Automation PC 620

User's Manual

Version:	**1.3 (February 2005)**
Model No.:	**-**

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Automation PC 620 User's Manual V 1.3

Chapter 1 • General Information

1. Manual History

Version	Date	Comment
1.0	July 21, 2004	Changes / New Features - First version
1.1	November 12, 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	November 12, 2004	Changes / New Features - Pictures of the interface from the previous page have been updated. - General descriptions of device interfaces have been revised. - New CPU boards and system units added. - USB Mediadevice and appropriate front cover added.
1.3	December 27, 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 221 added. - APC620 Interface Cover 5AC600.ICOV-00 added (see section "Interface Cover 5AC600.ICOV-00", on page 204). - 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.

Table 1: Manual History

2. Safety Guidelines

2.1 Introduction

Programmable logic controllers (PLCs, etc.), operating and monitoring devices (industrial PCs, Power Panels, MobilePanels, 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 without the implementation of exceptionally stringent safety precautions could lead to death, injury, serious physical damage or loss of any other kind. Such risks and hazards include in particular 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.

Both when using programmable logic controllers and when using operating and monitoring devices as control systems in conjunction with a Soft PLC (e.g. B&R Automation Runtime or comparable products) or a Slot PLC (e.g. B&R LS251 or comparable products), the safety precautions applying to industrial control systems (e.g. the provision of safety devices such as emergency stop circuits, etc.) in accordance with applicable national and international regulations must be observed. 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 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 before installation and commissioning and must be observed.

2.2 Intended Use

Electronic devices are generally not fail-safe. 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, such as motors, are made safe.

2.3 Transport and Storage

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

2.4 Mounting

- The installation must take place according to the documentation using suitable equipment and tools.

- The devices are only allowed to 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 Coming into Contact with 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 touch 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 connected to protective ground (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.

3. Safety Notices

The safety notices in this manual are organized as follows:

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

Table 2: Safety guidelines

4. Guidelines

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

5. Model Numbers

5.1 System Units

Model Number	Short description	Note
5PC600.SX01-00	**System 1 PCI** 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.SX02-01	**System 2 PCI 1 Disk Drive Slot** 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.SX02-00	**System 2 PCI 1 Disk Drive Slot, 1 Link Slot** 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.	In preparation
5PC600.SX05-01	**System 5 PCI 2 Disk Drive Slots** 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.	
5PC600.SX05-00	**System 5 PCI 2 Disk Drive Slots, 1 Link Slot** 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.	In preparation

Table 3: Model numbers for system units

5.2 CPU Boards 815E

Model Number	Short description	Note
5PC600.E815-00	**CPU Board 815E C3-400** CPU Board Intel Celeron 3, 400 MHz, 100 MHz FSB, 256 kB L2 Cache, Chipset 815E, 1 socket for SO-DIMM SDRAM module.	
5PC600.E815-02	**CPU Board 815E C3-733** CPU Board Intel Celeron 3, 733 MHz, 133 MHz FSB, 256 kB L2 Cache, Chipset 815E, 1 socket for SO-DIMM SDRAM module.	
5PC600.E815-03	**CPU Board 815E C3-1000** CPU Board Intel Celeron 3, 1000 MHz, 133 MHz FSB, 256 kB L2 Cache, Chipset 815E, 1 socket for SO-DIMM SDRAM module.	

Table 4: Model numbers for CPU boards 815E

Chapter 1
General Information

5.3 CPU Boards 855GME

Model Number	Short description	Note
5PC600.E855-00	**CPU Board 855GME PM-1100** CPU Board Intel Pentium M, 1100 MHz, 400 MHz FSB, 1 MB L2 Cache; Chipset 855GME, 1 socket for SO-DIMM DDR RAM module.	
5PC600.E855-01	**CPU Board 855GME PM-1600** CPU Board Intel Pentium M, 1600 MHz, 400 MHz FSB, 1 MB L2 Cache; Chipset 855GME, 1 socket for SO-DIMM DDR RAM module.	In preparation
5PC600.E855-02	**CPU Board 855GME PM-1400** CPU Board Intel Pentium M, 1400 MHz, 400 MHz FSB, 2 MB L2 Cache; Chipset 855GME; 1 socket for SO-DIMM DDR RAM module.	
5PC600.E855-04	**CPU Board 855GME CM-600** CPU Board Intel Celeron M, 600 MHz, 400 MHz FSB, 512 kB L2 Cache; Chipset 855GME, 1 socket for SO-DIMM DDR module.	

Table 5: Model numbers for CPU boards 855GME

5.4 Heat Sink

Model Number	Short description	Note
5AC600.HS01-00	**Heat Sink 815E** For APC620 system units with Intel 815E CPU board (5PC600.E815-00, 5PC600.E815-02 and 5PC600.E815-03)	
5AC600.HS01-01	**Heat Sink 855GME** For APC620 System units with Intel 855GME CPU Board (5PC600.E855-00, 5PC600.E855-02, 5PC600.E855-03 and 5PC600.E855-04)	
5AC600.HS01-02	**Heat Sink 855GME** For APC620 System units with Intel 855GME CPU Board (5PC600.E855-00, 5PC600.E855-01, 5PC600.E855-03 and 5PC600.E855-04)	In preparation

Table 6: Model numbers for heat sinks

5.5 Main Memory

Model Number	Short description	Note
5MMSDR.0128-01	**SO-DIMM SDRAM 128 MB PC133** SO-DIMM SDRAM 128 MB PC133 for 815E CPU Boards.	
5MMSDR.0256-01	**SO-DIMM SDRAM 256 MB PC133** SO-DIMM SDRAM 256 MB PC133 for 815E CPU Boards.	
5MMSDR.0512-01	**SO-DIMM SDRAM 512 MB PC133** SO-DIMM SDRAM 512 MB PC133 for 815E CPU Boards.	
5MMDDR.0256-00	**SO-DIMM DDR-SDRAM 256 MB PC2700** SO-DIMM DDR-SDRAM 256 MB PC2700 for 855GME CPU Boards.	
5MMDDR.0512-00	**SO-DIMM DDR-SDRAM 512 MB PC2700** SO-DIMM DDR-SDRAM 512 MB PC2700 for 855GME CPU Boards.	
5MMDDR.1024-00	**SO-DIMM DDR-SDRAM 1024 MB PC2700** SO-DIMM DDR-SDRAM 1024 MB PC2700 for 855GME CPU Boards.	

Table 7: Main memory model numbers

5.6 Drives

Model Number	Short description	Note
5AC600.HDDI-00	**Add-on Hard Disk 30 GB 24/7** 30 GB Hard disk (Add-on); Ideal for 24 hour operation. For installation in an APC620 or PPC700.	
5AC600.HDDI-01	**Add-on Hard Disk 20 GB ET** 20 GB Hard disk (Add-on); with expanded temperature range. For installation in an APC620 or PPC700.	
5AC600.CFSI-00	**Add-on Compact Flash slot** Compact Flash Slot (Add-On); For installation in an APC620 oder PPC700.	
5AC600.CDXS-00	**Slide-in CD-ROM** CD-ROM Drive (Slide-In); For operation in a Slide-In drive in an APC620 or PPC700 System.	
5AC600.DVDS-00	**Slide-in DVD-ROM/CD-RW** CD-ROM Drive (Slide-In); For operation in a Slide-In drive in an APC620 or PPC700 System.	
5AC600.FDDS-00	**Slide-in USB FDD** CD-ROM Drive (Slide-In); For operation in a Slide-In drive in an APC620 or PPC700 System.	
5AC600.HDDS-00	**Slide-in Hard Disk 30 GB 24x7** 30 GB Hard disk (Slide-In); Ideal for 24 hour operation. For use in a Slide-In drive in an APC620 or PPC700 system.	
5AC600.HDDS-01	**Slide-In Hard Disk 20 GB ET** 20 GB Harddisk (Slide-In); with expanded temperature range. For use in a Slide-In drive in an APC620 or PPC700 system.	

Table 8: Model numbers for drives

5.7 Interface options

Model Number	Short description	Note
5AC600.CANI-00	**Add-on CAN Interface**	In preparation
5AC600.485I-00	**Add-on RS232/422/485 Interface**	In preparation

Table 9: Model numbers for interfaces

5.8 Fan Kit

Model Number	Short description	Note
5PC600.FA01-00	**Fan Kit 1PCI** APC620 fan kit, for system units with 1 PCI slot.	
5PC600.FA02-00	**Fan Kit 2PCI** APC620 fan kit, for system units with 2 PCI slots.	
5PC600.FA05-00	**Fan Kit 5PCI** APC620 fan kit, for system units with 2 PCI slots.	In preparation

Table 10: Model numbers for fan kits

5.9 Accessories

Model Number	Short description	Note
0AC201.9	**Lithium Batteries (5x)** Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0TB103.9	**Plug 24V 5.08 3p screw clamps** 24 VDC 3-pin connector, female. Screw clamp, 1.5 mm², protected against vibration by the screw flange.	
0TB103.91	**Plug 24V 5.08 3p cage clamps** 24 VDC 3-pin connector, female. Cage clamps, 2.5 mm², protected against vibration by the screw flange.	
4A0006.00-000	**Lithium Battery (1x)** Lithium battery, 1 piece, 3 V / 950 mAh, button cell	
5A5003.03	**Front cover** Front cover appropriate for the USB 2.0 Media Drive 5MD900.USB2-00.	
5AC600.ICOV-00	APC620 interface covers; 5 pieces	In preparation
5AC900.1000-00	**Adapter DVI-A/m zu CRT DB15HD/f** Adapter DVI (connector) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	
5CFCRD.0032-02	**Compact Flash 32 MB TrueIDE SanDisk/A** Compact Flash card with 32 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0064-02	**Compact Flash 64 MB TrueIDE SanDisk/A** Compact Flash card with 64 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0128-02	**Compact Flash 128 MB TrueIDE SanDisk/A** Compact Flash card with 128 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0256-02	**Compact Flash 256 MB TrueIDE SanDisk/A** Compact Flash card with 256 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0512-02	**Compact Flash 512 MB TrueIDE SanDisk/A** Compact Flash card with 512 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.1024-02	**Compact Flash 1024 MB TrueIDE SanDisk/A** Compact Flash card with 1024 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.2048-02	**Compact Flash 2048 MB TrueIDE SanDisk/A** Compact Flash card with 2048 MB Flash PROM, and true IDE/ATA interface	
5MD900.USB2-00	**USB 2.0 Drive DVD-ROM/CD-RW FDD CF USB** USB 2.0 drive combination, consists of DVD-ROM/CD-RW, FDD, Compact Flash slot (type II), USB connection (type A front, type B back); 24 V DC.	
5MMUSB.0128-00	**USB memory stick 128 MB SanDisk** USB 2.0 Memory Stick 128 MB	
5MMUSB.0256-00	**USB memory stick 256 MB SanDisk** USB 2.0 Memory Stick 256 MB	
5MMUSB.0512-00	**USB memory stick 512 MB SanDisk** USB 2.0 Memory Stick 512 MB	

Table 11: Model numbers for accessories

5.10 Software

Model Number	Short description	Note
9S0000.01-010	**OEM MS-DOS 6.22 German (Disk)** OEM MS-DOS 6.22 German disks Only delivered with a new PC.	
9S0000.01-020	**OEM MS-DOS 6.22 English (Disk)** OEM MS-DOS 6.22 English disks Only delivered with a new PC.	
9S0000.08-010	**OEM Microsoft Windows XP Professional** CD, German; Only delivered with a new PC.	
9S0000.08-020	**OEM Microsoft Windows XP Professional** CD, English; Only delivered with a new PC.	
9S0000.09-090	**OEM Microsoft Windows XP Professional Multilanguage** CDs; Only delivered with a new PC.	
9S0001.19-020	**OEM Microsoft Windows XP embedded APC620 815E w/CF, English** 512 MB Compact Flash with Windows XP embedded Image for APC620 Systems with a 815E CPU board. Only delivered with a new PC.	
9S0001.20-020	**OEM Microsoft Windows XP embedded APC620 855GME w/CF, English** 512 MB Compact Flash with Windows XP embedded Image for APC620 Systems with a 855GME CPU board. Only delivered with a new PC.	

Table 12: Software model numbers

Chapter 2 • Technical Data

1. Introduction

Figure 1: Automation PC 620 system overview

1.1 Features

- Processors up to Pentium M 1.6 GHz
- Compact Flash 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[1]
- BIOS (Phoenix)
- Real-time clock (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 Construction

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)
- Drive (Mass memory such as Compact Flash card or hard disk) for the operating system
- Software

---

1) Dependant on the device configuration and the environmental temperature.

---

2. Device

2.1 APC620, 1 PCI Slot Variant

2.1.1 Interfaces
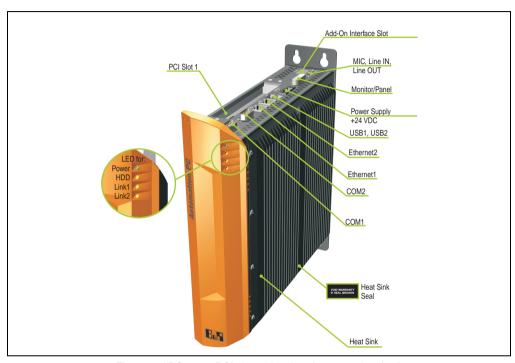
Figure 2: APC620, 1 PCI slot variant interface overview (top)

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.

Surface temperatures of the heat sink may reach 70 °C during operation.
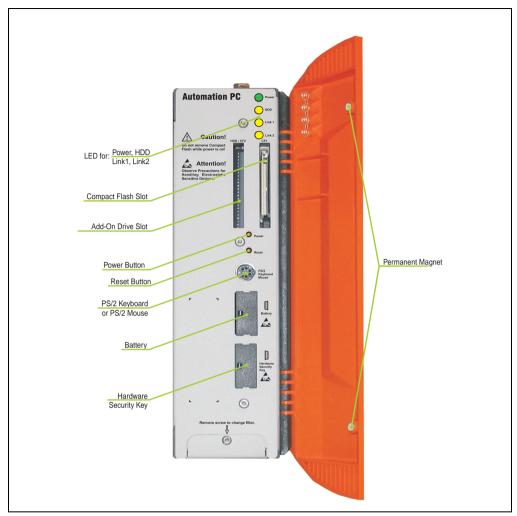
Figure 3: APC620, 1 PCI slot variant interface overview (front)

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

Information:

Measurement "A" is dependant on the APC620 heat sink being used!

APC620 Heat Sink Model Number	Spec. in mm
5AC600.HS01-00	12.8
5AC600.HS01-01	12.8
5AC600.HS01-02	30
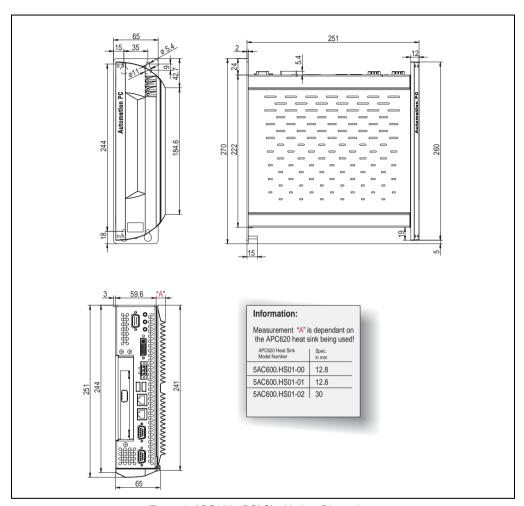
Figure 4: APC620 1PCI Slot Variant Dimensions

2.2 APC620, 2 PCI Slot Variant

2.2.1 Interfaces
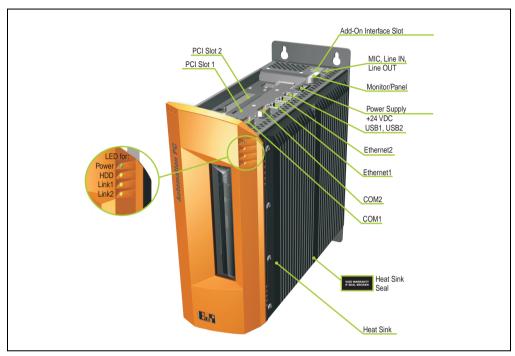
Figure 5: APC620, 2 PCI slot variant interface overview (top)

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.

Surface temperatures of the heat sink may reach 70 °C during operation.
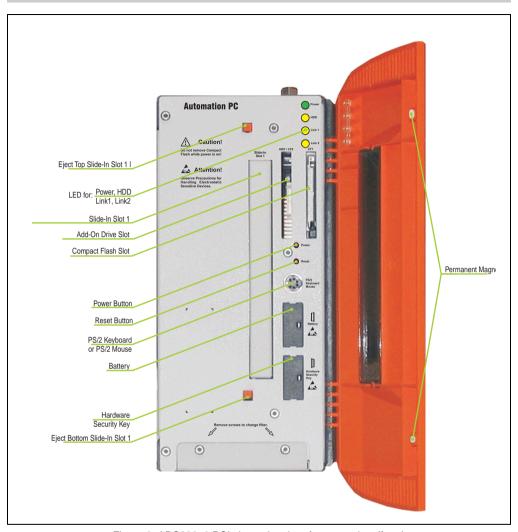
Figure 6: APC620, 2 PCI slot variant interface overview (front)

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
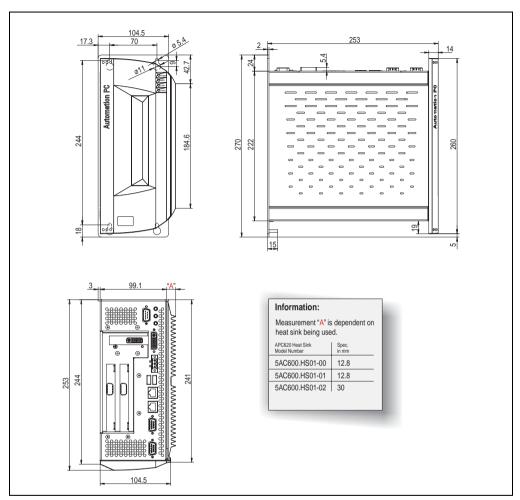
Figure 7: APC620, 2 PCI slot variant dimensions

Information:

Measurement "A" is dependent on heat sink being used.

APC620 Heat Sink Model Number	Spec. in mm
5AC600.HS01-00	12.8
5AC600.HS01-01	12.8
5AC600.HS01-02	30

2.3 APC620, 5 PCI Slot Variant

2.3.1 Interfaces

Figure 8: 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.

Surface temperatures of the heat sink may reach 70 °C during operation.
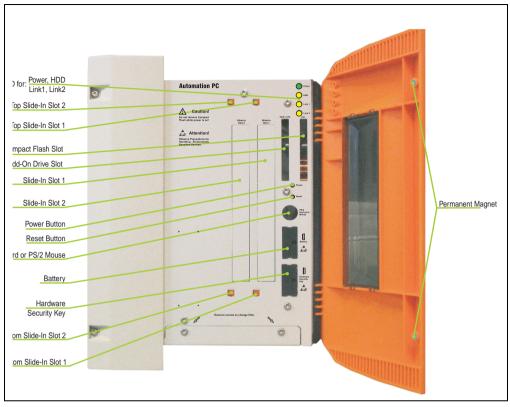
Figure 9: APC620, 5 PCI slot variant interface overview (front)

Information:

The front doors are 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
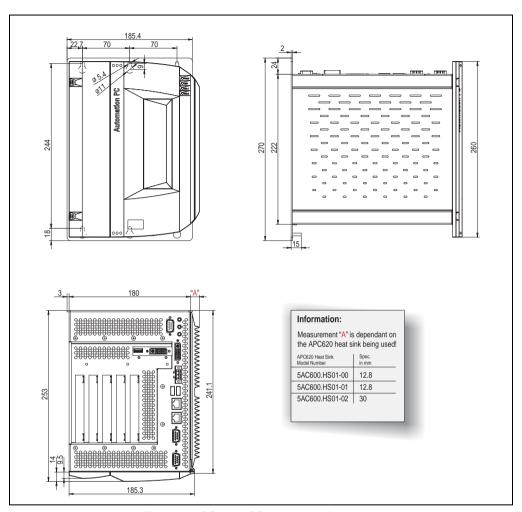
Figure 10: APC620, 5 PCI slot variant dimensions

Information:

Measurement "A" is dependant on the APC620 heat sink being used!

APC620 Heat Sink Model Number	Spec. in mm
5AC600.HS01-00	12.8
5AC600.HS01-01	12.8
5AC600.HS01-02	30

Chapter 2
Technical Data

2.4 General Device Interfaces

2.4.1 Serial Interface COM1

Serial Interfaces COM1		
Type	RS232, modem capable, not electrically isolated	
UART	16550 compatible, 16 byte FIFO	9 pin DSUB male
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 13: Pin assignment COM1

2.4.2 Serial Interface COM2

Serial Interfaces COM2		
Type	RS232, modem capable, not electrically isolated	
UART	16550 compatible, 16 byte FIFO	9 pin DSUB male
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 14: Pin assignment COM2

2.4.3 Ethernet connection ETH1

This ethernet connection is integrated in the CPU Board being used.

