SIEMENS

SIMATIC PC

Panel PC 870 V2 Computer Unit

Operating Instructions

Edition 03/2004

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety as well as to avoid property damage. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only have no safety alert symbol.

Danger

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

used without safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Notice

used without the safety alert symbol indicates a potential situation which, if not avoided, may result in an undesirable result or state.

Wehn several danger levels apply, the notices of the highest level (lower number) are always displayed. If a notice refers to personal damages with the safety alert symbol, then another notice may be added warning of property damage.

Qualified Personnel

The device/system may only be set up and operated in conjunction with this documentation. Only qualified personnel should be allowed to install and work on the equipment. Qualified persons are defined as persons who are authorized to commission, to earth, and to tag circuits, equipment and systems in accordance with established safety practices and standards.

Intended Use

Please note the following:

Warning

This device and its components may only be used for the applications described in the catalog or technical description, and only in connection with devices or components from other manufacturers approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored, set up and installed correctly, and operated and maintained as recommended.

Trademarks

All designations marked with ® are registered trademarks of Siemens AG. Other designations in this documentation might be trademarks which, if used by third parties for their purposes, might infringe upon the rights of the proprietors.

Disclaimer of Liability
We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in the manual are reviewed regularly, and any necessary corrections will be included in subsequent editions. Suggestions for improvement are welcomed.

Siemens AG
Automation and Drives Group
P.O. Box 4848, D-90327 Nuremberg (Germany)

Siemens AG 2004
Technical data subject to change

Siemens Aktiengesellschaft

Order No. CD Documentation and Drivers

Table of contents

Preface

1

1.1 This manual

Purpose of the manual

This manual provides information based on the requirements defined by DIN 8418 regarding mechanical engineering documentation. This information relates to the device, its place of use, transport, storage, installation, use and maintenance.

This manual is intended for the following target group:

- User
- Commissioning engineer
- Service technicians
- Maintenence technicians

Please read carefully the section "Safety information and general notes".

Basic knowledge required

A solid background in personal computers and Microsoft operating systems is required to understand this manual. General knowledge in the field automation control engineering is recommended.

Where is this manual valid?

This manual applies to devices with the order numbers 6AV774… and 6AV775….

Changes in comparison to the previous version 11/02

The layout of the document has been made more uniform: Header and numbering of the main section describe the main tasks in their order of occurance.

Incorporation into the communications environment

The documentation for the Panel PC includes the following sections:

- SIMATIC Panel PC 670 V2 Commissioning,
  SIMATIC Panel PC 870 V2, QuickStart with the following information:
  - Commissioning
  - Legal information
- SIMATIC Panel PC 670 V2 Device Manual for Operator Unit,
  SIMATIC Panel PC 870 V2, Operating Instructions for the Operator Unit with the following information:
  - Operation
  - Error diagnostics
  - Hardware

  Refered to as "operating instructions for the operator unit" in the following.
- SIMATIC Panel PC 670 V2 Device Manual for Computer Unit,
  SIMATIC Panel PC 870 V2, Operating Instructions for the Computer Unit with the following information:
  - Expansion options
  - Configuration
  - Error diagnostics
  - Hardware

  Refered to as "operating instructions for the computer unit" in the following.

The documentation is supplied with the Panel PC in electronic form as a PDF file on the "Documentation & Drivers" CD. QuickStart for the Panel PC 870 V2 is also supplied in printed form. The documentation is available in German, English, French, Italian and Spanish.

Additional information about the Windows operating system is available in the Internet at the Microsoft hompage, "www.Microsoft.com".

Online availability

The following links will bring you directly to the technical documentation collection for SIMATIC products and systems in the languages German, English, French, Italian and Spanish.

- SIMATIC guide to technical documentation in German:
  http://www.ad.siemens.de/simatic/portal/html_00/techdoku.htm
- SIMATIC guide to technical documentation in English:
  http://www.ad.siemens.de/simatic/portal/html_76/techdoku.htm

Conventions

The following text notation will faciliate reading this manual:

Format	Scope
"File"	• Terms used in the GUI such as names of dialogs, registry tabs, buttons and menu commands. • Required input such as limits and tag values. • Path information
"File > Edit"	Operation sequences such as menu command, context menu command.
<F1>, <Shift>+<F1>	Keys and key comibinations

The term "Panel PC 670/870 V2", "operator unit" and "computer unit" is uniformly refered to as the "device" in these operating instructions . The full term is only used when a concrete reference is necessary.

