Operating Instructions Edition 05/2006



Industrial PC
Box PC 840 V2

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Industrial PC
SIMATIC Box PC 840 V2

Operating Instructions

Release 05/2006
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Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.



Danger

indicates that death or severe personal injury **will** result if proper precautions are not taken.



Warning

indicates that death or severe personal injury **may** result if proper precautions are not taken.



Caution

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

Caution

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

Notice

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:



Warning

This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

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Introduction

1

1.1 Preface

Purpose of this documentation

These operating instructions contain all the information you need for commissioning and using the SIMATIC Box PC 840 V2.

It is intended both for programming and testing personnel commissioning the device and connecting it with other units (automation systems, additional programming devices), as well as for service and maintenance personnel installing add-ons or carrying out fault/error analyses.

Scope of validity for this documentation

This documentation is valid for all supplied variations of the SIMATIC Box PC 840 V2 and describes the state of delivery as of May 2006.

Position in the information landscape

The operating instructions are available on the supplied "Documentation and Drivers" CD.

For supplementary instructions on how to handle the software, please refer to the corresponding manuals.

Conventions

The abbreviation Box PC or device is also used within this documentation for the product name SIMATIC Box PC 840 V2.

History

Currently released versions of these operating instructions:

Edition	Comment
02/2004	First Edition
04/2004	• Maximum possible memory expansion changed
08/2005	• SATA-RAID Controller, in connection with SATA hard disks
05/2006	• Error correction in BIOS-SETUP • Attachment of power supply cable • Notes regarding transport safeguard for the optical drive • Notes on starting current

1.2 Guideline to the operating instructions

Contents format	Contents
Contents	Organization of the documentation, including the index of pages and chapters
Introduction	Purpose, layout and description of the important topics.
Safety information	Refers to all the valid safety-related aspects which are derived from statutory regulations and should be adhered to when installing, commissioning and operating the product/system.
Description	Fields of application, the features and the structure of the product/system
Application Planning	Aspects of storage, transport, environmental and EMC conditions to be considered in the preparatory stage
Installation	Product installation options and installation instructions
Connecting	Options of connecting the product and connection instructions
Commissioning	Commissioning the product/system.
Integration	Options of integrating the product into existing or planned system environments/networks
Functions	Monitoring and display functions
Expansions / Configuration	Procedure for expansion devices (memory, modules, drives)
Maintenance and service	Replacement of hardware components, restoring and setup of the operating system, installation of drivers and software
Troubleshooting	Problems, cause, remedy
Technical Data	General specifications in compliance with relevant standards and current/voltage values
Dimensional drawings	Dimensions of the device and of modules
Detailed descriptions	Structure, function and features of the vital components, allocation of system resources and use of the BIOS Setup
Appendix	Guidelines and certifications, service and support, notes on retrofitting
ESD Guidelines	General ESD guidelines.

Safety Information

2

2.1 General safety instructions



Caution

Please observe the safety instructions on the back of the cover sheet of this documentation. You should not expand your device unless you have read the relevant safety instructions.

This device is compliant with the relevant safety measures to IEC, EN, VDE, UL, and CSA. If you have questions about the validity of the installation in the planned environment, please contact your service representative.

Repairs

Only authorized personnel are permitted to repair the device.



Warning

Unauthorized opening and improper repairs can cause considerable damage to property or danger for the user.

System expansions

Only install system expansion devices designed for this device. The installation of other expansions can damage the system and violate the radio-interference suppression regulations. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

Caution

If you install or exchange system expansions and damage your device, the warranty becomes void.

Battery

This device is equipped with a Lithium battery. Batteries may only be replaced by qualified personnel.



Caution

There is the risk of an explosion if the battery is not replaced as directed. Replace only with the same type or with an equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with local regulations.



Warning

Risk of explosion and release of harmful substances!

Therefore, do not throw Lithium batteries into an open fire, do not solder or open the cell body, do not short-circuit or reverse polarity, do not heat up above 100° C, dispose of in accordance with regulations and protect against direct exposure to sunlight, moisture and condensation.

ESD guidelines

Modules containing electrostatic sensitive devices (ESDs) can be identified by the following label:



Strictly follow the guidelines mentioned below when handling modules which are sensitive to ESD:

- Always discharge your body´s static electricity before handling modules which are sensitive to ESD (for example, by touching a grounded object).
- All devices and tools must be free of static charge.
- Always pull the mains connector and disconnect the battery before you install or remove modules which are sensitive to ESD.
- Handle modules fitted with ESDs by their edges only.
- Do not touch any wiring posts or conductors on modules containing ESDs.

Description

3

3.1 Overview

The SIMATIC Box PC 840 V2 is optimized for industrial PC applications and for installation at the machine:

- High expandability (5 slots)
- High performance
- Rugged



Figure 3-1 SIMATIC Box PC 840 V2

3.2 Areas of application

The device provides industrial PC systems for high-performance and space-saving applications in particular in the field of machine, systems and switchgear cabinet engineering:

- Measuring and controlling of process and machine data (e.g., automated washing systems, robot controls)
- Operating and visualization tasks with separate display / monitor solutions (info terminals, large-scale displays in automotive production)
- Data logging and processing (e.g. system data logging, distributed process control)

3.3 Benefits

Minimization of downtime through increased system availability

- Efficient self-diagnostics (SIMATIC PC DiagMonitor, optionally available)
- Solutions for data security (preventative data backups, Image Creator, optionally available)
- Service-friendly design (modifications, servicing)

Cost reductions through high investment security

- High product continuity through long-term secure functionality in hardware and software (support for Legacy interfaces and ISA slots)
- Secure replacement availability of the components (5 years)

Reduced costs through high industrial functionality

- High industrial capability through extremely robust design, even against strong vibration and impact loads, and with high ambient temperatures (ventilation design)
- Totally Integrated Automation (TIA) components including integrated PROFIBUS/MPI interface (optional) and Ethernet interface, system-tested SIMATIC software package
- High flexibility and expandability (5 spare slots)

Cost minimization through time savings

- Configured, turn-key systems
- Preinstalled operating systems for fast commissioning
- Integrated interfaces for communication on the field or process control level

3.4 Function

- Integrated configurable monitoring functions (program execution (watchdog) for internal housing temperature, processor temperatures, disk drive temperatures and RPM of the two fans)
- Enhanced diagnostic / messaging via Ethernet, E-mail, SMS, and for direct input in SIMATIC software via OPC (optional via SIMATIC PC DiagMonitor):
  - Operating hours counter
  - Hard disk status
  - System status (heartbeat)
  - Automatic logging of all messages by means of log file
  - Options for central monitoring of networked SIMATIC PCs
- RAID1 for automatic data mirroring on two hard disks

3.5 Features

General features	
Installation design	Panel mounting device, box
Processor	• Design: mPGA478 Pentium 4 2.4 GHz, 533 MHz Front Side Bus (FSB), 512 KB Second Level Cache • Intel® Celeron 2.0 GHz, 400 MHz FSB, 128 KB Second Level Cache • Pentium 4 Mobile 2.2 GHz, 400 MHz FSB, 512 KB Second Level Cache
RAM	128 MB SDRAM (DDR266); expandable up to 2 GB SDRAM (DDR266)
Slots for add-ons	• 2x PCI long • 2x PCI/ISA (shared) long • 1x ISA long Note: The RAID1 option takes one PCI slot.
Graphic	VIA ProSavage 8 graphic memory 8, 16 or 32 MB SDRAM (adjustable in the system BIOS), uses system memory CRT: up to 1600 x 1200 pixels, 60 Hz, 16 -bit color up to 1280 x 1024 pixels, 100Hz, 32 -bit color LCD: LVDS or DVI up to 1280 x 1024 / 18-bit TFT
Interfaces	
PROFIBUS/MPI	12 Mbps (isolated potential, compatible to CP 5611)
Ethernet	10/100 Mbps (RJ45)
USB	2x USB 2.0, high current

General features	
Serial	COM1 (V.24), COM2 (V.24)
Parallel	LPT1
Monitor	1x DVI-I (VGA monitors can be connected with supplied DVI/VGA adapter)
Keyboard	PS/2
Mouse	PS/2
Power supply	• 120/230 V AC, 360 VA; wide-range; with short-term buffering against power failure in accordance with NAMUR: max. 20 ms at 0.85 nominal voltage • 24 V DC, 265 VA, (optional, only in connection with Pentium 4 Mobile)

Standard versions	
Processor	Celeron 2.0 GHz, 400 MHz FSB, 128 KB Second Level Cache
RAM expansion	128 MB SDRAM DDR266, (PC2100) 3 sockets for up to 2 GB
Power supply	120/230 V AC
Disk drives	
Floppy disk	1.44 MB
Hard disk drives	≥ 40 GB EIDE; 3.5“
Operating system	Without

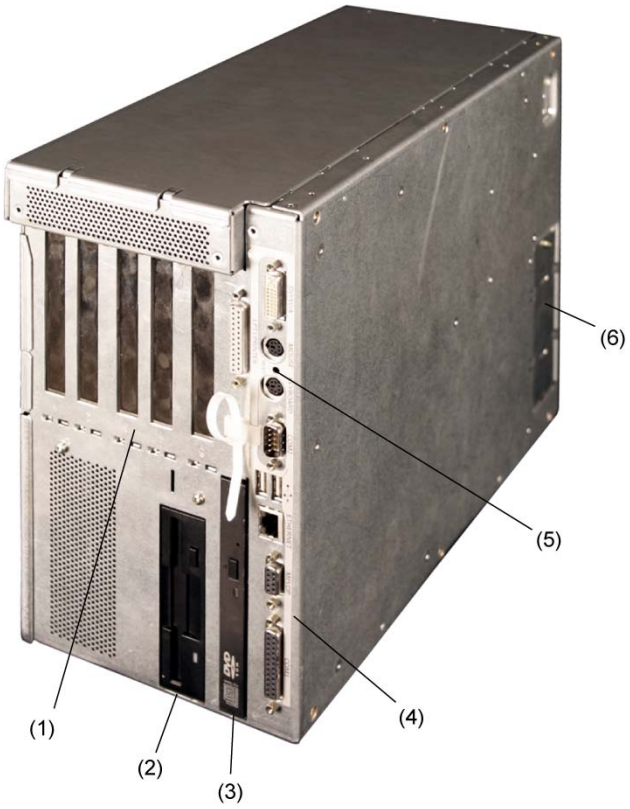
Optional accessories	
Processor	• Pentium 4 Mobile 2.4 GHz, 400 MHz FSB, 512 KB Second Level Cache • Pentium 4 Mobile 2.2 GHz, 533 MHz FSB, 512 KB Second Level Cache
RAM expansion	Up to 2 GB
PROFIBUS / MPI	On-board, compatible with CP5611
Disk drives	
CD drive	CD-ROM or CD-R/W/DVD drive
Hard disk drives	• 1 x 3.5" Hard disk drive (large capacity) • 2 x 2.5" Hard disk drives (PATA) • 1 x RAID1 with 2 x 2.5" Hard disk drives (PATA) • 1 x RAID1 with 2 x 2.5" Hard disk drives (SATA)
Power supply	24 V DC
Operating system	Preinstalled / supplied on Restore DVD • MS-DOS 6.22 English • Windows NT4 Workstation German/English • Windows 2000 Professional MUI* • Windows XP Professional MUI* *MUI: **M**ulti language **U**ser **I**nterface; 5 languages (German, English, French, Spanish, Italian)

Optional expansions	
SIMATIC PC DiagMonitor software	Software tool for monitoring local and remote SIMATIC PCs: • Watchdog • Temperature • Fan speed • Hard disk monitoring (SMART) • System / Ethernet monitoring (Heart Beat) • • Communication: • Ethernet interface (SNMP protocol) • OPC for integration in SIMATIC software • Client server architecture • Layout of log files
SIMATIC PC Image Creator software	Software tool for saving data locally

3.6 Design

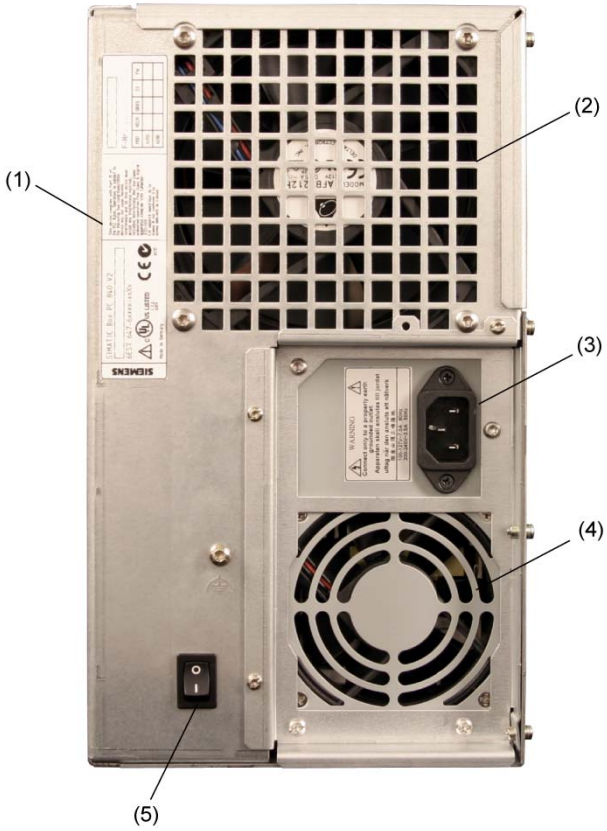
3.6.1 External structure

Front view



(1)	Expansion slots
(2)	Floppy disk
(3)	DVD-/CD drive
(4)	Front interfaces
(5)	Reset button
(6)	Steel cover plate for the operator panel interfaces

Rear view



(1)	Rating plate
(2)	Equipment fan
(3)	IEC power connector (screw terminals with 24 V DC)
(4)	Power supply module fan
(5)	On / Off switch

3.6.2 Operator Controls

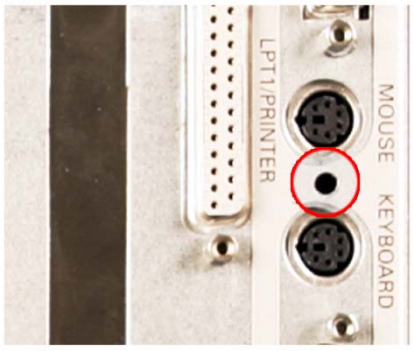
On / Off switch

On / Off switch	Description
	The On / Off switch does not disconnect the device from mains. When the switch is in 0 position (Off), the device is still connected to the auxiliary voltage.

Warning

The On / Off switch does not disconnect the device from mains.

Reset button

Reset button	Description
	The reset button can be actuated with a pin or an opened up paper clip, for example. The button signal triggers a hardware reset. The PC performs a restart (cold start.)

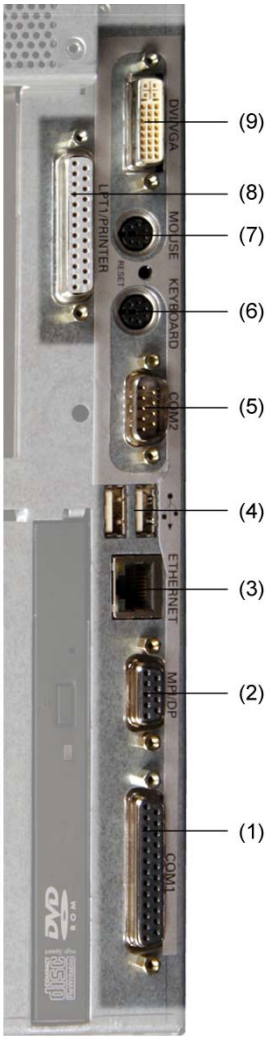
Caution

Data may be lost when the PC performs a hardware reset!

3.6.3 Connection components

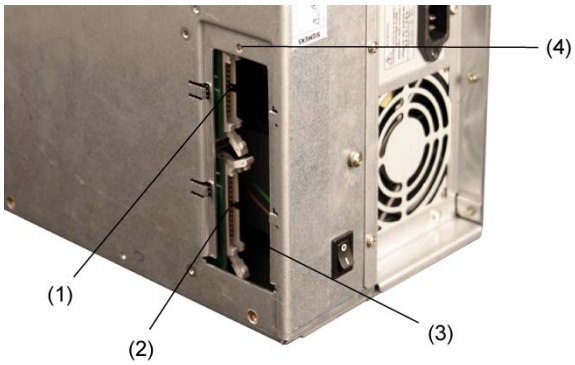
Ports

Arrangement of the ports on the front of the device



Pos	Name	Description
(1)	COM 1	Serial port 1 (V.24), 25-pin D-sub socket
(2)	PROFIBUS/MPI/DP	MPI interface (RS485, electrically isolated), optional 9-pin D-sub socket
(3)	ETHERNET	RJ 45 Ethernet connection 10/100 Mbps
(4)	USB 2.0	USB connector Right USB port 1, left USB port 2
(5)	COM2	Serial port (V.24), 9-pin D-sub plug
(6)	KEYBOARD	Connection for a PS/2 keyboard
(7)	Mouse	Connection for a PS/2 mouse
(8)	LPT1	Parallel interface, 25-pin
(9)	DVI/VGA	DVI/VGA connection for CRT or LCD monitor with DVI interface, VGA via DVI/VGA adapter (included in Box PC package)

Interfaces for connecting operator panels / displays

Arrangement of the interfaces		
	(1)	LVDS display interface for TFT displays up to 1024 x 768 pixels
	(2)	I/O interface for connecting front panel components
	(3)	Access to the interfaces on operator panels (closed by a screwed metal cover during shipment of Box PC)
	(4)	Mounting screw for the steel sheet cover

AC power supply

Position of the IEC power connector	Description
	IEC power connector for the AC power supply to the device. The maximum permitted power range is 120 V AC to 240 V AC.

DC power supply

Position of the screw terminals	Description	
	Screw terminals for connecting the DC power supply to the device	
	1	24 VDC
	2	0 VDC
	3	Protective conductor

Application Planning

4

4.1 Transport

Despite the device's rugged design, its internal components are sensitive to severe vibrations or shock. You must therefore protect the PC from severe mechanical stress when transporting it.

You should always use the **original packaging** for shipping and transporting the device.

Caution

Risk of damage to the device!

When transporting the PC in cold weather, it may be submitted to extreme variations in temperature. In this situation, ensure that no moisture (condensation) develops on or inside the device.

If condensation has developed, wait at least 12 hours before you switch on the device.

Notice

When transporting the device, there is a risk that the drive drawer may open and be damaged or that the drive may be soiled. A piece of Scotch tape serves as transport safeguard and this should be used for every transportation.

4.2 Unpacking and checking the delivery unit

Unpacking the device

Note the following points when you unpack the unit

- It is advisable not to dispose of the original packing material. Keep it in case you have to transport the unit again.
- Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.
- Check the delivery unit for any visible transport damage.
- Verify that the shipment contains the complete unit and your separately ordered accessories. Please inform your local dealer of any disagreements or transport damages.

4.3 Device identification data

The device can identified uniquely with the help of these numbers in case of repairs or theft.

Enter the following data in the table below:

- Serial number: The serial number is found on the rating plate.

Rating plate

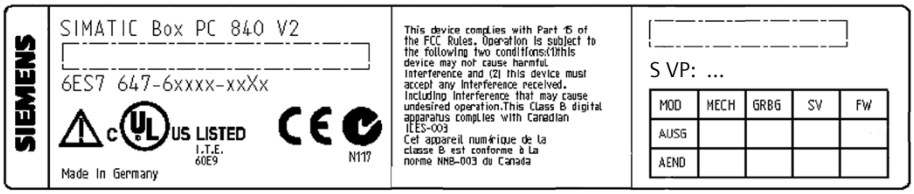


Figure 4-1 Rating plate

- Order number of the device
- Ethernet address: The Ethernet address of the device can be viewed in the BIOS Setup (F2) under Main > Hardware Options > Ethernet Address.
- Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA). The COA label is bonded to the device. The Product Key is always required to reinstall the operating system.

COA label



Figure 4-2 COA label

Serial number	S VP ...
Order No.	6ES ...
Microsoft Windows Product Key	
Ethernet address	

4.4 Ambient and Environmental Conditions

Please note the following when you plan your project:

- The climatic and mechanical environmental conditions specified in the specifications provided by your operating instructions.
- The clearance in the area of the ventilation slots must be at least 100 mm, so that the PC is sufficiently ventilated.
- Do not cover the vent slots of the device.
- The device with AC power supply satisfies fire protection requirements to EN 60950-1. It may therefore be installed without additional fire-proofing measures.
- The device with DC power supply does not satisfy fire protection requirements to EN 60950-1. It must therefore be installed in order to comply with the requirements for a fire-resistant enclosure.
- Always observe the mounting positions permitted for this device.



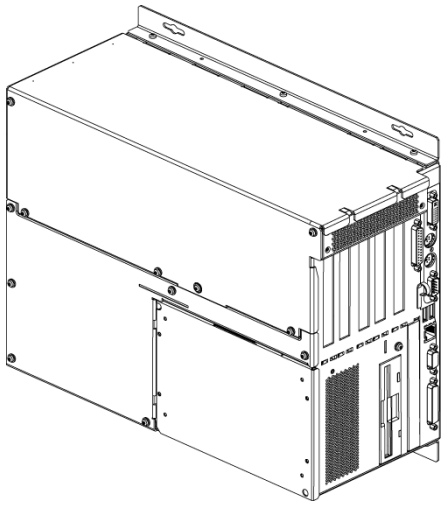
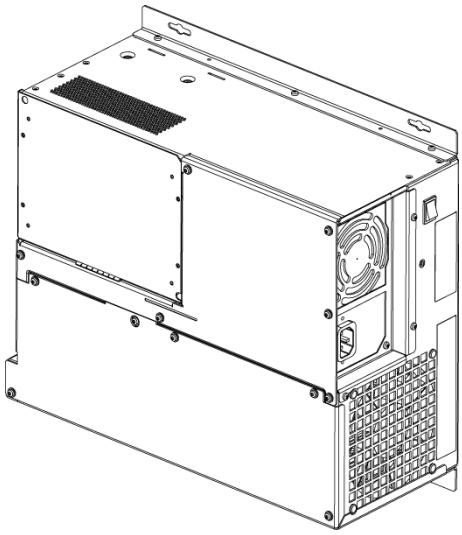
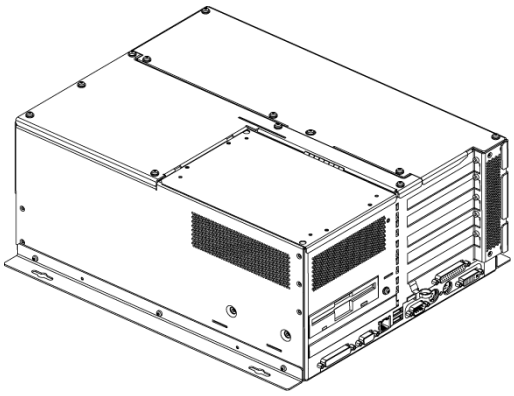
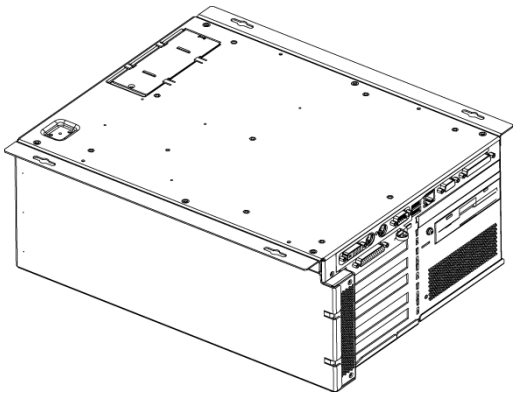
Warning

Failure to adhere to these conditions when mounting the system voids the approvals based on UL 60950-1, UL 508 and EN 60950-1!

4.5 Permitted mounting positions

PC mounting positions according to UL60950-1/UL508/EN60950-1/CSA22.2 No. 60950-1

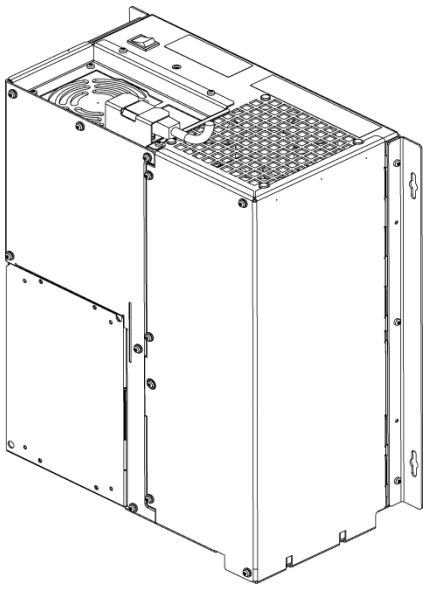
An inclination of ± 20° is permitted for all approved mounting positions.

<table>
<tr>
<td>
Position 1 (preferred)</td>
<td>
Position 2</td>
</tr>
<tr>
<td>
Position 3 (desktop)</td>
<td>
Position 4 (ceiling)

CD/DVD and floppy drives may not be operated.</td>
</tr>
</table>

Additional permissible PC mounting positions according to UL508/CSA 22.2 No. 142

An inclination of ±15° is allowed in this mounting position.

 Position 5 (ports facing down) CD/DVD and floppy drives may not be operated.	

Installation

5

5.1 Installing the device

The SIMATIC Box PC 840 V2 is particularly suitable for installation in control desks, switch cabinets and switchboards

Warning

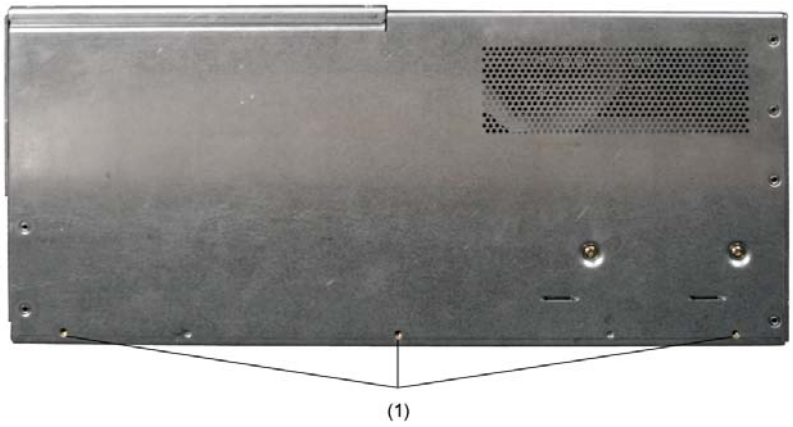
Function test while installing the device in machines or execute systems

Following the results of a risk analysis, additional protection equipment on the machine or the system is necessary to avoid endangering persons. With this, especially the programming, configuration and wiring of the inserted I/O modules have to be executed, in accordance with the necessary risk analysis identified safety performance (SIL, PL or Cat.). The intended use of the device has to be secured.

The proper use of the device has to be varified with a function test on the system. This test can detect programming, configuration and wiring errors. The test results have to be documented and if necessary inserted into the relevant inputs.

Screw-mounting the brackets

Two brackets are included, depending on the device version. You can attach these to the PC housing using six M3 x 6 mm screws.



(1)	Mount the brackets onto the device using the included M3 x 5 mm screws with a max. insertion depth of 5 mm (included in package).

Instructions for ceiling or wall mounting

Mounting examples		
Stock	**Bore diameter**	**Fixation**
Concrete	8 mm diameter, 60 mm depth	Dowel: 8 mm, 50 mm screws 4 mm, 50 mm
Plasterboard (min. 13 mm thick)	14 mm diameter	Tilting dowel diameter 4 mm min. length 50 mm
Metal (min. 2 mm thick)	5 mm diameter	Metal screws diameter 4 mm min. length 15 mm



Warning

Ensure that the wall or ceiling is capable of carrying four times the total weight of your Box PC 840 V2 (including brackets and expansion modules.) The total weight is approx. 10 kg.

Connecting

6

6.1 Connecting Peripheral Equipment

Note before connecting

Notice

Connect only I/O modules approved for industrial applications to EN 61000-6-2:2001.

Note

Hot-plug I/O modules (USB) may be connected while the PC is in operation.

Caution

I/O devices not capable of hot-plugging may only be connected after the device has been disconnected from the power supply.

Caution

Strictly adhere to the specifications for I/O modules.

6.2 Connecting the 120 V / 230 V Ac power supply

To be noted before you connect the device

Note

The varying voltage power supply module is designed for operation on 120/230/240 V AC networks. The setting of the voltage range takes place automatically.

Caution

Do not connect or disconnect power and data cables during thunderstorms.

Caution

The device is designed for operation on grounded power supply networks (TN systems to VDE 0100, Part 300, or IEC 60364-3).

It is not designed for operation on ungrounded or impedance-grounded power networks (IT networks).

Caution

The permitted nominal voltage of the device must conform with local mains voltage.

Caution

The mains connector must be disconnected to fully isolate the device from mains. Ensure easy access to this area.

A master mains disconnect switch must be installed if the device is mounted in a switch cabinet.

Always ensure free and easy access to the power inlet on the device or that the safety power outlet of the building installation is freely accessible and located close to the device.

Note

The power supply contains an active PFC (Power Factor Correction) circuit to conform to the EMC guidelines.

Uninterruptible AC power systems (UPS) must supply a sinusoidal output voltage in the normal and buffered mode when used with SIMATIC PCs with an active PFC.

UPS characteristics are described and classified in the standards EN 50091-3 and IEC 62040-3. Devices with sinusoidal output voltage in the normal and buffered mode are identified with the classification “VFI-SS-....” or “VI-SS-....”.

Localized information

Outside of the USA and Canada, operation on a 230 V power supply:

This device is equipped with a safety-tested power cord which may only be connected to a grounded sealed contact power outlet. If you choose not to use this cable, you must use a flexible cable of the following type: Min 18 AWG conductor cross-section and 15-A / 250-V shockproof connector. The cable set must be compliant with the safety regulations and stipulated IDs of the country where the system is to be installed.

For the USA and Canada:

For the United States and Canada, a CSA or UL-listed power cord must be used.

The connector must be compliant with NEMA 5-15.

120 V AC power supply
To be used is a flexible power cord approved to UL and with CSA label, and which has the following features: Type SJT with three leads, min. 18 AWG conductor cross-section, max. 4.5 m in length and parallel ground contact connector 15 A, min. 125 V.

240 V supply voltage
Use a flexible power cord with UL approval and with CSA label, and with the following features: Type SJT with three leads, min. 18 AWG conductor cross-section, max. 4.5 m long and tandem ground contact connector 15 A, min. 250 V.

Connecting

How to connect the device to the 120 V AC / 230 V AC power supply		
1.	Make sure that the ON / OFF switch is in "0" position (Off) when you plug in the power cord in order to avoid unintentional startup of the device.	
2.	Connect the IEC connector	
3.	Connecting the power cord to the power socket	

Secure the power plug

The supplied power plug locking mechanism prevents the power plug from being pulled out accidentally.

Steps for securing the AC power cable		
1.	Remove the power supply retaining screw	
2.	Screw the power plug locking mechanism into position	

Warning

If the power plug is secured with a clamp, the power outlet must be freely accessible to allow the device to be easily removed from the mains.

6.3 Connecting the (24 V) DC power supply

Note before connecting



Warning

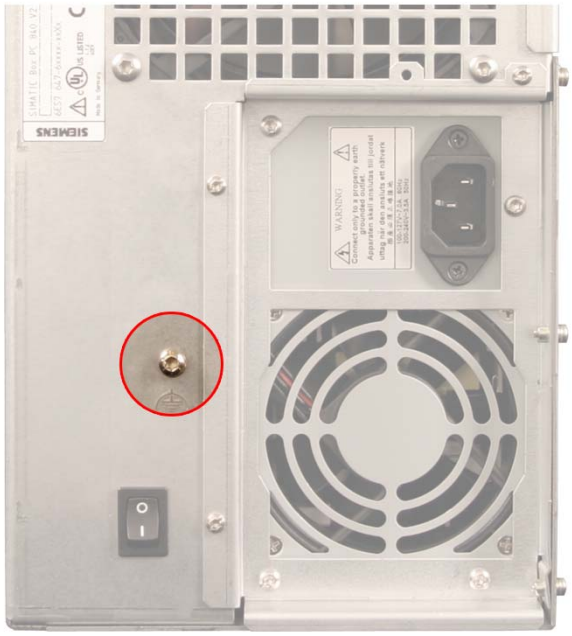
Only connect the device to 24 V DC power supply systems which meet the requirements of a safe extra-low voltage (SELV); in addition, a protective conductor must be connected. The conductors must withstand the short-circuit current of the 24 V DC power source, so that a short-circuit will not damage the cable. You may connect cables with a cross section of 5 mm^2.