Ethernet Connection (ETH1)			
Controller	Intel 82562		RJ45 Twisted Pair (10BaseT/100BaseT), female
Cabling	S/STP (category 5)		
Transfer Rate	10/100 MBit/s [1]		
LED	**On**	**Done**	
Green	100 MBit/s	10 MBit/s	
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)	

Table 15: 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**).

2.4.4 Ethernet Connection ETH2

This ethernet connection is integrated in the system unit.

Ethernet Connection (ETH2)				
Controller	Intel 82551ER		RJ45 Twisted Pair (10BaseT/100BaseT), female	
Cabling	S/STP (category 5)			
Transfer Rate	10/100 MBit/s [1]			
LED	**On**	**Done**		
Green	100 MBit/s	10 MBit/s		
Orange	Link (Ethernet network connection available)	Activity (blinking) (Data transfer in progress)		

Table 16: 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**).

2.4.5 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)	2x USB Typ A, female
Power Supply	max. 500 mA pro Port[1]	
Maximum Cable Length	5 m (not including hub)	

Table 17: 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.

Warning!

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

Driver Support

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

Chapter 2
Technical Data

2.4.6 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 has reverse polarity protection.

Supply Voltage		
protected againsed reverse polarity		3 pin, male
Pin	**Description**	
1	+	
2	Functional Ground	
3	-	
Accessories		
0TB103.9	Plug 24 V 5.08 3p screw clamps	
0TB103.91	Plug 24 V 5.08 3p cage clamps	
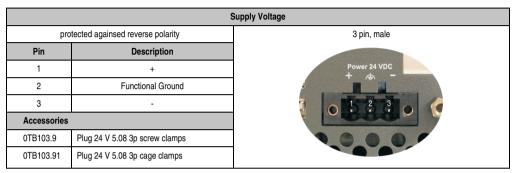
Figure 11: Supply voltage connection

Warning!

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

The grounding connection of the APC620 systems can be found on the bottom. The M4 self-locking nut can be used to fasten a copper strip.
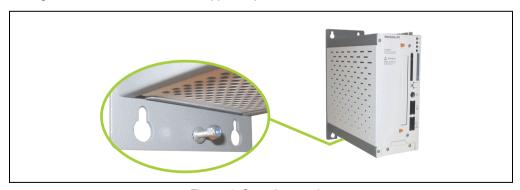
Figure 12: Ground connection

2.4.7 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.

<table>
<tr><td colspan="3" align="center">**Monitor / Panel**</td></tr>
<tr>
<td colspan="3">The following will provide an overview of the video signals available with different system units and CPU boards.</td>
<td align="center">24 pin DVI-I with special functions, female</td>
</tr>
<tr>
<td>**System Unit**</td><td>**815E Board**</td><td>**855GME Board**</td>
<td rowspan="6"></td>
</tr>
<tr><td>5PC600.SX01-00</td><td>RGB, DVI, SDL</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC600.SX02-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC600.SX02-01</td><td>RGB, DVI, SDL</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC600.SX05-00</td><td>RGB</td><td>RGB, DVI, SDL</td></tr>
<tr><td>5PC600.SX05-01</td><td>RGB, DVI, SDL</td><td>RGB, DVI, SDL</td></tr>
</table>

Figure 13: Monitor / Panel Connection

RGB means:

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

Automation PC 620

RGB Monitor

RGB TFT

Monitor / Panel Connection for the Automation PC 620

DVI - Monitor Adapter 5AC900.1000-00

DVI - Monitor Adapter 5AC900.1000-00
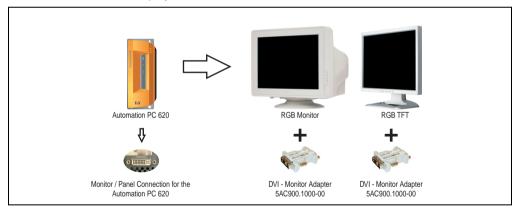
Figure 14: Monitor / Panel connection with RGB video signal

DVI means:

- Connection of B&R Automation Panel 900 display units with Automation Panel Link DVI Receiver (Model nr. 5DLDVI.1000-01), Office Digital/DVI Monitors and Office DVI TFT Displays is possible.
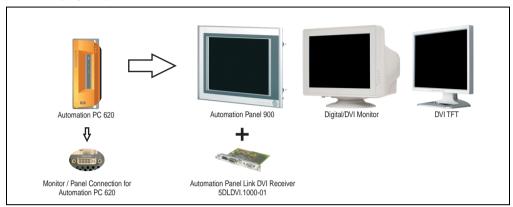
Figure 15: Monitor / Panel connection with DVI video signal

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) is possible.
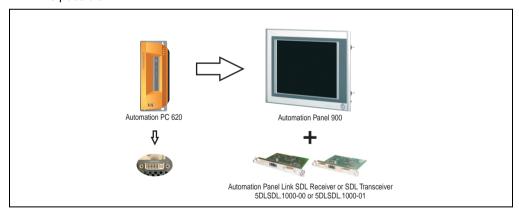
Figure 16: Monitor / Panel connection with SDL video signal

2.4.8 MIC, Line IN and Line OUT Port

All APC620 systems include an AC97 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 plug.	3,5 mm socket, female
Line IN	Stereo Line IN signal supplied via 3.5 mm plug.	
Line OUT	Connection of a stereo sound reader (eg. amplifier) via a 3.5 mm plug.	

Table 18: 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**).

2.4.9 Add-On Interface Slot

An optional add-on interface (eg. CAN, RS485) can be installed here.

Add-On Interface Slot		
Available add-on interfaces		
5AC600.CANI-00	Add-On CAN Interface	
5AC600.485I-00	Add-On RS232/422/485 Interface	
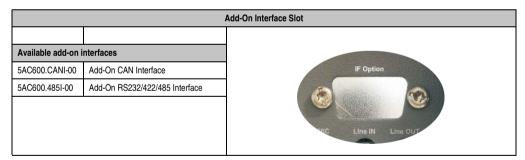
Table 19: Add-On Interface Slot

Information:

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

Chapter 2
Technical Data

2.4.10 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.
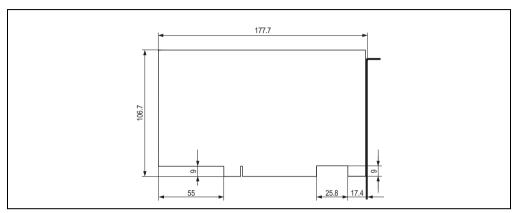
Figure 17: Dimensions of standard half-size PCI cards.

2.4.11 Status LEDs

Status LEDs				
LED	**Color**		**Description**	
Power	Green	On	Supply voltage OK	
	Red	On	The system is in power-saving mode (S5: soft-off mode or S4: hibernate mode - Suspend-to-Disk)	
HDD	Yellow	On	Signals an 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 20: Status LEDs

2.4.12 Compact Flash Slot (CF1)

This Compact Flash Slot is a fixed component of an APC620 system, and is defined in BIOS as the primary master drive. Available Compact Flash Cards - see table 11 "Model numbers for accessories" on Page 20.

Compact Flash Slot (CF1)		
Connection	Primary Master IDE Device	
Compact Flash Type	Type I	
Accessories	**Short description**	
5CFCRD.0032-02	Compact Flash 32 MB	
5CFCRD.0064-02	Compact Flash 64 MB	
5CFCRD.0128-02	Compact Flash 128 MB	
5CFCRD.0256-02	Compact Flash 256 MB	
5CFCRD.0512-02	Compact Flash 512 MB	
5CFCRD.1024-02	Compact Flash 1024 MB	
5CFCRD.2048-02	Compact Flash 2048 MB	

Table 21: Compact Flash Slot (CF1)

Warning!

The Compact Flash card can only be inserted or removed when the power is off!

2.4.13 Hard Disk / Compact Flash Slot (HDD/CF2)

This slot allows for installation of a hard disk or a second Compact Flash 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 / Compact Flash 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 Compact Flash slot		
5AC600.CFSI-00	Add-on Compact Flash slot	
Compact Flash Type	Type I	
Accessories	**Short description**	
5CFCRD.0032-02	Compact Flash 32 MB	
5CFCRD.0064-02	Compact Flash 64 MB	
5CFCRD.0128-02	Compact Flash 128 MB	
5CFCRD.0256-02	Compact Flash 256 MB	
5CFCRD.0512-02	Compact Flash 512 MB	
5CFCRD.1024-02	Compact Flash 1024 MB	
5CFCRD.2048-02	Compact Flash 2048 MB	

Table 22: Hard Disk / Compact Flash Slot (HDD/CF2)

Warning!

The Compact Flash card can only be inserted or removed when the power is off!

2.4.14 Power button

Due to the complete ATX power supply support, the power button serves various functions. These functions can be configured either in the BIOS setup (see BIOS function "power button function" in section "Power", on page 119 for 815E CPU boards, or section "Power", on page 172 for 855GME CPU boards) or, for example, in the operating system Windows XP.

Power button	
The power button can be pressed with a pointed object (i.e. paper clip or tip of a pen). The power button acts like the on/off switch on a normal desktop PC with ATX power supply: **press and release** ... Windows shuts down automatically **press and hold** ... ATX Powersupply turns off without shutting down the APC620.	
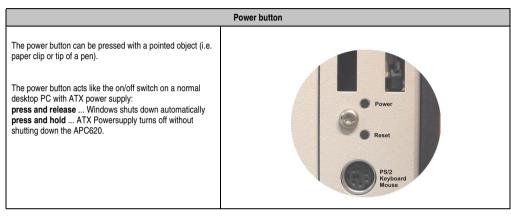
Table 23: Power Button

2.4.15 Reset Button

Reset Button	
The reset button can be pressed with a pointed object (i.e. paper clip or tip of a pen). Pushing the reset button results in a hardware-reset, PCI-reset. The Automation PC 620 restarts cold. The MTCX is not reset when the reset button is pressed.	
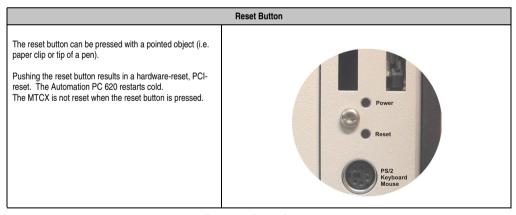
Table 24: Reset Button

2.4.16 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	PS/2 socket, female
1	DATA 0	
2	DATA 1	
3	GND	
4	+5 V [1]	
5	CLK 0	
6	CLK 1	

Table 25: Connection for external keyboard/mouse (PS/2)

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

Warning!

Because of general PC specifications, this interface should be used with extreme care as far as EMC, location of cables, etc. Therefore it should only be used for service!

2.4.17 Battery

The real time clock is buffered by a lithium battery (3 V, 950 mAh), which is located behind the black cover.

Battery		

Battery
  Type
  Exchangable
  Lifespan
	Renata 950 mAh
	Yes, accessible from the outside.
	4 years at 25 °C	
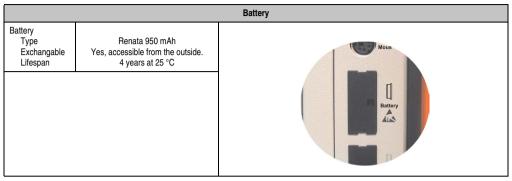
Table 26: Battery

Warning!

Turn off power before removing or adding the lithium battery.

2.4.18 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	
A hardware security key (Dongle) can be inserted behind the black cover.	
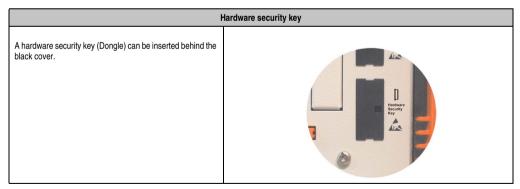
Table 27: Hardware security key

Warning!

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

2.4.19 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 for 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 (when power is OFF!).

- In system units with 5 PCI slots, the slide-in USB FDD drive must be inserted in slide-in slot 1 for mechanical reasons.

Slide-in Slot 1			
Connection	Secondary Slave IDE Device		
Accessories	**Short description**		
5AC600.CDXS-00	Slide-in CD-ROM		
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		
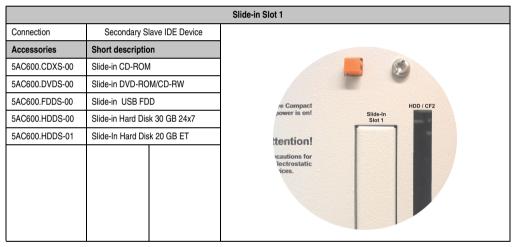
Table 28: Slide-in Slot 1

Caution!

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

2.4.20 Slide-in Slot 2 Drive Slot

This slide-in Slot 2 drive slot is only available in APC620 system units with 5 PCI slots, in which case it is possible to insert multiple slide-in drives. See table for available slide-in drives 8 "Model numbers for 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 (when power is OFF!).**

- **In system units with 5 PCI slots, the slide-in USB FDD drive must be inserted in slide-in slot 1.**

Slide-in Slot 2		
Connection	Secondary Master IDE Device	
Accessories	**Short description**	
5AC600.CDXS-00	Slide-in CD-ROM	
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	
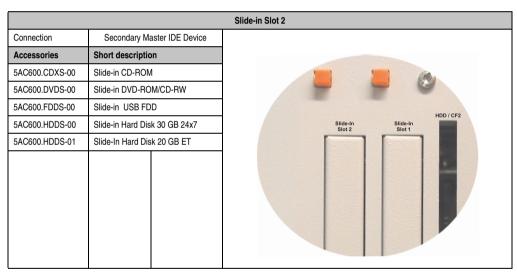
Table 29: Slide-in Slot 2

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
    Amount
    UART
    Transfer Rate
    Connection
	2
	RS232, modem capable
	16550 compatible, 16 byte FIFO
	max. 115 kBaud
	9 pin DSUB, male				

Ethernet
    Controller
    Transfer Rate
    Connection
	See "Ethernet connection ETH1", on page 35 and "Ethernet Connection ETH2", on page 36
	10/100 Mbit/s
	RJ45 Twisted Pair (10 BaseT / 100 BaseT)				

USB Interface
    Type
    Amount
    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	
Compact Flash Slot 1 (CF1) Internal organization	Integrated Primary Master				
Combined Compact Flash Slot 2 / Hard Disk (HDD/CF2) Internal Organization	Yes, optional add-on compact flash slot or add-on hard disk Primary Slave				
Insert for Slide-in Drive 1 Internal Organization	-	Yes Secondary Slave			

Table 30: Technical data for 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, either 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	TBD	Approx. 2.6 kg		TBD	
Mounting Plates (for M4 screws)	4			6	
Drilling Templates	(see Chapter 3 "Installation", Section 1 "Drilling Templates")				

Table 30: Technical data for system units (cont.)

3.2 CPU Boards 815E
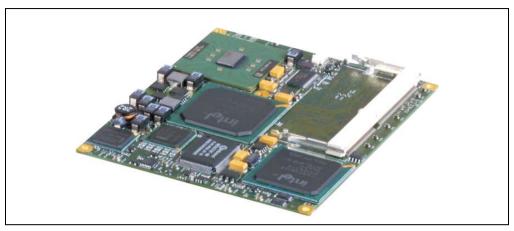
Figure 18: CPU Boards 815E

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, for example, these individual components are used, the data given for the entire device is valid.

3.2.1 Technical Data

Features	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03
Boot Loader / Operating System	BIOS Phoenix		

Processor
  Type
  Expanded Command Set
 	
  L1 Cache
  L2 Cache
  Floating Point Unit (FPU)
	Intel Celeron 3 400 MHz
	MMX Technology, Streaming
	SIMD Extension
	16 kByte
	256 kByte
	Yes
		Intel Celeron 3 733 MHz
		MMX Technology, Streaming
		SIMD Extension
		16 kByte
		256 kByte
		Yes
			Intel Celeron 1 GHz
			MMX Technology, Streaming
			SIMD Extension
			16 kByte
			256 kByte
			Yes

Chipset	Intel 82815E (GMCH) Intel 82801DB (ICH4)		
Front Side Bus	100 Mhz	133 Mhz	133 MHz
IDE Ports	2 IDE Ports, UDMA 100		

Table 31: Technical Data CPU Boards 815E

Features	5PC600.E815-00	5PC600.E815-02	5PC600.E815-03
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 31: Technical Data CPU Boards 815E (cont.)

Driver Support

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

Chapter 2
Technical Data

3.3 CPU Boards 855GME
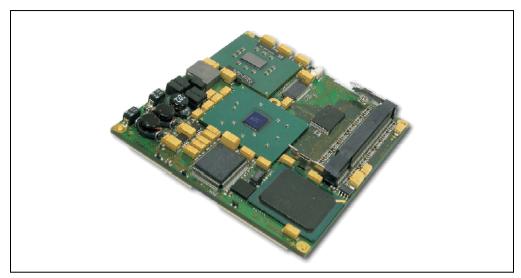
Figure 19: CPU Boards 855GME

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 components are used, refer to the data given specifically for the entire device.

3.3.1 Technical Data

Features	5PC600.E855-00	5PC600.E855-02	5PC600.E855-04
Boot Loader / Operating System	BIOS Phoenix		

Processor
  Type
 	
  Expanded Command Set
  L1 Cache
  L2 Cache
  Floating Point Unit (FPU)
	Intel Pentium M 1,1 GHz
	MMX Technology, Streaming
	SIMD Extension 2
	32 kByte
	1 MB
	Yes
		Intel Pentium M 1.4 GHz
		MMX Technology, Streaming
		SIMD Extension 2
		32 kByte
		2 MB
		Yes
			Intel Celeron M 600 MHz
			MMX Technology, Streaming
			SIMD Extension 2
			32 kByte
			512 kB
			Yes

Chipset	Intel 82855GME (GMHC) Intel 82801DB (ICH4)		
Front Side Bus	400 Mhz		
IDE Ports	2 IDE Ports, UDMA 100		

Table 32: Technical Data CPU Boards 855GME

Features	5PC600.E855-00	5PC600.E855-02	5PC600.E855-04

Memory
   Type
   Size
   Socket
	DDRAM
	max. 1 GB
	SO-DIMM 200-pin		

Graphics
   Controller
   Memory
   Color Depth
	Intel Extreme Graphics 2 (integrated in the Chipset)
	64 MB shared memory (reserved in the main memory)
	Max. 32 bit		

Table 32: Technical Data CPU Boards 855GME (cont.)

Driver Support

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

3.4 Heat Sink

There are several heat sink variants available for use in different CPU boards.
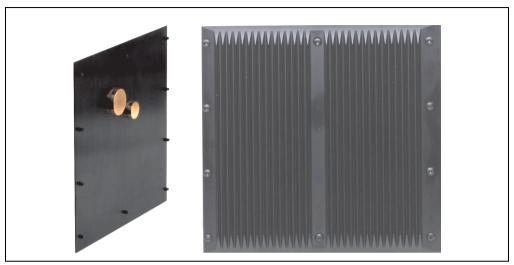
Figure 20: Heat Sink

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.

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.E855-00 5PC600.E855-01 5PC600.E855-02 5PC600.E855-04
Material	Black-coated aluminium		
Outer Dimensions Width Height Depth	228.7 mm 218 mm 12.8 mm		228.7 mm 218 mm 30 mm
Weight	1340 g		1640 g

Table 33: Technical Data Heat Sink

Information:

A heat sink can only be replaced in the B&R production facilities.

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.
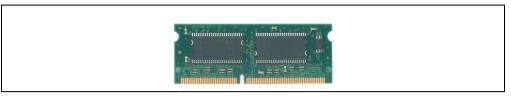
Figure 21: Main memory module

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.

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 Construct Ion Type	128 MB 144-pin SO-DIMM SDRAM	256 MB 144-pin SO-DIMM SDRAM	512 MB 144-pin SO-DIMM SDRAM	256 MB 200-pin SO-DIMM DDR-SDRAM	512 MB 200-pin SO-DIMM DDR-SDRAM	1 GB 200-pin SO-DIMM DDR-SDRAM
Organization	16Mx64	32Mx64	64Mx64	32Mx64	64Mx64	128Mx64

Table 34: Technical Data Main Memory

Information:

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

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.
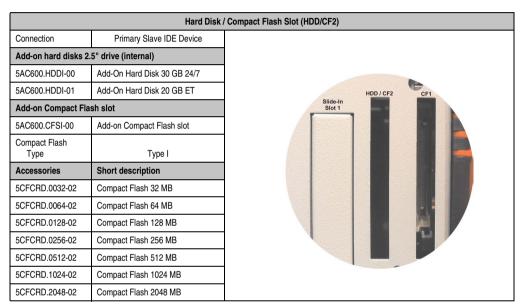

Figure 22: Add-On Hard Disk 30 GB 24/7

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.

