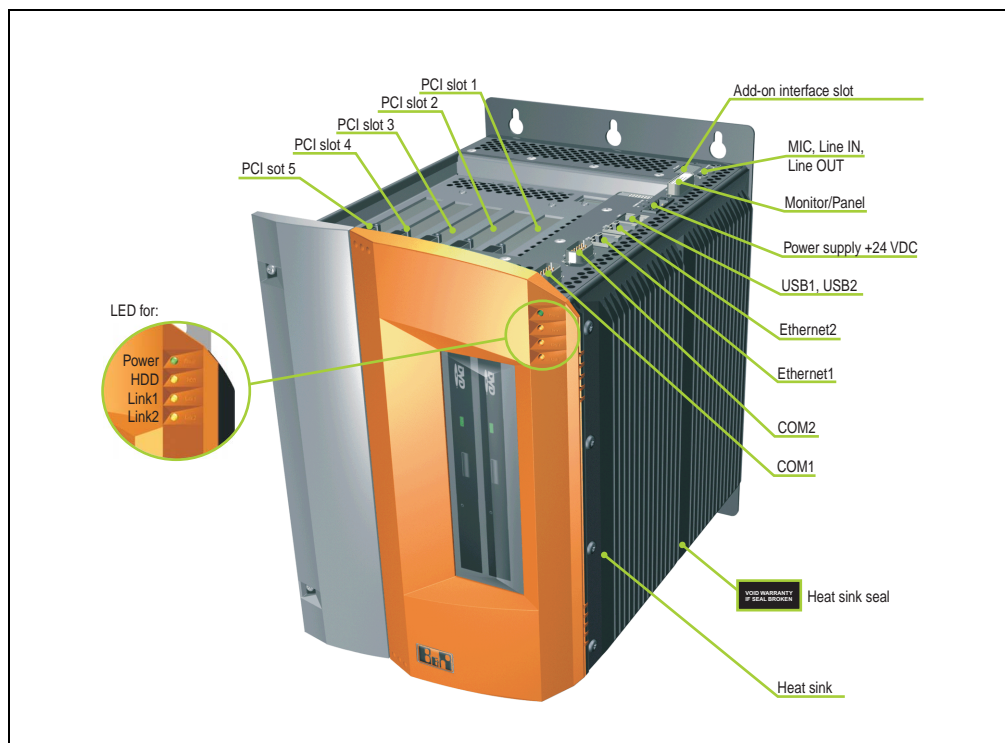


Figure 10: APC620, 5 PCI slot variant interface overview top

## Warning!

Do not remove mounting screws from the heat sink, as it is connected to the processor and chipset by a thermal coupling. Should this connection be broken, the APC620 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").

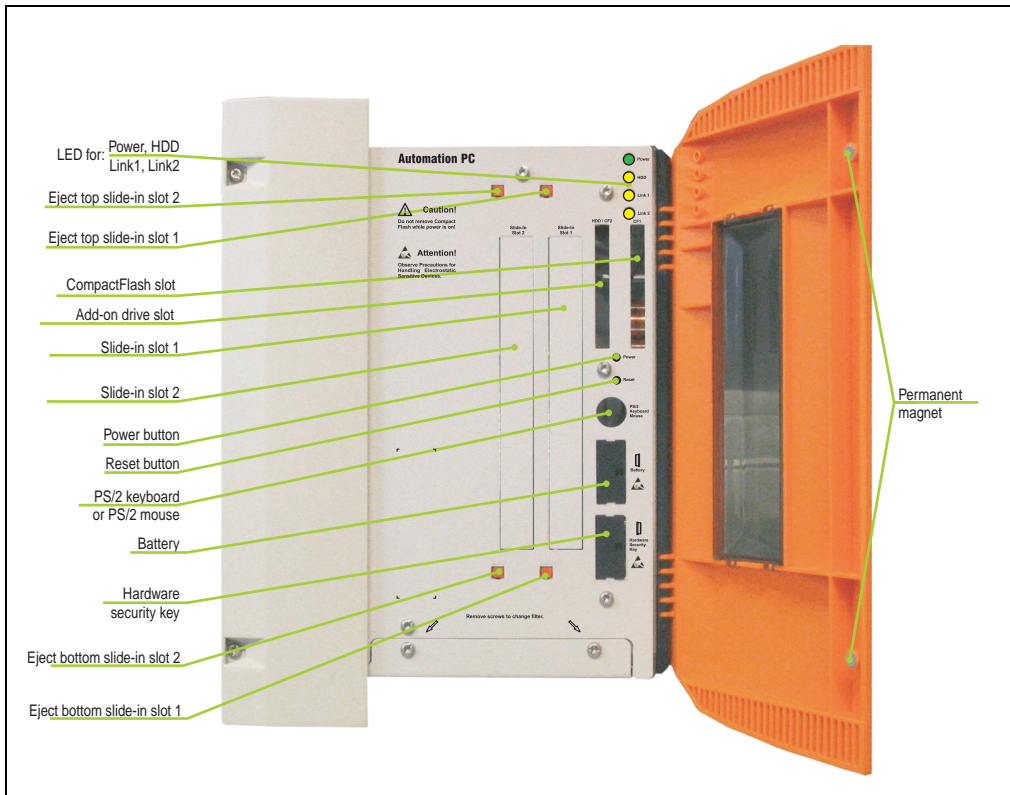


Figure 11: APC620, 5 PCI slot variant interface overview front

## Information:

The front doors contain two permanent magnets. Contact between a data carrier that saves data magnetically (hard disk, diskette, the magnetic strip of a credit card, etc.) and a magnet can cause loss of data.

2.3.2 Dimensions

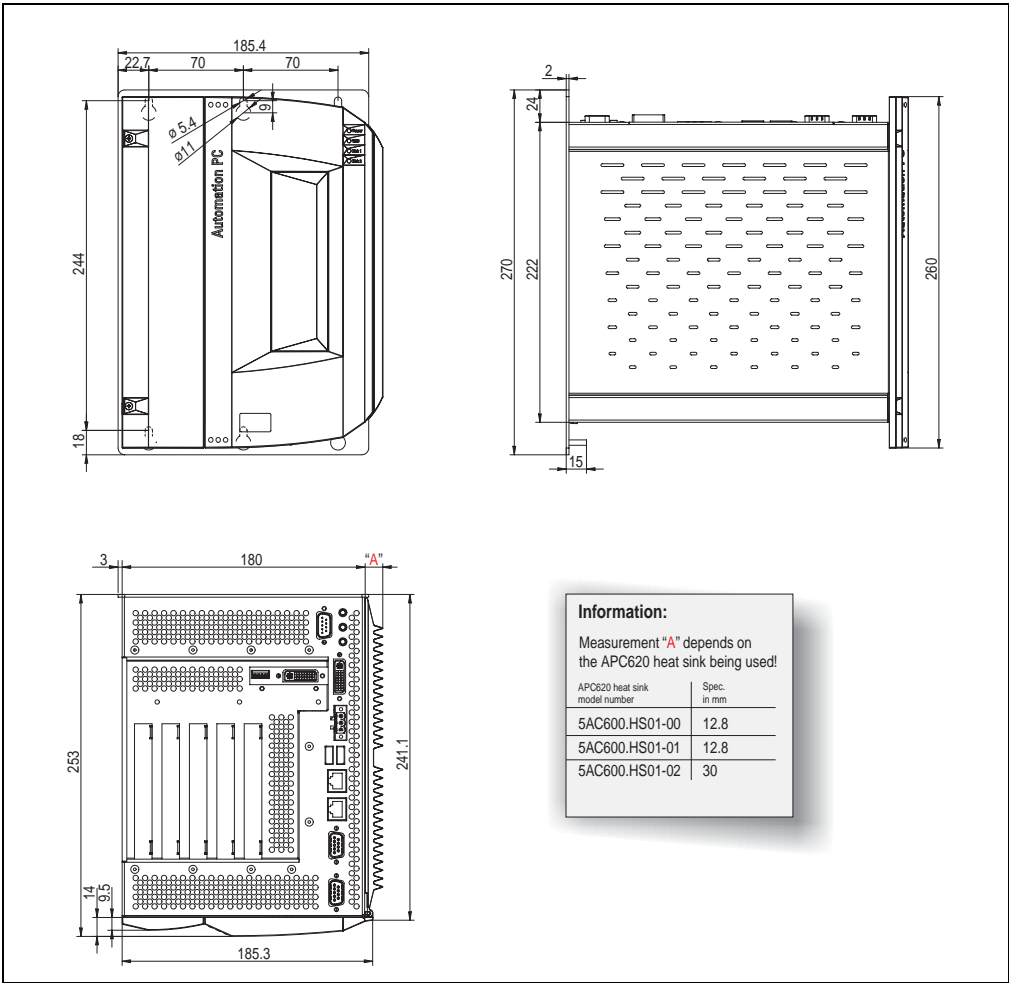


Figure 12: APC620, 5 PCI slot variant dimensions

## 2.4 Environmental temperature for systems with an 815E CPU board

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

		① 815E CPU board without fan kit and heat sink (5AC600.HS01-00)						① 815E CPU board with fan kit and heat sink (5AC600.HS01-00)							
		C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03				C3 400 5PC600.E815-00	C3 733 5PC600.E815-02	C3 1000 5PC600.E815-03					
All temperatures in degrees Celsius (°C)															
② Maximum environmental temp.		50	45	30				55	55	55					
What can still be operated at max. env. temp.? Or are there limitations?															
③	Add-on drive	On-board CompactFlash <sup>1)</sup>	✓	✓	✓			✓	✓	✓				70	I/O
		5AC600.CFSI-00 <sup>1)</sup>	✓	✓	✓			✓	✓	✓				70	
		5AC600.HDDI-01	✓	✓	✓			✓	✓	✓				80	
		5AC600.HDDI-00 (24-hour / standard)	~30	~25	~25			35/45	35/45	35/45				45/55	
	Slide-in drive	5AC600.CFSS-00 <sup>1)</sup>	✓	✓	✓			✓	✓	✓				70	Slide-in drive 1 and 2
		5AC600.CDXS-00	45	✓	✓			50	50	50				50	
		5AC600.DVDS-00	35	35	✓			40	40	40				55	
		5AC600.FDDS-00	35	35	✓			40	40	40				45	
		5AC600.HDDS-01	✓	✓	✓			✓	✓	✓				80	
		5AC600.HDDS-00 (24-hour / standard)	30/35	30/35	30/35			40/50	40/50	40/50				45/55	
	Main memory	5MMSDR.0128-01	✓	✓	✓			✓	✓	✓				-	
		5MMSDR.0256-01	✓	✓	✓			✓	✓	✓				-	
		5MMSDR.0512-01	✓	✓	✓			✓	✓	✓				-	
	System units	5PC600.SX01-00	✓	✓	✓			✓	✓	✓				95	Power supply
		5PC600.SX02-01	✓	✓	✓			✓	✓	✓				95	
		5PC600.SX02-00	✓	✓	✓			✓	✓	✓				95	
		5PC600.SX05-01	✓	✓	✓			✓	✓	✓				95	
		5PC600.SX05-00	✓	✓	✓			✓	✓	✓				95	
	Additional cards Interface / AP Link	5AC600.CANI-00	✓	✓	✓			✓	✓	✓				-	Slide-in drive 1 and 2
		5AC600.485I-00	✓	✓	✓			✓	✓	✓				-	
		5AC600.TSDL-00	✓	✓	✓			✓	✓	✓				-	
		5AC600.TLDL-00	✓	✓	✓			✓	✓	✓				-	
		5ACPCI.RAIS-00	30/35	30/35	30/35			40/50	40/50	40/50				45/55	

1) Only possible with a B&R CompactFlash card 5CFCRD.xxxx-02

See the following page for a description of the graphic.

### 2.4.1 How does one determine the maximum environmental temperature?

- 1) Selection of the CPU board (use **with** or **without** fan kit).
- 2) The "maximum environmental temperature" line shows the maximum environmental temperature for the entire system when using this CPU board.
- 3) Incorporating additional drives (add-on, slide-in), main memory, additional insert cards, etc. can change the temperature limits of an APC620 system.

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

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

#### Special cases: 5AC600.HDDI-00 and 5AC600.HDDS-00

For these hard disks, the limits will depend on whether the system is intended for 24-hour or standard<sup>1)</sup> 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 and 5AC600.HDDS-00.**

### 2.4.2 Temperature monitoring

The APC620 has temperature sensors in various places (I/O, power supply, slide-in drive 1, slide-in drive 2). The locations of the temperature sensors can be found in figure "Temperature sensor locations", on page 289. The value listed in the table represents the defined maximum temperature for this measurement point. When this temperature is exceeded, an alarm is triggered. The temperatures can be read in BIOS (menu item "advanced" - baseboard/panel features - baseboard monitor) or in Microsoft Windows XP/embedded, using B&R Control Center.

Additionally, the hard disks for APC620 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 in Microsoft Windows XP/embedded.

<sup>1)</sup> "Standard operation" of a hard disk assumes that it is turned on or off once every 12 hours.

## 2.5 Environmental temperature for systems with an 855GME CPU board

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

		① 855GME CPU board without fan kit and heat sink SAC600.HS01-01								① 855GME CPU board with fan kit and heat sink SAC600.HS01-02								Temperature monitored by sensor(s) in:
		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			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			
All temperatures in degrees Celsius (°C)																		
② Maximum environmental temperature		50	45	45	45	—	—			55	55	55	55	45	45			
What can still be operated at max. env. temp.? Or are there any limitations?																		
③																		
Add-on drive	On-board CompactFlash <sup>1)</sup>	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		70	
	5AC600.CFSI-00 <sup>1)</sup>	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		70	
	5AC600.HDDI-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		80	
	5AC600.HDDI-00 (24-hour / standard)	~ / 30	~ / 25	~ / 25	~ / 25					35 / 45	35 / 45	35 / 45	35 / 45	~ / 35	~ / 35		45 / 55	
Slide-in drive	5AC600.CFSS-00 <sup>1)</sup>	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		70	
	5AC600.CDXS-00	45	✓	✓	✓					50	50	50	50	40	40		50	
	5AC600.DVDS-00	35	35	35	35					40	40	40	40	30	30		55	
	5AC600.FDDS-00	35	35	35	35					40	40	40	40	35	35		45	
	5AC600.HDDS-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		80	
	5AC600.HDDS-00 (24-hour / standard)	30 / 35	30 / 35	30 / 35	30 / 35					40 / 50	40 / 50	40 / 50	40 / 50	30 / 40	30 / 40		45 / 55	
Main memory	5MMDDR.0256-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
	5MMDDR.0512-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
	5MMDDR.1024-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
System units	5PC600.SX01-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		95	
	5PC600.SX02-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		95	
	5PC600.SX02-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		95	
	5PC600.SX05-01	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		95	
	5PC600.SX05-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		95	
Additional cards: interface / AP Link	5AC600.CANI-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
	5AC600.485I-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
	5AC600.TSDL-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
	5AC600.TLDL-00	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓		-	
	5ACPCI.RAIS-00	30 / 35	30 / 35	30 / 35	30 / 35					40 / 50	40 / 50	40 / 50	40 / 50	30 / 40	30 / 40		45 / 55	

1) Only with a B&R CompactFlash card - 5CFCDR.xxxx-02

See the following page for a description of the graphic.

### 2.5.1 How does one determine the maximum environmental temperature?

- 1) Selection of the CPU board (use **with** or **without** fan kit).
- 2) The "maximum environmental temperature" line shows the maximum environmental temperature for the entire system when using this CPU board.
- 3) Incorporating additional drives (add-on, slide-in), main memory, additional insert cards, etc. can change the temperature limits of an APC620 system.

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

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

#### Special cases: 5AC600.HDDI-00 and 5AC600.HDDS-00

For these hard disks, the limits will depend on whether the system is intended for 24-hour or standard<sup>1)</sup> 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 and 5AC600.HDDS-00.**

### 2.5.2 Temperature monitoring

The APC620 has temperature sensors in various places (I/O, power supply, slide-in drive 1, slide-in drive 2). The locations of the temperature sensors can be found in figure "Temperature sensor locations", on page 289. The value listed in the table represents the defined maximum temperature for this measurement point. When this temperature is exceeded, an alarm is triggered. The temperatures can be read in BIOS (menu item "advanced" - baseboard/panel features - baseboard monitor) or in Microsoft Windows XP/embedded, using B&R Control Center.

Additionally, the hard disks for APC620 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 in Microsoft Windows XP/embedded.

<sup>1)</sup> "Standard operation" of a hard disk assumes that it is turned on or off once every 12 hours.



## 2.6 Performance management for APC620 systems with 1 and 2 PCI slots

The following block diagram presents the simplified structure of the APC620 supply voltage for system units 5PC600.SX01-00, 5PC600.SX02-00 and 5PC600.SX02-01.

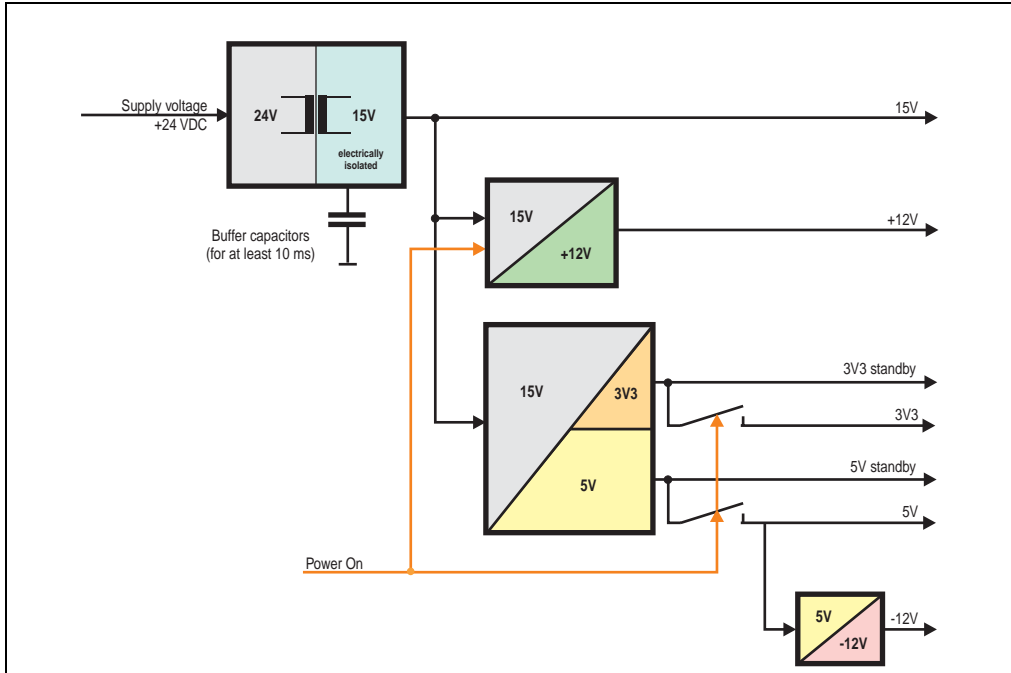


Figure 13: Block diagram, supply voltage

### **Explanation:**

The supply voltage is converted to 15 V with DC/DC converter. These electrically isolated 15 V feed two further DC/DC converters. One generates +12 V, and the other 3V3 and 5V standby.

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

## 2.6.1 Power consumption with system unit 5PC600.SX01-00 1 PCI

All values in Watts

APC620 system unit 5PC600.SX01-00										Current system
	C3 400	C3 723	C3 1000	CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800	
	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03	5PC600.E855-04	5PC600.E855-05	5PC600.E855-06	5PC600.E855-07	5PC600.E855-08	5PC600.E855-09	
Total power supply performance (max.)										70
Total power supply	Max. possible at 5V									55
	CPU board, set consumer	14	18	25	17	TBD	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
	External PS/2 keyboard, optional	1	1	1	1	1	1	1	1	1
	USB peripheral, optional (max. 2.5 Watts 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
	Performance value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>									
	External consumer, optional (via baseboard) <sup>2)</sup>	5	5	5	5	5	5	5	5	5
	Consumer									
3V3	Max. possible at 3V3									23
	System unit, set consumer	4	4	4	4	4	4	4	4	4
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Performance value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>									
+12V	Max. 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 consumer, optional (via baseboard) <sup>2)</sup>	10	10	10	10	10	10	10	10	10
	Performance value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 12 Watts with fan kit) <sup>1)</sup>									
-12V	Max. possible at -12V									1.2
	Performance value - PCI card manufacturer, optional (max. 1.2 Watts with or without fan kit) <sup>1)</sup>									
	Consumer									
	Total - all consumers									

1) The total power of a PCI card per PCI slot (= the sum of the power consumptions for each voltage area) may not exceed the max. power value with or without fan kit.

2) An external consumer can only be connected to the baseboard with Revision B7 or higher of the system unit 5PC600.SX01-00. Protected by a 1A multifuse.

## 2.6.2 Power consumption with system unit 5PC600.SX02-00 2 PCI

All values in Watts

APC620 system unit 5PC600.SX02-00										Current system
	C3 400	C3 733	C3 1000	CM 600	CM 1000	PM 1400	PM 1600	PM 1800	PM 2000	
	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03	5PC600.E855-04	5PC600.E855-05	5PC600.E855-06	5PC600.E855-07	5PC600.E855-08	5PC600.E855-09	
Total power supply (max.)										70
Total power supply	Maximum possible at 5V									55
	CPU board, set consumer	14	18	25	17	TBD	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 Watts 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
	Graphics adapter (AP Link), optional	5	5	5	5	5	5	5	5	5
	Power value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>									
Total power supply	External consumer, optional (via baseboard) <sup>2)</sup>	5	5	5	5	5	5	5	5	5
	Consumer									
	Maximum possible at 3V3									23
	System unit, set consumer	4	4	4	4	4	4	4	4	4
	Graphics adapter (AP Link), optional	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
	Power value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>									
	Consumer									
	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
Total power supply	External consumer, optional (via baseboard) <sup>2)</sup>	10	10	10	10	10	10	10	10	10
	Power value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 12 Watts with fan kit) <sup>1)</sup>									
	Consumer									
	Maximum possible at -12V									1.2
	Power value - PCI card manufacturer, optional (max. 1.2 Watts with or without fan kit) <sup>1)</sup>									
	Consumer									
	Total - all consumers									

1) The total power of a PCI card per PCI slot (= the sum of the power consumptions for each voltage area) may not exceed the max. power value with or without fan kit.

2) An external consumer can only be connected to the baseboard with Revision B7 or higher of the system unit 5PC600.SX02-00. Protected by a 1A multifuse.

### 2.6.3 Power consumption with system unit 5PC600.SX02-01 2 PCI

All values in Watts		APC620 system unit 5PC600.SX02-01										Current system	
		C3 400	C3 723	C3 1000	CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800			
		5PC600.E815-00	5PC600.E815-02	5PC600.E815-03	5PC600.E855-04	5PC600.E855-05	5PC600.E855-06	5PC600.E855-07	5PC600.E855-08	5PC600.E855-09			
Total power supply	Total power supply (max.)											70	
	Maximum possible at 5V											55	
	5V	CPU board, set consumer	14	18	25	17	TBD	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 Watts 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		
		Power value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>											
External consumer, optional (via baseboard) <sup>2)</sup>	5	5	5	5	5	5	5	5	5				
Consumer													
3V3	Maximum possible at 3V3											23	
	System unit, set consumer	4	4	4	4	4	4	4	4	4			
	Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25			
	Power value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>												
	Consumer												
+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 consumer, optional (via baseboard) <sup>2)</sup>	10	10	10	10	10	10	10	10	10			
	Power value - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 12 Watts with fan kit) <sup>1)</sup>												
Consumer													
-12V	Maximum possible at -12V											1.2	
	Power value - PCI card manufacturer, optional (max. 1.2 Watts with or without fan kit) <sup>1)</sup>												
	Consumer												
Total - all consumers													

<sup>1)</sup> The total power of a PCI card per PCI slot (= the sum of the power consumptions for each voltage area) may not exceed the max. power value with or without fan kit.

<sup>2)</sup> An external consumer can only be connected to the baseboard with Revision B7 or higher of the system unit 5PC600.SX02-01. Protected by a 1A multifuse.

## 2.7 Power management, APC620 systems with 5 PCI slots

The following block diagram presents the simplified structure of the APC620 supply voltage for system units 5PC600.SX05-00 and 5PC600.SX05-01.

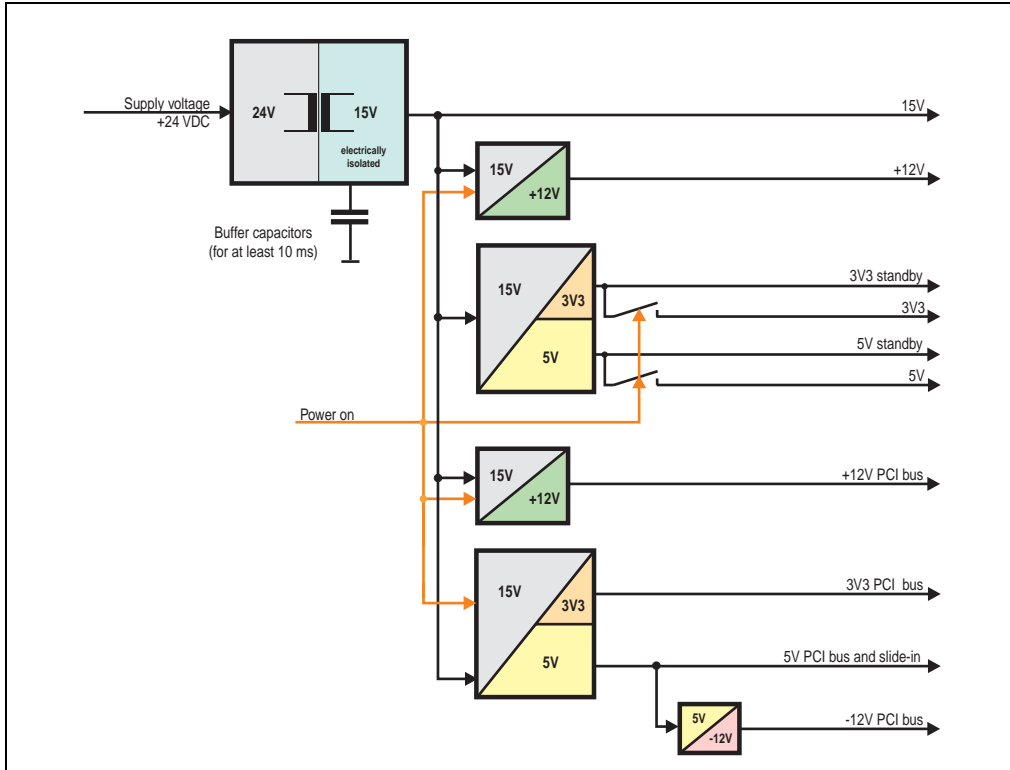


Figure 14: Block diagram, supply voltage

### **Explanation:**

Systems with 5 PCI slots have two additional power supplies for the PCI bus and the slide-in drives.

The supply voltage is converted to 15 V with DC/DC converter. These electrically isolated 15 V feed four further DC/DC converters. Two generate +12 V, and the others generate 3V3 and 5V standby.

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

## 2.7.1 Power consumption with system unit 5PC600.SX05-00 5 PCI

All values in Watts		APC620 system unit 5PC600.SX05-00										Current system
		C3 400	C3 723	C3 1000	CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800		
		5PC600.E815-00	5PC600.E815-02	5PC600.E815-03	5PC600.E855-04	5PC600.E855-05	5PC600.E855-06	5PC600.E855-07	5PC600.E855-08	5PC600.E855-09		
		Total power supply (max.)										110
5V	Maximum possible at 5V										55	
	CPU board, set consumer	14	18	25	17	TBD	23	23	37	37		
	Per CompactFlash, optional (add-on)	1	1	1	1	1	1	1	1	1		
	Hard disk, optional (add-on)	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 Watts 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		
	Graphics adapter (AP Link), optional	5	5	5	5	5	5	5	5	5		
	External consumer, optional (via baseboard) <sup>2)</sup>	5	5	5	5	5	5	5	5	5		
	Consumer											
3V3	Maximum possible at 3V3										23	
	System unit, set consumer	4	4	4	4	4	4	4	4	4		
	Graphics adapter (AP Link), optional	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		
Consumer												
+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 consumer, optional (via baseboard) <sup>2)</sup>	10	10	10	10	10	10	10	10	10		
Consumer												
Maximum power - PCI bus and slide-in power supply										50		
5V	Maximum possible at 5V PCI bus and slide-in										50	
	Per CompactFlash, optional (slide-in)	1	1	1	1	1	1	1	1	1		
	Per HardDisk, optional (slide-in)	4	4	4	4	4	4	4	4	4		
	Per drive, optional (slide-in - CD/DVD)	4	4	4	4	4	4	4	4	4		
	Power values - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>											
	Consumer											
3V3	Maximum possible at 3V3 - PCI bus and slide-in										23	
	Power values - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>											
	Consumer											
+12V	Maximum possible at +12V - PCI bus and slide-in										12	
	Power values - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 12 Watts with fan kit) <sup>1)</sup>											
	Consumer											
-12V	Maximum possible at -12V - PCI bus and slide-in										1.2	
	Power values - PCI card manufacturer, optional (max. 1.2 Watts with or without fan kit) <sup>1)</sup>											
	Consumer											
Total - PCI bus and slide-in												
Total - all consumers												

1) The total power of a PCI card per PCI slot (= the sum of the power consumptions for each voltage area) may not exceed the max. power value with or without fan kit.

2) An external consumer can only be connected to the baseboard with Revision A0 of the system unit 5PC600.SX05-00. Protected by a 1A multifuse.

## 2.7.2 Power consumption with system unit 5PC600.SX05-01 5 PCI

All values in Watts		APC620 system unit 5PC600.SX05-01										Current system	
		C3 400	C3 733	C3 1000	CM 600	CM 1000	PM 1100	PM 1400	PM 1600	PM 1800			
		5PC600.E815-00	5PC600.E815-02	5PC600.E815-03	5PC600.E855-04	5PC600.E855-05	5PC600.E855-06	5PC600.E855-07	5PC600.E855-08	5PC600.E855-09			
Total power supply	Total power supply (maximum)											110	
	5V	Maximum possible at 5V											55
		CPU board, set consumer	14	18	25	17	TBD	23	23	37	37		
		Per CompactFlash, optional (add-on)	1	1	1	1	1	1	1	1	1		
		Hard disk, optional (add-on)	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 Watts 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		
	External consumer, optional (via baseboard) <sup>2)</sup>	5	5	5	5	5	5	5	5	5			
	Consumer												
	3V3	Maximum possible at 3V3											23
		System unit, set consumer	4	4	4	4	4	4	4	4	4		
		Interface option (add-on interface), optional	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		
	Consumer												
	+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 consumer, optional (via baseboard) <sup>2)</sup>	10	10	10	10	10	10	10	10	10		
		Consumer											
PCI bus and slide-in power supply	Power - PCI bus and slide-in power supply (maximum)											50	
	5V	Maximum possible at 5V PCI bus and slide-in											50
		Per CompactFlash, optional (slide-in)	1	1	1	1	1	1	1	1	1		
		Per hard disk, optional (slide-in)	4	4	4	4	4	4	4	4	4		
		Per drive, optional (slide-in - CD/DVD)	4	4	4	4	4	4	4	4	4		
		Power values - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>											
	Consumer												
	3V3	Maximum possible at 3V3 PCI bus and slide-in											23
		Power values - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 17 Watts with fan kit) <sup>1)</sup>											
		Consumer											
	+12V	Maximum possible at +12V PCI bus and slide-in											12
		Power values - PCI card manufacturer, optional (max. 3 Watts without fan kit, max. 12 Watts with fan kit) <sup>1)</sup>											
		Consumer											
	-12V	Maximum possible at -12V PCI bus and slide-in											1.2
		Power values - PCI card manufacturer, optional (max. 1.2 Watts with or without fan kit) <sup>1)</sup>											
		Consumer											
Total - PCI bus and slide-in													
Total - all consumers													

1) The total power of a PCI card per PCI slot (= the sum of the power consumptions for each voltage area) may not exceed the max. power value with or without fan kit.

2) An external consumer can only be connected to the baseboard with Revision A0 of system unit 5PC600.SX05-01. Protected by a 1A multifuse.

2.8 General device interfaces

2.8.1 Serial interface COM1


Serial interfaces COM1		
Type	RS232, modem capable, not electrically isolated	<div>9-pin DSUB male</div> 
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 19: Pin assignments - COM1



## 2.8.2 Serial interface COM2

Serial interfaces COM2		
Type	RS232, modem capable, not electrically isolated	
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	

9-pin DSUB male




Table 20: Pin assignments - COM2

## 2.8.3 Ethernet connection ETH1

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

Ethernet connection (ETH1)			
Controller	Intel 82562		
Cabling	S/STP (category 5)		
Transfer rate	10/100 MBit/s <sup>1)</sup>		
LED	On	Off	
Green	100 MBit/s	10 MBit/s	
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)	

RJ45 Twisted Pair (10BaseT/100BaseT), female

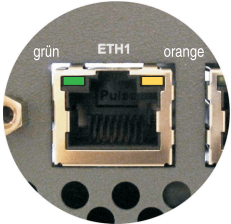


Table 21: Ethernet connection (ETH1)

1) 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](http://www.br-automation.com) ).

## 2.8.4 Ethernet connection ETH2

This Ethernet connection is integrated in the system unit.

Ethernet connection (ETH2)		
Controller	Intel 82551ER	
Cabling	S/STP (category 5)	
Transfer rate	10/100 MBit/s <sup>1)</sup>	
LED	On	Off
Green	100 MBit/s	10 MBit/s
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)

RJ45 Twisted Pair (10BaseT/100BaseT), female

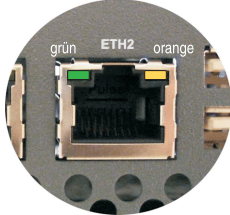


Table 22: Ethernet connection (ETH2)

1) 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](http://www.br-automation.com)).

### 2.8.5 USB port

The APC620 devices have a USB 2.0 (Universal Serial Bus) host controller with multiple USB ports, two of which are on the outside for easy user access.

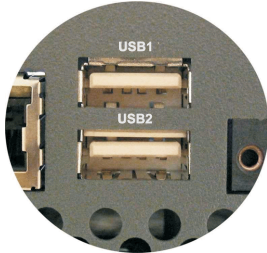
Universal Serial Bus		
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 Mbit/s)	<div>2x USB Type A, female</div> 
Power supply	max. 500 mA per Port <sup>1)</sup>	
Maximum cable length	5 m (not including hub)	

Table 23: USB port

1) 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.

### 2.8.6 Supply voltage

The Automation PC 620 has a 24 VDC ATX compatible power supply. Depending on the system unit, the power supply provides the following maximum performances (in Watts).

System unit	Max. performance at + 5 V	Max. performance at + 3V3	Max. power at + 12 V	Max. power at - 12 V	Max. total power
5PC600.SX01-00	55	23	12	1.2	70
5PC600.SX02-00	55	23	12	1.2	70
5PC600.SX02-01	55	23	12	1.2	70
5PC600.SX05-00	55	23	12	1.2	110
5PC600.SX05-01	55	23	12	1.2	110

Table 24: Power consumption, supply voltage

The 3-pin socket required for the supply voltage connection is not contained in the 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 Automation PC 620 housing. The supply voltage is internally protected (self-healing fuse), so that the device cannot be damaged if there is an overload or if the voltage supply is connected incorrectly (reverse polarity protection).

Supply voltage	
protected against reverse polarity	
Pin	Description
1	+
2	Functional grounding
3	-
Accessories	
0TB103.9	Plug 24 V 5.08 3p screw clamps
0TB103.91	Plug 24 V 5.08 3p cage clamps

3-pin, male

Figure 15: Supply voltage connection

## Important!

The pin's connection to the functional ground (pin 2) should be as short as possible.

The grounding connection can be found on the bottom of the APC620 systems. The M4 self-locking nut can be used, for example, to fasten a copper strip for grounding.

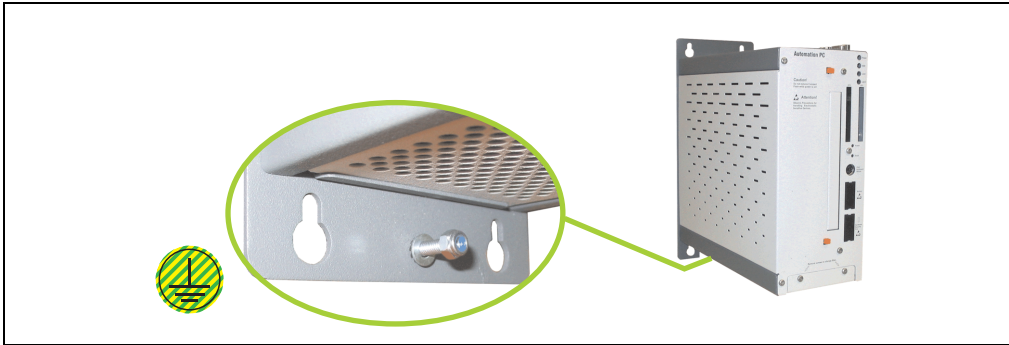


Figure 16: Ground connection

### 2.8.7 Monitor / Panel connection

When using this video output, understand that the video signals that are available (RGB, DVI, and SDL) will vary depending on the system unit and CPU board.

Monitor / Panel		
The following will provide an overview of the video signals available with different system units and CPU boards.		
System unit	815E board	855GME board
5PC600.SX01-00	RGB, DVI, SDL	RGB, DVI, SDL
5PC600.SX02-00	RGB	RGB, DVI, SDL
5PC600.SX02-01	RGB, DVI, SDL	RGB, DVI, SDL
5PC600.SX05-00	RGB	RGB, DVI, SDL
5PC600.SX05-01	RGB, DVI, SDL	RGB, DVI, SDL

24-pin DVI-I with special functions, female

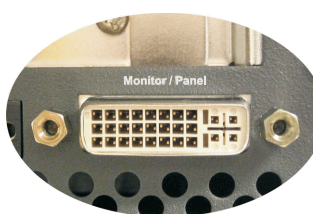


Figure 17: Monitor / Panel connection

See following pages for descriptions of RGB, DVI and SDL.

RGB means:

- It is possible to connect RGB monitors (with adapter, model nr. 5AC900.1000-00) and office RGB TFT displays.

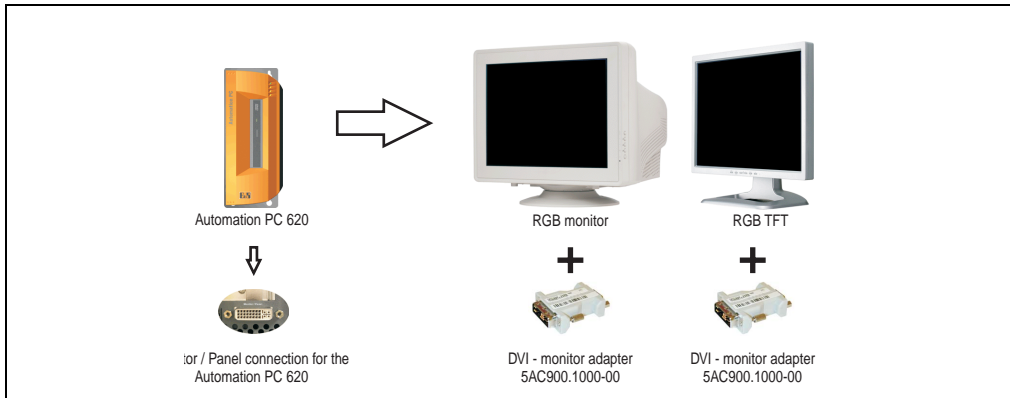


Figure 18: Monitor / Panel connection with RGB video signal

DVI means:

- Connection of B&R Automation Panel 900 display units with Automation Panel Link DVI Receiver (Model nr. 5DL DVI.1000-01), Office Digital/DVI Monitors and Office DVI TFT Displays is possible.

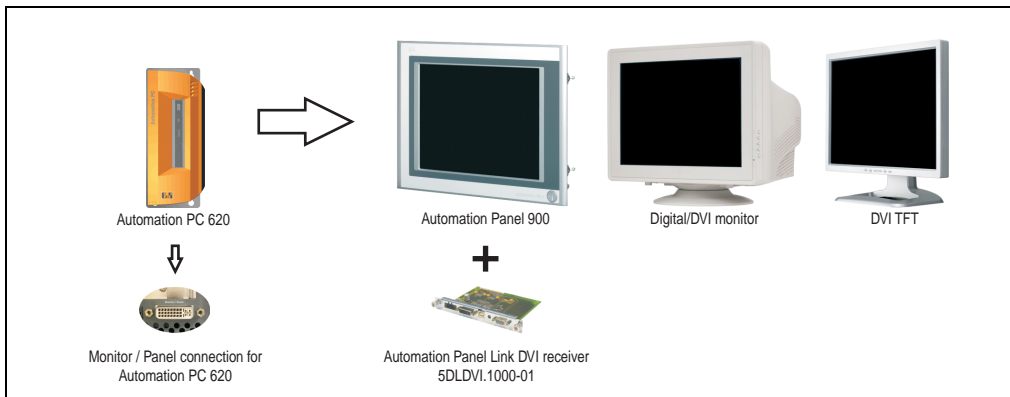


Figure 19: Monitor / Panel connection with DVI video signal

SDL means:

- Connection of B&R Automation Panel 900 display units with Automation Panel Link SDL receiver (Model nr. 5DLSDL.1000-01) or SDL transceiver (Model nr. 5DLSDL.1000-01).

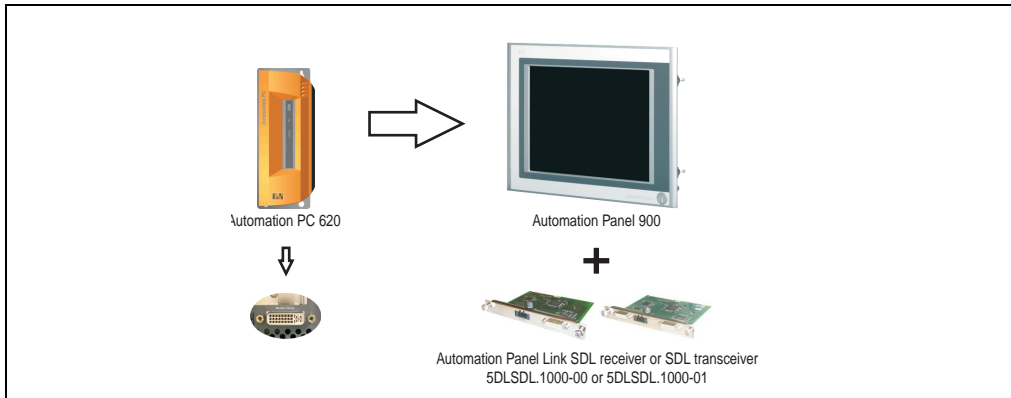


Figure 20: Monitor / Panel connection with SDL video signal

### 2.8.8 MIC, Line IN and Line OUT Port

All APC620 systems include an AC97 (specification 2.2) compatible sound chip with access to the channels MIC, Line IN and Line OUT from the outside.

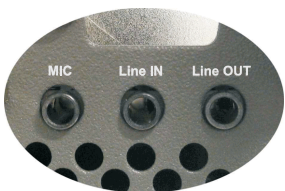
MIC, Line IN and Line OUT		
MIC	Connection of a mono microphone with a 3.5 mm stereo (headphone) jack.	<div>3.5 mm socket, female</div> 
Line IN	Stereo Line IN signal supplied via 3.5 mm plug.	
Line OUT	Connection of a stereo sound reader (e.g. amplifier) via a 3.5 mm plug.	

Table 25: MIC, Line IN and Line OUT Port

### Driver support

Special drivers are necessary for operating the AC97 sound chip. 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](http://www.br-automation.com)).



### 2.8.9 Add-on interface slot

An optional add-on interface (e.g. CAN, RS485) can be installed here. See also section 3.7 "Interface options" on page 102.

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

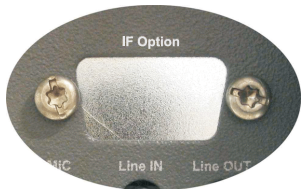


Table 26: Add-on interface slot

## Information:

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

### 2.8.10 AP Link slot

The option of inserting and using an AP Link card is only possible with system units 5PC600.SX02-00 and 5PC600.SX05-00.

The following video signals are then available on the AP Link and Monitor / Panel output with the CPU board (815E or 855GME) being used.

AP Link slot (AP Link card inserted)		
AP Link card	Signal with 815E board on	
	AP Link	Monitor / Panel
5AC600.TDVI-00	DVI	RGB
5AC600.TSDL-00	DVI, SDL	RGB
AP Link card	Signal with 855GME board on	
	AP Link	Monitor / Panel
5AC600.TDVI-00	DVI	RGB, DVI, SDL
5AC600.TSDL-00	DVI, SDL	RGB, DVI, SDL

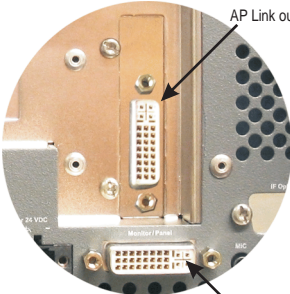


Table 27: AP Link slot (AP Link card inserted)

RGB means:

- It is possible to connect RGB monitors (with adapter, model nr. 5AC900.1000-00) and office RGB TFT displays.

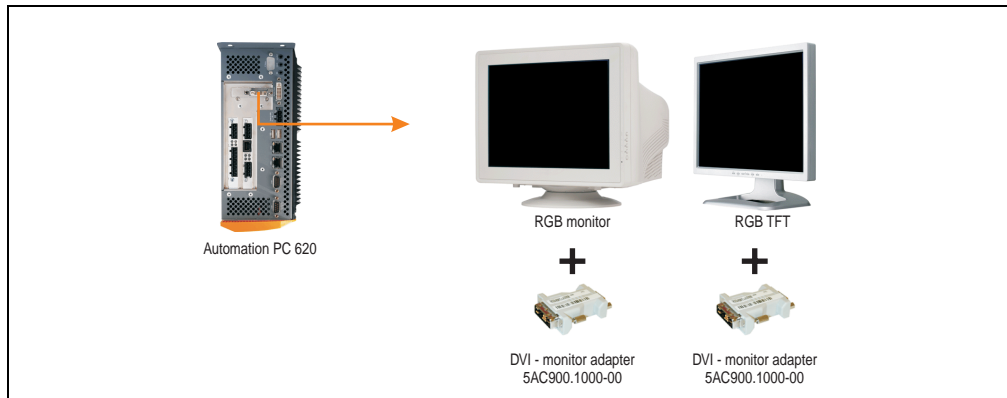


Figure 21: Monitor / Panel connection with RGB video signal

DVI means:

- The B&R Automation Panel 900 display units can be connected with Automation Panel Link DVI receiver (model nr. 5DLDMI.1000-01), Office Digital/DVI monitors and Office DVI TFT.

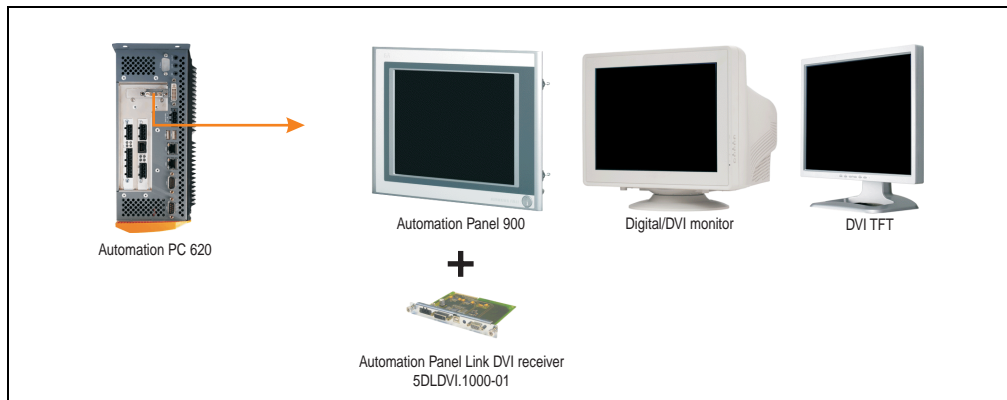


Figure 22: Monitor / Panel connection with DVI video signal

SDL means:

- Connection of B&R Automation Panel 900 display units with Automation Panel Link SDL receiver (model nr. 5DLSDL.1000-01) or SDL transceiver (model nr. 5DLSDL.1000-01).

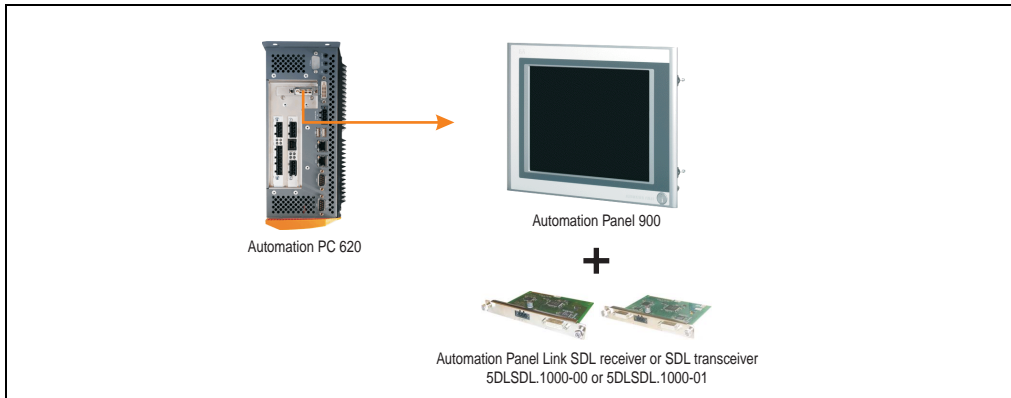


Figure 23: Monitor / Panel connection with SDL video signal

### 2.8.11 PCI slots

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

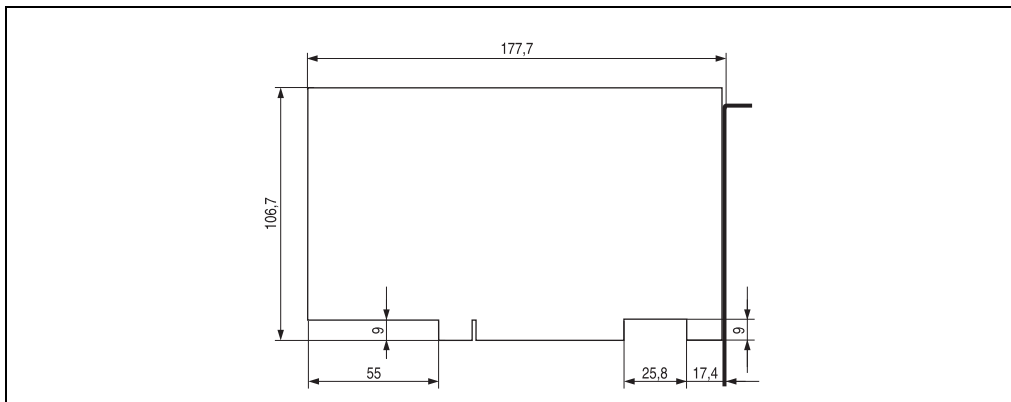


Figure 24: Dimensions - standard half-size PCI cards.