Connecting

Steps for connecting the device to the 24 V DC power supply		
1.	Ensure that the ON/OFF switch is in the '0' (OFF) position to prevent unintentional startup of the device when connecting it to the 24 V power supply.	
2.	Switch off the 24 V DC power source.	
3.	Connect the protective conductor (3) to an appropriate screw terminal	
4.	Connect +24 V DC (1) and 0 V DC (2) to the screw terminals	

6.4 Equipotential Bonding

A low-impedance earth connection ensures that interference signals generated by external power supply cables, signal cables or cables to the I/O modules are safely discharged to earth.

Equipotential bonding terminal	
The equipotential bonding terminal on the device (large surface, large-area contact) must be connected with the central grounding busbar of the cabinet or plant in which the PC is to be installed. The minimum conductor cross-section may not be less than 5 mm^2.	

Commissioning

7

7.1 Requirements for commissioning

- Before you switch on the device, you should verify that the peripherals are connected, i.e. the keyboard, mouse, monitor and the power supply.
- The operating system of your device is preinstalled on the hard disk.

Caution

Risk of damage to the device!

Make sufficient allowances for the device to acquire room temperature before you put it into use. If condensation develops, wait at least 12 hours before switching on the device.

7.2 Initial Commissioning - Initial Startup

The PC operating system is automatically set up the **first** time you switch on the device. Procedure:

1. Set the ON / Off switch to I position (On). The PC performs a POST. During the self-test, this message appears:

```
Press <F2> to enter SETUP or <ESC> to display the boot menu
```

2. Wait until this message is cleared, then follow the instructions on the screen.

3. Type in the Product Key as required. You can find this key on the "Certificate of Authentication", in the "Product Key" line.

Notice

The PC may not be switched off when you run setup.

Do not change the default BIOS settings, otherwise the operating system setup may become corrupted.

4. Automatic restart

After you have entered all necessary information and after the operating system setup is completed, the PC is automatically restarted and displays the user interface of the relevant operating system.

From now on, after you switch on the PC, the user interface of the operating system is automatically opened when the startup routine is completed.

Switching off the device

Note

On a Windows platform, always shut down the PC by clicking **Start > Close**.

Set the ON / Off switch to 0 position (off.) Disconnect the mains connector to isolate the device from mains.

7.3 Notes on operation

7.3.1 DVD ROM/CD RW

The DVD-ROM/CD-RW drive is an optional feature. Recording methods supported by the disk drive: Disc at once, Track at once, Session at once, Packet writing, whereby Disc at once und Track at once are recommended due to their compatibility to other CD drives. DVD-ROM, CD-ROM, CD-R and Video CDs can be read.

Burner/DVD player software

To utilize the full functionality of our DVD-ROM/CD-RW drive, you need to install additional software (burning or DVD player software). This software is included on the CD supplied with the device. Insert the CD in the drive, run setup and follow the instructions on the screen.

Notice

With the very first start up of the burning software, no media data carrier should be in the drive. The media data carrier with errors may disturb the automatic drive identification. The correct display of the possible burning function will therefore not be given.

Information on burning CD-Rs/CD-RWs

Caution

Data may be corrupted when burning CD-R or CD-RW!

Burning is permissible only in an undisturbed environment, i.e. shock and vibration stress must be avoided. Because of heavy fluctuation in the quality of CD-Rs, data may be corrupted in a burning session, even if no error message is initially displayed. The written data can only be verified by comparing these with the source. To be on the safe side, data should be verified after every burning session.

Restrictions under Microsoft Windows NT

DVD-ROM/CD-RW drive restrictions under Windows NT:

- no DMA mode
- write-at-once is not possible with CD-RW (packet writing per instant drive)

7.3.2 Operating two hard disks

Depending on the device features, the Panel PC 877 can be equipped with two 2.5“ (PATA) hard disk drives. The slave hard disk drive is not set up. This gives you the option of backing up your data to this hard disk. The two hard disk drives are operated as master or slave on the primary IDE controller of the basic module. For information on hard disk capacities, refer to your order documentation.

Booting from the slave hard disk

The master drive is the default boot drive. However, you may also boot the system from the slave drive.

In order to allow booting from the second hard disk drive, you need to set it up as primary boot device. In order to do so, undertake the following settings in your BIOS Setup:

Select Boot > Hard Drive > <Drive name> e.g. FUJITSU MHT2030AT- (PS), then press the ”+” key to move it up in the boot order.

(PS) = Primary Slave, (PM) = Primary Master.

Notice

The drive letters for the partitions on both drives are assigned by the operating system used. You can change these in the Control Panel as required.

Notice

A defective hard disk drive may block the IDE bus. To be able to continue working with the functional hard disk drive, disconnect the defective drive from the IDE bus and change the jumper settings on the drive as required (master setting, see the label on the drive.)

7.3.3 RAID system

Two types of RAID Controllers are available:

- PATA-RAID Controller of type Promise FastTrack 100 TX2 for EIDE (PATA) drives
- SATA-RAID Controller of type Promise FastTrack TX 2300 for SATA drives

This is a RAID1 system configuration (mirroring with two hard disks). The hard disk drives are operated on separate channels of the RAID Controller. This enables the system to continue to operate on one bus even when there is a problem with a cable and therefore increases the availability of the system.

The RAID controller is installed on slot 5 of the bus module.

Note

Information about the operation of the RAID system can be found in the Promise user manual on the included SIMATIC PC – Documentation and Drivers CD.

Functions for RAID system management

The preinstalled software of the RAID system offers enhanced functions for using and managing the RAID system.
PATA-RAID software is started via "Start > Programs > Promise Array Management > Remote Monitoring Utility".
SATA-RAID software is started via "Start > Programs > Promise Array Management > Local PAM".

Access to the RAID is protected by user name and password. Factory setting:

- User: *Administrator*

Notice

The security functions of the RAID system are effective without launching the software. The RAID status is always indicated in the Windows status bar.

In the event of an error, a hard disk can be duplicated by means of the RAID Controller BIOS or on the operating system level. It may take up to several hours to synchronize a new disk in the background, depending on the size of the hard disk and on the system load.

The redundant system state RAID Level 1 is reached again only after synchronization is completed.

Integration

8

The following options are available for the integration of the device in existing or planned system environments/networks:

Ethernet

The integrated Ethernet port (10/100 Mbps) can be used for communication and for data exchange with automation devices such as SIMATIC S7.
To this purpose you require the software package “SOFTNET S7”.

PROFIBUS / MPI

The optional potentially isolated Profibus interface (12 Mbps) can be used to interconnect distributed field devices or to carry out coupling to the SIMATIC S7.

To couple the device to an S7 PLC, you need the software package “SOFTNET for PROFIBUS”.

Further information

For further information, refer to the catalog and to the online ordering system of Siemens A&D.

Internet address: http://www.mall.automation.siemens.com

Functions

9

9.1 Overview

The following individual functions are implemented:

- Temperature monitoring and over/under temperature indication
- Watchdog
- Fan monitoring

Messages can be output from the monitoring modules to the applications.

The SOM software (Safecard On Motherboard) and DiagMonitor software on CD (optional) are available for this.

The DiagMonitor software CD contains the monitoring software, the software for the stations to be monitored, and a library for creating user-specific applications.

The description of the driver and SOM program are available on the CD "Documentation and Drivers" under **Drivers & Updates\<device>\...**

9.2 Temperature monitoring

Temperature monitoring

The temperature is recorded by means of three thermocouples. One thermocouple monitors the processor temperature, another the temperature in the area near the processor module, and a third the temperature in the area of the disk drives.

When the temperature is out of the range of one of the three set temperature thresholds, the following error reactions are triggered:

Response	Option
Device and CPU fans accelerate to maximum speed.	None
SOM or DiagMonitor software is activated	None

The temperature error is retained until the temperatures have fallen below the thresholds and are reset by one of the following measures:

- Error acknowledgement in the SOM program (manually by means of the broom icon)
- Restart of the device

Notice

When an error occurs, the "TEMP" LED also illuminates with the status indicators.

9.3 Watchdog (WD)

Function

The watchdog monitors the program execution and reports a program crash to the user by means of various reactions.

The watchdog is idle when the PC is switched on or after a HW-RESET(cold restart), i.e., no reaction of the WD is triggered.

WD reactions

If the WD is not triggered again within the set time (by driver or SOM program), the following reactions are initiated:

Response	Option
WD acknowledgement	None
Trigger a PC reset	Configurable
SOM or DiagMonitor software is activated	None

WD monitor times (TWD)

The TWD are adjustable in increments of one second in a range from 3 to 255 seconds.

Note

If the watchdog time is changed after the watchdog was enabled (i.e., while the watchdog is running), the watchdog is retriggered!

9.4 Fan monitoring

This function monitors operation of the housing and processor fans. When a fan fails, the following reactions are triggered:

Response	Option
SOM or DiagMonitor software is activated	None

The temperature error is retained until the cause of the fan failure has been rectified and the error is reset in one of the following ways:

- Acknowledgement of the error message by means of the SOM program
- Restart of the device

9.5 Safecard on Motherboard (SOM)

This application is used to monitor PC hardware (temperature, watchdog and fans) and to display the current measured values. A GUI is used to configure the application and also to activate the temperature monitoring watchdog function and fan monitoring function.

Your SIMATIC PC is equipped with three thermocouples, which are automatically detected by the application.

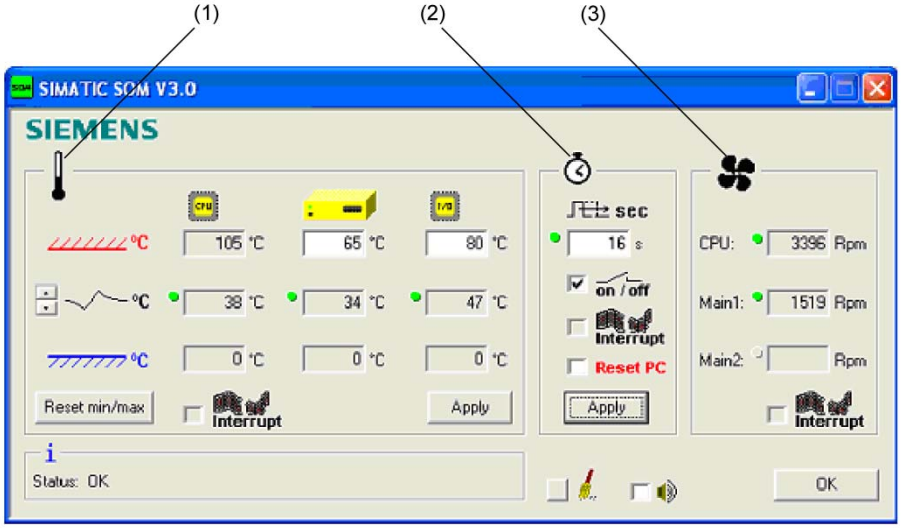


Figure 9-1 Safecard On Motherboard with three thermocouples

1	Temperature range:	Here the current temperature and limit values are shown. You can toggle the temperature display mode to indicate either the current temperature, or the min./max. values measured since the start of the application.
2	Watchdog area:	Here, you can configure the watchdog function in your monitoring application. You can specify the watchdog time, activate a PC reset and activate / deactivate the watchdog.
3	Fan area:	You can read the current fan speed in this area.

The description of the driver and SOM program are available on the CD "Documentation and Drivers" under **Drivers & Updates\<device>\...**

From the CD, run **Install.bat** and follow the instructions on your screen.

Expansions and configuration

10

10.1 Open the device

Caution

Work on the open device may only be carried out by authorized and qualified personnel. Within the warranty time, you are only allowed to install expansions for memory and expansion card modules.



Caution

The device contains electronic components which may be destroyed by electrostatic charge.

You therefore need to take precautionary measures before you open the device. Refer to the (ESD) directives for handling components which are sensitive to electrostatic charge.

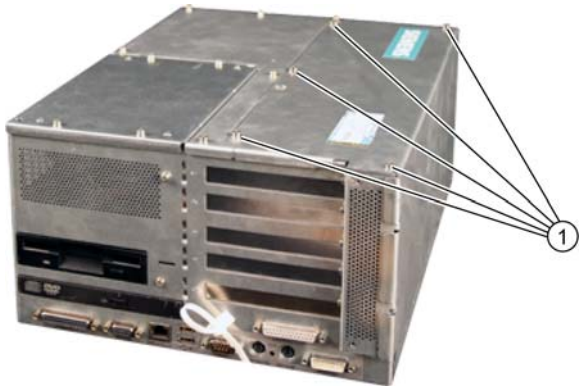
Tools

You can perform all installation tasks on the device using Torx T6, Torx T10, and Torx T20 screwdrivers and a Philips screwdriver.

Preparation

Disconnect the device from mains.

Open the device

Steps for opening the device		
1	Remove the five screws (1).	
2	Swing the lid to the front and remove it.	

10.2 Memory expansion

10.2.1 Removing/Installing Memory Module

Memory expansion options

The motherboard is equipped with 3 slots for memory modules. 184 pin DDR266 RAM chips (PC2100), unbuffered, no ECC. This allows you to expand the memory capacity of your PC to a maximum of 2 GB. Either one, two or three modules can be installed.

Combination	Slot X3	Slot X4	Slot X5	Maximum expansion
1	128/256/512MB/1GB			1 GB
2	128/256/512MB/1GB	128/256/512MB/1GB		2 GB
3	128/256MB	128/246MB	128/256/512MB/1GB	1.5GByte

Note

The modules can be installed in any slot. If 2x 512MB or 2x 1GB or 1x 512MB plus 1x 1GB modules are installed, no further module is allowed to be installed, regardless of its size.

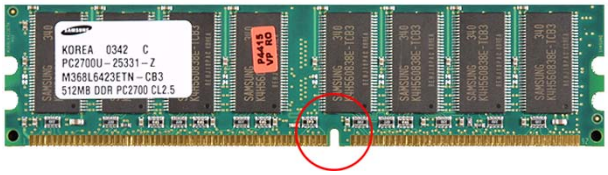
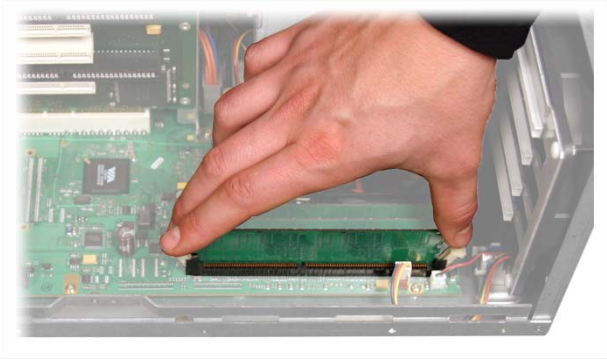
Preparation

Disconnect the device from mains and unplug all cables.

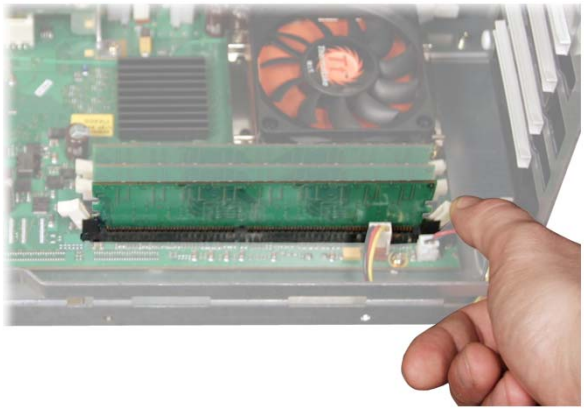
Caution

The electronic components on the PCBS are highly sensitive to electrostatic discharge. It is therefore vital to take precautionary measures when handling these components. Refer to the directives for handling components which are sensitive to electrostatic charge.

Installing a Memory Module

How to install a memory module		
1	Open the device	
2	Note where the (polarized) cutout is on the pin side of the RAM chip before inserting it.	
3	Push the module carefully into the slot until the latches engage.	
4	Close the device.	

Removing a Memory Module

How to remove a memory module		
1	Open the device	
2	Open the left and right latches.	
3	Pull the memory module out of the slot.	
4	Close the device.	

Display of the current memory configuration

A new memory module is automatically detected. The allocation of the ”base memory and extended memory” is automatically displayed when you switch on the device.

10.3 Installing PCI / AT format PCBs

10.3.1 Notes on the modules

Notes on module specifications

The device is designed for use with modules conforming to AT/PCI specifications. PCI modules with 5 V and 3.3 V supply voltage can be operated. The permitted dimensions of the modules are found in the dimensional drawings section.

Note about long PCI modules

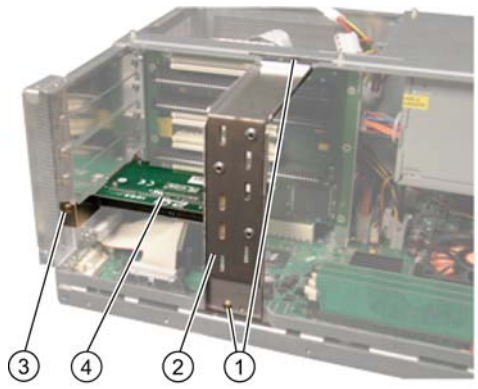
Before long PCI modules can be inserted into the guide rails, they must be fitted with an extender (this should be supplied with the long PCI board).

10.3.2 Installing / removing expansion modules

Preparation

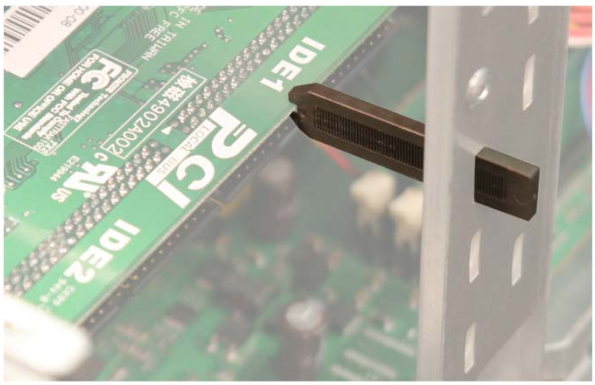
Disconnect the device from mains.

Installing expansion modules

How to install an expansion module (PCI / AT format):		
1	Open the device.	
2	Loosen the two fastening screws (1) and remove the module holding-down device (2).	
3	Remove the relevant steel slot cover (3).	
4	Insert the expansion module (4) into the relevant slot.	
5	Install the module holding-down device and insert the slider.	
6	Secure the steel slot cover (3) of the expansion module.	
7	Close the device.	

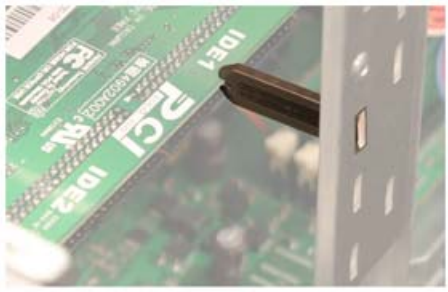
Inserting the slider

To insert the slider:

How to install a module holding-down device		
1	Push the slider through the guide slot until it is seated firmly on the module. Insert the module into the slot.	

Caution

Do not apply any pressure to the module Therefore, do not apply excessive force to the slider when you push it onto the module.

2	Cut off the rest of the slider: Use a knife to notch the slider at the upper edge of the bracket and then break this section off. Cut off the residual element using a sharp side cutter.	

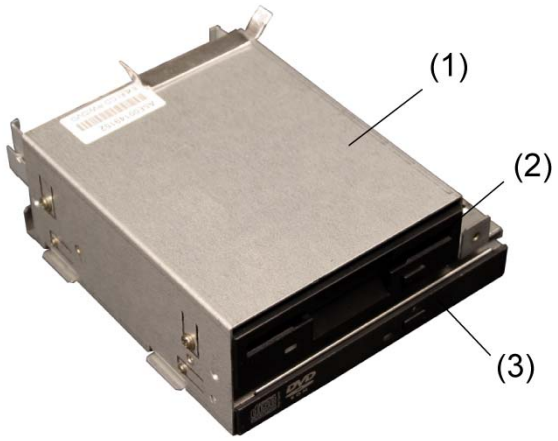
Notes on the allocation of resources

Due to the number of functions on the motherboard, there are no reserved interrupts for PCI modules. If the new expansion module requires exclusive resources, you have to disable the functions on the motherboard. For information on allocated resources, refer to the system resources section. For information on how to disable motherboard functions, refer to the BIOS Setup. Information on the assignment of PCI IRQs to the PCI slots is found in the "Advanced menu" or "Bus board" section.

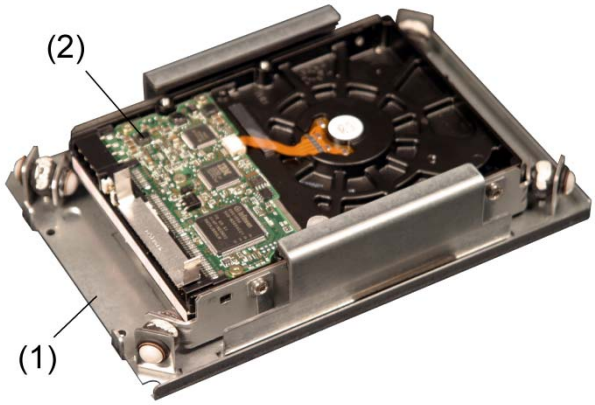
10.4 Installing disk drives

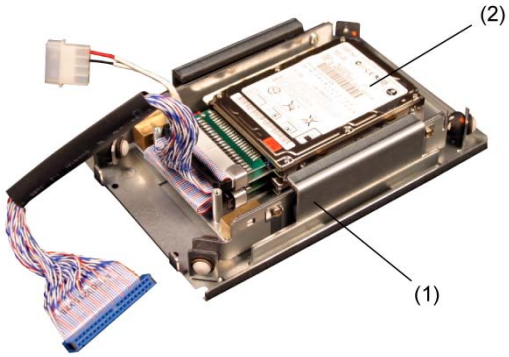
10.4.1 Options of installing disk drives

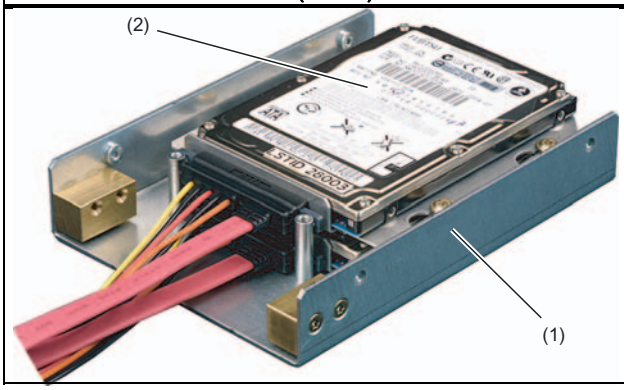
In the drive bay for disk / DVD-ROM drives

In the floppy disk / CD-RW / DVD-ROM drive bay	Pos	Description
	(1)	Disk / CD-RW / DVD-ROM drive bay
	(2)	Mounting slot for a 3.5`` hard disk drive
	(3)	Bay for a CD-RW or DVD-ROM / CD RW drive, Slimline EIDE

In the hard disk drive bay

One 3.5" hard disk	Pos	Description
	(1)	Hard disk drive bay for one 3.5" drive
	(2)	Mounting slot for a 3.5" hard disk drive bay

Two 2.5`` hard disk drives (PATA)	Pos	Description
	(1)	Hard disk drive bay for two 2.5" hard disks
	(2)	Two mounting slots for 2.5" hard disks

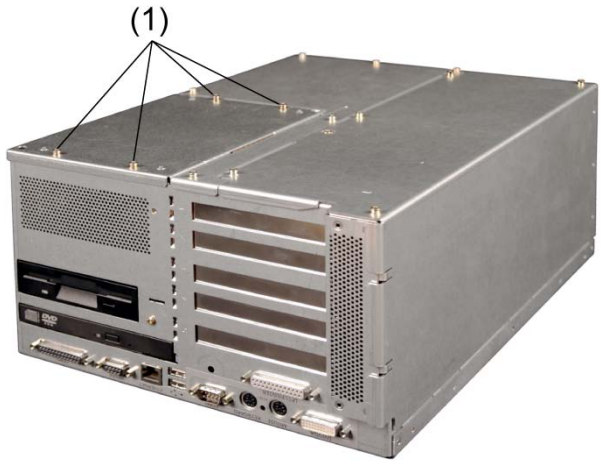
Two 2.5`` hard disk drives (SATA)	Pos	Description
	(1)	Hard disk drive bay for two 2.5" hard disks
	(2)	Two mounting slots for 2.5" hard disks

10.4.2 Installing / removing a drive bay

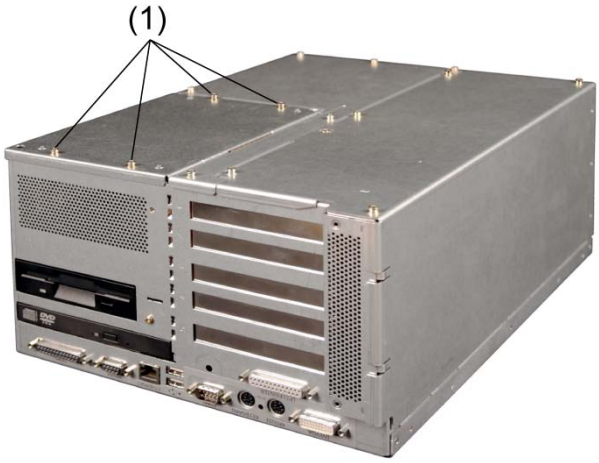
Preparations

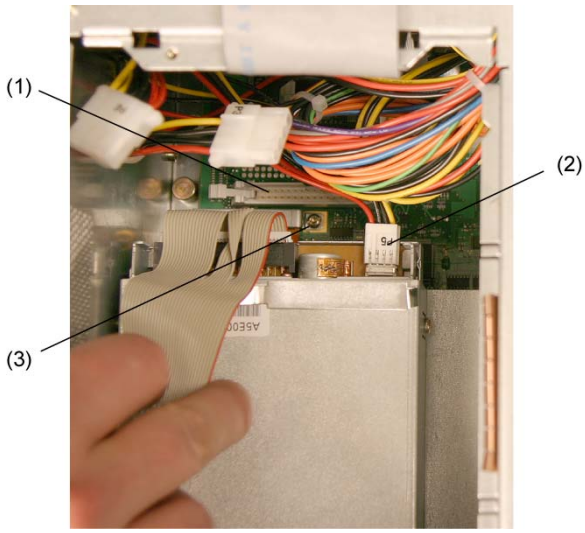
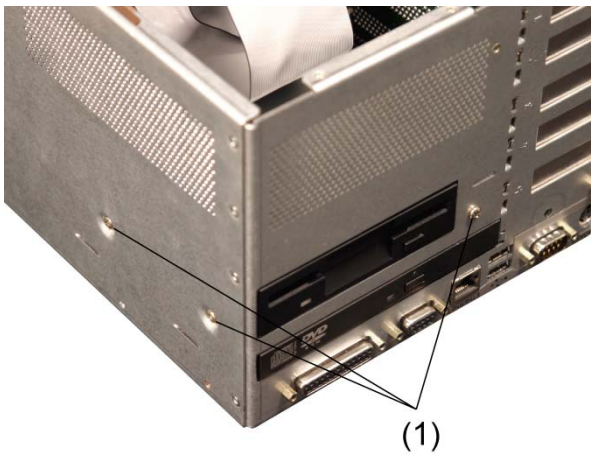
Disconnect the device from mains and unplug all cables.

Remove the hard disk bay

Steps for removing the drive bay		
1	Remove the four screws (1)	
2	Remove the hard disk bay and place it onto the device	

Removing drive bays for floppy disk and DVD drives

Steps for removing the drive bay		
1	Remove the four screws (1)	
2	Remove the hard drive bay and place it onto the device.	

Steps for removing the drive bay		
3	Remove the data cable between the floppy disk drive (1) and the motherboard and its power supply connector (2). Remove the screw (3) and open the bracket. Disconnect the connecting cable for the optical drive.	
4	Remove the three screws (1)	
5	Lift the drive bay out	

10.4.3 Disk / DVD-ROM Installing / removing a drive bay

Removing drives

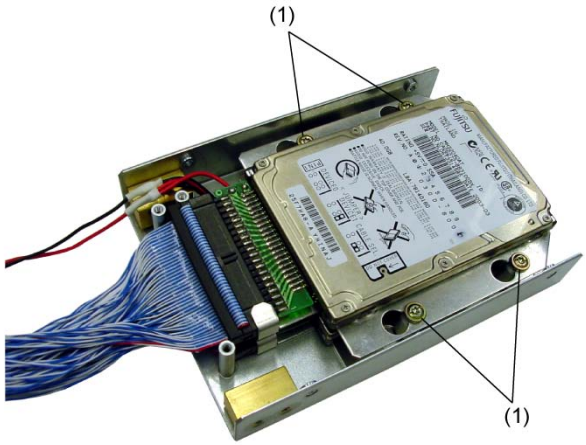
Steps for removing the drive		
1	Removing drive bays.	
2	Remove four of the screws of the respective drive.	
3	Slide the drive out to the front.	

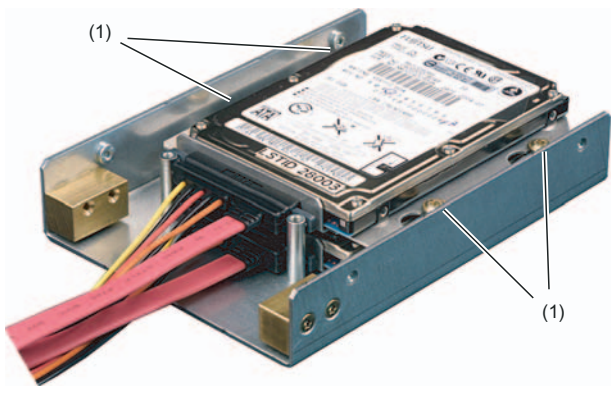
Required tools

A Torx 6 screwdriver is needed to remove an optical drive and a Torx 10 is needed to remove a floppy drive.

10.4.4 Installing / removing hard disks

Removing 2.5" drives

How to remove 2.5" drives (PATA)		
1	Removing drive bays.	
2	Remove the four screws (1).	
3	Remove the drive and the steel mounting bracket from the bay.	
4	Disconnect the cable and the power supply adapter from the drive.	

How to remove 2.5" drives (SATA)		
1	Removing drive bays.	
2	Remove the four screws (1).	
3	Remove the drive and the steel mounting bracket from the bay.	
4	Disconnect the cable and the power supply adapter from the drive.	

Removing 3.5" drives

How to remove 3.5" drives		
1	Removing drive bays.	
2	Disconnect the power supply and the data cable from the drive.	
3	Remove four of the screws of the respective drive.	
4	Take the drive out of the bay.	

Note

Note that special screws with inch threads (6-32 x 3/16" St G3E) are used!

Maintenance and service

11

11.1 Removing and installing hardware components

Notice

Similar to figure

The images presented below deviate slightly from the actual device in some respects.

Carrying out repairs

Only authorized personnel are permitted to repair the device.



Warning

Unauthorized opening and improper repairs on the device may result in substantial damage to equipment or endanger the user.

- Before you open the device, always disconnect the mains plug.
- Install only system expansions designated for this computer. The installation of other expansions can damage the system and violate the radio-interference suppression regulations. Contact your technical support team or your sales outlet to find out which system expansions are suitable for installation.

If you install or exchange system expansions and damage your device, the warranty becomes void.

Notice

Note the ESD instructions.

Limitation of liability

All technical data and licenses apply only to upgrades approved by SIEMENS.

No liability can be accepted for impairment of functions caused by the use of third-party devices or components.

Tools

You can perform all installation tasks on the device using Torx T6, Torx T10, and Torx T20 screwdrivers and a Philips screwdriver.

11.1.1 Replacing the Backup Battery

Note

Batteries are wearing parts and should be replaced after five years in order to ensure proper functioning of the PC.

To be noted before you replace the battery

Caution

Risk of damage!

The lithium battery may only be replaced with an identical battery, or with a type recommended by the manufacturer (Order No.: W79084-E1003-B1).



Warning

Risk of explosion and release of harmful substances!

Therefore, do not throw Lithium batteries into an open fire, do not solder or open the cell body, do not short-circuit or reverse polarity, do not heat up above 100 °C, dispose as regulated and protected against direct exposure to sunlight, humidity and condensation.

Disposal

Caution

Batteries must be disposed of in accordance with local regulations.