Technical data

Features	5AC600.HDDI-00
Manufacturer's Product ID	Fujitsu MHT2030AR
Formated Capacity	30 GB
Number of Heads	2
Number of Sectors (User)	58.605.120
Bytes Per Sector	512
Revolution Speed	4200 rpm ± 1%
Access Time (Average)	7.14 ms

Table 35: Technical Data Add-On Hard Disk 5AC600.HDDI-00

Features	5AC600.HDDI-00

Positioning Time (Seek, Typical Values)
  Minimum (Track to Track)
  Average (Read Access)
  Maximum
	
	1.5 ms
	12 ms
	22 ms

Starting Time (0 rpm to Read Access)	5 seconds (typically)
Interface	ATA-6

Data Transfer Rate
  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)	about 24 dBA at 30 cm
Electrical Characteristics	
Lifespan	5 years or 20000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical Characteristics	
Add-On Mounting	Fixed

Outer Dimensions (without Slide-In)
  Width
  Length
  Height
	
	70 mm
	100 mm
	9.5 mm

Weight	120 g
Environmental Characteristics	

Environmental Temperature
  Operation - standard [1]
  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^2 0-peak)
	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)

Shock (pulse with a Sinus Half-wave)
  Operation
  Storage
	
	No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration
	No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration
	No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration

Altitude
  Operation
  Storage
	
	- 300 to 3000 meters
	- 300 to 12000 meters

Table 35: 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.

Chapter 2
Technical Data

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 23: 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.

Technical Data

Features	5AC600.HDDI-01
Manufacturer's Product ID	Fujitsu MHT2020AC
Formated Capacity	20 GB
Number of Heads	2
Number of Sectors (User)	39.070.080
Bytes Per Sector	512
Revolution Speed	4200 rpm ± 1%
Access Time (Average)	7.14 ms

Table 36: 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)	about 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
  Length
  Height
	
	70 mm
	100 mm
	9.5 mm

Weight	120 g
Environmental Characteristics	

Environmental Temperature
  Operation
  Storage
  Transport
	
	-20 °C .. +85°C[1]
	-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^2 0-peak)
	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)

Shock (pulse with a Sinus Half-wave)
  Operation
  Storage
	
	No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration
	No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration
	No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration

Altitude
  Operation
  Storage
	
	- 300 to 3000 meters
	- 300 to 12000 meters

Table 36: Technical Data Add-On Hard Disk 5AC600.HDDI-01 (cont.)

1) Surface temperature of the hard disk.

3.6.3 Add-On Compact Flash Slot

A Compact Flash 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.
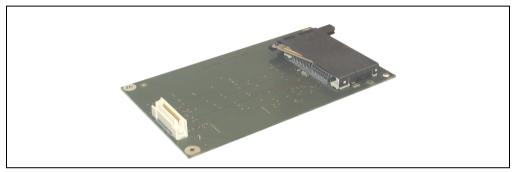
Figure 24: Add-on Compact Flash slot

Technical data

Features	5AC600.CFSI-00

Compact Flash
    Type
    Amount
    Connection
	Type I
	1 Slot
	Primary Slave

Weight	100 g

Table 37: Technical Data Add-On Compact Flash Slot 5AC600.CFSI-00

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 (when power is OFF!).

Caution!

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

Figure 25: Slide-in CD-ROM

Technical Data

Features	5AC600.CDXS-00
Reading Rate	24x
Data Transfer Rate	max. 33.3 MBytes/sec.
Access Time (Average)	115 ms
Revolution Speed	Max. 5136 rpm ± 1%
Starting Time (0 rpm to Read Access)	10 Seconds (maximum)
Host Interface	IDE (ATAPI)
Readable CD Media	CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW

Table 38: Technical data for slide-in CD-ROM 5AC600.CDXS-00

Features	5AC600.CDXS-00
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)	about 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[1]
	-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 38: Technical data for slide-in CD-ROM 5AC600.CDXS-00 (cont.)

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 (when power is OFF!)

Caution!

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

Figure 26: Slide-in DVD-ROM/CD-RW

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 MBytes/sec.

Table 39: Technical data for slide-in DVD-ROM/CD-RW 5AC600.DVDS-00

Features	5AC600.DVDS-00

Access Time (Average)
   CD
   DVD
	85 ms
	110 ms

Revolution Speed	max. 5136 rpm ± 1%
Starting Time (0 rpm to Read Access)	19 Seconds (maximum)
Host Interface	IDE (ATAPI)

Readable Media
   CD
   DVD
	CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW
	DVD-ROM, DVD-R, DVD-RW, DVD-RAM

Non-Write Protected Media CD	CD-R, CD-RW
Compatible Formats	CD-DA, CD-ROM Mode 1/Mode 2 CD-ROM XA Mode 2 (Form 1, Form 2) Photo CD (single/multi-session) Enhanced CD, CD-Text DVD-ROM, DVD-R, DVD-Video (Double Layer) DVD-RAM (4.7 GB, 2.6 GB)
Write-methods	Disc at once, Session at once, Packet write, Track at once
Lazer Class	Class 1 Lazer
Data Buffer Capacity	2 MB
Noise Level (complete read access)	about 45 dBA at 50 cm
Lifespan Opening/Closing the Drawer	60000 POH (Power On Hours) > 10000 times
Environmental Characteristics	

Environmental Temperature
   Operation
   Storage
   Transport
	-5 °C .. +60°C[1]
	-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

Shock (pulse with a Sinus Half-wave)
   Operation
   Storage
 	
   Transport
	at max. 5 g for 11 ms
	at max. 60 g for 11 ms
	at max. 200 g for 2 ms
	at max. 60 g for 11 ms
	at max. 200 g for 2 ms

Table 39: Technical data for slide-in DVD-ROM/CD-RW 5AC600.DVDS-00 (cont.)

1) Drive Surface Temperature

3.6.6 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 (when power is OFF!)**
- **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.

TBD

Figure 27: Slide-in USB FDD

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
    Storage
    Transport
	5 °C .. +45°C
	-20 °C .. +60 °C
	-40 °C .. +85 °C

Environmental Characteristics	

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

Environmental Characteristics	**5AC600.FDDS-00**

Table 40: Technical data for slide-in USB diskette drive 5AC600.FDDS-00

Shock (pulse with a Sinus Half-wave)
  Operation
  Storage
  Transport
	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 40: Technical data for slide-in USB diskette drive 5AC600.FDDS-00

3.6.7 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 (when power is OFF!).

Caution!

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

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Technical Data

Figure 28: 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.

Technical data

Features	5AC600.HDDS-00
Manufacturer's Product ID	Fujitsu MHT2030AR
Formated Capacity	30 GB
Number of Heads	2
Number of Sectors (User)	58,605,120
Bytes Per Sector	512
Revolution Speed	4,200 rpm ± 1%
Access Time (Average)	7.14 ms

Positioning Time (Seek, Typical Values)
    Minimum (Track to Track)
    Average (Read Access)
    Maximum
	
	1.5 ms
	12 ms
	22 ms

Starting Time (0 rpm to Read Access)	5 seconds (typically)
Interface	ATA-6

Data Transfer Rate
    To the Medium
    To / from Host
	
	26,1 bis 32,1 MB/s
	max. 100 MB/s (Ultra-DMA Mode 5)

Cache	2 MB
Noise Level (Idle Mode)	about 24 dBA at 30 cm
Electrical Characteristics	
Lifespan	5 years or 20,000 POH (Power-On Hours)
MTBF	300,000 hours
Mechanical Characteristics	
Slide-In Mounting	Fixed

Outer dimensions (without Slide-In)
    Width
    Length
    Height
	
	70 mm
	100 mm
	9.5 mm

Weight	120 g
Environmental Characteristics	

Environmental Temperature
    Operation - standard [1]
    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^2 0-peak)
	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)

Table 41: Technical Data Add-On Hard Disk 5AC600.HDDS-00

Features	5AC600.HDDS-00

Shock (pulse with a Sinus Half-wave)
    Operation
    Storage
	No non-recovered errors at max. 225 g (2207 m/s^2 0-peak) and 2 ms duration
	No damage at max. 900 g (8820 m/s^2 0-peak) and 1 ms duration
	No damage at max. 120 g (1176 m/s^2 0-peak) and 11 ms duration

Altitude
    Operation
    Storage
	- 300 to 3,000 meters
	- 300 to 12,000 meters

Table 41: Technical Data Add-On 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.

Chapter 2
Technical Data

3.6.8 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 (when power is OFF!)

Caution!

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

Figure 29: 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.

Technical data

Features	5AC600.HDDS-01
Manufacturer's Product ID	Fujitsu MHT2020AC
Formated Capacity	20 GB
Number of Heads	2
Number of Sectors (User)	39,070,080
Bytes Per Sector	512
Revolution Speed	4,200 rpm ± 1%
Access Time (Average)	.14 ms

Positioning Time (Seek, Typical Values)
    Minimum (Track to Track)
    Average (Read Access)
    Maximum
	1.5 ms
	12 ms
	22 ms

Starting Time (0 rpm to Read Access)	5 seconds (typically)
Interface	ATA-6

Data Transfer Rate
    To the Medium
    To / from Host
	up to 28.9 MB/s
	max. 100 MB/s (Ultra-DMA Mode 5)

Cache	2 MB
Noise Level (Idle Mode)	about 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
    Length
    Height
	70 mm
	100 mm
	9.5 mm

Weight	120 g
Environmental Characteristics	

Environmental Temperature
    Operation
    Storage
    Transport
	-20 °C .. +85°C[1)]
	-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^2 0-peak)
	No damage at max. 5 - 500 Hz and 5 g (49 m/s^2 0-peak)

Table 42: Technical Data Slide-In Hard Disk 5AC600.HDDS-01

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Technical Data

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^2 0-peak) and 2 ms duration
	No damage at max. 900 g (8,820 m/s^2 0-peak) and 1 ms duration
	No damage at max. 120 g (1,176 m/s^2 0-peak) and 11 ms duration

Altitude
   Operation
   Storage
	- 300 to 3,000 meters
	- 300 to 12,000 meters

Table 42: Technical Data Slide-In Hard Disk 5AC600.HDDS-01 (cont.)

1) Surface temperature of the hard disk.

3.7 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.

3.7.1 Fan Kit 1 PCI

This fan kit is an optional addition for system units with 1 PCI Slot.
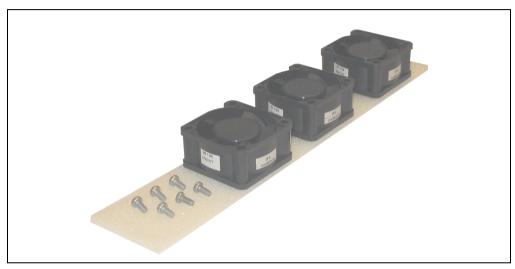
Figure 30: Fan Kit 5PC600.FA01-00

Technical data

Features	5PC600.FA01-00

Fan Type
    Width
    Length
    Height
	Ddouble Ball Bearings
	40 mm
	40 mm
	20 mm

Revolution Speed	5,600 rpm ± 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 43: Technical Data 5PC600.FA01-00

Contents of Delivery

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

Installation

For a description of how to install the fan kit, see Chapter 6 "Maintenance / Servicing", Section 2 "Installing and Replacing the Filter Kit", starting on page223.

3.7.2 Fan Kit 2 PCI

This fan kit is an optional addition for system units with 2 PCI slots.
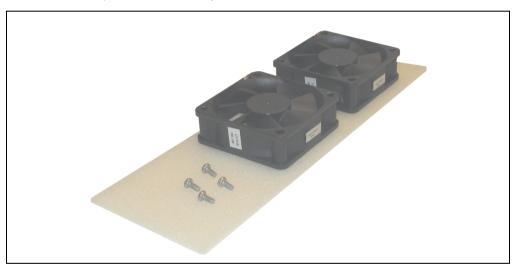
Figure 31: Fan Kit 5PC600.FA02-00

Technical data

Features	5PC600.FA02-00

Fan Type
    Width
    Length
    Height
	Double Ball Bearings
	60 mm
	60 mm
	20 mm

Revolution Speed	3,600 rpm ± 10%
Noise Level	30.5 dB
Lifespan	80,000 hours at 30 °C ..

Table 44: 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 44: Technical Data 5PC600.FA02-00 (cont.)

Contents of Delivery

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

Installation

For a description of how to install the fan kit, see Chapter 6 "Maintenance / Servicing", Section 2 "Installing and Replacing the Filter Kit", starting on page 226.

Chapter 2
Technical Data

Chapter 3 • Installation

1. Drilling Templates

APC620 with 1 PCI slot	APC620 with 2 PCI slots
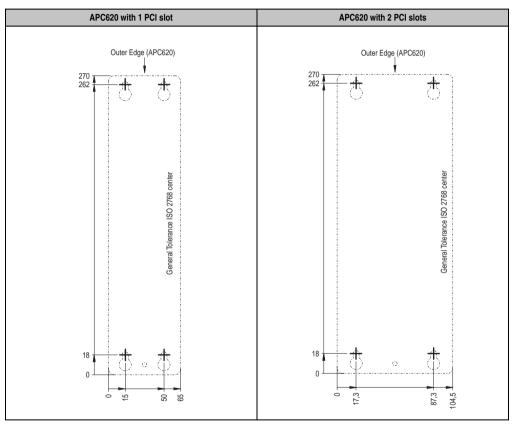
Table 45: Drilling templates for 1 and 2 PCI system units

APC620 with 5 PCI slots

Outer Edge (APC620)

General Tolerance ISO 2768 center

270
262

18

0

0
22,7
92,7
162,7
185,4
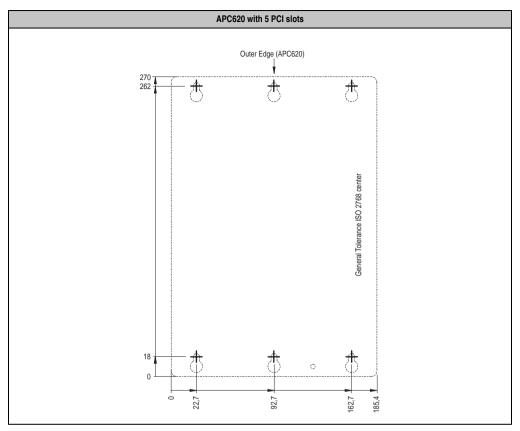
Table 46: Drilling templates for 5 PCI slots

2. Mounting Orientation

The Automation PC620 must be mounted as shown.
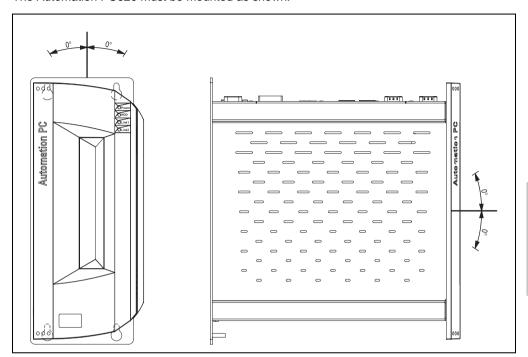
Figure 32: Mounting orientation

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In order to guarantee natural air circulation, mount the system so that the spacing on the top, bottom, and sides is as follows.
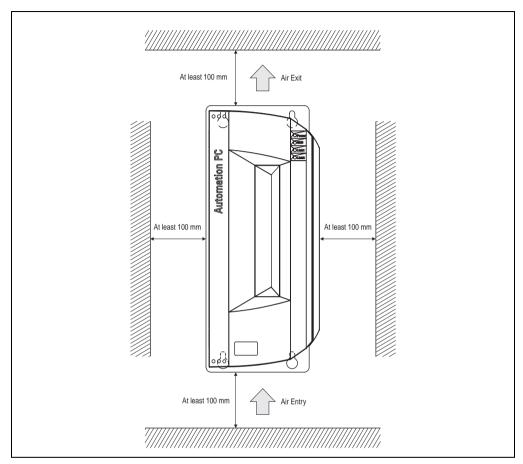
Figure 33: Spacing for air circulation.

Chapter 4 • Software

1. 815E BIOS Description

Information:

- **The following diagrams and BIOS menu items including descriptions refer to BIOS Version R110. Therefore, it is possible that these diagrams and BIOS descriptions might not correpsond with the installed BIOS version.**
- **The SETUP defaults are the settings recommended by B&R. The setup defaults are dependant on the DIP switch configuration on the baseboard (see Section 1.10 "Profile Overview" on Page 126).**

1.1 General Information

BIOS stands for "Basic Input Output System." It is the most basic standardized connection 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.

1.2 BIOS Setup

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

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

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

"Press <F2> to enter SETUP"

```
PhoenixBIOS 4.0 Release 6.1
Copyright 1985-2003 Phoenix Technologies Ltd.
All Rights Reserved
<1BR1R110> Bernecker + Rainer Industrie-Elektronik C1.10


CPU = Mobile Intel(R) Celeeron(TM) CPU          733MHz
126M System RAM Passed
256K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
UMB upper limit segment address: E542




Press <F2> to enter SETUP
```

Figure 34: 815E BIOS R110 Diagnostic Screen

1.2.1 Summary screen

After the POST the Summary screen displays the most important system characteristics.

```
                    PhoenixBIOS Setup Utilitiy

CPU Type          : Mobile Intel(R) Celeron(TM) CPU         733MHz
CPU Speed         : 733 MHz
                                   System ROM    : E542 - FFFF
System Memory     : 640 KB         BIOS Date     : 10/08/04
Extended Memory   : 259584 KB
Shadow Ram        : 384 KB         COM Ports     : 0378 02F8
Cache Ram         : 256 KB         LPT Ports     : 0378
                                   Display Type  : EGA \ VGA
                                   PS/2 Mouse    : Not Installed

Hard Disk 0       : None
Hard Disk 1       : None
Hard Disk 2       : None
Hard Disk 3       : None
```

Figure 35: 815E BIOS R110 Summary Screen

1.3 BIOS Setup Keys

The following keys are active during the POST:

Key	Function
F2	Enters the BIOS setup menu.
ESC	Cues the Bootmenu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER> is booted by this device.
<spacebar>	Pressing the spacebar skips the system RAM check.
<Pause >	Pressing the <Pause> key stopps the POST. Press any other key to resume the POST.

Table 47: 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 edge of the current BIOS setup page.
PgDn ↓	Moves the cursor to the bottom edge 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 chosen BIOS setting.
<F6> or <+> or <spacebar>	Scrolls to the next option for the chosen 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 48: Keys relevant to BIOS

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

BIOS Setup Menu Item	Function	From Page
Main	The basic system configurations (eg. time, date, hard disk parameters) can be set in this menu.	86
Advanced	Advanced BIOS options such as cache areas, PnP and keyboard repeat rate etc. can be configured here.	95
Security	For setting up the system's security functions.	117
Power	Setup of various APM (Advanced Power Management) options.	119
Boot	The boot order can be set here.	123
Exit	To end the BIOS setup.	124

Table 49: Overview of BIOS menu items

Chapter 4
Software

1.4 Main

```
1BR1                    PhoenixBIOS Setup Utility              R110
   Main     Advanced     Security     Power     Boot     Exit

                                              Item Specific Help
   System Time:            [08:26:59]
   System Date:            [10/11/2004]
                                           <Tab>, <Shift-Tab>, or
 ▶ Primary Master          [None]          <Enter> selects field.
 ▶ Primary Slave           [None]
 ▶ Primary Master          [None]
 ▶ Primary Slave           [None]

   SMART Device Monitoring: [Enabled]

   System Memory:          640 KB
   Extended Memory:        253 MB




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

Figure 36: 815E Main Menu

BIOS Setting	Description	Configuration Possibilities	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 87.
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 89.
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 91.

Table 50: 815E Main Configuration Options

BIOS Setting	Description	Configuration Possibilities	Effect
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 93.
Smart Device Monitoring	S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) is implemented in modern 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 50: 815E Main Configuration Options (cont.)

1.4.1 Primary Master

```
1BR1                    PhoenixBIOS Setup Utility                R110
  Main

          Primary Master [None]               Item Specific Help

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


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

Figure 37: 815E - Primary Master Setup

BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the primary master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 51: 815E - Primary Master Configuration Options

1.4.2 Primary Slave

```
1BR1                    PhoenixBIOS Setup Utility                R110
   Main

           Primary Slave [None]                 Item Specific Help

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


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

Figure 38: 815E Primary Slave Setup

BIOS Setting	Description	Configuration Possibilities	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 52: 815E Primary Slave Configuration Options

Chapter 4
Software

BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the primary slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 52: 815E Primary Slave Configuration Options (cont.)

1.4.3 Secondary Master

```
1BR1                    PhoenixBIOS Setup Utility              R110
  Main

            Secondary Master [None]              Item Specific Help

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

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

Figure 39: 815E Secondary Master Setup

BIOS Setting	Description	Configuration Possibilities	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 53: 815E Secondary Master Configuration Options

BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the secondary master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	DriveDrive support present, and function is activated.

Table 53: 815E Secondary Master Configuration Options (cont.)