## Information:

The total performance of one PCI card per PCI slot should not exceed the limit with or without a fan kit (see section "Performance management for APC620 systems with 1 and 2 PCI slots", on page 43).

## 2.8.12 Status LEDs

The status LEDs are integrated in the system unit behind the orange front cover.

Status LEDs			
LED	Color		Description
Power	Green	On	Supply voltage OK
	Red	On	The system is in standby mode (S5: soft-off mode or S4: hibernate mode - suspend-to-disk).
HDD	Yellow	On	Signals IDE drive access (CF, HDD, CD, etc.)
Link 1	Yellow	On	Active SDL connection.
		blinking	An active SDL connection has been interrupted by a loss of power in the display unit.
Link 2	Yellow	-	In preparation

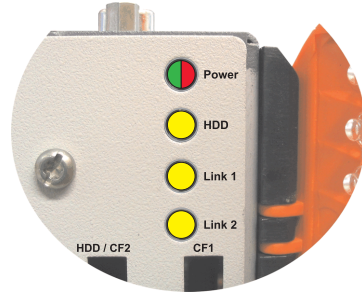


Table 28: Status LEDs

### 2.8.13 CompactFlash slot (CF1)

This CompactFlash slot is a fixed component of an APC620 system, and is defined in BIOS as the primary master drive. Available CompactFlash cards - see table 17 "Model numbers - other items" on page 22.

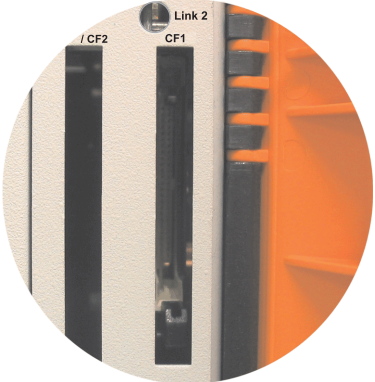
CompactFlash slot (CF1)		
Connection	Primary master IDE device	
CompactFlash type	Type I	
Accessories	Short description	
5CFCRD.0032-02	CompactFlash 32 MB	
5CFCRD.0064-02	CompactFlash 64 MB	
5CFCRD.0128-02	CompactFlash 128 MB	
5CFCRD.0256-02	CompactFlash 256 MB	
5CFCRD.0512-02	CompactFlash 512 MB	
5CFCRD.1024-02	CompactFlash 1024 MB	
5CFCRD.2048-02	CompactFlash 2048 MB	

Table 29: CompactFlash slot (CF1)

## Warning!

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

### 2.8.14 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 5.6 "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, this needs to be requested when placing the 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
Add-on CompactFlash slot	
5AC600.CFSI-00	Add-on CompactFlash slot
CompactFlash type	Type I
Accessories	Short description
5CFCRD.0032-02	CompactFlash 32 MB
5CFCRD.0064-02	CompactFlash 64 MB
5CFCRD.0128-02	CompactFlash 128 MB
5CFCRD.0256-02	CompactFlash 256 MB
5CFCRD.0512-02	CompactFlash 512 MB
5CFCRD.1024-02	CompactFlash 1024 MB
5CFCRD.2048-02	CompactFlash 2048 MB

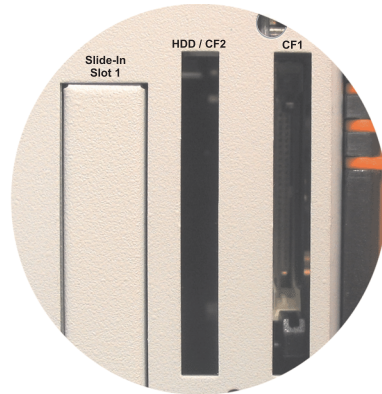


Table 30: Hard disk / CompactFlash slot (HDD/CF2)

## Warning!

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

### 2.8.15 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 165 for 815E CPU boards, or section "Power", on page 218 for 855GME CPU boards) or, for example, in the operating system Windows XP.


Power button	
<p>The power button can be pressed with a pointed object (i.e. paper clip or tip of a pen).</p> <p>The power button acts like the on/off switch on a normal desktop PC with ATX power supply:  <b>press and release ...</b> Windows shuts down automatically  <b>press and hold ...</b> ATX power supply switches off without shutting down the APC620 (<b>data could be lost!</b>).</p> <p>Pressing the power button does not reset the MTCX processor.</p>	

Table 31: Power button

### 2.8.16 Reset button


Reset button	
<p>The reset button can be pressed with a pointed object (i.e. paper clip or tip of a pen).</p> <p>Pushing the reset button results in a hardware-reset, PCI-reset. The Automation PC 620 restarts cold.</p> <p>The MTCX processor is not reset when the reset button is pressed.</p>	

Table 32: Reset button

## Warning!

A reset triggered by pressing the reset button can cause data to be lost!

### 2.8.17 PS/2 keyboard/mouse

A standard PS/2 mouse or a PS/2 AT enhanced keyboard can be connected here. BIOS automatically determines whether a mouse or a keyboard has been connected, and transfers this information to the operating system.

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

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

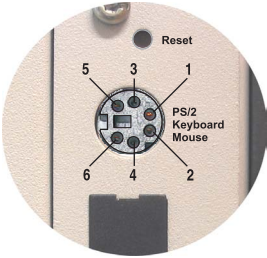
Connection for keyboard/mouse (PS/2)		
Pin	Assignment	<div>PS/2 socket, female</div> 
1	DATA 0	
2	DATA 1	
3	GND	
4	+5 V <sup>1)</sup>	
5	CLK 0	
6	CLK 1	

Table 33: 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.. Therefore it should 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").



### 2.8.18 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%).

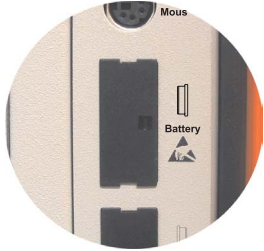
Battery		
Battery Type	Renata 950 mAh	
Exchangeable	Yes, accessible from the outside.	
Lifespan	4 years at 25 °C	

Table 34: Battery

## Warning!

**Turn off power before removing or adding the lithium battery.**

For more on changing the lithium battery, see chapter 6 "Maintenance / servicing", section "Changing the battery", on page 277.

### 2.8.19 Hardware security key

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

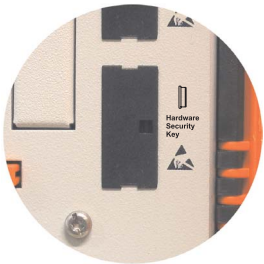
Hardware security key	
<p>A hardware security key (dongle) can be inserted behind the black cover.</p>	

Table 35: Hardware security key

## Warning!

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

### 2.8.20 Slide-in slot 1 drive slot

This slide-in slot 1 drive slot exists only in APC620 system units with 2 or 5 PCI slots, in which case it is possible to insert a number of slide-in drives. See table for available slide-in drives 8 "Model numbers - drives" on page 19.

The slide-in CD-ROM and the slide-in DVD-ROM/CD-RW drive are referred to in BIOS as "secondary slave". The slide-in USB FDD drive is referred to as USB.

## Information:

- It is possible to add, remove, or modify the slide-in drive at any time.
- In system units with 5 PCI slots, the slide-in USB FDD drive must be inserted in slide-in slot 1 for mechanical reasons. The slide-in drive 5AC600.CFSS-00 (slide-in CF 2-slot) should only be operated in slide-in slot 2.

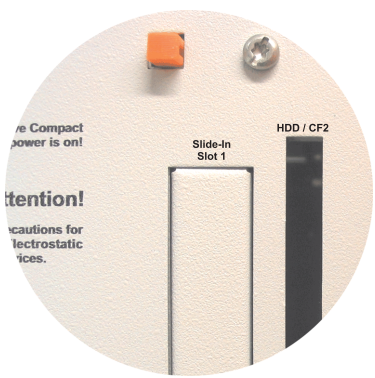
Slide-in slot 1		
Connection	Secondary slave IDE device	
Accessories	Short description	
5AC600.CDXS-00	Slide-in CD-ROM	
5AC600.CFSS-00	Slide-in CF 2-slot	
5AC600.DVDS-00	Slide-in DVD-ROM/CD-RW	
5AC600.FDDS-00	Slide-in USB FDD	
5AC600.HDDS-00	Slide-in hard disk 30 GB 24x7	
5AC600.HDDS-01	Slide-in hard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

Table 36: Slide-in slot 1

## Caution!

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

### 2.8.21 Slide-in slot 2 drive slot

This slide-in slot 2 drive slot exists only in APC620 system units with 5 PCI slots. This makes it possible to insert a number of slide-in drives. See table for available slide-in drives 8 "Model numbers - drives" on page 19.

The slide-in CD-ROM and the slide-in DVD-ROM/CD-RW drive are referred to in BIOS as "secondary master". The slide-in USB FDD drive is referred to as USB.

#### Information:

- It is possible to add or remove a slide-in drive at any time.
- In system units with 5 PCI slots, the slide-in USB FDD drive must be inserted in slide-in slot 1. The slide-in drive 5AC600.CFSS-00 (slide-in CF 2-slot) should only be operated in slide-in slot 2.

#### Caution!

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

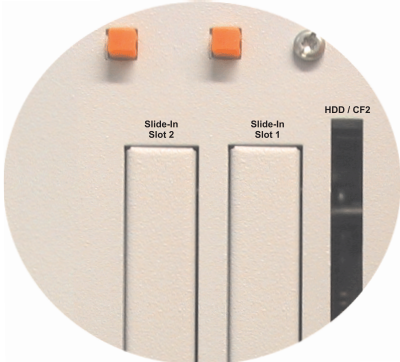
Slide-in slot 2		
Connection	Secondary master IDE device	
Accessories	Short description	
5AC600.CDXS-00	Slide-in CD-ROM	
5AC600.CFSS-00	Slide-in CF 2-slot	
5AC600.DVDS-00	Slide-in DVD-ROM/CD-RW	
5AC600.FDDS-00	Slide-in USB FDD	
5AC600.HDDS-00	Slide-in hard disk 30 GB 24x7	
5AC600.HDDS-01	Slide-in hard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

Table 37: Slide-in slot 2

#### Caution!

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

## 3. Individual components

### 3.1 System units

All of the individual components of the Automation PC620 system are combined to form the system unit. The system unit consists of an APC620 housing with an integrated main board. The housing comes in variants with 1, 2, or 5 PCI slots. Units with 2 or 5 PCI slots have an additional 1 or 2 slide-in drives, respectively.

#### 3.1.1 Technical data






Features	5PC600.SX01-00	5PC600.SX02-00	5PC600.SX02-01	5PC600.SX05-00	5PC600.SX05-01
					
Serial interfaces Type Number UART Transfer rate Connection	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 51 and "Ethernet connection ETH2", on page 53 10/100 Mbit/s RJ45 Twisted Pair (10 BaseT / 100 BaseT)				
USB interface Type Number Transfer rate Connection	USB 2.0 2 up to 480 MBit (high speed) Type A				
Monitor / Panel	DVI-I, female				
AC97 sound	Mic., line in, line out				
IF optional slot	1				
PCI slots (half-size) according to PCI half-size standard 2.2.	1	2		5	
CompactFlash slot 1 (CF1) Internal organization	Integrated Primary master				
Combined CompactFlash slot 2 / hard disk (HDD/CF2) Internal organization	Yes, optional add-on CompactFlash slot or add-on hard disk Primary slave				
Insert for slide-in drive 1 Internal organization	-	Yes Secondary slave			

Table 38: Technical data - system units

Features	5PC600.SX01-00	5PC600.SX02-00	5PC600.SX02-01	5PC600.SX05-00	5PC600.SX05-01
Insert for slide-in drive 2 Internal organization	-	-	-	Yes Secondary master	
Reset button	Yes				
Power button	Yes				
PS/2 keyboard/mouse	Yes, combined, will be automatically detected				
Battery slot	Yes				
Hardware security key slot	Yes (DS1425 from MAXIM/Dallas)				
Fan slot	Yes				
Automation Panel link slot	-	1	-	1	-
LEDs	Power, HDD, Link1, Link2				
Real-time clock Battery buffered Precision	Yes 15 ppm				
Electrical characteristics					
Power supply Rated voltage	24 VDC ± 25 %				
Mechanical characteristics					
Housing Material Paint Front cover	Galvanized steel plate Light gray (similar to Pantone 427CV), dark gray (similar to Pantone 432CV) Colored plastic (similar to Pantone 151CV)				
Outer dimensions Width Length Height	65 mm 251 mm 270 mm	104.5 mm 253 mm 270 mm		185.4 mm 253 mm 270 mm	
Weight	Approx. 1.5 kg	Approx. 2.6 kg		Approx. 3.8 kg	
Mounting plates (for M4 screws)	4			6	
Drilling templates	(see chapter 3 "Mounting", section 2 "Drilling templates")				

Table 38: Technical data - system units (cont.)

## 3.2 CPU boards 815E

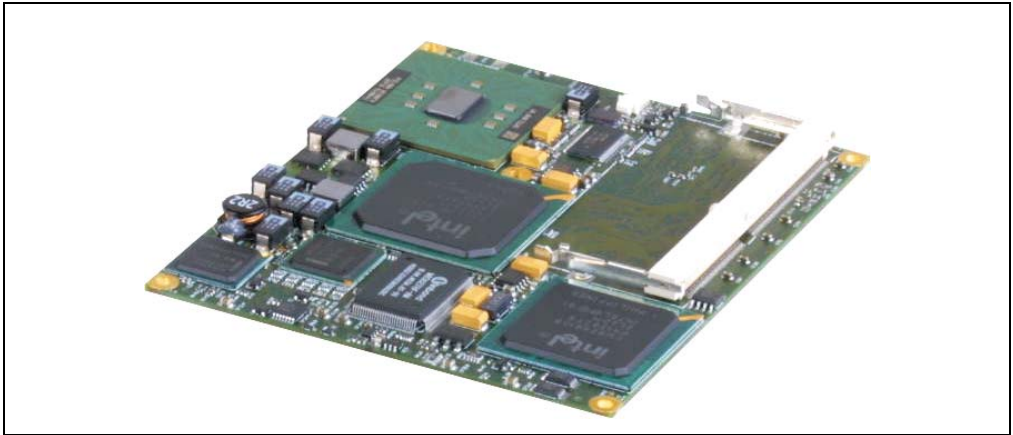


Figure 25: CPU boards 815E

### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

### 3.2.1 Technical data

Features	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03
Boot loader / Operating system	BIOS Phoenix		
Processor			
Architectures	0.13 µm	0.13 µm	0.13 µm
Type	Intel Celeron 3 400 MHz	Intel Celeron 3 733 MHz	Intel Celeron 1 GHz
Expanded command set	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension	MMX technology, streaming SIMD extension
L1 cache	16 kByte	16 kByte	16 kByte
L2 cache	256 kByte	256 kByte	256 kByte
Floating Point Unit (FPU)	Yes	Yes	Yes
Chipset	Intel 82815E (GMCH) Intel 82801DB (ICH4) - integrated real-time clock (RTC) <sup>1)</sup>		

Table 39: Technical data - CPU boards 815E

Features	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03
Front side bus	100 MHz	133 MHz	133 MHz
IDE ports	2 IDE ports, UDMA 100		
Memory Type Size 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) 64 MB shared memory (reserved in the main memory) Max. 24-bit		

Table 39: Technical data - CPU boards 815E (cont.)

1) The real-time clock (RTC) has an error of 2 seconds per day at 25°C and 6 seconds per day at 60°C.

## 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 graphic chip. They can be downloaded from the download area on the B&R homepage ([www.br-automation.com](http://www.br-automation.com)).

### 3.3 CPU boards 855GME

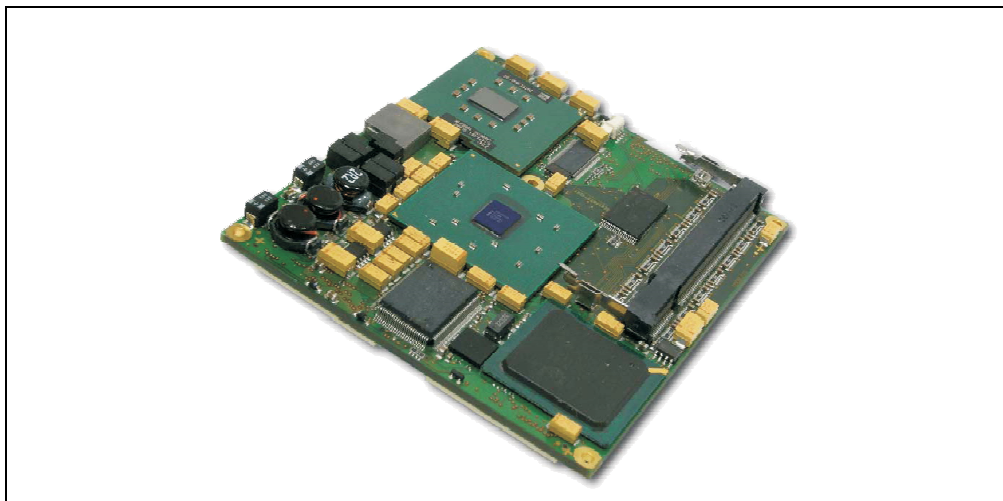


Figure 26: CPU boards 855GME

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.



### 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					
Processor	0.13 µm	0.13 µm	0.90 nm	0.90 nm	0.13 µm	90 nm
Architectures	Intel Pentium	Intel Pentium	Intel Pentium	Intel Pentium	Intel Celeron	Intel Celeron
Type	M 1,1 GHz	M 1.6 GHz	M 1.4 GHz	M 1.8 GHz	M 600 MHz	M 1000 MHz
Expanded command set	MMX technology, streaming SIMD	MMX technology, streaming SIMD	MMX technology, streaming SIMD	MMX technology, streaming SIMD	MMX technology, streaming SIMD	MMX technology, streaming SIMD
L1 cache	extension 2	extension 2	extension 2	extension 2	extension 2	extension 2
L2 cache	32 kByte	32 kByte	32 kByte	32 kByte	32 kByte	32 kByte
Floating Point Unit (FPU)	1 MB Yes	1 MB Yes	2 MB Yes	2 MB Yes	512 kB Yes	1 MB Yes
Features	5PC600.E855-00	5PC600.E855-01	5PC600.E855-02	5PC600.E855-03	5PC600.E855-04	5PC600.E855-05
Chipset	Intel 82855GME (GMHC) Intel 82801DB (ICH4) - integrated real-time clock (RTC) <sup>1)</sup>					
Front side bus	400 MHz					
IDE ports	2 IDE ports, UDMA 100					
Memory	DDRAM					
Type	Max. 1 GB					
Size	SO-DIMM 200-pin					
Socket						
Graphics	Intel Extreme Graphics 2 (integrated in the chipset)					
Controller	64 MB shared memory (reserved in the main memory)					
Memory	Max. 32-bit					
Color depth						

Table 40: Technical data - CPU boards 855GME

1) The quartz used has an accuracy of 10 ppm. This means after influences such as operating temperature have been taken into account, the inaccuracy is typically 2 seconds per day.

### 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 graphic chip. They can be downloaded from the download area on the B&R homepage ([www.br-automation.com](http://www.br-automation.com)).

### 3.4 Heat sink

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

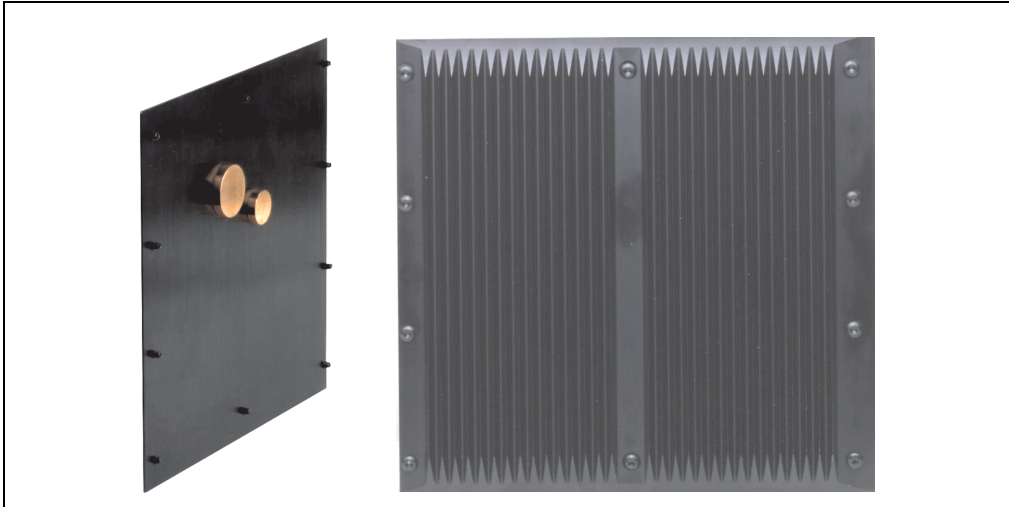


Figure 27: Heat sink

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are 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	5AC600.HS01-00	5AC600.HS01-01	5AC600.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.E855-00 5PC600.E855-01 5PC600.E855-02 5PC600.E855-03 5PC600.E855-04 5PC600.E855-05
Material	Black-coated aluminum		
Outer dimensions			
Width	228.7 mm		228.7 mm
Height	218 mm		218 mm
Depth	12.8 mm		30 mm
Weight	1340 g		1640 g

Table 41: Technical data - heat sink

### 3.5 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 CPU boards 512 MB, and for 855GME CPU boards 1 GB) and the correct type.

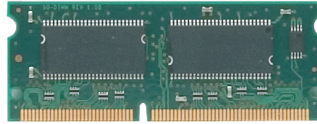


Figure 28: Main memory module

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

#### 3.5.1 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			855GME		
Size	128 MB	256 MB	512 MB	256 MB	512 MB	1 GB
Construction	144-pin	144-pin	144-pin	200-pin	200-pin	200-pin
Type	SO-DIMM SDRAM	SO-DIMM SDRAM	SO-DIMM SDRAM	SO-DIMM DDR-SDRAM	SO-DIMM DDR-SDRAM	SO-DIMM DDR-SDRAM
Organization	16Mx64	32Mx64	64Mx64	32Mx64	64Mx64	128Mx64

Table 42: Technical data - main memory

#### Information:

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

## 3.6 Drives

### 3.6.1 Add-on hard disk 30 GB 24x7

This hard disc 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, this needs to be requested when placing the order.



Figure 29: Add-on hard disk 30 GB 24/7

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

#### Technical data

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

Table 43: Technical data - add-on hard disk 5AC600.HDDI-00

Features	5AC600.HDDI-00
Revolution speed	4200 rpm $\pm$ 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 32.1 MB/s Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 24 dBA at 30 cm
<b>Electrical characteristics</b>	
lifespan	5 years or 20,000 POH (Power-On Hours)
MTBF	300,000 hours
<b>Mechanical characteristics</b>	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	70 mm 100 mm 9.5 mm
Weight	120 g
<b>Environmental characteristics</b>	
Environmental temperature Operation - standard <sup>1)</sup> Operation - 24-hour Storage Transport	+5 °C .. +55 °C +5 °C .. +45 °C -40 °C .. +60 °C -40 °C .. +60 °C
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 <sup>2</sup> 0-peak) No damage at max. 5 - 500 Hz and 5 g (49 m/s <sup>2</sup> 0-peak)
Shock (pulse with a sinus half-wave) Operation Storage	No non-recovered errors at max. 225 g (2,207 m/s <sup>2</sup> 0-peak) and 2 ms duration No damage at max. 900 g (8820 m/s <sup>2</sup> 0-peak) and 1 ms duration No damage at max. 120 g (1,176 m/s <sup>2</sup> 0-peak) and 11 ms duration
Altitude Operation Storage	- 300 to 3,000 meters - 300 to 12,000 meters

Table 43: Technical data - add-on hard disk 5AC600.HDDI-00 (cont.)

1) "Standard operation" of a hard disk assumes that it is turned on or off once every 12 hours.

### 3.6.2 Add-on hard disk 20 GB ET

This hard disk has an expanded temperature specification, but is not allowed 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, this needs to be requested when placing the order.



Figure 30: Add-on hard disk 20 GB

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

#### Technical data

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 $\pm$ 1%
Access time (average)	7.14 ms

Table 44: 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
<b>Electrical characteristics</b>	
MTBF	20,000 hours at -20 °C .. +55 °C 2,000 hours with environmental temperatures > + 55 °C
<b>Mechanical characteristics</b>	
Add-on mounting	Fixed
Outer dimensions (without slide-in) Width Length Height	70 mm 100 mm 9.5 mm
Weight	120 g
<b>Environmental characteristics</b>	
Environmental temperature Operation Storage Transport	-20 °C .. +85 °C <sup>1)</sup> -40 °C .. +85 °C -40 °C .. +85 °C
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 <sup>2</sup> 0-peak) No damage at max. 5 - 500 Hz and 5 g (49 m/s <sup>2</sup> 0-peak)
Shock (pulse with a sinus half-wave) Operation Storage	No non-recovered errors at max. 225 g (2,207 m/s <sup>2</sup> 0-peak) and 2 ms duration No damage at max. 900 g (8820 m/s <sup>2</sup> 0-peak) and 1 ms duration No damage at max. 120 g (1,176 m/s <sup>2</sup> 0-peak) and 11 ms duration
Altitude Operation Storage	- 300 to 3,000 meters - 300 to 12,000 meters

Table 44: Technical data - add-on hard disk 5AC600.HDDI-01 (cont.)

1) Surface temperature of the hard disk.

### 3.6.3 Add-on CompactFlash slot

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, this needs to be requested when placing the order.

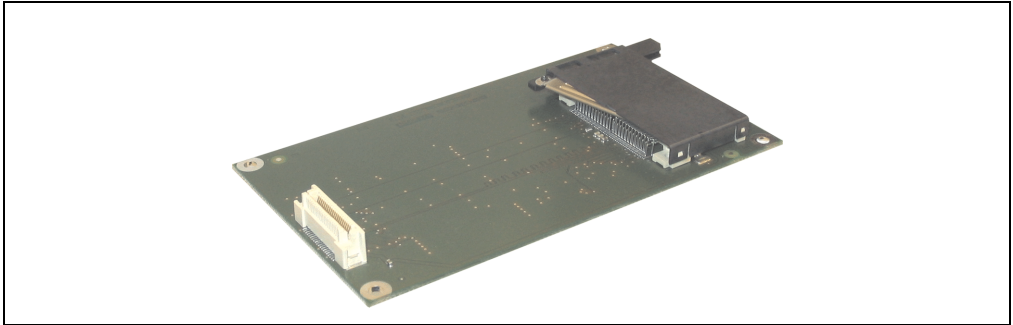


Figure 31: Add-on CompactFlash slot

#### Technical data

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

Table 45: Technical data - add-on CompactFlash slot 5AC600.CFSI-00

#### Warning!

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



### 3.6.4 Slide-in CD-ROM

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 32: Slide-in CD-ROM

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

**Technical data**

Features	5AC600.CDXS-00
Reading rate	24x
Data transfer rate	max. 33.3 MByte/sec.
Access time (average)	115 ms
Revolution speed	max. 5,136 rpm $\pm$ 1%
Starting time (0 rpm to read access)	10 seconds (maximum)
Host interface	IDE (ATAPI)
Readable CD media	CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW
Compatible formats	CD-DA, CD-ROM mode 1/mode 2 CD-ROM XA mode 2 (form 1, form 2) Photo CD (single/multi-session) Enhanced CD
Cache	128 kB
Noise level (complete read access)	Approx. 45 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
Environmental characteristics	
Environmental temperature Operation Storage Transport	-5 °C .. +60°C <sup>1)</sup> -20 °C .. +60 °C -40 °C .. +65 °C
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 0.3 g at max. 5 - 500 Hz and 2 g at max. 5 - 500 Hz and 5 g
Shock (pulse with a sinus half-wave) Operation Storage Transport	at max. 7 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 46: Technical data - slide-in CD-ROM 5AC600.CDXS-00

1) Drive surface temperature

### 3.6.5 Slide-in DVD-ROM/CD-RW

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 33: Slide-in DVD-ROM/CD-RW

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

**Technical data**

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 MByte/sec.
Access time (average) CD DVD	85 ms 110 ms
Revolution speed	max. 5,136 rpm $\pm$ 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	Disc at once, session at once, packet write, track at once
Laser class	Class 1 laser
Data buffer capacity	2 MB
Noise level (complete read access)	Approx. 45 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
<b>Environmental characteristics</b>	
Environmental temperature Operation Storage Transport	-5 °C .. +60°C <sup>1)</sup> -20 °C .. +60 °C -40 °C .. +65 °C
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

Table 47: Technical data - slide-in DVD-ROM/CD-RW 5AC600.DVDS-00

Features	5AC600.DVDS-00
Shock (pulse with a sinus 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 47: Technical data - slide-in DVD-ROM/CD-RW 5AC600.DVDS-00 (cont.)

1) Drive surface temperature

### 3.6.6 Slide-in CF 2-slot

The slide-in drive can be used in system units with 2 or 5 PCI slots. When inserted in slide-in slot 1, the CompactFlash slot CF3 is referred to internally as "secondary slave" and when in slide-in slot 2 as "secondary master." CompactFlash slot CF4 is always accessed via USB.

#### Information:

- It is possible to add or remove a slide-in drive at any time.
- When the slide-in drive 5AC600.CFSS-00 (slide-in CF 2-slot) is used with a 5 PCI slot system unit (5PC600.SX05-00 and 5PC600.SX05-01) it should only be operated in slide-in slot 2.

#### 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 APC620!

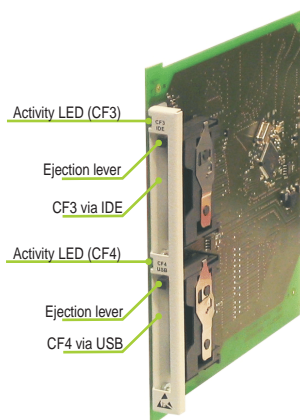


Figure 34: Slide-in CF 2-slot

# Technical data

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

Table 48: Technical data - slide-in CF 2 Slot 5AC600.CFSS-00

### 3.6.7 Slide-in USB FDD

The slide-in drive can be used in system units with 2 or 5 PCI slots. In these units it is connected to the system via USB.

#### Information:

- It is possible to add, remove, or modify the slide-in drive at any time.
- In system units with 5 PCI slots, the slide-in USB FDD drive must be inserted in slide-in slot 1 for mechanical reasons.

#### Caution!

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

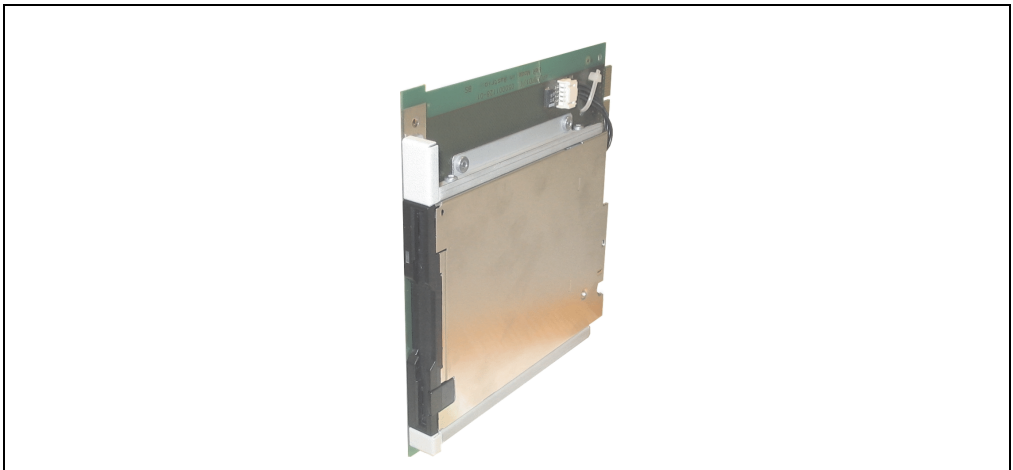


Figure 35: Slide-in USB FDD

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.



## Technical data

Features	5AC600.FDDS-00
Data capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
USB transfer rate	Full speed (12 Mbps)
Data transfer rate	250 kbits (720 KB) or 500 kbits (1.25 MB and 1.44 MB)
Rotation speed	Up to 360 rpm
Diskette media	High density (2HD) or normal density (2DD) 3.5" diskettes
MTBF	30,000 POH (Power-On Hours)
Environmental characteristics	
Environmental temperature	
Operation	5 °C .. +45 °C
Storage	-20 °C .. +60 °C
Transport	-40 °C .. +85 °C
Environmental characteristics	
Humidity	
Operation	20 - 80 % non-condensing
Storage	5 - 90 % non-condensing
Transport	5 - 95 % 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
Environmental characteristics	5AC600.FDDS-00
Shock (pulse with a sinus 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. 3,000 meters

Table 49: Technical data - slide-in USB diskette drive 5AC600.FDDS-00

### 3.6.8 Slide-in hard disk 30 GB 24x7

This hard disc is specified for 24-hour operation. 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 36: Slide-in hard disk 30 GB

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

## Technical data

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)	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 32.1 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 20,000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical characteristics	
Slide-in mounting	Fixed
Outer dimensions (without slide-in)	
Width	70 mm
Length	100 mm
Height	9.5 mm
Weight	120 g
Environmental characteristics	
Environmental temperature	
Operation - standard <sup>1)</sup>	+5 °C .. +55 °C
Operation - 24-hour	+5 °C .. +45 °C
Storage	-40 °C .. +60 °C
Transport	-40 °C .. +60 °C
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 <sup>2</sup> 0-peak)
Storage	No damage at max. 5 - 500 Hz and 5 g (49 m/s <sup>2</sup> 0-peak)

Table 50: Technical data - slide-in hard disk 5AC600.HDDS-00

## Technical data • Individual components

Features	5AC600.HDDS-00
Shock (pulse with a sinus half-wave) Operation Storage	No non-recovered errors at max. 225 g (2,207 m/s <sup>2</sup> 0-peak) and 2 ms duration No damage at max. 900 g (8820 m/s <sup>2</sup> 0-peak) and 1 ms duration No damage at max. 120 g (1,176 m/s <sup>2</sup> 0-peak) and 11 ms duration
Altitude Operation Storage	- 300 to 3,000 meters - 300 to 12,000 meters

Table 50: Technical data - slide-in hard disk 5AC600.HDDS-00 (cont.)

1) "Standard operation" of a hard disk assumes that it is turned on or off once every 12 hours.

### 3.6.9 Slide-in hard disk ET 20 GB

This hard disk has an expanded temperature specification, but is not allowed for 24 hour operation. 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 37: Slide-in hard disk 20 GB

#### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

**Technical data**

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	4,200 rpm $\pm$ 1%
Access time (average)	7.14 ms
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	Up to 28.9 MB/s
To / from host	Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 22 dBA at 30 cm
Electrical characteristics	
MTBF	20,000 hours at -20 °C .. +55 °C 2,000 hours with environmental temperatures > + 55 °C
Mechanical characteristics	
Slide-in mounting	Fixed
Outer dimensions (without slide-in)	
Width	70 mm
Length	100 mm
Height	9.5 mm
Weight	120 g
Environmental characteristics	
Environmental temperature	
Operation	-20 °C ... +85 °C <sup>1)</sup>
Storage	-40 °C .. +85 °C
Transport	-40 °C .. +85 °C
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 <sup>2</sup> 0-peak)
Storage	No damage at max. 5 - 500 Hz and 5 g (49 m/s <sup>2</sup> 0-peak)

Table 51: Technical data - slide-in hard disk 5AC600.HDDS-01

Features	5AC600.HDDS-01
Shock (pulse with a sinus half-wave) Operation Storage	No non-recovered errors at max. 225 g (2,207 m/s <sup>2</sup> 0-peak) and 2 ms duration No damage at max. 900 g (8,820 m/s <sup>2</sup> 0-peak) and 1 ms duration No damage at max. 120 g (1,176 m/s <sup>2</sup> 0-peak) and 11 ms duration
Altitude Operation Storage	- 300 to 3,000 meters - 300 to 12,000 meters

Table 51: Technical data - slide-in hard disk 5AC600.HDDS-01 (cont.)

1) Surface temperature of the hard disk.

### 3.6.10 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 to by the system when the faulty hard disk has been replaced.

The RAID 1 system is executed in the form of 2 PCI cards: PCI RAID controller (5ACPCI.RAIC-00) and PCI card with two hard disks (5ACPCI.RAIS-00). The system can be implemented in all APC620s with **two free PCI slots**. There are no further hardware requirements. The RAID card has its own controller. This means that the industrial PC's main processor is not overloaded by redundant data storage. 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.

### 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.

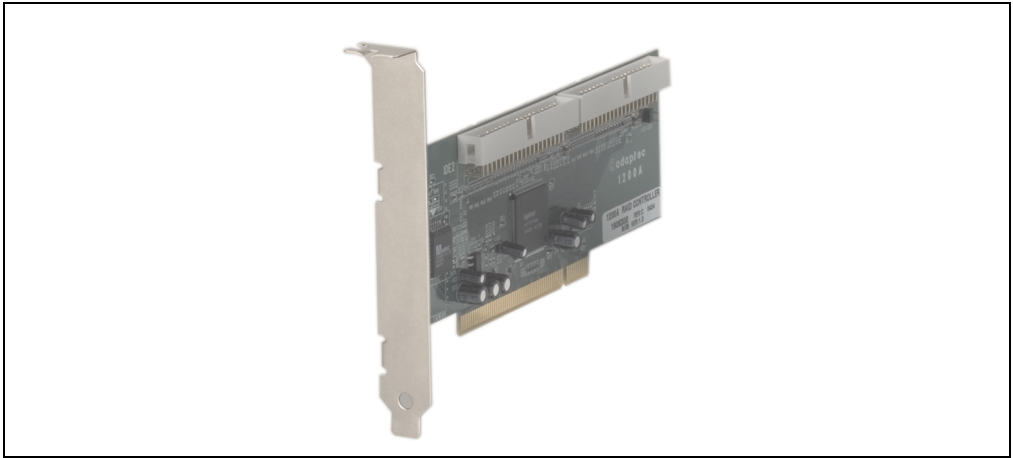


Figure 38: RAID controller 5ACPCI.RAIC-00

## 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
<b>Electrical characteristics</b>	
Power consumption	0.15 A at 5 V (PCI bus)
<b>Mechanical characteristics</b>	
Outer dimensions	
Length	168 mm
Height	64 mm
<b>Environmental characteristics</b>	
Environmental temperature	
Operation	0 °C .. 55 °C
Storage	-20 °C .. 60 °C
Transport	-20 °C .. 60 °C

Table 52: Technical data - RAID controller 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.

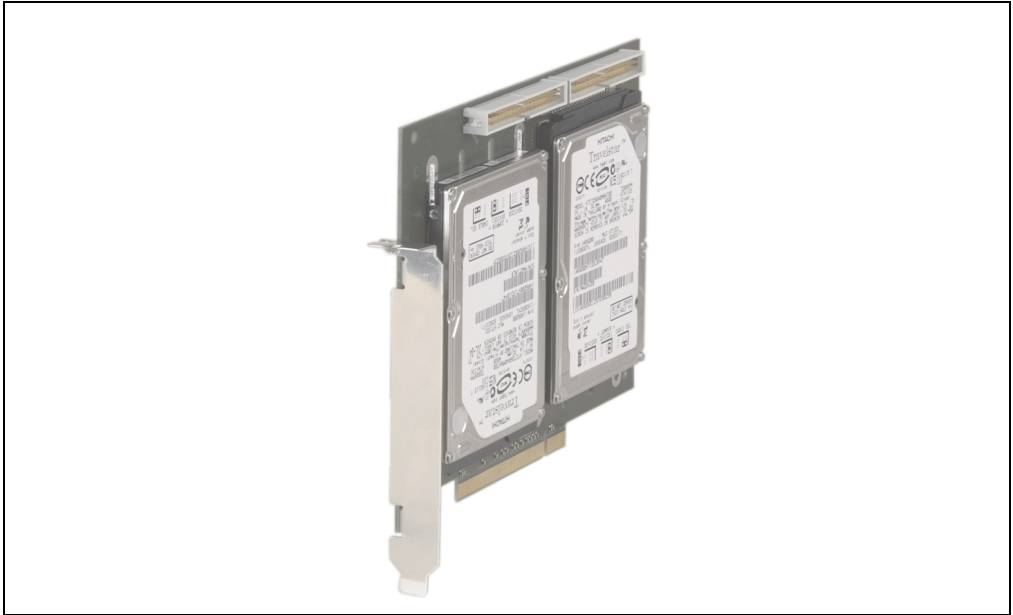


Figure 39: PCI RAID storage 5ACPCI.RAIS-00

### Information:

The following characteristics, features and limit values are only valid for these individual components and can deviate from those for the entire device. For the entire device in which these individual components are used, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

**Technical data**

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 $\pm$ 1%
Access time (average)	4.2 ms
Positioning time (seek, typical values)	
Minimum (track to track)	1 ms
Average (read access)	10 ms
Maximum	16 ms
Starting time (0 rpm to read access)	4 seconds (typically)
Interface	ATA-6
Data transfer rate	
To the medium	up to 28.9 MB/s
To / from host	Max. 100 MB/s (ultra-DMA mode 5)
Cache	2 MB
Noise level (idle mode)	Approx. 22 dBA at 30 cm
Electrical characteristics	
MTBF	30,000 hours
Mechanical characteristics	
Slide-in mounting	Fixed
Outer dimensions (without slide-in)	
Width	70 mm
Length	100 mm
Height	9.5 mm
Weight	120 g
Environmental characteristics	
Environmental temperature	
Operation - 24-hour	+5 °C .. +40 °C <sup>1)</sup>
Storage	-40 °C .. +65 °C
Transport	-40 °C .. +65 °C
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 <sup>2</sup> 0-peak)
Storage	No damage at max. 5 - 500 Hz and 5 g (49 m/s <sup>2</sup> 0-peak)

Table 53: Technical data - slide-in hard disk 5AC600.HDDS-01

Features	5ACPCI.RAIS-00
Shock (pulse with a sinus half-wave) Operation Storage	No non-recovered errors at max. 200 g (1,960 m/s <sup>2</sup> 0-peak) and 2 ms duration No damage at max. 1000 g (9,800 m/s <sup>2</sup> 0-peak) and 1 ms duration No damage at max. 120 g (1,176 m/s <sup>2</sup> 0-peak) and 11 ms duration
Altitude Operation Storage	- 300 to 3,000 meters - 300 to 12,000 meters

Table 53: Technical data - slide-in hard disk 5AC600.HDDS-01 (cont.)

1) Surface temperature of the hard disk.

### 3.7 Interface options

Another interface(CAN or combined RS232/422/485) can be inserted using an interface option.

#### Information:

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

#### Caution!

Turn off power before adding or removing an interface option.

#### 3.7.1 Add-on CAN interface

The Add-On CAN interface is equipped 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

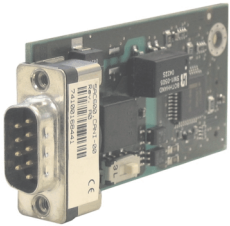
Model number	Description	Image
5AC600.CANI-00	<b>Add-on CAN interface</b> CAN interface for installation in an APC620 or PPC700.	

Table 54: Add-on CAN interface 5AC600.CANI-00

#### Technical data

Features	5AC600.CANI-00
CAN interface Controller Number Connection	Intel 82527 1 9-pin DSUB, male
Terminating resistance	Can be activated and deactivated using a sliding switch

Table 55: Technical data - add-on CAN interface 5AC600.CANI-00

## Pin assignments

Add-On CAN	
Electrically isolated	
Pin	Assignment
1	n.c.
2	CAN Low
3	GND
4	n.c.
5	n.c.
6	Reserved
7	CAN high
8	n.c.
9	n.c.

9-pin DSUB plug

Table 56: Pin assignments - CAN

## 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	Type 50
≤ 200	Type 250
≤ 60	Type 500

Table 57: CAN bus length and transfer rate

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

CAN cable	Property
Signal lines Cable cross section Wire insulation Conductor resistance Stranding Shield	2 x 0.25 mm <sup>2</sup> (24AWG/19), tinned Cu wire PE ≤ 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 mm <sup>2</sup> (22AWG/19), tinned Cu wire PE ≤ 59 Ohm / km

Table 58: CAN cable requirements

## Technical data • Individual components

CAN cable	Property
Outer sheathing Material Properties Entire shielding	PUR mixture Halogen free From tinned cu wires

Table 58: CAN cable requirements (cont.)

### Terminating resistance

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.

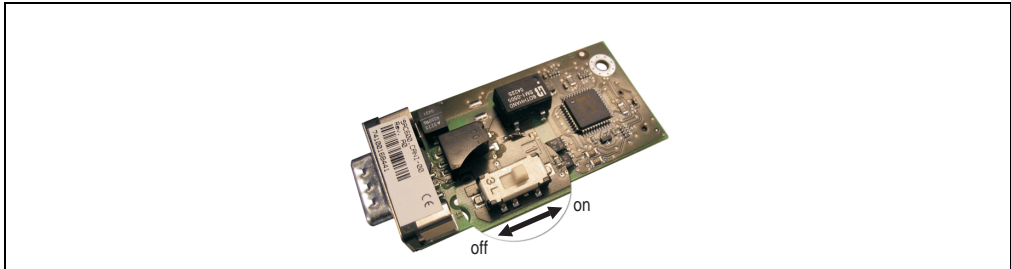


Figure 40: Terminating resistor for add-on CAN interface 5AC600.CANI-00

### Contents of the delivery / mounting material

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

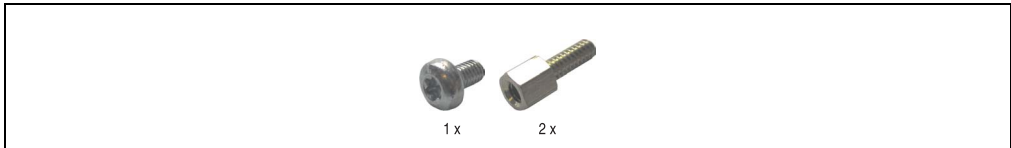


Figure 41: Contents of the delivery / mounting material 5AC600.CANI-00

### 3.7.2 Add-on RS232/422/485 interface

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

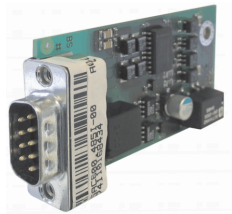
Model number	Description	Image
5AC600.485I-00	<b>Add-on RS232/422/485 interface</b> Add-On RS232/422/485 interface for installation in an APC620 and PPC700.	

Table 59: Add-on RS232/422/485 interface 5AC600.485I-00

#### Pin assignments

Add-on RS232/422/485		
RS232/RS422 interface electrically isolated		
Pin	Assignment RS232	Pin assignments - RS422
1	n.c.	$\overline{\text{TXD}}$
2	RXD	n.c.
3	TXD	n.c.
4	n.c.	TXD
5	GND	GND
6	n.c.	$\overline{\text{RXD}}$
7	RTS	n.c.
8	CTS	n.c.
9	n.c.	RXD

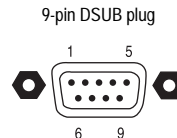


Table 60: Pin assignments - RS232/RS422

#### 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	Type 64

Table 61: RS232 bus length and transfer rate

## Technical data • Individual components

Distance [m]	Transfer rate [kBit/s]
≤ 10	Type 115
≤ 5	Type 115

Table 61: RS232 bus length and transfer rate

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

RS232 cable	Property
Signal lines Cable cross section Wire insulation Conductor resistance Stranding Shield	4 x 0.16 mm <sup>2</sup> (26AWG), tinned Cu wire PE ≤ 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 mm <sup>2</sup> (22AWG/19), tinned Cu wire PE ≤ 59 Ohm / km
Outer sheathing Material Properties Entire shielding	PUR mixture Halogen free From tinned cu wires

Table 62: 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	Type 115

Table 63: 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 Wire insulation Conductor resistance Stranding Shield	4 x 0.25 mm <sup>2</sup> (24AWG/19), tinned Cu wire PE ≤ 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 mm <sup>2</sup> (22AWG/19), tinned Cu wire PE ≤ 59 Ohm / km

Table 64: RS422 cable requirements



RS422 cable	Property
Outer sheathing	
Material	PUR mixture
Properties	Halogen free
Entire shielding	From tinned cu wires

Table 64: RS422 cable requirements (cont.)

## RS485 interface operation

In RS422 mode, the interface can also be operated as an RS485 interface. This is possible by a TriState switching, which is made using RTS (Request To Send).