Preparation

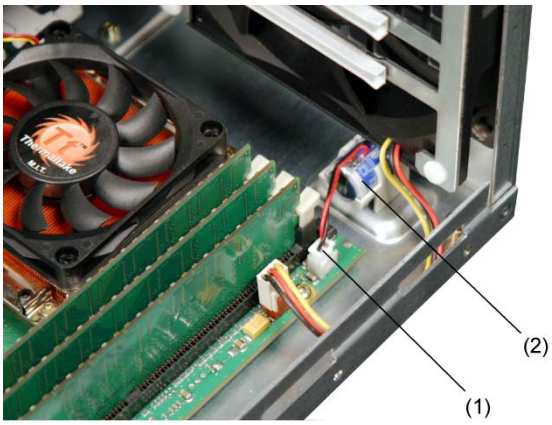
Note

When you replace the battery, you delete the configuration data of the device.

1. Note down the current settings of the BIOS Setup.
   A list in which you can note down this information is found in the BIOS manual
2. Disconnect the device from mains and unplug all cables.

Replacing the battery

Proceed as follows:

Steps for replacing the battery		
1	Open the device	
2	Disconnect the plug (1) and take the battery (2) out of the retainer.	
3	Place a new battery in the holder and reconnect the battery plug.	
4	Close the device.	

Reconfiguring the BIOS Setup

When a battery is exchanged, the configuration data of the device are lost and must be reentered in the BIOS setup.

11.1.2 Removing/Installing the Power Supply

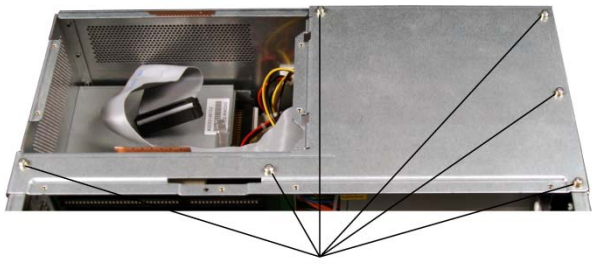
Warning

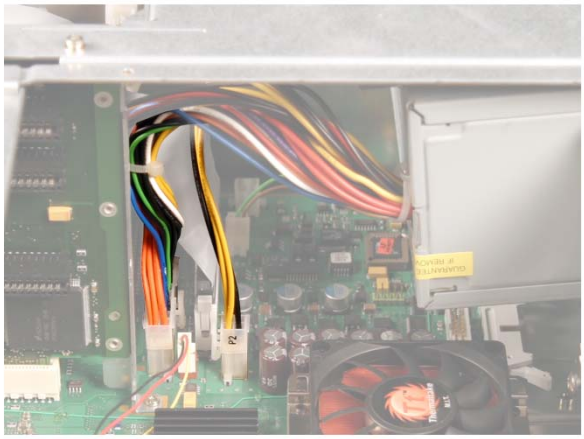
Only qualified personnel is authorized to exchange the power supply module.

Preparation

1. Disconnect the device from mains and unplug all cables.
2. Open the device.

Removing the power supply module

How to remove the power supply module		
1	Remove the hard disk drive bay.	
2	Remove the 6 screws (1) and the cover of the power supply module.	 (1)
3	Disconnect the power supply cables of all drives.	
4	Remove the 3 fastening screws (1) (Torx T10).	 (1)

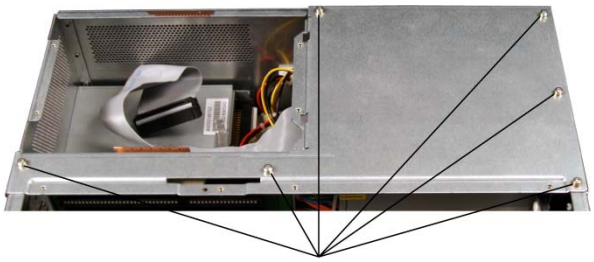
How to remove the power supply module		
5	Disconnect the power supply connector from the motherboard.	
6	Pull the power supply module out to the front.	
7	Also remove the four screws holding the steel bracket of the PS and take it off. These are special screws with imperial dimensions (6-32x3/16"-St-G3E).	

11.1.3 Installing / removing the bus board

Preparation

1. Disconnect the device from mains and unplug all cables.
2. Open the device.

Removing the bus board

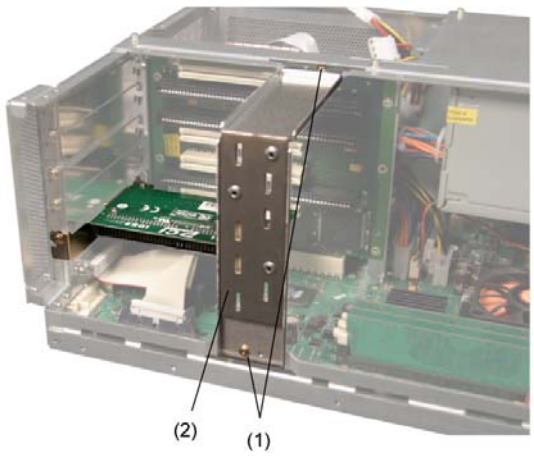
How to remove the bus board		
1	Remove all modules from their slots.	
2	Remove the hard disk drive bays.	
3	Remove the power supply cover: Remove the 6 screws (1).	 (1)
4	Remove the 2 screws (1) on the bus board.	 (1)
5	Remove the bus board from the motherboard.	

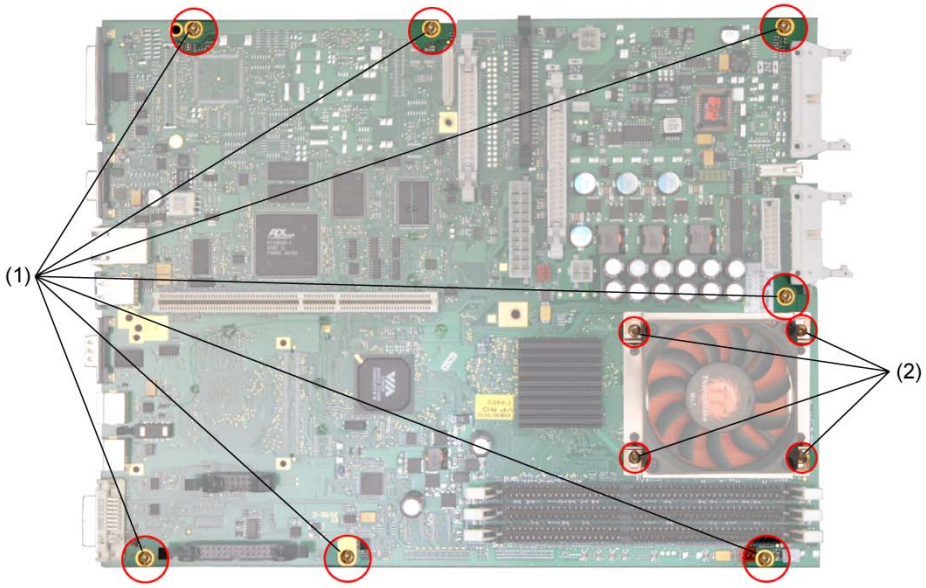
11.1.4 Installing / removing the motherboard

Preparation

1. Disconnect the device from mains and unplug all cables.
2. Open the device.

Removing the motherboard

How to remove the motherboard		
1	Remove the hard disk drive bay.	
2	Remove the module bracket (2). To do so, remove 2 screw (1).	
3	Remove the power supply cover.	
4	Remove the bus board.	
5	Removing the floppy / DVD drive bay.	
6	Remove the power supply module.	
7	Disconnect all cables off the motherboard, noting down their assignment while doing so.	

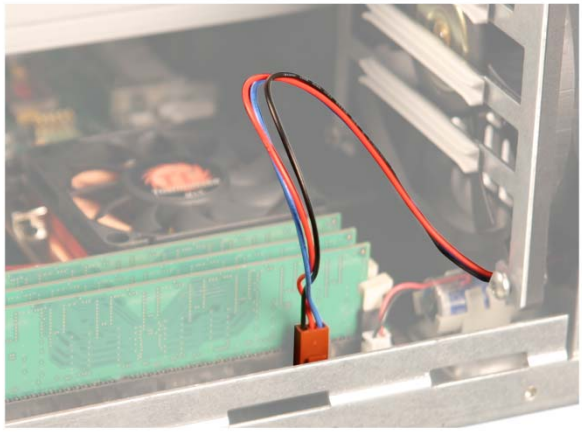
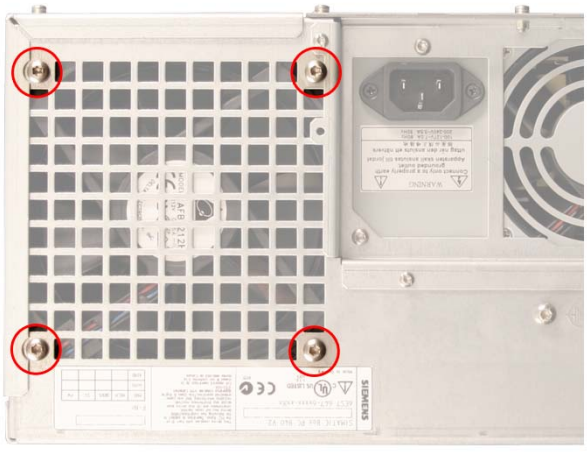
How to remove the motherboard		
8	Remove the 7 screws (1) and the processor fan: Remove the four screws (2).	
		
9	Remove the eight hexagonal bolts at the interfaces.	
		
10	Lift out the motherboard.	

11.1.5 Installing / removing the equipment fan

Preparations

1. Disconnect the device from mains.
2. Opening the device

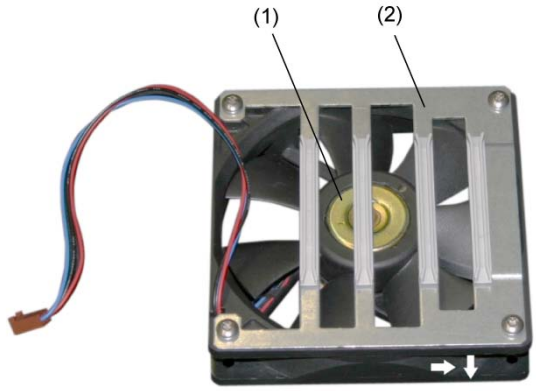
Removing the fan

How to remove the fan		
1	Unplug the fan connector from the motherboard.	
2	Remove the four screws (Torx T20).	
3	Lift out the fan from the housing.	
4	Remove the steel guide for long modules from the fan (4 screws G5 x 8 - St - A2K, Torx T20)	

Installing the fan

Notice

Always install a fan of the same type!

Fan mounting position	
The figure shows the correct fan (1) mounting position and the steel guide (2). Note the arrow directions!	

11.1.6 Installing / removing the processor

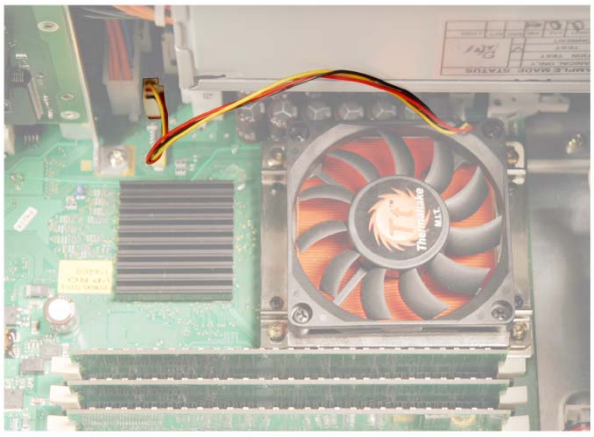
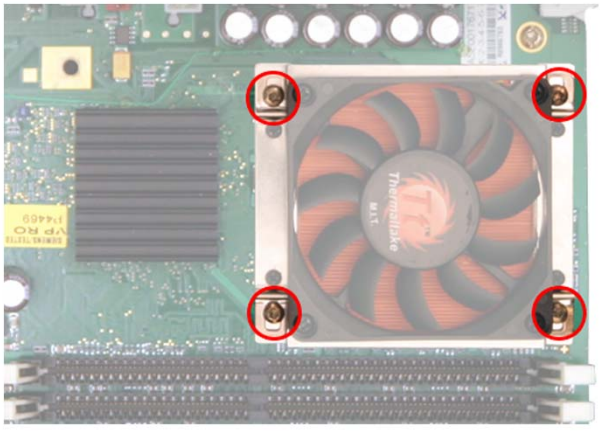
Caution

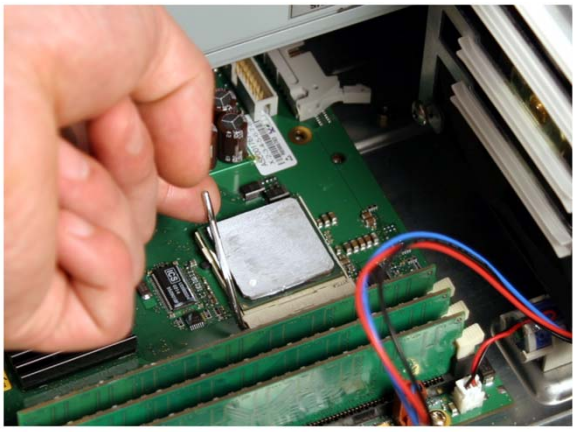
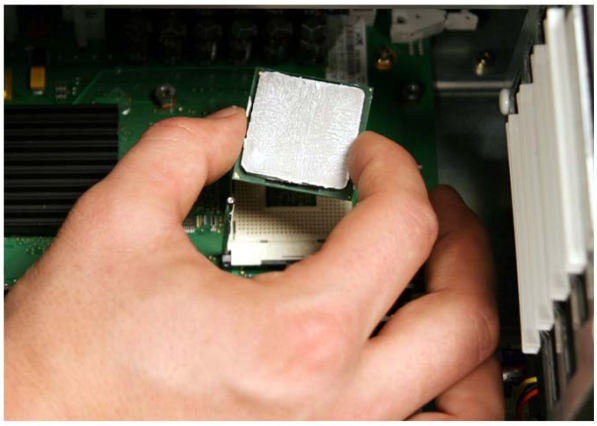
The processor replacement may only be carried out by authorized qualified personnel.

Preparation

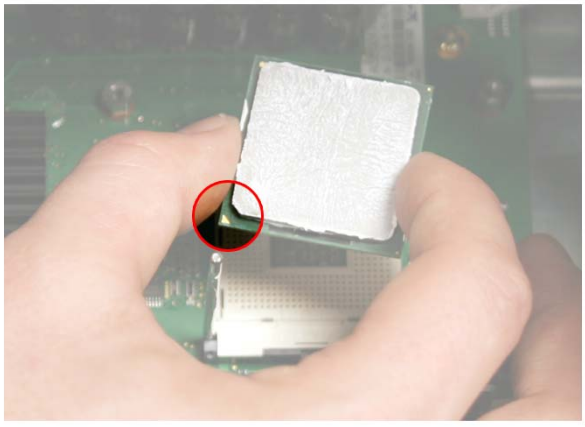
1. Unplug the device from mains.
2. Open the device

Removing the processor

How to remove the processor		
1	Disconnecting the processor fan connector.	
2	Remove the 4 screws holding the processor heat sink and remove the heat sink.	

3	Open the processor latch.	
4	Remove the processor.	

Installing the processor

How to install the processor		
1	Insert the processor.	

Notice

When you insert the processor, make sure the markings on the processor and on the socket match up.

2	Close the processor latch.	
3	Apply some heat-conductive paste to the processor.	



Caution

The processor may overheat when the system is in operation!

The heat-conductive paste must be applied very evenly, as a thin film!

4	Mount the fan unit.	
5	Fasten the fan unit with the 4 screws. To do so, insert the screws diagonally and tighten them evenly, working diagonally in order to avoid tilting of the fan unit. Tighten the screws down to the mechanical stop.	



Caution

Risk of damage!

Special screws are used to mount the heat sink:

- Celeron and desktop processor: Thread M3 / 17 mm length

- Mobile CPU: M3 / 15 mm length

Always use those mounting screws in order to avoid malfunctions.

6	Plug in the fan cable.	

11.2 Reinstalling the software

11.2.1 General installation procedure

In case of software errors, you can reinstall your software using the Recovery CD, the Documentation and Drivers CD or the Restore DVD.

Recovery CD:

Contains the tools for setting up hard disk drives and the operating system.

Documentation and Drivers CD:

Contains the documentation and the hardware drivers.

Restore DVD:

Contains a hard disk image file with the original software (operating system with installed hardware drivers).

11.2.2 Restoring the software to factory state using the Restore CD

You can restore the software to the original factory state using the Restore CD (not included in all package variants). The DVD contains the necessary images and tools for transferring the factory software to the hard disk of your device. You can restore the entire hard disk with drive C: (system) and drive D: or only drive C:. at the command line input. This allows you to retain any user data on drive D.

Retrieving an authorization or license key from the hard disk

- Check if you can retrieve your authorization or license key from the hard disk and perform the procedure described below if this is possible.
- If it is not possible to perform a backup, contact the Customer Support Hotline. There you can obtain information necessary for your software authorization.

Caution

With the option "Restore system partition only", all data on drive C: (System) will be deleted. All data, user settings and all authorizations or license keys on drive C: will be lost in the process! All data on drive C: of your hard disk will be deleted. Setup formats the hard disk partition and reinstalls the original factory software.

When you select the "Restore entire hard disk" option, ALL the data, user settings and authorizations or license keys will be lost on the hard disk.

Restoring the factory state

To restore the factory state, proceed as follows:

- Insert the Restore DVD in your drive and reboot the device. When the BIOS message appears, press

<F2> to enter SETUP or <ESC> to display the boot menu

- . After initialization, a "Boot Menu" is displayed.
- Select "CD-ROM Drive" with the cursor keys.
- Now follow the instructions on the screen.

Caution

All existing **data, programs, user settings** and **authorizations or license keys will be deleted** from the hard disk and therefore lost.

For information on the functions, refer to the README.TXT file on the Restore DVD.

11.2.3 Partitioning the hard disk

11.2.3.1 Setting up the partitions under Windows NT

After you have installed a new hard disk, or if partitions are corrupt, or when you wish to change the partitioning on your hard disk, you need to create or reconfigure partitions on the hard disk.

Caution

By deleting or creating partitions or logical DOS partitions, all saved data are lost on the hard disk. All partitions on the hard disk will be deleted.

Factory setup of the hard disk with Windows NT includes:

- One partition with a FAT16 file system
- One partition with a NTFS file system

To restore the partitions to factory state, proceed as follows:

Primary partition

1. To boot from the Recovery CD, wait until the BIOS message appears and then:

Press <F2> to enter Setup or <ESC> to show Bootmenu

press the ESC key. After initialization, a boot menu selection screen is displayed.

2. Select

CD-ROM drive

3. From the ”Microsoft Windows 98 Startup Menu” screen form, select

2. Boot for FDISK, FORMAT or Windows NT Setup

4. Select

A:\>FDisk

the Microsoft Windows 98 hard disk configuration program (A: is the CD-ROM drive).

5. In the select form, select support for large disks to set up the FAT16 partition.

Activate support (Y/N)...?

[N] for no.

6. Create a primary DOS partition with 2045 MB for a FAT16 file system. When prompted

```
Do you want to use the maximum available space for the primary DOS partition and activate this partition?
```

answer with [Y] for Yes.

7. Format the primary DOS partition by booting from the Recovery CD, as described above in steps 1 to 3. Then run the “Format” program in order to format the C: partition. At the prompt, enter:

```
A:\>Format C:
```

8. The formatting of the NTFS partitions is performed by the setup program of Windows NT. Run Windows NT Setup.

Caution

All the data of the relevant partition will be lost during formatting.

11.2.3.2 Setting up the partitions under Windows 2000/XP Professional

After you have installed a new hard disk, or if partitions are faulty, or when you wish to change the partitioning on your hard disk, you need to set up new partitions on the hard disk.

Caution

When you delete or create partitions or logical DOS partitions, you lose all data on the hard disk. All partitions on the hard disk will be deleted.

Factory setup of the hard disk with Windows 2000 and Windows XP:

- One partition with a FAT32 file system
- One partition with a NTFS file system

To restore the partition to its factory state, proceed as follows:

Primary partition, FAT 32 files system

1. To boot from the Recovery CD, when the BIOS message appears press:

```
<F2> to enter SETUP or <ESC> to display the boot menu
```

the ESC key. After initialization, a Boot Menu screen is displayed for selecting the boot device.

2. Select

```
CD-ROM drive
```

3. From the ”Microsoft Windows 98 Startup Menu” screen form, select

```
2. Boot for FDISK, FORMAT or Windows 2000 Setup
```

or

```
2. Boot for FDISK, FORMAT or Windows XP Professional Setup
```

4. Select

```
A:\>FDisk
```

the Microsoft Windows 98 hard disk configuration program (A: In the screen form, select support for large disks.

```
Do you wish to enable large disk support (Y/N)...?
```

[Y] for yes.

5. Create a primary DOS partition with at least 4090 MB. When prompted

```
Do you want to use the maximum memory size available for the primary DOS partition and do you want to activate this partition?
```

enter [N] for ”No” a and set the partition size to 10245 MB, for example.

6. To format the partition from the Recovery CD as described earlier in steps 1 to 3, restart the computer, the select

```
A:\>Format C:
```

(A: is the CD drive).

to format .

Caution

All the data of the relevant partition will be lost during formatting.

Setting up an extended FAT 32 partition

In order to create an extended partition, restart from the Recovery CD as described earlier in steps 1 to 4.

Create an extended DOS partition with the remaining capacity of the hard disk.

The FAT 32 files system can be converted to a NTFS files system under Windows 2000/XP with the

```
Format
```

function (total data loss), or by entering the command

```
CONVERT D: /FS:NTFS
```

without data loss.

11.2.4 Installing Microsoft Windows operating systems

11.2.4.1 Installation from the Recovery CD for Microsoft Windows NT

This CD contains encrypted data that can only be transferred to a SIMATIC PC.

The data can be copied using the program OEMSETUP.EXE on the CD-ROM or after booting from the CD with the Recovery function.

After the required data have been copied to the hard disk, you can run Windows NT Setup to install the operating system.

Information for systems with PATA-RAID or SCSI controllers

In case of systems with RAID controllers or SCSI controllers these have to be made known to the operating system.

1. During the booting phase, press the F6 key and follow the instructions on the screen. During the installation phases that follow, you are prompted several times for a floppy disk containing the missing drivers of the module. These are contained on the supplied "Documentation and Drivers" CD in the directory Drivers\RAID\Promise\TX100 or Drivers\SCSI\U160.
2. Copy the corresponding driver to an empty floppy disk.

Note

Please also observe the information in den electronic manuals of the controllers. These are available on the included "Documentation and Drivers" CD.

Windows NT Setup sequence

If a Windows operating system is already installed or if the PC has been started with a user boot disk, the transfer of the data can be performed with the program OEMSETUP.EXE. To do this, start the program OEMSETUP.EXE on the recovery CD and continue the sequence beginning with point 5.

If you have not installed an operating system yet, proceed as follows:

1. Insert the Recovery CD into the CD drive and reboot the system.

2. To boot from the CD, when the BIOS message appears press:

<F2> to enter SETUP or <ESC> to display the boot menu

the ESC key. After initialization, a boot menu selection screen is displayed.

3. Select

CD-ROM drive

4. From the ”Microsoft Windows 98 Startup Menu” screen form, select

1. Boot for CD Recovery

If your hard disk is not set up yet, select

2. Boot for FDISK, FORMAT or Windows Setup

5. Confirm the

SIEMENS End User License Agreement

by pressing F8. Press ESC to decline the agreement and to abort setup.

6. In the next screen form, select which components you want to copy from the CD to your hard disk. Minimum requirement for your Windows NT installation or setup is a copy of the "I386" folder.

7. Select the destination drive for data transfer. The selected drive is not the installation drive for Windows. Windows Setup requires approximately 300 MB of free hard disk space on your Windows installation drive.

Note

Drive C: is the default destination for the data transfer (Recovery).

Please note that drive C: must provide approximately 300 MB of free hard disk space after the selected recovery data have been copied.

8. Acknowledge the end message.

9. Run Windows Setup with

<<DRIVE>>:\I386\Winnt.exe

<<DRIVE**>>** is the destination drive to which the Recovery were copied.

For information on Windows NT Setup, refer to the SUPPORT\BOOKS\ folder on your Recovery CD.

Note

If you want to become an expert user of Microsoft Windows NT Workstation, see the "Windows NT Workstation Technical Reference, Version 4.0 (not included in the package). It contains specific information for system administrators who are responsible for installing, managing, and integrating Windows NT Workstation in a network or multiuser environment.

11.2.4.2 Installation from the Recovery CD for Microsoft Windows 2000

This CD contains encrypted data that can only be transferred to a SIMATIC PC.

The data can be copied using the program OEMSETUP.EXE on the CD-ROM or after booting from the CD with the Recovery function.

After the required data have been copied to the hard disk, you can run Windows 2000 Setup to install the operating system.

Notes for systems with SATA-Raid controller

In case of systems with RAID controllers these have to be made known to the operating system.

1. During the booting phase, press the F6 key and follow the instructions on the screen. During the installation phases that follow, you are prompted several times for a floppy disk containing the missing drivers of the module. These are contained on the supplied "Documentation and Drivers" CD in the directory Drivers\RAID\Promise\TX2300
2. Copy the corresponding driver to an empty floppy disk.

Note

Please also observe the information in den electronic manuals of the controllers. These are available on the included "Documentation and Drivers" CD.

Windows 2000 Setup sequence

If a Windows operating system is already installed or if the PC has been started with a user boot disk, the transfer of the data can be performed with the program OEMSETUP.EXE. To do this, start the program OEMSETUP.EXE from the root directory of the recovery CD and continue the sequence beginning with point 5.

If you have not installed an operating system yet, proceed as follows:

1. Insert the Recovery CD into the CD drive and reboot the system.

2. To boot from the CD, when the BIOS message appears press:

<F2> to enter SETUP or <ESC> to display the boot menu

the ESC key. After initialization, a Boot Menu screen is displayed for selecting the boot device.

3. Select

CD-ROM drive

4. From the ”Microsoft Windows 98 Startup Menu” screen form, select

1. Boot for CD Recovery

If your hard disk is not set up yet, select

2. Boot for FDISK, FORMAT or Windows Setup

5. Confirm the

SIEMENS End User License Agreement

by pressing F8. Press ESC to decline the agreement and to abort setup.

6. In the next screen form, select which components you want to copy from the CD to your hard disk. Minimum requirement for your Windows 2000 installation or setup is a copy of the "I386" folder.

7. Select the destination drive for data transfer. The selected drive is not the installation drive for Windows. Windows Setup requires approximately 500 MB of free hard disk space on your Windows installation drive.

Note

Drive C: is the default destination for the data transfer (Recovery).

Please note that drive C: must provide approximately 500 MB of free hard disk space after the selected recovery data have been copied.

8. Acknowledge the end message.

9. Run Windows Setup with

<<DRIVE>>:\I386\Winnt.exe

<<DRIVE**>>** is the destination drive to which the Recovery were copied.

10. Now follow the instructions on the screen.

Setting up the language selection for Windows 2000

The **M**ultilanguage **U**ser **I**nterface (MUI) allows you to set up the Windows 2000 menus and dialogs for additional languages.

To install the MUI, start

"MUI-german"

on your Recovery CD to run MUISETUP.EXE. Follow the instructions on the screen to install the required languages.

To set the required languages for the Windows 2000 menus, dialogs and keyboard layout, select:

Start > Settings > Control Panel > Regional Options > General tab, **Setting for the current user** field and **Language settings for the system** field and the **Keyboard layout** field in the **Input Locales** tab.

In addition to the menu and dialog language settings, you also need to set the default language by selecting **Set Default...** from the **Regional Options** dialog box.

The default language setting of your Windows 2000 installation is English and a US keyboard layout. To change to another language and keyboard layout, open the Control Panel and select:

Start > Settings > Control Panel > Regional Options >General tab, **Setting for current user** field and **Language settings for the system** field and the **Input language** field in the **Input Locales** tab.

11.2.4.3 Installation from the Recovery CD for Microsoft Windows XP

This CD contains encrypted data that can only be transferred to a SIMATIC PC.

The data can be copied using the program OEMSETUP.EXE on the CD-ROM or after booting from the CD with the Recovery function.

After the required data have been copied to the hard disk, you can run Windows XP professional Setup to install the operating system.

Notes for systems with SATA-Raid controller

In case of systems with RAID controllers these have to be made known to the operating system.

1. During the booting phase, press the F6 key and follow the instructions on the screen. During the installation phases that follow, you are prompted several times for a floppy disk containing the missing drivers of the module. These are contained on the supplied "Documentation and Drivers" CD in the directory Drivers\RAID\Promise\TX2300
2. Copy the corresponding driver to an empty floppy disk.

Note

Please also observe the information in den electronic manuals of the controllers. These are available on the included "Documentation and Drivers" CD.

Windows XP Professional Setup sequence

If a Windows operating system is already installed or if the PC has been started with a user boot disk, the transfer of the data can be performed with the program OEMSETUP.EXE. To do this, start the program OEMSETUP.EXE from the root directory of the recovery CD and continue the sequence beginning with point 5.

If you have not installed an operating system yet, proceed as follows:

1. Insert the Recovery CD into the CD drive and reboot the system.

2. To boot from the CD, when the BIOS message appears press:

<F2> to enter SETUP or <ESC> to display the boot menu

the ESC key. After initialization, a Boot Menu screen is displayed for selecting the boot device.

3. Select

CD-ROM drive

4. From the ”Microsoft Windows 98 Startup Menu” screen form, select

1. Boot for CD Recovery

If your hard disk is not set up yet, select

2. Boot for FDISK, FORMAT or Windows Setup

5. Confirm the

SIEMENS End User License Agreement

by pressing F8. Press ESC to decline the agreement and to abort setup.

6. In the next screen form, select which components you want to copy from the CD to your hard disk. Minimum requirement for your Windows XP installation or setup is a copy of the "I386" folder.

7. Select the destination drive for data transfer. The selected drive is not the installation drive for Windows. Windows Setup requires approximately 1500 MB of free hard disk space on your Windows installation drive.

Note

Drive C: is the default destination for the data transfer (Recovery).

Please note that drive C: must provide approximately 1500 MB of free hard disk space after the selected recovery data have been copied.

8. Confirm the end message.

9. Run Windows Setup with

<<DRIVE>>:\I386\Winnt.bat

<<DRIVE**>>** is the destination drive to which the Recovery were copied.

10. Now follow the instructions on the screen.

Setting up the language selection for Windows XP Professional

The **M**ultilanguage **U**ser **I**nterface (MUI) allows you to set up the Windows XP Professional menus and dialogs for additional languages.

To install the MUI, start

"MUI-german"

or “MUI Windows XP” in root folder of your Recovery CD to run MUISETUP.EXE. Follow the instructions on the screen to install the required languages.

Default language of your Windows XP MUI installation is English and a US keyboard layout. You can change the language in the Control Panel with the dialog

Start > Control Panel > Date & Time, **Language, and Regional Options > Add other languages**, **Languages** tab, **Language used in menus and dialogs** field. For the **Date**, **Time**, **Language**, and **Regional Options**, set the default as **non-Unicode programs** under **Advanced** in addition to the language for menus and dialogs.

11.2.5 Installing drivers and software

Notice

Before you install new drivers or updates for MUI operating systems, the regional settings for menus and dialogs and the default language must be reset to US English.

Install the drivers and software from the included "Documentation and Drivers". Procedure:

1. Place the CD in the CD ROM drive.
2. Run *START*.
3. Navigate to the driver list (language-, OS- and device-specific.)
4. Install the relevant driver according to the specifications in the driver list.

Notice

For new Windows 2000 / XP installations, the chipset driver must be installed before you install any other drivers.

When you install Windows NT, you need to install the Windows NT Service Pack before you install any other drivers. The Service Pack must be reinstalled after a driver installation.

11.2.6 Installing the Raid Controller driver

The procedure for installing the RAID controller drivers can be found in the PROMISE user manual on the supplied "Documentation and Drivers" CD.

Notes on Windows NT (only in connection with PATA-RAID Controller)

When you install Windows NT, select the WinNT Promise FastTrack 100 TX2/TX4 (tm) Controller from the list.

ATAPI.SYS must be enabled when you reinstall Windows NT, in order

to enable CD-ROM/CD-RW operation.

To do so, change the start mode to restart in the Control Panel > Devices > ATAPI. Restart the computer.

Notes on Windows 2000/XP

PATA-RAID Controller installieren
During the installation of Windows 2000 / XP, you need to select the Win2000 Promise FastTrack 100 TX2/TX4 (tm) Controller or WinXP Promise FastTrack 100 TX2/TX4 (tm) Controller from the list.

SATA-RAID Controller installieren
During the installation of Windows 2000 / XP, you need to select the Win2000 Promise FastTrack TX 2300 Controller or WinXP Promise FastTrack TX2300 (tm) Controller from the list.

11.2.7 Installing the RAID Controller software

The procedure for installing the software can be found in the PROMISE user manual on the supplied "Documentation and Drivers" CD.