1.4.4 Secondary Slave

```
 1BR1                    PhoenixBIOS Setup Utility                 R110

   Main

              Secondary Slave [None]              Item Specific Help

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

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

Figure 40: 815E Secondary Slave Setup

BIOS Setting	Description	Configuration Possibilities	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 54: 815E Secondary Slave Configuration Options

BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the secondary slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 54: 815E Secondary Slave Configuration Options (cont.)

1.5 Advanced

```
 1BR1                    PhoenixBIOS Setup Utility                      R110
    Main      Advanced      Security      Power      Boot      Exit

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



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

Figure 41: 815E Advanced Menu

BIOS Setup Menu	Description	Configuration Possibilities	Effect
Advanced Chipset Control	Setup of advanced chipset features.	Enter	Opens submenu see "Advanced Chipset Control", on page 96.
PCI/PNP Configuration	Configures PCI devices.	Enter	Opens submenu see "PCI/PNP Configuration", on page 97.
Memory Cache	Configuration of the memory cache resources.	Enter	Opens submenu see "Memory Cache", on page 104.
I/O Device Configuration	Configuration of the I/O devices.	Enter	Opens submenu see "I/O Device Configuration", on page 106.
Keyboard Features	Configuration of the keyboard options.	Enter	Opens submenu see "Keyboard Features", on page 108.
CPU Board Monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu see "CPU Board Monitor", on page 109.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc...).	Enter	Opens submenu see "Miscellaneous", on page 110.
Baseboard/Panel Features	Display of device specific information and setup of device specific values.	Enter	Opens submenu see "Baseboard/Panel Features", on page 112.

Table 55: 815E Advanced Menu Configuration Possibilities

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Software

1.5.1 Advanced Chipset Control

```
1BR1                    PhoenixBIOS Setup Utility                    R110
          Advanced

          Advanced Chipset Control              Item Specific Help

    Video boot type       [Onboard Video 1MB]     Select 'Onboard Video'
                                                  to enable the onboard
    Graphics Aperture:    [ 64 Mb]                video controller as
                                                  the boot display
    Enable memory gap:    [Disabled]              device. Select either
                                                  512K or 1MB of System
                                                  Memory to be allocated
                                                  to the onboard video
                                                  controller.

                                                  Select
                                                  'Disable Onboard Video'
                                                  to disable the onboard
                                                  video controller. No
                                                  System Memory will be
                                                  allocated for video.


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

Figure 42: 815E Advanced Chipset Control

BIOS Setting	Description	Configuration Possibilities	Effect
Video boot type	Settings can be made for the onboard video controller.	Onboard Video 1MB	1 MB main memory is reserved for the onboard video controller.
		Onboard Video 512k	512 k main memory is reserved for the onboard video controller.
		Disable Onboard Video	**Warning!** Activation of onboard video is necessary to make video output possible. Deactivate only for use of an external PCI graphics card.
Graphics Aperture	Reserves a memory location in the RAM for AGP (accelerated graphic port), into which the memory access will be directed.	32 MB	A 32 MB memory location is reserved in the main memory for graphic access.
		64 MB	A 64 MB memory location is reserved in the main memory for graphic access.
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 56: 815E Advanced Chipset Control Configuration Possibilities

1.5.2 PCI/PNP Configuration

```
 1BR1                    PhoenixBIOS Setup Utility              R110
         Advanced

              PCI/PNP Configuration              Item Specific Help

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

  ▶ PCI/PNP ISA IRQ Resource Exclusion
    Default Primary Video Adapter:   [PCI]

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

Figure 43: 815E PCI/PNP Configuration

BIOS Setting	Description	Configuration Possibilities	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 entrys (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 57: 815E PCI/PNP Configuration Options

Chapter 4
Software

BIOS Setting	Description	Configuration Possibilities	Effect
PCI Device, Slot #1	Advanced configuration of the PCI slot number 1.	Enter	Opens submenu See "PCI Device, Slot #1", on page 99
PCI Device, Slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens submenu See "PCI Device, Slot #2", on page 100
PCI Device, Slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens submenu See "PCI Device, Slot #3", on page 101
PCI Device, Slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens submenu See "PCI Device, Slot #4", on page 102
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 & Pla 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 103

Table 57: 815E PCI/PNP Configuration Options (cont.)

BIOS Setting	Description	Configuration Possibilities	Effect
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 57: 815E PCI/PNP Configuration Options (cont.)

PCI Device, Slot #1

```
1BR1                    PhoenixBIOS Setup Utility                R110
       Advanced

          PCI Device, Slot #1                  Item Specific Help

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




 F1   Help    ↑↓  Select Item  -/+   Change Values      F9    Setup Defaults
 Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10   Save and Exit
```
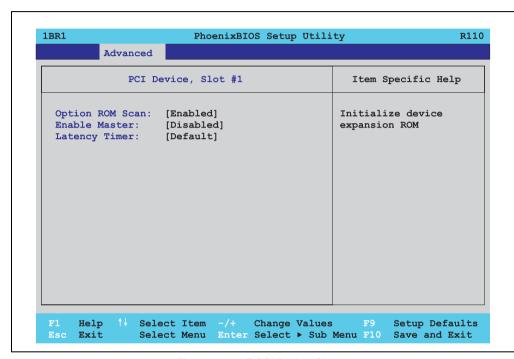
Figure 44: 815E PCI Device, Slot #1

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 58: 815E PCI Device, Slot #1 Configuration Possibilities

Chapter 4
Software

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 58: 815E PCI Device, Slot #1 Configuration Possibilities (cont.)

PCI Device, Slot #2

```
1BR1                    PhoenixBIOS Setup Utility              R110
        Advanced

            PCI Device, Slot #2               Item Specific Help

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




    F1   Help    ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults
    Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
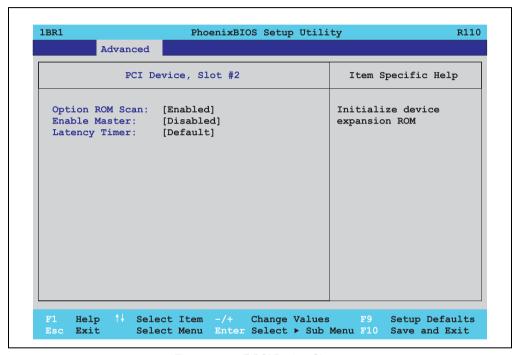
Figure 45: 815E PCI Device, Slot #2

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 59: 815E PCI Device, Slot #2 Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 59: 815E PCI Device, Slot #2 Configuration Possibilities (cont.)

PCI Device, Slot #3


```
1BR1                    PhoenixBIOS Setup Utility                R110
        Advanced

            PCI Device, Slot #3                  Item Specific Help

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




 F1   Help   ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults
 Esc  Exit       Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
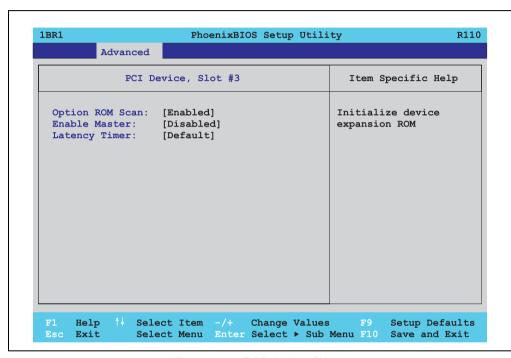
Figure 46: 815E PCI Device, Slot #3

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 60: 815E PCI Device, Slot #3 Configuration Possibilities

Chapter 4
Software

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 60: 815E PCI Device, Slot #3 Configuration Possibilities (cont.)

PCI Device, Slot #4

```
1BR1                   PhoenixBIOS Setup Utility              R110

      Advanced

            PCI Device, Slot #4                Item Specific Help

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




 F1   Help    ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults
 Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
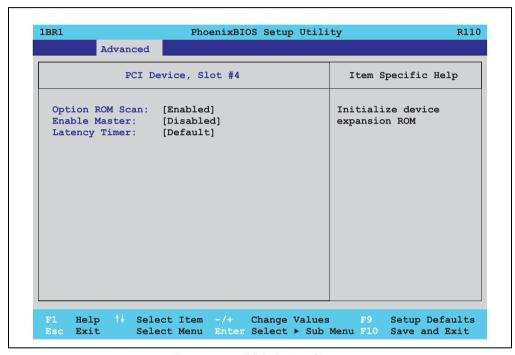
Figure 47: 815E PCI Device, Slot #4

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 61: 815E PCI Device, Slot #4 Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 61: 815E PCI Device, Slot #4 Configuration Possibilities (cont.)

PCI/PNP ISA IRQ Resource Exclusion

```
1BR1                   PhoenixBIOS Setup Utility              R110
        Advanced

      PCI/PNP ISA IRQ Resource Exclusion          Item Specific Help

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




   F1   Help   ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults
   Esc  Exit       Select Menu  Enter Select ▶ Sub Menu F10 Save and Exit
```
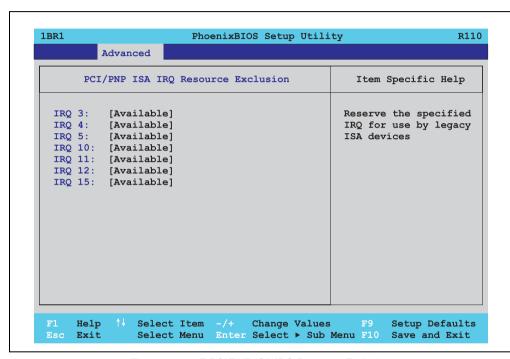
Figure 48: 815E PCI/PNP ISA IRQ Resource Exclusion

BIOS Setting	Description	Configuration Possibilities	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.

Table 62: 815E PCI/PNP ISA IRQ Resource Exclusion Configuration Possibilities

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BIOS Setting	Description	Configuration Possibilities	Effect
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.
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 62: 815E PCI/PNP ISA IRQ Resource Exclusion Configuration Possibilities (cont.)

1.5.3 Memory Cache

```
 1BR1                    PhoenixBIOS Setup Utility                      R110
         Advanced

                     Memory Cache                       Item Specific Help

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




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

Figure 49: 815E Memory Cache

BIOS Setting	Description	Configuration Possibilities	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.
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 63: 815E Memory Cache Configuration Possibilities

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1.5.4 I/O Device Configuration

```
1BR1                    PhoenixBIOS Setup Utility                R110
           Advanced

                I/O Device Configuration          Item Specific Help

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

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

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

Figure 50: 815E I/O Device Configuration

BIOS Setting	Description	Configuration Possibilities	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 64: 815E I/O Device Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
USB UHCI Host Controller 1	Configuration of the USB UHCI controller 1 for USB port 0 und 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI Host Controller 2	Configuration of the USB UHCI controller 1 for USB port 2 and 3. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI Host Controller	Configuration of the USB EHCI controller. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
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 on and off.	Disabled	Deactivates the LAN Controller.
		Enabled	Activates the LAN Controller.
Onboard LAN PXE ROM	For turning the remote boot BIOS extension for the on-board LAN controller 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.
		Auto	First BIOS and then the operating system configure 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	Selected base I/O address is assigned.
Interrupts	Selection of the interrupt for port A. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Selected interrupt is assigned.
Serial port B	For the configuration of serial port B (COM2).	Disabled	Port A deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured.
		Auto	First BIOS and then the operating system configure the port automatically.
Modes	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 assigned.

Table 64: 815E I/O Device Configuration Possibilities (cont.)

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BIOS Setting	Description	Configuration Possibilities	Effect
Interrupts	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	Selected base I/O address is assigned.

Table 64: 815E I/O Device Configuration Possibilities (cont.)

1.5.5 Keyboard Features

```
1BR1                    PhoenixBIOS Setup Utility               R110
        Advanced

            Keyboard Features                    Item Specific Help

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




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

Figure 51: 815E Keyboard Features

BIOS Setting	Description	Configuration Possibilities	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.
Key Click	Using this option, the clicking of the keys can be turned on or off.	Enabled	Activates the function.
		Disabled	Deactivates 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 characes 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 65: 815E Keyboard Features Configuration Possibilities

1.5.6 CPU Board Monitor

```
1BR1                 PhoenixBIOS Setup Utility              R110
         Advanced

         CPU Board Monitor                  Item Specific Help

 VCC 3.3V Voltage =   3.34V           All items on this menu
 CPU Core Voltage =   1.10V           cannot be modified in
      5Vsb Voltage =   4.87V          user mode, If any
  Battery Voltage =   3.42V           items require changes,
                                      please consult your
 CPU Temperature  =   +53°C/+127°F    system Supervisor.

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

Figure 52: 815E CPU Board Monitor

BIOS Setting	Description	Configuration Possibilities	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 celcius and fahrenheit).	None	

Table 66: 815E CPU Board Monitor Configuration Possibilities

1.5.7 Miscellaneous

```
1BR1                      PhoenixBIOS Setup Utility                      R110
        Advanced

            Miscellaneous                        Item Specific Help

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




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

Figure 53: 815E Miscellaneous

BIOS Setting	Description	Configuration Possibilities	Effect
Summary Screen	Set whether or not the system summary screen should open when the system is started (see figure 35 "815E BIOS R110 Summary Screen" on Page 84).	Enabled	Activates the function.
		Disabled	Deactivates the function.

Table 67: 815E Miscellaneous Configuration Options

BIOS Setting	Description	Configuration Possibilities	Effect
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 diagnostic screen (see figure 34 "815E BIOS R110 Diagnostic Screen" on Page 84) should be displayed when the system is started.	Enabled	Activates the function. The diagnostic screen is displayed.
		Disabled	Deactivates the function. The diagnostic 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, andmore than 63 sectors per track. Configuration Possibilities: DOS	Other	For non-compatible access (eg. Novell, SCO Unix.)
		DOS	For MS DOS compatible access.

Table 67: 815E Miscellaneous Configuration Options (cont.)

1.5.8 Baseboard/Panel Features

```
 1BR1                    PhoenixBIOS Setup Utility                R110
           Advanced

              Baseboard/Panel Features              Item Specific Help

   ▶ Panel Control
   ▶ Baseboard Monitor
   ▶ Legacy Devices

     Versions
       BIOS:            R110
       MTCX PX32:       V1.19
       MTCX FPGA:       V1.06

     Optimized ID:      00000001b
     Device ID:         00001B7Dh
     Compatibility ID:  0000h
     Serial Number:     70370168508
     Product Name:      System 1PCI
     User Serial ID:    00000000h


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

Figure 54: 815E Baseboard/Panel Features

BIOS Setting	Description	Configuration Possibilities	Effect
Panel Control	For special setup of connected panels.	Enter	Opens submenu See "Panel Control", on page 113
Baseboard Monitor	Display of various temperatures and fan rpms.	Enter	Opens submenu See "Baseboard Monitor", on page 114
Legacy Devices		Enter	Opens submenu See "Legacy Devices", on page 115
BIOS	Displays the BIOS version.	None	
MTCX PX32	Displays the MTCX PX32 firmware virsion.	None	
MTCX FPGA	Displays the MTCX FPGA firmware virsion.	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	

Table 68: 815E Baseboard/Panel Features Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
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 68: 815E Baseboard/Panel Features Configuration Possibilities

Panel Control

```
1BR1                    PhoenixBIOS Setup Utility                    R110
        Advanced

            Panel Control                      Item Specific Help

   Graphic Engine 1:      [Auto]            Select [Auto] or
                                            one of the
   Select Panel Number:   [ 0]             predefined LCDs:
   Version:               V0.00
   Brightness:            [ 50%]            VGA = 640x 480 1x18
   Temperature:           00°C/32°F         SVGA= 800x 600 1x18
   Fan Speed:             00 RPM            XGA =1024x 768 1X18
   Keys/Leds:             00/00             XGA2=1024x 768 2x18
                                            SXGA=1280x1024 2x24




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

Figure 55: 815E Panel Control

BIOS Setting	Description	Configuration Possibilities	Effect
Graphic Engine 1	Setting for the resolution of the connected panel .	Auto	Automatic setting of the resolution (using a read-out of the panel's EDID data).
		VGA, SVGA, XGA, XGA2, SXGA	Manual configuration of the resolution.

Table 69: 815E Panel Control Configuration Possibilities

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BIOS Setting	Description	Configuration Possibilities	Effect
Select Panel Number	Selection of the panel number for which the values should be read out and/or changed.	0 ... 15	Selection of panel 0 ... 15. Panel 15 is specifically intended for panel PC 700 systems.
Version	Display of the firmware version of the SDLR controller.	None	
Brightness	For setting the brightness of the selected panel.	0%, 25%, 50%, 75%, 100%	Brightness settings in %. Changes take effect after saving and restarting the system (eg. 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 69: 815E Panel Control Configuration Possibilities (cont.)

Baseboard Monitor

```
1BR1                    PhoenixBIOS Setup Utility                    R110
         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
```
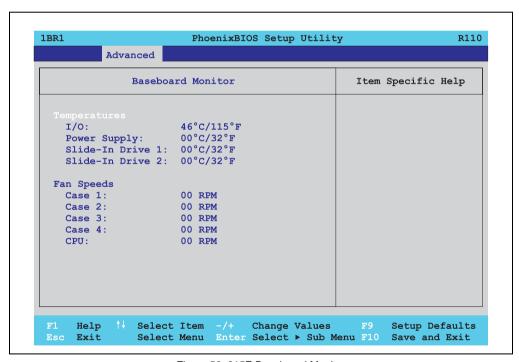
Figure 56: 815E Baseboard Monitor

BIOS Setting	Description	Configuration Possibilities	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 70: 815E Baseboard Monitor Configuration Possibilities

Legacy Devices

```
1BR1                    PhoenixBIOS Setup Utility                    R110
        Advanced

             Legacy Devices                    Item Specific Help

    COM C:               [Disabled]
    COM D:               [Disabled]
    COM E:               [Disabled]
    LPT:                 [Disabled]
    CAN:                 [Disabled]

    2nd LAN controller:  [Enabled]




 F1   Help    ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults
 Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
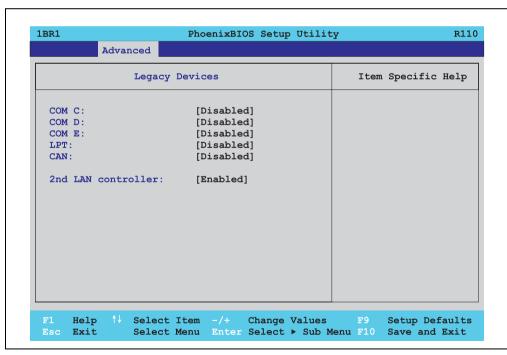
Figure 57: 815E Legacy Devices

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BIOS Setting	Description	Configuration Possibilities	Effect
COM C	Settings for the internal serial interfaces in the system. This setting activates the touch screen in panel PC 700 systems, and, using SDL and LDL transfer technology, also in Automation Panel 900 display units.	Disabled	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.
Interrupts	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.
Interrupts	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.
Interrupts	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	-
Interrupts	Selection of the interrupt for the CAN port.	IRQ 10	Selected interrupt is assigned.
		NMI	NMI interrupt is assigned.

Table 71: 815E Legacy Devices Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
2nd LAN controller	For turning the on-board LAN controller (ETH2) on and off.	Disabled	Deactivates the controller.
		Enabled	Activates the controller.

Table 71: 815E Legacy Devices Configuration Possibilities (cont.)
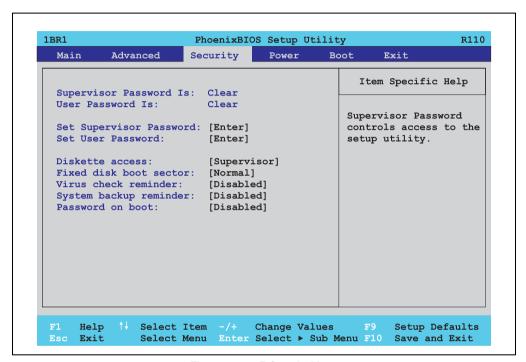
1.6 Security

```
 1BR1                  PhoenixBIOS Setup Utility              R110
    Main      Advanced     Security      Power     Boot      Exit

                                              Item Specific Help

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

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




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

Figure 58: 815E Security Menu

BIOS Setting	Description	Configuration Possibilities	Effect
Supervisor Password Is	Displays whether or not a supervisor password has been set.	None	Display **Set**: A supervisor password has been set. Display **Clear**: No supervisor password has been set.
User Password Is	Displays whether or not a user password has been set.	None	Display **Set**: A user password has been set. Display **Clear**: No user password has been set.
Set Supervisor Password	To enter/change a supervisor password. A supervisor password is necessary to edit all BIOS settings.	Enter maximum 7 alphanumeric characters - not case sensitive.	Press Enter and enter password two times. The password must be 7 alphanumeric characters or less. Needed to enter the BIOS setup menu. To change password, enter old password once and then the new password twice.

Table 72: 815E Security Configuration Options

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BIOS Setting	Description	Configuration Possibilities	Effect
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.
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 possibleof when a supervisor or user password is enabled.	Disabled	Deactivates the function.
		Enabled	Activates the function.

Table 72: 815E Security Configuration Options (cont.)