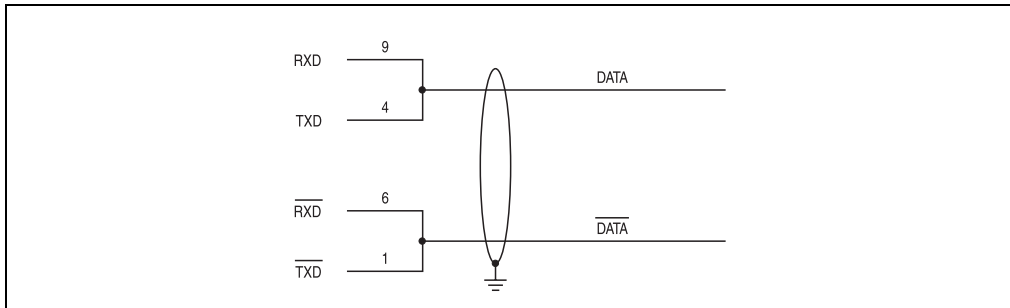


Figure 42: Add-on RS232/422/485 interface - operated in RS485 mode

## 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	Type 115

Table 65: RS485 bus length and transfer rate

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

RS485 cable	Property
Signal lines	
Cable cross section	4 x 0.25 mm <sup>2</sup> (24AWG/19), tinned Cu wire
Wire insulation	PE
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 mm <sup>2</sup> (22AWG/19), tinned Cu wire
Wire insulation	PE
Conductor resistance	≤ 59 Ohm / km

Table 66: RS485 cable requirements

**Technical data • Individual components**

RS485 cable	Property
Outer sheathing	
Material	PUR mixture
Properties	Halogen free
Entire shielding	From tinned cu wires

Table 66: RS485 cable requirements (cont.)

**Contents of the delivery / mounting material**

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

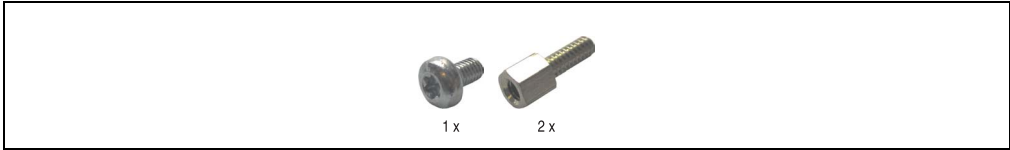


Figure 43: Contents of the delivery / mounting material 5AC600.485I-00

## 3.8 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.

#### 3.8.1 Fan kit 1 PCI

This fan kit is an optional addition for system units with 1 PCI Slot.

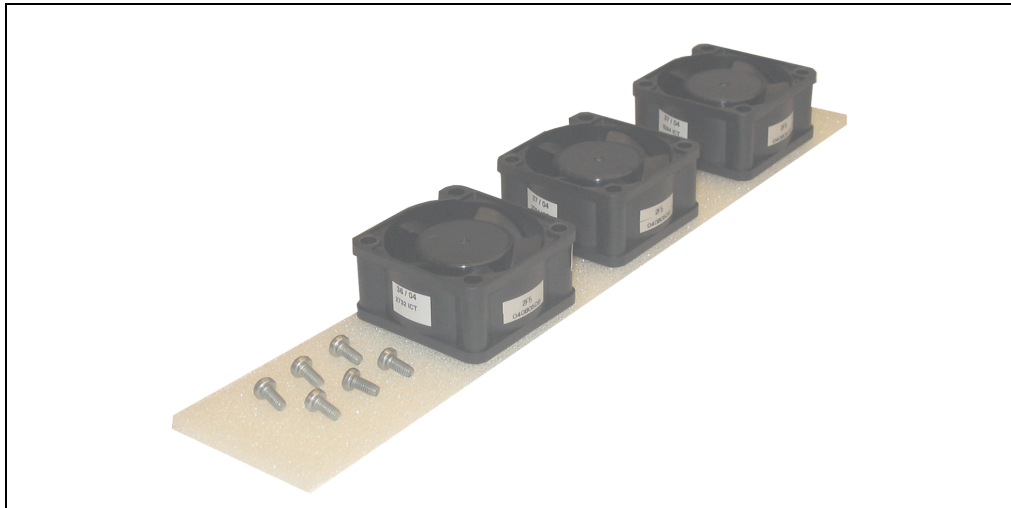


Figure 44: Fan kit 5PC600.FA01-00

### Technical data

Features	5PC600.FA01-00
Fan type	Double ball bearings
Width	40 mm
Length	40 mm
Height	20 mm
Revolution speed	5600 rpm $\pm$ 10%
Noise level	24 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.

Table 67: Technical data - 5PC600.FA01-00

### Contents of delivery

- 3 fans with 40 mm diameter
- 1 dust filter
- Installation material - mounting screws

### Mounting

For a description of how to install the fan kit, see chapter 6 "Maintenance / servicing", section2 "Installing and replacing the filter kit", starting on page 279.

#### 3.8.2 Fan kit 2 PCI

This fan kit is an optional addition for system units with 2 PCI Slot.

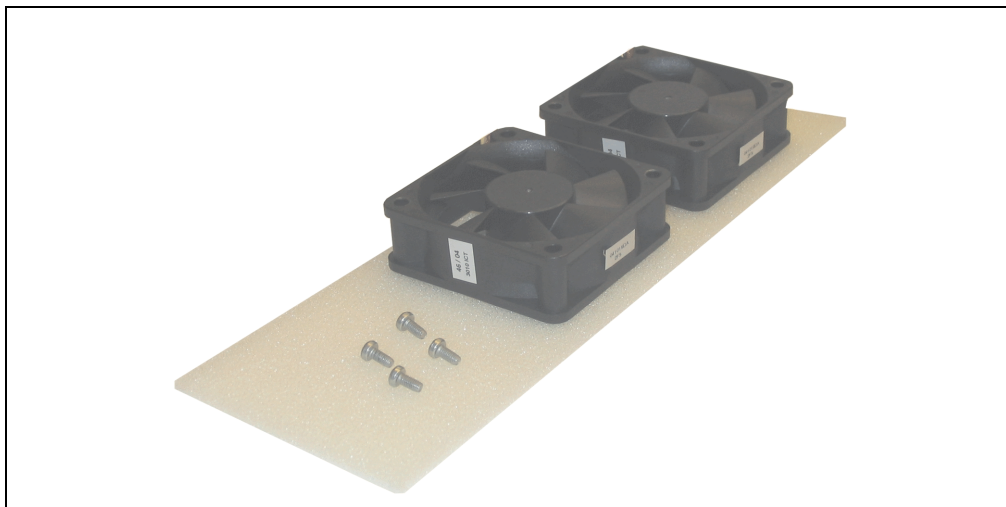


Figure 45: Fan kit 5PC600.FA02-00

### Technical data

Features	5PC600.FA02-00
Fan type	Double ball bearings
Width	60 mm
Length	60 mm
Height	20 mm
Revolution speed	3600 rpm $\pm$ 10%
Noise level	30.5 dB
lifespan	80,000 hours at 30 °C

Table 68: Technical data - 5PC600.FA02-00

Features	5PC600.FA02-00
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.

Table 68: Technical data - 5PC600.FA02-00 (cont.)

### Contents of delivery

- 2 fans with 60 mm diameter
- 1 dust filter
- Installation material - Mounting screws

### Mounting

For a description of how to install the fan kit, see chapter 6 "Maintenance / servicing", section 2 "Installing and replacing the filter kit", starting on page 282.

### 3.8.3 Fan kit 5 PCI

This fan kit is an optional addition for system units with 5 PCI slot.

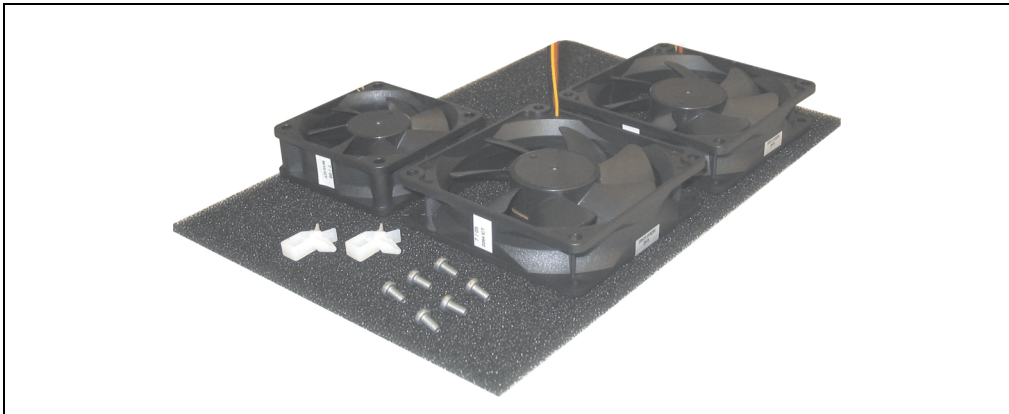


Figure 46: Fan kit 5PC600.FA05-00

### Technical data

Features	5PC600.FA05-00	
Fan type	Double ball bearings	Double ball bearings
Number	1	2
Width	60 mm	80 mm
Length	60 mm	80 mm
Height	20 mm	20 mm

Table 69: Technical data - 5PC600.FA05-00

## Technical data • Individual components

Features	5PC600.FA05-00	
Revolution speed	3600 rpm $\pm$ 10%	2600 rpm $\pm$ 10%
Noise level	30.5 dB	27 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.	

Table 69: Technical data - 5PC600.FA05-00 (cont.)

### Contents of delivery

- 1 fan with 60 mm diameter, 2 fans with 80 mm diameter
- 1 dust filter
- 2 cable fasteners
- Installation material - Mounting screws

### Mounting

For a description of how to install the fan kit, see chapter 6 "Maintenance / servicing", section 2 "Installing and replacing the filter kit", starting on page 282.

### 3.9 AP Link cards

For the APC620 system units 5PC600.SX02-00 and 5PC600.SX05-00 a 2 graphics line can be created using the AP Link graphics adapter cards.

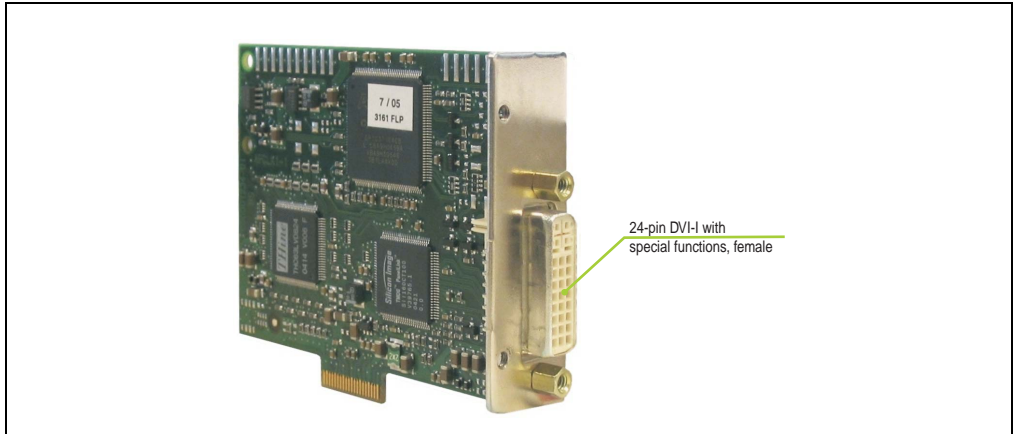


Figure 47: AP Link card

The following graphics interfaces are available:

Model number	Short description	Note
5AC600.TDVI-00	AP Link DVI transmitter	In preparation
5AC600.SDL0-00	AP Link SDL transmitter	

Table 70: Model numbers - AP Link graphics adapter

For more information see section 2.8.10 "AP Link slot" on page 59.

For installation of an AP Link card, see section TBD.





## Chapter 3 • Mounting

The APC620 systems are mounted with the mounting plates found on the housing. The plates are designed for M5 screws.

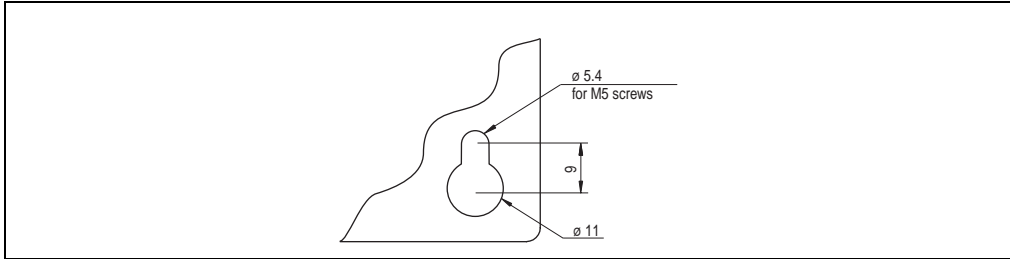


Figure 48: Mounting plates for the APC620

The exact positioning of the mounting holes can be seen in the following drilling templates.

### 1. Important mounting information

- One must consider the environmental conditions (see chapter 2 "Technical data", section 2.4 "Environmental temperature for systems with an 815E CPU board" on page 39, and section 2.5 "Environmental temperature for systems with an 855GME CPU board" on page 41).
- The APC620 is only for operation in closed rooms.
- The APC620 may not 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 3 "Mounting orientation" on page 118).
- Be sure the the wall or switching cabinet can withstand four times the total weight of the the PC620.

2. Drilling templates

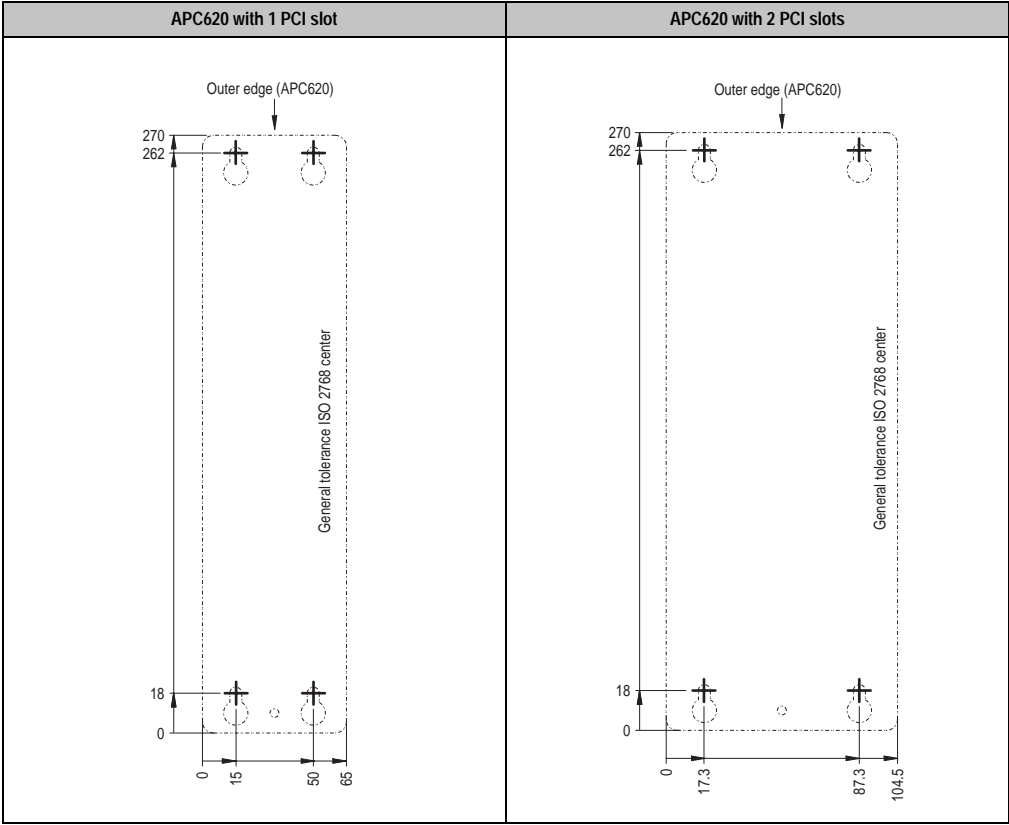


Table 71: Drilling templates - 1 and 2 PCI system units

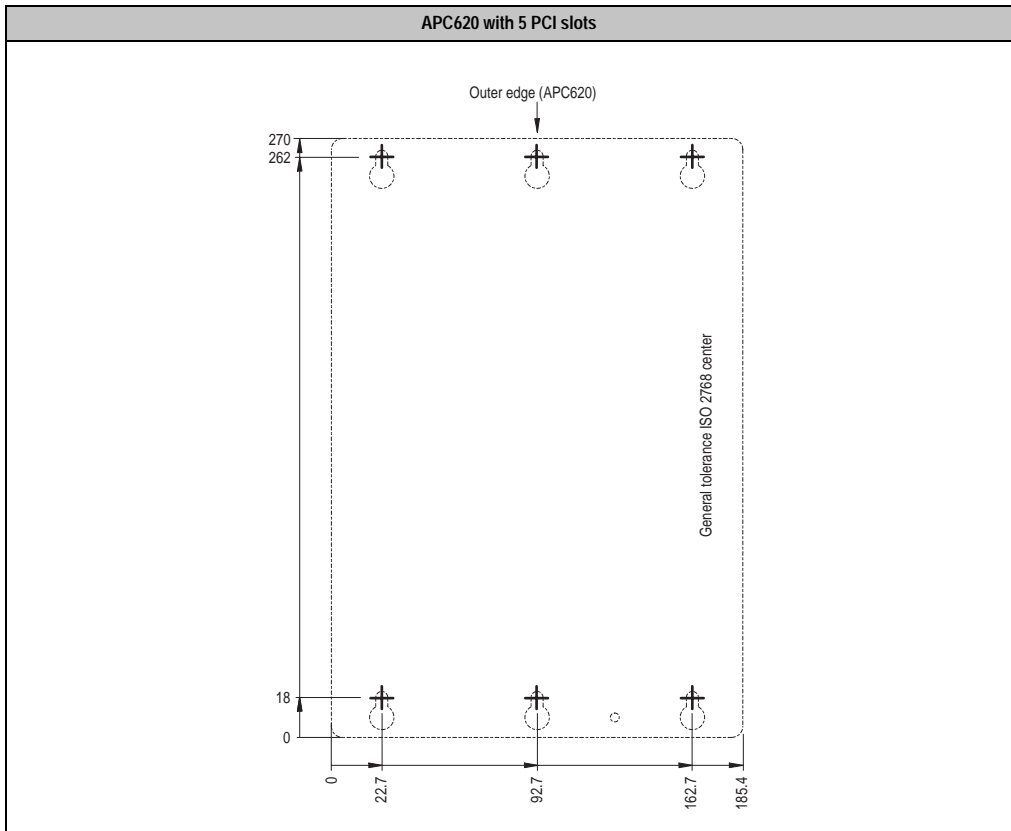


Table 72: Drilling templates - 5 PCI slots

### 3. Mounting orientation

The Automation PC620 system must be mounted as described in the following.

#### 3.1 Standard mounting

Standard mounting refers to vertical mounting orientation.

APC620 systems with and without fan kit can be mounted this way.

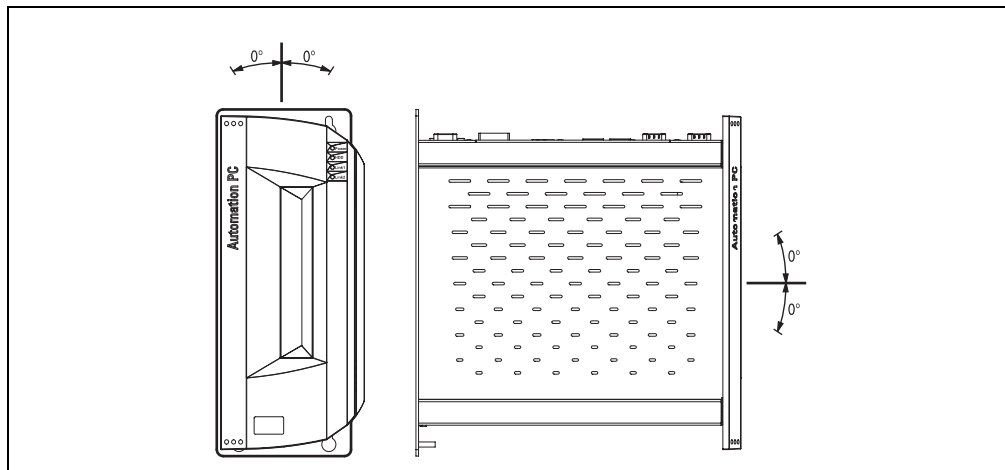


Figure 49: Mounting orientation - standard

In order to guarantee natural air circulation, mount the system so that the spacing on the top, bottom, and sides is as follows.

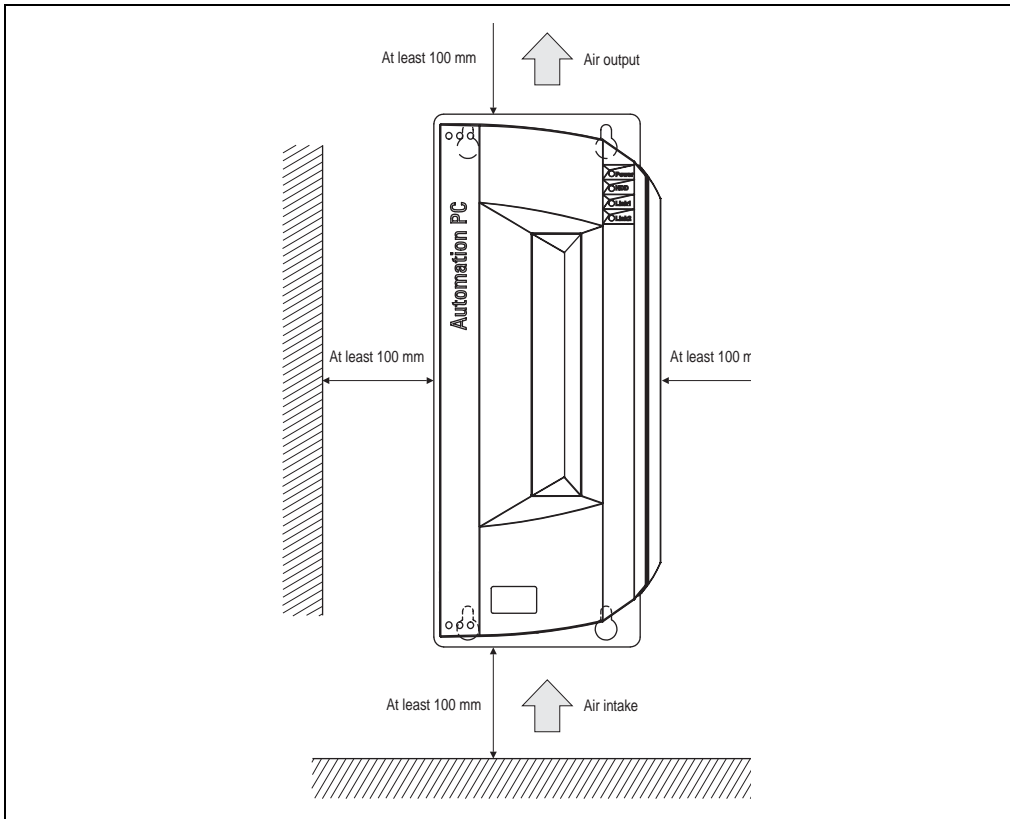


Figure 50: Air circulation spacing - standard

## 3.2 Optional mounting orientations

### Caution!

A fan kit must be used if the system is mounted in the following orientations. In addition, it is important to be sure that the components used are installed in a way that complies with the specifications of the drives being used (CD-ROM, DVD/CD-RW, hard disk, etc.). See the following pages for information regarding the specifications for installation orientation.

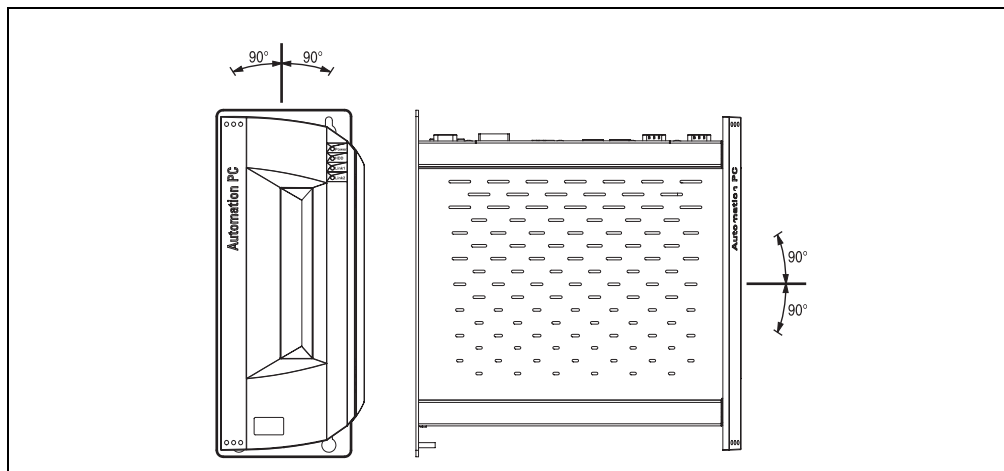


Figure 51: Optional mounting orientations

In order to guarantee natural air circulation, mount the system so that the spacing on the top, bottom, and sides is as follows.

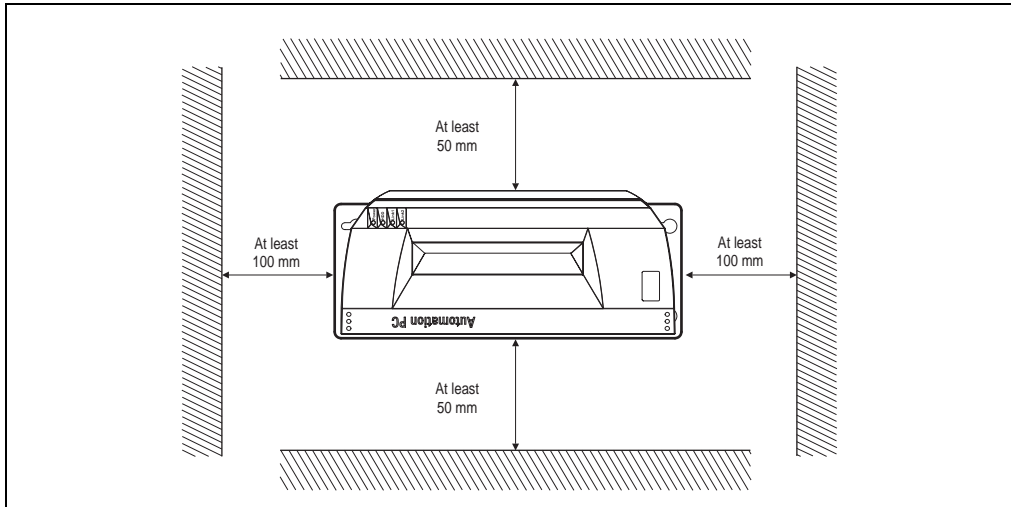


Figure 52: Optional circulation spacing

## 3.2.1 CompactFlash slot, add-on or slide-in

No limitation on installation orientation. Allowable installation orientations are as seen in Figure 51 "Optional mounting orientations" on page 120.

### 3.2.2 Hard disks, 20 and 30 GB, add-on or slide-in.

The following figure shows the possible installation orientations for an APC620 device with an add-on or slide-in hard disk.

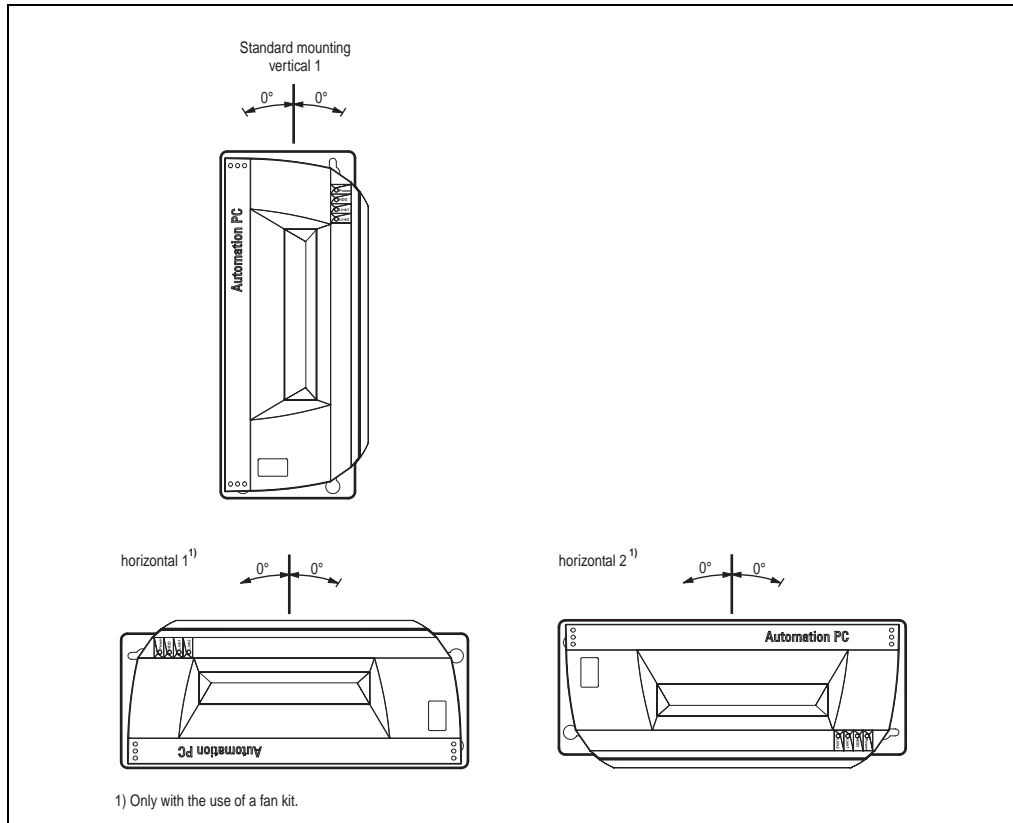


Figure 53: Installation orientations for an APC620 with hard disk drive.

The installation orientations "horizontal 1" and "horizontal 2" require the use of a fan kit.



### 3.2.3 Slide-in CD-ROM drive

The following figure shows the possible installation orientations for an APC620 device with a slide-in CD-ROM drive.

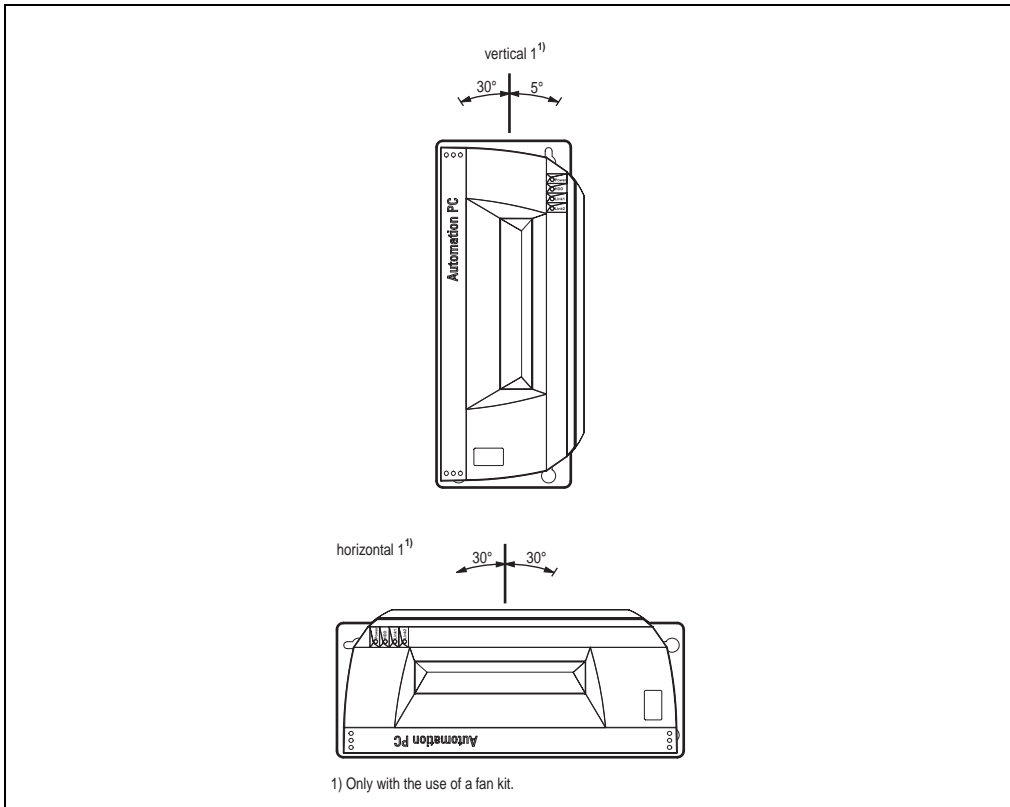


Figure 54: Installation orientations for an APC 620 with a slide-in CD-ROM drive

The installation orientation "horizontal 1" requires the use of a fan kit.

Installation orientation "vertical 1" can also be used at 0° without a fan kit.

### 3.2.4 Slide-in DVD-ROM/CD-RW drive

The following figure shows the possible installation orientations for an APC620 device with a slide-in DVD-ROM/CD-RW drive.

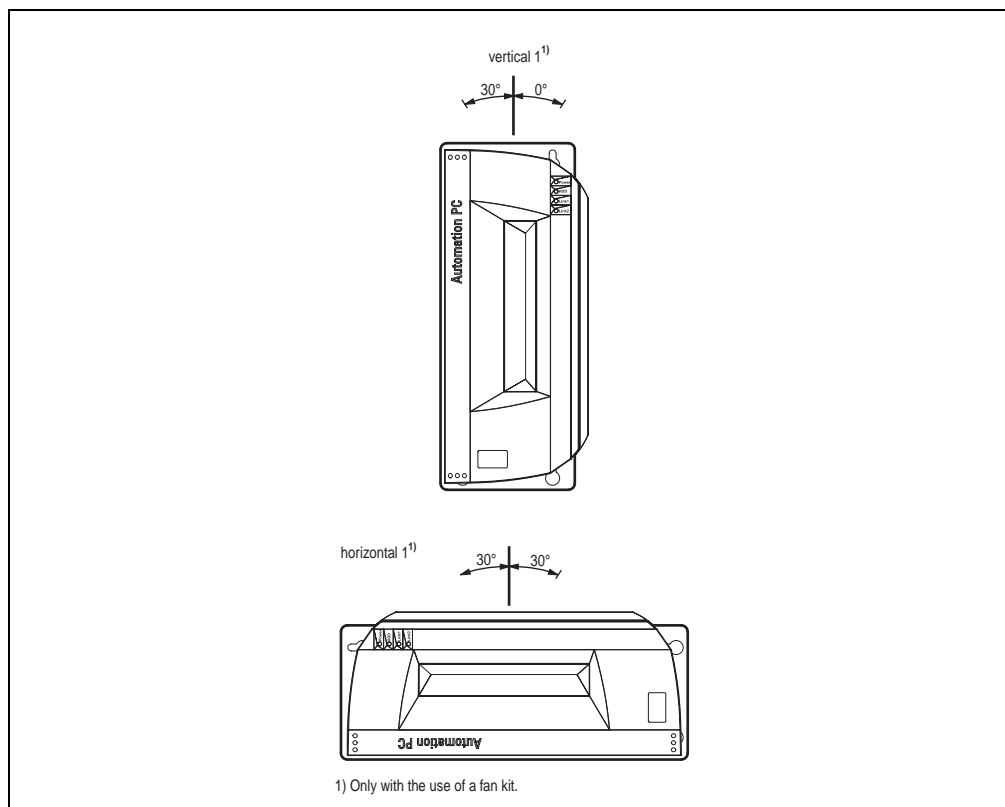


Figure 55: Installation orientations for an APC620 with a slide-in DVD-ROM/CD-RW drive

The installation orientation "horizontal 1" requires the use of a fan kit.

Installation orientation "vertical 1" can also be used at 0° without a fan kit.

### 3.2.5 Slide-in USB FDD

The following figure shows the possible installation orientations for an APC620 device with a slide-in USB FDD drive.

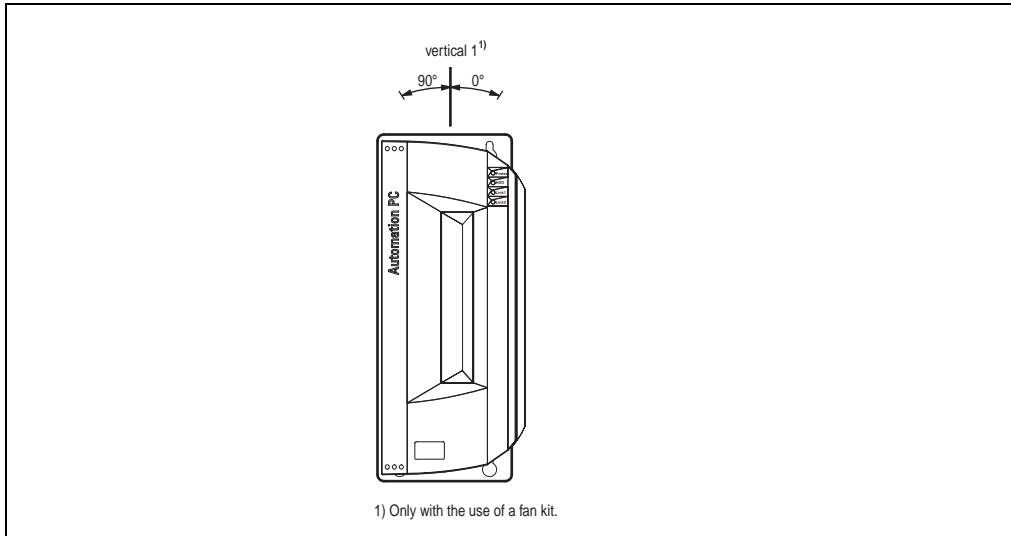


Figure 56: Installation orientations for an APC620 with a slide-in USB FDD drive

Installation orientation "vertical 1" can also be used at 0° without a fan kit.



# Chapter 4 • Software

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## 1. APC620 with Automation Runtime

TBD

## 2. APC620 with BIOS

### 2.1 815E BIOS description

#### Information:

- The following diagrams, BIOS menu items, and descriptions refer to BIOS Version R115. Therefore, it is possible that the diagrams and BIOS descriptions might 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 2.1.10 "Profile overview" on page 171).

#### 2.1.1 General information

BIOS stands for "Basic Input Output System." It is the most basic standardized communication between the user and the system (hardware). The BIOS system used in the Automation PC 620 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 APC620 even when the power is turned off (no 24 VDC supply) .

#### 2.1.2 BIOS setup

The BIOS is immediately activated when you switch on the power supply of the Automation PC 620 system. BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the Power On Self Test (POST).

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

To enter BIOS setup, the F2 key must be pressed as soon as the following message appears on the lower margin of the display (during POST):

"Press <F2> to enter SETUP"

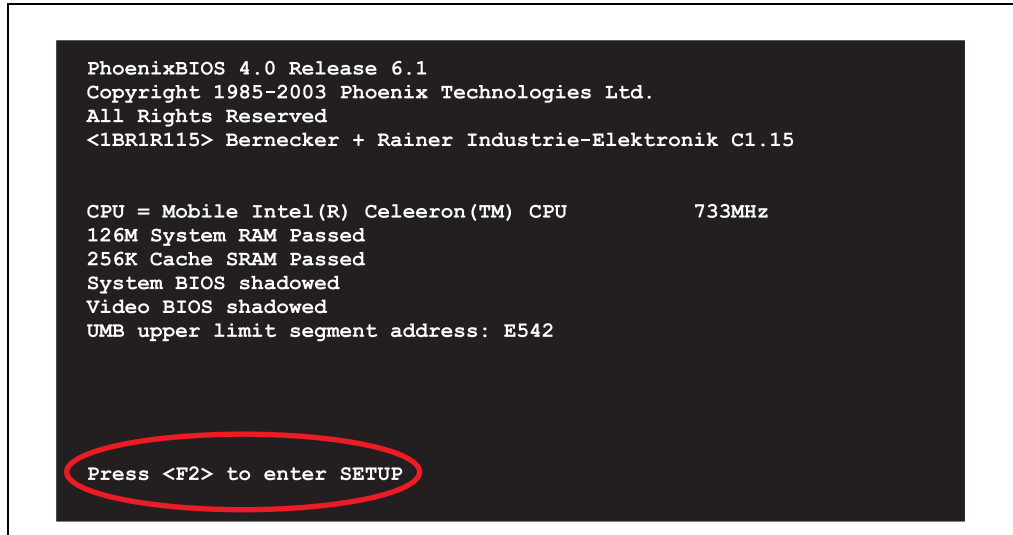


Figure 57: 815E - BIOS diagnostic screen

## Summary screen

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

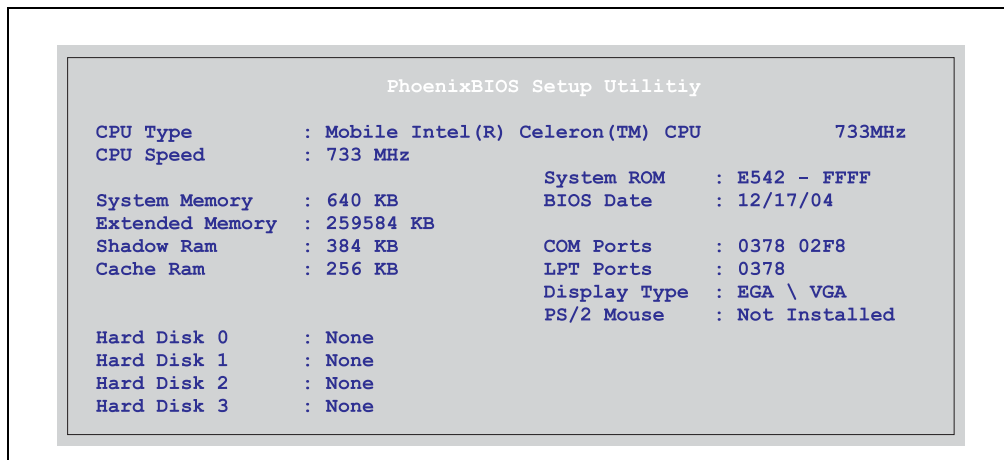


Figure 58: 815E - BIOS summary screen

### 2.1.3 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 73: Keys relevant to BIOS during POST

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

Key	Function
Cursor ↑	Move to previous item.
Cursor ↓	Move to 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.

Table 74: Keys relevant to BIOS

Key	Function
<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 74: Keys relevant to BIOS

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

BIOS setup menu Item	Function	From page
<b>Main</b>	The basic system configurations (e.g. time, date, hard disk parameters) can be set in this menu.	131
<b>Advanced</b>	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.	140
<b>Security</b>	For setting up the system's security functions.	163
<b>Power</b>	Setup of various APM (Advanced Power Management) options.	165
<b>Boot</b>	The boot order can be set here.	169
<b>Exit</b>	To end the BIOS setup.	170

Table 75: Overview of BIOS menu items



## 2.1.4 Main

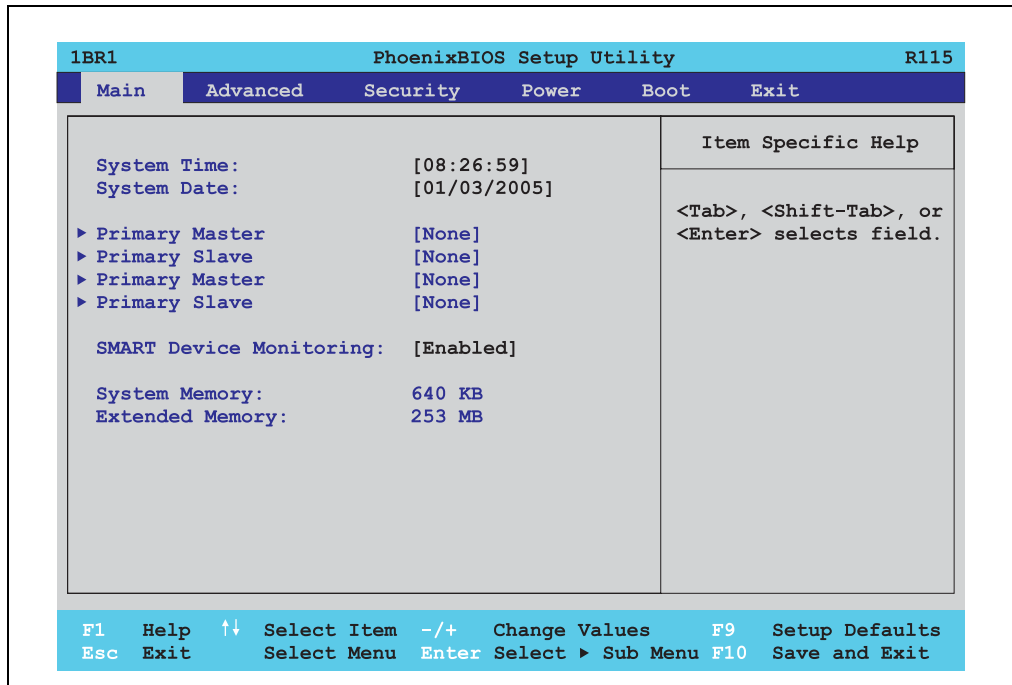


Figure 59: 815E - main menu

BIOS setting	Description	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	Personal setting of 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	Personal setting of the system date in the format (mm:dd:yyyy).
Primary master	The drive in the system that is connected to the IDE primary master port is configured here.	Enter	Opens submenu see "Primary master", on page 132.
Primary slave	The drive in the system that is connected to the IDE primary slave port is configured here.	Enter	Opens submenu see "Primary slave", on page 134.
Secondary master	The drive in the system that is connected to the IDE secondary master port is configured here.	Enter	Opens submenu see "Secondary master", on page 136.
Secondary slave	The drive in the system that is connected to the IDE secondary slave port is configured here.	Enter	Opens submenu see "Secondary slave", on page 138.

Table 76: 815E - main setting options

BIOS setting	Description	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 determine problems with reading or spinning 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	-

Table 76: 815E (cont.)- main setting options

## Primary master

1BR1	PhoenixBIOS Setup Utility		R115
Main			
Primary Master [None]		Item Specific Help	
Type:	[Auto]	User = you enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 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.	
Multi-Sector Transfers:	[Disabled]		
LBA Mode Control:	[Enabled]		
32 Bit I/O:	[Disabled]Monitor		
Transfer Mode:	[Fast PIO 2]		
Ultra DMA Mode:	[Disabled]		
SMART Monitoring:	[Disabled]		
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults
Esc Exit	Select Menu	Enter Select ► Sub Menu	F10 Save and Exit

Figure 60: 815E - primary master setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the 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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 77: Setting options - 815E primary master

## Primary slave

1BR1 PhoenixBIOS Setup Utility R115	
Main	
Primary Slave [None]	Item Specific Help
Type: [Auto] Multi-Sector Transfers: [Disabled] LBA Mode Control: [Enabled] 32 Bit I/O: [Disabled] Monitor Transfer Mode: [Fast PIO 2] Ultra DMA Mode: [Disabled] SMART Monitoring: [Disabled]	User = you enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 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 61: 815E - primary slave setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the function.
		2, 4, 8 or 16 sectors	Number of sectors per block.

Table 78: Setting options - 815E primary slave

BIOS setting	Description	Setting options	Effect
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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 78: Setting options - 815E primary slave (cont.)

## Secondary master

1BR1 PhoenixBIOS Setup Utility R115	
Main	
Secondary Master [None]	Item Specific Help
Type: [Auto] Multi-Sector Transfers: [Disabled] LBA Mode Control: [Enabled] 32 Bit I/O: [Disabled]Monitor Transfer Mode: [Fast PIO 2] Ultra DMA Mode: [Disabled] SMART Monitoring: [Disabled]	User = you enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 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 62: 815E - secondary master setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the function.
		2, 4, 8 or 16 sectors	Number of sectors per block.

Table 79: Setting options - 815E secondary master

BIOS setting	Description	Setting options	Effect
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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 79: Setting options - 815E secondary master (cont.)

## Secondary slave

1BR1 PhoenixBIOS Setup Utility R115	
Main	
Secondary Slave [None]	Item Specific Help
Type: [Auto]	User = you enter parameters of hard-disk drive installed at this connection.
Multi-Sector Transfers: [Disabled]	Auto = autotypes hard-disk drive installed here.
LBA Mode Control: [Enabled]	1-39 = you select pre-determined type of hard-disk drive installed here.
32 Bit I/O: [Disabled]Monitor	CD-ROM = a CD-ROM drive is installed here.
Transfer Mode: [Fast PIO 2]	ATAPI Removeable = removeable disk drive is installed here.
Ultra DMA Mode: [Disabled]	
SMART Monitoring: [Disabled]	
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ► Sub Menu F10 Save and Exit	

Figure 63: 815E - secondary slave setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the function.
		2, 4, 8 or 16 sectors	Number of sectors per block.

Table 80: Setting options - 815E secondary slave



BIOS setting	Description	Setting options	Effect
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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 80: Setting options - 815E secondary slave (cont.)