Note

A note is important information about the product, handling the product or a reference to specific sections of the documentation that require special consideration.

Trademarks

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HMI®
SIMATIC®
SIMATIC HMI®
SIMATIC ProTool®
SIMATIC WinCC®
Panel PC 670®
Panel PC 870®

1.2 Further Support

Representatives and offices

Please consult your Siemens representative at the office nearest you for any other questions regarding the use of the products described in the manual.

Locate your representative at:

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

Training Centers

Siemens offers a number of training courses to familiarize you with the automation system. Please contact your regional training center or our central training center in 90327 Nuremberg, Germany for details:

Telephone: +49 (911) 895-3200.

Internet: http://www.sitrain.com/

Service & Support on the Internet

Extensive additional information concerning the SIMATIC products is available to you through online services at "http://www.siemens.com/automation/service&support."

- The newsletter with continuously updated information about your products.
- Numerous documents available through search in Service & Support.
- A bulletin board, where users and experts from all over the world exchange their experiences.
- Current product information, FAQs and downloads.
- Your local representative for Automation & Drives.
- Infomation about local service, repairs, replacement parts and much more under the heading "Services."

A&D Technical Support

Available 24 hours a day worldwide:

Worldwide (Nuremberg) **Technical Support** (Free Contact) Local time: Mo - Fr 7:00 am to 5:00 pm Telephone: +49 (0) 180 5050-222 Fax: +49 (0) 180 5050-223 E-mail: adsupport@siemens.com GMT: +1:00	**Worldwide**(Nuremberg) **Technical Support** (subject to fees, with SIMATIC Card only) Local time: 24 hours a day / 365 days a year: Telephone: +49 (911) 895-7777 Fax: +49 (911) 895-7001 GMT: +1:00	
Europe / Africa (Nuremberg) **Authorization** Local time: Mo - Fr 7:00 am to 5:00 pm Telephone: +49 (911) 895-7200 Fax: +49 (911) 895-7201 E-Mail: adauthorisierung@siemens.com GMT: +1:00	**United States**(Johnson City) **Technical Support and Authorization** Local time: Mo - Fr 8:00 am to 7:00 pm Telephone: +1 423 461-2522 Fax: +1 423 461-2289 E-mail: simatic.hotline@sea.siemens.com GMT: -5:00	**Asia/Pacific**(Beijing) **Technical Support and Authorization** Local time: Mo - Fr 8:30 am to 5:00 pm Telephone: +86 10 64 75 75 75 Fax: +86 10 64 74 74 74 E-mail: adsupport.asia@siemens.com GMT: +8:00

Information available in German and English.

Safety information and general notes

2

2.1 Safety information

Caution

Please follow the safety instructions on the back of the coverpage in 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 admissibility of the installation in the designated environment, please contact your service representative.

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.

System expansions

Install only system expansion devices designed for this computer. If you install other expansion devices, you may damage the system or violate the safety requirements and regulations on RF suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

Caution

The warranty becomes void if you damage your device by installing or replacing system expansions.

Battery

This device is equipped with a backup battery. Batteries may only be exchanged by qualified personnel.

Caution

There is the risk of an explosion if the battery is not exchanged 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!

Hence, 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 dewing.

Guidelines for Handling Electrostatic Sensitive Devices (ESD)

Modules containing electrostatically 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 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 power plug and disconnect the battery before you install or remove modules which are sensitive to ESD.
- Handle modules ESD-sensitive modules only at their edges.
- Do not touch any wiring posts or conductors on a module with ESD.

2.2 General notes

Overview

Caution

The device is approved for operation in closed rooms only.

Notice

The guarantee is void if these stipulations are ignored.

Avoid extreme environmental operating conditions. Protect your device against dust, moisture and heat. For additional information, refer to the specifications.

Do not place the device in direct sunlight.

Transport

Unpack the device at the its installation location. Transport the device only in the original packaging. Do not transport the device when it is mounted.

Notice

Adhere to these stipulations each time the device is transported, otherwise the guarantee is void.

Caution

Condensation
When transporting the device in low temperatures, ensure that no moisture gets on or in the device. This also applies when the device is subjected to extreme changes in temperature.

Commissioning
Allow the device to slowly adjust to room temperature before commissioning the device. Do no place the device near heat radiation. If moisture condensation occurs, wait at least about 12 hours before you switch on the device.