1.7 Power

```
1BR1                    PhoenixBIOS Setup Utility                R110
   Main      Advanced      Security      Power      Boot      Exit

                                                  Item Specific Help

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

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

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

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


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

Figure 59: 815E Power Menu

BIOS Setting	Description	Configuration Possibilities	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 121
Thermal Management	Configuration of specific CPU limits.	Enter	Opens submenu See "Thermal Management", on page 122
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 73: 815E Power Configuration Options

BIOS Setting	Description	Configuration Possibilities	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 elecricity. 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. **Since the APC620 contains an ATX power supply, ATX should be selected.**
		AT	An AT compatible power supply is being used.
Power Button Function	This option determines the function of the power button.	Power Off	Shuts down the system.
		Sleep	The system enters sleep mode.
Power Loss Control	This option determines how the system reacts to a power outage.	Stay Off	The system does not turn back on. The system remains off until the power button is pressed.
		Power On	The system turns back on.
		Last State	The system resumes the last state it was in before the power outage.

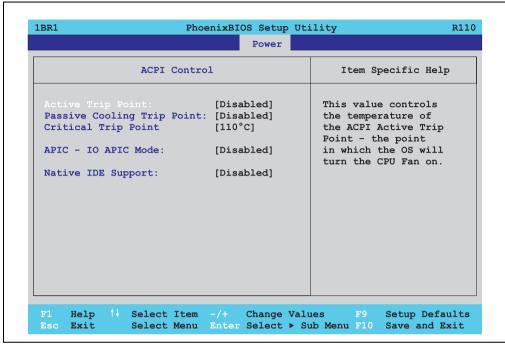Table 73: 815E Power Configuration Options (cont.)

1.7.1 ACPI Control

```
 1BR1                    PhoenixBIOS Setup Utility                    R110
                                 Power

                  ACPI Control                  │      Item Specific Help

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




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

Figure 60: 815E ACPI Control

BIOS Setting	Description	Configuration Possibilities	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. **Warning!** **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 74: 815E ACPI Control Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
APIC - IO APIC Mode	This option controlls 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 74: 815E ACPI Control Configuration Possibilities (cont.)

1.7.2 Thermal Management

```
1BR1                     PhoenixBIOS Setup Utility                  R110
                                   Power

             Thermal Management                    Item Specific Help


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

















 F1   Help    ↑↓  Select Item  -/+  Change Values      F9   Setup Defaults
 Esc  Exit        Select Menu   Enter Select ▶ Sub Menu F10  Save and Exit
```
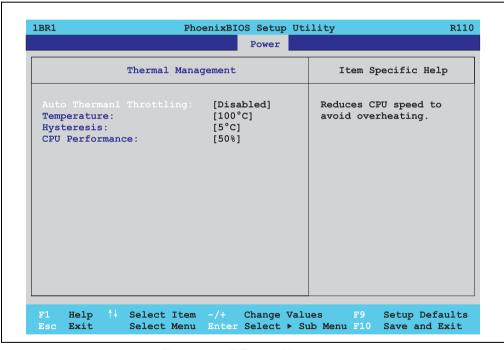
Figure 61: 815E Thermal Management

BIOS Setting	Description	Configuration Possibilities	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.
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.

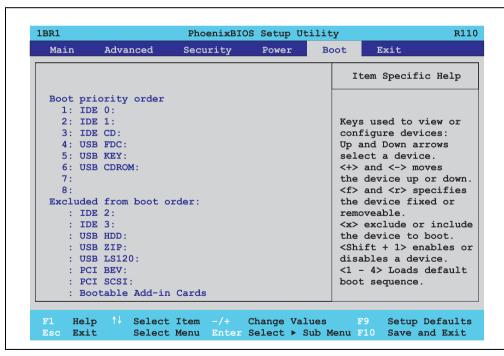Table 75: 815E Thermal Management

1.8 Boot

```
1BR1                    PhoenixBIOS Setup Utility                    R110
  Main      Advanced      Security      Power      Boot     Exit

                                              Item Specific Help

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

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

Figure 62: 815E Boot Menu

BIOS Setting	Description	Configuration Possibilities	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 76: 815E Boot Configuration Options

1.9 Exit

```
1BR1                    PhoenixBIOS Setup Utility                R110
   Main       Advanced     Security     Power      Boot     Exit

                                              Item Specific Help

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












   F1   Help   ↑↓  Select Item  -/+   Change Values   F9   Setup Defaults
   Esc  Exit       Select Menu  Enter Execute Command  F10  Save and Exit
```
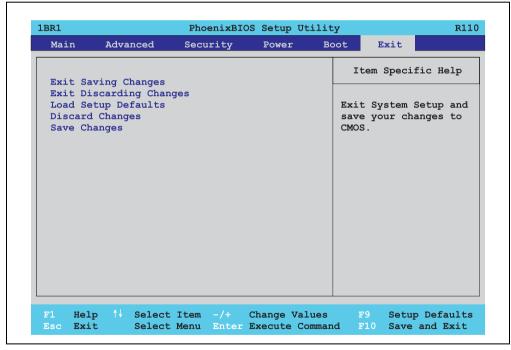
Figure 63: 815E Exit Menu

BIOS Setting	Description	Configuration Possibilities	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 77: 815E Exit Configuration Options

BIOS Setting	Description	Configuration Possibilities	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 77: 815E Exit Configuration Options (cont.)

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Software

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 3.9 "Position of the DIP Switch for APC620 System Units" on Page 197).

Figure 64: DIP Switch on System Unit

The first six DIP switches (1-6) are used to set the profiles. The rest (7,8) are reserved.

Number	optimized for	DIP Switch Setting							
		1	2	3	4	5	6	7[1]	8[1]
Profile 0	Automation PC 620 System units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	On	Off	Off	Off	Off	Off	-	-
Profile 2	Automation PC 620 System units 5PC600.SX02-00, 5PC600.SX02-01, 5PC600.SX05-00 and 5PC600.SX05-01.	Off	On	Off	Off	Off	Off	-	-
Profile 3	Panel PC 700 System unit 5PC720.1043-00 and 5PC720.1505-00.	On	On	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 System unit 5PC720.1043-01 and 5PC720.1505-01.	Off	Off	On	Off	Off	Off	-	-

Table 78: 815E Profile Overview

1) Reserved.

The following pages provide an overview of the BIOS default settings for the different DIP switch configurations.

Personal Settings

If changes have been made to the BIOS defaults, they can be entered in the following tabels for backup.

1.10.1 Main

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
System Time	-	-	-	-	-	
System Date	-	-	-	-	-	
SMART Device Monitoring	Enabled	Enabled	Enabled	Enabled	Enabled	
Primary Master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Primary Slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Secondary Master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Secondary Master						
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Secondary Slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 79: 815E Main Profile Setting Overview

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Software

1.10.2 Advanced

Advanced Chipset Control

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Video Boot Type	Onboard Video 1MB	Onboard Video 1MB	Onboard Video 1MB	Onboard Video 1MB	Onboard Video 1MB	
Graphics Aperture	64 MB	64 MB	64 MB	64 MB	64 MB	
Enable Memory Gap	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 80: 815E Advanced Chipset Control Profile Setting Overview

PCI/PNP Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
PNP OS Installed	Yes	Yes	Yes	Yes	Yes	
Reset Configuration Data	No	No	No	No	No	
Secured Setup Configuration	Yes	Yes	Yes	Yes	Yes	
PCI IRQ line 1	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
PCI IRQ line 2	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
PCI IRQ line 3	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
PCI IRQ line 4	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
Onboard LAN IRQ Line	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
Onboard USB EHCI IRQ Line	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
Default Primary Video Adapter	PCI	PCI	PCI	PCI	PCI	
PCI Device, Slot #1						
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	
PCI Device, Slot #2						
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	
PCI Device, Slot #3						
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	

Table 81: 815E PCI/PNP Configuration Profile Setting Options

PCI Device, Slot #4	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	
PCI/PNP ISA IRQ Resource Exclusion						
IRQ 3	Available	Available	Available	Available	Available	
IRQ 4	Available	Available	Available	Available	Available	
IRQ 5	Available	Available	Available	Available	Available	
IRQ 7	Available	Available	Available	Available	Available	
IRQ 9	Available	Available	Available	Available	Available	
IRQ 10	Available	Available	Available	Available	Available	
IRQ 11	Available	Available	Available	Available	Available	
IRQ 12	Available	Available	Available	Available	Available	
IRQ 15	Available	Available	Available	Available	Available	

Table 81: 815E PCI/PNP Configuration Profile Setting Options (cont.)

Memory Cache

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Memory Cache	Enabled	Enabled	Enabled	Enabled	Enabled	
Cache System BIOS area	Write Protect	Write Protect	Write Protect	Write Protect	Write Protect	
Cache Video BIOS area	Write Protect	Write Protect	Write Protect	Write Protect	Write Protect	
Cache Extended Memory Area	Write Back	Write Back	Write Back	Write Back	Write Back	
Cache D000 - D3FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache D400 - D7FF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache D800 - DBFF	Disabled	Disabled	Disabled	Disabled	Disabled	
Cache DC00 - DFFF	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 82: 815E Memory Cache Profile Setting Overview

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Software

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	
Interrupts	IRQ 4	IRQ 4	IRQ 4	IRQ 4	IRQ 4	
Serial Port B	Enabled	Enabled	Enabled	Enabled	Enabled	
Modes	Normal	Normal	Normal	Normal	Normal	
Base I/O Address	3F8	3F8	3F8	3F8	3F8	
Interrupts	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 83: 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 84: 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 85: 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 86: 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	-	-	-	-	-	
Panel Control						
Graphic Engime 1	Auto	Auto	Auto	Auto	Auto	
Select Panel Number	0	0	0	0	0	
Version	-	-	-	-	-	
Brightness	50 %	50 %	50 %	50 %	50 %	
Temperature	-	-	-	-	-	
Fan Speed	-	-	-	-	-	
Keys/Leds	-	-	-	-	-	
Baseboard Monitor						
Temperatures	-	-	-	-	-	
I/O	-	-	-	-	-	
Power Supply	-	-	-	-	-	
Slide-In Drive 1	-	-	-	-	-	
Slide-In Drive 2	-	-	-	-	-	

Table 87: 815E Baseboard/Panel Features Profile Setting Overview

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Software

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	-	-	-	-	-	
Legacy Devices						
COM C	Disabled	Disabled	Disabled	Enabled	Enabled	
Base I/O Address	-	-	-	3E8h	3E8h	
Interrupts	-	-	-	11	11	
COM D	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O Address	-	-	-	-	-	
Interrupts	-	-	-	-	-	
COM E	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O Address	-	-	-	-	-	
Interrupts	-	-	-	-	-	
LPT	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O Address	-	-	-	-	-	
CAN	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O Address	-	-	-	-	-	
Interrupts	-	-	-	-	-	
2nd LAN Controller	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 87: 815E Baseboard/Panel Features Profile Setting Overview (cont.)

1.10.3 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 88: 815E Security Profile Setting Overview

1.10.4 Power

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Enable ACPI	Yes	Yes	Yes	Yes	Yes	
Power Savings	Disabled	Disabled	Disabled	Disabled	Disabled	
Standby Timeout	-	-	-	-	-	
Auto Suspend Timeout	-	-	-	-	-	
Hard Disk Timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Video Timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Resume On Modem Ring	Off	Off	Off	Off	Off	
Resume On Time	Off	Off	Off	Off	Off	
Resume Time	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	
Power Supply	ATX	ATX	ATX	ATX	ATX	
Power Button Function	Power Off	Power Off	Power Off	Power Off	Power Off	
Power Loss Control	Power On	Power On	Power On	Power On	Power On	
ACPI Control						
Active Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Passive Cooling Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Critical Trip Point	110°C	110°C	110°C	110°C	110°C	
APIC - IO APIC Mode	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Native IDE Support	Disabled	Disabled	Disabled	Disabled	Disabled	
Thermal Management						
Auto Thermal Throttling	Enabled	Enabled	Enabled	Enabled	Enabled	
Temperature	100°C	100°C	100°C	100°C	100°C	
Hysteresis	5°C	5°C	5°C	5°C	5°C	
CPU Performance	50%	50%	50%	50%	50%	

Table 89: 815E Power Profile Setting Overview

Chapter 4
Software

1.10.5 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**	-	-	-	
8:	-	-	-	-	-	
Excluded from boot order						
:	IDE 2	IDE 2	IDE 2	IDE 2	IDE 2	
:	IDE 3	IDE 3	IDE 3	IDE 3	IDE 3	
:	USB HDD	USB HDD	USB HDD	USB HDD	USB HDD	
:	USB ZIP	USB ZIP	USB ZIP	USB ZIP	USB ZIP	
:	USB LS120	USB LS120	USB LS120	USB LS120	USB LS120	
:	PCI BEV	**PCI SCSI**	PCI BEV	PCI BEV	PCI BEV	
:	PCI SCSI	**Bootable Add-in Cards**	PCI SCSI	PCI SCSI	PCI SCSI	
:	Bootable Add-in Cards		Bootable Add-in Cards	Bootable Add-in Cards	Bootable Add-in Cards	

Table 90: 815E Boot Profile Setting Overview

2. 855GME BIOS Description

Information:

- **The following diagrams and BIOS menu items including descriptions refer to BIOS Version R110. Therefore, it is possible that these diagrams and BIOS descriptions might not correpsond with the installed BIOS version.**

- **The SETUP defaults are the settings recommended by B&R. The setup defaults are dependant on the configuration of the DIP switches on the baseboard (see Section 2.10 "Profile Overview" on Page 178).**

2.1 General Information

BIOS stands for "Basic Input Output System." It is the most basic standardized connection 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.

2.2 BIOS Setup

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

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

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

"Press <F2> to enter SETUP"

```
PhoenixBIOS 4.0 Release 6.1
Copyright 1985-2003 Phoenix Technologies Ltd.
All Rights Reserved
<0BR1R110> Bernecker + Rainer Industrie-Elektronik B1.10


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 65: 855GME BIOS R110 Diagnostic Screen

2.2.1 Summary Screen

After the POST the Summary screen displays the most importand system characteristics.

```
                    PhoenixBIOS Setup Utilitiy

CPU Type          : Mobile Genuine Intel(R) processor        1100MHz
CPU Speed         : 1100 MHz
                                    System ROM    : E5A9 - FFFF
System Memory     : 640 KB          BIOS Date     : 10/11/04
Extended Memory   : 514048 KB
Shadow Ram        : 384 KB          COM Ports     : 0378 02F8
Cache Ram         : 1024 KB         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 66: 855GME BIOS R110 Summary Screen

2.3 BIOS Setup Keys

The following keys are active during the POST:

Key	Function
F2	Enters the BIOS setup menu.
ESC	Cues the Bootmenu. Lists all bootable devices that are connected to the system. With cursor ↑ and cursor ↓ and by pressing <ENTER> is booted by this device.
<spacebar>	Pressing the spacebar skips the system RAM check.
<Pause >	Pressing the <Pause> key stopps the POST. Press any other key to resume the POST.

Table 91: 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 edge of the current BIOS setup page.
PgDn ↓	Moves the cursor to the bottom edge 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 chosen BIOS setting.
<F6> or <+> or <spacebar>	Scrolls to the next option for the chosen 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 92: Keys relevant to BIOS

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

BIOS Setup Menu Item	Function	From Page
Main	The basic system configurations (eg. time, date, hard disk parameters) can be set in this menu.	138
Advanced	Advanced BIOS options such as cache areas, PnP and keyboard repeat rate etc. can be configured here.	147
Security	For setting up the system's security functions.	170
Power	Setup of various APM (Advanced Power Management) options.	172
Boot	The boot order can be set here.	175
Exit	To end the BIOS setup.	176

Table 93: Overview of BIOS menu items

2.4 Main

```
 0BR1                      PhoenixBIOS Setup Utility                   R110
   Main      Advanced      Security      Power      Boot      Exit

                                                    ┌─────────────────────────┐
                                                    │  Item Specific Help     │
     System Time:              [08:48:25]           │                         │
     System Date:              [10/11/2004]         │                         │
                                                    │ <Tab>, <Shift-Tab>,     │
   ▶ Primary Master            [None]               │ or <Enter> selects      │
   ▶ Primary Slave             [FUJITSU MHT2030AR-(PS]│ field.                │
   ▶ Primary Master            [None]               │                         │
   ▶ Primary Slave             [CD-224E-(SS)]       │                         │
                                                    │                         │
     SMART Device Monitoring:  [Enabled]            │                         │
                                                    │                         │
     System Memory:            640 KB               │                         │
     Extended Memory:          502 MB               │                         │
                                                    │                         │
                                                    │                         │
                                                    │                         │
                                                    └─────────────────────────┘

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

Figure 67: 855GME Main

BIOS Setting	Description	Configuration Possibilities	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 139.
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 141.
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 143.

Table 94: 855GME Main Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
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 145.
Smart Device Monitoring	S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) is implemented in modern 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 94: 855GME Main Configuration Possibilities (cont.)

2.4.1 Primary Master

```
0BR1                  PhoenixBIOS Setup Utility              R110

   Main

         Primary Master [None]              Item Specific Help

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


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

Figure 68: 855GME Primary Master Setup

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BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the primary master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

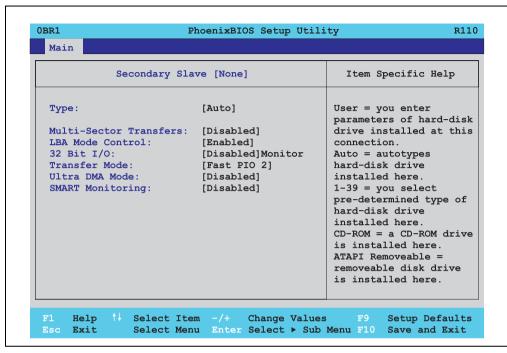Table 95: 855GME Primary Master Configuration Possibilities

2.4.2 Primary Slave

```
0BR1                    PhoenixBIOS Setup Utility                    R110
  Main

           Primary Slave [None]                   Item Specific Help

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


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

Figure 69: 855GME Primary Slave Setup

BIOS Setting	Description	Configuration Possibilities	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 96: 855GME Primary Slave Configuration Possibilities

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BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the primary slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 96: 855GME Primary Slave Configuration Possibilities (cont.)

2.4.3 Secondary Master

```
0BR1                  PhoenixBIOS Setup Utility                R110
  Main

            Secondary Master [None]              Item Specific Help

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


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

Figure 70: 855GME Secondary Master Setup

BIOS Setting	Description	Configuration Possibilities	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 97: 855GME Secondary Master Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the secondary master drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 97: 855GME Secondary Master Configuration Possibilities (cont.)

2.4.4 Secondary Slave

```
0BR1                    PhoenixBIOS Setup Utility                    R110
  Main

                Secondary Slave [None]              Item Specific Help

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

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

Figure 71: 855GME Secondary Slave Setup

BIOS Setting	Description	Configuration Possibilities	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 98: 855GME Secondary Slave Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	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 the 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 Configuration Option for UDMA Mode.
SMART Monitoring	Indicates whether the secondary slave drive supports SMART technology.	Disabled	No drive support, and function is deactivated.
		Enabled	Drive support present, and function is activated.

Table 98: 855GME Secondary Slave Configuration Possibilities (cont.)

2.5 Advanced

```
0BR1                    PhoenixBIOS Setup Utility              R110
   Main       Advanced     Security     Power     Boot     Exit

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




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

Figure 72: 855GME Advanced Setup Menu Overview

BIOS Setup Menu	Description	Configuration Possibilities	Effect
Advanced Chipset Control	Setup of advanced chipset features.	Enter	Opens submenu see "Advanced Chipset Control", on page 148.
PCI/PNP Configuration	Configures PCI devices.	Enter	Opens submenu see "PCI/PNP Configuration", on page 149.
Memory Cache	Configuration of the memory cache resources.	Enter	Opens submenu see "Memory Cache", on page 156.
I/O Device Configuration	Configuration of the I/O devices.	Enter	Opens submenu see "I/O Device Configuration", on page 158.
Keyboard Features	Configuration of the keyboard options.	Enter	Opens submenu see "Keyboard Features", on page 160.
CPU Board Monitor	Displays the current voltages and temperature of the processor in use.	Enter	Opens submenu see "CPU Board Monitor", on page 161.
Miscellaneous	Configuration of various BIOS settings (summary screen, halt on errors, etc...).	Enter	Opens submenu see "Miscellaneous", on page 162.
Baseboard/Panel Features	Display of device specific information and setup of device specific values.	Enter	Opens submenu see "Baseboard/Panel Features", on page 164.

Table 99: 855GME Advanced Menu Configuration Possibilities

2.5.1 Advanced Chipset Control

```
 0BR1                    PhoenixBIOS Setup Utility                    R110
         Advanced

        Advanced Chipset Control                 Item Specific Help

    Enable memory gap:          [Disabled]       If enabled, turn system
                                                 RAM off to free address
    IGD - Device 2:             [Enabled]        space for use with an
    IGD - Device 2, Function 1: [Enabled]        option card. Either a
    IGD - Memory Size:          [UMA = 8MB]      device. Select either
                                                 128KB conventional
                                                 memory gap, starting at
                                                 512KB, or a 1MB
                                                 extended memory gap,
                                                 starting at 15 MB, will
                                                 be created in system
                                                 RAM.