Notes on Windows NT (only in connection with PATA-RAID Controller)

When you install Windows NT, select FastTrak from the list.

ATAPI.SYS must be enabled when you reinstall Windows NT, in order

to enable CD-ROM/CD-RW operation.

To do so, change the start mode to restart in the Control Panel > Devices > ATAPI. Restart the computer.

Notes on Windows 2000/XP

When you install Windows 2000/XP, select FastTrak from the list.

11.2.8 Installing burner/DVD software

The supplied CD provides information about installation of the burner/DVD software.

Alarm, error and system messages

12

12.1 Boot error messages

During startup (the boot process), the BIOS first performs a **P**ower **O**n **S**elf **T**est (POST) and checks whether certain functional units of the PC are operating error-free. When an error occurs within this phase, the BIOS outputs a tone sequence (beep code) based on the current test result. The boot sequence is interrupted immediately if fatal errors occur.

If the POST does not return an error, the BIOS initializes and tests further functional units. In this startup phase, the graphics controller is initialized and any error messages are output to the screen.

The following lists the error messages from the system BIOS. For information on error messages output by the operating system or programs, refer to the corresponding manuals.

On-screen error messages

On-screen error message	Meaning / suggestions
Address conflict	Plug and Play problem. Contact your technical support team.
Combination not supported	Plug and Play problem. Contact your technical support team.
IO device IRQ conflict	Plug and Play problem. Contact your technical support team.
Invalid System Configuration Data	Plug and Play Problem • Set the RESET CONFIGURATION DATA option in the "Advanced" menu of Setup. • Contact your technical support team.
Allocation Error for ...	Plug and Play problem • Please undo the last hardware change. • Contact your technical support team.
System battery is dead. Replace and run SETUP	The battery on the CPU module is defective or dead. Contact your technical support team.
System CMOS checksum bad Run SETUP	Call up SETUP, adjust settings and save. If this message appears during each startup, contact your technical support team.
Failure Fixed Disk	Error accessing the hard drive. Check the SETUP settings. Contact your technical support team.
Keyboard error	Check whether the keyboard is properly connected.
Key seizure	Check whether a key on the keyboard has seized.

On-screen error message	Meaning / suggestions
System RAM Failed at offset:	Memory error. Contact your technical support team.
Shadow RAM Failed at offset:	Memory error. Contact your technical support team.
Extended RAM Failed at offset:	Memory error. Contact your technical support team.
Failing Bits:	Memory error. Contact your technical support team.
Operating system not found	Possible causes: • No operating system present • Wrong drive addressed (disk in drive A/B) • Incorrect active boot partition • Wrong boot drive settings in SETUP • Hard disk is not connected / defective
Previous boot incomplete Default configuration used	Abort of the previous BOOT procedure, for example, due to a power failure. Adjust the settings in SETUP.
System cache error Cache disabled	Error in the CPU's cache module. Contact your technical support team.
Monitor type does not match CMOS Run SETUP	The monitor does not match the SETUP entries. Adapt the SETUP entries to the monitor.
System time-out	Hardware error. Contact your technical support team.
Real-time clock error	Clock chip error. Contact your technical support team.
Keyboard controller error	Keyboard error. Contact your technical support team.

12.2 BIOS POST codes

The following section lists the POST codes relevant to users in the sequence in which they occur: Contact Customer Support for all other POST codes.

Display (hex)	Meaning	Description	Remedy
16H	TP_CHECKSUM	BIOS checksum test	Service event
28H	TP_SIZE_RAM	Determine DRAM size	Replace memory modules
2AH	TP_ZERO_BASE	Set base RAM 64KB to 0	Replace memory modules
2CH	TP_ADDR_TEST	Check address busses	Replace memory modules
2EH	TP_BASERAML	BaseRam Low	Replace memory modules
30H	TP_BASERAMH	BaseRam High	Replace memory modules
38H	TP_SYS_SHADOW	BIOS is copied to DRAM	Replace memory modules
3AH	TP_CACHE_AUTO	Determine CPU cache	Exchange CPU
22H	TP_8742-TEST	Test keyboard controller	Check if keyboard is connected or defective
3CH	TP_ADV_CS_CONFIG	Configure the advanced chip set	Test by switching off the hardware components in Setup
49H	TP_PCI_INIT	Initialize the PCI interface	Test by switching off the hardware components in Setup or removing installed expansion modules from the bus module
55H	TP_USB_INIT	Activation of the USB hardware	Removal of USB devices
4AH	TP_VIDEO	Initialize the video interface	
5CH	TP_MEMORY_TEST	Test of the system memory	Replace memory modules
60H	TP_EXT_MEMORY	Test of the complete memory	Replace memory modules
62H	TP_EXT_ADDR	Test of the address busses	Replace memory modules
90H	TP_FDISK	Initialization and test of the hard disk hardware	Disconnect hard disk, replace if necessary
95H	TP_CD	Initialization and test of the CD hardware	Disconnect CD ROM, replace if necessary
98H	TP_ROM_SCAN	Search for BIOS expansions	Test by switching off the hardware components in Setup or removing installed expansion modules from the bus module
BCH	TP_PARITY	Test of the memory modules	Replace memory modules
00H		BIOS Power On Self Test completed. Loading operating system	

Special codes

The following Beep codes are available in addition to the listed POST codes:

- **3x short** Press INSERT key at system start:
  If an external graphics card on the bus board is not detected, you can try to activate it by pressing the INSERT key.
  The "INSERT" key activates special enumerations for activating a PCI-VGA card.
- **1x long 8x short** Error reading the MPI system information:
  Please contact Customer Support.
- **4x short** MPI firmware updated:
  This can occur one-time following a BIOS update.
- **2x short** Error in checksum test of the BIOS:
  This can occur following a battery replacement or when the battery is empty.

Troubleshooting

13

13.1 General problems

This chapter provides you with tips on how to localize and troubleshoot frequently occurring problems.

Problem	Possible causes	To correct or avoid error
The device is not operational	There is no power supply to the device.	• Check the power supply, the network cable and the power plug. • Check if the On/Off switch is in the correct position.
	Device is being operated outside the specified ambient. conditions	• Check the ambient conditions. • After transport in cold weather, wait approximately 12 hours before switching on the device.
The external monitor remains dark.	The monitor is switched off.	Switch on the monitor.
	The monitor is in "power save" mode.	Press any key on the keyboard.
	The brightness button has been set to dark.	Increase the screen brightness. For detailed information, refer to the monitor operating instructions.
	The power cord or the monitor cable is not connected.	• Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. • Check whether the monitor cable has been properly connected to the system unit and to the monitor.
		If the monitor screen still remains dark after you have performed these checks, please contact your technical support team.
The mouse pointer does not appear on the screen.	The mouse driver is not loaded.	1. Check whether the mouse driver is properly installed and present when you start the application program.
	The mouse is not connected.	Check whether the mouse lead is connected to the system unit. If you are using an adapter or extension for the mouse lead, check the connectors. Should the mouse cursor still not be visible on-screen after completing these checks and measures, contact technical support.
Wrong time and/or date on the PC.		1. Press <F2> within the boot sequence to open the BIOS Setup. 2. Set the time and date in the setup menu.
Although the BIOS setting is OK, the time and data are still wrong.	The backup battery is dead.	In this case, please contact your technical support team.

Problem	Possible causes	To correct or avoid error
USB device not responding.	The USB ports are disabled in your BIOS.	Use a different USB port or enable the port.
	USB 2.0 device connected but USB 2.0 is disabled.	Enable USB 2.0.
	Operating system does not support the USB port.	Enable USB Legacy Support for the mouse and keyboard. For all other devices you need USB drivers for the specific operating system.
DVD: The front loader does not open.	The device is switched off or the open/close button is disabled by a software application.	Emergency removal of the data medium: 1. Switching off the device 2. Insert a pointed object, a pin for example, or an opened paper clip into the emergency extraction opening of the drive. Apply slight pressure to the contact until the front loader opens. 3. Pull the loader further out.

13.2 Problems when Using Modules of Third-party Manufacturers

Problem	Possible causes	To correct or avoid error
The PC crashes during startup	• I/O addresses are assigned twice. • Hardware interrupts and/or DMA channels are assigned twice. • Signal frequencies or signal levels are incorrect. • Connector assignments deviate. • “Reset Configuration” in BIOS SETUP has not been carried out.	Check your computer configuration: • If the computer configuration corresponds with factory state, please contact your technical support team. • If the computer configuration has changed, restore the original factory settings. Remove all third-party modules, then restart the PC. If the error no longer occurs, the third-party module was the cause of the fault. Replace this module with a Siemens module or contact the module supplier. • Force a “Reset Configuration” using the BIOS setup.
		If the PC still crashes, contact your technical support team.
	• If the performance of the external 24 V power supply is insufficient	• use a larger power supply.

Technical data

14

14.1 General specifications

General specifications	
Order nos.	see the order documents
Dimensions	390x285x166 (WxHxD in mm)
Weight	approx. 10 kg
Voltage supply (AC)	120 V to 240 V AC (85 to 264 V AC)
Voltage supply (DC)	DC 24 V (DC 20.4 to 28.8 V)*5
Line voltage frequency	50 - 60 Hz
Transient current interruption according to Namur	AC: min. 20 ms (at 93 to 264 V) (max. 10 events per hour; min. recovery time 1 s) DC: no buffering
Max. power consumption AC (at 230 W secondary)	360 W (efficiency approx. 65%)
Max. power consumption DC (at 180 W secondary)	265 W primary (with approx. 70% efficiency) *5
max. current output (AC)	+5 V/25 A * * +3.3 V/10 A * * * 155 W total allowed +12 V/12.2 A peak 14.0A –12 V/0.8 A –5 V/0.5 A limited to >0.8 A +5 Vaux/2 A peak 2.5 A The total voltage amounts to max. 230 W.
Max. (DC) current output	+5 V/22 A * +3.3 V/16 A ** *140 W total allowed +12 V/4.4 A peak 8.0 A –12 V/0.5 A –5 V/0.5 A +5 Vaux/1 A The total voltage amounts to 180 W.
Noise emission	< 55 dB(A) according to DIN 45635-1
Degree of protection	IP 20
Security	
Protection class	Protection class I to IEC 61140
Safety specifications	AC: EN 60950-1; UL60950; CSA C22.2 No 60950-01 DC: EN 61131-2; UL508; CSA C22.2 No 142

General specifications	
Electromagnetic compatibility (EMC)	
Emitted Interference (AC)	EN 55022 Class B, EN 61000-3-2 Class D EN 61000-3-3; FCC Class A
Emitted interference (DC)	EN 55022 Class A, FCC Class A
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV; (according to IEC 61000-4-4; Burst) ± 1 kV; (according to IEC 61000-4-5; Surge sym) ± 2 kV; (according to IEC 61000-4-5; Surge asym)
Noise immunity on signal lines	± 1 kV;(according to IEC 61000-4-4; Burst; Length < 3 m) ± 2 kV; (according to IEC 61000-4-4; Burst; Length > 3 m) ± 2 kV; (according to IEC 61000-4-5; Surge; Length > 30 m)
Immunity to discharges of static electricity	± 6 kV contact discharge (according to IEC 61000–4–2) ± 8 kV air discharge (according to IEC 61000-4-2)
Immunity to RF interference	10 V/m 80–1000 MHz, 80% AM (according to IEC 61000-4-3) 10 V/m 900 MHz u. 1.89 GHz, 50% ED (according to IEC 61000-4-3) 10 V 9 KHz-80MHz (according to IEC 61000-4-6)
Magnetic field	30 A/m, 50 Hz (to IEC 61000-4-8)
Climatic Conditions	
Temperature	Tested to IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14,
-Operation	+ 5 °C to + 45 °C + 5 °C to + 55 °C *1
-Storage/transport	– 20 °C to +60 °C
- Gradient	max. 10° C/h in operation, 20° C/h storage, no condensation
Relative humidity	tested to IEC 60068-2-78, IEC 60068-2-30
-Operation	5% to 80 % at 25° C (no condensation)
-Storage/transport	5% to 95% at 25° C (no condensation)
Mech. Ambient conditions	
Vibration Operation *2 , Storage/transport	tested to DIN IEC 60068-2-6 10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s^2 5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s^2
Shock resistance -In operation -Storage/transport	Tested to IEC 60068-2-27, IEC 60068-2-29 50 m/s^2, 30 ms, 250 m/s^2, 6 ms,
Special features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Pentium IV 2.4GHz (up to 45°C) Intel ® Celeron 2.0GHz (up to 45°C) Pentium IV Mobile 2,2GHz (up to 55°C)
Internal processor cache	Pentium IV 2.4 GHz 512 KB Pentium IV 2.0GHz Celeron 128 KB Pentium IV Mobile 2.2GHz, 512 KB

General specifications	
Front Side Bus	Pentium IV 2.4GHz 533 MHz FSB Intel ® Celeron IV 2.0GHz 400 MHz FSB Pentium IV Mobile 2.2GHz, FSB 400 MHz
RAM	3 sockets, max. 2GB SDRAM DDR266 (PC2100) For memory expansion, refer to the order forms.
Free expansion slots	2 shared ISA/PCI, long 2 x PCI, long 1 ISA, long
Maximum permissible current consumption per ISA slot Max. admissible power consumption per PCI slot	5 V/ 2 A, 12 V/ 0.3 A, -12 V/ 0.05 A 5 V/ 2 A or 3.3 V/ 2A, 12 V/ 0.3 A, -12 V/ 0.05 A The accumulated power consumption (all slots) may not exceed 50 W
Disk drives	
Floppy drive *3	3.5” (1.44 MB) / 3.5”
Hard disk	3.5” EIDE, UDMA, for hard disk capacity, refer to the order forms.
CD-ROM, DVD-ROM/CD-RW *3	EIDE, UDMA33, for information on features, refer to the order forms.
Graphic	
Graphic controller	VIA ProSavage8
Graphic memory	Graphics memory 8, 16 or 32 MB SDRAM, uses system memory
Resolutions/frequencies/colors	CRT: up to 1600x1200 at 60 Hz / 16-bit color depth CRT: 1280 x 1024 at 100 Hz / 32-bit color depth LCD: 1280 x 1024 / 18-bit
Interfaces	
COM1	Serial port 1, 25-pin Cannon socket
COM2	Serial port 2, 9-pin Cannon plug
LPT1	Parallel port (standard mode, EPP mode) Connection for parallel port printer
DVI	Port for external CRT / LCD monitor
Keyboard	PS/2 keyboard
Mouse	PS/2 mouse port
USB 2.0	2 x external at the interface side
PROFIBUS / MPI interface, isolated *4 - Transmission rate - Operating mode - Physical interface - Memory address area - Interrupts	9-pin Cannon socket 9.6 Kbps to 12 Mbps, software-selectable potential isolation: - Data lines A,B - Control lines RTS AS, RTS_PG - 5V supply voltage (max. 90 mA) Ground connection: - DP12 connector cable shield RS485, potential isolated Automatically configured Automatically configured
Ethernet	Ethernet interface (RJ45), VIA MAC. VT6103 PHy

General specifications	
Status displays on the device	
	FD access (at the FD drive on the side of the housing) CD-ROM access (at the CD drive, if installed)

*1 when using the P4 Mobile 2.2 GHz Processor; operation of disks/CD-ROM/CD-RW is only permitted in a device ambient temperature of up to 45°C.

*2 Restriction for CD-ROM and DVD-ROM/CD-RW drives:
CD-ROM or DVD-ROM/CD-RW 10 to 58 Hz: 0.019 mm / 58 to 500 Hz: 2.5 m/s^2

*3 Restrictions for DVD-ROM/CD-RW: burner operation is only allowed without external disruptions and at an ambient temperature between +5° C to +40° C.

*4 Optional product feature

*5 DC power supply may only be used together with the Pentium 4 Mobile 2.2 GHz Processor.

14.2 Power requirements of the components

Standard system

Components	Voltage					
	+5 V	+3.3 V	+12 V	-5 V	-12 V	5 Vaux
Motherboard	1.3 A	4.8 A	0.2 A		0.03 A	0.3 A
Pentium IV desktop or Celeron processor with active heat sink			5.8 A			
Pentium IV Mobile processor with active heat sink	7 A					
Floppy drive	0.6 A					
Hard disks-drive; 1 x 3.5"	0.3 A		0.5 A			
Hard disks-drive; 2 x 2.5"						
CD-ROM drive	0.7 A					
DVD-ROM/CD-RW drive	0.9 A		0.8 A			
Equipment fan			0.2 A			
RAID controller [3]	0.5 A					
ISA-PCI slots (sum)	10 A	[1]	1.5 A	0.5 A	0.25 A	0.25 A
Front panel port	2.5 A	0.9 A	4.2 A			
Individual currents (max. permitted) on DC power supply	**22 A** [2]	**16 A** [2]	**4.4 A**	**0.5 A**	**0.5 A**	**1 A**
Individual currents (max. permitted) on AC power supply	**25 A** [4]	**10 A** [4]	**12.2 A**	**0.5 A**	**0.8 A**	**2 A**
Permitted total power consumption on DC power supply	180 W					
Permitted total power consumption on AC power supply	230 W					

[1] The ISA/PCI slots can be operated both 5 V and on 3.3 V with the same power consumption.

[2] The max. permitted accumulated power of the +5 V and + 3.3 V is 140 W

[3] Depends on the selected device configuration

[4] The max. permitted accumulated power of the +5 V and + 3.3 V is 155 W

14.3 AC voltage supply

Technical specifications

Input voltage	110-240 V AC (85-264 V AC)
Frequency	50 - 60 Hz
Max. power consumption (continuous operation)	360 W
Power failure buffering	20 ms
Maximum continuous output power	230 W
Protection rating	IP20 (in installed state)
Protection class	VDE 0106

Inrush current

The inrush current of the PC 840 V2 power supply fulfils NAMUR requirements. This means the transient pulse peak value may not exceed 15 times the nominal peak value at a half-width of ≥ 5 ms, as shown on the power supply label (3.5A x 1.414 at 200-240V or 7.0A x 1.414 at 110-127V).

The following requirements must be adhered to for the power supply source: the power supply must be able to supply pulsed current corresponding to 15 times the nominal current of the PC 840 V2. A maximum voltage dip of 15% is permissible on the device's connection terminals for higher current values. The internal supply resistance must be low-impendence, in order that no current limitation takes place.

Note

The power supply contains an active PFC (Power Factor Correction) circuit to conform to the EMC guidelines.

Uninterruptible AC power systems (UPS) must supply a sinusoidal output voltage in the normal and buffered mode when used with SIMATIC PCs with an active PFC.

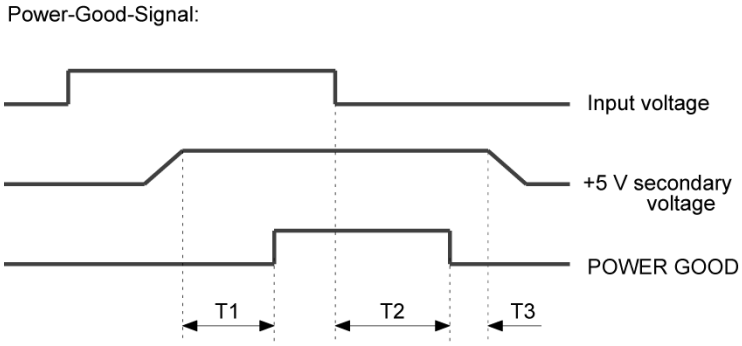
UPS characteristics are described and classified in the standards EN 50091-3 and IEC 62040-3. Devices with sinusoidal output voltage in the normal and buffered mode are identified with the classification “VFI-SS-....” or “VI-SS-....”.

Output voltages

Voltage	Max. current
+ 12 V	12.2 A peak 14 A
- 12 V	0.8 A
+ 5 V	25 A [1]
- 5 V	0.5 A
+ 3.3 V	10 A [1]
+ 5 V_{aux}	2 A peak 2.5 A

[1] The max. permitted accumulated power of the +5 V and + 3.3 V is 155 W.

Power Good Signal of the AC power supply



T1:	preset time	100 ... 500 ms
T2:	hold-up time	20 ms minimum
T3:	save time	1 ms mimimum

14.4 DC power supply

Technical specifications

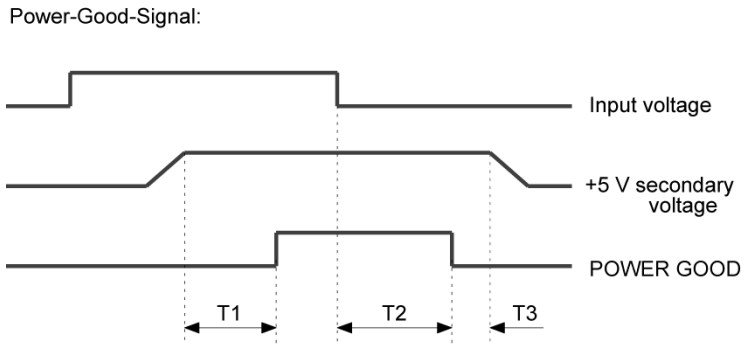
Input voltage	24 V DC (20.4 to 28.8 V DC)
Power consumption	265 W
Power failure buffering	1 ms at nominal voltage
Maximum continuous output power	180 W
Degree of protection	IP20 (in installed state)
Protection class	VDE 0106

Output voltages

Voltage	Max. current
+ 12 V	4.4 A
- 12 V	0.5 A
+ 5 V	22 A [1]
- 5 V	0.5 A
+ 3.3 V	16 A [1]
+ 5 V_{aux}	1 A

[1] The max. permitted accumulated power of the +5 V and + 3.3 V is 140 W

Power Good Signal of the DC power supply



T1:	preset time	100 ... 500 ms
T2:	hold-up time	**not specified**
T3:	save time	1 ms mimimum

Dimensional Drawings

15

15.1 Dimensional Drawing of the Device

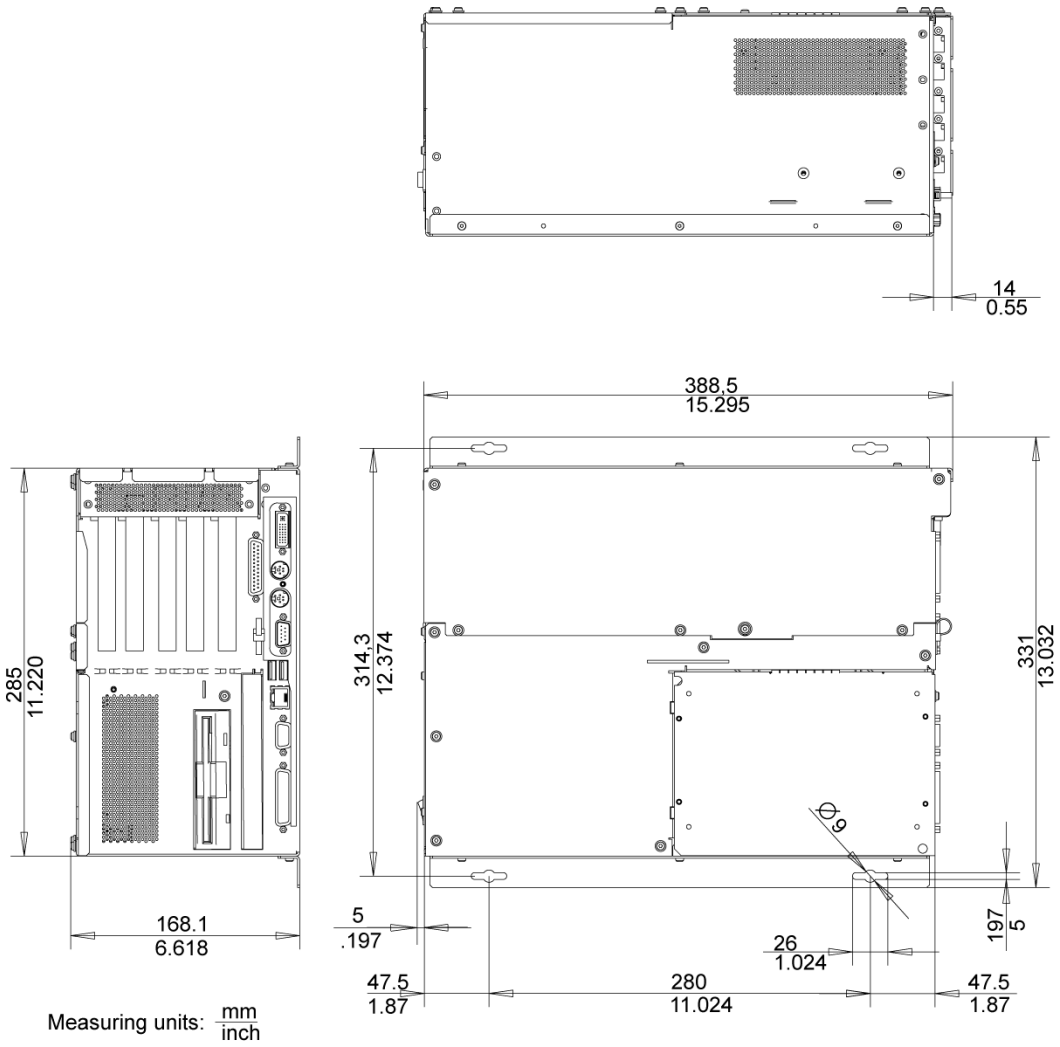


Figure 15-1 Dimensional drawing for mounting with angle bracket

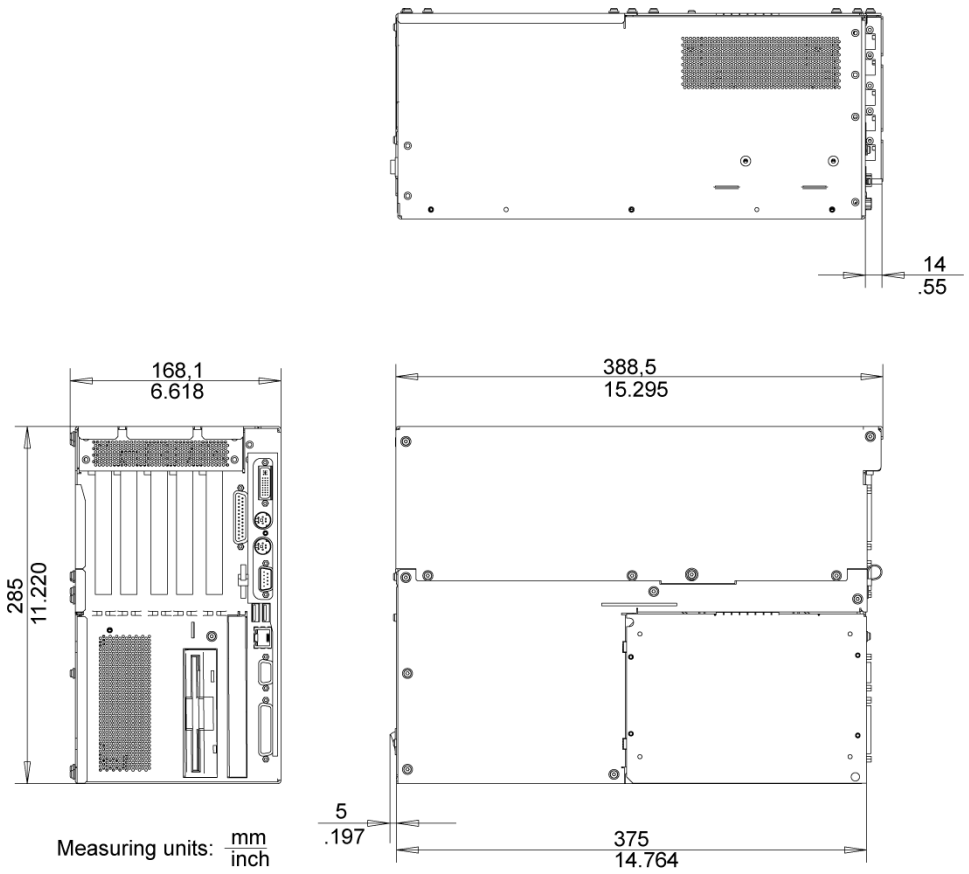
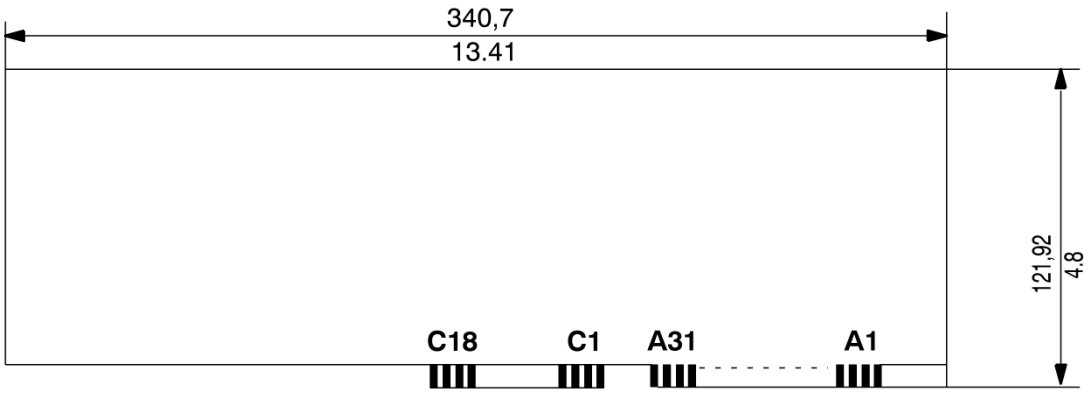


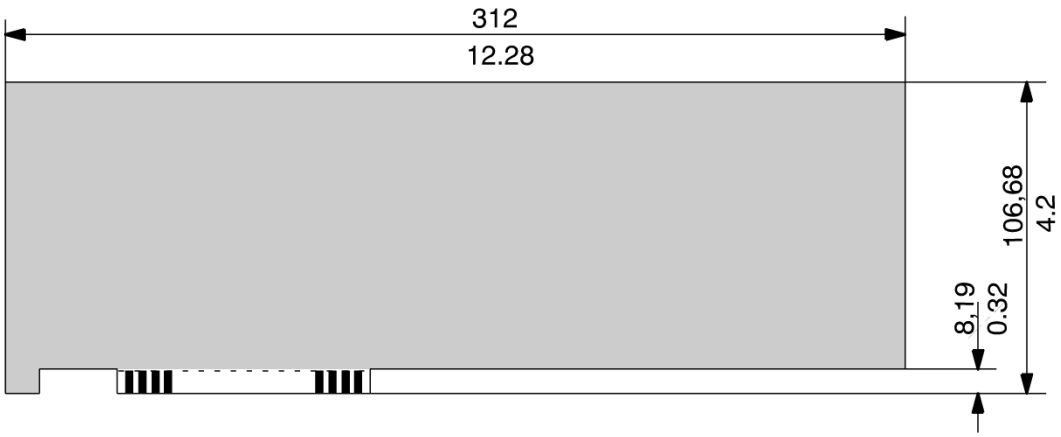
Figure 15-2 Dimensional drawing for mounting without angle bracket

15.2 Dimensional drawings for the installation of expansion modules



Dimensions: mm / Inch

Figure 15-3 AT module



Dimensions: mm / Inch

Figure 15-4 Long format PCI module

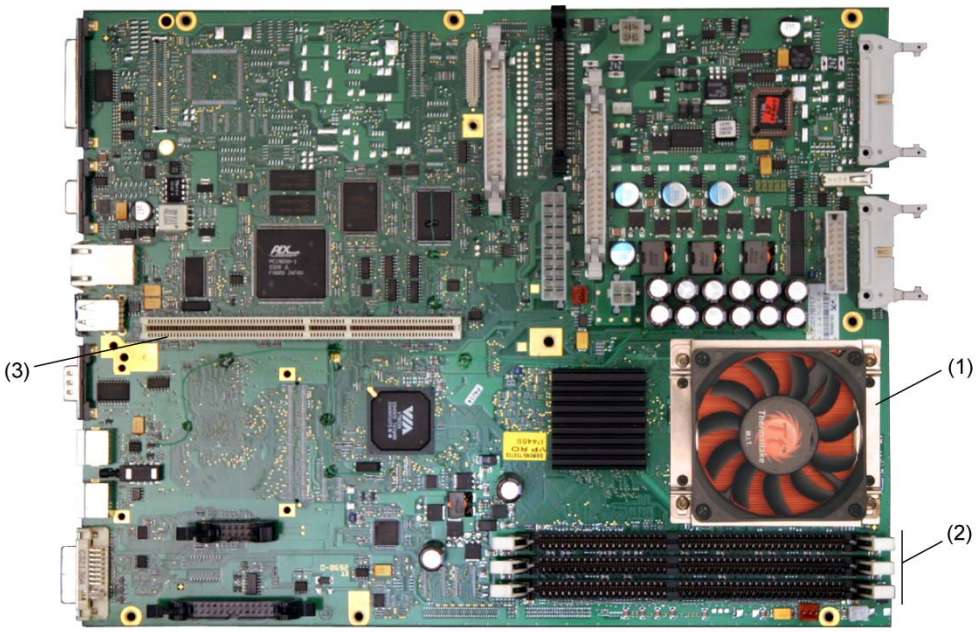
Detailed descriptions

16

16.1 Motherboard

16.1.1 Structure and functions of the motherboard

The essential components of the motherboard are the processor and the chipset, three slots for memory modules, internal and external interfaces, and the Flash BIOS.