Vibration
CD/DVD drives are sensitive to vibration. Vibrations during operation may result in loss of data or damage to the drive or data medium.

Before transporting the device, wait at least 20 seconds to allow the drive to stop completely.

Updates

Regularly check if hotfixes for your device are available at the Siemens Internet site.

Description

3

3.1 Design

The computer unit serves as a base for PC-based HMI devices, the Panel PCs. The computer unit is furthermore as a base for custom designed devices in special configurations.

Figure 3-1 Panel PC 870 V2

3.2 Function

- Integrated configurable monitoring functions (program execution (watchdog) for internal housing temperature, processor temperaturs, temperaturs at the disk drives and rpm of both 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 of central monitoring of networked SIMATIC PCs
- RAID1 for automatic data mirroring on two EIDE hard disk drives

3.3 Features

General features	
Installation design	Central and distributed configuration, built-in device
Processor	Design: mPGA478 -Pentium 4 2.4 GHz, 533 MHz Front Side Bus FSB, 512 Kbyte Second Level Cache -Intel® Celeron 2.0 GHz, 400 MHz FSB, 128 Kbyte Second Level Cache -Pentium 4 Mobile 2.2 GHz, 400 MHz FSB, 512 Kbyte Second Level Cache
RAM	128 MB SDRAM (DDR266); expandable up to 3 GB SDRAM (DDR266)
Slots for expansions	- 2x PCI long -2x PCI/ISA shared long -1x ISA long Note: The RAID1 option occupies one PCI slot
Graphics	VIA ProSavage 8 with 8, 16 or 32 MB SDRAM graphic memory (configurable 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
Interfacen	
PROFIBUS / MPI	12 Mbps (isolated potential, compatible to CP 5611
Ethernet	10/100 Mbps, RJ45
USB	2x USB 2.0, high current
Serial	COM1 V.24, COM2 V.24
Parallel	LPT1
Monitor	1 x DVI-I VGA monitors can be connected with a DVI/VGA adapter.
Keyboard	PS/2
Mouse	PS/2
Power supply	- 120 / 240 V AC, 360 VA; wide range; with short-term buffering against power failure in accordance with NAMUR: max. 20 ms at 0.85 of the rated voltage -24 V DC, 265 VA, optional, only with Pentium 4 Mobile

Standard versions	
Processor	-Celeron 2.0 GHz, 400 MHz FSB, 128 K Second Level Cache
RAM expansion	128 MB SDRAM DDR266, PC2100 3 sockets for up to 3 GB
Power supply	AC 120/230V
Floppy disk drive	1.44 MB
Hard disk drives	= 40 GB EIDE; 3.5“
Operating system	none
PROFIBUS / MPI	On-board, compatible with CP5611

Optional accessories	
Processor	-Pentium 4 2.4 GHz, 400 MHz FSB, 512 K Second Level Cache -Pentium 4 Mobile 2.2 GHz, 533 FSB, 512 K Second Level Cache
RAM expansion	Up to 3 GB
Disk drive	CD-ROM or CD-R/W/DVD drive
Hard disk drives	-1 x 3.5" hard disk drive 80 GB -2 x 2.5" hard disk drives 30 GB or RAID1 system
Power supply	24 V DC
Operating system	Preinstalled, also factory installed on the Restore CD and Microsoft Recovery CD -Windows 2000 Professional MUI* -Windows XP Professional MUI* *MUI: Multi-lingual user interface; German, English, French, Italian, Spanish, Japanese, Korean, Chinese simplified and Chinese traditional

Accessories	
SIMATIC PC DiagMonitor SW	Software tool for monitoring local and remote SIMATIC PCs: -Watchdog -Temperature -Fan speed -Hard disk monitoring, SMART -System monitoring, Ethernet monitoring: Heartbeat Communication: -Ethernet interface, SNMP protocol -OPC for the integration in SIMATIC Software - Client/server architecture -Structure of log files
SIMATIC PC Image Creator SW	Software tool for local data backup

Planning use

4

4.1 Overview

Introduction

This section describes the first steps after unpackaging, the permitted mounting positions and the fixation. This section describes the necessary considerations for EMC.

Notice

Take note of the corresponding information in the operating instructions for the computer unit and the operator unit.

Field of application

The SIMATIC Panel PC is an industry-standard PC platform for demanding tasks in the field of PC-based automation. The Panel PC is designed for on-site use on the machine, installed for example in:

- Control cabinets and consoles
- 19" racks
- Swivel arms (booms)

Note

In the following, the term "control cabinet" also refers to rack, mounting rack, switchboard, operator panel and console. The term "device" represents the Panel PC and its variants.