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

Figure 73: 855GME Advanced Chipset Control

BIOS Setting	Description	Configuration Possibilities	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) .
IGD - Device 2	For turning the internal graphics controller on and off.	Enabled	Activate graphic controller.
		Disabled	Disable graphics controller. **Warning!** **Activation of onboard video controller is necessary to make video output possible. Deactivate only for use of an external PCI graphics card.**
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	For setting how much of the main memory (in MB) the graphics controller can use.	UMA = 1MB, 8MB, 16MB or 32MB	x MB main memory to be used by the graphics controller.

Table 100: 855GME Advanced Chipset Control Configuration Possibilities

2.5.2 PCI/PNP Configuration

```
0BR1                   PhoenixBIOS Setup Utility                R110
              Advanced

            PCI/PNP Configuration                Item Specific Help

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

▶ PCI/PNP ISA IRQ Resource Exclusion
  Default Primary Video Adapter:     [PCI]

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

Figure 74: 855GME PCI/PNP Configuration

BIOS Setting	Description	Configuration Possibilities	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 entrys (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 101: 855GME PCI/PNP Configuration Possibilities

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BIOS Setting	Description	Configuration Possibilities	Effect
PCI Device, Slot #1	Advanced configuration of the PCI slot number 1.	Enter	Opens submenu See "PCI Device, Slot #1", on page 151
PCI Device, Slot #2	Advanced configuration of the PCI slot number 2.	Enter	Opens submenu See "PCI Device, Slot #2", on page 152
PCI Device, Slot #3	Advanced configuration of the PCI slot number 3.	Enter	Opens submenu See "PCI Device, Slot #3", on page 153
PCI Device, Slot #4	Advanced configuration of the PCI slot number 4.	Enter	Opens submenu See "PCI Device, Slot #4", on page 154
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 155

Table 101: 855GME PCI/PNP Configuration Possibilities (cont.)

BIOS Setting	Description	Configuration Possibilities	Effect
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 101: 855GME PCI/PNP Configuration Possibilities (cont.)

PCI Device, Slot #1

```
1BR1                    PhoenixBIOS Setup Utility                R110
        Advanced

            PCI Device, Slot #1                  Item Specific Help

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




    F1   Help    ↑↓  Select Item  -/+  Change Values     F9   Setup Defaults
    Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
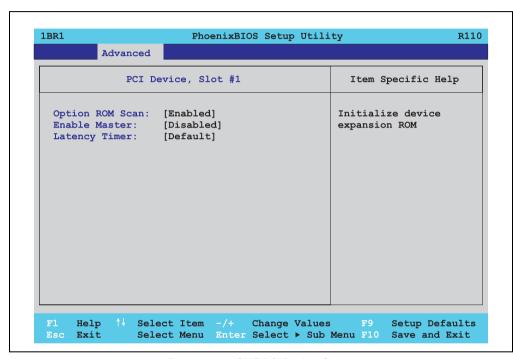
Figure 75: 855GME PCI Device, Slot #1

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 102: 855GME PCI Device, Slot #1 Configuration Possibilities

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Software

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 102: 855GME PCI Device, Slot #1 Configuration Possibilities

PCI Device, Slot #2


```
1BR1                      PhoenixBIOS Setup Utility              R110
        Advanced

              PCI Device, Slot #2                 Item Specific Help

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




    F1   Help    ↑↓  Select Item  -/+  Change Values   F9   Setup Defaults
    Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
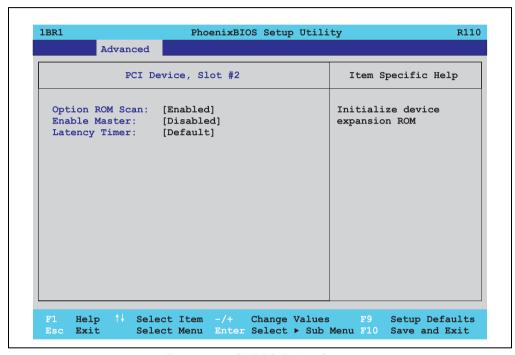
Figure 76: 855GME PCI Device, Slot #2

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 103: 855GME PCI Device, Slot #2 Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 103: 855GME PCI Device, Slot #2 Configuration Possibilities

PCI Device, Slot #3

```
1BR1                  PhoenixBIOS Setup Utility              R110
        Advanced

            PCI Device, Slot #3                  Item Specific Help

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




    F1   Help    ↑↓  Select Item  -/+   Change Values     F9    Setup Defaults
    Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10   Save and Exit
```
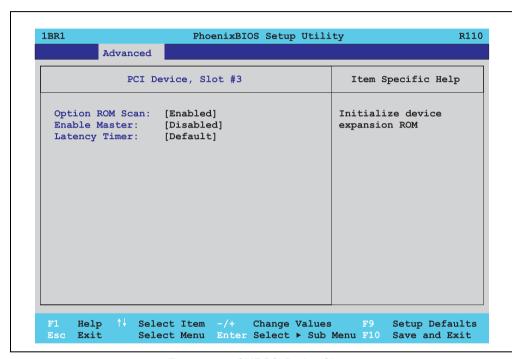
Figure 77: 855GME PCI Device, Slot #3

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 104: 855GME PCI Device, Slot #3 Configuration Possibilities

Chapter 4
Software

BIOS Setting	Description	Configuration Possibilities	Effect
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 104: 855GME PCI Device, Slot #3 Configuration Possibilities (cont.)

PCI Device, Slot #4

```
1BR1                    PhoenixBIOS Setup Utility                R110
        Advanced

            PCI Device, Slot #4                 Item Specific Help

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




    F1   Help    ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults
    Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
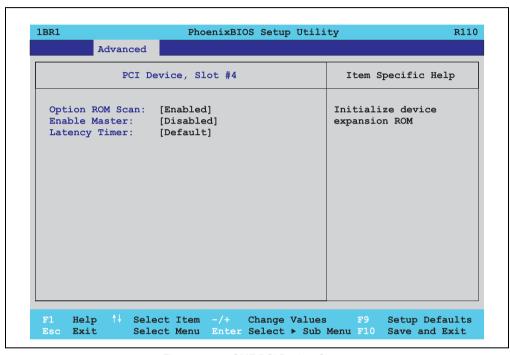
Figure 78: 855GME PCI Device, Slot #4

BIOS Setting	Description	Configuration Possibilities	Effect
Option ROM Scan	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.

Table 105: 855GME PCI Device, Slot #4 Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
Latency Timer	This option controlls 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 105: 855GME PCI Device, Slot #4 Configuration Possibilities (cont.)

PCI/PNP ISA IRQ Resource Exclusion


```
0BR1                    PhoenixBIOS Setup Utility                   R110
      Advanced

     PCI/PNP ISA IRQ Resource Exclusion           Item Specific Help


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




  F1   Help    ↑↓  Select Item  -/+  Change Values   F9   Setup Defaults
  Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
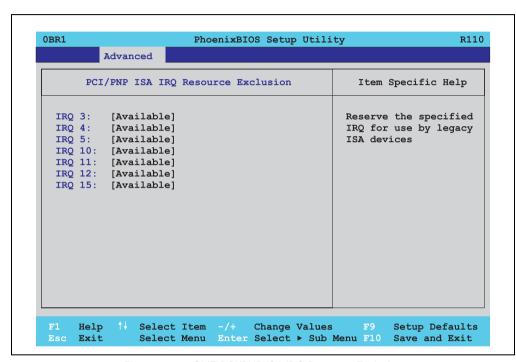
Figure 79: 855GME PCI/PNP ISA IRQ Resource Exclusion

BIOS Setting	Description	Configuration Possibilities	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.

Table 106: 855GME PCI/PNP ISA IRQ Resource Exclusion Configuration Possibilities

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Software

BIOS Setting	Description	Configuration Possibilities	Effect
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.
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 106: 855GME PCI/PNP ISA IRQ Resource Exclusion Configuration Possibilities (cont.)

2.5.3 Memory Cache


```
0BR1                    PhoenixBIOS Setup Utility              R110
          Advanced

               Memory Cache                    Item Specific Help

   Memory Cache:            [Enabled]          Sets the state of the
   Cache System BIOS area:  [Write Protect]    memory cache.
   Cache Video BIOS area    [Write Protect]
   Cache 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 80: 855GME Memory Cache

BIOS Setting	Description	Configuration Possibilities	Effect
Memory Cache	Enable/ disable utilization of the L2 cache.	Enabled	Activates the function.
		Disabled	Deactivates the function.

Table 107: 855GME Memory Cache Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
Cache System BIOS Area	Set whether or not the system BIOS should be buffered.	Write Protect	System BIOS is mapped in the cache.
		Uncached	System BIOS is not mapped in the cache.
Cache Video BIOS Area	Set whether or not the video BIOS should be buffered.	Write Protect	Video BIOS is mapped in the cache.
		Uncached	Video BIOS is not mapped in the cache.
Cache Base 0-512k	Set whether the memory content should be mapped in the cache (0-512k), and when necessary, written in the main memory.	Uncached	No mapping.
		Write Through	Memory content is simultaneously mapped in the cache and written to the main memory.
		Write Protect	Memory content is mapped in the cache.
		Write Back	Memory content is mapped only when necessary.
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 107: 855GME Memory Cache Configuration Possibilities (cont.)

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2.5.4 I/O Device Configuration

```
 0BR1                      PhoenixBIOS Setup Utility                    R110
                  Advanced

            I/O Device Configuration              Item Specific Help

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

       Serial port A:                [Enabled]
         Base I/O address:           [3F8]
         Interrupt:                  [IRQ 4]
       Serial port B:                [Enabled]
         Mode:                       [Normal]
         Base I/O address:           [2F8]
         Interrupt:                  [IRQ 3]
       Parallet 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 81: 855GME I/O Device Configuration

BIOS Setting	Description	Configuration Possibilities	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 108: 855GME I/O Device Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
USB UHCI Host Controller 1	Configuration of the USB UHCI controller 1 for USB port 0 und 1.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI Host Controller 2	Configuration of the USB UHCI controller 1 for USB port 2 and 3. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
USB UHCI Host Controller	Configuration of the USB EHCI controller. Can only be configured if the USB UHCI controller 1 is activated.	Disabled	Deactivates the USB support.
		Enabled	Activates the USB support.
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 on and off.	Disabled	Deactivates the LAN Controller.
		Enabled	Activates the LAN Controller.
Onboard LAN PXE ROM	For turning the remote boot BIOS extension for the on-board LAN controller 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.
		Auto	First BIOS and then the operating system configure 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	Selected base I/O address is assigned.
Interrupts	Selection of the interrupt for port A. A yellow star indicates a conflict with another device.	IRQ 3, IRQ 4	Selected interrupt is assigned.
Serial Port B	For the configuration of serial port B (COM2).	Disabled	Port A deactivated.
		Enabled	Port A activated. The base I/O addresses and the interrupt must then be configured.
		Auto	First BIOS and then the operating system configure the port automatically.
Modes	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 assigned.

Table 108: 855GME I/O Device Configuration Possibilities (cont.)

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BIOS Setting	Description	Configuration Possibilities	Effect
Interrupts	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 configurating 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	Selected base I/O address is assigned.

Table 108: 855GME I/O Device Configuration Possibilities (cont.)

2.5.5 Keyboard Features

```
0BR1                    PhoenixBIOS Setup Utility              R110
            Advanced

            Keyboard Features                  Item Specific Help

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




   F1   Help    ↑↓  Select Item  -/+  Change Values   F9   Setup Defaults
   Esc  Exit        Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
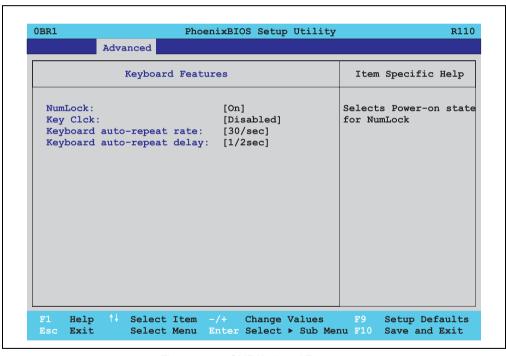
Figure 82: 855GME Keyboard Features

BIOS Setting	Description	Configuration Possibilities	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.
Key Click	Using this option, the clicking of the keys can be turned on or off.	Disabled	Activates the function.
		Enabled	Deactivates 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 charactes 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 109: 855GME Keyboard Features Configuration Possibilities

2.5.6 CPU Board Monitor

```
0BR1                    PhoenixBIOS Setup Utility              R110
         Advanced

            CPU Board Monitor                  Item Specific Help


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










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

Figure 83: 855GME CPU Board Monitor

BIOS Setting	Description	Configuration Possibilities	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 celcius and fahrenheit).	None	

Table 110: 855GME CPU Board Monitor Configuration Possibilities

2.5.7 Miscellaneous

```
0BR1                    PhoenixBIOS Setup Utility                    R110
        Advanced

              Miscellaneous                   Item Specific Help

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




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

Figure 84: 855GME Miscellaneous

BIOS Setting	Description	Configuration Possibilities	Effect
Summary Screen	Set whether or not the system summary screen should open when the system is started (see figure 66 "855GME BIOS R110 Summary Screen" on Page 136).	Enabled	Activates the function.
		Disabled	Deactivates the function.

Table 111: 855GME Miscellaneous Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
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 diagnostic screen (see figure 65 "855GME BIOS R110 Diagnostic Screen" on Page 136) should be displayed when the system is started.	Enabled	Activates the function. The diagnostic screen is displayed.
		Disabled	Deactivates the function. The diagnostic 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, andmore than 63 sectors per track. Configuration Possibilities: DOS	Other	For non-compatible access (eg. Novell, SCO Unix.)
		DOS	For MS DOS compatible access.

Table 111: 855GME Miscellaneous Configuration Possibilities

2.5.8 Baseboard/Panel Features

```
 0BR1                      PhoenixBIOS Setup Utility                    R110
            Advanced

                   Baseboard/Panel Features              Item Specific Help

     ▶ Panel Control
     ▶ Baseboard Monitor
     ▶ Legacy Devices

       Versions
         BIOS:            R110
         MTCX:            V1.19
         FPGA:            V1.06

       Optimized ID:      00000001b
       Device ID:         00001BB7h
       Compatibility ID:  0000h
       Serial Number:     70950168449
       Product Name:      System 2PCI 1DD
       User Serial ID:    00000000h


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

Figure 85: 855GME Baseboard/Panel Features

BIOS Setting	Description	Configuration Possibilities	Effect
Panel Control	For special setup of connected panels.	Enter	Opens submenu see "Panel Control", on page 165.
Baseboard Monitor	Display of various temperatures and fan rpms.	Enter	Opens submenu see "Baseboard Monitor", on page 167.
Legacy Devices		Enter	Opens submenu see "Legacy Devices", on page 168.
BIOS	Displays the BIOS version.	None	
MTCX PX32	Displays the MTCX PX32 firmware virsion.	None	
MTCX FPGA	Displays the MTCX FPGA firmware virsion.	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	

Table 112: 855GME Baseboard/Panel Features Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
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 112: 855GME Baseboard/Panel Features Configuration Possibilities (cont.)

Panel Control

```
0BR1                    PhoenixBIOS Setup Utility                   R110
      Advanced

              Panel Control                   Item Specific Help

  Graphic Engine 1:       [Auto]
    Default Flat Panel:   [XGA]
    Flat Panel Scaling:   [Centered]

  Graphic Engine 2:       [Auto]

  Select Panel Number:    [ 0]
    Version:              V0.00
    Brightness:           [ 50%]
    Temperature:          00°C/32°F
    Fan Speed:            00 RPM
    Keys/Leds:            00/00




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

Figure 86: 855GME Panel Control

BIOS Setting	Description	Configuration Possibilities	Effect
Graphic Engine 1	Setting for the resolution of the connected panel .	Auto	Automatic setting of the resolution (using a read-out of the panel's EDID data).
Default Flat Panel	For setting the resolution of a connected panel.	VGA, SVGA, XGA, XGA2, SXGA, UXGA	Manual configuration of the resolution.

Table 113: 855GME Panel Control Configuration Possibilities

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BIOS Setting	Description	Configuration Possibilities	Effect
Flat Panel Scaling	For setting whether the video signal should be centered on the panel (stamp format), or fill the entire display.	Centered	Display is centered.
		Stretched	Display is stretched to fit screen.
Graphic Engine 2	-	Auto	-
Select Panel Number	Selects panel to be changed, and displays possible values for the panel.	0 ... 15	Selection of panel 0 ... 15. Panel 15 is specifically intended for panel PC 700 systems.
Version	Display of the firmware version of the SDLR controller.	None	
Brightness	For setting the brightness of the selected panel.	0%, 25%, 50%, 75%, 100%	Brightness settings in %. Changes take effect after saving and restarting the system (eg. by pressing <F10>).
Temperature	Displays temperature of the selected panel.	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 113: 855GME Panel Control Configuration Possibilities (cont.)

Baseboard Monitor

```
0BR1                    PhoenixBIOS Setup Utility              R110
          Advanced

                    Baseboard Monitor              Item Specific Help

       Temperatures
         I/O:              36°C/97°F
         Power Supply:     00°C/32°F
         Slide-In Drive 1: 25°C/77°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
```
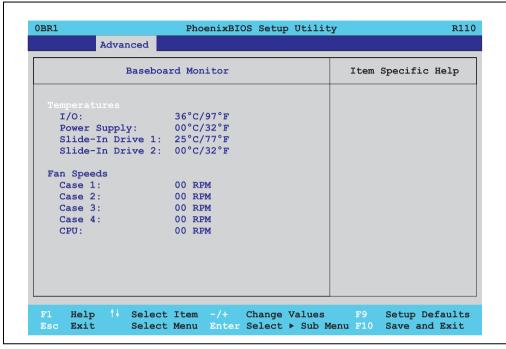
Figure 87: 855GME Baseboard Monitor

BIOS Setting	Description	Configuration Possibilities	Effect
I/O	Displays the temperature in the I/O area in degrees celsius and fahrenheit.	None	
Power supply	Displays the temperature in the power supply area in degrees celsius and fahrenheit.	None	
Slide-In Drive 1	Displays the temperature of the Slide-In drive 25.40 mm degrees celsius and fahrenheit.	None	
Slide-In Drive 2	Displays the temperature of the Slide-In drive 2 in degrees celsius and fahrenheit.	None	
Case 1	Displays the fan 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 114: 855GME Baseboard Monitor Configuration Possibilities

Legacy Devices

```
 0BR1                    PhoenixBIOS Setup Utility              R110
              Advanced

              Legacy Devices                    Item Specific Help

     COM C:                 [Enabled]
       Base I/O address:    [2E8]
       Interrupt:           [IRQ 3]
     COM D:                 [Disabled]
     COM E:                 [Disabled]
     LPT:                   [Enabled]
       Base I/O address:    [278]
     CAN:                   [Enabled]
       Base I/O address:    384/385h
       Interrupt:           [IRQ 10]

     2nd LAN controller:    [Enabled]


 F1   Help     ↑↓  Select Item  -/+   Change Values    F9   Setup Defaults
 Esc  Exit         Select Menu  Enter Select ▶ Sub Menu F10  Save and Exit
```
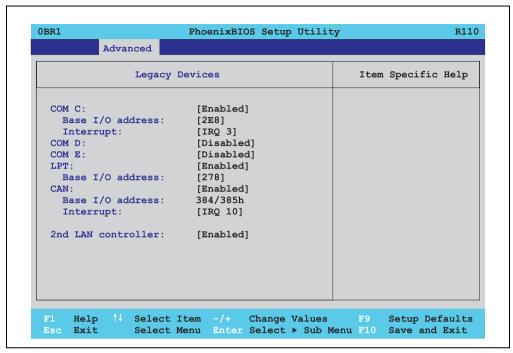
Figure 88: 855GME Legacy Devices

BIOS Setting	Description	Configuration Possibilities	Effect
COM C	Settings for the internal serial interfaces in the system. This interface activates the touch screen in panel PC 700 systems, and, using SDL and LDL 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.
Interrupts	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.

Table 115: 855GME Legacy Devices Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
Base I/O address	Configuration of the base I/O address for the serial COM D port. A yellow star indicates a conflict with another device.	238, 2E8, 2F8, 328, 338, 3E8, 3F8	Selected base I/O address is assigned.
Interrupts	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.
Interrupts	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	-
Interrupts	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 115: 855GME Legacy Devices Configuration Possibilities (cont.)