(1)	Processor heat sink with fan
(2)	Three memory module slots
(3)	Slot for the bus board

16.1.2 Technical features of the motherboard

Component / interface	Description	Characteristics
Chip set	Single chip set	VIA P4N266A (VT8703A and VT8235)
BIOS	Update by means of software	Phoenix NuBIOS V4, modified by Siemens
CPU	Pentium 4 / Mobile P4 / Intel ® Celeron (design mPGA478)	Upgradeable - Multimedia support - On-board L2-Cache with 512 K / 512 K / 128 K
Memory	3 DIMM module slots, max. 1 GB/DIMM	- Data length = 64 bit - 3.3 V - SDRAM DDR266 to PC2100 specification - up to 512 MB chip size on the module - 66/100/133 MHz bus clock 3) - 128 MB to 2 GB/DIMM variable
Graphic	integrated in chip set	Compatible with S3 Pro Savage, graphic memory 8, 16 or 32 MB SDRAM, uses system memory - DVI interface (X303) -CRT: Up to 1600x1200 pixels, 60Hz, 16-bit color. Up to 1280x1024 pixels, 100Hz, 32-bit color. -LCD: LVDS or DVI up to 1280x1024 / 18-bit TFT
Hard disk drive 4) [Primary EIDE interface]	As master or slave on ATA 33/66/100 mode	- UDMA capable
CD-ROM4) DVD-ROM/CD-RW4)	Master on secondary EIDE interface	- DMA capable
Floppy 4)	FD drive interface	- 1.44 Mbps
Keyboard	PS/2 keyboard interface	- Standard
Mouse	PS/2 mouse interface	- Standard
Serial	COM1/25-pin COM2/9-pin	- V.24
Parallel	Standard, bidirectional, EPP mode	- 25-pin subminiature connector
PROFIBUS/MPI 2)	Communication interface SIMATIC S7	- Isolated 1) CP 5611-compatible - 12 MBaud
USB	Universal Serial Bus	- High-current (500 mA) USB interfaces, 5 channels: 2 x external at the interface side, 3 x internal
Ethernet	10BaseT/100Base-TX (compatible with VIA Rhein family)	-10/100 Mbps, electrically isolated1)

1) Electrically isolated within the safety extra-low voltage circuit (SELV)
2) Optional product feature
3) Depends on the CPU type
4) Depends on the selected device configuration

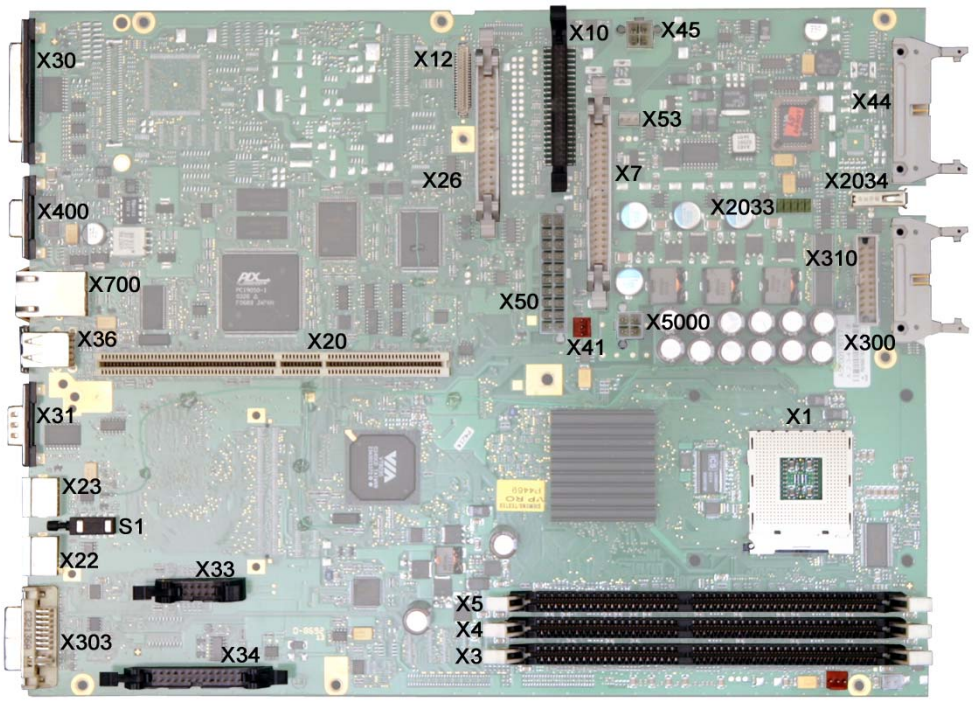
16.1.3 Position of the ports on the motherboard

Interfaces

The motherboard of the device features the following interfaces:

- Interfaces for the connection of external devices
- Interfaces for internal components (drives, bus boards etc.)

The figure below shows the location of the internal and external interfaces on the motherboard.



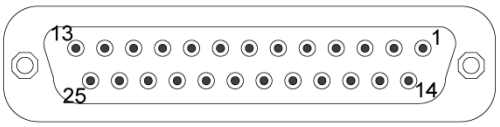
16.1.4 External interfaces

Interface	Position	Connector	Description
COM1	External	X30	25-pin socket, V.24/V.28
COM2	External	X31	9-pin, standard connector
LPT1	External	-	25-pin, standard socket
PS/2 mouse	External	X22	6-pin, miniature DIN socket
PS/2 keyboard	External	X23	6-pin, miniature DIN socket
USB 2.0		X36	X36 first (X36 below) and second USB channel, (X36 above)
PROFIBUS / MPI	External	X400	9-pin, standard socket, electrically isolated interface
Ethernet	External	X700	RJ45
DVI	External	X303	26-pin socket

Serial interface COM 1, X30

The serial interface (COM 1) on the device has the following pinout:

Serial interface COM 1 (socket)

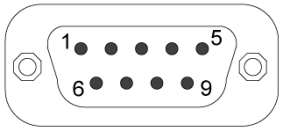


PinNo.	Abbreviation	Meaning	Input/Output
1	–	Shielding	–
2	TxD (D1)	Serial transmit data	Output
3	RxD (D2)	Serial receive data	Input
4	RTS (S2)	Request to send	Output
5	CTS (M2)	Clear to send	Input
6	DSR (M1)	Ready for operation	Input
7	GND (E2)	Functional ground (reference potential)	–
8	DCD (M5)	Data carrier detect	Input
9	–	–	–
10–17	–	Not assigned	–
18	–	–	–
19	–	–	–
20	DTR (S1)	Data terminal ready	Output
21	–	–	–
22	RI (M3)	Incoming call	Input
23–25	–	Not assigned	–

COM 2 serial interface (V24/Mouse), X31

The serial interface (COM 2) has the following pinout:

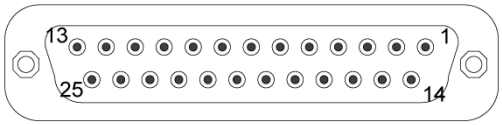
COM 2 serial interface (V24/Mouse)



PinNo.	Abbreviation	Meaning	Input/Output
1	DCD (M5)	Receiving signal level carrier	Input
2	RxD (D2)	Received data	Input
3	TxD (D1)	Transmitted data	Output
4	DTR (S1)	Data terminal ready	Output
5	GND (E2)	Functional ground (reference potential)	–
6	DSR (M1)	Ready for operation	Input
7	RTS (S2)	Request to send	Output
8	CTS (M2)	Clear to send	Input
9	RI (M3)	Incoming call	Input

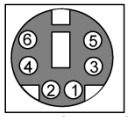
LPT1 parallel interface, X134

The parallel interface (LPT 1) has the following pinout:

Parallel interface LPT1			
			
PinNo.	**Abbreviation**	**Meaning**	**Input/Output**
1	/ Strobe (CLK)	Data message	Output (open collector)
2	Data - Bit 0	Data channel 0	Output (TTL level)
3	Data - Bit 1	Data channel 1	Output (TTL level)
4	Data - Bit 2	Data channel 2	Output (TTL level)
5	Data - Bit 3	Data channel 3	Output (TTL level)
6	Data - Bit 4	Data channel 4	Output (TTL level)
7	Data - Bit 5	Data channel 5	Output (TTL level)
8	Data - Bit 6	Data channel 6	Output (TTL level)
9	Data - Bit 7	Data channel 7	Output (TTL level)
10	/ACK	Data acknowledge	Input (4.7 kO pull-up)
11	BUSY	Not ready	Input (4.7 kO pull-up)
12	PE (PAPER END)	Paper end	Input (4.7 kO pull-up)
13	SELECT	Device selection	Input (4.7 kO pull-up)
14	/ AUTO FEED	Automatically new line	Output (open collector)
15	/ ERROR	Device error	Input (4.7 kO pull-up)
16	/ INIT	Reset / Initialization	Output (open collector)
17	/ SELECT IN	Printer selection	Output (open collector)
18 – 25	GND	Ground	–

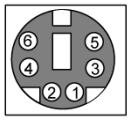
PS/2 mouse interface, X22

Pin assignment of the interface:

PS/2	Pin No.	Abbreviation	Meaning	Input/Output
 View onto the socket	1	DAT	Data channel, mouse	Input/output
	2	–	Not assigned	–
	3	GND	Ground	–
	4	P5VFK	+ 5 V (fused)	Output
	5	CLK	Clock channel, mouse	Input/output
	6	–	Not assigned	–

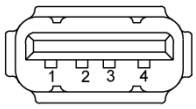
PS/2 keyboard interface, X23

Pin assignment of the interface:

PS/2	Pin No.	Abbreviation	Meaning	Input/Output
 View onto the socket	1	DAT	Data channel, keyboard	Input/output
	2	–	Not assigned	–
	3	GND	Ground	–
	4	P5VFK	+ 5 V (fused)	Output
	5	CLK	Clock channel, keyboard	Input/output
	6	–	Not assigned	–

USB interfaces, X36

The Universal Serial Bus interfaces have the following pinout:

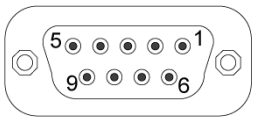
USB interface			
			
Pin No.	**Abbreviation**	**Meaning**	**Input/Output**
1	VCC	+ 5 V (fused)	Output
2	– Data	Data channel	Input/Output
3	+ Data	Data channel	Input/Output
4	GND	Ground	–

The connectors are of type A.

The interface is rated as a high current USB (500mA).

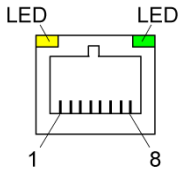
PROFIBUS/MPI interface, X400

The PROFIBUS/MPI socket has the following pinout:

PROFIBUS/MPI interface [1]			
			
PinNo.	**Abbreviation**	**Meaning**	**Input/Output**
1	–	Not assigned	–
2	–	Not assigned	–
3	LTG_B	Signal line B of MPI module	Input/output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is "1" active when the directly connected PLC is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply. The current load caused by an external consumer connected between P5EXT and M5EXT must not exceed the maximum of 90 mA.	Output
6	P5 EXT	P5EXT power supply (+5 V) of the 5 V power supply. The current load caused by an external consumer connected between P5EXT and M5EXT must not exceed the maximum of 90 mA.	Output
7	–	Not assigned	–
8	LTG_A	Signal line A of MPI module	Input/output
9	RTS_PG	RTS output signal of the MPI module. The control signal is "1" when the PG is sending.	Output
Shielding		on connector casing	

[1] Optional product feature

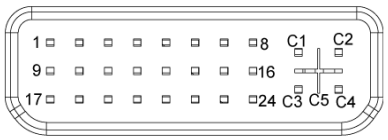
Ethernet RJ45 connection, X700

Ethernet RJ45 connection			
			
PinNo.	**Abbreviation**	**Meaning**	**Input/Output**
1	TD+	Transmitted data	Output
2	TD-	Transmitted data	Output
3	RD+	Received data	Input
4, 5 [1)]	SYMR	Internal 75 Ohm terminating resistor	–
6	RD-	Received data	Input
7, 8 [1)]	SYMT	Internal 75 Ohm terminating resistor	–
S		Shielding	–
	Yellow LED	Connection	–
	Green LED	Activity	–

[1)] is not necessary for data transfer

DVI interface, X303

The DVI socket has the following pinout:

DVI interface			
			
PinNo.	**Abbreviation**	**Meaning**	**Input/Output**
S	GND	Ground	–
S1	GND	Ground	–
C1	R	Red	Output
C2	G	Green	Output
C3	B	Blue	Output
C4	HSYNC	Horizontal synchronizing pulse	Output
C5	GND	Ground	–
CSA	GND	Ground	–
1	TX2N	TDMS data 2-	Output
2	TX2P	TDMS data 2+	Output
3	GND	Ground	–
4	NC	Not assigned	–
5	NC	Not assigned	–
6	DDC CLK	DDC clock	Input/Output
7	DDC CLK	DDC data	Input/Output
8	VSYNC	Vertical synchronizing pulse	Output
9	TX1N	TDMS data 1-	Output
10	TX1P	TDMS data 1+	Output
11	GND	Ground	–
12	NC	Not assigned	–
13	NC	Not assigned	–
14	+5 V	+5 V	Output
15	GND	Ground	–
16	MONDET	Hotplug detect	Input
17	TX0N	TDMS data 0-	Output
18	TX0P	TDMS data 0+	Output
19	GND	Ground	–
20	NC	Not assigned	–
21	NC	Not assigned	–
22	GND	Ground	–
23	TXCP	TDMS clock +	Output
24	TXCN	TDMS clock -	Output

16.1.5 Front ports

Overview

Interface	Position	Connector	Description
Display (LVDS)	Internal	X300	Connection of LCD displays with LVDS interface (channel 1)
Display (LVDS)	Internal	X310	Connection of LCD displays with LVDS interface (channel 2)
I/O front	Internal	X44	Interface for I/O front
COM2	Internal	X33	Internal COM2 interface
USB	Internal	X2033	Internal USB 2.0 interface (USB channel 5)

Display interfaces

TFT displays with an LVDS interface can be connected to this interface. You may connect 18-bit displays with a resolution up to 1024x768 pixels on X300 only (single-channel LVDS), and of 1280 x 1024 pixels on X300 and X301 (dual-channel LVDS). X301 is also connected to a +12VF at max. 4.2. A power supply for backlight inverters for 17" / dual-channel LVDS displays. The permitted display clock rate is 20MHz to 66MHz. The display is selected automatically according to the coding of the display select inputs.

The display power supply voltages (3.3V and 5V) are switched via the graphic controller, independent of the requirements of the connected display units. The maximum cable length is 50 cm at a transmission rate of 455 MHz. Make allowances for the special channel features of differential line pairs with LVDS specifications.

Display interface (1st LVDS channel), X300

Pin No.	Abbreviation	Meaning	Input/Output
1	P5V_D_fused	+5V (fused) display VCC	Output
2	P5V_D_fused	+5V (fused) display VCC	Output
3	RXIN0-	LVDS output signal bit 0 (-)	Output
4	RXIN0+	LVDS output signal bit 0 (+)	Output
5	P3V3_D_fused	+3.3V (fused) display VCC	Output
6	P3V3_D_fused	+3.3V (fused) display VCC	Output
7	RXIN1-	LVDS output signal bit 1 (-)	Output
8	RXIN1+	LVDS output signal bit 1 (+)	Output
9	GND	Ground	-
10	GND	Ground	-
11	RXIN2-	LVDS output signal bit 2 (-)	Output
12	RXIN2+	LVDS output signal bit 2 (+)	Output
13	GND	Ground	-
14	GND	Ground	-
15	RXCLKIN-	LVDS clock signal (-)	Output

Pin No.	Abbreviation	Meaning	Input/Output
16	RXCLKIN+	LVDS clock signal (+)	Output
17	GND	Ground	-
18	GND	Ground	-
19	NC	Not assigned	-
20	NC	Not assigned	-

Display interface (2nd LVDS channel), X310

Pin No.	Abbreviation	Meaning	Input/Output
1	GND	Ground	-
2	GND	Ground	-
3	RXIN10-	LVDS input signal bit 0 (-)	Output
4	RXIN10+	LVDS input signal bit 0 (+)	Output
5	GND	Ground	Output
6	GND	Ground	Output
7	RXIN11-	LVDS input signal bit 1 (-)	Output
8	RXIN11+	LVDS input signal bit 1 (+)	Output
9	GND	Ground	-
10	GND	Ground	-
11	RXIN12-	LVDS input signal bit 2 (-)	Output
12	RXIN12+	LVDS input signal bit 2 (+)	Output
13	GND	Ground	-
14	GND	Ground	-
15	RXCLKIN1-	LVDS clock signal (-)	Output
16	RXCLKIN1+	LVDS clock signal (+)	Output
17	GND	Ground	-
18	P12VF	+12V fused	Output
19	P12VF	+12V fused	Output
20	P12VF	+12V fused	Output

Assignment of the display to the display select pins

The display select inputs are used to configure one of 15 possible displays automatically. The display select inputs are equipped with pull-up resistors, i.e., these inputs have a high signal if they are not connected. The input must be connected to GND if a low signal is to be generated.

Pin No.	LCD_SEL3	LCD_SEL2	LCD_SEL1	LCD_SEL0	Display type
0	low	low	low	low	reserved
1	low	low	low	high	1280x1024 (SXGA), TFT, 2 x 18-bit, LVDS channel 1 and 2
2	low	low	high	low	DVI LCD 640 x 480
3	low	low	high	high	DVI LCD 800 x 600
4	low	high	low	low	640 x 480 (VGA), TFT, 18 bits, LVDS channel 1
5	low	high	low	high	reserved
6	low	high	high	low	1024 x 768 (XGA), TFT, 18 bits, LVDS channel 1
7	low	high	high	high	800 x 600 (SVGA), TFT, 18 bits, LVDS channel 1
8	high	low	low	low	reserved
9	high	low	low	high	reserved
10	high	low	high	low	reserved
11	high	low	high	high	reserved
12	high	high	low	low	Reserved 1024 x 768 (XGA), TFT, 2 x 18-bit, LVDS channel 1 and 2
13	high	high	low	high	DVI LCD 1024 x 768
14	high	high	high	low	DVI LCD 1280 x 1024
15	high	high	high	high	No LVDS display or DVI LCD with automatic DDC ID

I/O front interface for operator panels, X44

This interface carries all signals required for the connection of operator panels in addition to the display and USB interface. The maximum cable length is 50 cm at a USB data rate of 12 Mbps.

Pin No.	Abbreviation	Meaning	Input/Output
1	GND	Ground	-
2	P12V	Inverter voltage supply	Output
3	BL_ON	Backlight ON (5 V = ON)	Output
4	P5V_fused	+5 V (fused)	Output
5	GND	Ground	-
6	P3V3_fused	+3.3 V VCC (fused)	Output
7	K_CLK	Keyboard clock channel	Output
8	K_DATA	Keyboard data channel	Input/Output
9	M_CLK	Mouse clock channel	Output
10	K_DATA	Mouse data channel	Input/Output
11	P5V_fused	+5 V (fused)	Output
12	USB_D1M	USB data channel 1	Input/Output
13	USB_D1P	USB data+, channel 1	Input/Output
14	GND	Ground	-
15	LCD_SEL0	Display type - Select signal 0	Input
16	LCD_SEL1	Display type - Select signal 1	Input
17	LCD_SEL2	Display type - Select signal 2	Input
18	LCD_SEL3	Display type - Select signal 3	Input
19	RESET_N	Reset signal (active low)	Input
20	Power button	Power button function front	Input
21	HD_LED	HD LED, anode with 1 kW in series on the motherboard	Output
22	DP_LED	MPI/DP LED, anode via 1 KOhm in series on the motherboard	Output
23	Ethernet_LED	Ethernet LED, anode with 1 kW in series on the motherboard	Output
24	TEMP_ERR	Temperature error LED, anode with 1 kW in series on the motherboard	Output
25	RUN_R	Watchdog error LED, anode with 1 kW in series on the motherboard	Output
26	RUN_G	Watchdog OK LED, anode with 1 kW in series on the motherboard	Output

16.1.6 Internal ports

Pin assignment of the internal interfaces

Port	Position	Connectors	Description
Memory	Internal	X3, X4, X5	3 DIMM sockets, 64-Bit
Processor	Internal	X1	Socket for FCPGA processor
Bus expansion	Internal	X20	Socket for bus expansion, assigned with ISA and PCI bus signals
Power supply	Internal	X50, X5000	20-pin power supply connector ATX 12 V expansion
Floppy	Internal	X26	One drive is possible (82078 compatible) 360 K, 720 K, 1.2 MB, 1.44 MB 3F0h–3F7h, 370h–377h, switched IRQ 6, edge triggered 34-pin socket for standard FD drive
3.5" hard disk drive	Internal	X7	170h–177h, 1F0h-1F7h, switchable IRQ 14, IRQ 15, edge triggered 40-pin, 2.54mm male connector (3.5" HD, primary), up to two drives can be operated
CD-ROM, (back-packed)	Internal	X10	170h–177h, 1F0h–1F7h, switchable IRQ14, IRQ15, edge triggered 44-pin, 2 mm male connector
CD-ROM, integrated	Internal	X12	170h–177h, 1F0h–1F7h, switchable IRQ14, IRQ15, edge triggered 1 x 41-pin (Hirose DF9-41, CD-ROM, Master)
PS circuit for CPU fan	Internal	X41	Power supply for CPU fan, 3-pin male connector
PS connection for equipment fan	Internal	X42	Power supply for equipment fan, 3-pin male connector
Backup battery	Internal	X49	Power supply for back-up battery, 2-pin male connector
Power supply connection for 17" front components with 12 V DC power supply	Internal	X45	Additional power supply connector for 17" fronts
On / Off switch	Internal	X53	Switches off the power supply on the secondary side, the AUX voltage is not switched off.
LVDS channel 1	Internal	X300	LVDS display interface for 12 to 19" fronts
LVDS channel 2	Internal	X310	Expansion of the LVDS display interface X300 for dual-channel LVDS displays (resolution 1280 x 1024)
I/O interface for front components	Internal	X44	
USB interface	Internal	X2033	
USB interface for front components	Internal	X2034	USB interface (front USB channels 3 and 5)

Connector for CD-ROM drive X 12

Pin No.	Abbreviation	Meaning	Input/Output
1	Reserved	Reserved	-
2	Reserved	Reserved	-
3	Reserved	Reserved	-
4	GND	Ground	-
5	Reset	Reset signal	Input/Output
6	D8	Data signal D8	Input/Output
7	D7	Data signal D7	Input/Output
8	D9	Data signal D9	Input/Output
9	D6	Data signal D6	Input/Output
10	D10	Data signal D10	Input/Output
11	D5	Data signal D5	Input/Output
12	D11	Data signal D11	Input/Output
13	D4	Data signal D4	Input/Output
14	D12	Data signal D12	Input/Output
15	D3	Data signal D3	Input/Output
16	D13	Data signal D13	Input/Output
17	D2	Data signal D2	Input/Output
18	D14	Data signal D14	Input/Output
19	D1	Data signal D1	Input/Output
20	D15	Data signal D15	Input/Output
21	D0	Data signal D0	Input/Output
22	DREQ	DMA request	Input
23	GND	Ground	-
24	IOR_N	Read signal	Output
25	IOW_N	Write signal	Output
26	GND	Ground	-
27	IORDY	Ready signal	Input
28	DACK_N	DMA acknowledgment	Output
29	IRQ15	Interrupt signal	Input
30	AD_1	Addess1	Output
31	AD_0	Address 0	Output
32	AD_2	Address 2	Output
33	CS_N	Chip select signal	Output
34	HDACT_N	Activity	Input
35	CS1_N	Chip select 1	-
36	CSEL	Chip select signal	-
37	GND	Ground	-
38	P5V	+5 V voltage supply	Output
39	P5V	+5 V voltage supply	Output
40	P5V	+5 V voltage supply	Output
41	P5V	+5 V voltage supply	Output

Interface to floppy disk drive, X26

This interface is designed for connecting a standard floppy drive. The maximum length of the data cable should not exceed 40 cm.

Pin No.	Abbreviation	Meaning	Input/Output
1	GND	Ground	-
2	DENSEL	High density disk selection	Output
3	GND	Ground	-
4	-	Unassigned	-
5	GND	Ground	-
6	DRAME0	Data rate signal	Output
7	GND	Ground	-
8	INDEX_N	Index hole recognition	Input
9	GND	Ground	-
10	MOT_N0	Activate motor 0	Output
11	GND	Ground	-
12	DS_N1	Drive 1 selection	-
13	GND	Ground	-
14	DS_N0	Drive 0 selection	-
15	GND	Ground	-
16	MOT_N0	Activate motor 1	Output
17	GND	Ground	-
18	DIR_SL_N	Step motor direction	Output
19	GND	Ground	-
20	STEP_N	Step motor pulse	-
21	GND	Ground	-
22	WR_DAT_N	Write data signal	Output
23	GND	Ground	-
24	WR_GAT_N	Enable data signal	Output
25	GND	Ground	-
26	TRACK_N0	Track 0 signal	Input
27	GND	Ground	-
28	WR_PRT_N	Write protection signal	Input
29	GND	Ground	-
30	RD_DAT_N	Read data signal	Input
31	GND	Ground	-
32	SIDE_1_N	Page selection	Output
33	MED_ID1	High density disk recognition	Input
34	DCHG_N	Disk change display	Input

Pinout of the CPU fan power supply, X41

Pin No.	Abbreviation	Meaning	Input/Output
1	GND	Ground	-
2	+12 V	Switched power supply	Output
3	CPU FAN_CLK	Clock signal	Input

Pinout of the main fan power supply, X42

Pin No.	Abbreviation	Meaning	Input/Output
1	GND	Ground	-
2	+12 V	Switched power supply	Output
3	PG1 FAN_CLK	Clock signal	Input

Additional power supply connector (12V) for devices with 17" or 18" front, X45

Pin No.	Abbreviation	Meaning	Input/Output
1	GND	Ground	-
2	GND	Ground	-
3	+12 V	12 V power supply	Input
4	-12 V	12 V power supply	Input

Connector for back-up battery, X49

A battery for buffering the CMOS RAM is connected to this connector. This is a 3,6 V Lithium battery with a capacity of 750 mAh.

Pin No.	Abbreviation	Meaning	Input/Output
1	+	Plus pole	Input
2	-	Minus pole	-

Connection for On / Off switch connector, X53

Pin No.	Abbreviation	Meaning	Input/Output
1	Power On	On signal	Input
2	GND	Ground	-

Pinout of the internal USB interface connector, X2033

Pin No.	Abbreviation	Meaning
1	VCC 3.3V	+3.3V, fused
2	VCC 5V	+ 5 V, fused
3	USB3	USB3_M
4	USB5	USB5_M
5	USB3	USB3_P
6	USB5	USB5_P
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground

Pinout of the USB 2.0 port, X2034

Pin No.	Abbreviation	Meaning
1	VCC	+ 5 V, fused
2	USB5	USB5_M
3	USB5	USB5_P
4	GND	Ground
S1	I	Shield
S2	S1	Shield

Note

For detailed information on the pin assignments of the interfaces, please contact Costumer Support or the Repair Center.

16.2 Bus board

16.2.1 Layout and principle of operation

The bus board is designed as a link between the motherboard and the expansion modules. It is mounted with two screws.
The bus board has two PCI expansion slots (1 x short, 1 x long), two long shared ISA/PCI and one long ISA slot. It can host expansion modules conforming to ISA specification (Rev. 3.1) and PCI specification (Rev. 2.0 for 5 V and 3.3 V modules). All PCI slots are master–capable. The expansion modules are supplied with power via the bus board to motherboard connection.

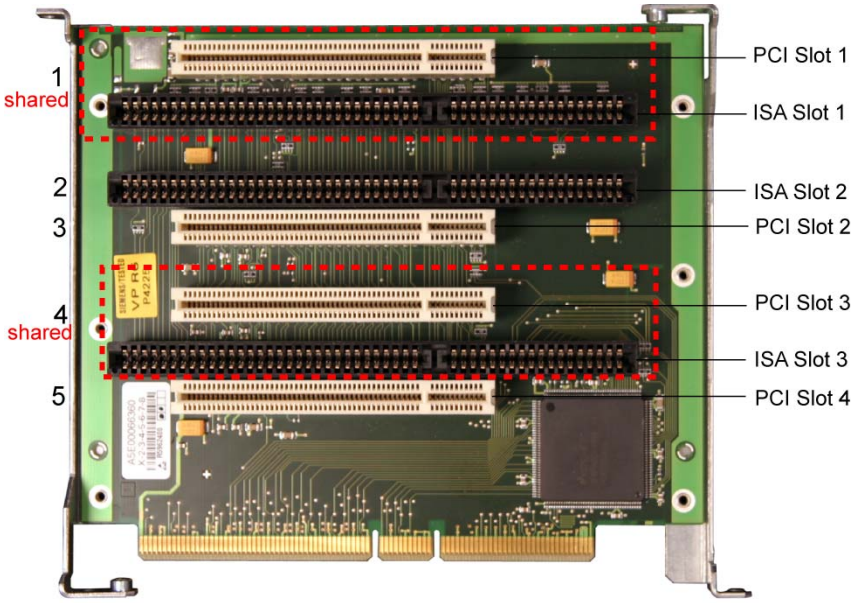


Figure 16-1 Bus board

16.2.2 Assignment of the PCI IRQ channels to the PCI slots

Assignment of the PCI IRQ channels to the PCI slots

Box PC 840 V2	**PCI modules interrupt assignment (PCI IRQ) in:**			
Module interrupt (Pin No.)	Slot 1	Slot 2	Slot 3	Slot 4
INT – A (A6)	**channel 1**	**channel 2**	**channel 3**	**channel 4**
INT – B (B7)	channel 2	channel 3	channel 4	channel 1
INT – C (A7)	channel 3	channel 4	channel 1	channel 2
INT – D (B8)	channel 4	channel 1	channel 2	channel 3

Highlighted entries refer to master interrupts of the slot module

16.2.3 Exclusive PCI hardware interrupt

Applications demanding a high-performance interrupt require a high-speed hardware interrupt reaction. The PCI hardware interrupt should be used only by one resource in order to ensure high-speed reaction of the hardware. This can be forced by appropriate setting in the system BIOS.

Setting up a reserved interrupt on the device

A reserved interrupt can only be set and used for PCI slots 2 and 4. Further reserved interrupts for use on the slots are not available.

An exclusive interrupt cannot be used on any of the PCI slots in the basic configuration. In order to set up a reserved interrupt, you first need to disable the functions on the motherboard*. This is possible for PCI slots 2 and 4.

In order to set up a reserved interrupt on PCI slot 2, you need to disable USB Controller B (this is the external USB port at the top) in the BIOS.

In order to set up a reserved interrupt on PCI slot 4, you need to disable USB 2.0 Controller (all USB ports are now operating in USB 1.1 mode) and (if installed on your Box PC) the PROFIBUS.

* For information on how to disable motherboard functions, refer to the chapter dealing with the BIOS Setup.

Assigning a reserved interrupt in the BIOS Setup

With the factory setting of the system BIOS, the interrupts are automatically assigned to the slots.

Depending on the system configuration, several slots may be assigned the same interrupt. Here we refer to interrupt sharing.

The special feature of the Box PC 840 BIOS is, that interrupts can be set selectively and assigned to the interrupt channels of the slots. Here we refer to a reserved interrupt.

Specific interrupts can be assigned to slots in the **Advanced** menu of the BIOS setup.

To do so:

To enable the use of a reserved interrupt at **PCI slot 2**, assign **PCI IRQ Line 2** the required free interrupt, and **all other** PCI interrupt channels (channels 1, 3, 4) **another** interrupt.

To enable the use of a reserved interrupt at **PCI slot 4**, assign **PCI IRQ Line 4** the required free interrupt, and **all other** PCI interrupt channels (channels 1, 2, 3) **another** interrupt.

To do this, open the **Advanced** menu of the BIOS setup and then **PCI Configuration.** In this menu you can assign the specific **PCI IRQ channels** to the respective interrupts.

You cannot assign interrupts that are already used by the system.

If you assign an interrupt which is already in use by the system or is reserved, the system marks it with a yellow star.

➞ May not be used.

Interrupts not reserved by the system can be assigned twice.