## 2.1.5 Advanced

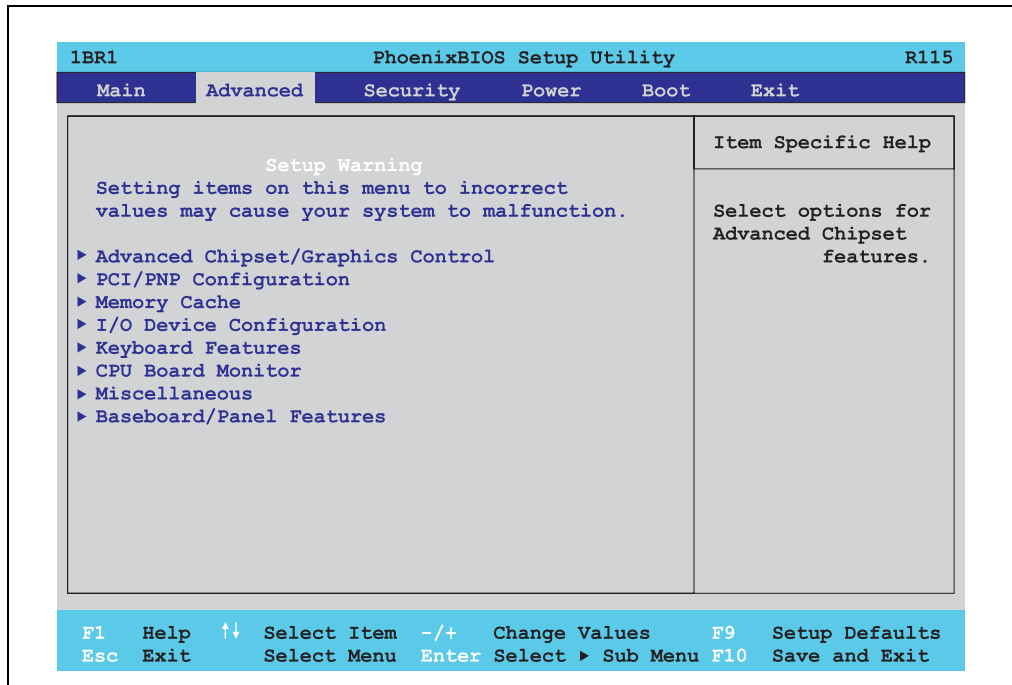


Figure 64: 815E - advanced menu

BIOS setup menu	Description	Setting options	Effect
Advanced chipset/graphics control	Setup of advanced chipset and graphics functions.	Enter	Opens submenu see "Advanced chipset/graphics control", on page 141.
PCI/PNP configuration	Configures PCI devices.	Enter	Opens submenu see "PCI/PNP configuration", on page 143.
Memory cache	Configuration of the memory cache resources.	Enter	Opens submenu see "Memory cache", on page 150.
I/O device configuration	Configuration of the I/O devices.	Enter	Opens submenu see "I/O device configuration", on page 152.
Keyboard features	Configuration of the keyboard options.	Enter	Opens submenu see "Keyboard features", on page 154.
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu see "CPU board monitor", on page 155.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc...).	Enter	Opens submenu see "Miscellaneous", on page 156.
Baseboard/panel features	Display of device specific information and setup of device specific values.	Enter	Opens submenu see "Baseboard/panel features", on page 158.

Table 81: Setting options - 815E advanced menu

## Advanced chipset/graphics control

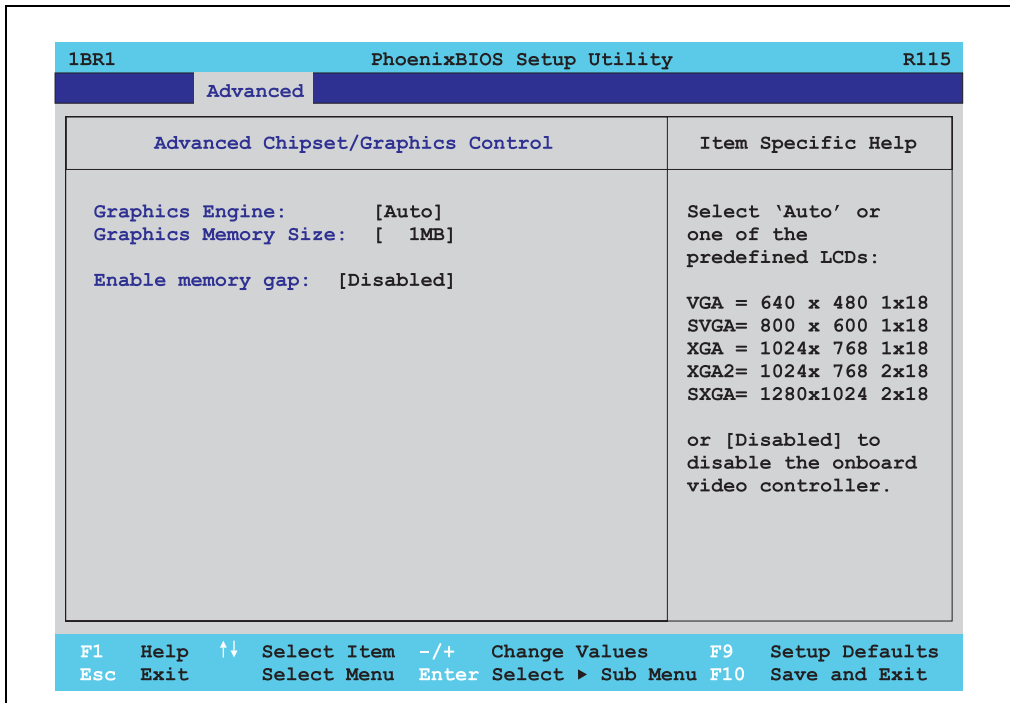


Figure 65: 815E - advanced chipset/graphics control

BIOS setting	Description	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	<b>Important!</b> 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.

Table 82: 815E - advanced chipset/graphics control configuration possibilities

BIOS setting	Description	Setting options	Effect
Enable memory gap	Specific settings for an inserted PCI graphics card can be activated here.	Disabled	Deactivates the function.
		Extended	A memory location is reserved in the main memory: 128 kB (for cards with 512 kB or more) or 1 MB (for cards with 15 MB or more) .

Table 82: 815E - advanced chipset/graphics control configuration possibilities

## PCI/PNP configuration

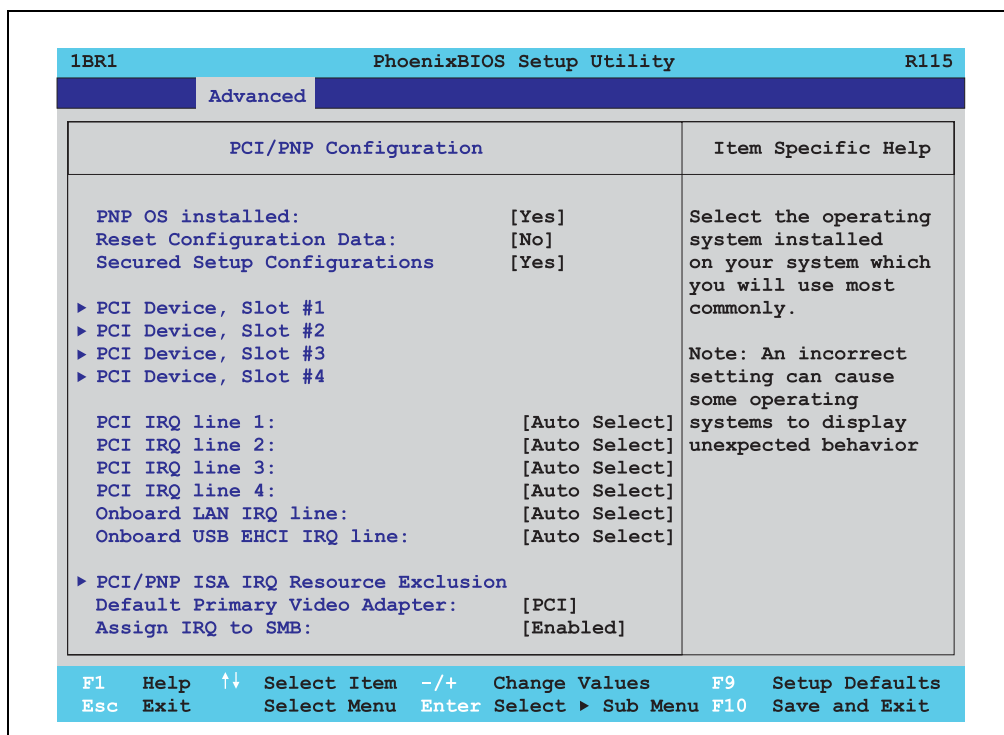


Figure 66: 815E - PCI/PNP configuration

BIOS setting	Description	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	Deactivates the 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	Deactivates the function. Changes are allowed.

Table 83: Setting options - 815E PCI/PNP

BIOS setting	Description	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 145
PCI device, slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens submenu See "PCI device, slot #2", on page 146
PCI device, slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens submenu See "PCI device, slot #3", on page 147
PCI device, slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens submenu See "PCI device, slot #4", on page 148
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	Deactivates the 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	Deactivates the 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	Deactivates the 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	Deactivates the 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	Deactivates the 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	Deactivates the function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI/PNP ISA IRQ resource exclusion	This option reserves IRQs that are not being used by plug & play capable ISA devices.	Enter	Opens submenu See "PCI/PNP ISA IRQ resource exclusion", on page 149
Default primary video adapter	This option sets the default graphics card (either an existing AGP or the PCI graphic 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.

Table 83: Setting options - 815E PCI/PNP (cont.)

BIOS setting	Description	Setting options	Effect
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 83: Setting options - 815E PCI/PNP (cont.)

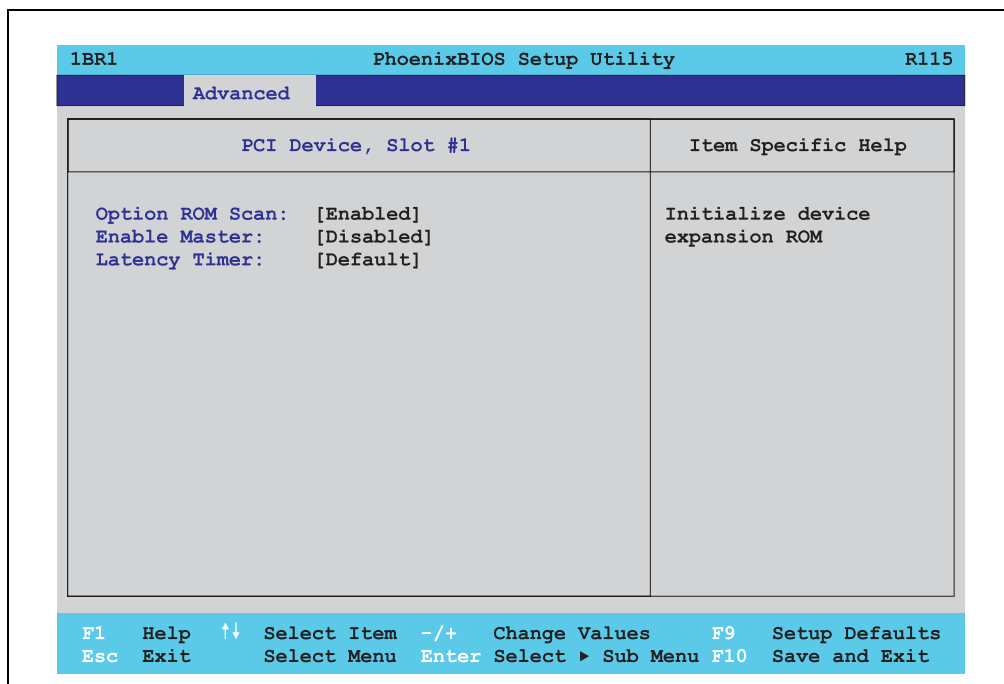
PCI device, slot #1

Figure 67: 815E - PCI device, slot #1

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 84: Setting options - 815E PCI device, slot #1

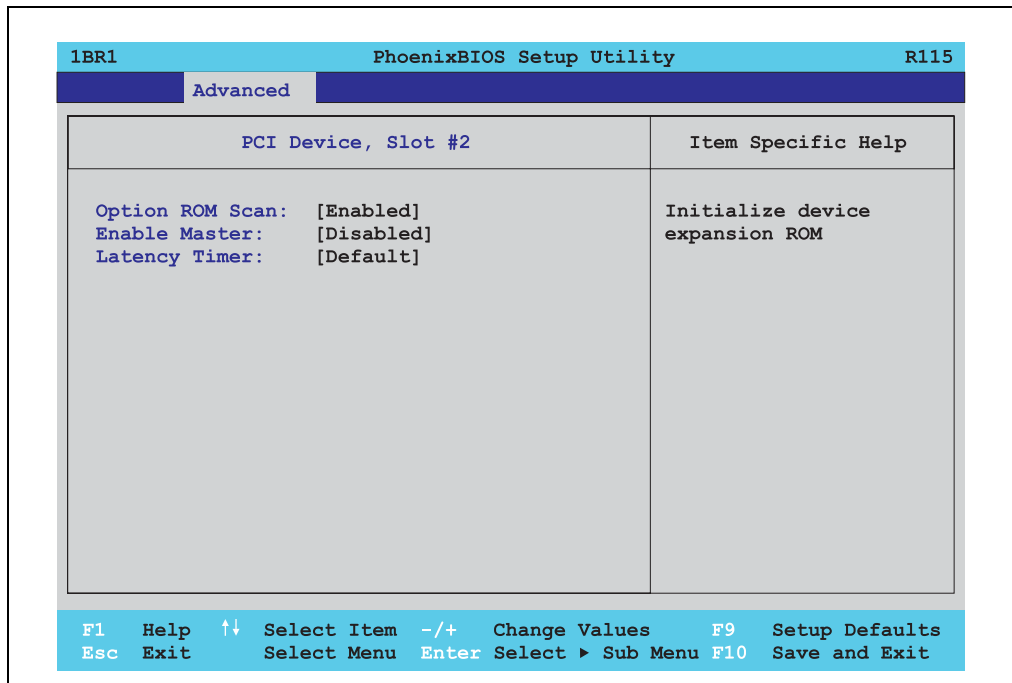
PCI device, slot #2

Figure 68: 815E - PCI device, slot #2

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 85: Setting options - 815E PCI device, slot #2



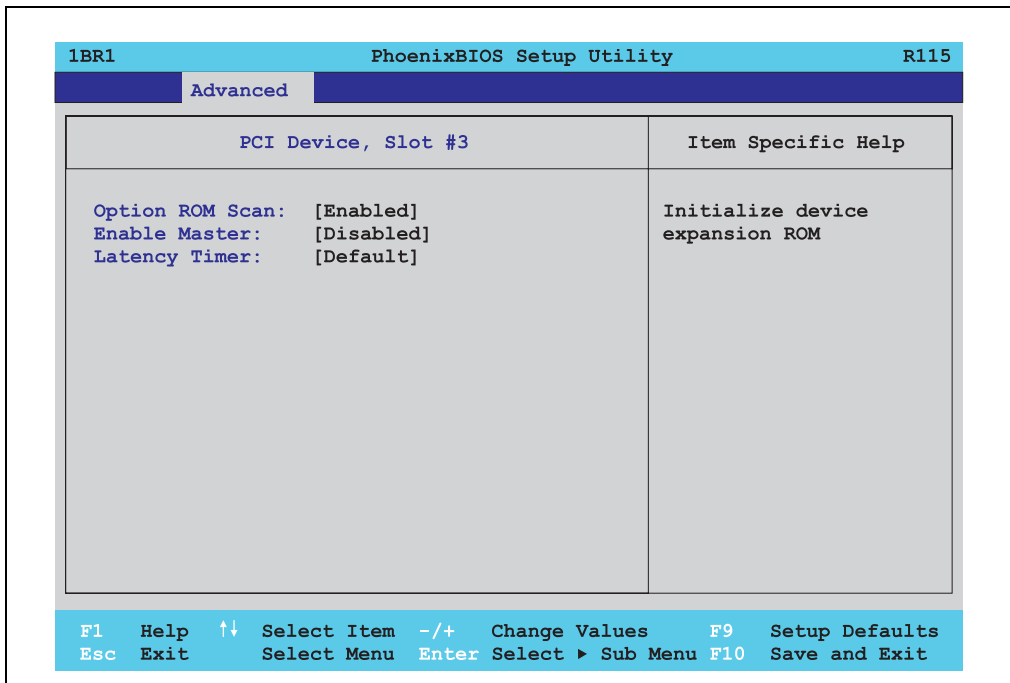
PCI device, slot #3

Figure 69: 815E - PCI device, slot #3

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 86: Setting options - 815E PCI device, slot #3

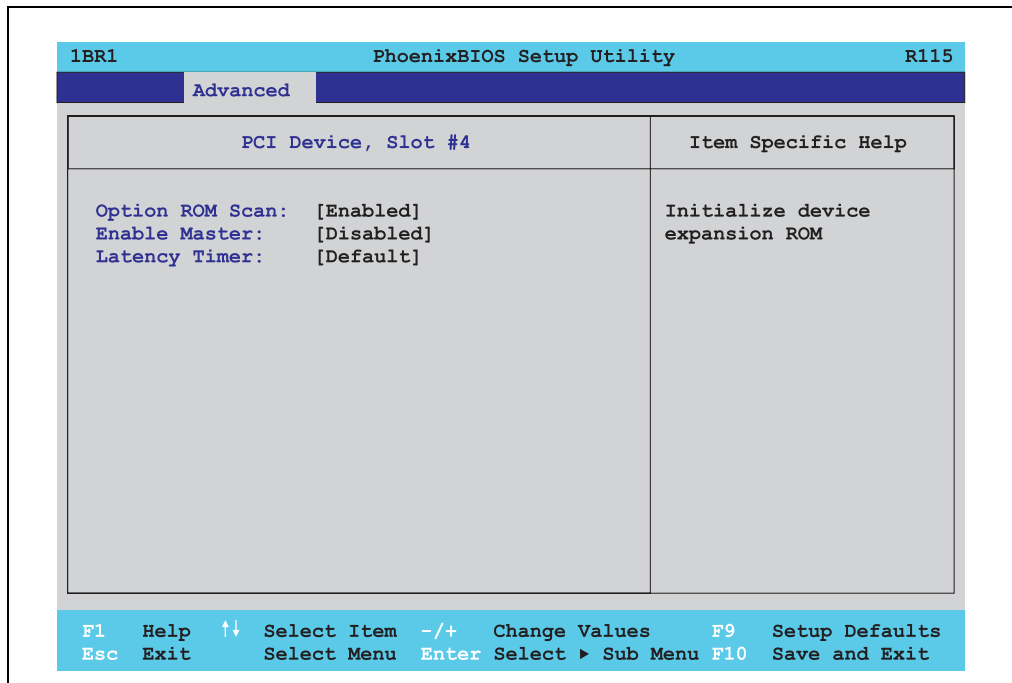
[PCI device, slot #4](#)

Figure 70: 815E - PCI device, slot #4

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 87: Setting options - 815E PCI device, slot #4

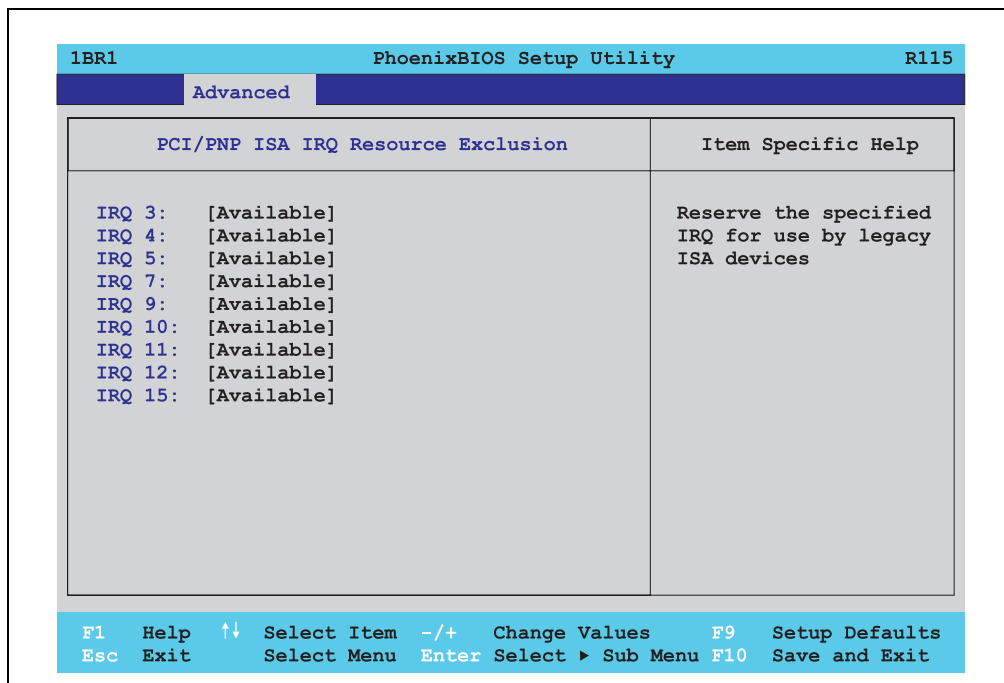
PCI/PNP ISA IRQ resource exclusion

Figure 71: 815E - PCI/PNP ISA IRQ resource exclusion

BIOS setting	Description	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 88: Setting options - 815E - PCI/PNP ISA IRQ resource exclusion

BIOS setting	Description	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 88: Setting options - 815E - PCI/PNP ISA IRQ resource exclusion (cont.)

## Memory cache

1BR1		PhoenixBIOS Setup Utility		R115	
		Advanced			
Memory Cache				Item Specific Help	
Memory Cache: [Enabled]				Sets the state of the memory cache.	
Cache System BIOS area: [Write Protect]					
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]					
F1 Help		↑↓ Select Item		-/+ Change Values	
Esc Exit		Select Menu		Enter Select ► Sub Menu	
F9 Setup Defaults		F10 Save and Exit			

Figure 72: 815E - memory cache

BIOS setting	Description	Setting options	Effect
Memory cache	Enable/ disable utilization of the L2 cache.	Enabled	Activates the function.
		Disabled	Deactivates the 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 89: Setting options - 815E memory cache

BIOS setting	Description	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 D800 - 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.

Table 89: Setting options - 815E memory cache (cont.)

## I/O device configuration

1BR1		PhoenixBIOS Setup Utility		R115	
Advanced					
I/O Device Configuration				Item Specific Help	
Local Bus IDE adapter: [Both] Primary IDE UDMA66/100: [Enabled] 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]				Enable the integrated local bus IDE adapter	
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] Parallelt 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 73: 815E - I/O device configuration

BIOS setting	Description	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 90: Setting options - 815E I/O device

BIOS setting	Description	Setting options	Effect
USB UHCI host controller 1	Configuration of the USB UHCI controller 1 for USB port 0 and 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller 2	Configuration of the USB UHCI controller 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 USB2.0 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.
		Enabled	IRQ assigned.
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 on-board LAN controller (ETH1) on and off.	Disabled	Deactivates the function.
		Enabled	Activates the function.
Serial port A	For the configuration of serial port A (COM1).	Disabled	Port A deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Base I/O address	Selection of the base I/O address for port A. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Base I/O address is manually assigned.
Interrupt	Selection of the interrupt for port A. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Manual assignment of the interrupt.
Serial port B	For the configuration of serial port B (COM2).	Disabled	Port B deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Mode	This option is for setting the serial port B as either a standard interface or as an infrared interface.	Normal	Serial port B is used as a standard interface.
		IR	The serial interface is used as an infrared interface, and allows data transfers up to 115 kBit/s.
Base I/O address	Selection of the base I/O address for port B. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Selected base I/O address is manually assigned.

Table 90: Setting options - 815E I/O device (cont.)

BIOS setting	Description	Setting options	Effect
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 90: Setting options - 815E I/O device (cont.)

## Keyboard features

1BR1		PhoenixBIOS Setup Utility		R115	
		Advanced			
Keyboard Features				Item Specific Help	
NumLock: [On] Key Click: [Disabled] Keyboard auto-repeat rate: [30/sec] Keyboard auto-repeat delay: [1/2sec]				Selects Power-on state for NumLock	
F1 Help ↑↓		Select Item -/+ Change Values		F9 Setup Defaults	
Esc Exit		Select Menu Enter Select ► Sub Menu		F10 Save and Exit	

Figure 74: 815E - keyboard features

BIOS setting	Description	Setting options	Effect
NumLock	This option sets the status of the numeric keypad when the the system is booted.	On	Numeric keypad is activated.
		Off	Only the cursor functions of the numerical keypad are activated.
		Auto	Numeric keypad is activated, if present.

Table 91: Setting options - 815E keyboard features



BIOS setting	Description	Setting options	Effect
Key click	Using this option, the clicking of the keys can be turned on or off.	Disabled	Deactivates the function.
		Enabled	Activates the 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 91: Setting options - 815E keyboard features

## CPU board monitor

1BR1	PhoenixBIOS Setup Utility		R115
	Advanced		
CPU Board Monitor		Item Specific Help	
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.	
F1	Help	↑↓	Select Item
Esc	Exit	-/+	Change Values
		Enter	Select
		▶	Sub Menu
F9	Setup Defaults		
F10	Save and Exit		

Figure 75: 815E - CPU board monitor

BIOS setting	Description	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	

Table 92: Setting options - 815E CPU board monitor

BIOS setting	Description	Setting options	Effect
Battery voltage	Displays the battery voltage (in volt).	None	
CPU temperature	Displays the processor's temperature (in degrees Celsius and Fahrenheit).	None	

Table 92: Setting options - 815E CPU board monitor

## Miscellaneous

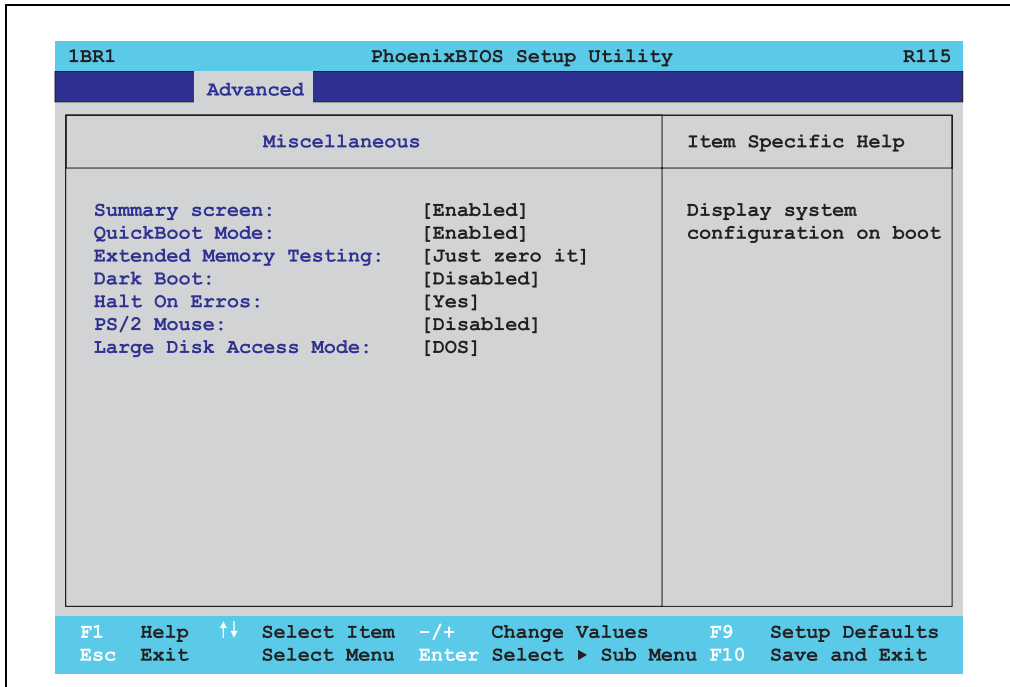


Figure 76: 815E - miscellaneous

BIOS setting	Description	Setting options	Effect
Summary screen	Set whether or not the system summary screen should open when the system is started (see figure 58 "815E - BIOS summary screen" on page 129).	Enabled	Activates the function.
		Disabled	Deactivates the function.
QuickBoot mode	Speeds up the booting process by skipping several tests.	Enabled	Activates the function.
		Disabled	Deactivates the function.

Table 93: Miscellaneous setting options - 815E

BIOS setting	Description	Setting options	Effect
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 57 "815E - BIOS diagnostic screen" on page 128) should be displayed when the system is started.	Enabled	Activates the function. The diagnostics screen is displayed.
		Disabled	Deactivates the function. The diagnostics screen is not displayed.
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 93: Miscellaneous setting options - 815E (cont.)

## Baseboard/panel features

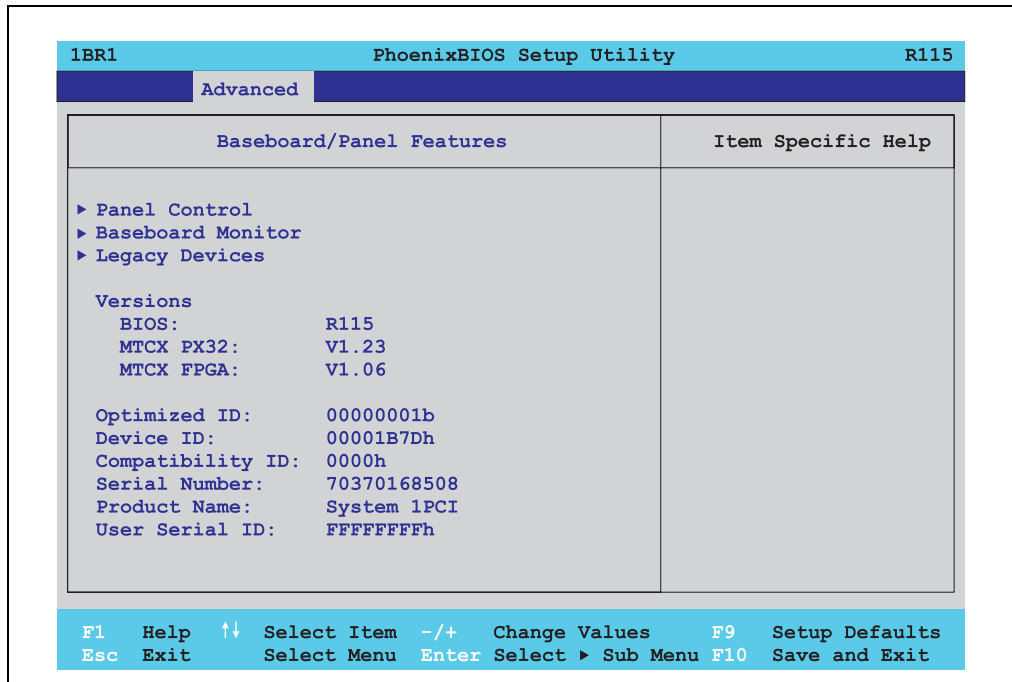


Figure 77: 815E - baseboard/panel features

BIOS setting	Description	Setting options	Effect
Panel control	For special setup of connected panels (display units).	Enter	Opens submenu See "Panel control", on page 159
Baseboard monitor	Display of various temperatures and fan RPMs.	Enter	Opens submenu See "Baseboard monitor", on page 160
Legacy devices		Enter	Opens submenu See "Legacy devices", on page 161
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	

Table 94: Setting options - 815E Baseboard/panel features

BIOS setting	Description	Setting options	Effect
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 94: Setting options - 815E Baseboard/panel features

## Panel control

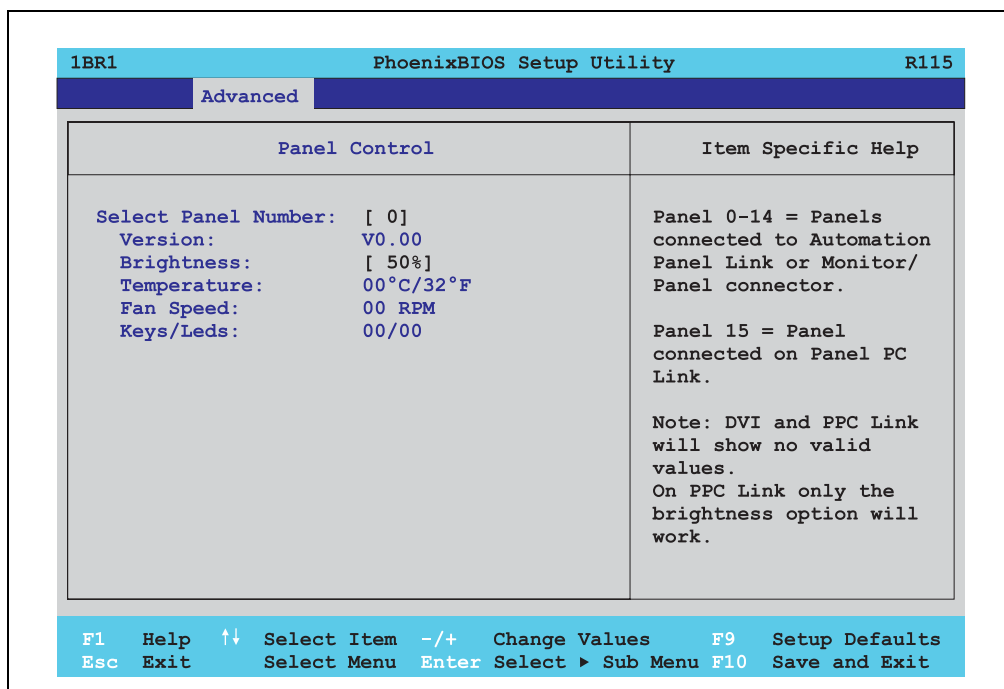


Figure 78: 815E - panel control

BIOS setting	Description	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>).

Table 95: Setting options - 815E panel control

BIOS setting	Description	Setting options	Effect
Temperature	Displays the selected panel's temperature (in degrees Celsius and Fahrenheit).	None	
Fan speed	Displays fan RPMs of the selected panel.	None	
Keys/LEDs	Displays the available keys and LEDs on the selected panel.	None	

Table 95: Setting options - 815E panel control (cont.)

### Baseboard monitor

1BR1	PhoenixBIOS Setup Utility	R115
Advanced		
Baseboard Monitor	Item Specific Help	
Temperatures I/O: 46°C/115°F Power Supply: 00°C/32°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		
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ► Sub Menu F10 Save and Exit		

Figure 79: 815E - baseboard monitor

BIOS setting	Description	Setting options	Effect
I/O	Displays the temperature in the I/O area in degrees Celsius and Fahrenheit.	None	
Power supply	Displays the temperature in the power supply area in degrees Celsius and Fahrenheit.	None	
Slide-in drive 1	Displays the temperature of the slide-in drive 1 in degrees Celsius and Fahrenheit.	None	
Slide-in drive 2	Displays the temperature of the slide-in drive 2 in degrees Celsius and Fahrenheit.	None	

Table 96: Setting options - 815E baseboard monitor

BIOS setting	Description	Setting options	Effect
Case 1	Displays the fan RPMs of housing fan 1.	None	
Case 2	Displays the fan RPMs of housing fan 2.	None	
Case 3	Displays the fan RPMs of housing fan 3.	None	
Case 4	Displays the fan RPMs of housing fan 4.	None	
CPU	Displays the fan RPMs of the processor fan.	None	

Table 96: Setting options - 815E baseboard monitor (cont.)

## Legacy devices

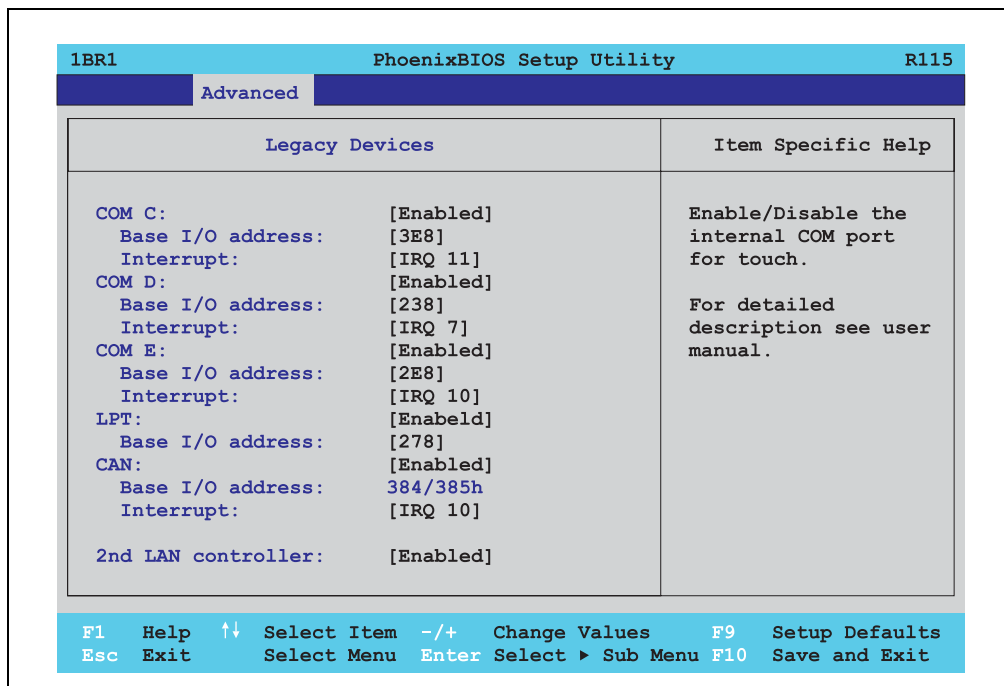


Figure 80: 815E - legacy devices

BIOS setting	Description	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	Deactivates the interface.
		Enabled	Activates the interface.

Table 97: Setting options - 815E legacy devices

BIOS setting	Description	Setting options	Effect
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	Deactivates the interface.
		Enabled	Activates 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 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	Deactivates the interface.
		Enabled	Activates 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	Deactivates the interface.
		Enabled	Activates 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	Deactivates the interface.
		Enabled	Activates 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 on-board LAN controller (ETH2) on and off.	Disabled	Deactivates the controller.
		Enabled	Activates the controller.

Table 97: Setting options - 815E legacy devices (cont.)



## 2.1.6 Security

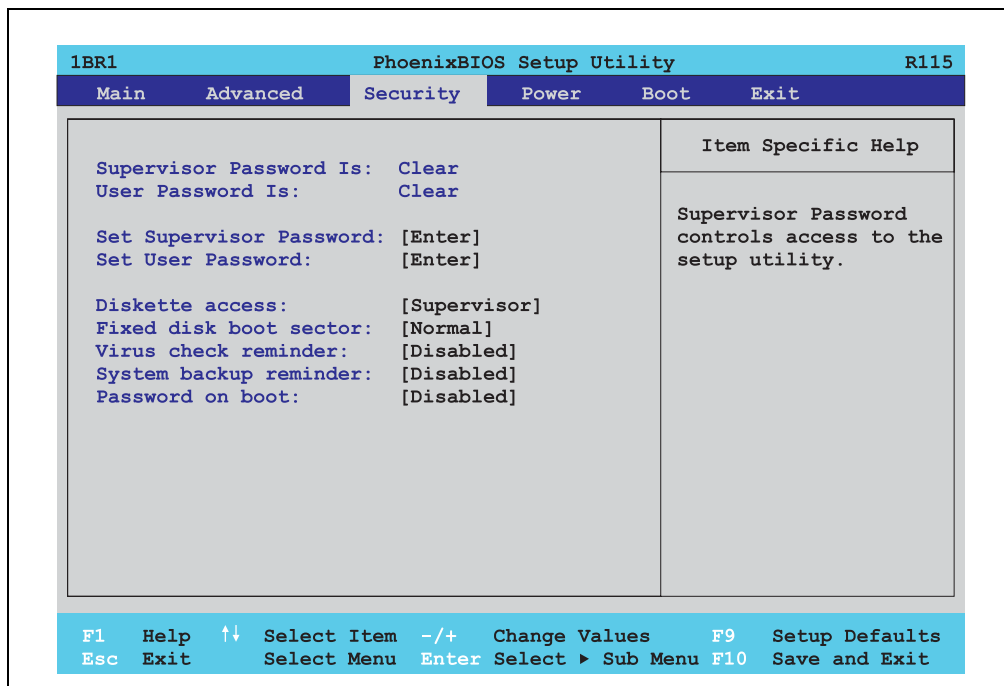


Figure 81: 815E - security menu

BIOS setting	Description	Setting options	Effect
Supervisor password is	Displays whether or not a supervisor password has been set.	None	Display <b>set</b> : A supervisor password has been set. Display <b>clear</b> : No supervisor password has been set.
User password is	Displays whether or not a user password has been set.	None	Display <b>set</b> : A user password has been set. Display <b>clear</b> : 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 the BIOS setup menu. To change password, enter 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 the BIOS setup menu. To change password, enter old password once and then the new password twice.

Table 98: Security setting options - 815E

BIOS setting	Description	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	Deactivates the 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	Deactivates the 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	Deactivates the function.
		Enabled	Activates the function.

Table 98: Security setting options - 815E (cont.)

## 2.1.7 Power

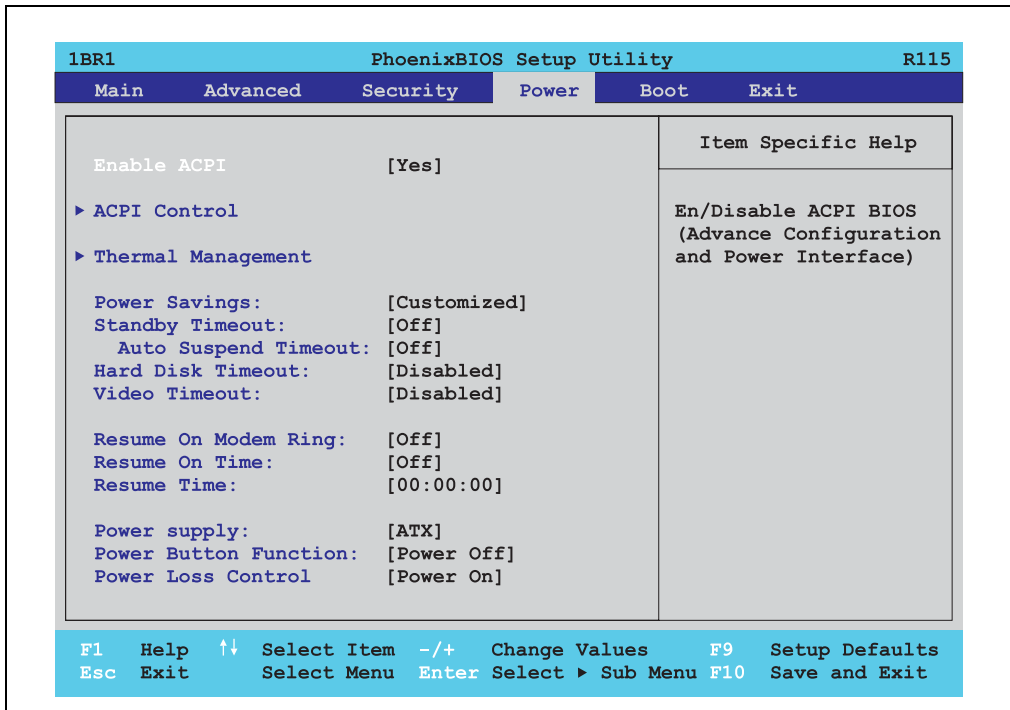


Figure 82: 815E - power menu

BIOS setting	Description	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	Activates the function.
		No	Deactivates the function.
ACPI control	Configuration of specific limits.	Enter	Opens submenu See "ACPI control", on page 167
Thermal management	Configuration of specific CPU limits.	Enter	Opens submenu See "Thermal management", on page 168
Power savings	This function determines if and how the power save function is used.	Disabled	Deactivates the power save function.
		Customized	Power management is custom configured by adjusting the individual settings.
		Maximum power Savings	Maximum power savings function.
		Maximum performance	Energy savings function to maximize performance.

Table 99: Power setting options - 815E

BIOS setting	Description	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	Deactivates the 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		Disabled	
Resume on modem ring	If an external modem is connected to a serial port and the telephone rings, the system starts up.	Off	Deactivates the function.
		On	Activates the function.
Resume on time	This function enables the system to start at the time set under "resume time."	Off	Deactivates the function.
		On	Activates the 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. <b>Since the APC620 contains an ATX power supply, ATX should be selected.</b>
		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 99: Power setting options - 815E (cont.)

## ACPI control

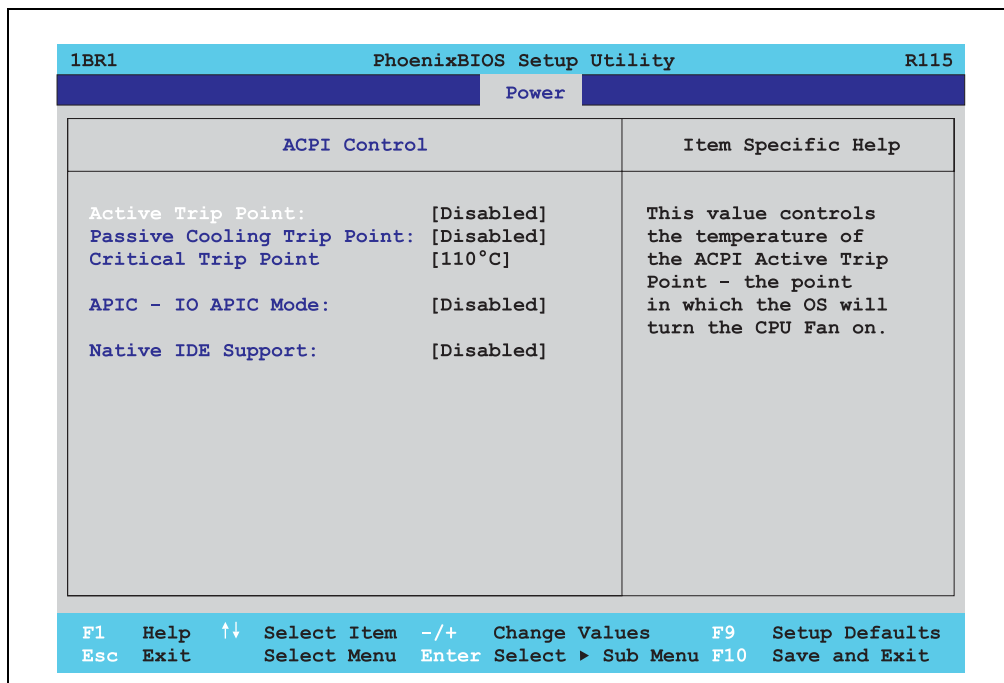


Figure 83: 815E - ACPI control

BIOS setting	Description	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	Deactivates the 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	Deactivates the 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.  <b>Warning!</b> This function should never be deactivated, as this would allow the CPU to rise above the temperature specifications.	Disabled	Deactivates the function.
		40°... 110°C	Temperature setting for the critical trip point. Can be set in 5 degree increments.

Table 100: 815E - ACPI control configuration possibilities

BIOS setting	Description	Setting options	Effect
APIC - I/O APIC mode	This option controls the functionality of the advanced interrupt controller in the processor.	Disabled	Deactivates the function
		Enabled	Activates the 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	Deactivates the function.
		Enabled	Activates the function.

Table 100: 815E - ACPI control configuration possibilities (cont.)

## Thermal management

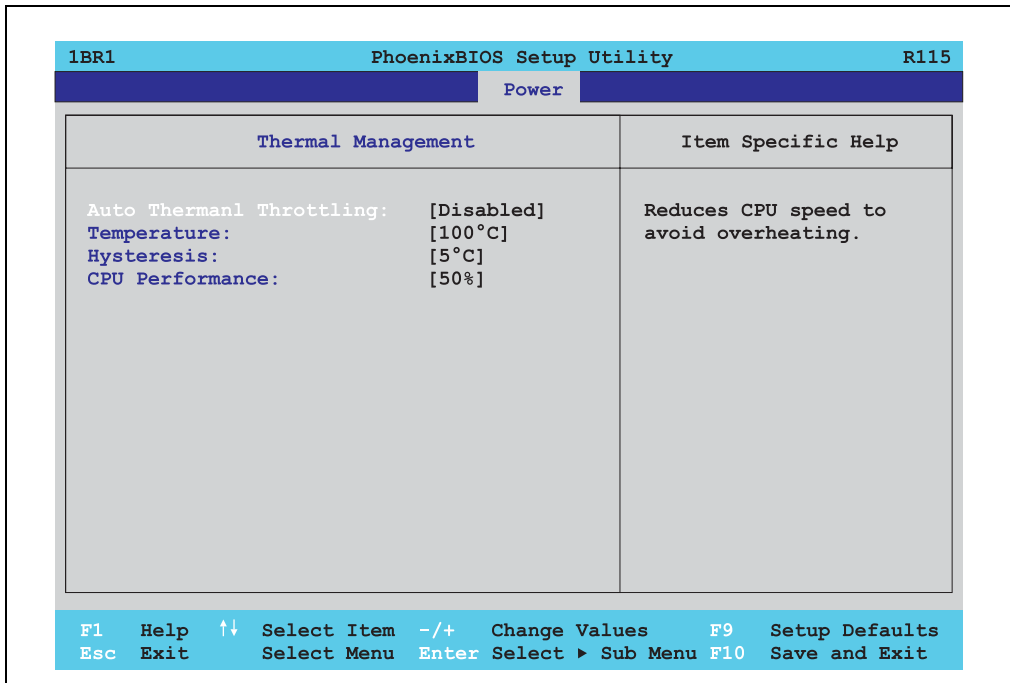


Figure 84: 815E - thermal management

BIOS setting	Description	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	Activates the function.
		Disabled	Deactivates the function.

Table 101: 815E - thermal management

BIOS setting	Description	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 101: 815E - thermal management (cont.)