Chapter 4
Software

2.6 Security

```
0BR1                   PhoenixBIOS Setup Utility                 R110
   Main      Advanced    Security    Power     Boot     Exit

                                              Item Specific Help

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

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


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

Figure 89: 855GME Security Menu

BIOS Setting	Description	Configuration Possibilities	Effect
Supervisor Password Is	Displays whether or not a supervisor password has been set.	None	Display **Set**: A supervisor password has been set. Display **Clear**: No supervisor password has been set.
User Password Is	Displays whether or not a user password has been set.	None	Display **Set**: A user password has been set. Display **Clear**: No user password has been set.
Set Supervisor Password	To enter/change a supervisor password. A supervisor password is necessary to edit all BIOS settings.	Enter maximum 7 alphanumeric characters - not case sensitive.	Press Enter and enter password two times. The password must be 7 alphanumeric characters or less. Needed to enter 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 116: 855GME Security Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	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 116: 855GME Security Configuration Possibilities (cont.)

Chapter 4
Software

2.7 Power

```
0BR1                    PhoenixBIOS Setup Utility                R110
   Main      Advanced      Security      Power      Boot      Exit

                                                 Item Specific Help

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

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

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

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


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

Figure 90: 855GME Power Menu

BIOS Setting	Description	Configuration Possibilities	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 174
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.

Table 117: 855GME Power Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
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.
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 elecricity. 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 117: 855GME Power Configuration Possibilities (cont.)

2.7.1 ACPI Control

```
0BR1                    PhoenixBIOS Setup Utility              R110
                                Power

           ACPI Control                    Item Specific Help

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




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

Figure 91: 855GME ACPI Control

BIOS Setting	Description	Configuration Possibilities	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. **Warning!** **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 118: 855GME ACPI Control Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	Effect
APIC - IO APIC Mode	This option controlls 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 118: 855GME ACPI Control Configuration Possibilities

2.8 Boot

```
0BR1                    PhoenixBIOS Setup Utility                  R110
   Main      Advanced      Security      Power     Boot     Exit

                                            Item Specific Help

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

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

Figure 92: 855GME Boot Menu

BIOS Setting	Description	Configuration Possibilities	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 119: 855GME Boot Configuration Possibilities

2.9 Exit

```
1BR1                    PhoenixBIOS Setup Utility                R110
   Main      Advanced      Security      Power      Boot      Exit

                                              Item Specific Help

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




  F1   Help    ↑↓   Select Item  -/+   Change Values    F9   Setup Defaults
  Esc  Exit         Select Menu  Enter Execute Command  F10  Save and Exit
```
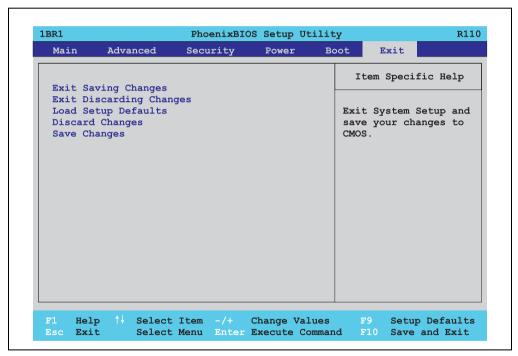
Figure 93: 855GME Exit Menu

BIOS Setting	Description	Configuration Possibilities	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 120: 855GME Exit Configuration Possibilities

BIOS Setting	Description	Configuration Possibilities	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 120: 855GME Exit Configuration Possibilities

Chapter 4
Software

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 3.9 "Position of the DIP Switch for APC620 System Units" on Page 197).

Figure 94: DIP Switch on System Unit

The first six DIP switches (1-6) are used to set the profiles. The rest (7,8) are reserved.

Number	Optimized for	DIP Switch Setting							
		1	2	3	4	5	6	7[1]	8[1]
Profile 0	Automation PC 620 System units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	On	Off	Off	Off	Off	Off	-	-
Profile 2	Automation PC 620 System units 5PC600.SX02-00, 5PC600.SX02-01, 5PC600.SX05-00 and 5PC600.SX05-01.	Off	On	Off	Off	Off	Off	-	-
Profile 3	Panel PC 700 System unit 5PC720.1043-00 and 5PC720.1505-00.	On	On	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 System unit 5PC720.1043-01 and 5PC720.1505-01.	Off	Off	On	Off	Off	Off	-	-

Table 121: 855GME Profie Overview

1) Reserved.

The following pages provide an overview of the BIOS default settings for the different DIP switch configurations.

Personal Settings

If changes have been made to the BIOS defaults, they can be entered in the following tabels for backup.

2.10.1 Main

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
System Time	-	-	-	-	-	
System Date	-	-	-	-	-	
SMART Device Monitoring	Enabled	Enabled	Enabled	Enabled	Enabled	
Primary Master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Primary Slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Secondary Master						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	
Secondary Slave						
Type	Auto	Auto	Auto	Auto	Auto	
Multi-Sector Transfer	-	-	-	-	-	
LBA Mode Control	-	-	-	-	-	
32 Bit I/O	Disabled	Disabled	Disabled	Disabled	Disabled	
Transfer Mode	-	-	-	-	-	
Ultra DMA Mode	-	-	-	-	-	
SMART Monitoring	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 122: 855GME Main Configuration Possibilities

Chapter 4
Software

2.10.2 Advanced

Advanced Chipset Control

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Enable memory gap	Disabled	Disabled	Disabled	Disabled	Disabled	
IGD - Device 2	Enabled	Enabled	Enabled	Enabled	Enabled	
IGD - Device 2, Function 1	Enabled	Enabled	Enabled	Enabled	Enabled	
IGD - Memory Size	UMA = 8MB	UMA = 8MB	UMA = 8MB	UMA = 8MB	UMA = 8MB	

Table 123: 855GME Advanced Chipset Control Profile Setting Overview

PCI/PNP Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
PNP OS Installed	Yes	Yes	Yes	Yes	Yes	
Reset Configuration Data	No	No	No	No	No	
Secured Setup Configuration	Yes	Yes	Yes	Yes	Yes	
PCI IRQ line 1	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
PCI IRQ line 2	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
PCI IRQ line 3	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
PCI IRQ line 4	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
Onboard LAN IRQ Line	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
Onboard USB EHCI IRQ Line	Auto-Select	Auto-Select	Auto-Select	Auto-Select	Auto-Select	
Default Primary Video Adapter	PCI	PCI	PCI	PCI	PCI	
PCI Device, Slot #1						
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	
PCI Device, Slot #2						
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	
PCI Device, Slot #3						
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	

Table 124: 855GME PCI/PNP Configuration Profile Setting Overview

PCI Device, Slot #4	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Option ROM Scan	Enabled	Enabled	Enabled	Enabled	Enabled	
Enable Master	Disabled	Disabled	Disabled	Disabled	Disabled	
Latency Timer	Default	Default	Default	Default	Default	
PCI/PNP ISA IRQ Resource Exclusion						
IRQ 3	Available	Available	Available	Available	Available	
IRQ 4	Available	Available	Available	Available	Available	
IRQ 5	Available	Available	Available	Available	Available	
IRQ 7	Available	Available	Available	Available	Available	
IRQ 9	Available	Available	Available	Available	Available	
IRQ 10	Available	Available	Available	Available	Available	
IRQ 11	Available	Available	Available	Available	Available	
IRQ 12	Available	Available	Available	Available	Available	
IRQ 15	Available	Available	Available	Available	Available	

Table 124: 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 125: 855GME Memory Cache Profile Setting Overview

Chapter 4
Software

I/O Device Configuration

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Local Bus IDE adapter	Primary	**Both**	**Both**	Primary	**Both**	
Primary IDE UDMA66/100	Enabled	Enabled	Enabled	Enabled	Enabled	
Secondary IDE UDMA66/100	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI Host Controller 1	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI Host Controller 2	Enabled	Enabled	Enabled	Enabled	Enabled	
USB UHCI Host Controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Legacy USB Support	Enabled	Enabled	Enabled	Enabled	Enabled	
AC97 Audio Controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN Controller	Enabled	Enabled	Enabled	Enabled	Enabled	
Onboard LAN PXE ROM	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Serial port A	Enabled	Enabled	Enabled	Enabled	Enabled	
Base I/O address	3F8	3F8	3F8	3F8	3F8	
Interrupts	IRQ 4	IRQ 4	IRQ 4	IRQ 4	IRQ 4	
Serial port B	Enabled	Enabled	Enabled	Enabled	Enabled	
Modes	Normal	Normal	Normal	Normal	Normal	
Base I/O address	3F8	3F8	3F8	3F8	3F8	
Interrupts	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 126: 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 127: 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 128: 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 129: 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	-	-	-	-	-	
Device ID	-	-	-	-	-	
Compatibility ID	-	-	-	-	-	
Serial Number	-	-	-	-	-	
Product Name	-	-	-	-	-	
User Serial ID	-	-	-	-	-	
Panel Control						
Graphic Engine 1	Auto	Auto	Auto	Auto	Auto	
Default Flat Panel	XGA	XGA	XGA	XGA	XGA	
Flat Panel Scaling	Stretched	Stretched	Stretched	Stretched	Stretched	
Graphic Engine 2	Auto	Auto	Auto	Auto	Auto	

Table 130: 855GME Baseboard/Panel Features Profile Setting Overview

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Software

Panel Control	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Select Panel Number	0	0	0	0	0	
Version	-	-	-	-	-	
Brightness	50 %	50 %	50 %	50 %	50 %	
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**	
Interrupts	-	-	-	**11**	**11**	
COM D	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupts	-	-	-	-	-	
COM E	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupts	-	-	-	-	-	
LPT	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
CAN	Disabled	Disabled	Disabled	Disabled	Disabled	
Base I/O address	-	-	-	-	-	
Interrupts	-	-	-	-	-	
2nd LAN controller	Enabled	Enabled	Enabled	Enabled	Enabled	

Table 130: 855GME Baseboard/Panel Features Profile Setting Overview (cont.)

2.10.3 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 131: 855GME Security Profile Setting Overview

2.10.4 Power

	Profile 0	Profile 1	Profile 2	Profile 3	Profile 4	Personal Settings
Enable ACPI	Yes	Yes	Yes	Yes	Yes	
Max CPU frequency	Dependant on processor	Dependant on processor	Dependant on processor	Dependant on processor	Dependant on processor	
Automatic Thermal Control Circuit	TM2	TM2	TM2	TM2	TM2	
Power Savings	Disabled	Disabled	Disabled	Disabled	Disabled	
Standby Timeout	-	-	-	-	-	
Auto Suspend Timeout	-	-	-	-	-	
Hard Disk Timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Video Timeout	Disabled	Disabled	Disabled	Disabled	Disabled	
Resume On Modem Ring	Off	Off	Off	Off	Off	
Resume On Time	Off	Off	Off	Off	Off	
Resume Time	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	
Power supply	ATX	ATX	ATX	ATX	ATX	
Power Button Function	Power Off	Power Off	Power Off	Power Off	Power Off	
Power Loss Control	Power On	Power On	Power On	Power On	Power On	
ACPI Control						
Active Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Passive Cooling Trip Point	Disabled	Disabled	Disabled	Disabled	Disabled	
Critical Trip Point	110℃	110℃	110℃	110℃	110℃	
APIC - IO APIC Mode	Disabled	**Enabled**	Disabled	Disabled	Disabled	
Native IDE Support	Disabled	Disabled	Disabled	Disabled	Disabled	

Table 132: 855GME Security Profile Setting Overview

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2.10.5 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**	-	-	-	
8:	-	-	-	-	-	
Excluded from boot order						
:	IDE 2	IDE 2	IDE 2	IDE 2	IDE 2	
:	IDE 3	IDE 3	IDE 3	IDE 3	IDE 3	
:	USB HDD	USB HDD	USB HDD	USB HDD	USB HDD	
:	USB ZIP	USB ZIP	USB ZIP	USB ZIP	USB ZIP	
:	USB LS120	USB LS120	USB LS120	USB LS120	USB LS120	
:	PCI BEV	**PCI SCSI**	PCI BEV	PCI BEV	PCI BEV	
:	PCI SCSI	**Bootable Add-in Cards**	PCI SCSI	PCI SCSI	PCI SCSI	
:	Bootable Add-in Cards		Bootable Add-in Cards	Bootable Add-in Cards	Bootable Add-in Cards	

Table 133: 855GME Boot Profile Setting Overview

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 134: CPU Board Software Versions

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

Table 135: Automation Panel Link Software Versions

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)

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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.

3.2.1 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) Celeeron(TM) CPU          733MHz
58M System RAM Passed




Press <F2> to enter SETUP
```

Figure 95: 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 136: Differentiating between 815E and 855GME CPU boards

3.2.2 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):

```
                    PhoenixBIOS Setup Utility
         Advanced

           Baseboard/Panel Features              Item Specific Help

     ▶ Panel Control
     ▶ Baseboard Monitor
     ▶ Legacy Devices

       Versions                  ┌─────────────────────────────┐
         BIOS:          R007     │ System BIOS                 │
         MTCX PX32:     V1.19    │ MTCX PX32 Firmware          │
         MTCX FPGA:     V1.06    │ MTCX FPGA Firmware          │
                                 └─────────────────────────────┘
       Optimized ID:    11111111b
       Device ID:       00001BB7h
       Compatibility ID: 0000h
       Serial Number:   70950168449
       Product Name:    System 2PCI 1DD
       User Serial ID:  00000000h


     F1   Help    ↑↓  Select Item  -/+   Change Features   F9   Setup Defaults
     Esc  Exit        Select Menu  Enter Select  Sub Menu  F10  Save and Exit
```
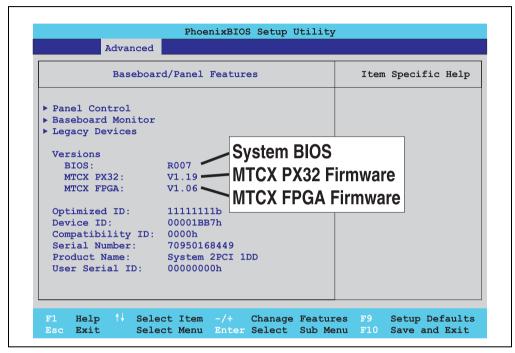
Figure 96: Software versions

3.2.3 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.

```
                    PhoenixBIOS Setup Utility
          Advanced

               Panel Control                    Item Specific Help

     Select Panel Number:  [ 0]

     Version:              V0.03          ──── FPGA firmware for
     Brightness:           [ 50%]              the SDLR Controller
     Temperature:          00°C/32°F
     Fan Speed:            00 RPM
     Keys/Leds:            00/00