16.2.4 ISA slot pin assignment

Pin No.	Abbreviation	Type*	Pin No.	Abbreviation	Type
A1	IOCHCK#	I	B1	0V	GND
A2	SD 07	I/O	B2	RESET DRV	O
A3	SD 06	I/O	B3	+ 5V	VCC
A4	SD 05	I/O	B4	IRQ 9	I
A5	SD 04	I/O	B5	- 5V	VCC
A6	SD 03	I/O	B6	Reserved	I
A7	SD 02	I/O	B7	- 12V	VCC
A8	SD 01	I/O	B8	Reserved	I
A9	SD 00	I/O	B9	+ 12V	VCC
A10	IOCHRDY	I	B10	0V	GND
O11	AEN	O	B11	SMEMW#	O
A12	SA 19	I/O	B12	SMEMR#	O
A13	SA 18	I/O	B13	IOW#	I/O
A14	SA 17	I/O	B14	IOR#	I/O
A15	SA 16	I/O	B15	DACK3#	O
A16	SA 15	I/O	B16	DRQ 3	I
A17	SA 14	I/O	B17	DACK1#	O
A18	SA 13	I/O	B18	DRQ 1	I
A19	SA 12	I/O	B19	REFRESH#	I/O
A20	SA 11	I/O	B20	CLK	O
O21	SA 10	I/O	B21	IRQ 7	I
A22	SA 09	I/O	B22	Reserved	I
A23	SA 08	I/O	B23	IRQ 5	I
A24	SA 07	I/O	B24	IRQ 4	I
A25	SA 06	I/O	B25	IRQ 3	I
A26	SA 05	I/O	B26	Reserved	O
A27	SA 04	I/O	B27	TC	O
A28	SA 03	I/O	B28	BALE	O
A29	SA 02	I/O	B29	+ 5V	VCC
A30	SA 01	I/O	B30	OSC	O
A31	SA 00	I/O	B31	0 V	GND

*) I/O determines the direction of the signals for the CPU module.

low active

Pin No.	Abbreviation	Type*	Pin No.	Abbreviation	Type
C1	-SBHE	O	D1	-MEMCS16	I
C2	LA 23	I/O	D2	-IOCS16	I
C3	LA 22	I/O	D3	IRQ 10	I
C4	LA 21	I/O	D4	IRQ 11	I
C5	LA 20	I/O	D5	IRQ 12	I
C6	LA 19	I/O	D6	IRQ 13	I
C7	LA 18	I/O	D7	IRQ 14	I
C8	LA 17	I/O	D8	-DACK0	O
C9	-MEMR	I/O	D9	DRQ 0	I
C10	-MEMW	I/O	D10	-DACK5	O
C11	SD 08	I/O	D11	DRQ 5	I
C12	SD 09	I/O	D12	-DACK6	O
C13	SD 10	I/O	D13	DRQ 6	I
C14	SD 11	I/O	D14	-DACK7	O
C15	SD 12	I/O	D15	DRQ 7	I
C16	SD 13	I/O	D16	+ 5V	VCC
C17	SD 14	I/O	D17	-MASTER	I
C18	SD 15	I/O	D18	0 V	GND

Under normal conditions, the signals -SBHE, LA17 - LA23, -MEMR and MEMW are operated as outputs (sending from the CPU). Only CPU modules which are suitable for use as a master CPU for system bus access send and receive these signals. A minus sign “-” in front of the signal name shows that the signal is LOW active.

16.2.5 PCI slot pin assignment

	5V System Environment Side B Side A	
1	-12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5 V	+5 V
6	+5 V	INTA#
7	INTB#	INTC#
8	INTD#	+5 V
9	PRSNT1#	Reserved
10	Reserved	+5V (I/O)
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V (I/O)
17	Ground	GNT#

	5V System Environment Side B Side A	
18	REQ#	Ground
19	+5V (I/O)	Reserved
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SDONE
41	+3.3V	SBO#
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground
49	Ground	AD[09]
50	CONNECTOR KEY	
51	CONNECTOR KEY	
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V (I/O)	+5V (I/O)
60	ACK64#	REQ64#
61	+5 V	+5 V
62	+5 V	+5 V

16.3 System resources

16.3.1 Currently allocated system resources

All system resources (hardware addresses, memory configuration, interrupt assignment, DMA channels) are assigned dynamically by the Windows OS, depending on the hardware configuration, drivers, and connected peripheral devices. You can view the current configuration of system resources or possible conflicts with the following operating systems:

Windows NT 4.0	**Start > Programs > Management (General) > Windows NT Diagnosis**
Windows 2000 Professional/ XP Professional	**Start > Run :** In the **Open** dialog, enter *msinfo32*and confirm with **OK**

16.3.2 System resources used by the BIOS/DOS

The following table describes the system resources for the factory state of the device.

16.3.2.1 I/O address allocation

I/O address (hex)		Size (bytes)	Description of the basic function	Possible alternative function
from	up to			
0000	000F	16	DMA controller	
0010	001F	16	Motherboard resources	
0020	0021	2	Programmable interrupt controller	
0022	003F	30	Motherboard resources	
0040	0043	4	System timer	
0044	005F	28	Motherboard resources	
0060	0060	1	Keyboard controller	
0061	0061	1	System loudspeaker	
0062	0063	2	Motherboard resources	
0064	0064	1	Keyboard controller	
0067	006F	9	Motherboard resources	
0070	0075	6	System CMOS/real-time clock	
0076	0080	138	Motherboard resources	
0081	008F	15	DMA controller	
0090	009F	16	Motherboard resources	
00A0	00A1	2	Programmable interrupt controller	
00A2	00BF	30	Motherboard resources	
00C0	00DF	32	DMA controller	

I/O address (hex)		Size (bytes)	Description of the basic function	Possible alternative function
00E0	00EF	16	Motherboard resources	
00F0	00FE	15	Numeric data processor	
0100	016F	112	Unused	
0170	0177	8	Secondary EIDE channel	
0178	01EF	120	Unused	
01F0	01F7	8	Primary EIDE channel	Switchable in Setup, then free
01F8	01FF	116	Unused	
0200	0273	16	Reserved for game port	
0274	0277	4	ISA PNP Read Data Port	
0279	0279	4	ISA PNP Read Data Port	
027C	02E7	108	Unused	
02E8	02EF	8	Reserved	
02F8	02FF	8	COM2	Switchable in Setup, then free
0300	031F	32	Unused	
0320	032F	16	Unused	
0330	033F	16	Unused	
0340	035F	32	Unused	
0360	0367	8	Unused	
0370	0371	2	SOM	
0372	0375	4	Unused	
0376	0376	1	Secondary EIDE channel	
0378	037F	8	LPT 1	Switchable in Setup, then free
0380	03AF	48	Unused	
03B0	03BB	12	S3 Graphics Pro Savage DDR	
03BC	03BF	4	Reserved	
03C0	03DF	16	S3 Graphics Pro Savage DDR	
03E0	03E7	8	Unused	
03E8	03EF	6	Reserved	
03F0	03F5	6	Standard floppy disk controller	
03F6	03F6	1	Primary EIDE channel	
03F7	03F7	1	Standard floppy disk controller	
03F8	03FF	8	COM1	Switchable in Setup, then free
Dynamic area; resources are managed via Plug and Play				
0400	0777	888	Unused	
0778	077F	8	ECP LPT 1	
0780	0CF7	1400	unused	
0CF8	0CFB	4	PCI configuration index	fixed
0CFC	0CFF	4	PCI configuration data	fixed

I/O address (hex)		Size (bytes)	Description of the basic function	Possible alternative function
0D00	0EFF	512	Unused	
0F00	0F4F	80	Super IO	
0F50	0FFF	176	Unused	
1000	10FF	256	Internal allocation	
1180	11FF	128	Internal allocation	
1800	187F	128	Internal allocation	
8800	8BFF	1023	SATA RAID Controller	
8C00	FEFF	29288	Unused at SATA RAID	
8870	8897	39	PATA RAID Controller	
8898	FEFF	30311	Unused at PATA RAID	
1880	886F	28655	Unused	
FF00	FF0F	16	EIDE bus master register	

16.3.2.2 Interrupt assignments

Interrupt	Description	Comment
IRQ0	Timer output 0	fixed
IRQ1	Keyboard	fixed
IRQ2	Cascaded (IRQ9)	fixed
IRQ3	Serial port 2	2)
IRQ4	Serial port 1	2)
IRQ5	PCI, Plug and Play	1) Priority interrupt for PROFIBUS
IRQ6	FD controller	fixed
IRQ7	Parallel port 1	2)
IRQ8	Real-time clock (RTC)	fixed
IRQ9	PCI, Plug and Play (Redirected IRQ2)	1) 2) Priority interrupt for Ethernet and RAID controller
IRQ10	PCI, Plug and Play	1) 2) Priority interrupt for VGA
IRQ11	PCI, Plug and Play	1)
IRQ12	PS/2 mouse	2)
IRQ13	Numeric processor	fixed
IRQ14	1. HD controller 1 (primary)	2)
IRQ15	2. HD controller 2 (secondary)	2)

PCI Interrupt Lines	Description	Comment
A	USB controller A (USB channel 1)	fixed
	Ethernet	2)
B	USB controller B (USB channels 2 and 3)	2)
C	USB controller C (USB channels 4 and 5)	2)
	VGA	fixed
D	USB 2.0 controllers A, B, C	2)
	PROFIBUS	2) free in version without PROFIBUS

1) PCI boards and the on-board PCI devices require PCI interrupt channels. These interrupt channels are sharable and plug and play compatible. This means several devices can share the same interrupt. The IRQ is assigned automatically. PCI interrupt channels must be derived from the ISA interrupt pool, which means that the PCI modules also use ISA resources. This allocation is done automatically, too. Plug and play incompatible ISA cards can be allocated to a free IRQ by setting the "IRQ Resource Exclusion" of the corresponding interrupt to reserved in the BIOS Setup menu. Refer to the respective ISA module documentation for the respective interrupt to be allocated.

2) These functions can be disabled in the Setup This releases allocated resources.

16.3.2.3 Memory address assignments

PCI VGA modules can be operated with an expansion ROM of a size up to 48 K.

Address		Size	Description of the basic function	Possible alternative function
from	up to			
0000 0000	0007 FFFF	512K	Conventional system memory	
0008 0000	0009 8FFF	123 K	Conventional system memory extended	
0009 9C00	0009 FFFF	5K	XBDA, extended Bios Data Area	
000A 0000	000A FFFF	64K	VGA graphics refresh memory	
000B 0000	000B 7FFF	32K	Software graphics/text refresh memory	Shared SMM for power management
000B 8000	000B FFFF	32K	VGA graphics/text refresh memory	
000C 0000	000C BFFF	48K	VGA BIOS expansion	
000C C000	000C CFFF	4K	USB	
000C D000	000C DFFF	4K	Optional PXE part,	Always occupied
000C D000	000C FFFF	12K	unused (device driver or ISA hardware)	Can be disabled in SETUP, via EMM High DOS Memory
000D 0000	000D 7FFF	32K	unused (device driver or ISA hardware)	via EMM High DOS Memory

Address				
000D 8000	000D FFFF	32K	unused (device or ISA hardware)	via EMM High DOS Memory
000D 0000	000D 97FF	38K	RAID	
000D 0000	000D 93FF	37K	SATA RAID	
000D 9400	000E 97FF	65K	Unused	
000D 9800	000E 97FF	64K	Unused	
000E 0000	000E 3FFF	16K	Legacy USB BIOS extension, cannot be used for ISA cards!	via EMM High DOS Memory
000E 6000	000F FFFF	112K	System BIOS	via EMM High DOS Memory
0010 0000	00EF FFFF	14M	System memory	
00F0 0000	00FF FFFF	16M-5M=1M	System memory or memory hole	
0100 0000	7FFF FFFF	Max. 2 GB - 16 MB	System memory, 512 Kbytes of top of memory are reserved for USB.	via ISA memory setup (memory hole)
7000 0000	FFF7 FFFF		PCI memory address area	Depends on memory configuration
FFF8 0000	FFFF FFFF		Firmware HUB	For PCI expansion cards

16.4 BIOS Setup

16.4.1 Overview

BIOS Setup program

The BIOS SETUP program is stored in the ROM BIOS. Information about the system configuration is stored in the battery-backed RAM of the device.

You can use SETUP to set the hardware configuration (for example, the hard disk type) and define the system properties. You can also use SETUP to set the time-of-day and date.

Changing the device configuration

Your Rack PC device configuration is preset for working with the software supplied with the unit. You should only change the preset values if you have modified your Rack PC in any way, or if a fault occurs when the unit is powered up.

16.4.2 Starting BIOS Setup

Starting BIOS Setup

1. Start the setup program as follows:

2. Reset the device (warm or cold restart).

In the figures shown, the default settings differ based on the device versions. With the default setting of your device, the display shown below appears following power-on, **for example**:

```
Phoenix BIOS 4.0 Release 6.0
Copyright 1985 - 2002 Phoenix Technologies Ltd.
All Rights Reserved
SIMATIC Box PC 840 V2 Profibus/MPI
CPU = Intel ® Pentium 4 CPU X.X GHz
639 K System RAM Passed
127 MB Extended RAM Passed
Press <F2> to enter setup or <ESC> to show boot menu
```

On completion of the POST, the BIOS gives you the opportunity of starting the SETUP program. The following message appears on the screen:

```
Press < F2 > to enter SETUP or <ESC> to show boot menu
```

3. Press the F2 key as long as the BIOS prompt appears on the screen.

16.4.3 BIOS setup menus

The various menus and submenus are listed on the next pages. You can obtain information on the selected SETUP item from the "item-specific help" part of the respective menu.

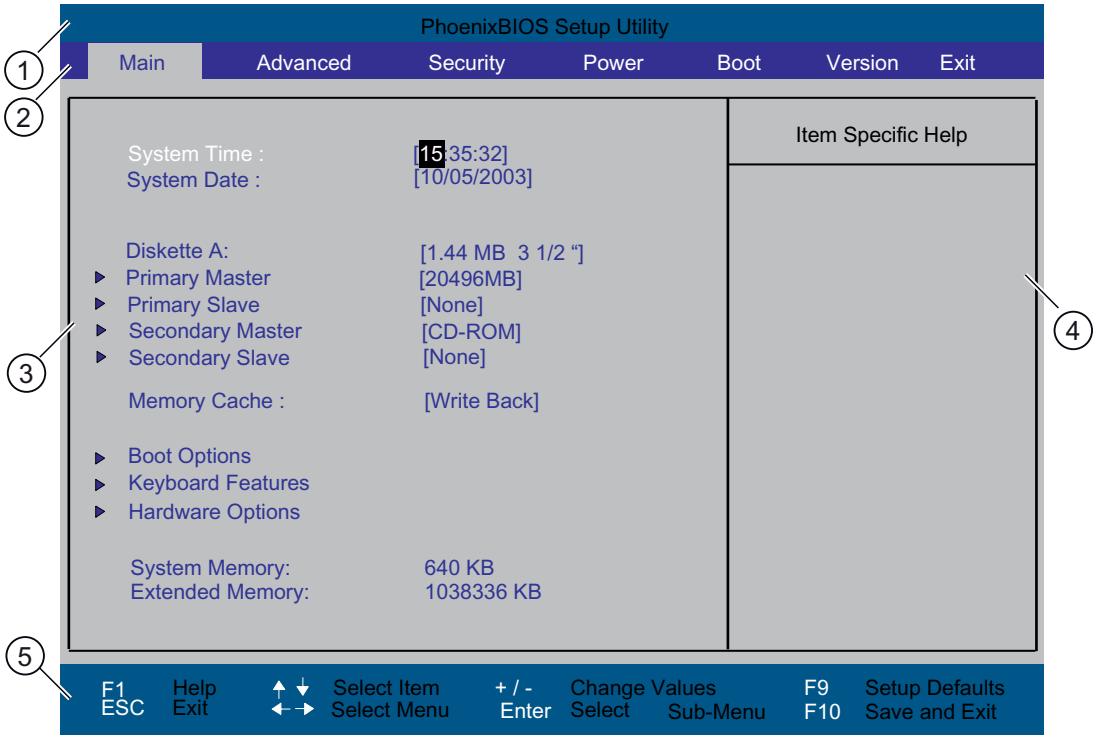


Figure 16-2 BIOS SETUP menus (example)

(1) Header	(4) Help view
(2) Menu line	(5) Input line
(3) Selectable submenu	

Menu layout

The screen is divided into four sections. In the top part (2), you can select the menu forms [Main], [Advanced], [Security], [Power], [Boot Sequence], [Version], [Exit]. In the left of the center section (3) you can select various settings or submenus. Brief help texts appear on the right (4) for the currently selected menu entry. The bottom section contains information for operator input.

The figures below represent examples of specific device configurations. The screen content changes based on the supplied equipment configuration.

Yellow stars to the left of the interface designation (for example, Internal COM 1) indicate a resource conflict between the interfaces managed by the BIOS. In this case you should select the default settings (F9) or eliminate the conflict.

You can move between the menu forms using the cursor keys [←] left and [→] right.

Menu	Meaning
Main	System functions are set here
Advanced	An extended system configuration can be set here
Security	Security functions are set here, for example, a password.
Power	Power-saving functions can be selected here.
Boot	This is where the boot priority is specified.
Version	Information about the programming device (for example, release status) can be found here.
Exit	Used for terminating and saving.

16.4.4 Main menu

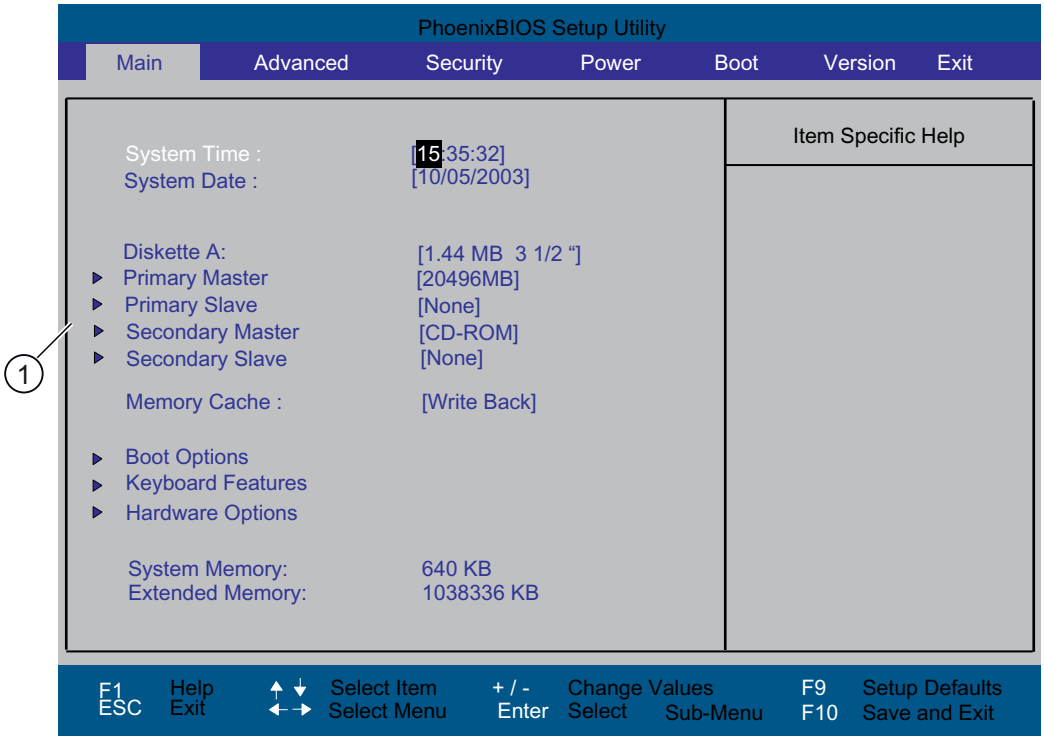


Figure 16-3 SETUP main menu (example)

(1) Selectable submenu

Settings in the main menu

In the main menu, you can move up and down to select the following system configuration boxes by means of the [↑] up and [↓] down cursor keys:

Field	Meaning
System time	For viewing and setting the current time
System date	For viewing and setting the current date
Floppy disk A	Type of installed floppy disk drive
Memory cache	Used for setting the cache options
by submenus	
Primary master	Type of installed disk drives
Primary slave	Type of installed disk drives
Secondary master	Type of installed disk drives
Secondary slave	Type of installed disk drives
Boot options	Used for setting the boot options
Keyboard features	Used for setting of keyboard interface (for instance, NUM-LOCK, typematic rate)
Hardware options	Used for setting the hardware options

System time and system date

System time and system date indicate the current values. Once you have selected the appropriate option, you can use the [+] and [-] keys to modify the time setting

Hour: Minute: Second

and for the date

Month/Day/Year

modify.

You can move between the entries in the date and time fields (for example, from hour to minute) using the tab key.

Floppy disk A (Floppy disk drive)

The type of floppy disk drive installed in the PC is set here. The following entries are possible:

[Disabled]	if no disk drive is available.
[1.44 MB, 3 1/2"]	Default setting for an installed disk drive A

Primary master, primary slave, secondary master, secondary slave

The system jumps to the following submenu when you select this type of menu field:

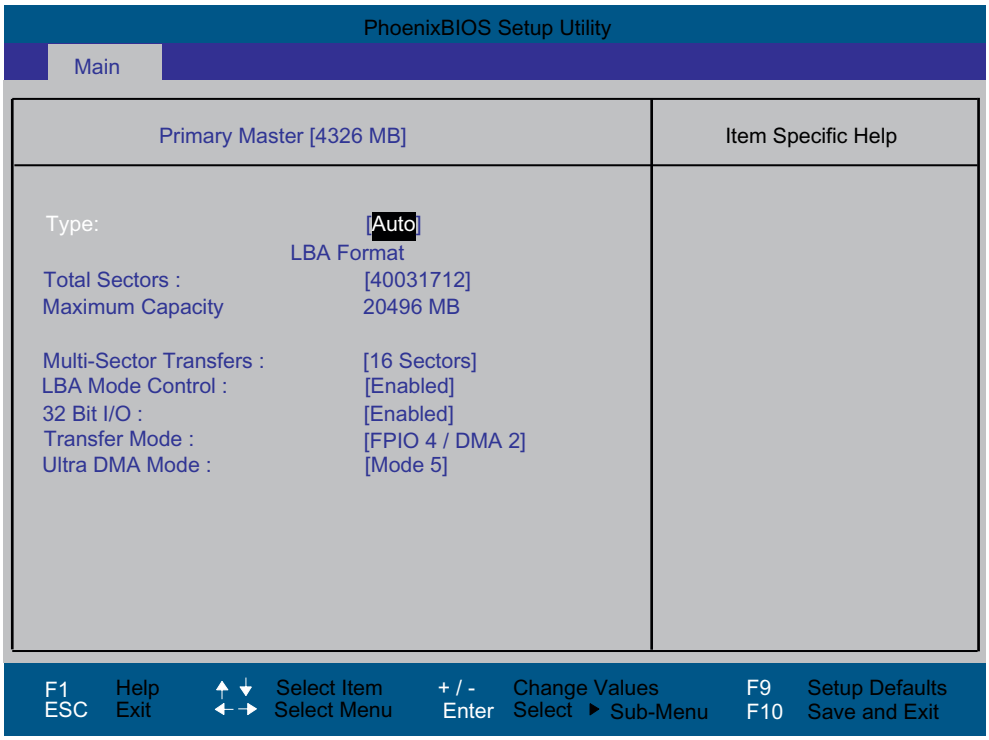


Figure 16-4 Primary Master (Example)

"Type" field	The parameters which you can select here are usually saved on the respective IDE drive. The 'Auto' setting in the 'Type' field means that these values are automatically read from the drive and written to memory **(Auto detect).** If Type is selected for a drive that cannot be detected, a time-out is triggered after approximately 1 minute and the entries remain unchanged. You should always check that the interfaces for which you select 'Auto' are in fact connected to drives. Select “User” if you want to define the hard disk drive. You also need to configure the other options, for example, Cylinder, Heads, Sectors/Track, or other properties of the hard disk drive. Select "None" if you have not connected a disk drive. This setting reduces the system waiting time.
Option “Multi-Sector Transfers”	The number of sectors transmitted per interrupt are transferred in the option “Multi-Sector Transfers.” The value depends on the drive and should be set only to "Auto" in the "Type" field.
	Disabled 2,4,8,16 sectors
"LBA Mode Control" field	“Enabled” in the option “LBA Mode Control” (enabled, disabled) means that hard disk capacities greater than 528 MB are supported. The value depends on the drive and should be set only to "Auto" in the "Type" field.

In the field 32-bit I/O	The type of access to the drive is defined in the 32-bit I/O field	
	Disabled	16-bit access
	Enabled	32-bit access (default)
"Transfer Mode" and "Ultra DMA Mode" options	The settings in these fields define the interface data transfer rate. The value depends on the drive and should be set only to "Auto" in the "Type" field. You leave the submenu using the ESC key.	

"Memory cache" field

The following context menu appears when you select the option “Memory cache” in the main menu:

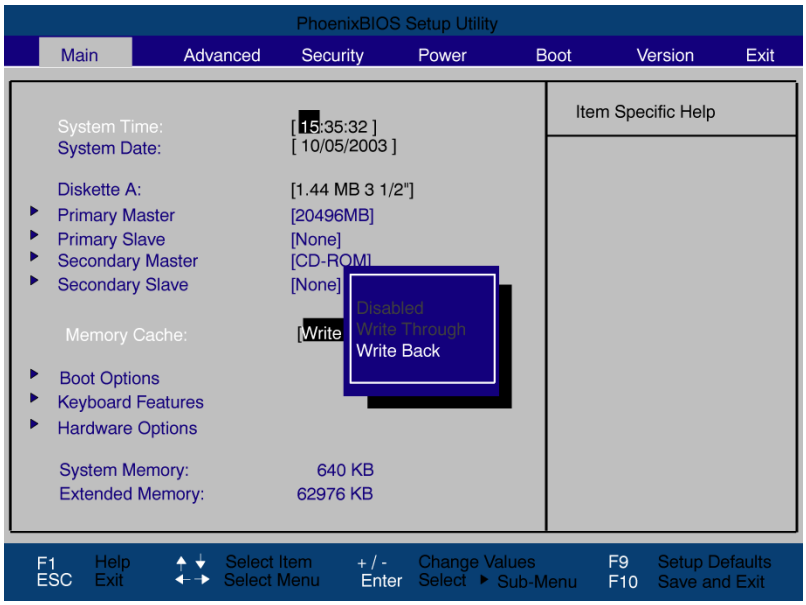


Figure 16-5 "Memory cache" field

The cache is a high-speed memory buffer between the CPU and memory (DRAM). Repeated memory access operations are executed in the fast cache, and not in the main memory, provided the feature is enabled. In some cases it may be necessary to disable the cache for certain types of hardware and software because intentional program runtimes or delay times may be prevented by the fast cache.

[Disabled]	Cache is disabled
[Write Through]	Write access is not concluded until the entry has been made in main memory
[Write Back]	Write access is concluded immediately, the entry in main memory takes place in the background (default)

"Boot options" field

The following context menu appears when you select “Boot options” in the main menu:

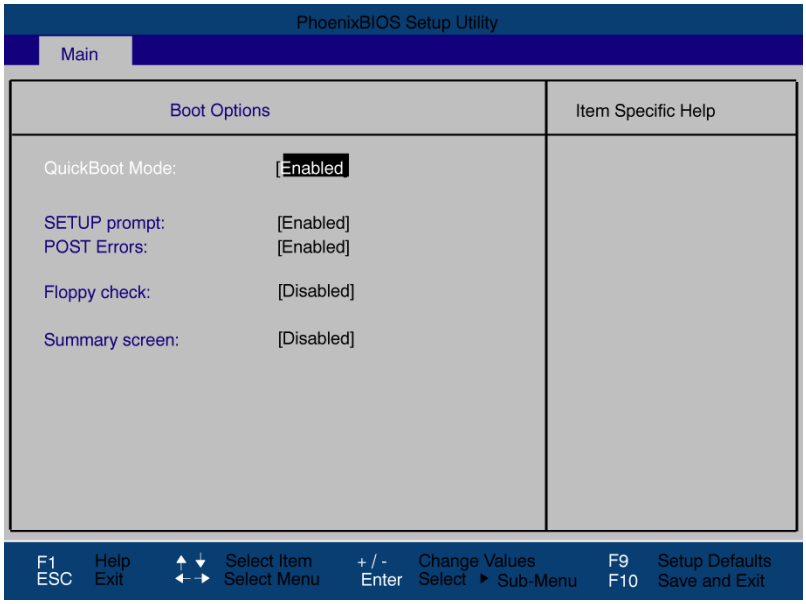


Figure 16-6 "Boot Options" field

Quick boot mode	Some hardware tests are skipped to speed up the boot sequence.
SETUP prompt	During the system load phase, the message Press <F2> to enter Setup or <Esc> to show boot menu is output on the bottom of the screen.
POST errors	The boot sequence is stopped if an error is detected; you must press F1 to acknowledge. Enter "Disabled" to avoid the necessity of acknowledging errors, for example, if no keyboard is connected.
Floppy check	The floppy head is stepped inward and then back to its original position during the system run-up phase. This test is useful because it reinitializes the drive.
Summary screen	The most important system parameters are displayed when the system boot phase completes.

'Enabled' means that the feature is active. 'Disabled' means that the feature is inactive.

Example of a summary screen:

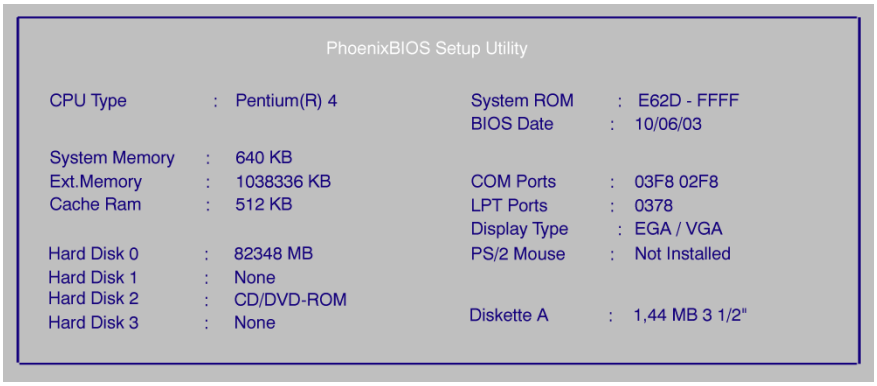


Figure 16-7 Summary screen (example)

The summary screen appears when the system boot phase completes.

"Keyboard features" field

The following submenu appears when you select the option “Keyboard features” in the main menu:

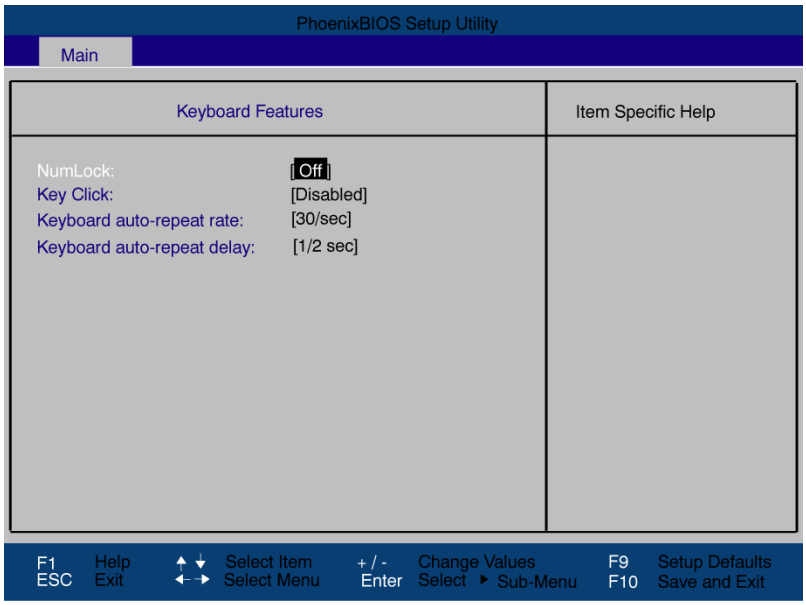


Figure 16-8 "Keyboard features" submenu (example)

Numlock	Switches Numlock on or off following power on.
Key click	A keystroke can be heard
Keyboard auto-repeat rate	Increase in keyboard auto-repeat rate
Keyboard auto-repeat delay	On-delay of keyboard auto-repeat

"Hardware options" field

The following submenu, for example, appears when you select “Hardware options” in the main menu:

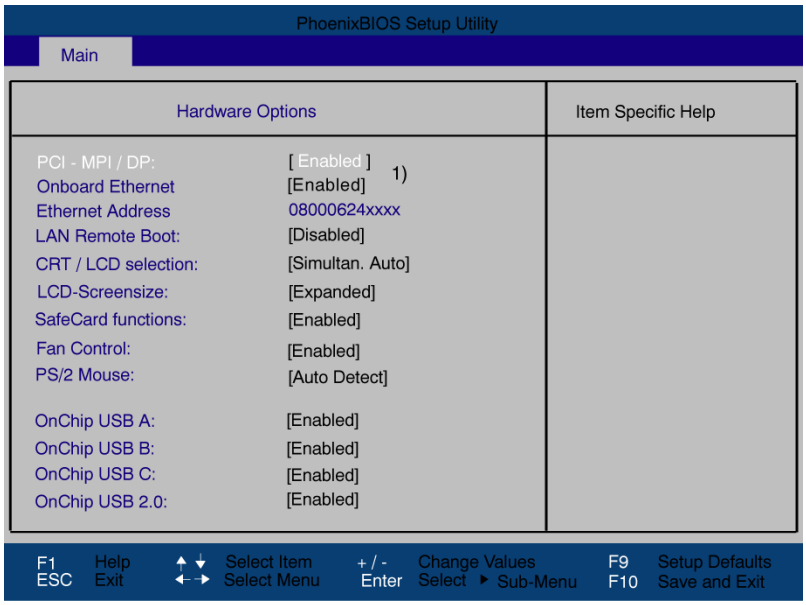


Figure 16-9 "Hardware options" submenu (example)

The parameters of the interfaces present on the motherboard are set here.