## 2.1.8 Boot

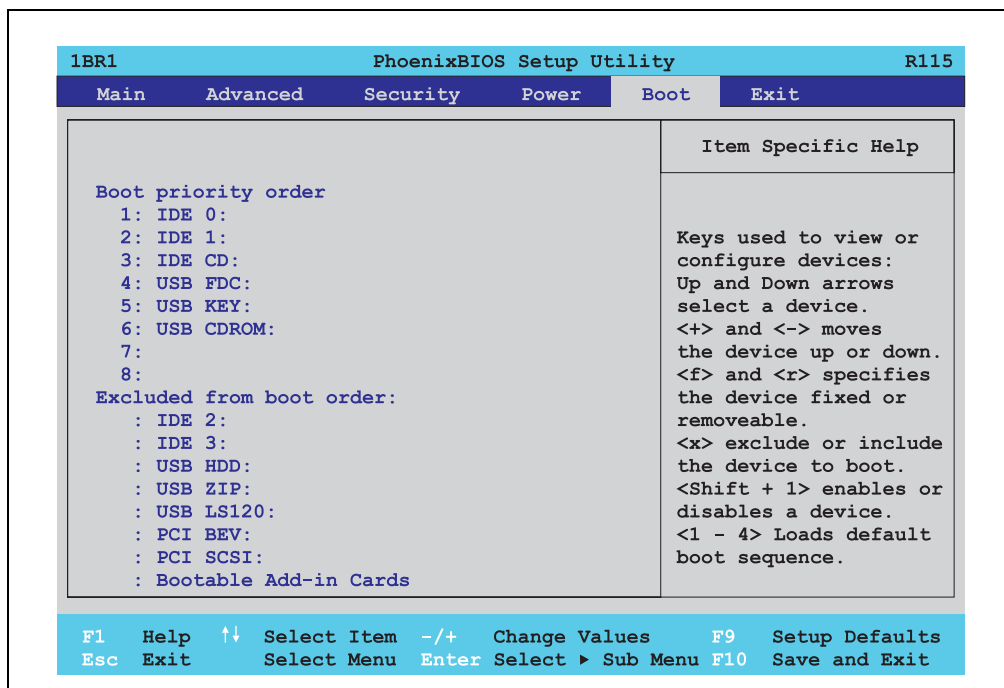


Figure 85: 815E - boot menu

BIOS setting	Description	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 102: 815E - boot setting options

## 2.1.9 Exit

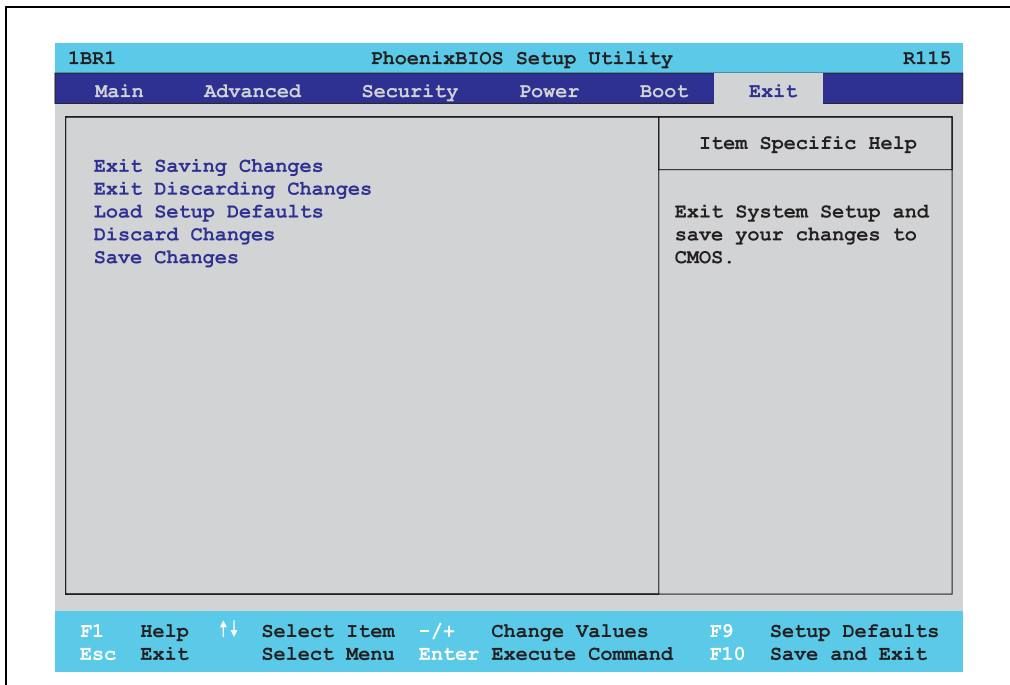


Figure 86: 815E - exit menu

BIOS setting	Description	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 103: 815E - exit setting options



BIOS setting	Description	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 103: 815E - exit setting options (cont.)

### 2.1.10 Profile overview

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

DIP switch position see Section 2.3.9 "Position of the DIP switch for APC620 system units" on page 241).

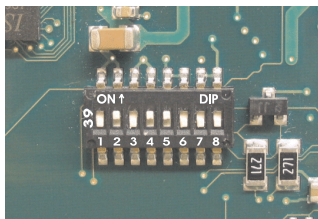


Figure 87: DIP switch on system unit

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 <sup>1)</sup>	8 <sup>1)</sup>
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, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00.	On	On	Off	Off	Off	Off	-	-

Table 104: 815E - profile overview

Number	Optimized for	DIP switch setting							
		1	2	3	4	5	6	7 <sup>1)</sup>	8 <sup>1)</sup>
Profile 4	Panel PC 700 system unit 5PC720.1043-01, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	On	Off	Off	Off	-	-

Table 104: 815E - profile overview (cont.)

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 personal settings column of 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	
<b>Primary master</b>						
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	
<b>Primary slave</b>						
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	
<b>Secondary master</b>						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	

Table 105: 815E - main profile setting overview

LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
<b>Secondary master</b>						
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
<b>Secondary slave</b>						
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 105: 815E - main profile setting overview (cont.)

## 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 106: 815E - 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	

Table 107: 815E - PCI/PNP configuration - profile setting options

Default primary video adapter	PCI	PCI	PCI	PCI	PCI	
Assign IRQ to SMB	Enabled	Enabled	Enabled	Enabled	Enabled	
<b>PCI device, slot #1</b>						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
<b>PCI device, slot #2</b>						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
<b>PCI device, slot #3</b>						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	

<b>PCI device, slot #4</b>	<b>Profile 0</b>	<b>Profile 1</b>	<b>Profile 2</b>	<b>Profile 3</b>	<b>Profile 4</b>	<b>Personal settings</b>
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
<b>PCI/PNP ISA IRQ resource exclusion</b>						
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 107: 815E - PCI/PNP configuration - profile setting options (cont.)

## Memory cache

	<b>Profile 0</b>	<b>Profile 1</b>	<b>Profile 2</b>	<b>Profile 3</b>	<b>Profile 4</b>	<b>Personal settings</b>
Memory cache	Enabled	Enabled	Enabled	Enabled	Enabled	
Cache system BIOS area	Write protect	Write protect	Write protect	Write protect	Write protect	

Table 108: 815E - memory cache - profile setting overview

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	

Table 108: 815E - memory cache - profile setting 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	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	3F8	
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 109: 815E - 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 110: 815E - 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 111: 815E - 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 112: 815E - 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	-	-	-	-	-	
<b>Panel control</b>						
Select panel number	0	0	0	15	15	
Version	-	-	-	-	-	
Brightness	100 %	100 %	100 %	100 %	100 %	

Table 113: 815E - baseboard/panel features - profile setting overview

Temperature	-	-	-	-	-	
Fan speed	-	-	-	-	-	
Keys/LEDs	-	-	-	-	-	
<b>Baseboard monitor</b>						
Temperatures	-	-	-	-	-	
I/O	-	-	-	-	-	
Power supply	-	-	-	-	-	
Slide-in drive 1	-	-	-	-	-	
Slide-in drive 2	-	-	-	-	-	

Baseboard monitor	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Fan speeds	-	-	-	-	-	
Case 1	-	-	-	-	-	
Case 2	-	-	-	-	-	
Case 3	-	-	-	-	-	
Case 4	-	-	-	-	-	
CPU	-	-	-	-	-	
<b>Legacy devices</b>						
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 113: 815E - 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	

Table 114: 815E - security - profile setting overview

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 114: 815E - security - profile setting 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	
<b>ACPI control</b>						
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	
<b>Thermal management</b>						
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 115: 815E - 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 FDC	
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 116: 815E - boot - profile setting overview

## 2.2 855GME -BIOS description

### Information:

- The following diagrams, BIOS menu items, and descriptions refer to BIOS Version R114. Therefore, it is possible that the diagrams and BIOS descriptions might 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 2.2.10 "Profile overview" on page 223).

#### 2.2.1 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 in the Automation PC 620 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 APC620 even when the power is turned off (no 24 VDC supply) .

#### 2.2.2 BIOS setup

The BIOS is immediately activated when you switch on the power supply of the Automation PC 620 system. BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the Power On Self Test (POST).

When these "preliminary steps" are finished, BIOS searches for 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
<0BR1R110> Bernecker + Rainer Industrie-Elektronik B1.14

```

```

CPU = Mobile Genuine Intel(R) processor      1100MHz
126M System RAM Passed
256K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed

```

Press <F2> to enter SETUP

Figure 88: 855GME - BIOS diagnostics screen

## Summary screen

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

```

                                PhoenixBIOS Setup Utility

CPU Type       : Mobile Genuine Intel(R) processor      1100MHz
CPU Speed      : 1100 MHz

System Memory   : 640 KB
Extended Memory : 514048 KB
Shadow Ram      : 384 KB
Cache Ram       : 1024 KB

System ROM      : E5A9 - FFFF
BIOS Date       : 12/17/04

COM Ports       : 0378 02F8
LPT Ports       : 0378
Display Type    : EGA \ VGA
PS/2 Mouse      : Not Installed

Hard Disk 0     : None
Hard Disk 1     : FUJITSU MHT2030AR-(RS)
Hard Disk 2     : None
Hard Disk 3     : CD-224E-(SS)

```

Figure 89: 855GME - BIOS summary screen

### 2.2.3 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 117: Keys relevant to BIOS during POST

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

Key	Function
Cursor ↑	Move to previous item.
Cursor ↓	Move to 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 118: Keys relevant to BIOS

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

BIOS setup menu Item	Function	From page
<b>Main</b>	The basic system configurations (e.g. time, date, hard disk parameters) can be set in this menu.	183
<b>Advanced</b>	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.	192
<b>Security</b>	For setting up the system's security functions.	216
<b>Power</b>	Setup of various APM (Advanced Power Management) options.	218
<b>Boot</b>	The boot order can be set here.	221
<b>Exit</b>	To end the BIOS setup.	222

Table 119: Overview of BIOS menu items

## 2.2.4 Main

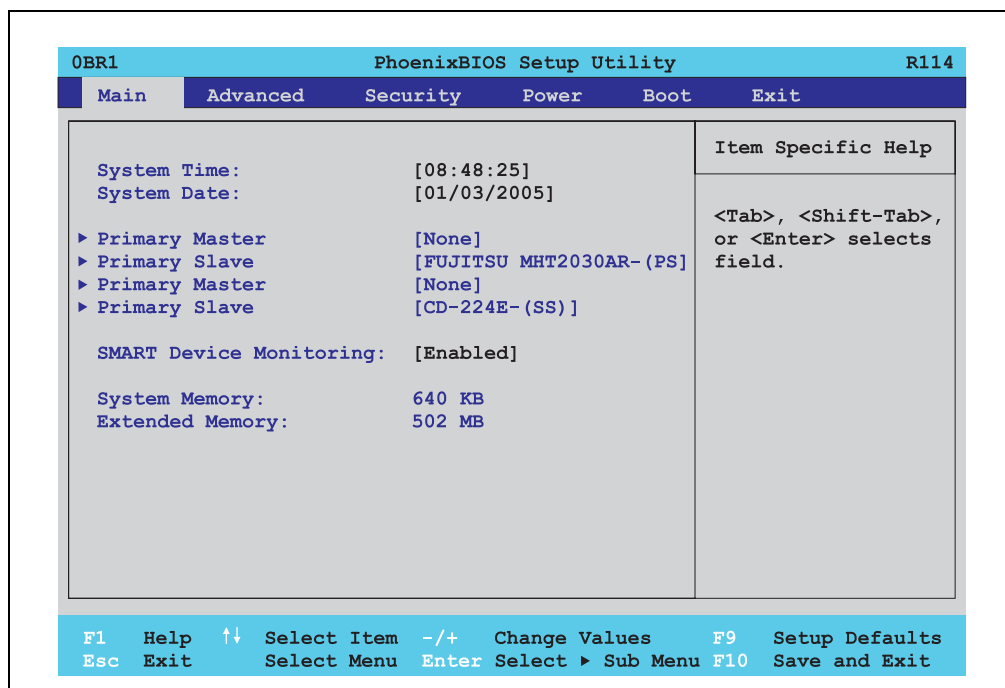


Figure 90: 855GME - main

BIOS setting	Description	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	Personal setting of 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	Personal setting of the system date in the format (mm:dd:yyyy).
Primary master	The drive in the system that is connected to the IDE primary master port is configured here.	Enter	Opens submenu see "Primary master", on page 184.
Primary slave	The drive in the system that is connected to the IDE primary slave port is configured here.	Enter	Opens submenu see "Primary slave", on page 186.
Secondary master	The drive in the system that is connected to the IDE secondary master port is configured here.	Enter	Opens submenu see "Secondary master", on page 188.
Secondary slave	The drive in the system that is connected to the IDE secondary slave port is configured here.	Enter	Opens submenu see "Secondary slave", on page 190.

Table 120: Main setting options - 855GME

BIOS setting	Description	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 determine problems with reading or spinning 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	-

Table 120: Main setting options - 855GME (cont.)

## Primary master

0BR1
PhoenixBIOS Setup Utility
R114

Main

Primary Master [None]

Type:
[Auto]

Multi-Sector Transfers:
[Disabled]

LBA Mode Control:
[Enabled]

32 Bit I/O:
[Disabled]Monitor

Transfer Mode:
[Fast PIO 2]

Ultra DMA Mode:
[Disabled]

SMART Monitoring:
[Disabled]

Item Specific Help

User = you enter parameters of hard-disk drive installed at this connection.  
Auto = autotypes hard-disk drive installed here.  
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 91: 855GME - primary master setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the 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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 121: Setting options - 855GME primary master

## Primary slave

0BR1 PhoenixBIOS Setup Utility R114	
Main	
Primary Slave [None]	Item Specific Help
Type: [Auto] Multi-Sector Transfers: [Disabled] LBA Mode Control: [Enabled] 32 Bit I/O: [Disabled] Monitor Transfer Mode: [Fast PIO 2] Ultra DMA Mode: [Disabled] SMART Monitoring: [Disabled]	User = you enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 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 92: 855GME - primary slave setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the function.
		2, 4, 8 or 16 sectors	Number of sectors per block.

Table 122: Setting options - 855GME primary slave



BIOS setting	Description	Setting options	Effect
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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 122: Setting options - 855GME primary slave (cont.)

## Secondary master

0BR1 PhoenixBIOS Setup Utility R114	
Main	
Secondary Master [None]	Item Specific Help
Type: [Auto] Multi-Sector Transfers: [Disabled] LBA Mode Control: [Enabled] 32 Bit I/O: [Disabled]Monitor Transfer Mode: [Fast PIO 2] Ultra DMA Mode: [Disabled] SMART Monitoring: [Disabled]	User = you enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 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 93: 855GME - secondary master setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the function.
		2, 4, 8 or 16 sectors	Number of sectors per block.

Table 123: Setting options - 855GME secondary master

BIOS setting	Description	Setting options	Effect
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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 123: Setting options - 855GME secondary master (cont.)

## Secondary slave

0BR1 PhoenixBIOS Setup Utility R114	
Main	
Secondary Slave [None]	Item Specific Help
Type: [Auto] Multi-Sector Transfers: [Disabled] LBA Mode Control: [Enabled] 32 Bit I/O: [Disabled]Monitor Transfer Mode: [Fast PIO 2] Ultra DMA Mode: [Disabled] SMART Monitoring: [Disabled]	User = you enter parameters of hard-disk drive installed at this connection. Auto = autotypes hard-disk drive installed here. 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 94: 855GME - secondary slave setup

BIOS setting	Description	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 or floppy drive.
Multi-sector transfer	This option determines the number of sectors per block. Only possible when manually setting up the drive (user option).	Disabled	Deactivates the function.
		2, 4, 8 or 16 sectors	Number of sectors per block.

Table 124: Setting options - 855GME secondary slave

BIOS setting	Description	Setting options	Effect
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 (user option).	Disabled	Deactivates the function.
		Enabled	Activates the function.
32-bit I/O	This function enables 32-bit data transfer.	Disabled	Deactivates the function.
		Enabled	Activates the 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 (user option).	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 (user option).	Disabled	Deactivates the 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	Dive support present, and function is activated.

Table 124: Setting options - 855GME secondary slave (cont.)

## 2.2.5 Advanced

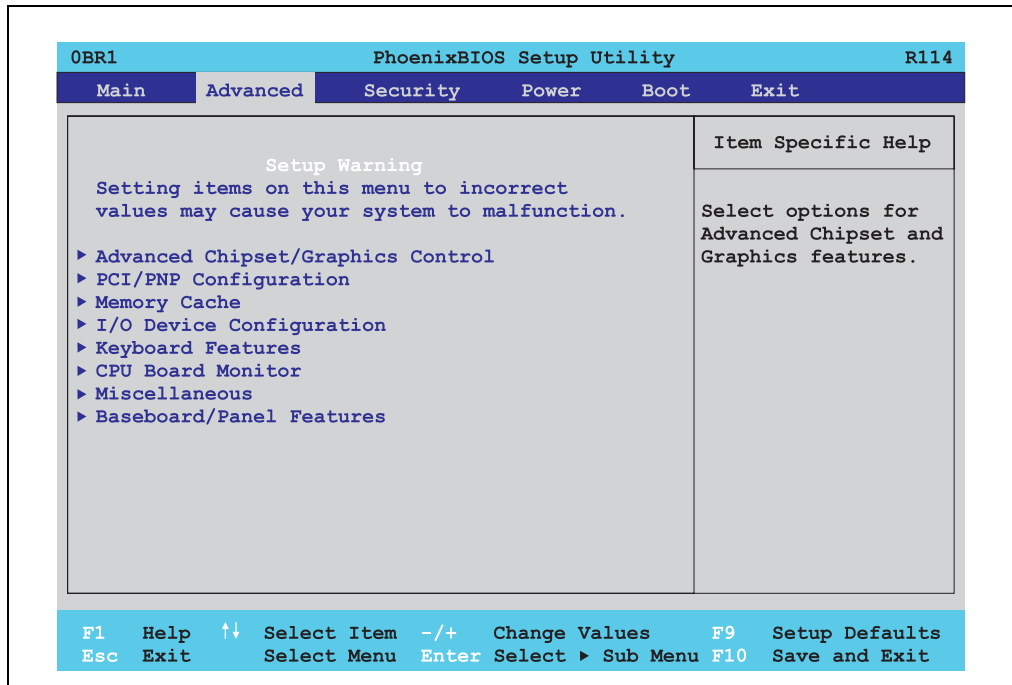


Figure 95: 855GME - advanced setup menu - overview

BIOS setup menu	Description	Setting options	Effect
Advanced chipset/graphics control	Setup of advanced chipset and graphics functions.	Enter	Opens submenu see "Advanced chipset/graphics control", on page 193.
PCI/PPN configuration	Configures PCI devices.	Enter	Opens submenu see "PCI/PPN configuration", on page 195.
Memory cache	Configuration of the memory cache resources.	Enter	Opens submenu see "Memory cache", on page 202.
I/O device configuration	Configuration of the I/O devices.	Enter	Opens submenu see "I/O device configuration", on page 204.
Keyboard features	Configuration of the keyboard options.	Enter	Opens submenu see "Keyboard features", on page 207.
CPU board monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu see "CPU board monitor", on page 208.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc...).	Enter	Opens submenu see "Miscellaneous", on page 209.
Baseboard/panel features	Display of device specific information and setup of device specific values.	Enter	Opens submenu see "Baseboard/panel features", on page 210.

Table 125: 855GME - advanced menu - setting options

## Advanced chipset/graphics control

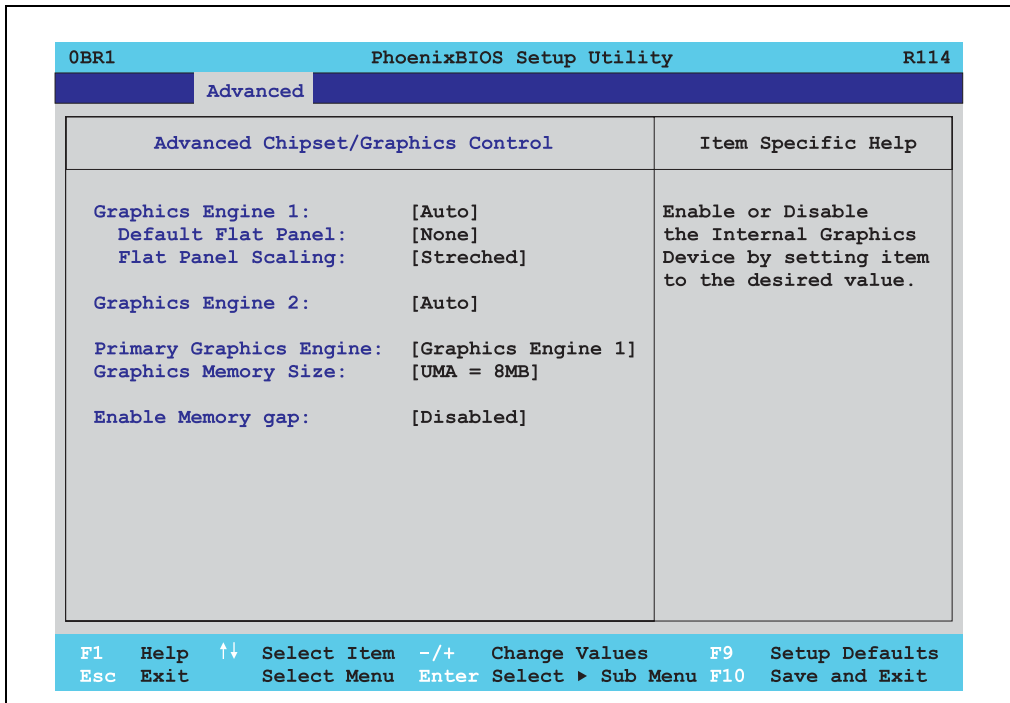


Figure 96: 855GME - advanced chipset control

BIOS setting	Description	Setting options	Effect
Graphics engine 1	Settings can be made for the onboard video controller (internal graphics device).	Auto	Automatic setting of graphics engine 1. The resolution is set using a read-out of the EDID data from the panel connected to the monitor / panel plug.
		Disabled	Disable graphics controller.  <b>Important!</b> 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	
		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

Table 126: 855GME - advanced chipset control - setting options

BIOS setting	Description	Setting options	Effect
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		Auto	Automatic setting of graphics engine 2. The resolution is set using a read-out of the EDID data from the panel connected to the AP Link output (via AP Link - optional).
		Disabled	Deactivates the graphics interface.
Graphics engine	Selection of the primary video output line. Graphics engine 1 = monitor / panel Graphics engine 2 = AP Link output	Graphics engine 1	The display devices on the monitor / panel plug are the primary video output.
		Graphics engine 2	The display devices on the AP Link output (via AP Link - optional) are 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.
Enable memory gap		Disabled	
		Extended	
IGD - device 2, function 1	For turning function 1 of the internal graphics controller on and off.	Enabled	Activate function.
		Disabled	Deactivate function.
IGD - memory size		UMA = 1MB, 8MB, 16MB or 32MB	

Table 126: 855GME - advanced chipset control - setting options



## PCI/PNP configuration

0BR1 PhoenixBIOS Setup Utility R114	
Advanced	
PCI/PNP Configuration	Item Specific Help
PNP OS installed: [Yes] Reset Configuration Data: [No] Secured Setup Configurations [Yes]  ▶ PCI Device, Slot #1 ▶ PCI Device, Slot #2 ▶ PCI Device, Slot #3 ▶ PCI Device, Slot #4  PCI IRQ line 1: [Auto Select] PCI IRQ line 2: [Auto Select] 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]  ▶ PCI/PNP ISA IRQ Resource Exclusion Default Primary Video Adapter: [PCI] Assing IRQ for SMB: [Enabled]	Select the operating system installed on your system which you will use most commonly.  Note: An incorrect setting can cause some operating systems to display unexpected behavior
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit Select Menu Enter Select ▶ Sub Menu F10 Save and Exit	

Figure 97: 855GME - PCI/PNP configuration

BIOS setting	Description	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	Deactivates the 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	Deactivates the function. Changes are allowed.

Table 127: 855GME - PCI/PNP - setting options

BIOS setting	Description	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 197
PCI device, slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens submenu See "PCI device, slot #2", on page 198
PCI device, slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens submenu See "PCI device, slot #3", on page 199
PCI device, slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens submenu See "PCI device, slot #4", on page 200
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	Deactivates the 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	Deactivates the 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	Deactivates the 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	Deactivates the 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	Deactivates the 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	Deactivates the function. No assignment.
		3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15	Manual configuration of the IRQ.
PCI/PNP ISA IRQ resource exclusion	This option reserves IRQs that are not being used by plug & play capable ISA devices.	Enter	Opens submenu See "PCI/PNP ISA IRQ resource exclusion", on page 201
Default primary video adapter	This option sets the first activated graphics card (either an existing AGP or the PCI graphic 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.

Table 127: 855GME - PCI/PNP - setting options (cont.)

BIOS setting	Description	Setting options	Effect
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 127: 855GME - PCI/PNP - setting options (cont.)

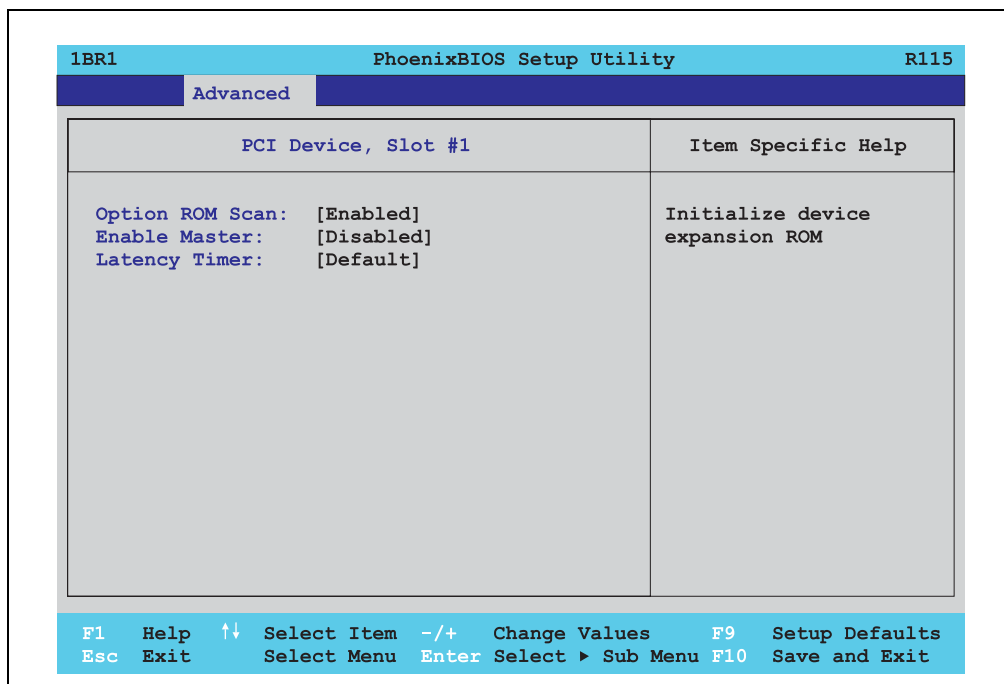
PCI device, slot #1

Figure 98: 855GME - PCI device, slot #1

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 128: 855GME - PCI device, slot #1 - setting options

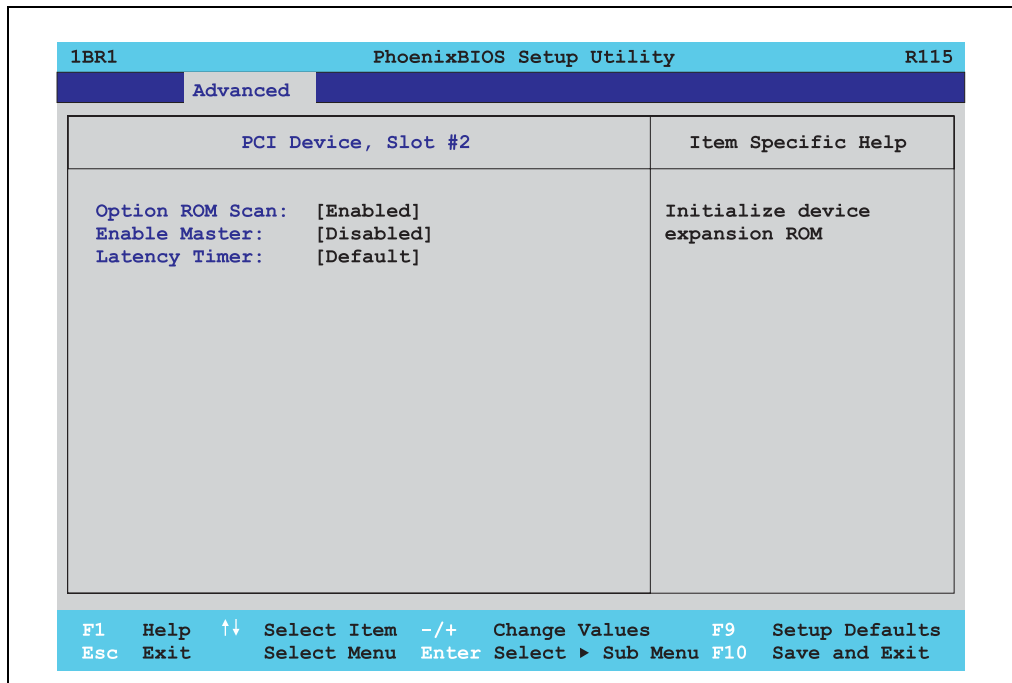
PCI device, slot #2

Figure 99: 855GME - PCI device, slot #2

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 129: 855GME - PCI device, slot #2 - setting options

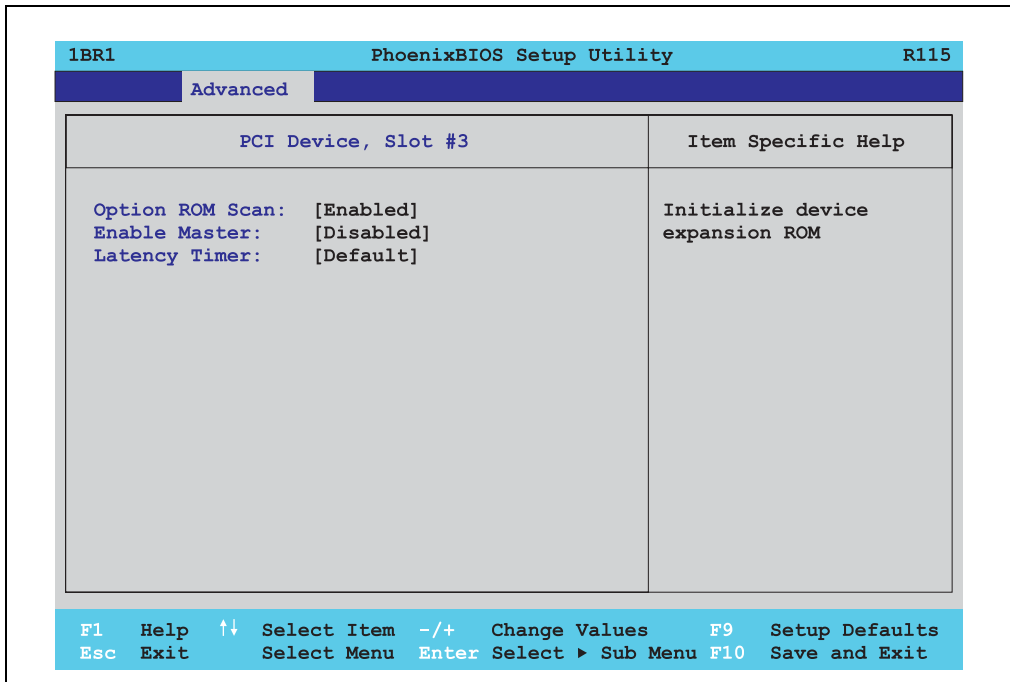
PCI device, slot #3

Figure 100: 855GME - PCI device, slot #3

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 130: 855GME - PCI device, slot #3 - setting options

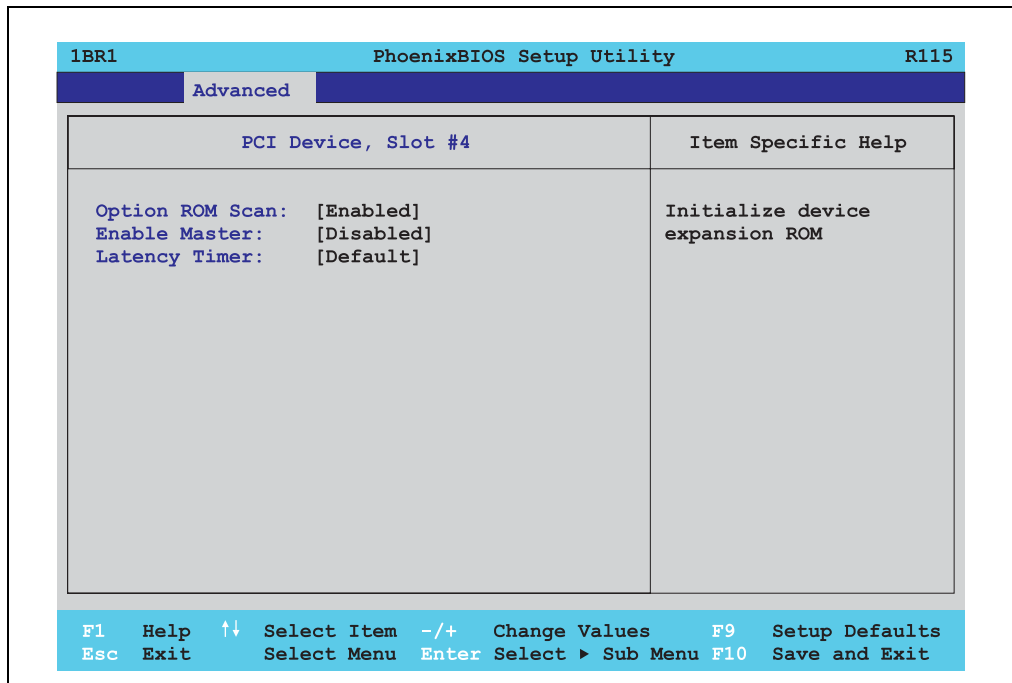
[PCI device, slot #4](#)

Figure 101: 855GME - PCI device, slot #4

BIOS setting	Description	Setting options	Effect
ROM scan option	Setting for the initialization of a device's ROM.	Enabled	Activates the function.
		Disabled	Deactivates the 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	Activates the function.
		Disabled	Deactivates the 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	Manual configuration of the setting.

Table 131: 855GME - PCI device, slot #4 - setting options

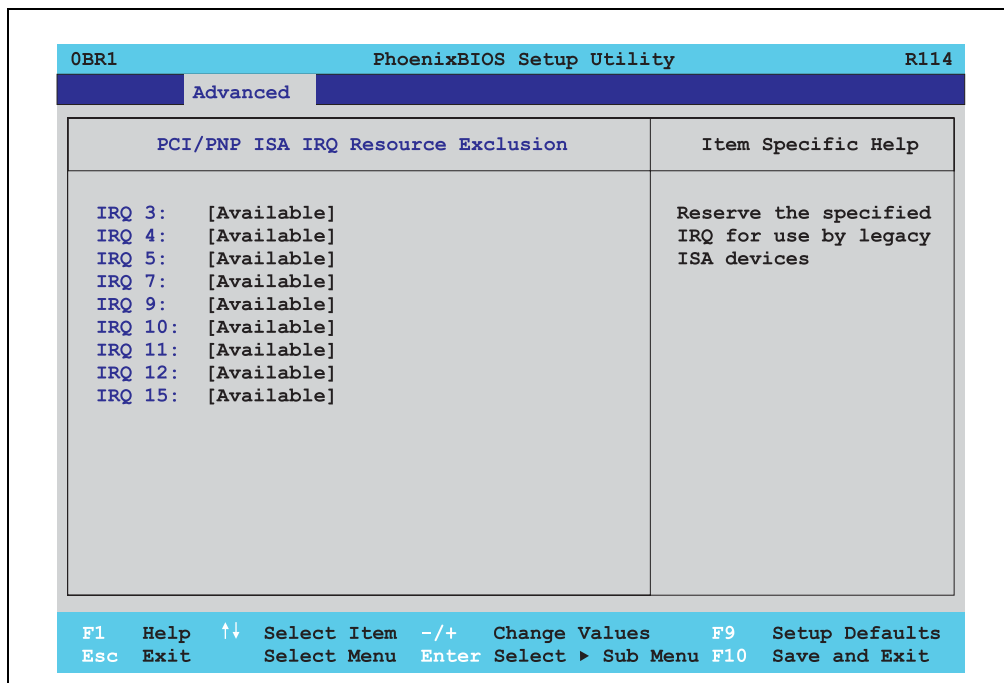
PCI/PNP ISA IRQ resource exclusion

Figure 102: 855GME - PCI/PNP ISA IRQ resource exclusion

BIOS setting	Description	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 132: 855GME - PCI/PNP ISA IRQ resource exclusion - setting options

BIOS setting	Description	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 132: 855GME - PCI/PNP ISA IRQ resource exclusion - setting options (cont.)

## Memory cache

0BR1		PhoenixBIOS Setup Utility		R114			
		Advanced					
Memory Cache				Item Specific Help			
Memory Cache: [Enabled]				Sets the state of the memory cache.			
Cache System BIOS area: [Write Protect]							
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]							
F1	Help	↑↓	Select Item	-/+	Change Values	F9	Setup Defaults
Esc	Exit		Select Menu	Enter	Select ► Sub Menu	F10	Save and Exit

Figure 103: 855GME - memory cache

BIOS setting	Description	Setting options	Effect
Memory cache	Enable/ disable utilization of the L2 cache.	Enabled	Activates the function.
		Disabled	Deactivates the 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 133: 855GME - memory cache - setting options



BIOS setting	Description	Setting options	Effect
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.
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.	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 D800 - 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.

Table 133: 855GME - memory cache - setting options (cont.)

## I/O device configuration

0BR1 PhoenixBIOS Setup Utility R114	
Advanced	
I/O Device Configuration	Item Specific Help
Local Bus IDE adapter: [Both] Primary IDE UDMA66/100 [Enabled] 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]	Enable the integrated local bus IDE adapter
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] Parallelt 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 104: 855GME - I/O device configuration

BIOS setting	Description	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 134: 855GME - I/O device configuration - setting options

BIOS setting	Description	Setting options	Effect
USB UHCI host controller 1	Configuration of the USB UHCI controller 1 for USB port 0 and 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI host controller 2	Configuration of the USB UHCI controller 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 USB2.0 support is activated as soon as a USB 2.0 device is connected to the interface.
Legacy USB support	Here an IRQ is assigned to the USB connection.	Disabled	No IRQ assigned.
		Enabled	IRQ assigned.
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 on-board LAN controller (ETH1) on and off.	Disabled	Deactivates the function.
		Enabled	Activates the function.
Serial port A	For the configuration of serial port A (COM1).	Disabled	Port A deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Base I/O address	Selection of the base I/O address for port A. A yellow star indicates a conflict with another device.	3F8, 2F8, 3E8, 2E8	Base I/O address is manually assigned.
Interrupt	Selection of the interrupt for port A. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Manual assignment of the interrupt.
Serial port B	For the configuration of serial port B (COM2).	Disabled	Port B deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured manually.
		Auto	Either BIOS or the operating system configures the port automatically.
Mode	This option is for setting the serial port B as either a standard interface or as an infrared interface.	Normal	Serial port B is used as a standard interface.
		IR	The serial interface is used as an infrared interface, and allows data transfers up to 115 kBit/s.

Table 134: 855GME - I/O device configuration - setting options (cont.)

BIOS setting	Description	Setting options	Effect
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 134: 855GME - I/O device configuration - setting options (cont.)

## Keyboard features

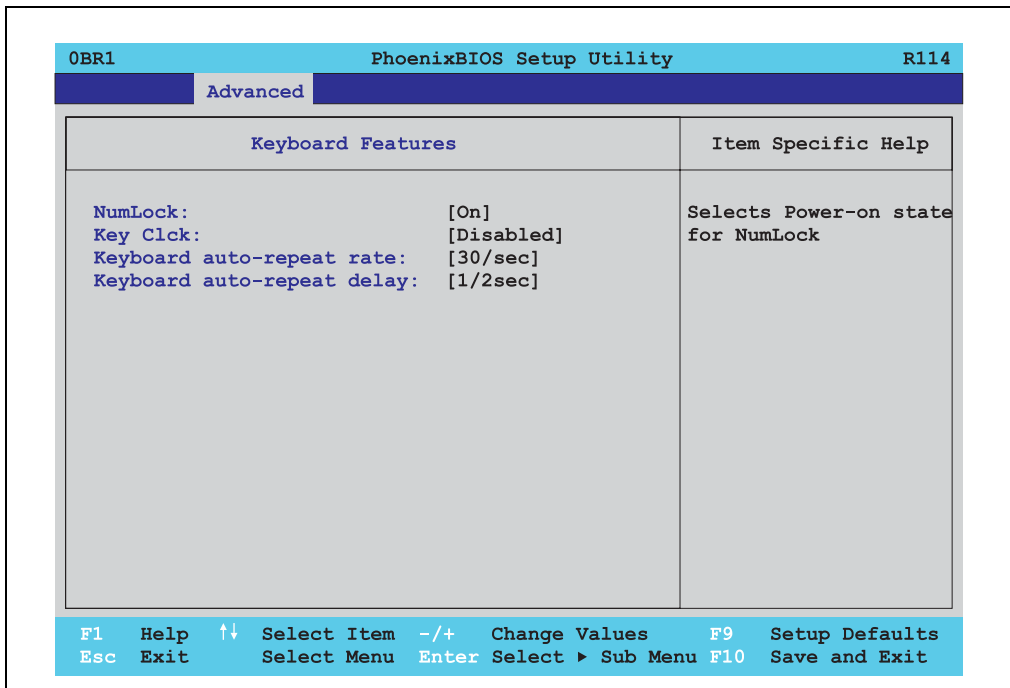


Figure 105: 855GME - keyboard features

BIOS setting	Description	Setting options	Effect
NumLock	This option sets the status of the numeric keypad when the system is booted.	On	Numeric keypad is activated.
		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	Deactivates the function.
		Enabled	Activates the 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 135: 855GME - keyboard features - setting options

## CPU board monitor

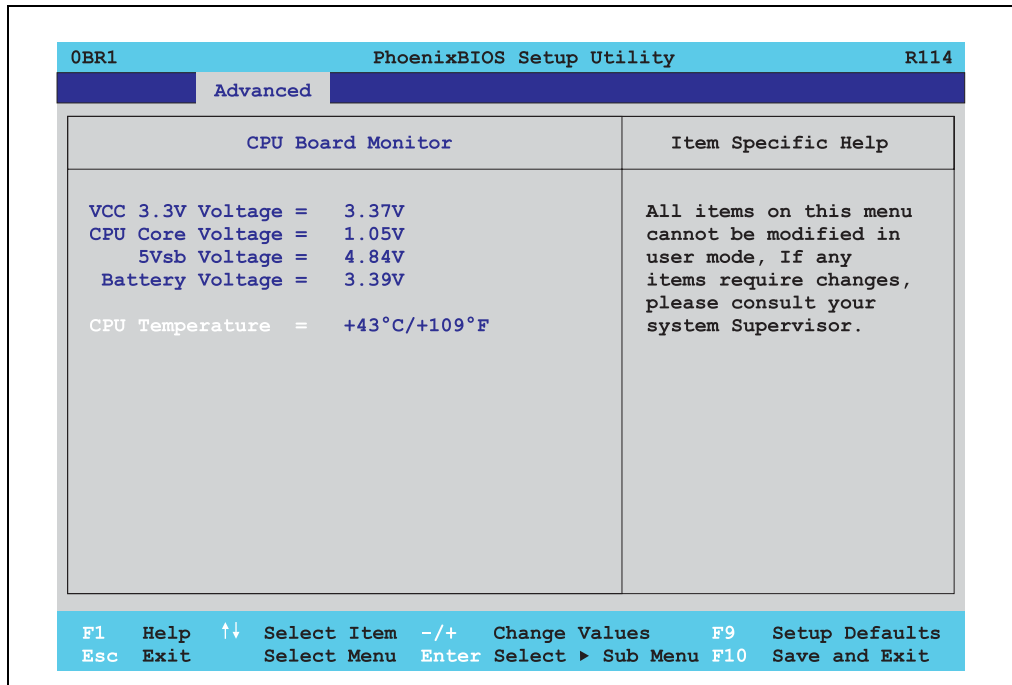


Figure 106: 855GME - CPU board monitor

BIOS setting	Description	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 volt).	None	
CPU temperature	Displays the processor's temperature (in degrees Celsius and Fahrenheit).	None	

Table 136: 855GME - CPU board monitor - setting options

## Miscellaneous

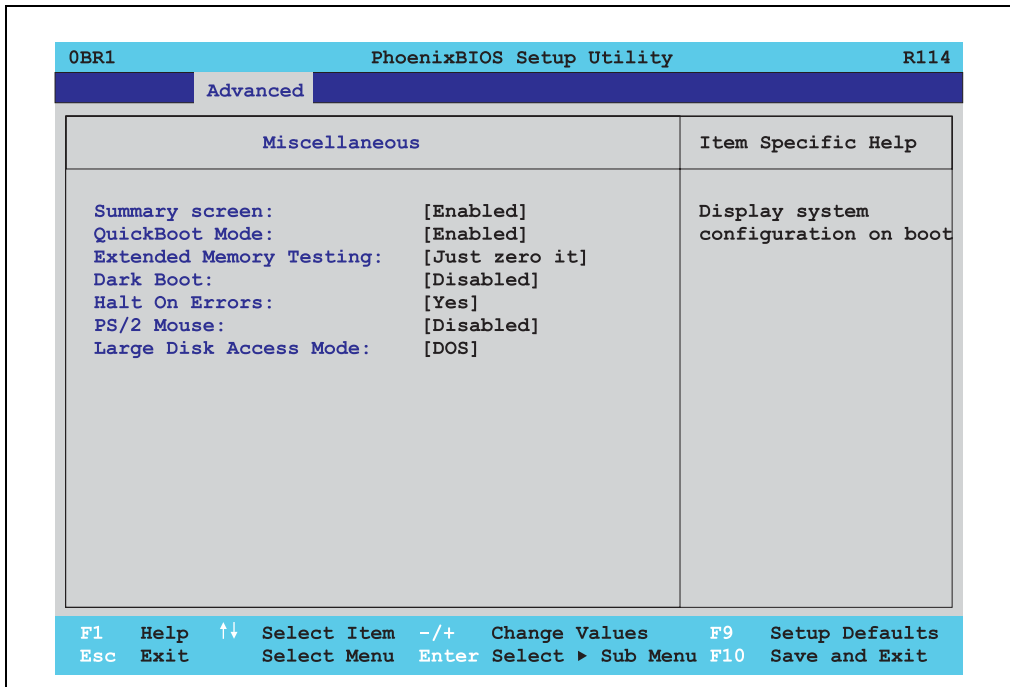


Figure 107: 855GME - miscellaneous

BIOS setting	Description	Setting options	Effect
Summary screen	Set whether or not the system summary screen should open when the system is started (see figure 89 "855GME - BIOS summary screen" on page 181).	Enabled	Activates the function.
		Disabled	Deactivates the function.
QuickBoot mode	Speeds up the booting process by skipping several tests.	Enabled	Activates the function.
		Disabled	Deactivates the 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 88 "855GME - BIOS diagnostics screen" on page 181) should be displayed when the system is started.	Enabled	Activates the function. The diagnostics screen is displayed.
		Disabled	Deactivates the function. The diagnostics screen is not displayed.

Table 137: 855GME - miscellaneous - setting options

BIOS setting	Description	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 137: 855GME - miscellaneous - setting options

## Baseboard/panel features

0BR1 PhoenixBIOS Setup Utility R114	
Advanced	
Baseboard/Panel Features	Item Specific Help
<ul style="list-style-type: none"> <li>▶ Panel Control</li> <li>▶ Baseboard Monitor</li> <li>▶ Legacy Devices</li> </ul> <p>Versions</p> <p>BIOS: R114</p> <p>MTCX: V1.23</p> <p>FPGA: V1.06</p> <p>Optimized ID: 00000001b</p> <p>Device ID: 00001BB7h</p> <p>Compatibility ID: 0000h</p> <p>Serial Number: 70950168449</p> <p>Product Name: System 2PCI 1DD</p> <p>User Serial ID: FFFFFFFFh</p>	
<p>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults</p> <p>Esc Exit Select Menu Enter Select ▶ Sub Menu F10 Save and Exit</p>	

Figure 108: 855GME - baseboard/panel features

BIOS setting	Description	Setting options	Effect
Panel control	For special setup of connected panels.	Enter	Opens submenu see "Panel control", on page 212.
Baseboard monitor	Display of various temperatures and fan RPMs.	Enter	Opens submenu see "Baseboard monitor", on page 213.

Table 138: 855GME - baseboard/panel features - setting options



BIOS setting	Description	Setting options	Effect
Legacy devices		Enter	Opens submenu see "Legacy devices", on page 214.
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 138: 855GME - baseboard/panel features - setting options (cont.)

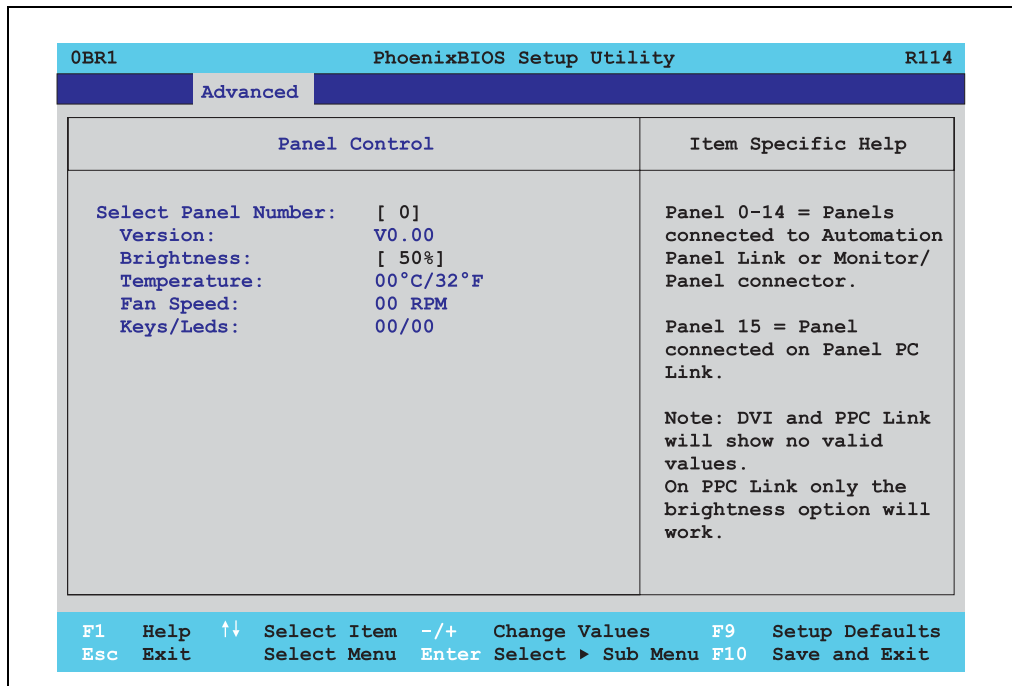
[Panel control](#)

Figure 109: 855GME - panel control

BIOS setting	Description	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 RPMs of the selected panel.	None	
Keys/LEDs	Displays the available keys and LEDs on the selected panel.	None	

Table 139: 855GME - panel control - setting options

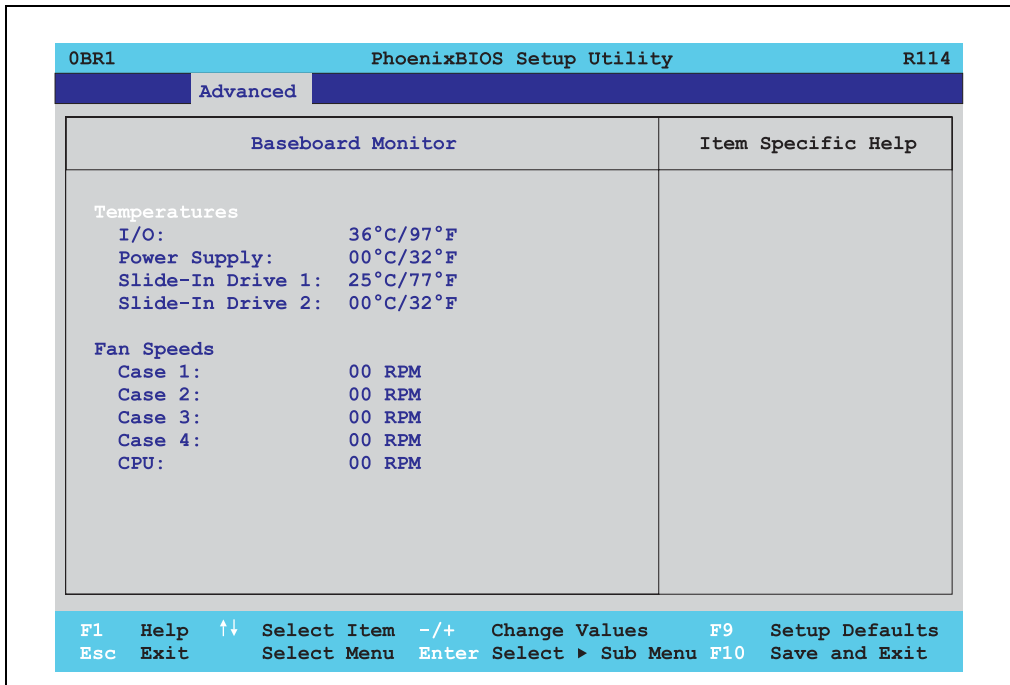
Baseboard monitor

Figure 110: 855GME - baseboard monitor

BIOS setting	Description	Setting options	Effect
I/O	Displays the temperature in the I/O area in degrees Celsius and Fahrenheit.	None	
Power supply	Displays the temperature in the power supply area in degrees Celsius and Fahrenheit.	None	
Slide-in drive 1	Displays the temperature of the slide-in drive 1 in degrees Celsius and Fahrenheit.	None	
Slide-in drive 2	Displays the temperature of the slide-in drive 2 in degrees Celsius and Fahrenheit.	None	
Case 1	Displays the fan RPMs of housing fan 1.	None	
Case 2	Displays the fan RPMs of housing fan 2.	None	
Case 3	Displays the fan RPMs of housing fan 3.	None	
Case 4	Displays the fan RPMs of housing fan 4.	None	
CPU	Displays the fan RPMs of the processor fan.	None	

Table 140: 855GME - baseboard monitor - setting options

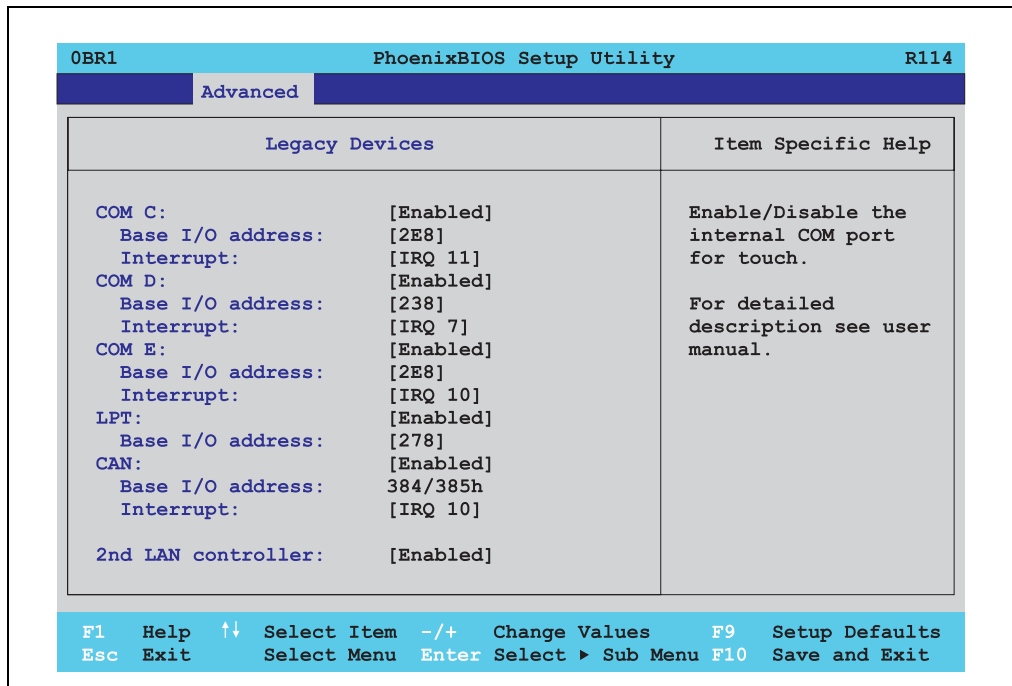
Legacy devices

Figure 111: 855GME - legacy devices

BIOS setting	Description	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	Deactivates the interface.
		Enabled	Activates 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	Deactivates the interface.
		Enabled	Activates 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.

Table 141: 855GME - legacy devices - setting options

BIOS setting	Description	Setting options	Effect
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	Deactivates the interface.
		Enabled	Activates 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	Deactivates the interface.
		Enabled	Activates 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	Deactivates the interface.
		Enabled	Activates 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 on-board LAN controller (ETH2) on and off.	Disabled	Deactivates the controller.
		Enabled	Activates the controller.

Table 141: 855GME - legacy devices - setting options (cont.)

## 2.2.6 Security

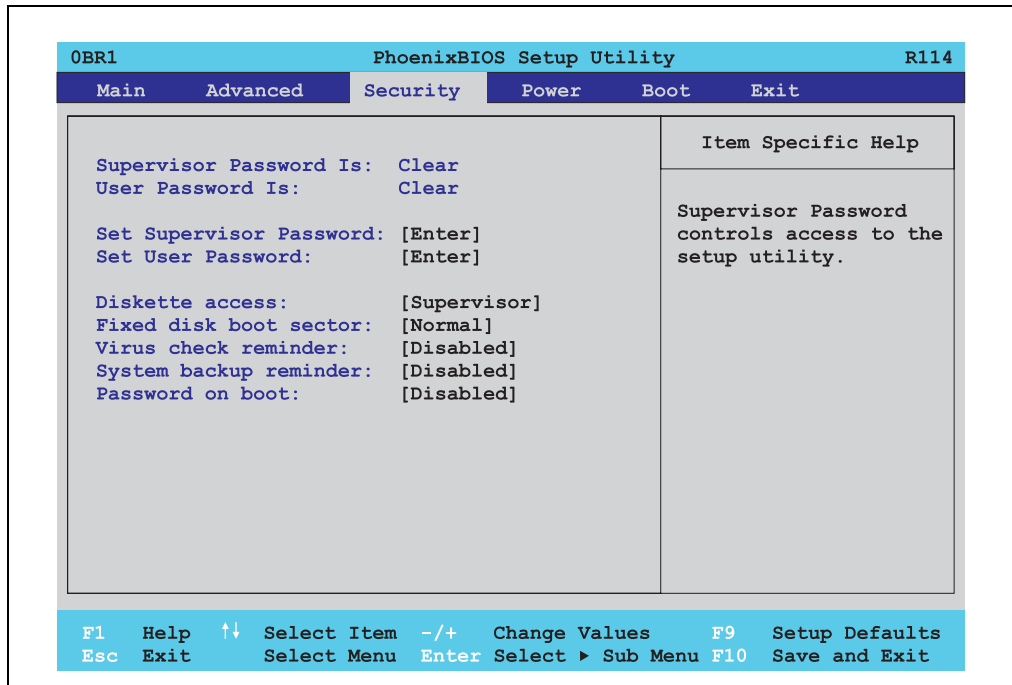


Figure 112: 855GME - security menu

BIOS setting	Description	Setting options	Effect
Supervisor password is	Displays whether or not a supervisor password has been set.	None	Display <b>set</b> : A supervisor password has been set. Display <b>clear</b> : No supervisor password has been set.
User password is	Displays whether or not a user password has been set.	None	Display <b>set</b> : A user password has been set. Display <b>clear</b> : 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 the BIOS setup menu. To change password, enter 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 the BIOS setup menu. To change password, enter old password once and then the new password twice.

Table 142: 855GME - security - setting options

BIOS setting	Description	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	Deactivates the 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	Deactivates the 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	Deactivates the function.
		Enabled	Activates the function.

Table 142: 855GME - security - setting options (cont.)

## 2.2.7 Power

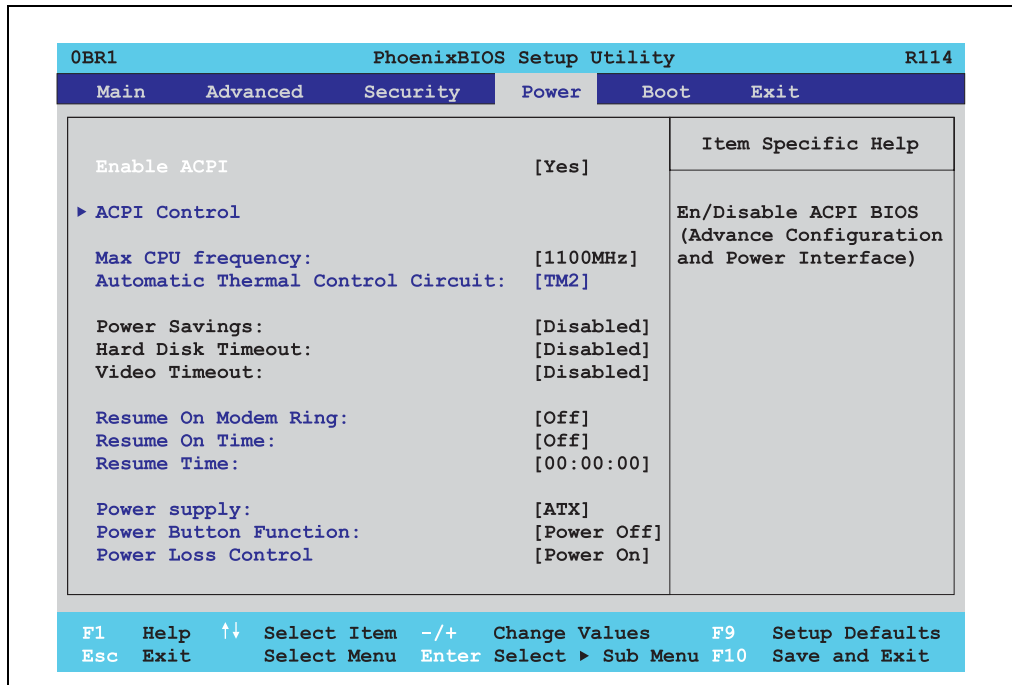


Figure 113: 855GME - power menu

BIOS setting	Description	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	Activates the function.
		No	Deactivates the function.
ACPI control	Configuration of specific limits.	Enter	Opens submenu See "ACPI control", on page 220
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	Deactivates the function.
		TM1	Operation with 50 % load.
		TM2	Operation in accordance with Intel's Geyserville specifications.
Power savings	This function determines if and how the power save function is used.	Disabled	Deactivates the power save function.
		Customized	Power management is custom configured by adjusting the individual settings.
		Maximum power Savings	Maximum power savings function.
		Maximum performance	Energy savings function to maximize performance.

Table 143: 855GME - power - setting options



BIOS setting	Description	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	Deactivates the 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		Disabled	
Resume on modem ring	If an external modem is connected to a serial port and the telephone rings, the system starts up.	Off	Deactivates the function.
		On	Activates the function.
Resume on time	This function enables the system to start at the time set under "resume time."	Off	Deactivates the function.
		On	Activates the 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.

Table 143: 855GME - power - setting options (cont.)

## ACPI control

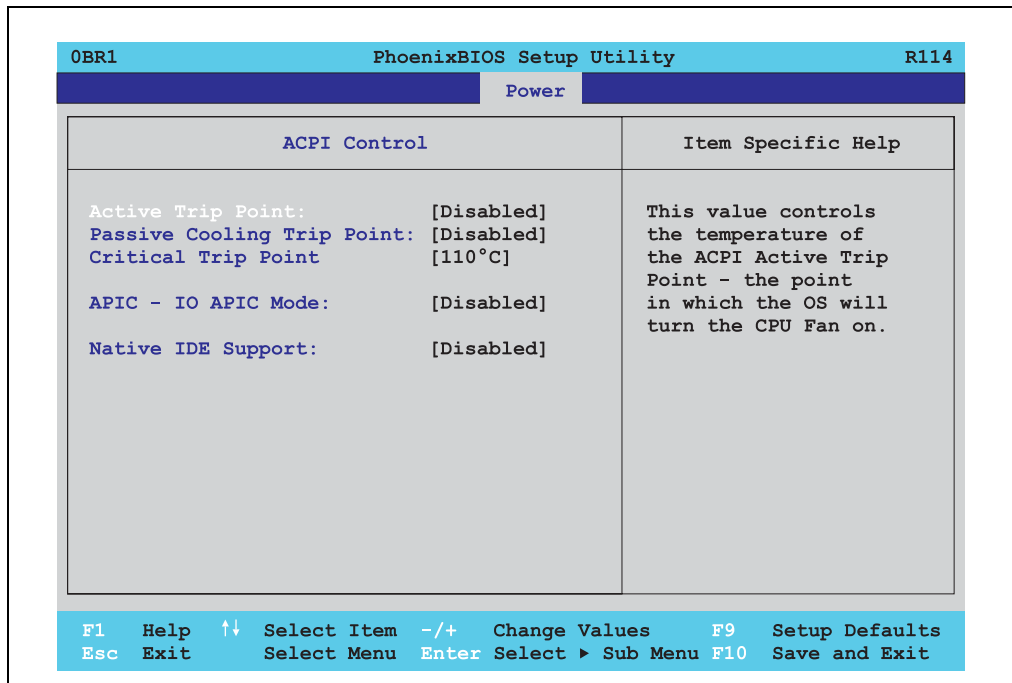


Figure 114: 855GME - ACPI control

BIOS setting	Description	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	Deactivates the 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	Deactivates the 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.  <b>Warning!</b>  This function should never be deactivated, as this would allow the CPU to rise above the temperature specifications.	Disabled	Deactivates the function.
		40°... 110°C	Temperature setting for the critical trip point. Can be set in 5 degree increments.

Table 144: 855GME - ACPI control - setting options

BIOS setting	Description	Setting options	Effect
APIC - I/O APIC mode	This option controls the functionality of the advanced interrupt controller in the processor.	Disabled	Deactivates the function
		Enabled	Activates the 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	Deactivates the function.
		Enabled	Activates the function.

Table 144: 855GME - ACPI control - setting options

## 2.2.8 Boot

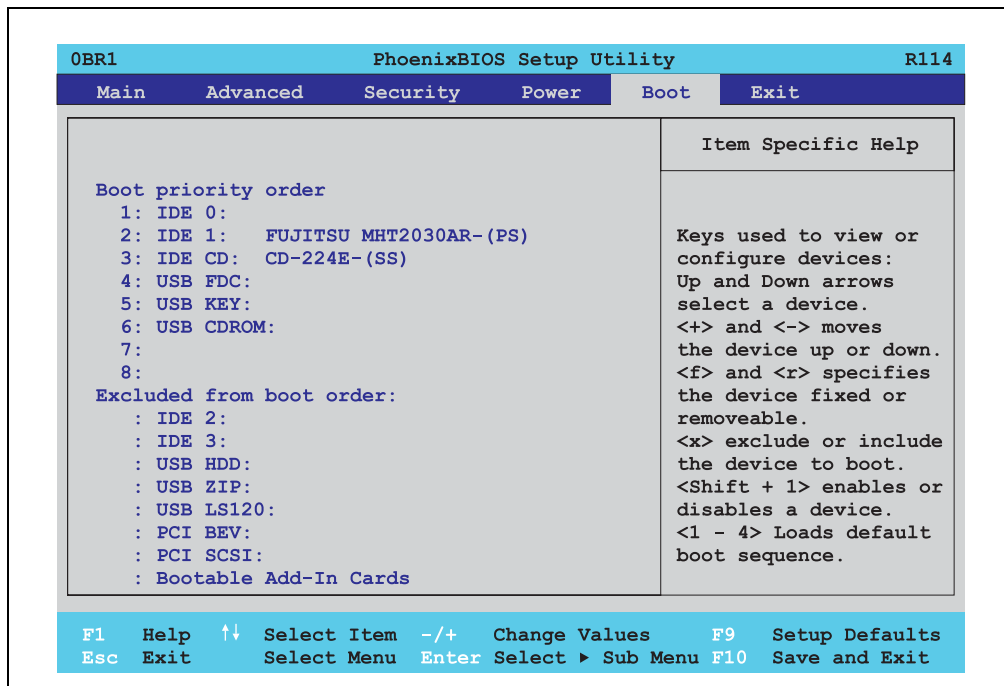


Figure 115: 855GME - boot menu

BIOS setting	Description	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 145: 855GME - boot - setting options

## 2.2.9 Exit

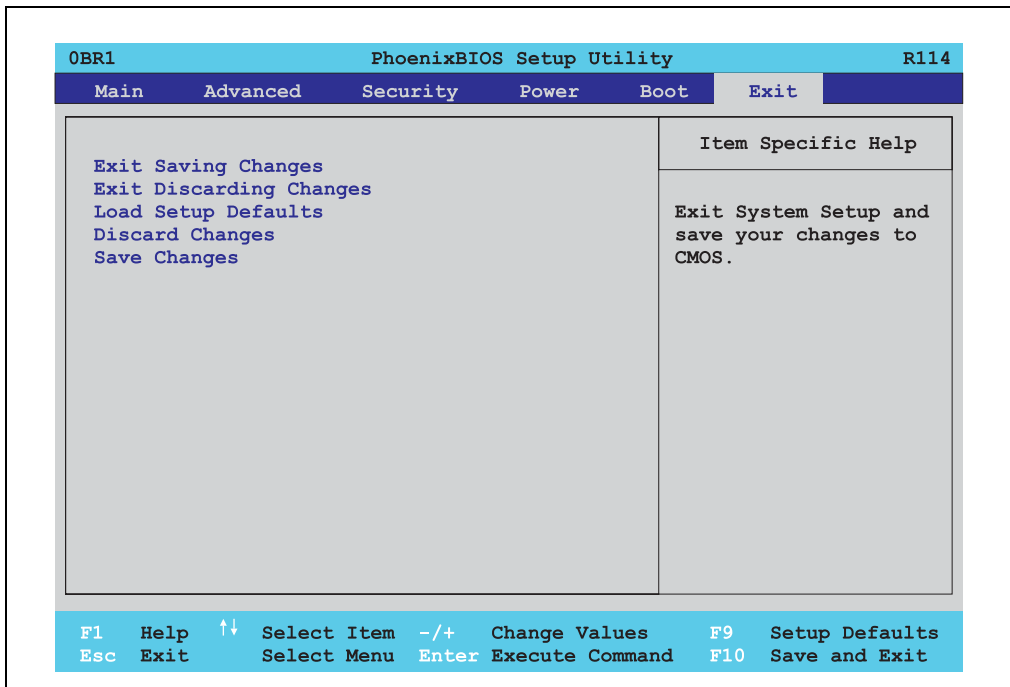


Figure 116: 855GME - exit menu

BIOS setting	Description	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 146: 855GME - exit - setting options

BIOS setting	Description	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 146: 855GME - exit - setting options

### 2.2.10 Profile overview

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

DIP switch position see Section 2.3.9 "Position of the DIP switch for APC620 system units" on page 241).

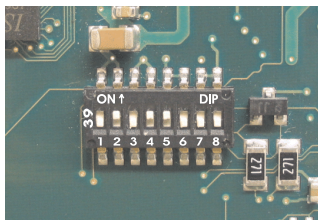


Figure 117: DIP switch on system unit

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 <sup>1)</sup>	8 <sup>1)</sup>
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, 5PC781.1043-00, 5PC781.1505-00 and 5PC782.1043-00.	On	On	Off	Off	Off	Off	-	-

Table 147: 855GME - profile overview

Number	Optimized for	DIP switch setting							
		1	2	3	4	5	6	7 <sup>1)</sup>	8 <sup>1)</sup>
Profile 4	Panel PC 700 system unit 5PC720.1043-01, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	On	Off	Off	Off	-	-

Table 147: 855GME - profile overview (cont.)

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 personal settings column of 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	
<b>Primary master</b>						
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	
<b>Primary slave</b>						
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	
<b>Secondary master</b>						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-sector transfer	-	-	-	-	-	

Table 148: 855GME - main - profile setting overview

LBA mode control	-	-	-	-	-	
32-bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer mode	-	-	-	-	-	
Ultra DMA mode	-	-	-	-	-	
SMART monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
<b>Secondary slave</b>						
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 148: 855GME - 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 149: 855GME - 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	

Table 150: 855GME - PCI/PNP configuration - profile setting overview

## Software • APC620 with BIOS

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	
<b>PCI device, slot #1</b>						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
<b>PCI device, slot #2</b>						
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 #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	
<b>PCI device, slot #4</b>						
ROM scan option	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency timer	Default	Default	Default	Default	Default	
<b>PCI/PNP ISA IRQ resource exclusion</b>						
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 150: 855GME - PCI/PNP configuration - profile setting 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	

Table 151: 855GME - memory cache - profile setting overview

## I/O device configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Local bus IDE adapter	Primary	<b>Both</b>	<b>Both</b>	Primary	<b>Both</b>	
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	<b>Enabled</b>	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	3F8	
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 152: 855GME - 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 153: 855GME - 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 154: 855GME - 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 155: 855GME - 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	-	-	-	-	-	

Table 156: 855GME - baseboard/panel features - profile setting overview

Device ID	-	-	-	-	-	
Compatibility ID	-	-	-	-	-	
Serial number	-	-	-	-	-	
Product name	-	-	-	-	-	
User serial ID	-	-	-	-	-	
Panel control	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal settings
Select panel number	0	0	0	0	0	
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	-	-	-	-	-	
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	-	-	-	-	-	

Table 156: 855GME - baseboard/panel features - profile setting overview (cont.)

Interrupt	-	-	-	-	-	
2nd LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 156: 855GME - 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 157: 855GME - 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	
<b>ACPI control</b>						
Active trip point	Disabled	Disabled	Disabled	Disabled	Disabled	
Passive cooling trip point	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 158: 855GME - power - profile setting overview

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 158: 855GME - 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 FDC	
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 159: 855GME - boot - profile setting overview

## 2.3 BIOS upgrade

### Warning!

The upgrade procedures described in the following pages must be carried out for all APC620 systems with software versions lower than those listed in the following table.

CPU board software	815E	855GME
BIOS	< R017	< R007
MTCX PX32 firmware	< V1.19	< V1.19
MTCX FPGA firmware	< V1.06	< V1.06

Table 160: CPU board software versions

Automation Panel Link	Transceiver (5DLSDL.1000-01)	Receiver (5DLSDL.1000-00)
SDLR version	< V0.03	< V0.03

Table 161: Automation panel link software versions

### 2.3.1 Requirements

The following peripheral devices are needed for a software upgrade:

- USB floppy drive or USB memory stick
- 1.44MB HDD diskette(s) (max. 3 diskettes)
- PS/2 or USB keyboard
- B&R upgrade software ([www.br-automation.com](http://www.br-automation.com))

### 2.3.2 What information do I need?

Before starting the upgrade, you should know the CPU board type (815E and 855GME) and the various software versions.

#### Which CPU board do I have?

After switching on the APC620, 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) Celeron(TM) CPU          733MHz
58M System RAM Passed

Press <F2> to enter SETUP