     F1   Help   ↑↓  Select Item  -/+   Chanage Features  F9   Setup Defaults
     Esc  Exit       Select Menu  Enter Select  Sub Menu  F10  Save and Exit
```
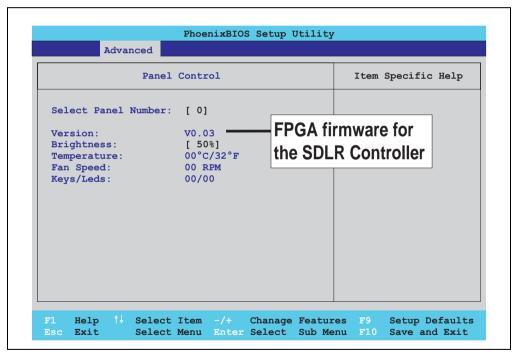
Figure 97: Firmware version of Automation Panel Link SDL Transceiver/Receiver

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 3.8 "Creating a DOS Boot Diskette in Windows XP" on page 196).
- 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 197.

Figure 98: DIP Switch on System Unit (example)

Number	Optimized for device	DIP Switch Setting							
		1	2	3	4	5	6	7[1]	8[1]
Profile 0	Automation PC 620 System units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	On	Off	Off	Off	Off	Off	-	-

Table 137: Profile Overview

Number	Optimized for device	DIP Switch Setting							
		1	2	3	4	5	6	7[1]	8[1]
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 and 5PC720.1505-00.	On	On	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 System unit 5PC720.1043-01 and 5PC720.1505-01.	Off	Off	On	Off	Off	Off	-	-

Table 137: Profile Overview (cont.)

1) Not required. Free.

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 3.8 "Creating a DOS Boot Diskette in Windows XP" on page 196).
- 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, 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 197.

Figure 99: DIP Switch on System Unit (example)

Number	Optimized for device	DIP Switch Setting							
		1	2	3	4	5	6	7[1)	8[1)
Profile 0	Automation PC 620 System units 5PC600.SX01-00.	Off	Off	Off	Off	Off	Off	-	-
Profile 1	Reserved	On	Off	Off	Off	Off	Off	-	-
Profile 2	Automation PC 620 System units 5PC600.SX02-00, 5PC600.SX02-01, 5PC600.SX05-00 and 5PC600.SX05-01.	Off	On	Off	Off	Off	Off	-	-
Profile 3	Panel PC 700 System unit 5PC720.1043-00 and 5PC720.1505-00.	On	On	Off	Off	Off	Off	-	-
Profile 4	Panel PC 700 System unit 5PC720.1043-01 and 5PC720.1505-01.	Off	Off	On	Off	Off	Off	-	-

Table 138: Profile Overview

1) Not required. Free.

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 3.8 "Creating a DOS Boot Diskette in Windows XP" on page 196).
- 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).

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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 lower 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).

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).
- 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.

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).

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 3.6 "Installing the graphic chip driver for 815E CPU boards").

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..."**.
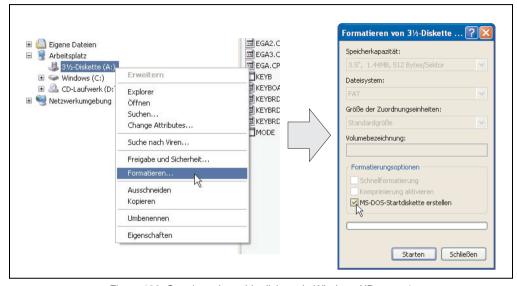
Figure 100: Creating a bootable diskette in Windows XP - step 1

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

Figure 101: Creating a bootable diskette in Windows XP - step 2

Figure 102: 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".
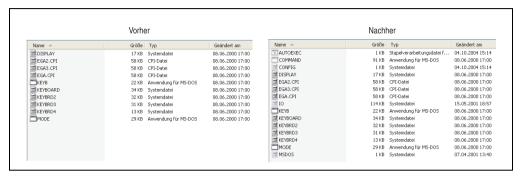
Figure 103: Creating a bootable diskette in Windows XP - step 4
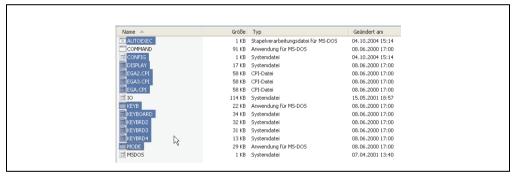
Figure 104: Creating a bootable diskette in Windows XP - step 5

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

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. The DIP switches can then 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.
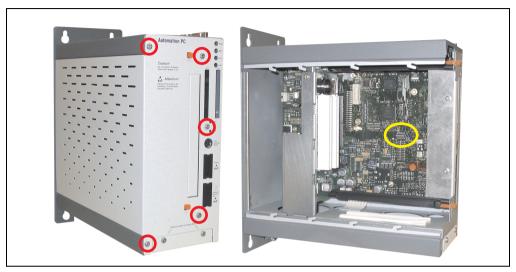
Figure 105: DIP switch position

Chapter 5 • Accessories

1. Overview

Model Number	Short description	Note
0AC201.9	**Lithium Batteries (5x)** Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0TB103.9	**Plug 24V 5.08 3p screw clamps** 24 VDC 3-pin connector, female. Screw clamp, 1.5 mm², protected against vibration by the screw flange.	
0TB103.91	**Plug 24V 5.08 3p cage clamps** 24 VDC 3-pin connector, female. Cage clamps, 2.5 mm², protected against vibration by the screw flange.	
4A0006.00-000	**Lithium Battery (1x)** Lithium battery, 1 piece, 3 V / 950 mAh, button cell	
5A5003.03	**Front cover** Front cover appropriate for the USB 2.0 Media Drive 5MD900.USB2-00.	
5AC600.ICOV-00	APC620 interface covers; 5 pieces	In preparation
5AC900.1000-00	**Adapter DVI-A/m zu CRT DB15HD/f** Adapter DVI (connector) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	
5CFCRD.0032-02	**Compact Flash 32 MB TrueIDE SanDisk/A** Compact Flash card with 32 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0064-02	**Compact Flash 64 MB TrueIDE SanDisk/A** Compact Flash card with 64 MB Flash PROM, and true IDE/ATA interface.	
5CFCRD.0128-02	**Compact Flash 128 MB TrueIDE SanDisk/A** Compact Flash card with 128 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0256-02	**Compact Flash 256 MB TrueIDE SanDisk/A** Compact Flash card with 256 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.0512-02	**Compact Flash 512 MB TrueIDE SanDisk/A** Compact Flash card with 512 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.1024-02	**Compact Flash 1024 MB TrueIDE SanDisk/A** Compact Flash card with 1024 MB Flash PROM, and true IDE/ATA interface	
5CFCRD.2048-02	**Compact Flash 2048 MB TrueIDE SanDisk/A** Compact Flash card with 2048 MB Flash PROM, and true IDE/ATA interface	
5MD900.USB2-00	**USB 2.0 Drive DVD-ROM/CD-RW FDD CF USB** USB 2.0 drive combination, consists of DVD-ROM/CD-RW, FDD, Compact Flash slot (type II), USB connection (type A front, type B back); 24 V DC.	
5MMUSB.0128-00	**USB memory stick 128 MB SanDisk** USB 2.0 Memory Stick 128 MB	

Table 139: Model numbers for accessories

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Accessories

Model Number	Short description	Note
5MMUSB.0256-00	**USB memory stick 256 MB SanDisk** USB 2.0 Memory Stick 256 MB	
5MMUSB.0512-00	**USB memory stick 512 MB SanDisk** USB 2.0 Memory Stick 512 MB	

Table 139: Model numbers for accessories

2. TB103 3-pin Supply Voltage Connector

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)	
0TB103.91	Plug for the 24 V supply voltage (cage clamps)	
		0TB103.9 0TB103.91

Table 140: TB103 order data

2.3 Technical Data

Name	0TB103.9	0TB103.91
Number of Pins	3	
Type of Terminal	Screw clamps	Cage clamps
Distance Between Contacts	5,08 mm	
Resistance Between Contacts	≤ 5 mΩ	
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 mm² -2.5 mm² (AWG 26 - 12)	
Cable Type	Only copper wires (no aluminum wires!)	

Table 141: TB103 technical data

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Accessories

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 142: Lithium Battery Order Data

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.

Features	0AC201.9 and 4A0006.00-000
Capacity	950 mAh
Voltage	3 V
Self Discharge at 23°C	< 1% per year
Storage Time	Max. 3 years at 30° C
Environment	
Storage Temperature	-20 °C to +60° C
Humidity	0 to 95 % (non-condensing)

Table 143: Technical data for lithium batteries

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 214) to protect the interface.

4 x
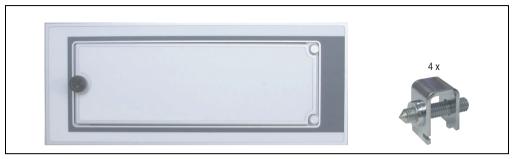
Figure 106: Front Cover 5A5003.03

4.1 Technical Data

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

Table 144: Technical Data 5A5003.03

4.2 Dimensions
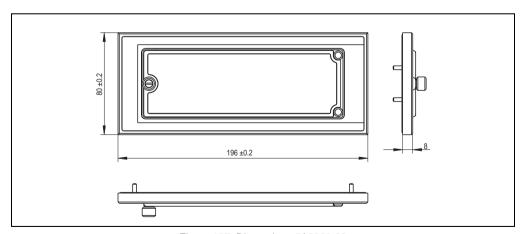
Figure 107: Dimensions 5A5003.03

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4.3 Installation

The front cover is attached to the USB media drive with the mounting rail bracket. The USB media drive and front cover can be mounted as a whole in (for example) a switching cabinet door.

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	APC620 interface covers; 5 pieces	

Table 145: APC620 Interface Cover Order Data

5.2 Contents of Delivery
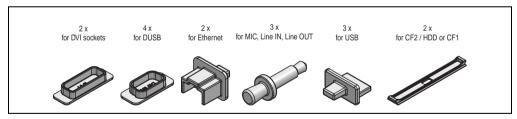
Figure 108: Interface Cover - contents of delivery

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 zu CRT DB15HD/f** Adapter DVI (connector) to CRT (socket), for connecting a standard monitor to a DVI-I interface.	

Table 146: DVI - CRT Adapter Order Data

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Accessories

7. Compact Flash Cards 5CFCRD.xxxx-02

7.1 General Information

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

7.2 Order Data

Model Number	Description	Image
5CFCRD.0032-02	Compact Flash 32 MB TrueIDE SanDisk/A	
5CFCRD.0064-02	Compact Flash 64 MB TrueIDE SanDisk/A	
5CFCRD.0128-02	Compact Flash 128 MB TrueIDE SanDisk/A	
5CFCRD.0256-02	Compact Flash 256 MB TrueIDE SanDisk/A	
5CFCRD.0512-02	Compact Flash 512 MB TrueIDE SanDisk/A	
5CFCRD.1024-02	Compact Flash 1024 MB TrueIDE SanDisk/A	
5CFCRD.2048-02	Compact Flash 2048 MB TrueIDE SanDisk/A	

Table 147: Order data for Compact Flash 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.

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
Mechanics	**5CFCRD.xxxx-02**

Table 148: Compact Flash cards 5CFCRD.xxxx-02 technical data

Dimensions
    Length
    Width
    Thickness
	36,4 ± 0,15 mm
	42,8 ± 0,10 mm
	3.3 mm ± 0.10 mm

Weight	11,4 g
Environment	

Environmental Temperature
    Operation
    Storage
    Transport
	0 °C to +70 °C
	-25 °C to +85 °C
	-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	24000 meters

Table 148: Compact Flash cards 5CFCRD.xxxx-02 technical data (cont.)

7.4 Dimensions
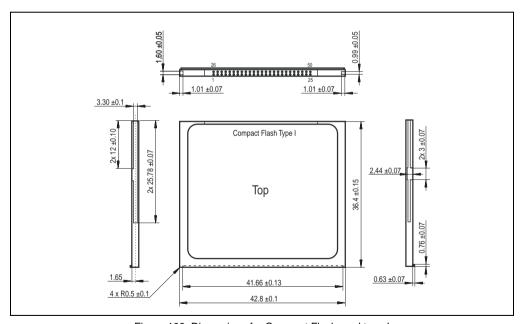
Figure 109: Dimensions for Compact Flash card type I

7.5 Calculating the Lifespan

SanDisk provides a 6-page "White Paper" for the lifespan calculation for Compact Flash cards (see following pages). This document can also be found on the SanDisk homepage.

SanDisk

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W E A R   L E V E L I N G

October 2003

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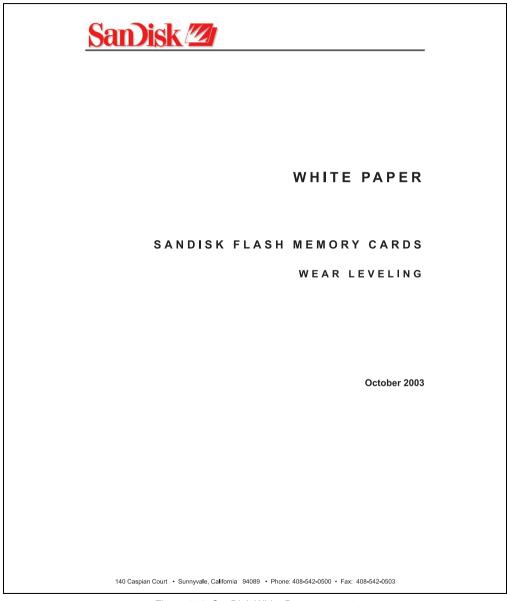
Figure 110: SanDisk White Paper - page 1

White Paper   **October 2003**

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

SanDisk Corporation

Doc No. 80-36-00278   SanDisk Flash Memory Cards Wear Leveling   Page 2

Figure 111: SanDisk White Paper - page 2

**Chapter 5
Accessories**

OVERVIEW

This purpose of this white paper is to help SanDisk customers understand the benefits of wear leveling and to assist customers in calculating life expectancy of SanDisk cards in specific applications.

Flash memory is susceptible to wear as a result of the repeated program and erase cycles that are inherent in typical data storage applications. Applications in which this is a major concern include hard disk replacement applications where write operations occur frequently. How a storage system manages the wear of the memory is key to understanding the extended reliability of the host that relies on these storage systems.

WEAR LEVELING METHODOLOGY

Current products available in the industrial channel use NAND flash memory. It is important to understand the NAND memory architecture to gain insight into the wear leveling mechanism.

Each memory chip is divided into blocks. A block is an array of memory cells organized as sectors. The number of blocks and sectors vary from product to product. The minimum unit for a write or read operation is a page (or sector). The minimum unit for an erase operation is a block. Physical blocks are logically grouped into zones. For the current technology, a typical zone size is 4 MB. However, this may change from product to product. Wear leveling is done within a zone. The current firmware does not spread the wear across the capacity of the card. Each zone has about 3% additional "spare blocks" beyond what is assigned to meet the logical capacity of the flash card. This group of blocks is commonly referred to as the "Erase Pool".

With the introduction of SanDisk's Write-before-Erase architecture, each time a host writes data to the same logical address (CHS or LBA), data is written into a newly assigned, empty physical block from the "Erase Pool". The intrinsic nature of writing to a new physical location each time a logical address is written to is the basis for wear leveling found in SanDisk cards. This action spreads the writes over the zone, thus greatly extending the overall life of the card. The methodology of using a large number of physical addresses to manage a smaller logical address table allows for rotation of the physical addresses among the entire group of physical blocks within a zone. The resulting wear leveling optimizes the effective life of the media and avoids prematurely reaching the end of life on frequently written to host addresses.

When a card detects that a block has reached the end of its useful life, it removes that block from the blocks that are available for write operations. The result is a reduction of the size of the erase pool. This does not affect the capacity of the card as seen by the host. When the pool of blocks available for write operations has been exhausted due to wear, the card will reach the end of its useful life for write operations.

Figure 112: 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

Figure 113: SanDisk White Paper - page 4

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area being used for such files. Special cases to consider include those where the files being updated are very small. Typically an operating system uses a minimum number of sectors to store a file, referred to as a cluster. Typical cluster sizes range from 8 to 64 sectors in size. The cluster size is important for files that are the same or smaller than the 32-sector block since these may trigger garbage collection operations. If these updates happen in a random fashion (sequential updates would not be affected by cluster size) lifetime may be reduced as a result. Finally, the frequency of such updates is then used to determine how long it will take before the card reaches its statistical limit for endurance. These factors can be combined in an equation that can be used to calculate the minimum time a card will function in that application:

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

where C_{zone} is the total capacity of the zone, C_{fixed} is the capacity used by fixed files, $N_{cluster}$ is the cluster size, FS_{typ} is the average file size and f_w is the average frequency at which files are updated. k_r 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.

$$lifetime = 2,000,000 \times \frac{\left(4000 - 500\right) \times \left(1 - 0\right)}{128} \times \frac{1}{1/day}$$

$$lifetime = 149828\, years$$

Example 2

This example is a data logging operation using a 1GB card where a 4kB file is updated every five seconds. This would result in sequential address being written.

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

$$lifetime = 317\, years$$

Figure 114: 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.

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

$$lifetime = 79.3\, years$$

C O N C L U S I O N

These examples are general in nature but show how the equation can be used as a guideline for calculating card lifetime in different applications. They also demonstrate that SanDisk card architecture exceeds reasonable life expectancy in typical applications. If a particular applications behaves in such a way that this equation cannot be applied, the SanDisk Applications Engineering group can assist in performing card lifetime analysis.

For more information, please visit the SanDisk Web site at: www.sandisk.com

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Figure 115: SanDisk White Paper - page 6

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

Figure 116: USB Media Drive

8.1 Features

- +24 VDC supply (back side)
- USB/B 2.0 connection (back side)
- Desktop or rack-mount operation
- Integrated USB diskette drive
- Integrated DVD-ROM/CD-RW drive
- Integrated Compact Flash 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 203)

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, for example, these individual components are used, the data given for the entire device is valid.

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 ± 25%
Features - Diskette Drive	
Data Capacity	720 KB / 1.25 MB / 1.44 MB (formatted)
Data Transfer Rate	250 kbits (720 KB) or 500 kbits (1.25 MB and 1.44 MB)
Rotation Speed	Up to 360 rpm
Diskette Media	High Density (2HD) or Normal Density (2DD) 3.5" Diskettes
MTBF	30000 POH (Power On Hours)
Features DVD-ROM/CD-RW Drive	

Write Speed
   CD-R
   CD-RW
	24x, 16x, 10x and 4x
	10x and 4x

Reading Rate
   CD
   DVD
	24x
	8x

Data Transfer Rate	max. 33.3 MBytes/sec.

Access Time (Average)
   CD
   DVD
	85 ms
	110 ms

Revolution Speed	max. 5136 rpm ± 1%
Starting Time (0 rpm to Read Access)	19 Seconds (maximum)
Host Interface	IDE (ATAPI)

Readable Media
   CD
   DVD
	CD/CD-ROM (12 cm, 8 cm), CD-R, CD-RW
	DVD-ROM, DVD-R, DVD-RW, DVD-RAM

Non-Write Protected Media CD	CD-R, CD-RW
Compatible Formats	CD-DA, CD-ROM Mode 1/Mode 2 CD-ROM XA Mode 2 (Form 1, Form 2) Photo CD (single/multi-session) Enhanced CD, CD-Text DVD-ROM, DVD-R, DVD-Video (Double Layer) DVD-RAM (4.7 GB, 2.6 GB)
Write-methods	Disc at once, Session at once, Packet write, Track at once
Lazer Class	Class 1 Lazer
Data Buffer Capacity	2 MB
Noise Level (complete read access)	about 45 dBA at 50 cm
Lifespan Opening/Closing the Drawer	60000 POH (Power On Hours) > 10000 times
Features - Compact Flash Slot	

Table 149: Technical Data USB Media Drive 5MD900.USB2-00

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Compact Flash
    Type
    Amount
    Connection
	Type I
	1 Slot
	IDE / ATAPI

Compact Flash LED	signals read or write access to a compact flash card.
Hot Plug Capable	Yes
Features - USB connections	
USB A on the Front Side Power Supply	Connection of further peripheral devices Max. 500 mA
USB B back side	connection to the system
Mechanical Characteristics	

Outer dimensions (without Slide-In)
    Width
    Length
    Height
	
	70 mm
	100 mm
	9.5 mm

Weight	Approx. 1.1 kg (without front cover)
Environmental Characteristics	

Environmental Temperature
    Operation
    Storage
    Transport
	
	5 °C .. +45°C
	-20 °C .. +60 °C
	-40 °C .. +60 °C

Environmental Characteristics	

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 149: Technical Data USB Media Drive 5MD900.USB2-00 (cont.)

8.3 Dimensions
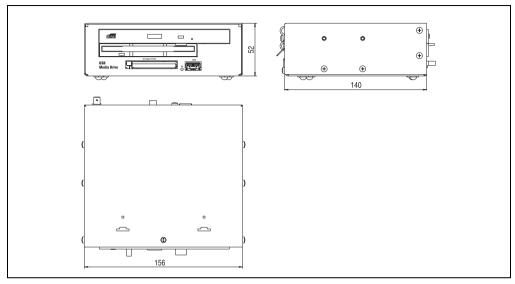
Figure 117: Dimensions 5MD900.USB2-00

8.4 Interfaces
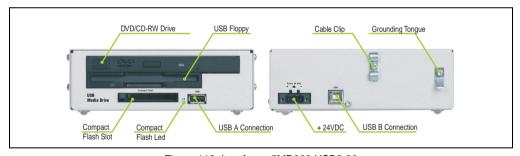
Figure 118: Interfaces 5MD900.USB2-00

8.5 Installation

The USB Media Drive can be operated as a desktop device (rubber feet) or as a rack-mount device (2 mounting rail brackets included).
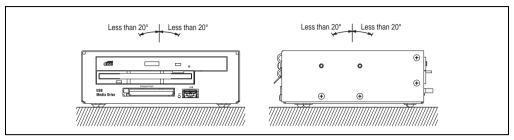
Figure 119: Installation position 5MD900.USB2-00

9. USB Memory Stick

9.1 General Information

USB memory sticks are easy-to-exchange memory media. Because of the fast data transfer USB 2.0, USB memory sticks provide optimal values 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 150: USB memory stick order data

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.

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

Interface
    Type
    Transfer Rate
    Sequential Reading
    Sequential Writing
    Connection
	USB specification 2.0 high speed device, mass storage class, USB-IF and WHQL certified
	USB 1.1 and 2.0 compatible
	up to 480 MBit (high speed)
	Max. 8.7 MB/second
	Max. 1.7 MB/second
	to each USB type A interface

MTBF (@ 25°C)	> 100,000 hours

Table 151: USB memory stick 5MMUSB.0xxx-00 technical data

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Features	5MMUSB.0xxx-00
Data Preservation	10 years
Maintenance	None
Operating System Support	Windows CE 4.1, CE 4.2, 98SE[1] , 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 151: USB memory stick 5MMUSB.0xxx-00 technical data (cont.)

1) For Win 98SE, a driver can be downloaded from the SanDisk homepage.

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:

Changing the battery should only be carried out 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 1.10 "Profile Overview" from page 126 for CPU boards, or Section 2.10 "Profile Overview" from page 178).

- Disconnect the power supply to the Automation PC 620.

- Touch the housing or earth 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 120: Battery removal

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- 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.
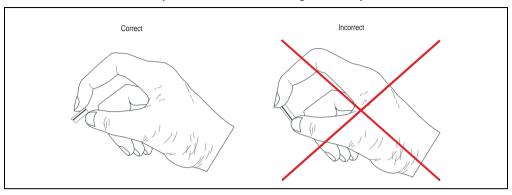
Figure 121: Handling the battery

Figure 122: 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 earth 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.
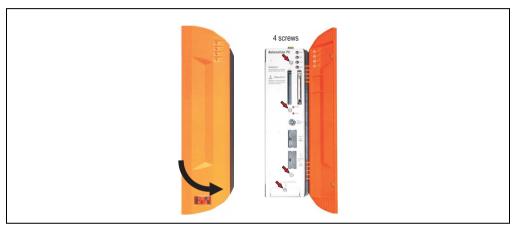
Figure 123: APC620 1PCI Slot - Remove screws to install/ remove filter kit

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

Figure 124: APC620 1PCI Slot - Remove side cover and fan kit cover

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- 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.
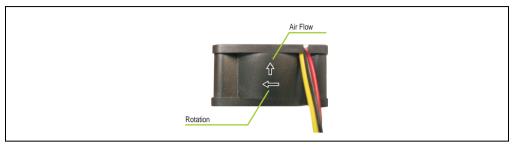
Figure 125: Markings for direction of airflow / fan rotation

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.
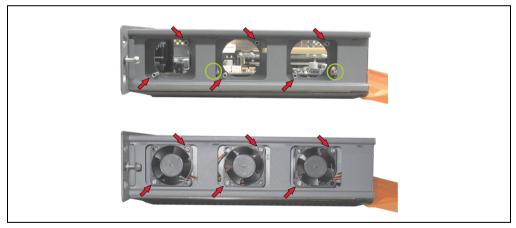
Figure 126: APC620 1PCI Slot - Fan installation

- 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).
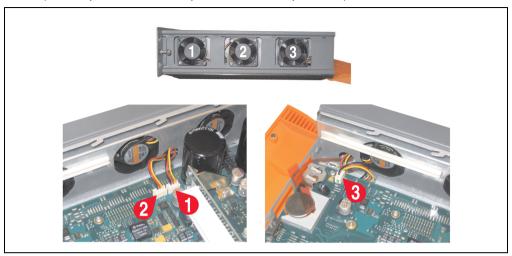
Figure 127: APC620 1PCI Slot - Fan cable connection to the main board

- 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 128: 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.
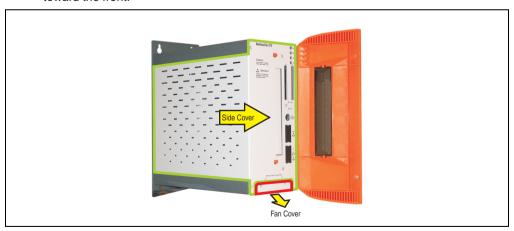
Figure 129: APC620 2PCI Slot - Remove side cover and fan kit cover

- 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.
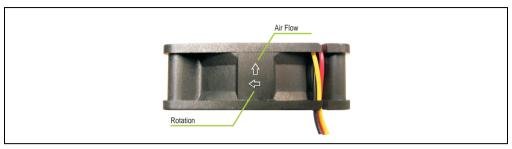
Figure 130: Markings for direction of airflow / fan rotation

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.
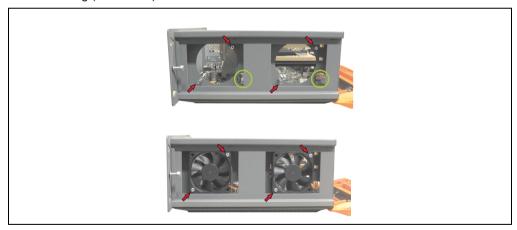
Figure 131: APC620 2PCI Slot - Fan installation

- 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).
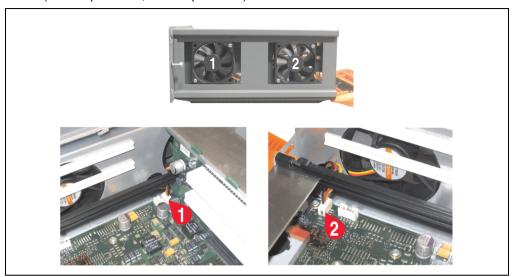
Figure 132: APC620 2PCI Slot - Fan cable connection to the main board

- 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.

Table Index

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