Entry	Meaning	
PCI-MPI/DP [1]	Enables the CP5611-compatible MPI/DP interface. The resources are managed by the BIOS PCI Plug and Play mechanism.	
On-board Ethernet	[Enabled]	The Ethernet interface on the motherboard is enabled.
	[Disabled]	The Ethernet interface on the motherboard is disabled.
Ethernet address	Shows the individual Ethernet address.	

[1)] Optional product feature

Entry	Meaning	
LAN remote boot	[Enabled]	Booting via a connected LAN is possible. The respective boot source is displayed as Intel® Boot-Agent in the boot sequence menu.
	[Disabled]	Booting via LAN is not possible.
SafeCard functions	[Enabled]	On-board monitoring functions are enabled.
	[Disabled]	No monitoring functions.
	The relevant driver and the application must be started for operation of the monitoring functions.	

Entry	Meaning	
CRT / LCD selection	[CRT only]	A CRT monitor is addressed, or a DVI LCD monitor, if it is connected to the DVI ports when the system boots up.
	[LCD only]	The internal LVDS interface or the digital DVI interface is enabled, if a valid display ID was read during the boot sequence; if not, the procedure as for 'CRT only' applies.
	[Simultan. Auto]	The two interfaces, CRT and LVDS, are activated when a CRT monitor is connected with valid display detection. The external monitor is only enabled for operation if it is connected and detected at the start of the boot sequence. Data will not be output to an external monitor if it is connected after the boot sequence.
	[Simultan. Forced CRT]	Like [Simultan Auto]. In this case, however, the CRT output is always enabled, irrespective whether CRT is connected or not.
	DVI LCD and LVDS displays cannot be operated in parallel; LVDS takes priority over DVI!	
LCD screen size	[Normal]	The presentation of text and the graphic modes are not expanded to the full screen size.
	[Expanded]	The text-based and graphic modes are expanded to the full screen size.
Fan control	[Enabled]	The fan speed is controlled based on the temperature.
	[Disabled]	The fan always runs at full speed.
PS/2 mouse	[Enabled]	The PS/2 port is enabled. The PS/2 mouse is thus enabled. IRQ 12 is assigned.
	[Disabled]	The PS/2 port is disabled, IRQ12 is available.
	[Auto Detect]	The system automatically detects the mouse. **Invariably, changes to this interface do not come into effect until the PC is switched off and on again.**
On-chip USB A	[Enabled]	On-chip USB A determines the function of USB ports 0 and 1. On-chip USB A occupies PCI IRQ Channel 1. On-chip USB A port 0 is located on the front interface socket X44, port 1 on the bottom of the device rear X36. Users cannot edit this value.
OnChip USB B	[Enabled]	On-chip USB B determines the function of USB ports 2 and 3. On-chip USB B occupies PCI IRQ Channel 2. On-chip USB B port 3 is located on internal X2033. Port 2 is located on the bottom of the device rear X36.
	[Disabled]	The interface is disabled, resources are released and can be used otherwise.
On-chip USB C	[Enabled]	On-chip USB C occupies PCI IRQ channel 3. On-chip USB C Port 5 is located at the front interface socket X2034.
	[Disabled]	The interface is disabled, resources are released and can be used otherwise.
On-chip USB 2.0	[Enabled]	USB 2.0 is enabled for ports 0 to 5. OnChip USB 2.0 is allocated to PCI IRQ channel 4. Accessible are only the the USB ports 1 and 2 on the top/bottom of the rear panel of the device, or USB 5 on the front panel.
	[Disabled]	The USB interfaces on port 0 to 5 support only USB 1.1 and occupy resources as described earlier.

16.4.5 Advanced Menu

Menu layout

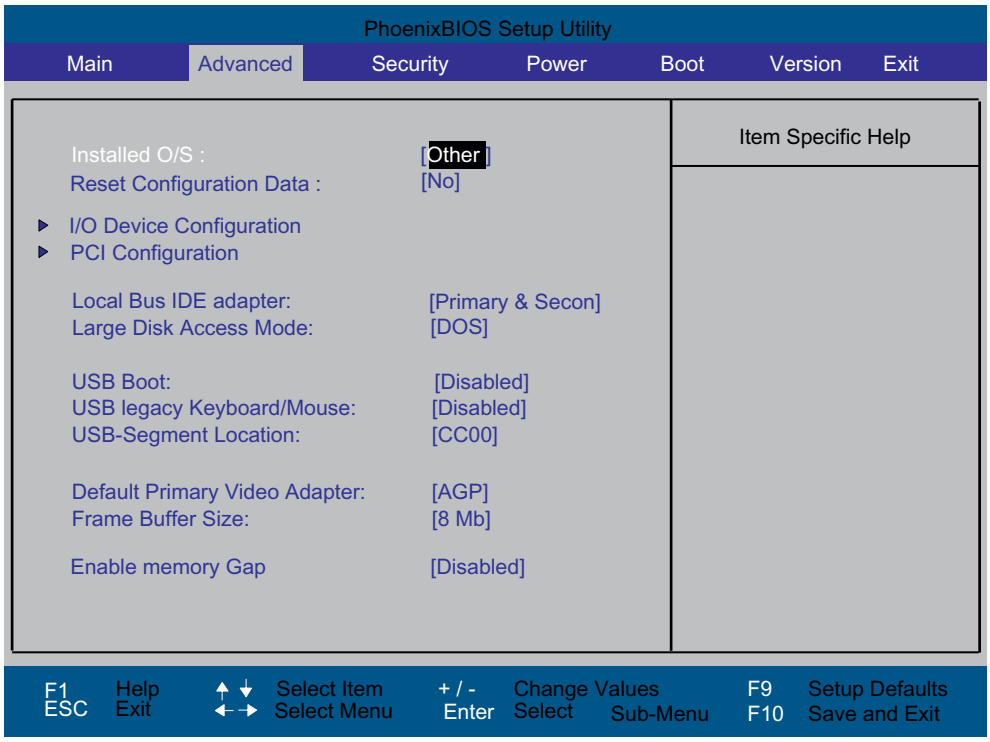


Figure 16-10 Advanced menu

Settings in the Advanced menu

Installed O/S	Plug&Play means that all modules are automatically detected and installed, providing they support the Plug&Play functionality.	
	[Other]	BIOS handles the entire Plug&Play capability, default setting.
	[Win2000/XP]	The operating system handles the Plug&Play functions.
Reset Configuration Data	[Yes]	All installations under Plug&Play are deleted and the configuration is retriggered the next time the system boots. The entry is then reset to [No]. System components that do not support Plug&Play have to be entered manually.
	[No]	The Plug&Play system components are initialized after the next system start.
Local Bus IDE adapter	[Primary] [Secondary]	One IDE interface for max. two drives.
	[Primary & Secondary]	Two IDE interfaces for max. four drives.
	[Disabled]	No local IDE interface.

Large disk access mode	[DOS]	The drive tables are adapted for DOS access operations in accordance with Enhanced IDE.
	[OTHER]	The tables are not adapted.
USB boot:	this function defines whether the system can be booted from a USB device.	
USB legacy keyboard/mouse	[Disabled]	Disables Legacy Universal Serial Bus support
	[Enabled]	this function determines whether a USB keyboard or mouse can be used with software or tools on an MS-DOS platform (e.g. SIMATIC PC ImageCreator). The ISA bus is disabled when this option is set. The USB Boot function must be enabled to allow booting from a USB device, or if the system is to be operated without USB support with a USB keyboard or mouse. The USB Legacy Keyboard/Mouse function also needs to be enabled in addition to USB Boot (Enable), if operating systems without USB support are operated with a USB keyboard or mouse. The "Post errors" function must be disabled in the Main menu -> Boot options of the BIOS setup to enable operation only with USB keyboard and USB mouse and automatic system startup.
USB segment location	CC00 DC00	If you experience problems, switch to a different USB segment
Default primary video adapter	[AGP]	BIOS messages are output via the onboard AGP interface.
	[PCI]	BIOS messages are output via installed PCI cards.
Frame Buffer Size	[8Mb] [16Mb] [32MB] [None]	The frame buffer size can be adapted to the graphics requirement of your application.
Enable memory gap	[Disabled]	The onboard RAM is fully available.
	[Enabled]	A 1 MB area of the RAM beginning at 15 MB (address F0 0000 - FF FFFF) can be used by auxiliary ISA cards.

"I/O device configuration" submenu

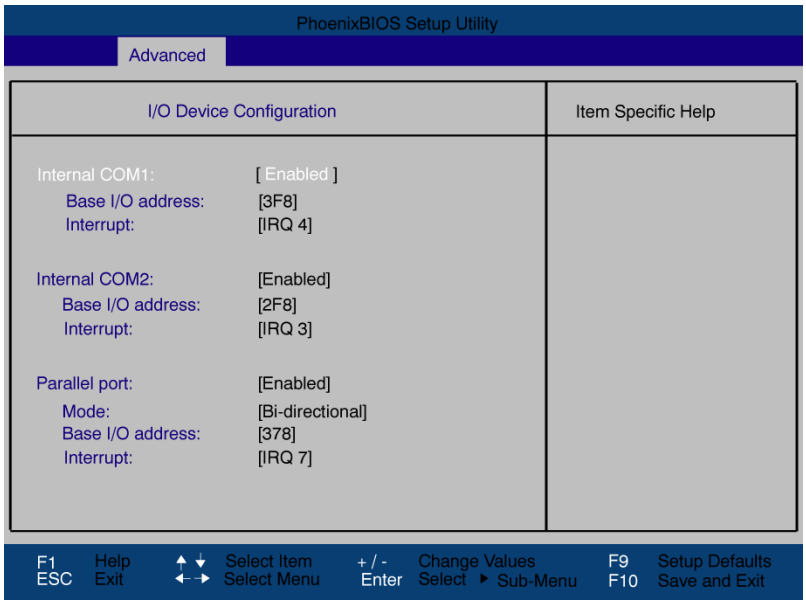


Figure 16-11 "I/O device configuration" submenu

The resources used by an interface are released when you disable the interface in question.

The I/O addresses and interrupts are pre-assigned; it is advisable not to change these default assignments.

Internal printer port LPT1

Mode:	Use this setting to set the operating mode of the printer port. Refer to the table below to ensure that the setting matches the data output device you connected to the printer port.

Configurable mode	Features
Output Only Standard Parallel Port - uni-directional (SPP)	• Standard setting for the 8 bit parallel transfer according to IEEE1284 specifications • Feedback of the output device is only possible via the control cables
Bi–directional Standard Parallel Port - bi-directional	as for SPP – uni-directional, however: • Feedback of the output device is also possible via the 8 bit data cables
EPP enhanced parallel port	• Enhanced parallel port (data transfer rate from 500 Kbps up to 2 Mbps) • Hardware handshake • different devices can be addressed

"PCI Configuration" submenu

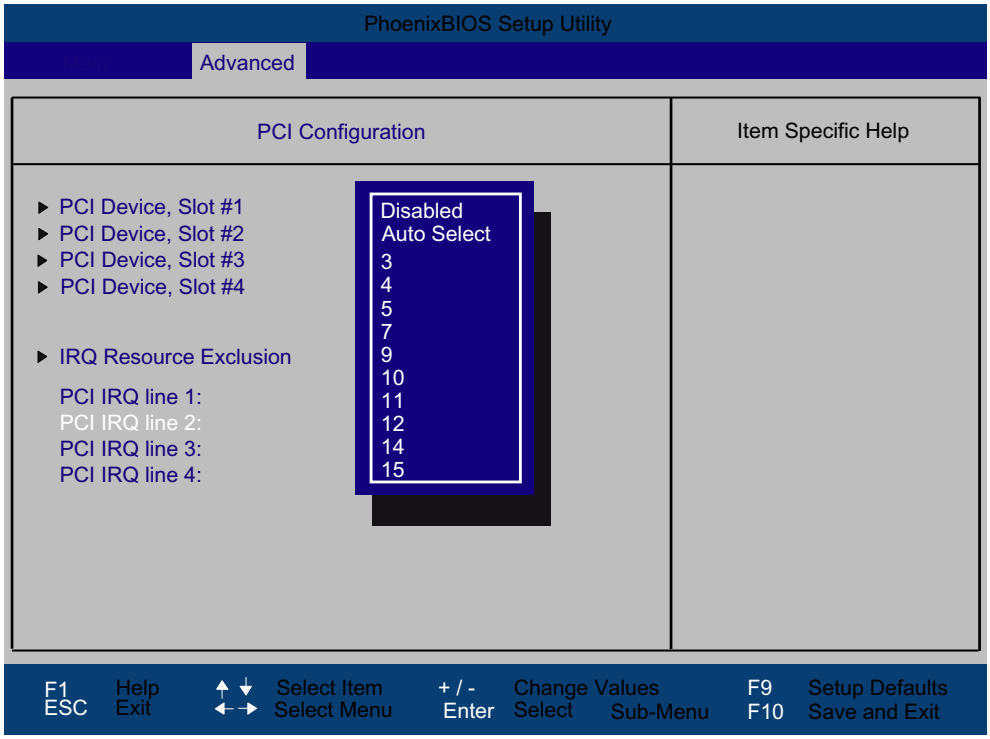


Figure 16-12 PCI Configuration submenu (example)

"PCI Devices" field

If the PCI devices field is selected, the following submenu appears:

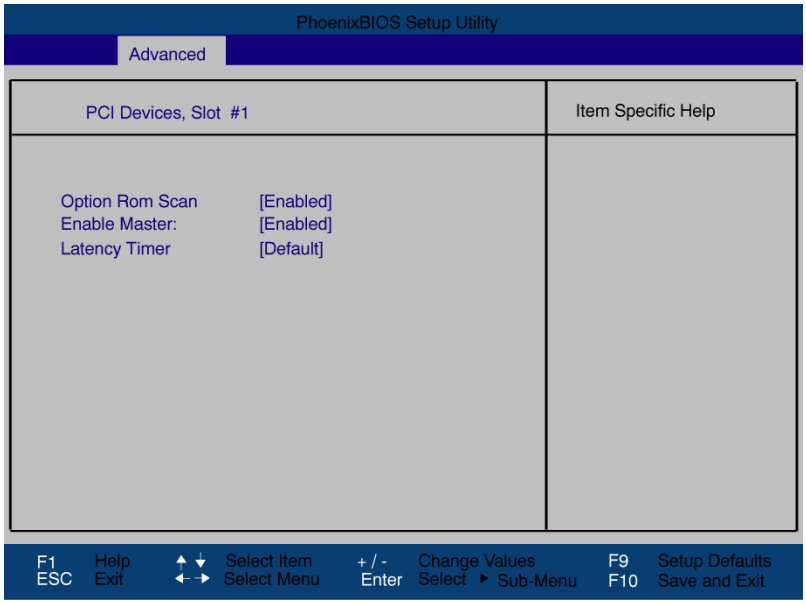


Figure 16-13 PCI Devices submenu, slot #1

ROM scan option:	[Enabled]	The Option ROM of the PCI module (if present) is enabled
	[Disabled]	The ROM option of a PCI module is disabled.
Enable Master	[Enabled]	This slot can be assigned master functions
	[Disabled]	This slot can only operate as a PCI slave.
Latency Timer	[Default]	The number of active PCI clock cycles of the master modules is determined by this module
	[0020H to 00E0H]	With these settings, you set the maximum number of active PCI clock cycles to the selected value.
	You should only use a value different from the default if the module or its application requires it.	

"IRQ Resource Exclusion" submenu

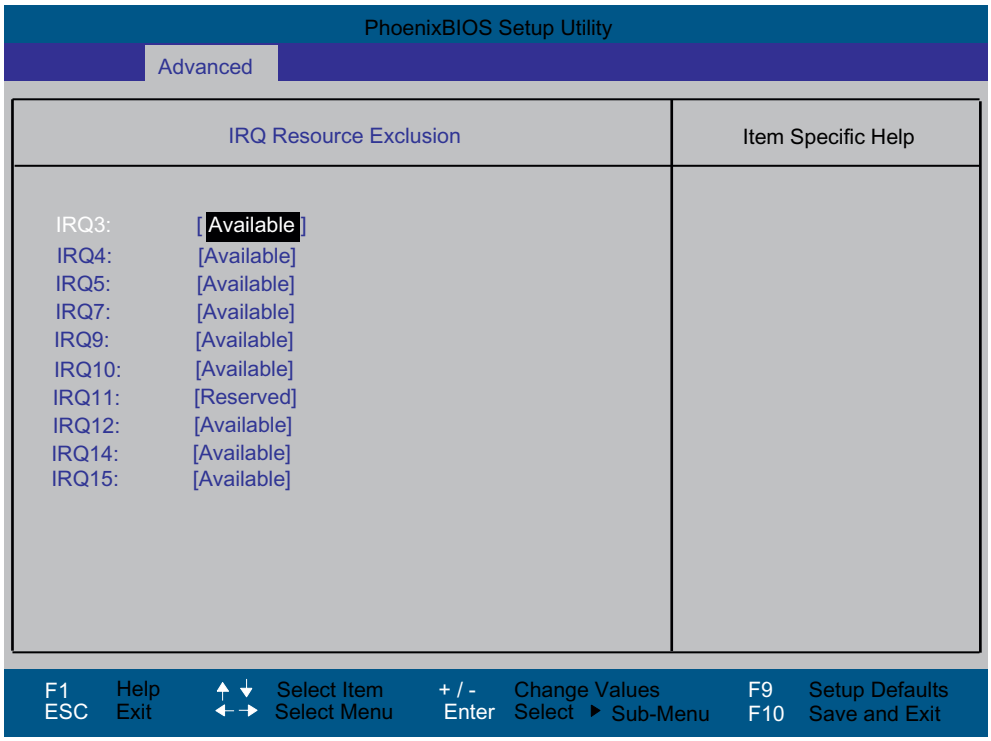


Figure 16-14 IRQ Resource Exclusion submenu (example)

Available means that the Plug and Play mechanism in BIOS can allocate the IRQ to Plug and Play submodules or motherboard functions.

Use the 'Reserved' setting only if the interrupt has to be assigned specifically to submodules with no Plug and Play capability.

"PCI IRQ channels" field

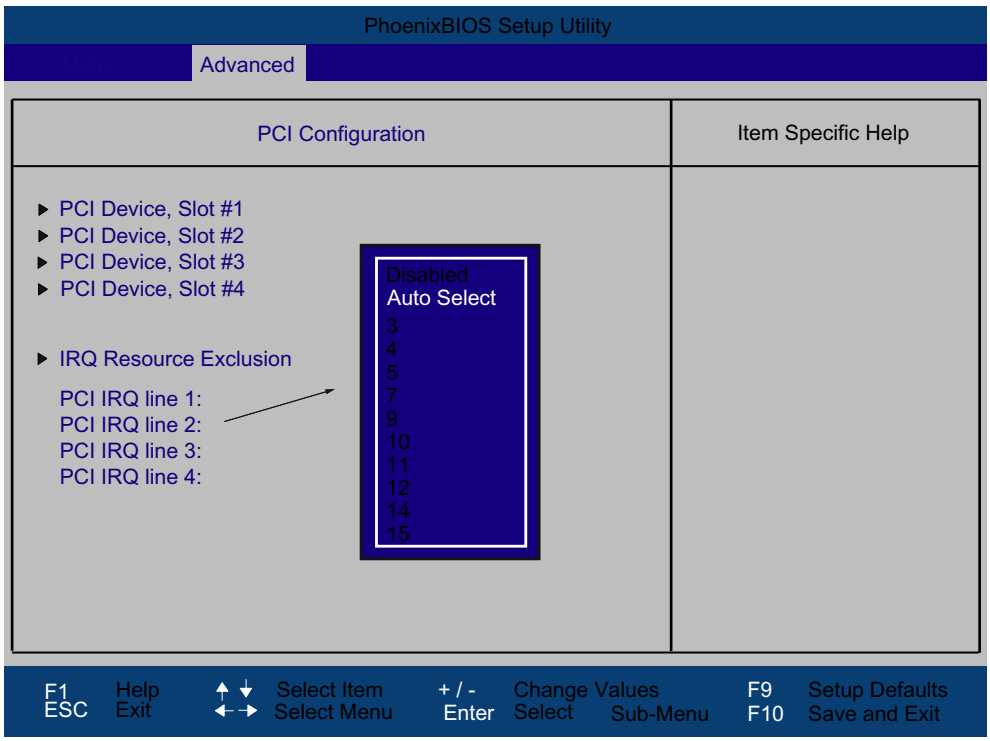


Figure 16-15 The PCI IRQ line field

Disabled	No interrupt possible for the selected PCI IRQ channel
AutoSelect	Plug and Play mechanism in BIOS selects unassigned interrupts and allocates them to the on-board PCI devices.
3 to 15	The selected PCI IRQ channel is assigned permanently to the selected interrupt. You should only select this setting if this is specified in the documentation for your application.

Assignment of the PCI IRQ channels to the PCI slots.

Box PC 840	**PCI module interrupt assignment (PCI IRQ) in:**			
Module interrupt (Pin No.)	Slot 1	Slot 2	Slot 3	Slot 4
INT - A (A6)	**channel 1**	**channel 2**	**channel 3**	**channel 4**
INT - B (B7)	channel 2	channel 3	channel 4	channel 1
INT - C (A7)	channel 3	channel 4	channel 1	channel 2
INT - D (B8)	channel 4	channel 1	channel 2	channel 3

Bold letters indicate the master interrupt of the slot module

16.4.6 Security menu

You can only edit the fields enclosed in square brackets. Two passwords can be assigned to protect your PC from unauthorized use. The Supervisor password can be used to restrict usage of the hard disk.

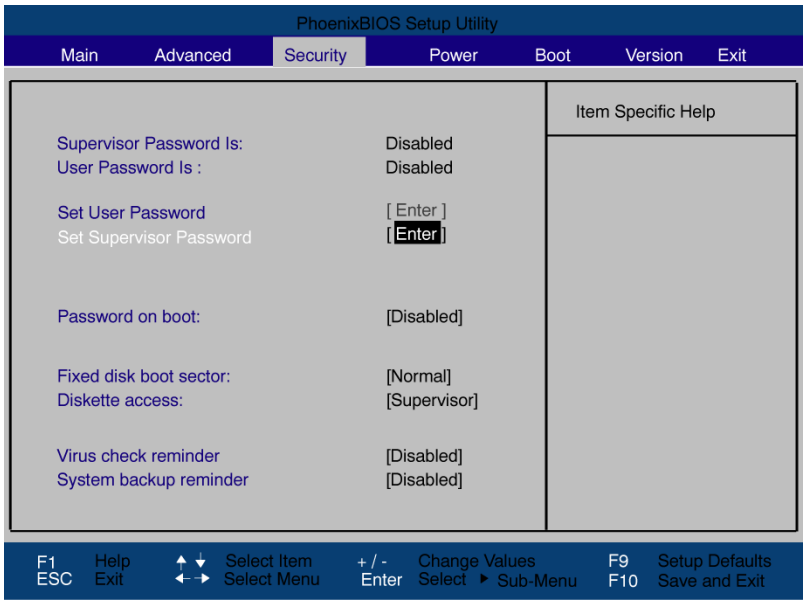


Figure 16-16 Security menu

User password is	Disabled	The password is disabled.
	Enabled	Certain Setup fields are thus configurable by the user, including the user password.
	The field resets automatically from [Disabled] to [Enabled] when the password is entered.	
Set Supervisor Password	This field opens the dialog box for entering a password. Once it has been entered, the supervisor password can be changed or deleted by pressing ”Return” and thus deactivated.	
Set User Password	This field opens the dialog box for entering a password. Once it has been entered correctly, the user password can be changed or deleted by pressing ”Return” and thus deactivated.	
Password on boot	[Disabled]	No password required for system boot.
	[Enabled]	Supervisor or user password must be entered for system boot.
Fixed disk boot sector	[Normal]	All types of hard-disk access are permitted.
	[Write protect]	the user cannot install an operating system. This is a way of protecting against boot viruses.

Floppy disk drive access	This mode of protection is not enabled unless "Password on boot " is [enabled].	
	[Supervisor]	Diskette access is not possible unless the supervisor password was entered during system boot.
	[User]	Diskette access is not possible unless the user password was entered during system boot. Attention: This function cannot be used under Windows NT/2000 Professional/XP Professional, since this operating system does not access the diskette via BIOS routines. Please use the Windows NT/2000/ Professional/XP Professional system programs for this purpose.
Virus check reminder	Outputs a virus check prompt when booting.	
	[Disabled]	No message during system startup.
	[Daily]	Daily
	[Weekly]	Every Monday
	[Monthly]	Every first of the month
System backup reminder	Outputs a message when booting requesting a system backup.	
	[Disabled]	No message during system startup.
	[Daily]	daily
	[Weekly]	Every Monday
	[Monthly]	Every first of the month

16.4.7 Power menu

This menu has the following layout.

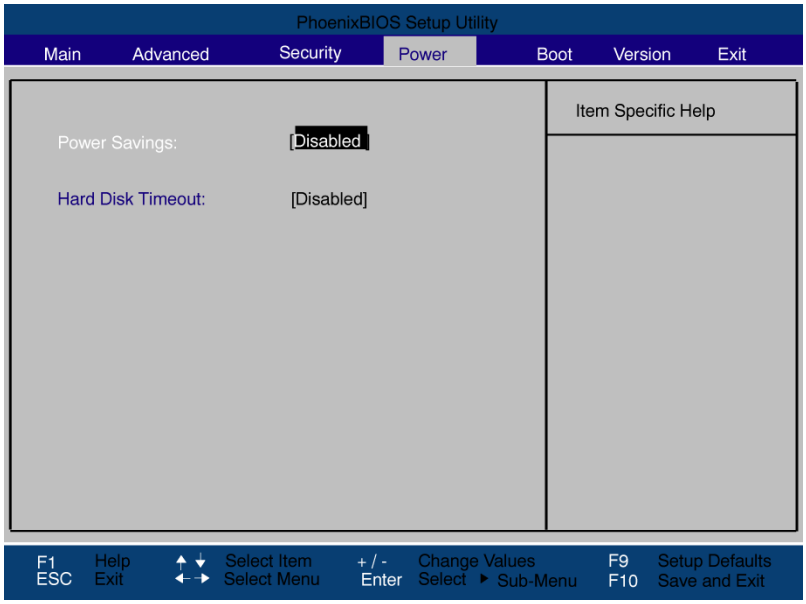


Figure 16-17 "Power" menu (Example)

The Power menu offers a number of power saver modes for environmentally friendly computing:

Power Savings	[Disabled]	no energy-saving functions
	[Customized, Maximum Power Savings, Maximum Performance]	freely selectable or default values for min./max. energy saving functions. You can set the parameters for Standby Time-out and Fixed Disk Timeout, or they are set automatically to their defaults.
Hard Disk Timeout	[Disabled]	The hard disk is not switched off.
	[6, 8, 10, 15]	Minutes after the last access the hard disk drive is switched off. The next time it is accessed, the hard disk starts spinning again after a brief delay.

16.4.8 Boot menu

This menu allows you to assign a priority for the boot devices.

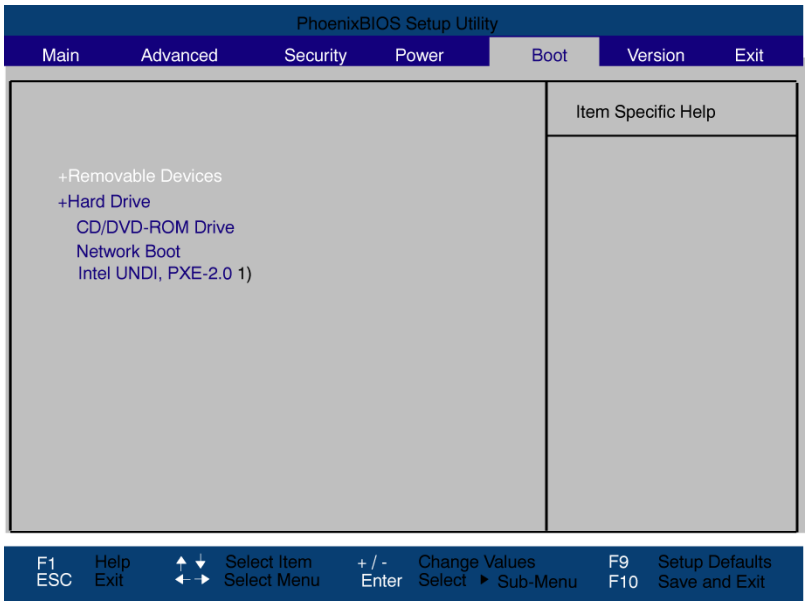


Figure 16-18 Boot Menu

[1)]Intel® UNDI, PXE-2.0 is only displayed if, beforehand, the Wake on LAN boot function has been set to "Enabled" in the hardware options menu.

This menu lists the boot devices in groups. The group with the highest priority is at the top. To change the sequence:

Select the group with the ↑ ↓ keys, move to the desired position with + or -.

Note

During startup the boot drive can be selected using the ESC key.

Groups marked + can contain more than one device. When you select a group marked in this way, press Enter to view the list of devices in the group.

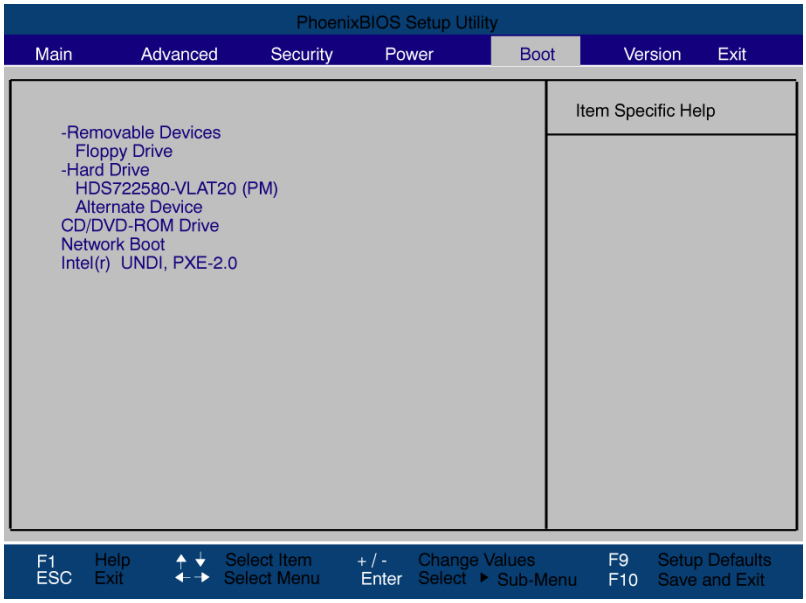


Figure 16-19 Boot menu (example)

This screen shows all possible boot devices. The device taking highest priority is listed in the first line of the relevant group. Here again, you can change the order of appearance as described above.

If a boot device is not available, the next device in the sequence is automatically checked to ascertain whether or not it is bootable.

16.4.9 Version menu

This menu contains the information you will have to quote when you send us technical questions about your system.