```

Figure 118: Differentiating between 815E and 855GME CPU boards

Letter	CPU board	Model number
B	855GME	5PC600.E855-00
C	815E	5PC600.E815-00, 5PC600.E815-02, 5PC600.E815-03

Table 162: Differentiating between 815E and 855GME CPU boards

### Which BIOS version and firmware are already installed on the APC620?

This information can be found on the same BIOS setup page for both the 815E and the 855GME CPU boards:

- After switching on the APC620, you can get to the BIOS setup by pressing "F2".
- From the BIOS main menu "advanced" (top), select "baseboard/panel features" (bottom):

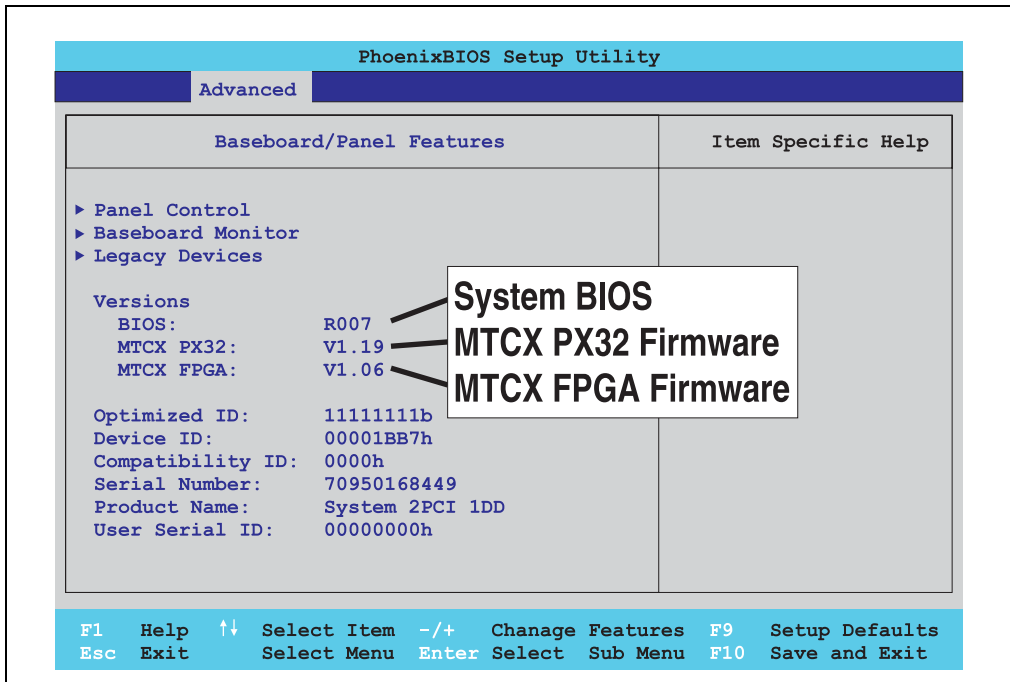


Figure 119: Software versions

### 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 and the 855GME CPU boards:

- After switching on the APC620, you can get to the BIOS setup by pressing "F2".
- From the BIOS main menu "advanced" (top), select "baseboard/panel features" (bottom) and then "panel control":

### Information:

The version can only be shown if an Automation Panel with Automation Panel Link SDL transceiver (5DLSDL.1000-01) and Automation Panel Link SDL receiver (5DLSDL.1000-00) is connected.



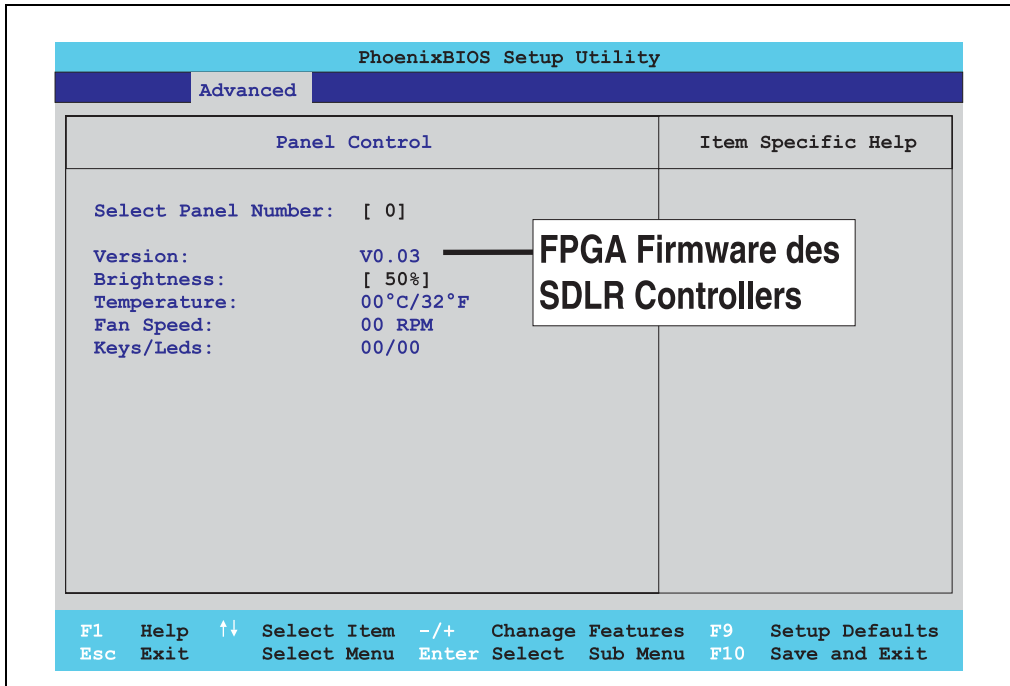


Figure 120: Firmware version of Automation Panel Link SDL transceiver/receiver

### 2.3.3 Upgrade BIOS for 815E

- 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 2.3.8 "Creating a DOS boot diskette in Windows XP" on page 239).
- Place the diskette in the USB floppy drive and reboot the APC620.
- The following boot menu will be shown after startup

1. Upgrade PHOENIX BIOS for 815E
2. Exit

Concerning point 1:  
BIOS is automatically upgraded (default after 5 seconds).

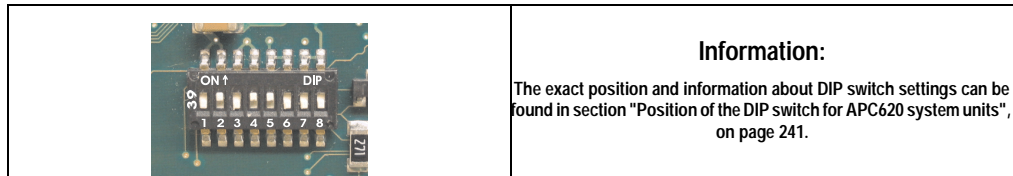
Concerning point 2:  
Return to the shell (MS-DOS).

- The system must be rebooted after a successful upgrade.

## Information:

When the system has rebooted, setup default values must be reloaded after the Checksum error message (press F1 or select "load setup defaults" in the BIOS setup "exit" menu). Afterwards, the time and date must be set again.

When using a system unit with 2 PCI slots, the DIP switches on the system unit must be set to profile position 2. When using a system unit with 1 PCI slot, the DIP switches do not have to be changed.



### Information:

The exact position and information about DIP switch settings can be found in section "Position of the DIP switch for APC620 system units", on page 241.

Figure 121: DIP switch on system unit (example)

Number	Optimized for device	DIP switch setting							
		1	2	3	4	5	6	7 <sup>1)</sup>	8 <sup>1)</sup>
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, 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, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	On	Off	Off	Off	-	-

Table 163: Profile overview

1) Not required. Free.

### 2.3.4 Upgrade BIOS for 855GME

- 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 2.3.8 "Creating a DOS boot diskette in Windows XP" on page 239).
- Place the diskette in the USB floppy drive and reboot the APC620.
- The following boot menu will be shown after startup

1. Upgrade PHOENIX BIOS for 855GME
2. Exit

Concerning point 1:  
BIOS is automatically upgraded (default after 5 seconds).

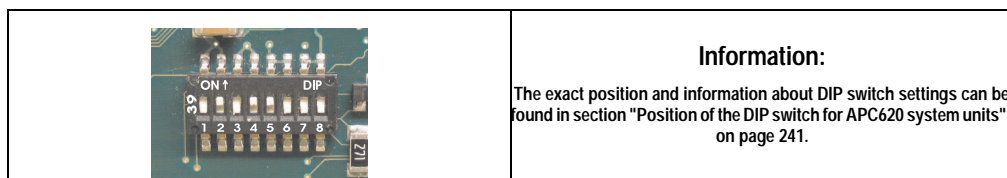
Concerning point 2:  
Return to the shell (MS-DOS).

- The system must be rebooted after a successful upgrade.

## Information:

**When the system has rebooted, Load Setup Default values must be reloaded after the Checksum Error message (press F1 or select "Load Setup Defaults" in the BIOS setup "Exit" menu). Afterwards, the time and date must be set again.**

When using a system unit with 2 PCI slots, the DIP switches on the system unit must be set to profile position 2. When using a system unit with 1 PCI slot, the DIP switches do not have to be changed.



### Information:

The exact position and information about DIP switch settings can be found in section "Position of the DIP switch for APC620 system units", on page 241.

Figure 122: DIP switch on system unit (example)

Number	Optimized for device	DIP switch setting							
		1	2	3	4	5	6	7 <sup>1)</sup>	8 <sup>1)</sup>
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, 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, 5PC720.1505-01 and 5PC720.1505-02.	Off	Off	On	Off	Off	Off	-	-

Table 164: Profile overview

1) Not required. Free.

### 2.3.5 Upgrade the firmware

Depending on the design, a APC620 system is equipped with several controllers (MTCX, SDLR). The firmware can be upgraded individually.

- 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 2.3.8 "Creating a DOS boot diskette in Windows XP" on page 239).
- Place the diskette in the USB floppy drive and reboot the APC620.
- The following boot menu will be shown after startup

1. Upgrade MTCX PX32 and FPGA
2. Upgrade MTCX PX32 only
3. Upgrade MTCX FPGA only
4. Upgrade SDLR on Panel 0 only
5. Exit

Concerning point 1:

Automatically upgrade PX32 and FPGA for MTCX (default after 5 seconds).

Concerning point 2:

Automatically upgrade PX32 for MTCX.

Concerning point 3:

Automatically upgrade FPGA for MTCX.

Concerning point 4:

Automatically upgrade FPGA firmware for SDLR controller on Panel 0.

## Warning!

**The SDLR firmware can only be updated if an Automation Panel with Automation Panel Link SDL Transceiver (5DLSDL.1000-01) and Automation Panel Link SDL 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 SDL Transceiver (5DLSDL.1000-01) or Automation Panel Link SDL Receiver (5DLSDL.1000-00) must be exchanged or sent in for repair.**

Concerning point 5:

Return to the shell (MS-DOS).

### 2.3.6 Installing the graphic chip driver for 815E CPU boards

The following must be observed when installing the graphic chip driver for the graphic chip integrated in the 815E chip set:

- The driver available from Intel is NOT permitted to be used, only the driver available from B&R([www.br-automation.com](http://www.br-automation.com)).

- After unpacking the \*.zip file, the driver must be updated using the Windows Device Manager "Start - Control Panel - System - Hardware - Device Manager - Update Driver". When doing this, use the file **i81xnt5.inf**.
- The initial installation of the driver can only be carried out with an external monitor connected. After successfully installing the B&R driver, an Automation Panel be operated without problems.

## Caution!

**Presently, this driver is only approved for the Windows XP Professional and Windows XP embedded operating systems.**

### 2.3.7 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 drive must be reinstalled.

To do this, use the audio driver from the B&R Homepage ([www.br-automation.com](http://www.br-automation.com)).

During the installation of the audio driver, the following 2 files must be hand 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.

In order to be able to set up all possible resolutions when using an 815E CPU board, the graphics driver must be reinstalled (see 2.3.6 "Installing the graphic chip driver for 815E CPU boards").

### 2.3.8 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 3 1/2" Floppy icon and select **"Format..."**.

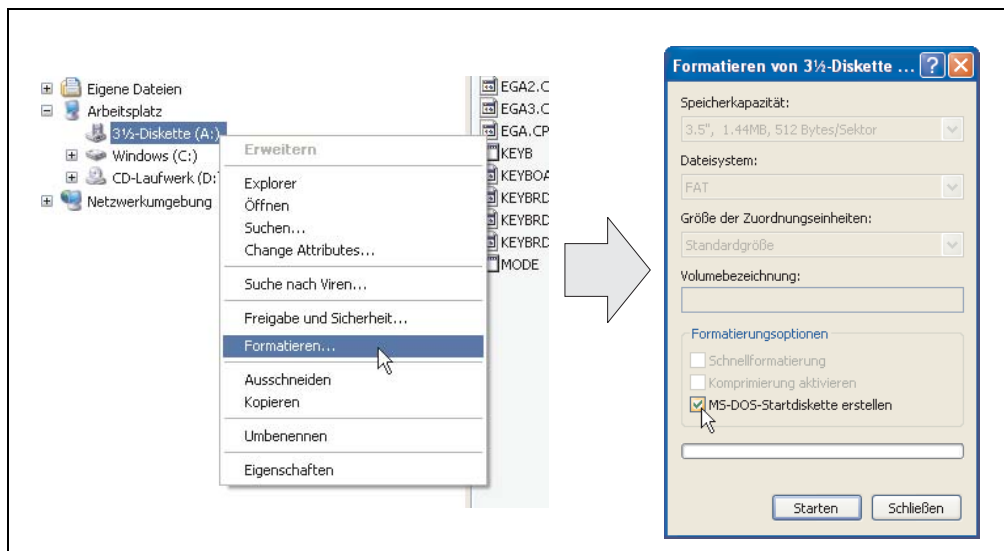


Figure 123: Creating a bootable diskette in Windows XP - step 1

- Then select the checkbox **"Create an MS-DOS startup disk"**, press **"Start"** and acknowledge the warning message with **"OK"**.

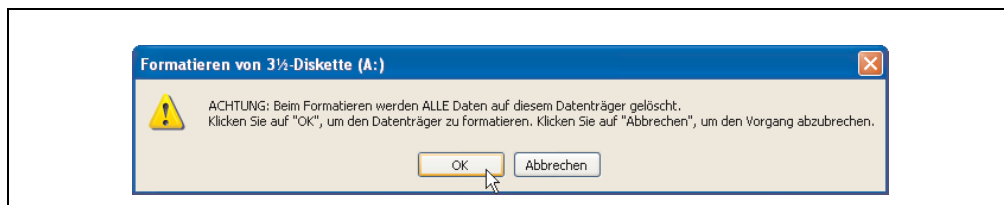


Figure 124: Creating a bootable diskette in Windows XP - step 2



Figure 125: 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				After			
Name	Größe	Typ	Geändert am	Name	Größe	Typ	Geändert am
DISPLAY	17 KB	Systemdatei	08.06.2000 17:00	AUTOEXEC	1 KB	Stapelverarbeitungsdatei für MS-DOS	04.10.2004 15:14
EGA2.CPI	58 KB	CPI-Datei	08.06.2000 17:00	COMMAND	91 KB	Anwendung für MS-DOS	08.06.2000 17:00
EGA3.CPI	58 KB	CPI-Datei	08.06.2000 17:00	CONFIG	1 KB	Systemdatei	04.10.2004 15:14
EGA.CPI	58 KB	CPI-Datei	08.06.2000 17:00	DISPLAY	17 KB	Systemdatei	08.06.2000 17:00
KEYB	22 KB	Anwendung für MS-DOS	08.06.2000 17:00	EGA2.CPI	58 KB	CPI-Datei	08.06.2000 17:00
KEYBOARD	34 KB	Systemdatei	08.06.2000 17:00	EGA3.CPI	58 KB	CPI-Datei	08.06.2000 17:00
KEYBRD2	32 KB	Systemdatei	08.06.2000 17:00	EGA.CPI	58 KB	CPI-Datei	08.06.2000 17:00
KEYBRD3	31 KB	Systemdatei	08.06.2000 17:00	IO	114 KB	Systemdatei	15.05.2001 18:57
KEYBRD4	13 KB	Systemdatei	08.06.2000 17:00	KEYB	22 KB	Anwendung für MS-DOS	08.06.2000 17:00
MODE	29 KB	Anwendung für MS-DOS	08.06.2000 17:00	KEYBOARD	34 KB	Systemdatei	08.06.2000 17:00
				KEYBRD2	32 KB	Systemdatei	08.06.2000 17:00
				KEYBRD3	31 KB	Systemdatei	08.06.2000 17:00
				KEYBRD4	13 KB	Systemdatei	08.06.2000 17:00
				MODE	29 KB	Anwendung für MS-DOS	08.06.2000 17:00
				MSDOS	1 KB	Systemdatei	07.04.2001 13:40

Figure 126: Creating a bootable diskette in Windows XP - step 4

Name	Größe	Typ	Geändert am
AUTOEXEC	1 KB	Stapelverarbeitungsdatei für MS-DOS	04.10.2004 15:14
COMMAND	91 KB	Anwendung für MS-DOS	08.06.2000 17:00
CONFIG	1 KB	Systemdatei	04.10.2004 15:14
DISPLAY	17 KB	Systemdatei	08.06.2000 17:00
EGA2.CPI	58 KB	CPI-Datei	08.06.2000 17:00
EGA3.CPI	58 KB	CPI-Datei	08.06.2000 17:00
EGA.CPI	58 KB	CPI-Datei	08.06.2000 17:00
IO	114 KB	Systemdatei	15.05.2001 18:57
KEYB	22 KB	Anwendung für MS-DOS	08.06.2000 17:00
KEYBOARD	34 KB	Systemdatei	08.06.2000 17:00
KEYBRD2	32 KB	Systemdatei	08.06.2000 17:00
KEYBRD3	31 KB	Systemdatei	08.06.2000 17:00
KEYBRD4	13 KB	Systemdatei	08.06.2000 17:00
MODE	29 KB	Anwendung für MS-DOS	08.06.2000 17:00
MSDOS	1 KB	Systemdatei	07.04.2001 13:40

Figure 127: Creating a bootable diskette in Windows XP - step 5

Now all files (marked) except Command.com, IO.sys and MSDOS.sys can be deleted.

### 2.3.9 Position of the DIP switch for APC620 system units

## Warning!

The following procedure is only permitted with the power switched off and the supply voltage disconnected!

To get to the DIP switches, it is necessary to open the front cover. To do this, loosen the five Torx screws (T10) marked and pull the cover off towards the front. Then the DIP switches can be accessed at the location marked in yellow. The setting can now be made using a pointed object. If the system has a slide-in drive, it must be removed first to get to the DIP switches.

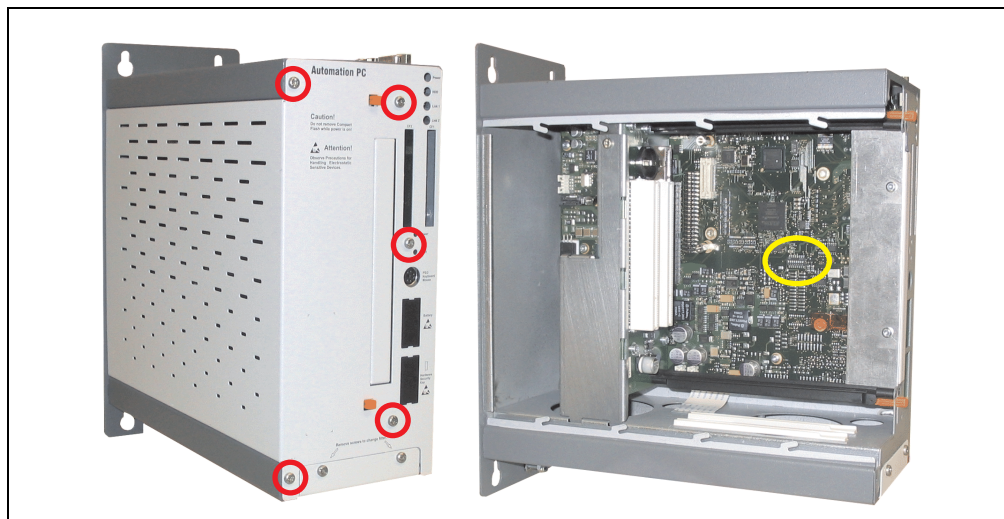


Figure 128: DIP switch position

### 3. Automation PC 620 with MS-DOS

TBD

### 4. Automation PC 620 with Windows XP Pro.

TBD

### 5. Automation PC 620 with Windows 2000

TBD

### 6. Automation PC 620 with Windows XP embedded

TBD



## 7. Automation PC 620 with Windows CE 5.0

TBD



# Chapter 5 • Accessories

## 1. Overview

Model number	Short description	Note
0AC201.9	<b>Lithium batteries (5x)</b> Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0TB103.9	<b>Plug 24V 5.08 3p screw clamps</b> 24 VDC 3-pin connector, female. Screw clamp, 1.5 mm <sup>2</sup> , protected against vibration by the screw flange.	
0TB103.91	<b>Plug 24V 5.08 3p cage clamps</b> 24 VDC 3-pin connector, female. Cage clamps, 2.5 mm <sup>2</sup> , protected against vibration by the screw flange.	
4A0006.00-000	<b>Lithium battery (1x)</b> Lithium battery, 1 piece, 3 V / 950 mAh, button cell	
5A5003.03	<b>Front cover</b> Front cover appropriate for the USB 2.0 Media Drive 5MD900.USB2-00.	
5AC600.ICOV-00	<b>Interface covers</b> Interface covers for APC620 and PPC700 devices; 5 pieces	
5AC900.1000-00	<b>Adapter DVI-A/m to CRT DB15HD/f</b> Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	
5CADVI.0018-00	<b>DVI-D cable 1.8 m / single</b> Cable single DVI-D/m:DVI-D/m 1.8 m	
5CADVI.0050-00	<b>DVI-D cable 5 m / single</b> Cable single DVI-D/m:DVI-D/m 5 m	
5CADVI.0100-00	<b>DVI-D cable 10 m / single</b> Cable single DVI-D/m:DVI-D/m 10 m	
5CASDL.0018-00	<b>SDL cable (1.8 m)</b> Cable SDL DVI-D/m:DVI-D/m 1.8 m	
5CASDL.0050-00	<b>SDL cable (5 m)</b> Cable SDL DVI-D/m:DVI-D/m 5 m	
5CASDL.0100-00	<b>SDL cable (10 m)</b> Cable SDL DVI-D/m:DVI-D/m 10 m	
5CASDL.0150-00	<b>SDL cable (15 m)</b> Cable SDL DVI-D/m:DVI-D/m 15 m	
5CAUSB.0018-00	<b>Cable USB 2.0 A/m:B/m 1.8 m</b> USB 2.0 connection cable; Type A - Type B; 1.8 m	
5CAUSB.0050-00	<b>Cable USB 2.0 A/m:B/m 5 m</b> USB 2.0 connection cable; Type A - Type B; 5 m	
5CFCRD.0032-02	<b>CompactFlash 32 MB True IDE SanDisk/A</b> CompactFlash card with 32 MB Flash PROM, and true IDE/ATA interface.	

Table 165: Model numbers - accessories

Model number	Short description	Note
5CFCRD.0064-02	<b>CompactFlash 64 MB True IDE SanDisk/A</b> CompactFlash card with 64 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0128-02	<b>CompactFlash 128 MB True IDE SanDisk/A</b> CompactFlash card with 128 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0256-02	<b>CompactFlash 256 MB True IDE SanDisk/A</b> CompactFlash card with 256 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0512-02	<b>CompactFlash 512 MB True IDE SanDisk/A</b> CompactFlash card with 512 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.1024-02	<b>CompactFlash 1024 MB True IDE SanDisk/A</b> CompactFlash card with 1024 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.2048-02	<b>CompactFlash 2048 MB True IDE SanDisk/A</b> CompactFlash card with 2048 MB Flash PROM, and true IDE/ATA interface	
5MD900.USB2-00	<b>USB 2.0 drive DVD-ROM/CD-RW FDD CF USB</b> 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.	
5MMUSB.0128-00	<b>USB memory stick 128 MB SanDisk</b> USB 2.0 memory stick 128 MB	
5MMUSB.0256-00	<b>USB memory stick 256 MB SanDisk</b> USB 2.0 memory stick 256 MB	
5MMUSB.0512-00	<b>USB memory stick 512 MB SanDisk</b> USB 2.0 memory stick 512 MB	
9A0014.02	<b>Cable RS232 DB9/f:DB9/m 1.8 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 1.8 m.	
9A0014.05	<b>Cable RS232 DB9/f:DB9/m 5 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 5 m.	
9A0014.10	<b>Cable RS232 DB9/f:DB9/m 10 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 10 m.	

Table 165: Model numbers - accessories

2. Supply voltage connector (TB103 3-pin)

2.1 General information

This single row 3-pin terminal block is mainly used to connect the supply voltage.

2.2 Order data



Model number	Description	Image
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 166: Order data - TB103

2.3 Technical data

Information:

The following defined characteristics, features and limit values are only valid for this accessory and can deviate from the entire device. For the entire device where this accessory is installed, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

Name	0TB103.9	0TB103.91
Number of pins	3	

Table 167: Technical data - TB103

## Accessories • Replacement CMOS batteries

Name	0TB103.9	0TB103.91
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	
Resistance between contacts	$\leq 5 \text{ m}\Omega$	
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	
Connection cross section	0.08 mm <sup>2</sup> - 2.5 mm <sup>2</sup> (AWG 26 - 12)	
Cable type	Only copper wires (no aluminum wires!)	