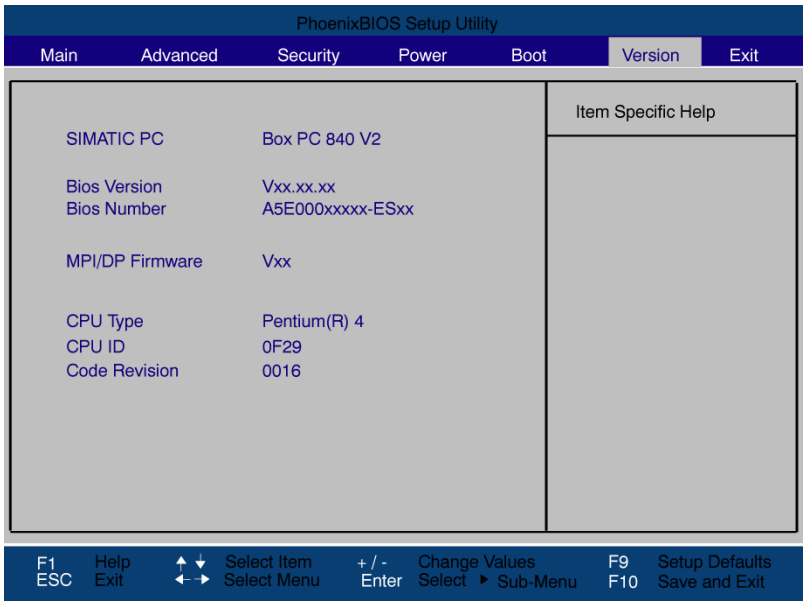


Figure 16-20 "Version" menu (Example)

16.4.10 Exit menu

The setup program is always closed from this menu.



Figure 16-21 Exit menu

Save Changes & Exit	All changes are saved; a system restart is carried out with the new parameters.
Discard Changes & Exit	All changes are discarded and the system performs a restart based on the old parameters.
Get Default Values	All parameters are set to safe values.
Load Previous Values	The last saved values are reloaded.
Save Changes	Save all Setup settings.

16.4.11 Default BIOS Setup entries

Documenting your device configuration

If you have changed any default settings in Setup, you can enter them in the following table. You can then refer to these entries for any future hardware modifications.

Note

Print out the table below and keep the pages in a safe place once you made your entries.

BIOS Setup default settings

System parameters	Defaults	Custom entries
Main		
System Time	hh:mm:ss	
System Date	MM/DD/YYYY	
Floppy disk A	1.44 MB, 3½”	
Primary Master	HDS722580-VLAT20 (PM)	
Primary Slave	None	
Secondary Master	None	
Secondary slave	None	
Memory Cache	Write Back	
Boot options		
Quick Boot Mode	Enabled	
SETUP prompt	Enabled	
POST errors	Enabled	
Floppy check	Disabled	
Summary screen	Enabled	
Keyboard Features		
Num Lock	On	
Key Click	Disabled	
Keyboard auto-repeat rate	30/sec	
Keyboard auto-repeat delay	½ sec	

Hardware Options		
PCI-MPI/DP:	Enabled	
On-board Ethernet	Enabled	
Ethernet address	08000624xxxx	
CRT / LCD selection	Simultan. Auto	
LCD screen size	Expanded	
LAN Remote Boot	Disabled	
SafeCard functions	Enabled	
Fan control	Enabled	
PS/2 mouse	Auto Detect	
On-chip USB A	Enabled	
On-chip USB B	Enabled	
On-chip USB C	Enabled	
On-chip USB 2.0	Enabled	

Advanced		
Installed O/S	Other	
Reset Configuration Data	No	

I/O Device Configuration		
Serial Port A	Enabled	
Serial Port B	Enabled	
Parallel port	Enabled	

PCI Configuration		
PCI Device Slot 1		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency timer	Default	
PCI Device Slot 2		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency timer	Default	
PCI Device Slot 3		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency timer	Default	
PCI Device Slot 4		
ROM scan option:	Enabled	
Enable Master	Enabled	

PCI Configuration		
Latency timer	Default	
IRQ Resource Exclusion		
IRQ3	Available	
IRQ4	Available	
IRQ5	Available	
IRQ7	Available	
IRQ9	Available	
IRQ10	Available	
IRQ11	Reserved	
IRQ12	Available	
IRQ14	Available	
IRQ15	Available	
PCI IRQ Line 1	Auto Select	
PCI IRQ Line 2	Auto Select	
PCI IRQ Line 3	Auto Select	
PCI IRQ Line 4	Auto Select	
Local Bus IDE adapter	Primary & Secondary	
Large disk access mode	DOS	
USB Boot	Disabled	
USB legacy keyboard/mouse	Disabled	
USB segment location	CC00	
Default primary video adapter	AGP	
Frame Buffer Size	8MB	
Enable memory gap	Disabled	

Security		
Supervisor Password Is	Disabled	
User Password is	Disabled	
Set Supervisor Password	Enter	
Set User Password	Enter	
Password on boot	Disabled	
Fixed disk boot sector	Standard	
Diskette Access	Supervisor	
Virus check reminder	Disabled	
System backup reminder	Disabled	

Power		
Power Savings	Disabled	
Hard disk timeout	Disabled	

Boot		
Removable Devices		
Hard Drive		
CD/DVD–ROM Drive		
Network boot		
Intel® UNDI, PXE-2.0		

Version		
SIMATIC	Box PC 840 V2	
BIOS Version		
BIOS Number		
MPI/DP Firmware		
CPU Type	Pentium®4	
CPU ID		
Code Revision		

Appendix

17

17.1 Guidelines and declarations

Notes on the CE markings

The following applies to the SIMATIC product described in this documentation:

EMC Guideline

AC voltage supply

The devices with AC power supply fulfill the requirements for the EC directive ™89/336/EEC Electromagnetic Compatibility™ and the following fields of application apply according to this CE label:

Area of Application	Requirement for	
	Emitted interference	Noise Immunity
Domestic housing area, business and trade areas and small businesses.	EN 61000-6-3: 2001	EN 61000-6-1: 2001
Industry	EN 61000-6-4: 2001	EN 61000-6-2: 2001

The device is also compliant with EN 61000-3-2:2000 (harmonic currents) and EN 61000-3-3:1995 (voltage fluctuation and flicker.)

DC power supply

The devices with DC power supply fulfill the requirements of the EC directive "89/336/EEC Electromagnetic Compatibility", and the following fields of application apply according to this CE label:

Area of Application	Requirement for	
	Emitted interference	Noise Immunity
Industry	EN 61000-6-4: 2001	EN 61000-6-2: 2001

The device is also compliant with EN 61000-3-2:2000 (harmonic currents) and EN 61000-3-3:1995 (voltage fluctuation and flicker.)

Caution

This is Class A equipment. The equipment may cause radio interference in residential areas; in such cases, the operator can be requested to take reasonable countermeasures.

Low-voltage directive

The devices with AC and DC power supply are compliant with the requirements of the EC Directive 73/23/EEC "Low-Voltage Directive." Conformance with this directive has been verified according to EN 60950-1.

Declaration of conformity

The EC declaration of conformity and the corresponding documentation are made available to authorities in accordance with the EC directives stated above. Your sales representative can provide these on request.

Note the installation guidelines

The installation guidelines and safety instructions in this documentation must be followed during commissioning and operation.

Connecting peripherals

The requirements relating to noise immunity according to EN 61000-6-2:2001 are met when you connect a peripheral suitable for an industrial environment. Peripheral devices are only be connected via shielded cables.

17.2 Certificates and Approvals

DIN ISO 9001 certificate

The quality assurance system for the entire product process (development, production, and marketing) at Siemens fulfills the requirements of ISO 9001 (corresponds to EN29001: 1987).

This has been certified by DQS (the German society for the certification of quality management systems).

EQ-Net certificate no.: 1323-01

Software License Agreement

The device can be supplied with or without preinstalled software. For devices with preinstalled software, please note the relevant license agreements.

Approvals for the USA, Canada and Australia

Product safety

One of the following markings on a device is indicative of the corresponding approval:	
	Underwriters Laboratories (UL) per UL 60950-1 (I.T.E) or per UL 508 (IND.CONT.EQ)
	Underwriters Laboratories (UL) according to Canadian standard C22.2 No. 60950-1 (I.T.E) or C22.2 No. 142 (IND.CONT.EQ)
	Underwriters Laboratories (UL) to Standard UL 60950-1, Report E11 5352 and Canadian Standard C22.2 no. 60950-1 (I.T.E), or to UL508 and C22.2 no. 142 (IND.CONT.EQ)
	UL recognition mark
	Canadian Standard Association (CSA) per Standard C22.2. No. 60950-1 (LR 81690) or per C22.2 No. 142 (LR 63533)
	Canadian Standard Association (CSA) to the American Standard UL 60950-1 (LR 81690), or to the UL 508 (LR 63533)

EMC

USA	
Federal Communications Commission Radio Frequency Interference Statement	This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Shielded cables	Shielded cables must be used with this equipment to maintain compliance with FCC regulations.
Modifications	Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
Conditions of operations	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CANADA	
Canadian Notice	This Class A digital apparatus complies with Canadian ICES-003.
Avis Canadian	Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

17.3 Service and support

Additional support

If you have any further questions relating to the products described in this documentation, contact your local representative at the SIEMENS office nearest you.

Find your contact partner at:

http://www.siemens.com/automation/partner

A guide to the technical documentation for the various SIMATIC products and systems is available at:

http://www.siemens.de/simatic-tech-doku-portal

The online catalog and the online ordering system is available at:

http://mall.automation.siemens.com/

Training center

Siemens offers a number of training courses to familiarize you with the SIMATIC automation system. Please contact your regional Training Center, or the central Training Center in D90327 Nuremberg.

Phone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

Technical support

You can reach technical support for all A&D products at:

- Support request form on the web:
  http://www.siemens.de/automation/support-request
- Phone: +49 180 5050 222
- Fax: +49 180 5050 223

Further information about our technical support is available in the Internet at www.siemens.com/automation/service

When you contact the customer support, please have the following information for the technician on hand:

- BIOS version
- Order No. (MLFB) of the device
- Installed additional software
- Installed additional hardware

Service & support on the Internet

In addition to our documentation, we offer our complete knowledge base on the Internet at.

http://www.siemens.com/asis

There you will find:

- The newsletter which provides the latest information on your products
- Relevant documentation for your application which you can access via the search function in our service & support database.
- The current BIOS version
- A forum is available for users and specialists from all over the world to exchange experiences
- Your local Siemens partner for Automation & Drives in our partner database
- Information about on-site service, repairs, spare parts. Lots more is available under ”Services”

You can find the latest information about your device at the following address:

http://support.automation.siemens.com

17.4 Retrofitting instructions

Device configurations permitted for the temperature range 5°C to 45°C

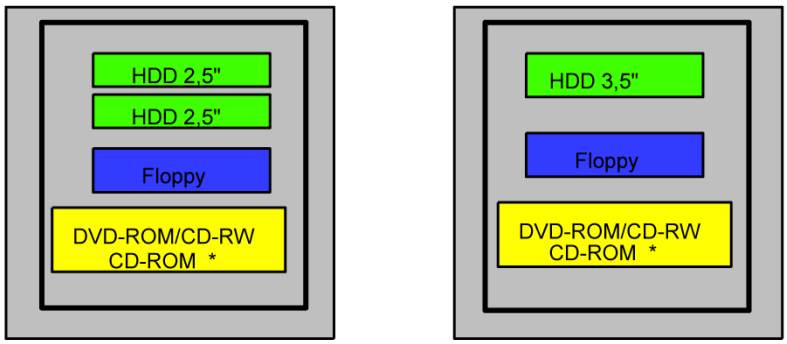


Figure 17-1 Approved configuration versions for the temperature range 5 to 45° C

You may use Intel ® Celeron 2.0 GHz or P4 processors up to 2.4 GHz, and Mobile processors with 2.2 GHz. The maximum permissible power loss of expansion modules is 50 W.

Device configurations permitted for the temperature range 5°C to 55°C

Mobile processors with 2.2 GHz can be used. The maximum permissible power loss of expansion modules is 50 W.

DVD-ROM/CD-RW and CD-ROM are allowed to be installed but are not allowed to be accessed.

ESD Guidelines

18

18.1 ESD Guidelines

What does ESD mean?

All electronic modules are equipped with highly integrated modules or components. Based on their design, these electronic components are highly sensitive to overvoltage and thus to discharge of static electricity.

The electrostatic sensitive components/modules are commonly referred to as ESD devices. You can also find the commonly used international designation ESD for electrostatic sensitive device.

Electrostatic sensitive modules are identified by the following symbol:



Caution

Electrostatic sensitive devices may be destroyed by voltages and energies that are undetectable to a human. Voltages of this kind occur as soon as a component or an assembly is touched by a person who is not grounded against static electricity. The damage to a module as a result of overvoltage cannot usually be detected immediately. It may only become apparent after a long period of operation.

Electrical charge

Anyone who is not connected to the electrical potential of their surroundings can be electrostatically charged.

The figure below shows the maximum electrostatic voltages that can accumulate in a person who is operating equipment when he/she comes into contact with the materials indicated. These values correspond with specifications to IEC 801-2.

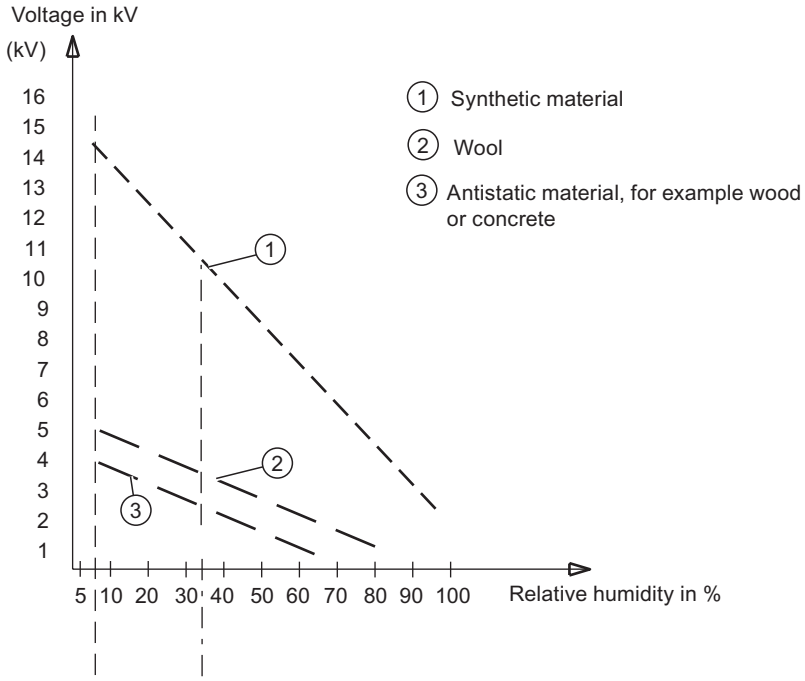


Figure 18-1 Electrostatic voltages on an operator

Basic protective measures against discharge of static electricity

- Ensure good equipotential bonding:
  When handling electrostatic sensitive devices, ensure that your body, the workplace and packaging are grounded. This helps you avoid static charge.
- As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). When you touch modules, make sure that you do not touch either the pins on the modules or the printed conductors. This prevents any discharge of static electricity to sensitive component and thus avoids damage.

  Discharge electrostatic energy from your body before you perform measurements on a module. To do so, touch a grounded metallic object. Always use grounded measuring instruments.

Abbreviations

19

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
ACPI	Advanced Configuration and Power Interface	
PLC	Automation device	
AGP	Accelerated Graphics Port	High speed bus system
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controler
APM	Advanced Power Management	Tool for monitoring and reducing power consumption of the PC
PLC	Automation system	
AT	Advanced Technology	
ATA	Advanced Technology Attachment	
ATX	AT-Bus-Extended	
AWG	American Wire Gauge	US standard for the cable diameter
BIOS	Basic Input Output System	Basic Input Output System
CAN	Controller Area Network	
CD-ROM	Compact Disc – Read Only Memory	Removable storage medium for large data volumes
CD-RW	Compact Disc – Rewritable	Rewritable CD
CE	Communauté Européenne (CE symbol)	The product is in conformance with all applicable EC directives
CF	Compact Flash	
CGA	Color Graphics Adapter	Standard monitor interface
CLK	Clock pulse	Clock signal for controllers
CMOS	Complementary Metal Oxide Semiconductors	Complementary metal oxide semiconductors
COA	Certificate of authentication	Microsoft Windows Product Key
CoL	Certificate of License	License authorization
COM	Communications Port	Term for the serial interface
CP	Communication Processor	Communication computer
CPU	Central Processing Unit	CPU
CSA	Canadian Standards Association	Canadian organisation for tests and certifications according to own or binational standards (with UL / USA) standards
CTS	Clear To Send	Clear to send

Abbreviation	Term	Meaning
DRAM	Dynamic Random Access Memory	
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	Direct memory access
DOS	Disc Operating System	Operating system without GUI
DP	Decentralized peripherals	
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DDRAM	Double Data Random Access Memory	Memory chip with high-speed interface
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready
DVD	Digital Versatile Disc	Digital versatile disk
DVI	Digital Visual Interface	Digital display interface
ECC	Error Correction Code	Error correction code
ECP	Extended capability port	Extended parallel port
EGA	Enhanced Graphics Adapter	PC to monitor interface
ESD	Components sensitive to electrostatic charge	
DM	Electronic Manual	
EIDE	Enhanced Integrated Drive Electronics	An enhancement of the IDE standard
EISA	Extended Industry Standard Architecture	Extended ISA standard
EMM	Expanded Memory Manager	Manages memory expansions
EM64T	Extended Memory 64 technology	
EN	European standard	
EPROM / EEPROM	Erasable Programmable Read-Only Memory / Electrically Erasable Programmable Read-Only Memory	Plug-in submodules with EPROM/EEPROM chips
EPP	Enhanced Parallel Port	Bi-directional Centronics interface
ESC	Escape character	Control character
EWF	Enhanced Write Filter	
FAQ	Frequently Asked Questions	FAQs
FAT 32	File Allocation Table 32-bit	32-bit file allocation table
FD	Floppy disk	Disk drive, 3.5"
FSB	Front Side Bus	
GND	Ground	Chassis ground
HD	Hard disk	Hard disk
HDA	High Definition Audio	
HU	Height unit	
HMI	Human Machine Interface	User interface
HT	Hyper-Threading	
HTML	Hyper Text Markup Language	Script language for creating Internet pages.
HTTP	Hypertext Transfer Protocol	Protocol for data transfer on the Internet
Hardware	Hardware	

Abbreviation	Term	Meaning
I/O	Input/Output	Data input/output on computers
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IP	Ingress Protection	Degree of protection
IR	Infrared	Infrared
IRDA	Infrared Data Association	Standard for data transfer via IR module
IRQ	Interrupt Request	Interrupt request
ISA	Industry Standard Architecture	Bus for expansion modules
IT	Information Technology	Information technology
LAN	Local Area Network	Computer network that is limited to a local area.
LCD	Liquid Crystal Display	Liquid crystal display
LEDs	Light Emitting Diode	Light emitting diode
LPT	Line Printer	Printer port
LVDS	Low Voltage Differential Signaling	
LW	Disk drive	
MAC	Media access control	Media access control
MC	Memory Card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	Memory card with the format 32 x 24.5 mm
MPI	Multipoint-capable interface for programming devices	
MS-DOS	Microsoft Disc Operating System	
MTBF	Mean Time Between Failures	
MUI	Multilanguage User Interface	Language localization in Windows
NA	Not Applicable	
NAMUR	Normenarbeitsgemeinschaft für Mess- und Regelungstechnik in der chemischen Industrie (standardization body for instrumentation and control technology in the chemicals industry)	
NC	Not Connected	Not connected
NCQ	Native Command Queuing	Automatic re-sorting of the file and disk access, for increased performance
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NMI	Non Maskable Interrupt	Interrupt the processor can not reject
NTFS	New Techniques File System	Secure file system for certain versions of Windows (NT, 2000, XP)
OPC	OLE for Process Control	Standardized interface for industrial processes
PATA	Parallel ATA	
PC	Personal computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCMCIA	Personal Computer Memory Card International Association	

Abbreviation	Term	Meaning
PI	Protective Earth	Protective conductor
PG	Programming device	
PIC	Programmable Interrupt Controller	Programmable interrupt controller
POST	Power On Self Test	
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAM	Random Access Memory	
RI	Ring Input	Incoming call
ROM	Read-Only Memory	
RS 485	Reconciliation Sublayer 485	Bi-directional bus system designed for up to 32 nodes
RTC	Real Time Clock	Real-time clock
RTS	Reliable Transfer Service	Request to send
RxD	Receive Data	Data transfer signal
SATA	Serial ATA	
SCSI	Small Computer System Interface	
SDRAM	Synchronous DRAM	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SMS	Short Message Service	Short message via telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	SafeCard on Motherboard (SOM)	
SPP	Standard Parallel Port	Synonym for parallel port
SVGA	Super Video Graphics Array	Enhanced VGA standard with at least 256 colors
SVP	Serial number of the device	
SW	Software	
TCO	**T**otal **C**ost of **O**wnership	
TFT	Thin-Film-Transistor	Type of LCD flat-screen
TTY	Tele Type	Asynchronous data transfer
TxD	Transmit Data	Data transfer signal
TWD	Watchdog Time	Watchdog monitoring time
UL	Underwriters Laboratories Inc.	US organisation for tests and certifications according to own or binational standards (with CSA / Canada) standards
UMA	Unified Memory Architecture	
URL	Uniform Resource Locator	Designation of the full address of an Internet page
USB	Universal Serial Bus	
UXGA	Ultra Extended Graphics Array	Graphic standard, maximum resolution 1.600 x 1.200 pixels

Abbreviation	Term	Meaning
V.24		ITU-T standardized recommendation for data transfer via serial ports
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	
VGA	Video Graphics Array	Video adapter which meets industrial standard
VRM	Voltage Regulator Module	
W2k	Windows 2000	
WAV	Wave Length Encoding	Loss-free file format for audio data
WD	Watchdog	Program monitoring with error detection and alarming.
WLAN	Wireless LAN	LWireless local area network
WWW	World Wide Web	
XGA	Extended Graphics Array	Graphic standard, maximum resolution 1.024 x 768 pixels

Glossary

ATAPI CD-ROM Drive

AT-Bus **A**ttachment **P**acket **I**nterface (connected to AT bus) CD-ROM drive

Automation device (AG)

The programmable logical controllers (PLC) of the SIMATIC S5 system consist of a central controller, one or more CPUs, and various other modules (e.g. I/O modules).

Automation system (AS)

The programmable logical controllers (PLC) of the SIMATIC S7 system consist of a central controller, one or more CPUs, and various I/O modules.

Backup

Duplicate of a program, data carrier or database, used either for archiving purposes or for the protection of vital and non-replaceable data against loss when the working copy is corrupted. Some applications automatically generate backup copies of data files, and manage both the current and the previous versions on the hard disk.

Baud

Physical unit for the step speed in signal transmission. Defines the number of transferred signal states per second. With only two states, one baud is equivalent to a transmission rate of 1 bps.

BEEP code

If the BIOS detects a boot error, it outputs an audible warning based on the current test result

Boot diskette

A diskette that contains a boot sector and an initial loader for the operating system. This can be used to load the operating system from the disk.

Booting

Start or restart of the computer. During booting the operating system is transferred from the system data carrier to the work memory.

Cache

High-speed access buffer for interim storage (buffering) of requested data.

CE marking

Communauté **E**uropéene The CE symbol confirms the conformance of the product with all applicable EC directives, e.g. the EMC directive.

Chipset

Located on the motherboard, connects the processor with the RAM, the graphic controller, the PCI bus, and the external interfaces.

Cold start

A start sequence, starting when the computer is switched on. The system usually performs some basic hardware checks within the cold start sequence, and then loads the operating system from the hard disk to work memory -> boot

COM interface

The COM interface is a serial V.24 interface. The interface is suitable for asynchronous data transfer.

Configuration files

These are files containing data which define the configuration after restart. Examples of such files are CONFIG.SYS, AUTOEXEC.BAT and the registry files .

Configuration software

The configuration software updates the device configuration when new modules are installed . This is done either by copying the configuration files supplied with the module or by manual configuration using the configuration utility.

Controller

Integrated hardware and software controllers that control the functions of certain internal or peripheral devices (for example, the keyboard controller).

Device configuration

The configuration of a PC or programming device contains information on hardware and device options, such as memory configuration, drive types, monitor, network address, etc. The data are stored in a configuration file and enable the operating system to load the correct device drivers and configure the correct device parameters. . If changes are made to the hardware configuration, the user can change entries in the configuration file using the SETUP program. .

Disc-at-once

With this burning technique, data are written to a CD in a single session, and the CD is then closed. Further write access is then no longer possible.

Drivers

Program parts of the operating system. They adapt user program data to the specific formats required by I/O devices such as hard disk, printers, and monitors.

EMC directive

Directive concerning **E**lectro**m**agnetic **C**ompatibility. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

Energy management

The energy management functions of a modern PC allow individual control over the current consumption of vital computer components (e.g. of the monitor, hard disk and CPU), by restricting their activity based on the current system or component load. Energy management is of particular importance for mobile PCs.

Energy options

The energy options can be used to reduce energy consumption of the computer, while keeping it ready for immediate use. This can be configured in Windows by selecting Settings > Control Panel > Energy options.

ESD guidelines

Directive for using electrostatic sensitive components.

Ethernet

Local network (bus structure) for text and data communication with a transfer rate of 10/100 Mbps.

Formatting

Basic partitioning of memory space on a magnetic data carrier into tracks and segments. Formatting deletes all data on a data carrier. All data carriers must be formatted prior to their first use.

Gender changer

Using the gender changer (25-pin / 25-pin), the COM1/V24/AG interface of the SIMATIC PC family can be converted to the usual 25-pin male connector.

Hard disks

Hard disks represent a form of magnetic disk storage medium (Winchester drives, hard disks) with integrated magnetic disks.

Hot swapping

The SATA interface gives the device's hard drive system hot-swap capability. The prerequisite for this is a RAID1 system, comprising a SATA RAID controller (onboard or as a slot board, and at least two SATA swap frames. The advantage of hot swapping is that defective hard disks can be replaced without the need for rebooting.

Hub

A term in network technology. In a network, a device joining communication lines at a central location, providing a common connection to all devices on the network.

Hyper Threading

HT technology enables the parallel processing of tasks. HT is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Image

This refers to the image, for example, of hard disk partitions saved to a file in order to restore them when necessary.

Intel chip set 915 GM

The chip set organizes the data traffic between the main processor, working memory, cache, slots and other interfaces.

Functions of the 915 GM: Front side bus with 533 MHz, Intel® graphical media accelerator 900, support for up to 2 GB dual-channel DDR2 memories, Intel® High definition audio, Intel® display power-saving technology 2 (Intel® DPST 2)

Interface

see Interface

Interface, multi-point

MPI is the programming interface of SIMATIC S7/M7. Allows central access to programmable modules, text-based displays and OPs. The MPI nodes can intercommunicate.

LAN

Local **A**rea **N**etwork: LAN is a local network that consists of a group of computers and other devices that are distributed across a relatively restricted range and are linked with communication cables. The devices connected to a LAN are called nodes. The purpose of networks is the mutual use of files, printers or other resources.

Legacy USB support

Support of USB devices (e.g. mouse, keyboard) on the USB ports without driver.

License key

The license key represents the electronic license stamp of a license. Siemens provides the license keys for protected software.

License key diskette

The license key diskette contains the authorizations or license keys required to enable protected SIMATIC software.

Low-voltage directive

EC directive for product safety of products operated with low voltage (AC 50V to 1000V, DV 70V to 1500V) that are not governed by other directives. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

LPT interface

The LPT interface (Centronics interface) is a parallel interface that can be used to connect a printer.

Memory card

Memory cards in credit card format. Memory for user programs and parameters, for example, for programmable modules and CPs.

Module

Modules are plug-in units for PLCs, programming devices or PCs. They are available as local modules, expansion modules, interfaces or mass storage (Mass storage module).

Module bracket

The module bracket is used to fasten modules and ensure safe contact and transport. Shocks and vibrations especially affect large, heavy modules. It is therefore recommended to use the module bracket for this type of module. There are also short, compact and light modules on the market. The module bracket was not designed for these modules because the standard fastening is sufficient for them.

Motherboard

The motherboard is the core of the computer. Here, data are processed and stored, and interfaces and device I/Os are controlled and managed.

Operating system

Summarizing term describing all functions for program execution, allocation of system resources to the various user programs, and for controlling and monitoring consistency of the operating mode in cooperation with the hardware (e.g. Windows XP Professional).

Packet writing

The CD-RW is used as a diskette medium. The CD can then be read only by packet–writing compatible software or has to be finalized. Finalization of a CD closes the CD within an ISO9660 shell. You can still write to the CD-RW several times in spite of finalization. Not all CD drives can read packet-written CDs . There are restrictions to using this method in general data transfer.

PATA

An interface for hard disk drives and optical drives with parallel data transfer of up to 100 Mbps.

PC card

Trademark of the Personal Computer Memory Card International Association (PCMCIA). Designation for auxiliary cards that conform with PCMCIA specifications. A PC card that has roughly the size of a credit card can be plugged into a PCMCIA slot. Version 1 specifies cards of Type I with a thickness of 3.3 millimeters, which is conceived mainly for use as external memory. Version 2 of the PCMCIA specification also defines a card Type II with a thickness of 5 mm and a card of the Type III with a thickness of 10.5 mm. Type II cards can realize devices such as modems, fax and network interface cards. Type III cards are equipped with devices that require more space, for example wireless communication modules or rotary storage media (hard disks, for example).

PC/104 / PC/104-Plus

Two bus architectures are especially fashionable today in the industrial world. PC/104 and PC/104-*Plus*. Both are standard in single-board computers of the PC class. The electrical and logical layout of the two bus systems is identical with ISA (PC/104) and PCI (PC/104-*Plus*). Software cannot usually detect a difference between them and normal desktop bus systems. Their advantage is the compact design and the resulting space they save.

PCMCIA

Association consisting of approx. 450 member companies of the computer industry. Their focus is set on providing worldwide standards for miniaturization and flexible use of PC expansion cards, and thus to provide a basic technology to the market.

Pentium M

Intel processor type: The architecture of the processor is designed for mobile computing; the processor features superior performance characteristics for computer applications and enhanced power-saving functions

Pixel

PixElement (picture point). The pixel represents the smallest element that can be reproduced on-screen or on a printer.

POST

Self-test performed by the BIOS after the computer is switched on. Performs a RAM test and a graphic controller test, for example. The system outputs audible signals (beep codes) if the BIOS detects any errors; the relevant message indicating cause of error is output on the screen.

PROFIBUS/MPI

Process **F**ield **Bus** (standard bus system for process applications)

PXE server

A **P**reboot E**x**ecution **E**nvironment server is part of a network environment and can provide software to connected computers even before they boot. This can involve operating system installations or servicing tools, for example.

RAID

Redundant **A**rray of **I**ndependent **D**isks: Data storage system which is used to store data along with the error correction codes (e.g. parity bits) on at least two hard disks, in order to increase system reliability and performance. The hard disk array is controlled by management programs and a hard disk controller for error correction. The RAID system is usually implemented in network servers.

Recovery CD

Contains the tools for setting up the hard disks and the Windows operating system.

Reset

Hardware reset: Reset/restart of the PC using a button/switch.

Restart

Warm start of a computer in operating state without switching off the power supply (Ctrl + Alt + Del)

Restore DVD

The Restore DVD is used to restore the system partition or the entire hard disk to factory state if the system has crashed. The bootable DVD contains all the necessary image files. You can also create a boot disk allowing restoration via the network.

ROM

Read-Only Memory ROM is a read-only memory in which every memory location can be addressed individually. The programs or data are permanently stored and are not lost in the event of a power failure.

SCSI interface

Small Computer System Interface Interface for connecting SCSI devices (e.g. hard disk or optical drives)

Session at once

In session at once, the CD can be written to both with an audio session and a data session. The two sessions are written to at once (as in disc at once).

SETUP (BIOS Setup)

A program in which information about the device configuration (that is, the configuration of the hardware on the PC/PG) is defined. The device configuration of the PC/PG is preset with defaults. Changes must therefore be entered in the SETUP if a memory extension, new modules or a new drive are added to the hardware configuration.

Track-at-once

In track-at-once recording, a CD can be written to in bits in several sessions if the CD was not closed.

Troubleshooting

Error cause, cause analysis, remedy

V.24 interface

The V.24 interface is a standardized interface for data transmission. Printers, modems, and other hardware modules can be connected to a V.24 interface

Warm restart

The restart of a computer after a program was aborted. The operating system is loaded and restarted again. The hot key CTRL+ ALT+ DEL can be used to perform a warm start.

Windows

Microsoft Windows is a multitasking graphical user interface. Windows provides a standard graphical interface based on drop-down menus, windowed regions on the screen, and allows operation with a pointer device such as a mouse.

WLAN

Wireless **LAN** is a local network that transmits data via radio waves, infrared light or another wireless technology. Wireless LAN is mainly used in connection with mobile computers in the office or in factory environments.

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