Table 167: Technical data - TB103 (cont.)

## 3. Replacement CMOS batteries

The lithium battery is needed for buffering the BIOS, the real-time clock, and SRAM data.

Model number and accessory table

### 3.1 Order data


Model number	Description	Image
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 168: Order data - Lithium battery

### 3.2 Technical data

#### Information:

The following defined characteristics, features and limit values are only valid for this accessory and can deviate from the entire device. For the entire device where this accessory is installed, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

Features	0AC201.9	4A0006.00-000
Capacity	950 mAh	

Table 169: Technical data - lithium batteries

Features	0AC201.9	4A0006.00-000
Voltage	3 V	
Self discharge at 23°C	< 1% per year	
Storage time	Max. 3 years at 30° C	
<b>Environment</b>		
Storage temperature	-20 °C to +60 °C	
Humidity	0 to 95 % (non-condensing)	

Table 169: Technical data - lithium batteries (cont.)

## 4. Front cover 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 - see Section 8 "USB Media Drive DVD-ROM/CD-RW FDD CF USB" on page 261) to protect the interface.

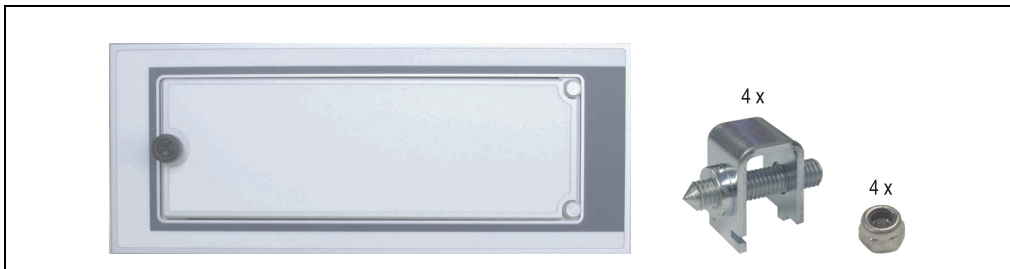


Figure 129: Front cover - 5A5003.03

### 4.1 Technical data

#### Information:

The technical data corresponds to the current status when this manual was printed.  
We reserve the right to make changes.

Features	5A5003.03
Front cover design / colors Dark gray border around the cover Light gray background	Pantone 432CV Pantone 427CV

Table 170: Technical data - 5A5003.03

## 4.2 Dimensions

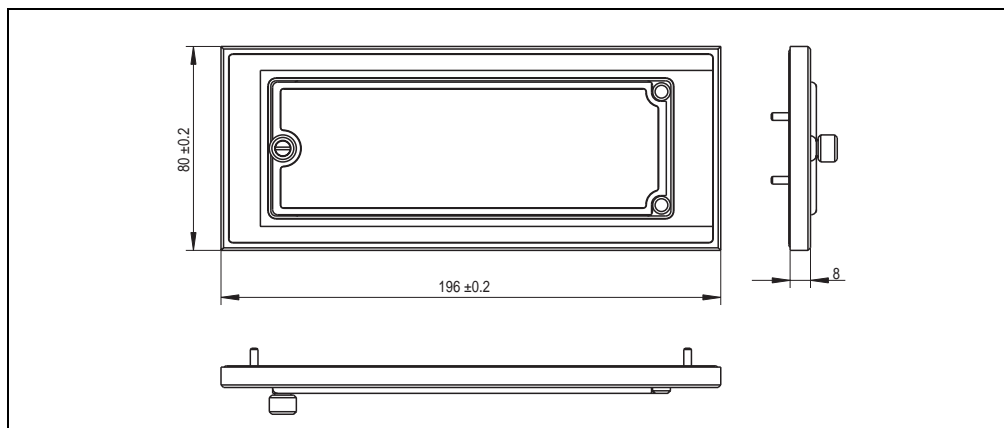


Figure 130: Dimensions - 5A5003.03

## 4.3 Installation

The front cover is attached with 2 mounting rail brackets (included with USB Media Drive) and 4 M3 locknuts. The USB media drive and front cover can be mounted as a whole in (for example) a switching cabinet door.

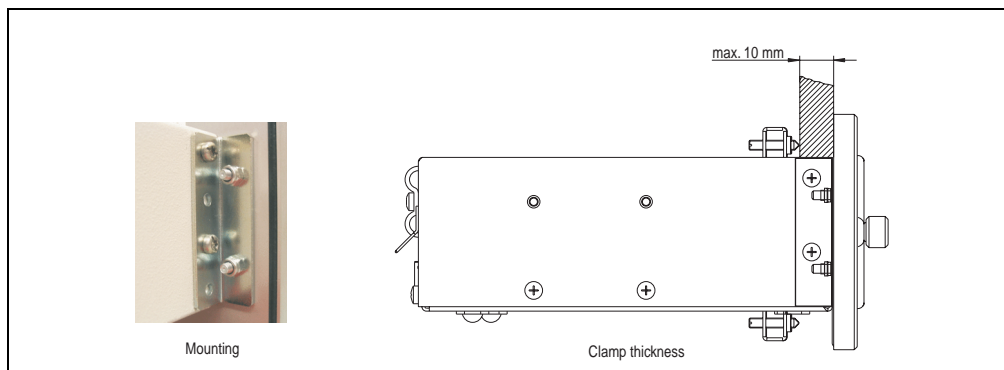


Figure 131: Front cover mounting and installation size



## 5. Interface cover 5AC600.ICOV-00

The interface cover protects interfaces from dirt and dust when not in use.

### 5.1 Order data

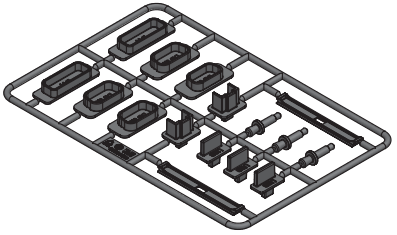
Model number	Description	Image
5AC600.ICOV-00	<b>Interface covers</b> Interface covers for APC620 and PPC700 devices; 5 pieces	

Table 171: Order data - APC620 interface cover

### 5.2 Contents of delivery

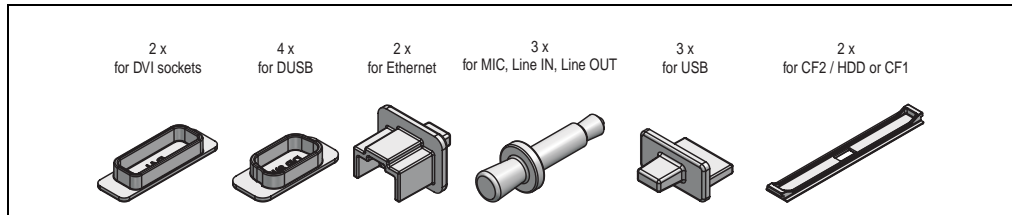


Figure 132: Interface cover - contents of delivery

6. DVI - monitor adapter 5AC900.1000-00

This adapter enables a standard monitor to be connected to the DVI-I interface.

6.1 Order data


Model number	Description	Image
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 172: Order data - DVI - CRT adapter

## 7. CompactFlash cards 5CFCRD.xxxx-02

### 7.1 General information

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

### 7.2 Order data


Model number	Description	Image
5CFCRD.0032-02	CompactFlash 32 MB True IDE SanDisk/A	
5CFCRD.0064-02	CompactFlash 64 MB True IDE SanDisk/A	
5CFCRD.0128-02	CompactFlash 128 MB True IDE SanDisk/A	
5CFCRD.0256-02	CompactFlash 256 MB True IDE SanDisk/A	
5CFCRD.0512-02	CompactFlash 512 MB True IDE SanDisk/A	
5CFCRD.1024-02	CompactFlash 1024 MB True IDE SanDisk/A	
5CFCRD.2048-02	CompactFlash 2048 MB True IDE SanDisk/A	

Table 173: Order data - CompactFlash cards

### 7.3 Technical data

#### Information:

The following defined characteristics, features and limit values are only valid for this accessory and can deviate from the entire device. For the entire device where this accessory is installed, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

Features	5CFCRD.xxxx-02
MTBF (@ 25°C)	> 3,000,000 hours
Maintenance	None
Data reliability	< 1 unrecoverable error in $10^{14}$ bit read accesses < 1 faulty correction in $10^{20}$ bit read accesses
Clear/write procedures	> 2,000,000 times

Table 174: Technical data - CompactFlash cards 5CFCRD.xxxx-02

Mechanics	5CFCRD.xxxx-02
Dimensions	
Length	36.4 ± 0.15 mm
Width	42.8 ± 0.10 mm
Thickness	3.3 mm ± 0.10 mm
Weight	11.4 g
Environment	
Environmental temperature	
Operation	0 °C to +70 °C
Storage	-25 °C to +85 °C
Transport	-25 °C to +85 °C
Humidity	
Operation/Storage	8% to 95%, non-condensing
Vibration	
Operation/Storage	Maximum 30 G (point to point)
Shock	
Operation/Storage	Maximum 3,000 G
Altitude	24,000 meters

Table 174: Technical data - CompactFlash cards 5CFCRD.xxxx-02 (cont.)

## 7.4 Dimensions

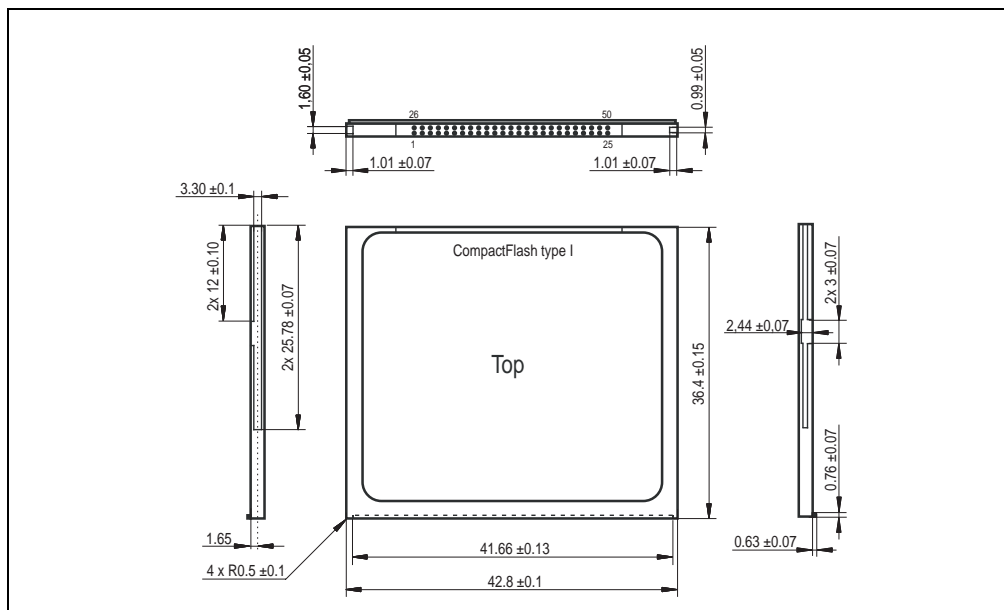


Figure 133: Dimensions - CompactFlash card type I

## 7.5 Calculating the lifespan

SanDisk provides a 6-page "white paper" for the lifespan calculation for CompactFlash cards (see following pages). This document can also be found on the SanDisk homepage.

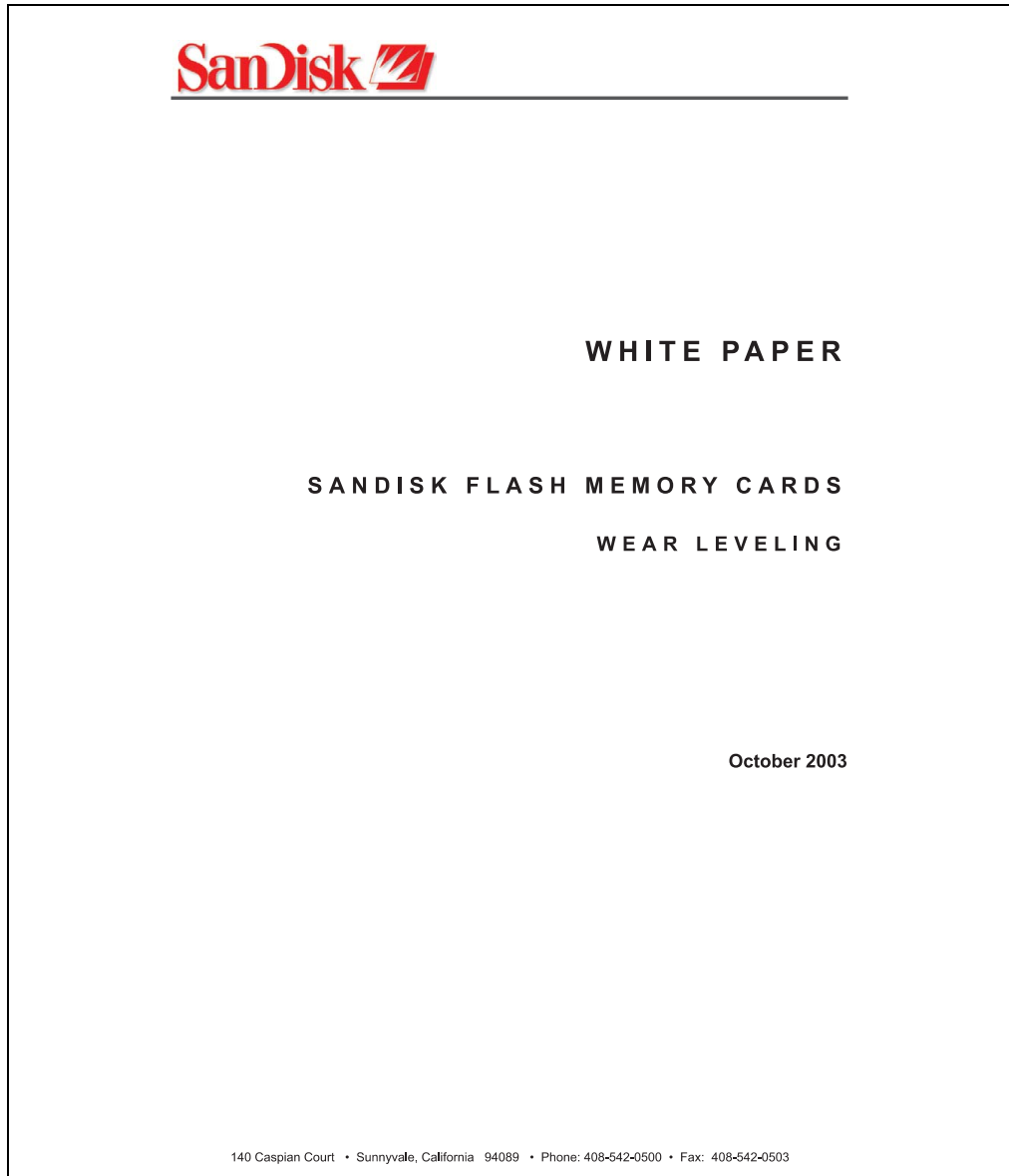


Figure 134: SanDisk white paper - page 1

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*Lit. No. 80-36-00278 10/03 Printed in U.S.A.*

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**SanDisk Corporation**

Doc No. 80-36-00278

SanDisk Flash Memory Cards Wear Leveling

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Figure 135: SanDisk white paper - page 2

## 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.

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SanDisk Flash Memory Cards Wear Leveling

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Figure 136: SanDisk white paper - page 3

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

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Figure 137: SanDisk white paper - page 4



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:

$$lifetime = 2,000,000 \times \frac{(C_{zone} - C_{fixed}) \times \left(1 - k_r \times \frac{32 - N_{cluster}}{32}\right)}{FS_{typ}} \times \frac{1}{f_w}$$

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.

$$lifetime = 2,000,000 \times \frac{4000}{4} \times \frac{1}{1/5 \text{ sec}}$$

$$lifetime = 317 years$$

Figure 138: SanDisk white paper - page 5

**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.

$$lifetime = 2,000,000 \times \frac{4 \times \left(1 - 1 \times \frac{32-8}{32}\right)}{.004} \times \frac{1}{1/5 \text{ sec}}$$

$$lifetime = 79.3 \text{ years}$$

**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](http://www.sandisk.com)

**SanDisk Corporation**

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**SanDisk Corporation**

Figure 139: SanDisk white paper - page 6

## 8. USB Media Drive DVD-ROM/CD-RW FDD CF USB



Figure 140: USB Media Drive

### 8.1 Features

- +24 VDC supply (back side)
- USB/B 2.0 connection (back side)
- 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)
- Optional front cover (model number 5A5003.03 see also Section 4 "Front cover for the USB Media Drive" on page 249)

### Information:

The following defined characteristics, features and limit values are only valid for this accessory and can deviate from the entire device. For the entire device where this accessory is installed, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

## 8.2 Technical data

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 $\pm$ 25%
Features - diskette drive	
Data capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
Data transfer rate	250 kbits (720 KB) or 500 kbits (1.25 MB and 1.44 MB)
Rotation speed	Up to 360 rpm
Diskette media	High density (2HD) or normal density (2DD) 3.5" diskettes
MTBF	30,000 POH (Power-On Hours)
Features DVD-ROM/CD-RW drive	
Write speed CD-R CD-RW	24x, 16x, 10x and 4x 10x and 4x
Reading rate CD DVD	24x 8x
Data transfer rate	max. 33.3 MByte/sec.
Access time (average) CD DVD	85 ms 110 ms
Revolution speed	max. 5,136 rpm $\pm$ 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	Disc at once, session at once, packet write, track at once
Laser class	Class 1 laser
Data buffer capacity	2 MB
Noise level (complete read access)	Approx. 45 dBA at 50 cm
Lifespan Opening/closing the drawer	60,000 POH (Power-On Hours) > 10,000 times
Features - CompactFlash slot	5MD900.USB2-00

Table 175: Technical data - USB Media Drive 5MD900.USB2-00

CompactFlash Type Number Connection	Type I 1 slot IDE / ATAPI
CompactFlash LED	signals read or write access to a CompactFlash card.
Hot Plug capable	Yes
<b>Features - USB connections</b>	
USB A on the front side Power supply	Connection of further peripheral devices Max. 500 mA
USB B back side	connection to the system
<b>Mechanical characteristics</b>	
Outer dimensions (without slide-in) Width Length Height	70 mm 100 mm 9.5 mm
Weight	Approx. 1.1 kg (without front cover)
<b>Environmental characteristics</b>	
Environmental temperature Operation Storage Transport	5 °C .. +45 °C -20 °C .. +60 °C -40 °C .. +60 °C
<b>Environmental characteristics</b>	
Humidity Operation Storage Transport	20 - 80 % non-condensing 5 - 90 % non-condensing 5 - 95 % non-condensing
Vibration Operation Storage Transport	at max. 5 - 500 Hz and 0.3 g at max. 10 - 100 Hz and 2 g at max. 10 - 100 Hz and 2 g
Shock (pulse with a sinus half-wave) Operation Storage (packed) Transport (packed)	at max. 5 g for 11 ms at max. 60 g for 11 ms at max. 60 g for 11 ms
Altitude	Max. 3,000 meters

Table 175: Technical data - USB Media Drive 5MD900.USB2-00 (cont.)

## 8.3 Dimensions

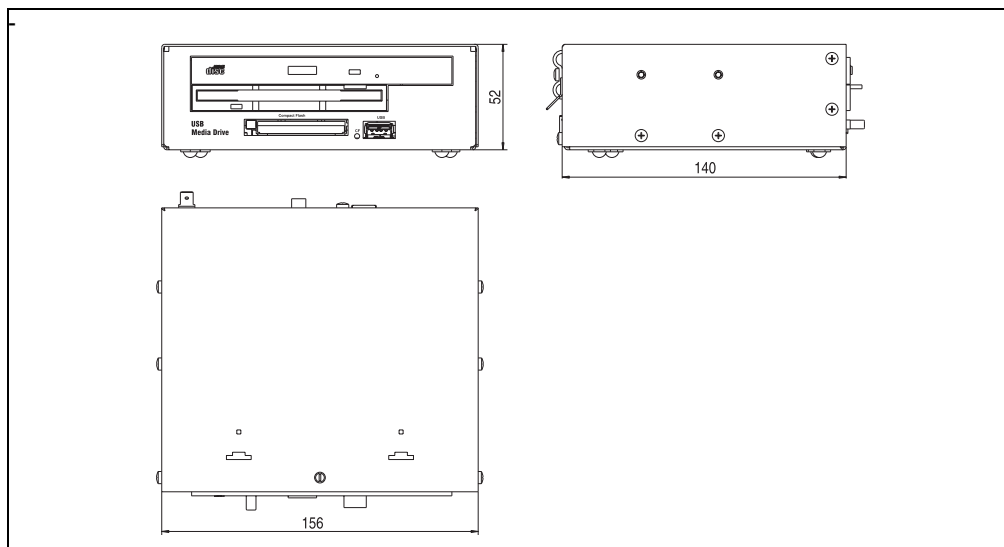


Figure 141: Dimensions - 5MD900.USB2-00

## 8.4 Interfaces

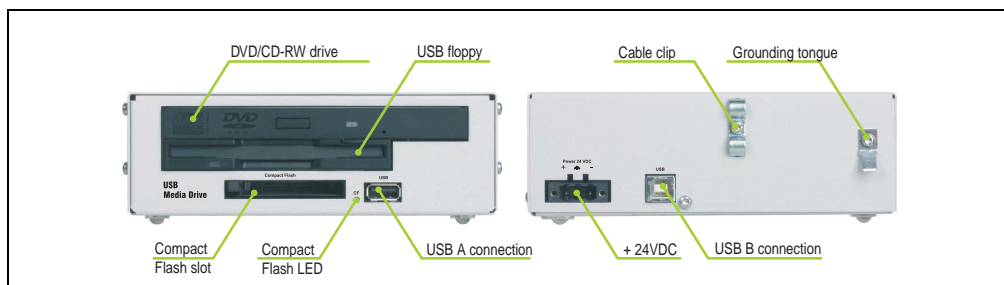


Figure 142: Interfaces - 5MD900.USB2-00

## 8.5 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).

In connection

### 8.5.1 Mounting position

Because of limits to the mounting position 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.

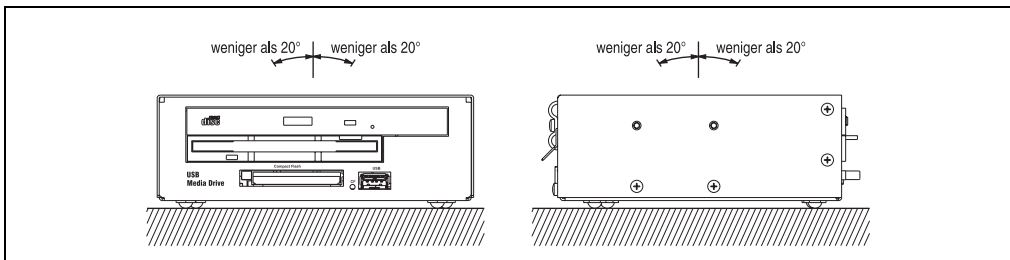


Figure 143: Installation position 5MD900.USB2-00

## 9. USB memory stick

### 9.1 General information

USB memory sticks are easy-to-exchange memory media. Because of the fast data transfer provided by USB 2.0, the USB memory sticks are ideal for use as a portable memory medium. "Hot PLUG & PLAY" - without requiring additional drivers (except with Windows 98SE), the USB memory stick can be converted immediately into an additional drive, in which data can be read from or written to. Only USB memory sticks from the memory specialists [SanDisk](#) are being used.

### 9.2 Order data


Model number	Description	Image
5MMUSB.0128-00	USB memory stick 128 MB SanDisk	
5MMUSB.0256-00	USB memory stick 256 MB SanDisk	
5MMUSB.0512-00	USB memory stick 512 MB SanDisk	

Table 176: Order data - USB memory stick

### 9.3 Technical data

#### Information:

The following defined characteristics, features and limit values are only valid for this accessory and can deviate from the entire device. For the entire device where this accessory is installed, refer to the data given specifically for the entire device.

The technical data corresponds to the current status when this manual was printed. We reserve the right to make changes.

Features	5MMUSB.0xxx-00
LED	1 LED (green), signals data transfer (send and receive)
Power supply Current requirements	via the USB port < 650 $\mu$ A in sleep mode, < 150 mA read/write

Table 177: Technical data - USB memory stick 5MMUSB.0xxx-00



Features	5MMUSB.0xxx-00
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 (@ 25°C)	> 100000 hours
Data preservation	10 years
Maintenance	None
Operating system support	Windows CE 4.1, CE 4.2, 98SE <sup>1)</sup> , ME, 2000, XP Mac OS 9.1 and 10.1.2+
Mechanics	
Dimensions Length Width Thickness	62 mm 19 mm 11 mm
Environment	
Environmental temperature Operation Storage Transport	0 °C to +45 °C -20 °C to +60 °C -20 °C to +60 °C
Humidity Operation Storage Transport	10 % to 90 %, non-condensing 5 % to 90 %, non-condensing 5 % to 90 %, non-condensing
Vibration Operation Storage Transport	2 G (10 to 500 Hz), oscillation rate 1/minute 4 G (10 to 500 Hz), oscillation rate 1/minute 4 G (10 to 500 Hz), oscillation rate 1/minute
Shock Operation Storage Transport	40 G and 11 ms duration (all axes) 80 G and 11 ms duration (all axes) 80 G and 11 ms duration (all axes)
Altitude Operation Storage Transport	3,048 meters 12,192 meters 12,192 meters

Table 177: Technical data - USB memory stick 5MMUSB.0xxx-00 (cont.)

1) For Win 98SE, a driver can be downloaded from the [SanDisk](http://www.sandisk.com) homepage.

## 10. Cable

### 10.1 DVI cable

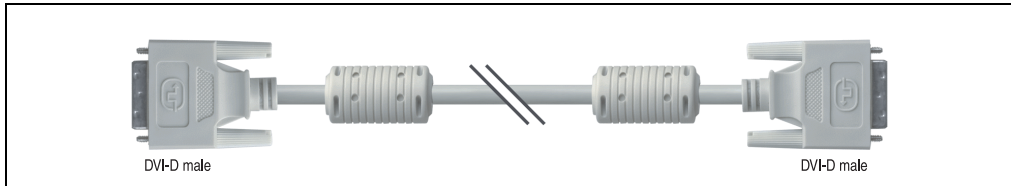


Figure 144: DVI extension cable (similar)

#### 10.1.1 Order data

Model number	Description	Note
5CADVI.0018-00	<b>DVI-D cable 1.8 m / single</b> Cable single DVI-D/m:DVI-D/m 1.8 m	
5CADVI.0050-00	<b>DVI-D cable 5 m / single</b> Cable single DVI-D/m:DVI-D/m 5 m	
5CADVI.0100-00	<b>DVI-D cable 10 m / single</b> Cable single DVI-D/m:DVI-D/m 10 m	

Table 178: Model numbers - DVI cables

#### 10.1.2 Technical data

### Information:

The technical data corresponds to the current status when this manual was printed.  
We reserve the right to make changes.

Features	5CADVI.0018-00	5CADVI.0050-00	5CADVI.0100-00
Length	1.8 m ± 30 mm	5 m ± 50 mm	10 m ± 100 mm
Outer diameter	Max. 8.5 mm		
Shielding	Individual cable pairs and entire cable		
Connector type	2x DVI-D (18+1), male		
Wire cross section	AWG 28		
Wave impedance	Max. 237 Ω/km		
Insulation resistance	Min. 100 MΩ/km		
Mobility	Flexible		
Flex radius	Min. 146 mm		

Table 179: Technical data - DVI cables

### 10.1.3 Cable specifications

The following figure shows the cable 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 assignments.

## 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.**

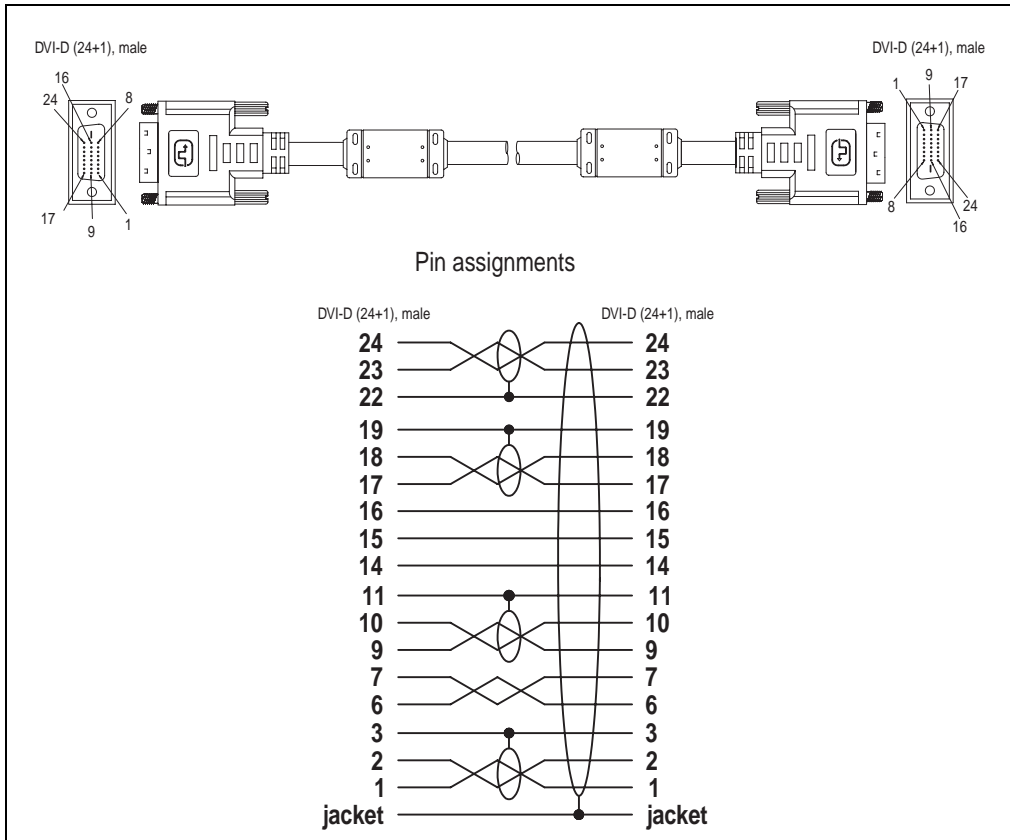


Figure 145: DVI cable assignments

## 10.2 SDL cable

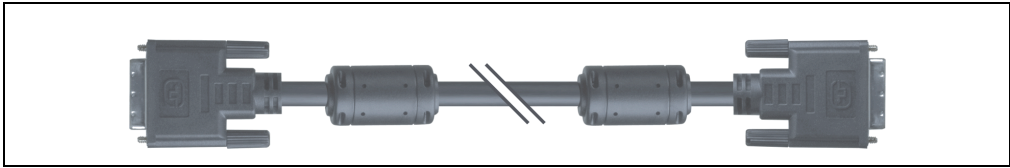


Figure 146: SDL extension cable (similar)

### 10.2.1 Order data

Model number	Description	Note
5CASDL.0018-00	<b>SDL cable (1.8 m)</b> Cable SDL DVI-D/m:DVI-D/m 1.8 m	
5CASDL.0050-00	<b>SDL cable (5 m)</b> Cable SDL DVI-D/m:DVI-D/m 5 m	
5CASDL.0100-00	<b>SDL cable (10 m)</b> Cable SDL DVI-D/m:DVI-D/m 10 m	
5CASDL.0150-00	<b>SDL cable (15 m)</b> Cable SDL DVI-D/m:DVI-D/m 15 m	

Table 180: Model numbers - SDL cables

### 10.2.2 Technical data

#### Information:

The technical data corresponds to the current status when this manual was printed.  
We reserve the right to make changes.

Features	5CASDL.0018-00	5CASDL.0050-00	5CASDL.0100-00	5CASDL.0150-00
Length	1.8 m ± 50 mm	5 m ± 80 mm	10 m ± 100 mm	15 m ± 120 mm
Outer diameter	Max. 9 mm		Max. 11.5 mm	
Shielding	Individual cable pairs and entire cable			
Connector type	2x DVI-D (24+1), male			
Wire cross section	AWG 24			
Wave impedance	Max. 237 Ω/km			
Insulation resistance	Min. 93 MΩ/km			
Mobility	Flexible			
Flex radius	Min. 129 mm		Min. 165 mm	

Table 181: Technical data - SDL cables

### 10.2.3 Cable specifications

The following figure shows the cable 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 assignments.

## 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.**

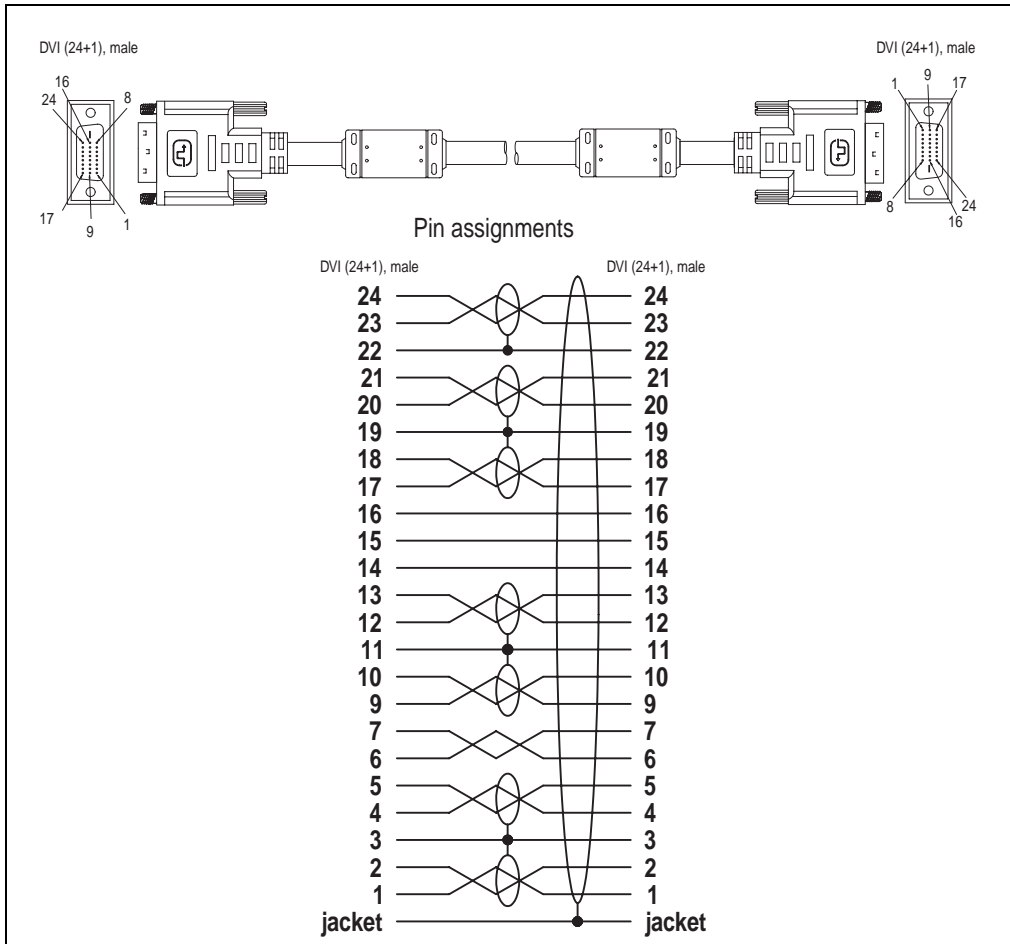


Figure 147: SDL cable assignments

### 10.3 RS232 cable

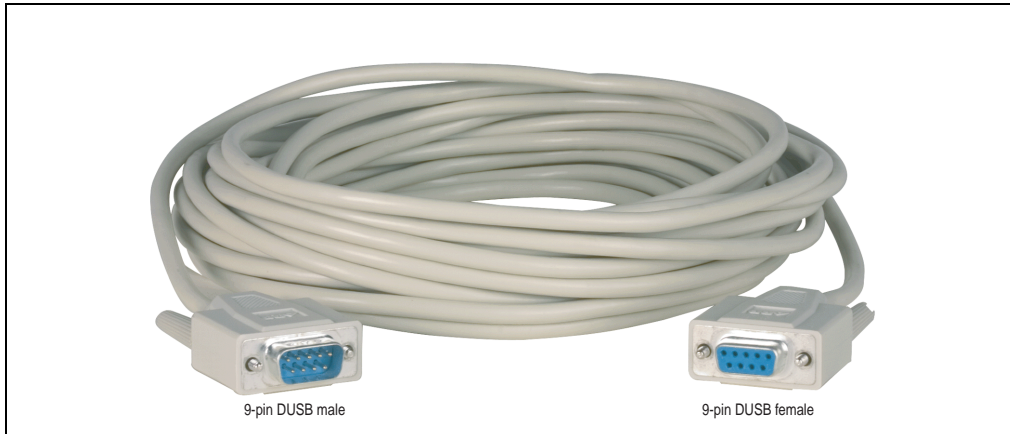


Figure 148: RS232 extension cable (similar)

#### 10.3.1 Order data

Model number	Description	Note
9A0014.02	<b>Cable RS232 DB9/f:DB9/m 1.8 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 1.8 m.	
9A0014.05	<b>Cable RS232 DB9/f:DB9/m 5 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 5 m.	
9A0014.10	<b>Cable RS232 DB9/f:DB9/m 10 m</b> RS232 extension cable for remote operation of a display unit with touch screen, length 10 m.	

Table 182: Model numbers - RS232 cables

#### 10.3.2 Technical data

### Information:

**The technical data corresponds to the current status when this manual was printed.  
We reserve the right to make changes.**

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		

Table 183: Technical data - RS232 cables

Features	9A0014.02	9A0014.05	9A0014.10
Mobility	Flexible		
Flex radius	Min. 70 mm		

Table 183: Technical data - RS232 cables

### 10.3.3 Cable specifications

The following figure shows the cable 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 assignments.

## 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.**

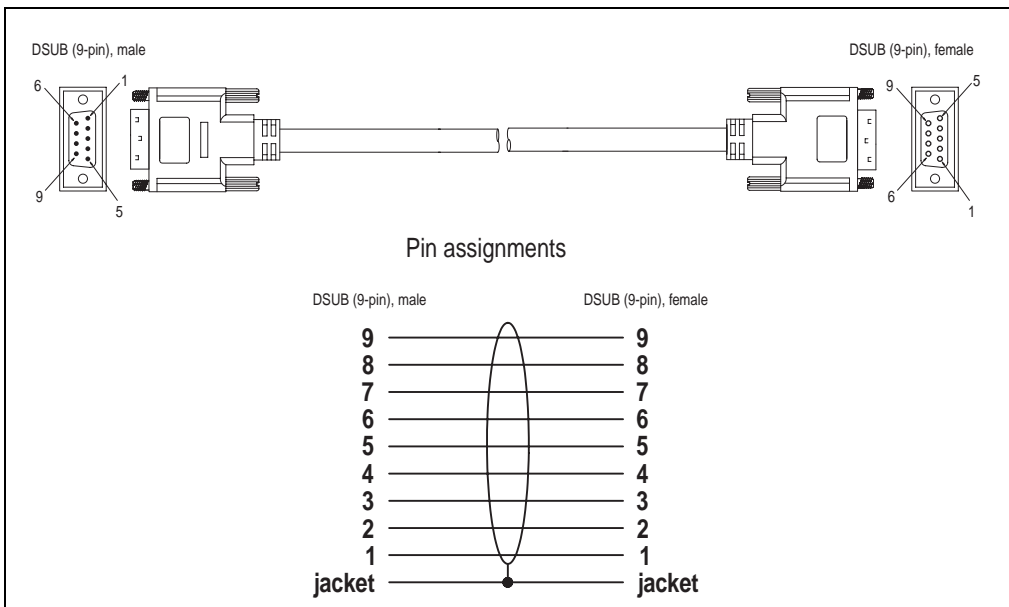


Figure 149: RS232 cable assignments

## 10.4 USB cable

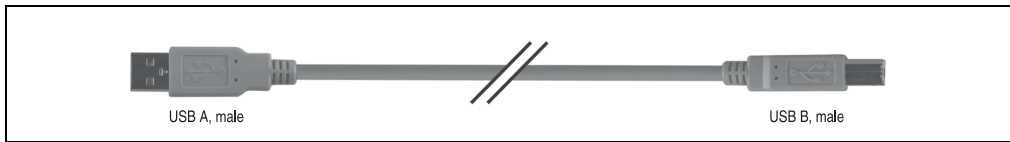


Figure 150: USB extension cable (similar)

### 10.4.1 Order data

Model number	Description	Note
5CAUSB.0018-00	Cable USB 2.0 A/m:B/m 1.8 m USB 2.0 connection cable; Type A - Type B; 1.8 m	
5CAUSB.0050-00	Cable USB 2.0 A/m:B/m 5 m USB 2.0 connection cable; Type A - Type B; 5 m	

Table 184: Model numbers - USB cables

### 10.4.2 Technical data

#### Information:

The technical data corresponds to the current status when this manual was printed.  
We reserve the right to make changes.

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	
Mobility	Flexible	
Flex radius	Min. 100 mm	

Table 185: Technical data - USB cables



### 10.4.3 Cable specifications

The following figure shows the cable 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 assignments.

## 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.**

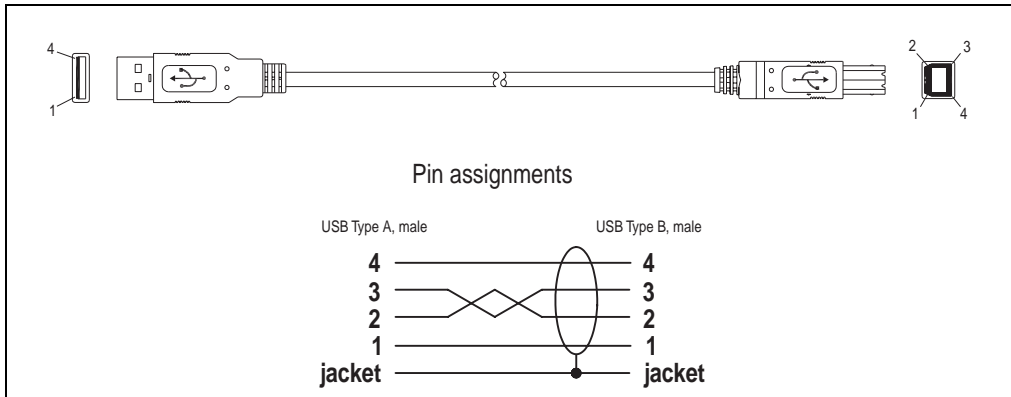


Figure 151: USB cable assignments



## Chapter 6 • 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 guarantees buffering of the internal real-time clock (RTC) as well as individually saved BIOS settings. 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%).

BIOS settings (date, time, etc.) are not buffered during battery change. They must be re-entered afterward.

#### Information:

**The battery should only be changed by qualified personnel.**

#### 1.1 Procedure

- Make note of BIOS settings. If settings have been made that deviate from the BIOS setup defaults, they can be noted in the same table of the profile overview (see section 2.1.10 "Profile overview" from page 171 for CPU boards, or section 2.2.10 "Profile overview" from page 223).
- Disconnect the power supply to the Automation PC 620.
- 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 battery using removal strips.



Figure 152: 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.

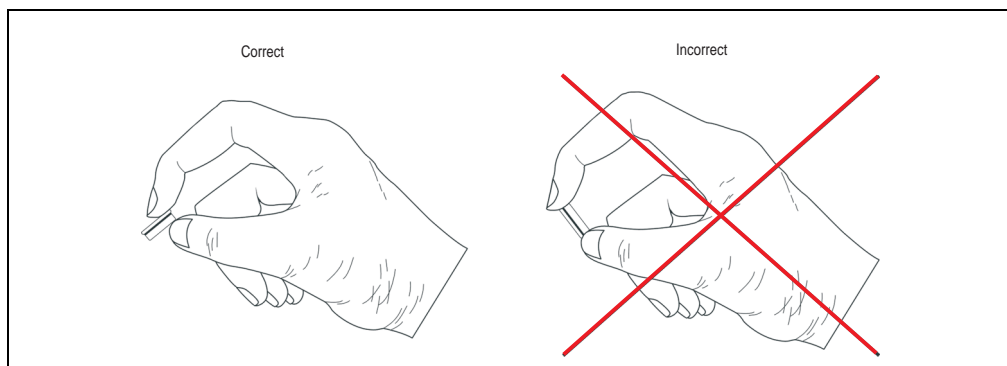


Figure 153: Handling the battery

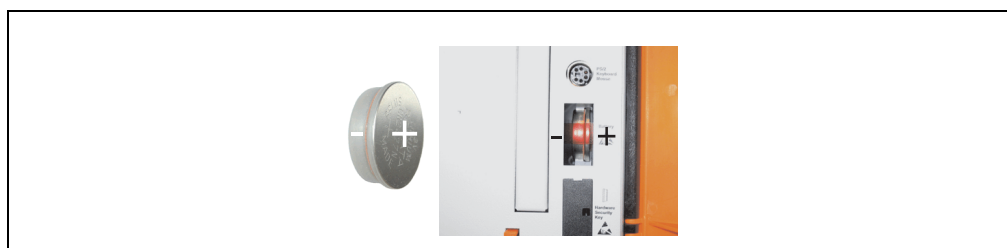


Figure 154: Battery polarity

- To make the next battery change easier, be sure the removal strip is in place when inserting battery.
- Reconnect power supply to the PC 620 (plug in power cable and press power button).
- Re-enter date, time, and other settings in BIOS.

## **Warning!**

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

## 2. Installing and replacing the filter kit

### 2.1 Procedure for APC620 with 1 PCI slot

- Disconnect the power supply to the Automation PC 620.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body
- Open the orange front cover. Behind the cover there are 4 Kombitorx screws (T10) that must be removed.

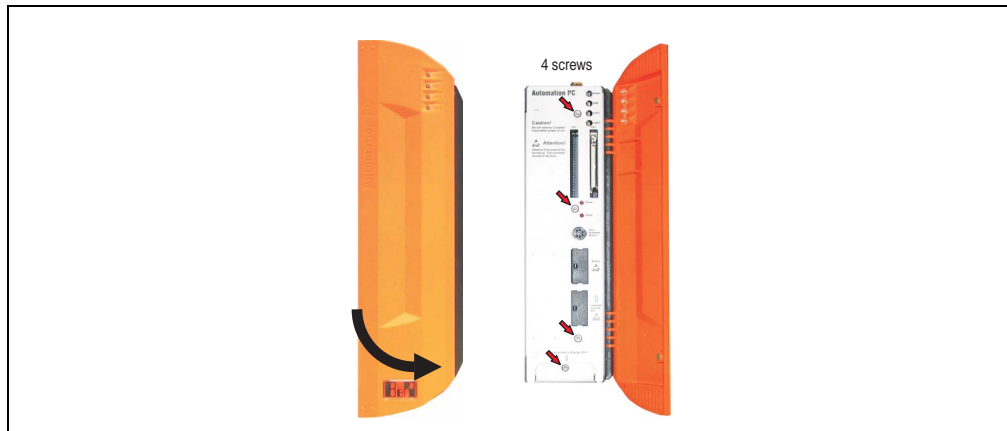


Figure 155: APC620 1PCI slot - remove screws to install/ remove filter kit

- After the screws have been removed, the side cover and the fan kit cover can be removed toward the front.



Figure 156: APC620 1PCI slot - remove side cover and 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.

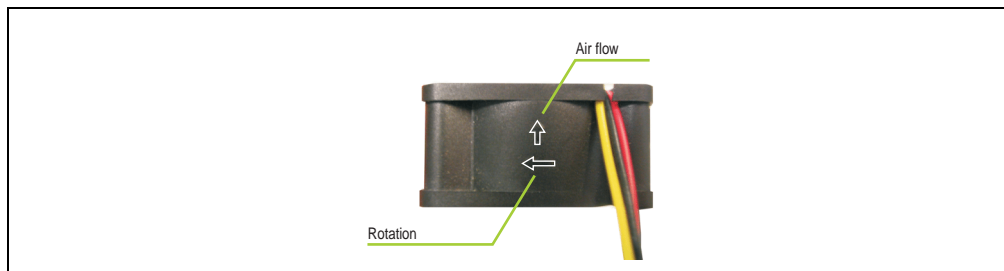


Figure 157: Markings for direction of airflow / fan rotation

## Warning!

**The fans must be inserted so that the air flows toward the inside of the housing.**

- Align fans over the fastening bolts (see arrows). Feed cables through the openings in the housing (see circles) into the main board of the APC620.

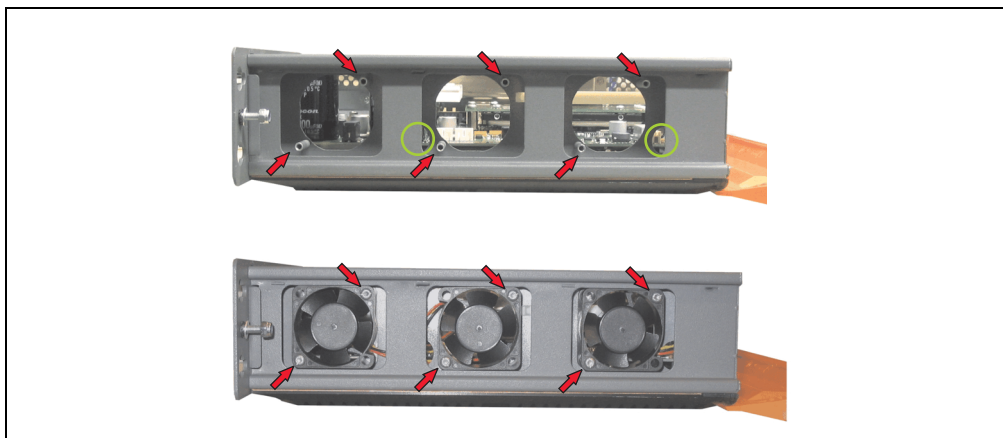


Figure 158: APC620 1PCI slot - fan installation

- Secure fans with the 6 included Kombitorx (T10) screws.

- 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, fan 3 at position 3).

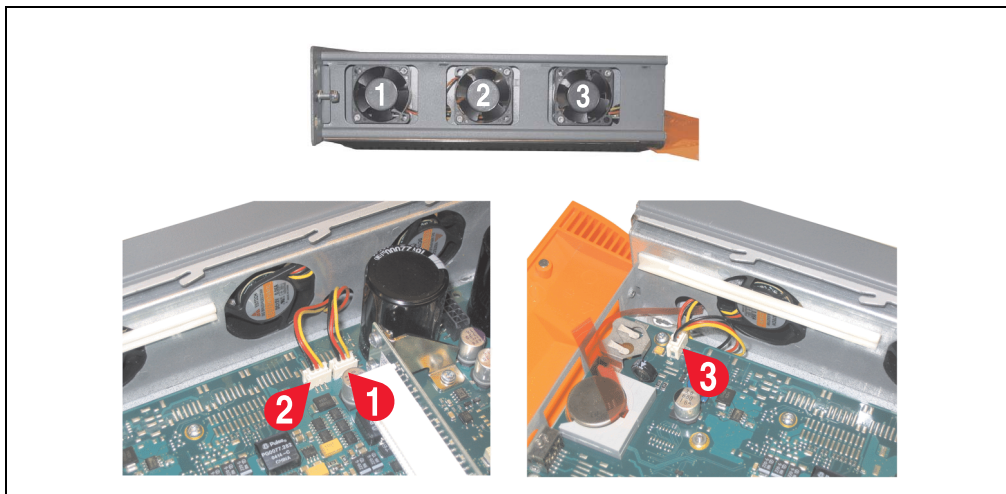


Figure 159: APC620 1PCI slot - fan cable connection to the main board

- If a PCI card was previously in place, it can now be re-inserted.
- Place dust filter in the filter kit cover and replace removed components (filter kit cover, side cover) in reverse order.

## 2.2 Procedure for APC620 with 2 PCI slot

- Disconnect the power supply to the Automation PC 620.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body
- Open the orange front cover. Behind the cover there are 4 Kombitorx screws (T10) that must be removed.



Figure 160: APC620 2PCI slot - remove screws to install/ remove filter kit

- After the screws have been removed, the side cover and the fan kit cover can be removed toward the front.



Figure 161: APC620 2PCI slot - remove side cover and fan kit cover

- If one or more PCI cards are in place, they must be removed before moving on to the next step.



- If slide-in drive is in place, it also 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.

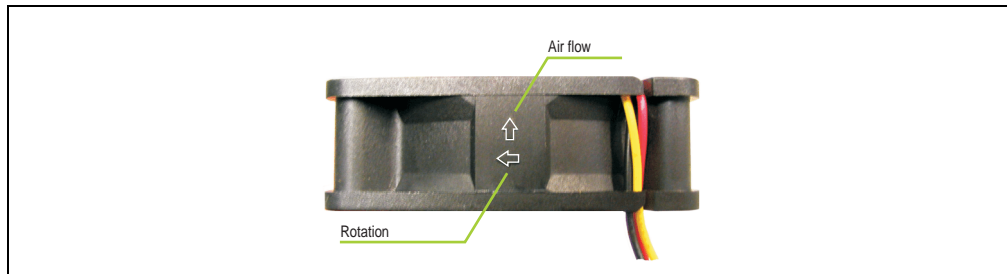


Figure 162: Markings for direction of airflow / fan rotation

## Warning!

**The fans must be inserted so that the air flows toward the inside of the housing.**

- Align fans over the fastening bolts (see arrows). Feed cables through the openings in the housing (see circles) into the main board of the APC620.

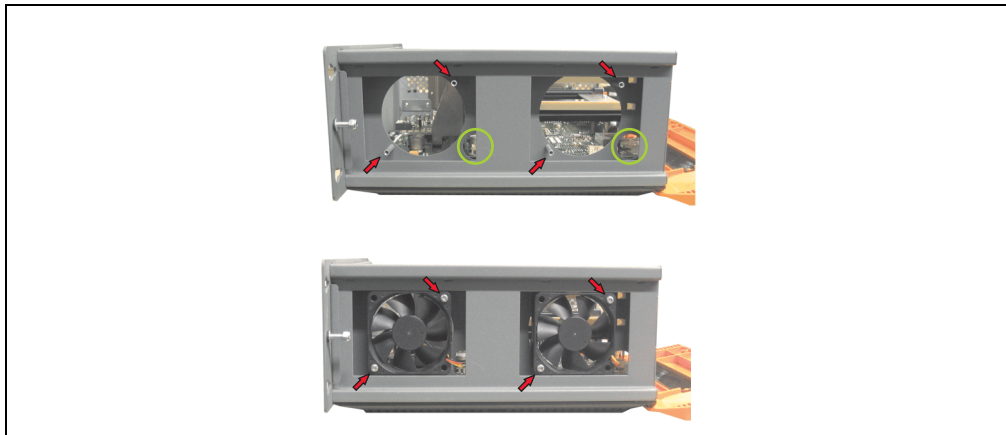


Figure 163: APC620 2PCI slot - fan installation

- Secure fans with the 4 included Kombitorx (T10) screws.

- 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).

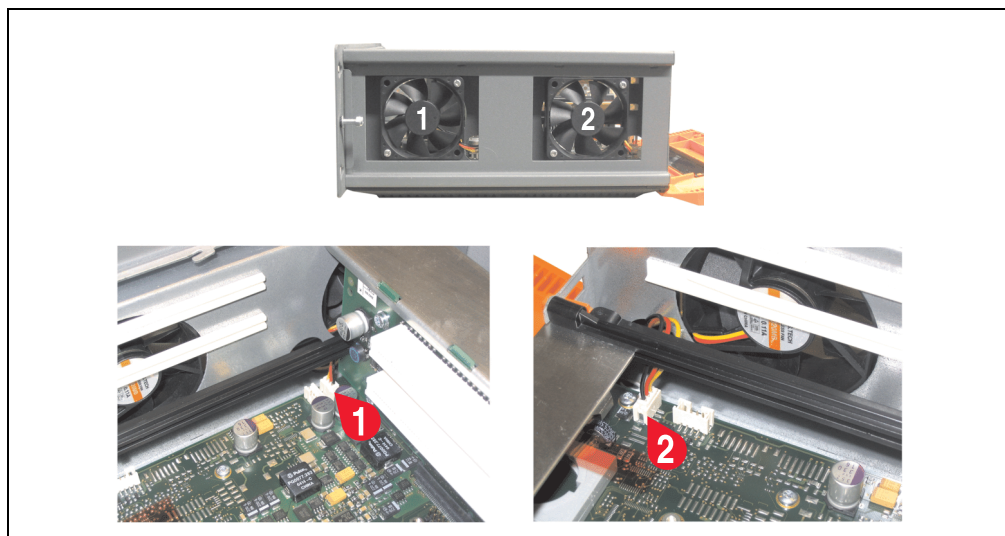


Figure 164: APC620 2PCI slot - fan cable connection to the main board

- If one or more PCI cards were previously in place, they can now be re-inserted.
- If a slide-in drive was previously in place, it too can now be re-inserted.
- Place dust filter in the filter kit cover and replace removed components (filter kit cover, side cover) in reverse order.

## 2.3 Procedure for APC620 with 5 PCI slot

- Disconnect the power supply to the Automation PC 620.
- Touch the housing or ground connection (not the power supply!) in order to discharge any electrostatic charge from your body
- Open the orange front cover. Behind the cover there are 4 Kombitorx screws (T10) that must be removed.

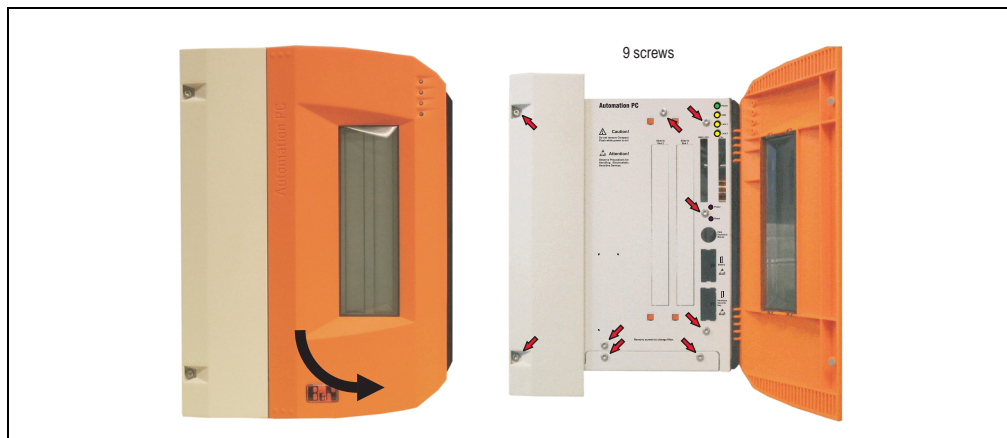


Figure 165: APC620 5PCI slot - remove screws to install/ remove filter kit

- After the screws have been removed, the side cover and the fan kit cover can be removed toward the front.



Figure 166: APC620 5PCI slot - remove side cover and fan kit cover

- If one or more PCI cards are in place, they must be removed before moving on to the next step.
- If slide-in drive is in place, it also must be removed before moving on to the next step.

- Attach the two included cable fasteners in the appropriate holes.

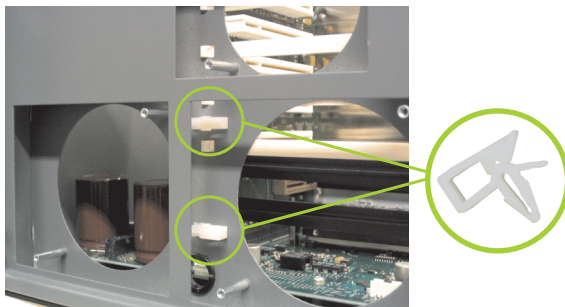


Figure 167: APC620 5PCI attach cable fasteners

- There are two arrows on the fans that indicate the direction of air flow and the direction of fan rotation.

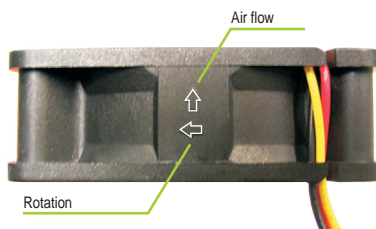


Figure 168: Markings for direction of airflow / fan rotation

## Warning!

The fans must be inserted so that the air flows toward the inside of the housing.

- Align fans over the fastening bolts (see arrows). Feed cables through the openings in the housing (see circles) into the main board of the APC620.  
The fan connector cable for the 40 mm fan should be placed in the cable fastener.

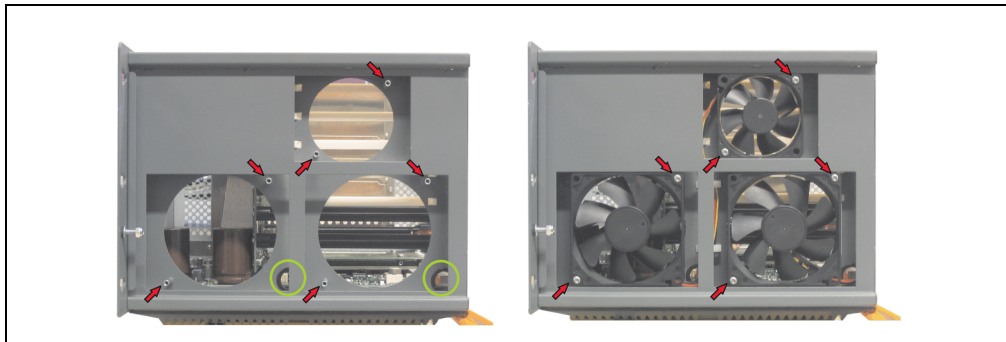


Figure 169: APC620 5PCI slot - fan installation

- Secure fans with the 6 included Kombitorx (T10) screws.

- 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, fan 3 at position 3).

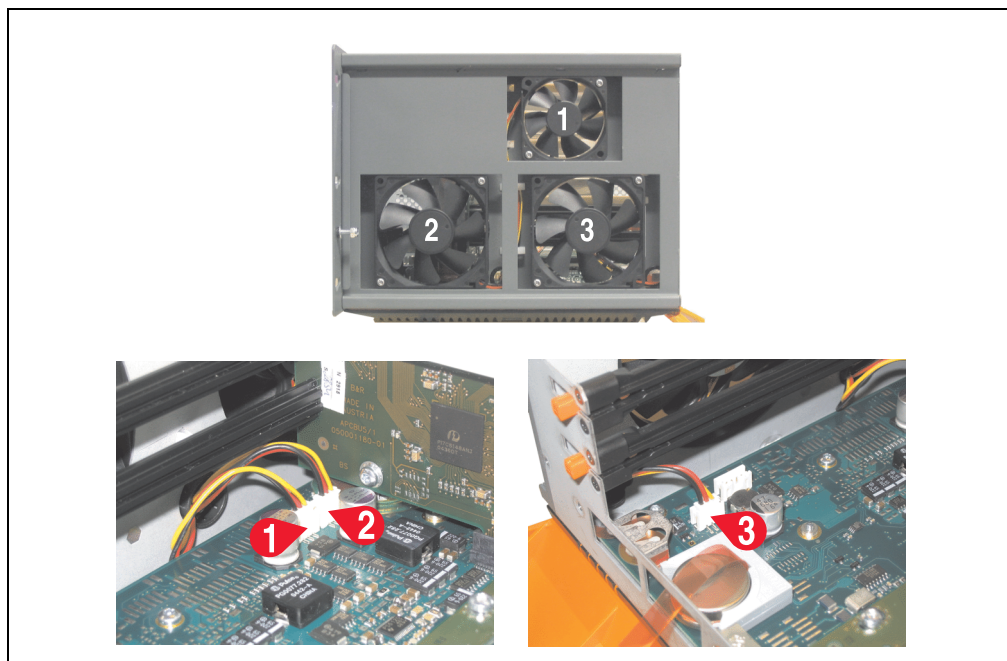


Figure 170: APC620 5PCI slot - fan cable connection to the main board

- If one or more PCI cards were previously in place, they can now be re-inserted.
- If a slide-in drive was previously in place, it too can now be re-inserted.
- Place dust filter in the filter kit cover and replace removed components (filter kit cover, side cover) in reverse order.

## Appendix -A

### 1. Temperature sensor locations

The APC620 has temperature sensors in various places (CPU, power supply, slide-in drive 1, slide-in drive 2, I/O). The temperatures can be read in BIOS (menu item "advanced" - baseboard/panel features - baseboard monitor) or in Microsoft Windows XP/embedded, using B&R Control Center.

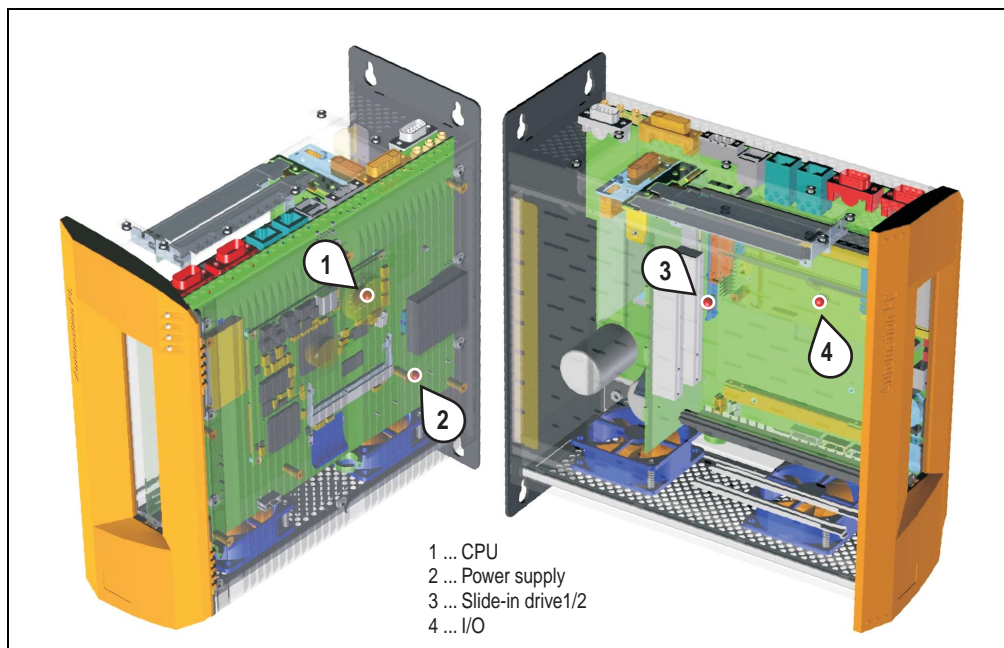


Figure 171: Temperature sensor locations

Range		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 (each slide-in drive has a temperature sensor)
4	I/O	Temperature under an add-on drive

Table 186: Temperature sensor locations

## 2. B&R Key Editor information

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.

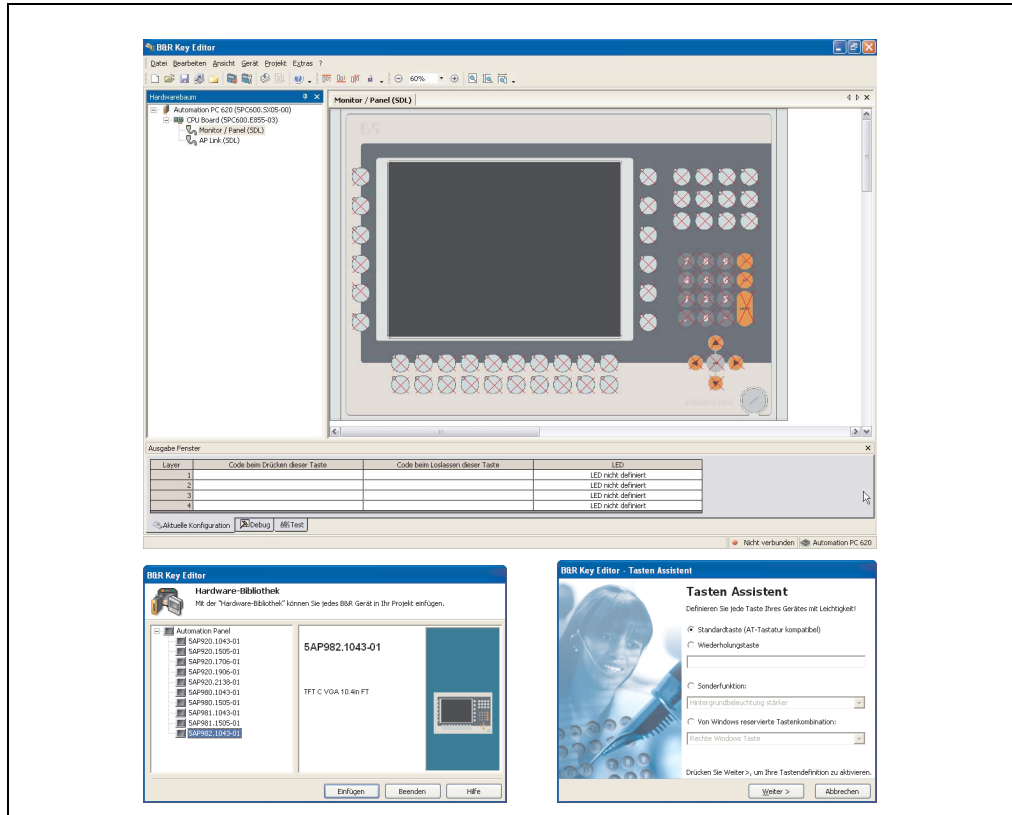


Figure 172: B&R Key Editor screenshots (Version 2.10)

### 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 (setting User LED, brightness, etc.)
- Assign functions to LEDs (HDD access, power, etc.)
- 4 assignments per key possible (using layer function)
- Configuration of panel blocking time when multiple Automation Panel 900 devices are connected to an Automation PC 620 and Panel PC 700.



Supports following systems:

- Automation PC 620
- Panel PC 700
- Provit 2000
- Provit 5000
- Power Panel BIOS devices
- Mobile Panel BIOS devices

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](http://www.br-automation.com)).

### 3. B&R Automation Device Interface (ADI) driver

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 Control Center applet in the control panel.

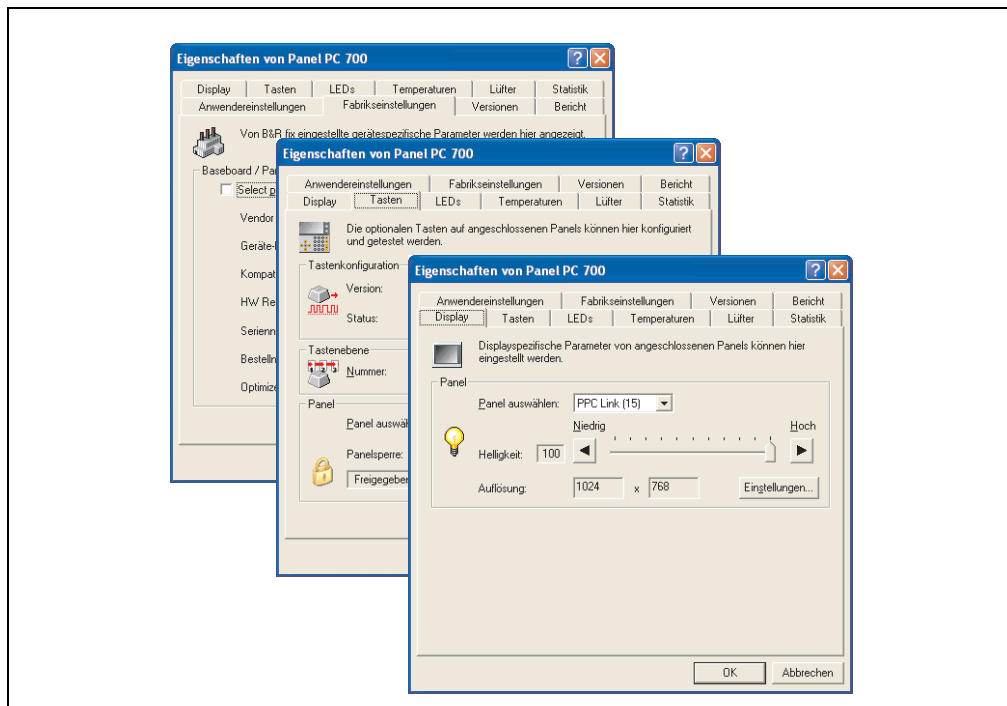


Figure 173: ADI Control Center screenshots (Version 1.20) - example Panel PC 700

#### Features (device dependent)

- Adjusting the display brightness of connected Panels
- Reading device specific keys (in order for this to be possible, a key configuration must be installed that was created with the B&R Key Editor)
- Activation of device specific LEDs on a Mylar 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)

Supports following systems:

System	Operating system	Note
Automation PC 620	Windows XP Professional Windows 2000	Installation using its own setup
	Windows XP Embedded	Content of B&R Windows XP Embedded image
Panel PC 700	Windows XP Professional Windows 2000	Installation using its own setup
	Windows XP Embedded	Content of B&R Windows XP Embedded image
Power 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.
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	-	With Automation PC620 and Panel PC 700

Table 187: System support - ADI driver

A detailed description of the Control Center can be found in the integrated online help.

The B&R Automation Device Interface (ADI) driver (also contains Control Center) can be downloaded for free from the download area on the B&R homepage ([www.br-automation.com](http://www.br-automation.com)).

## 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.

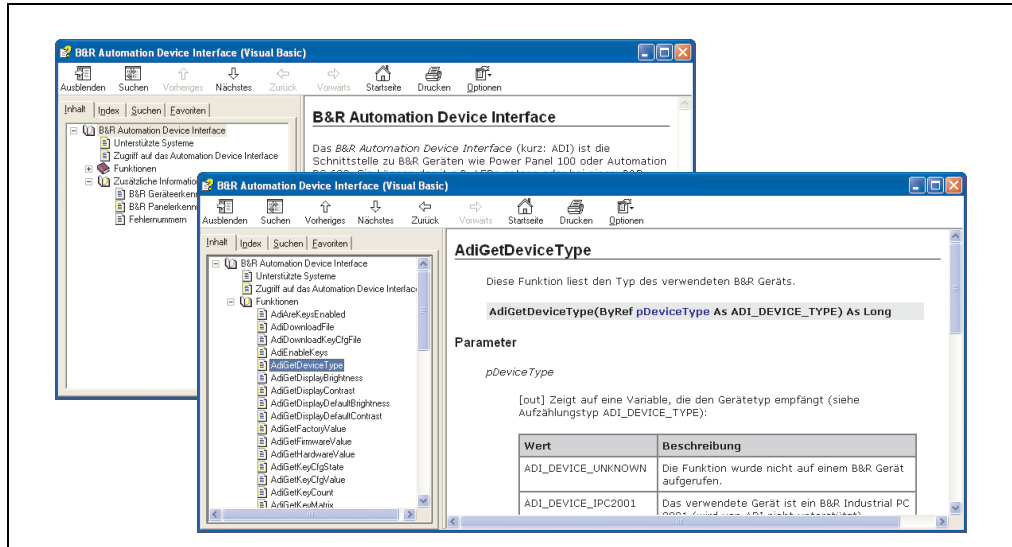


Figure 174: ADI development kit screenshots (Version 1.20)

### 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 620
- Panel PC 700
- Power Panel BIOS devices
- Mobile Panel BIOS devices
- Automation Panel 900

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](http://www.br-automation.com)).

## 5. Connection examples - Automation Panel 900

The following examples provide an overview of the configuration options for connecting APC620 systems with Automation Panel 900 display units. The following questions will be answered:

- How does one connect Automation Panel 900 devices to the monitor / panel output of the APC620, and what needs to be considered?
- How does one connect Automation Panel 900 devices to the AP Link output of the APC620, and what needs to be considered?
- How are Automation Panel 900 devices operated in dual monitor operation?
- How many Automation Panel 900 devices can be connected per line?
- How are the connected Automation Panel 900 devices numbered internally?

### Information:

An RGB monitor / flat-screen can always be connected to the monitor / panel output of the APC620 (DVI-A/m to CRT adapter needed, model number 5AC900.1000-00).

## 5.1 Monitor / Panel connection

### 5.1.1 Automation Panel 900 via DVI

The Automation Panel 900 with an Automation Panel DVI Link insert card can be operated up to a maximum distance of 10 meters from the Automation PC 620. If USB devices are to be operated on the Automation Panel 900, this maximum distance is 5 meters. A separate cable is needed for DVI (video signals), USB and RS232 (touch screen).

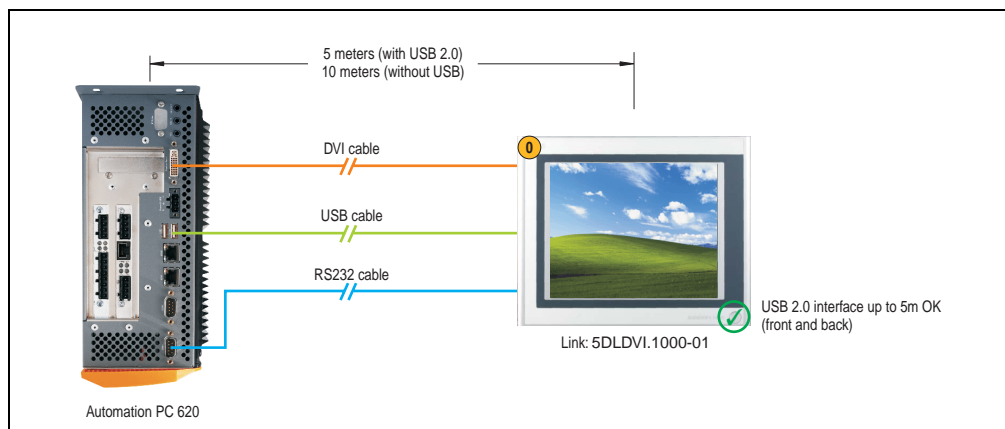


Figure 175: Monitor / Panel connection - Automation Panel 900 via DVI

## Basic system requirements

CPU board	with system unit					Limitation Resolution
	5PC600.SX01-00	5PC600.SX02-00	5PC600.SX02-01	5PC600.SX05-00	5PC600.SX05-01	
5PC600.E815-00	✓	-	✓	-	✓	Max. SXGA
5PC600.E815-02	✓	-	✓	-	✓	Max. SXGA
5PC600.E815-03	✓	-	✓	-	✓	Max. SXGA
5PC600.E855-00	✓	✓	✓	✓	✓	Max. SXGA
5PC600.E855-01	✓	✓	✓	✓	✓	Max. SXGA
5PC600.E855-02	✓	✓	✓	✓	✓	Max. SXGA
5PC600.E855-03	✓	✓	✓	✓	✓	Max. SXGA
5PC600.E855-04	✓	✓	✓	✓	✓	Max. SXGA
5PC600.E855-05	✓	✓	✓	✓	✓	Max. SXGA

Table 188: Possible combinations of the basic system - DVI

## Cable

Model number	Description	Note
5CADVI.0018-00	DVI-D cable (1.8 m)	
5CADVI.0050-00	DVI-D cable (5 m)	
5CADVI.0100-00	DVI-D cable (10 m)	USB not possible
5CAUSB.0018-00	USB 2.0 cable (1.8 m)	
5CAUSB.0050-00	USB 2.0 cable (5 m)	
9A0014.02	RS232 cable (1.8 m)	
9A0014.05	RS232 cable (5 m)	
9A0014.10	RS232 cable (10 m)	USB not possible

Table 189: Possible cables - DVI

## Link modules

Model number	Description	Note
5DLDVI.1000-01	Automation Panel Link DVI Receiver	

Table 190: Possible link modules - DVI

## Automation Panel 900

Model number	Description	Note
5AP920.1043-01	<b>AP920 TFT C VGA 10.4" T</b> Automation Panel AP920; 10.4" VGA color TFT display with touch screen (resistive);	Statistics cannot be read
5AP920.1505-01	<b>AP920 TFT C XGA 15" T</b> Automation Panel AP920; 15" XGA color TFT display with touch screen (resistive);	Statistics cannot be read
5AP920.1706-01	<b>AP920 TFT C SXGA 17" T</b> Automation Panel AP920; 17" SXGA color TFT display with touch screen (resistive);	Statistics cannot be read
5AP920.1906-01	<b>AP920 TFT C SXGA 19" T</b> Automation Panel AP920; 19" SXGA color TFT display with touch screen (resistive);	Statistics cannot be read
5AP920.2138-01	<b>AP920 TFT C UXGA 21.3" T</b> Automation Panel AP920; 21.3" UXGA color TFT display with touch screen (resistive);	Max. SXGA possible Statistics cannot be read

Table 191: Possible Automation Panel 900 - DVI

## BIOS settings

No special BIOS settings are necessary for operation.



## 5.2 Simultaneous operation on monitor / panel and AP Link output

### 5.2.1 Four Automation Panel 900 units via SDL (2 per line)

Two Automation Panel 900 units are connected to the integrated monitor / panel interface via SDL (Short Distance Link). Two additional Automation Panel 900 units are connected on the optional SDL interface (via AP Link). The Automation Panel 900 units in each line must be the same type (same model number). The display content of the two lines is different (dual independent display operation - extended desktop), but both displays in the same line show the same content (dual display clone - daisy chain).

Only one cable is needed for video signals, USB and RS232 (touch screen).

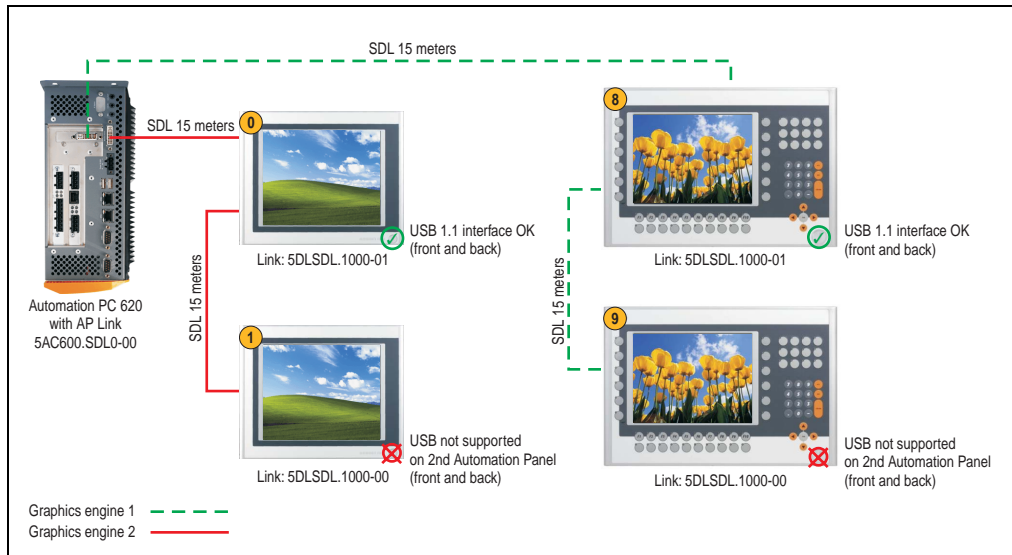


Figure 176: Four Automation Panel 900 units via SDL (2 per line)

### Basic system requirements

CPU board	with system unit					Limitation
	5PC600.SX01-00	5PC600.SX02-00	5PC600.SX02-01	5PC600.SX05-00	5PC600.SX05-01	Resolution
5PC600.E815-00	-	-	-	-	-	-
5PC600.E815-02	-	-	-	-	-	-
5PC600.E815-03	-	-	-	-	-	-

Table 192: Requirements of the basic system - via SDL

CPU board	with system unit					Limitation Resolution
	5PC600.SX01-00	5PC600.SX02-00	5PC600.SX02-01	5PC600.SX05-00	5PC600.SX05-01	
5PC600.E855-00	-	✓	-	✓	-	Max. SXGA on monitor / panel  Max. UXGA (AP Link output)
5PC600.E855-01	-	✓	-	✓	-	
5PC600.E855-02	-	✓	-	✓	-	
5PC600.E855-03	-	✓	-	✓	-	
5PC600.E855-04	-	✓	-	✓	-	
5PC600.E855-05	-	✓	-	✓	-	

Table 192: Requirements of the basic system - via SDL

## Cable

Model number	Description	Note
5CASDL.0018-00	SDL cable (1.8 m)	
5CASDL.0050-00	SDL cable (5 m)	
5CASDL.0100-00	SDL cable (10 m)	
5CASDL.0150-00	SDL cable (15 m)	

Table 193: Possible cables - SDL

## Link modules

Model number	Description	Note
5DLSL.1000-00	Automation Panel Link SDL Receiver	
5DLSL.1000-01	Automation Panel Link SDL transceiver	
5AC600.SDL0-00	AP Link SDL transmitter	

Table 194: Possible link modules - SDL

## Automation Panel 900

Any Automation Panel 900 device can be used.

## BIOS settings

The BIOS option "Primary graphics engine" (under Advanced - Advanced chipset / Graphics control) determines which graphics engine line (1 or 2) should be activated when the APC620 is booted (until the Intel Windows driver is initialized).

Depending on the operation mode of Automation Panel 900 display units with a touch screen (extended desktop or dual display clone), the serial interfaces COM C and COM D must be activated in BIOS (BIOS default setting = deactivated).

## Windows graphics driver settings

For operation modes "extended desktop" and "dual display clone", the Intel Extreme graphics chip driver must be installed. This can be found in the download area (Service - Product Related Downloads - BIOS / Drivers / Updates) on the B&R homepage ([www.br-automation.com](http://www.br-automation.com)).

The graphics driver for the APC620 / Panel PC CPU board 855GME is needed.

### Information:

The following screenshots and descriptions refer to the graphics driver version 14.13 for 855GME CPU boards. Therefore, it is possible that the screenshots and descriptions might not correspond with the installed driver version.

After the driver is installed, it can be configured in the Control Panel (called up through the icon in the taskbar or Start - Control Panel - Display - Settings - Advanced).

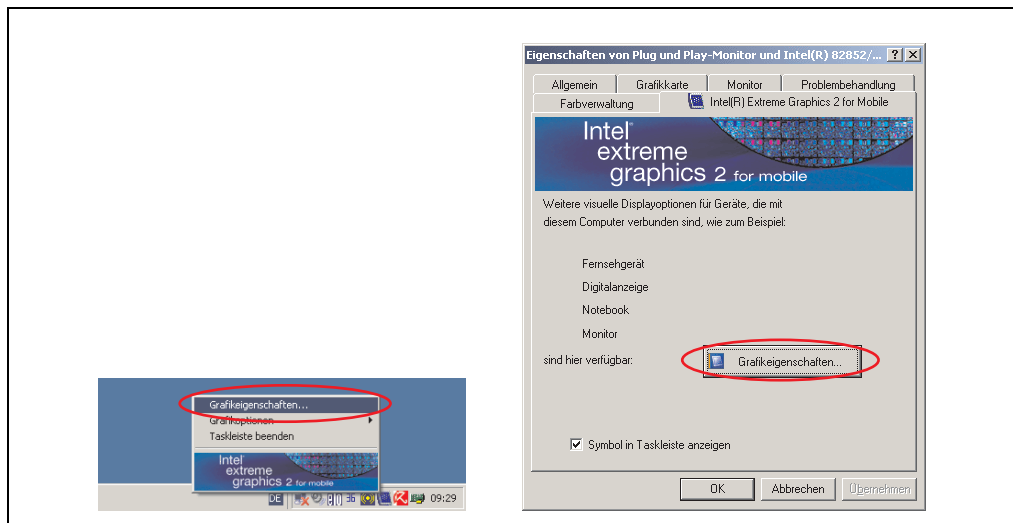


Figure 177: Accessing the graphics driver via Control Panel

## Extended desktop

Under the "Extended desktop" settings, "Notebook" can be set as the primary device (Graphics Engine 1) and "Digital display" as secondary device (Graphics Engine 2).

Driver settings		Effect on APC620	
Primary device	Notebook	AP Link output	Graphics engine 1
Secondary device	Digital display	Monitor / Panel	Graphics engine 2
Primary device	Digital display	Monitor / Panel	Graphics engine 2
Secondary device	Notebook	AP Link output	Graphics engine 1

Table 195: Relationship between driver settings and graphics engine

Resolution and color depth can be configured separately for each line via the display settings for notebook and digital display.



Figure 178: Extended desktop settings - primary and secondary device

Due to the operation of two different lines, for each line one of the internal serial interfaces COM C and COM D on the APC620 must be activated in BIOS (under Advanced - Baseboard/Panel Features - Legacy Devices) for the Automation 900 devices' touch screens.

## Dual display clone

In "Dual display clone" mode, the same content is displayed on every connected Automation Panel 900 unit on both lines (Graphics Engine 2 and Graphics Engine 2). This enables operation of the application from every display.

Driver settings		Effect on APC620	
Primary device	Notebook	AP Link output	Graphics engine 1
Secondary device	Digital display	Monitor / Panel	Graphics engine 2
Primary device	Digital display	Monitor / Panel	Graphics engine 2
Secondary device	Notebook	AP Link output	Graphics engine 1

Table 196: Relationship between driver settings and graphics engine

Resolution and color depth can only be set on the line designated as the primary device.

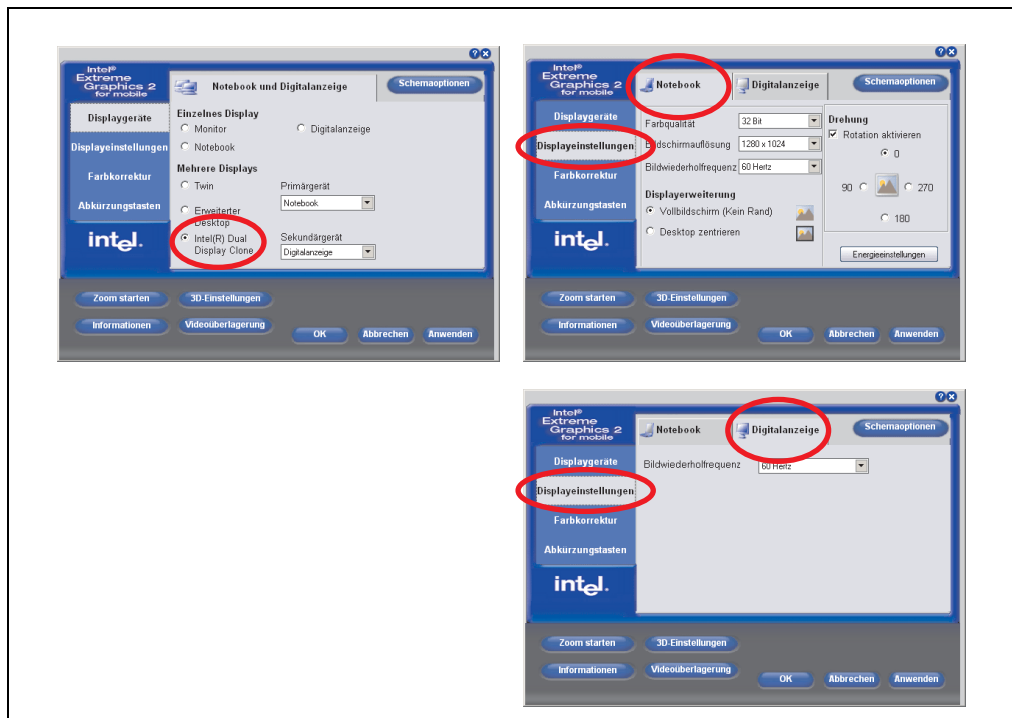


Figure 179: Dual display clone settings - primary and secondary device

The internal serial interface COM C on the APC620 must be activated in BIOS (under Advanced - Baseboard/Panel Features - Legacy Devices) for the Automation 900 devices' touch screens.

A panel locking time can be set in the B&R Control Center to prevent simultaneous operation of the Automation Panel 900 (see the .chm help file for the B&R Control Center).

## Information:

- The panel locking time is only active when the B&R Control Center is open (when no KCF (Key Configuration File) with panel locking time has been transferred).
- IF a KCF with a set panel locking time is transferred to the APC620, it is active even when the B&R Control Center is closed.

### Settings - Windows touch driver

For operation modes "extended desktop" and "dual display clone", the Elo touch screen driver must be installed. This can be found in the download area (Service - Product Related Downloads - BIOS / Drivers / Updates) on the B&R homepage ([www.br-automation.com](http://www.br-automation.com)).

### Extended desktop

## Information:

- Activate COM C and COM D in BIOS.
- During installation the panel locking time must be set to 0 ms ("Auto detect" of the driver could only recognize 1 touch screen).
- Executing setup
- The Automation Panel 900 unit's touch screen is connected with the APC620 serially, so the serial touch screen drivers must be installed.

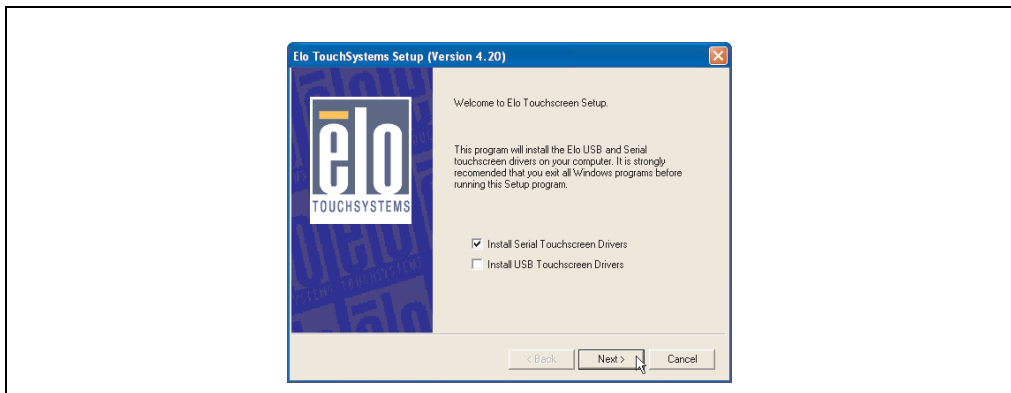


Figure 180: Touch screen driver - serial touch screen

- The driver's auto-detect function sends data packets to every existing serial interface. It then returns a list of all the ports on which an Elo touch screen is connected. The panel locking time must be set to 0 ms (auto-detect only found 1 touch screen)

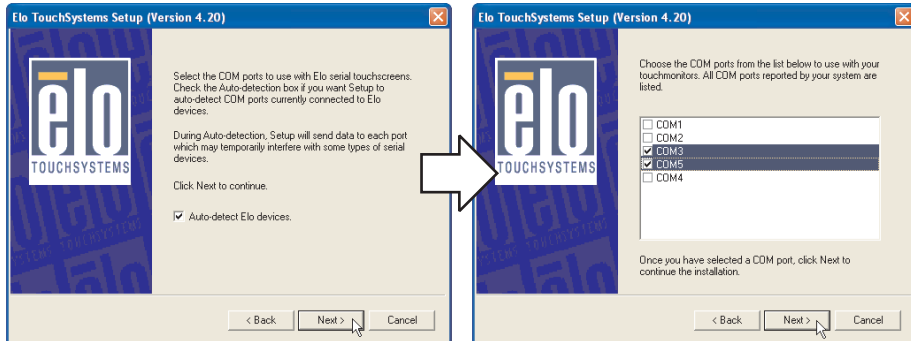


Figure 181: Touch screen driver - auto-detect

- After selecting the COM ports on which Elo touch screens are connected, the system must be rebooted.
- After restarting, each line of touch screens must be calibrated separately. This is done in the menus "Properties 1" and "Properties 2" with the "Align" button. When one touch screen is being calibrated, the others are automatically locked.

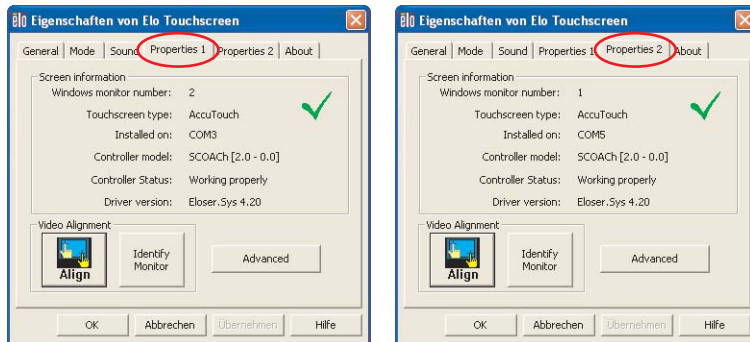


Figure 182: Touch screen calibration

[Dual display clone](#)**Information:**

- Activate COM C in BIOS.
- During installation the panel locking time must be set to 0 ms ("Auto detect" of the driver could only recognize 1 touch screen).
- Executing setup
- The Automation Panel 900 unit's touch screen is connected with the APC620 serially, so the serial touch screen drivers must be installed.

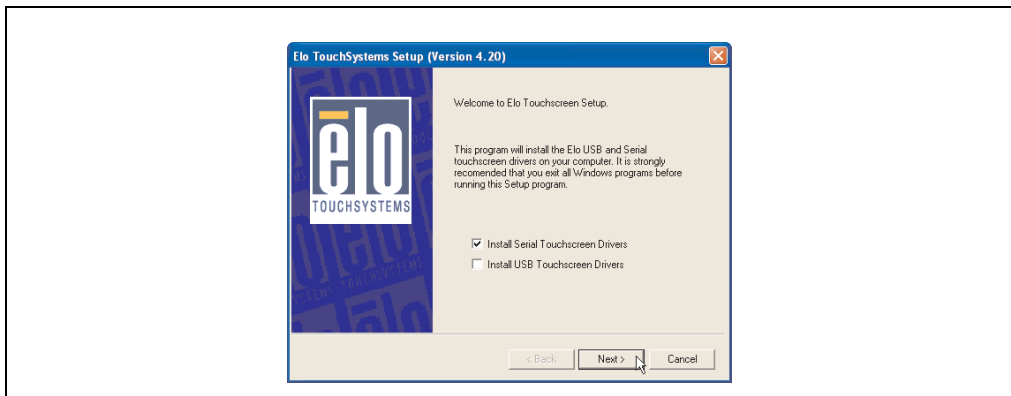


Figure 183: Touch screen driver - serial touch screen

- The driver's auto-detect function sends data packets to every existing serial interface. It then returns a list of all the ports on which an Elo touch screen is connected. The panel locking time must be set to 0 ms (auto-detect only found 1 touch screen)

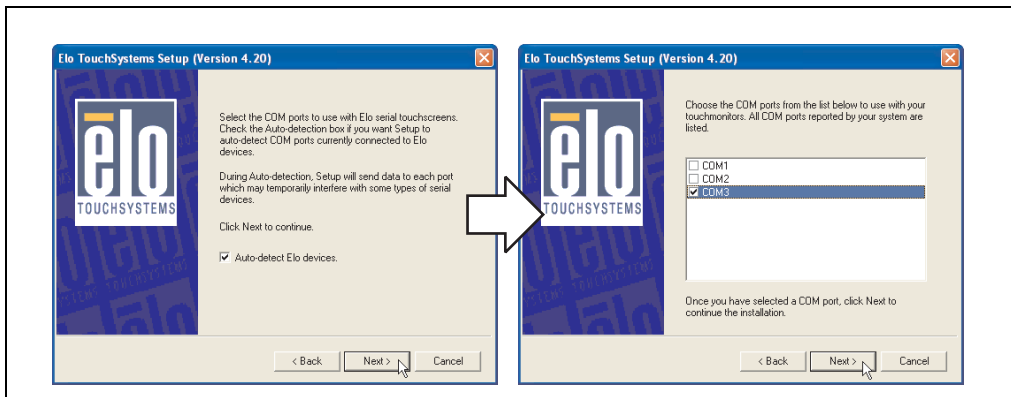


Figure 184: Touch screen driver - auto-detect



- After selecting the COM ports on which Elo touch screens are connected, the system must be rebooted.
- After restarting, only one touch screen must be calibrated. These settings are then applied to other touch screens.



Figure 185: Touch screen calibration



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