4.2 Unpacking and checking the delivery unit

Procedure

1. Upon delivery, check the packaging for damage incurred during transport.
2. If any transport damage is present at the time of delivery, lodge a complaint at the shipping company in charge. Have the shipper confirm the transport damage immediately.
3. Unpack the device.
4. Keep the packaging material in case you have to transport the unit again.

Notice

The packaging protects the device during transport and storage. Therefore, never dispose of the original packaging material!

5. Please keep the enclosed documentation in a safe place. You will need the documentation when you start up the device for the first time.
6. Check the package contents for completeness and any visible transport damage. Check for completeness using the enclosed "Contents of Delivery" list.
7. Notify the delivery service in charge immediately if the packages contents are incomplete or damaged.

Warning

Make sure that a damaged unit is not installed nor put into operation.

4.3 Guidelines for Handling Electrostatic Sensitive Devices (EMC)

Electromagnetic Compatibility

The device fulfills the requirements of the EMC law of the Federal Republic of Germany as well as the EMC Guidelines of the Single European Market.

The device is designed as a built-in model with front-sided Protection Class IP 65. Ensure compliance with the EN 61000-4-2 standard by installing the device in grounded metal cabinets, e.g. MC cabinets, Siemens catalog NV21.

Note

Please refer to the appendix for for more information concerning the EMC requirements.

Installing the device according to EMC guidelines

Principles of interference-free operation:

- Installing the controls according to EMC guidelines
- Using interference immune cable

Note

The instructions "Guidelines for the assembly of interference immune programmable logic controllers" with the article ID 1064706 and the manual "PROFIBUS networks" with the article ID 1971286, which also applies to the installation of the device, is located on the "Documentation and Drivers" CD.

4.4 Mounting positions and fastening

4.4.1 Installation guidelines

Before installing the device, please observe the following information which applies both to the centralized and decentralized designs.

Warning

Dangerous voltage

When opening the switch cabinet, beware of exposed live parts which are dangerous upon contact.

Isolate the power supply to the switch cabinet before opening it. Make sure that the power to the switch cabinet cannot be turned on accidentally.

Caution

The device is approved for use in closed areas only.

- Make sure that the protective contact socket of the building installation is easily accessible, and that a central power disconnector exists in switch cabinet installations.
- Position the screen in an ergonomic position favorable to the user. Choose a suitable installation height.
- Position the screen so that it is not subject to direct sunlight or other strong sources of light.
- Shocks CD/DVD drives are susceptible to shocks. Shocks during operation can lead to the loss of data or damage to the drive or data carrier. Burners and CD/DVD are not suitable for long-term writing.

- Applies to devices which are installed in swivel arm housings: Avoid rapid or jerky movements of the swivel arm during operation. The ensuing forces could lead to possible irreversible damage of the hard disk.
- The device with DC power supply is considered an open means of operation on the part of the voltage supply. Therefore, make sure that the switch cabinet fulfills the the requirements of a fire protection housing.

Note

The computer unit with AC power supply fulfills the requirements of a fire protection housing according to EN60950. Therefore, no additional fire protection is necessary for the installation.

- Provide adequate volume in the switch cabinet for air circulation and heat transport. Keep a distance of at least 10 cm circumference between the device and switch cabinet.
- Do not allow the maximum air intake temperature to exceed 45 °C. Decisive is the temperature measured at a distance of 10 cm from an air intake. The maxiumum air intake temperature must be accounted for especially when sizing closed switch cabinets.
- The minimum distance between the device and the housing is 10 cm on the air output side at the ventilator.
- Position the device so that the air vents of the housing are not covered up following installation.
- Provide an extra 1 cm of space for air circulation for the decentralized design.
- Also provide enough free space to add on to the device.
- The connecting cable between the control unit and the computer unit is 20 meters maximum.
- Equip the switch cabinet with struts for stabilizing the recessed mounting cut-out. Install struts where necessary.
- Avoid extreme environmental conditions. Protect your device from dust, moisture and heat.
- Install the device in such a way that it poses no danger, e.g. by falling over.
- During assembly, please comply with the approved installation positions.

Notice

If the device is installed in an unapproved position, the licenses expire in accordance with UL 508 and EN 60950!

For additional information, refer to the dimension diagrams in the appendix.

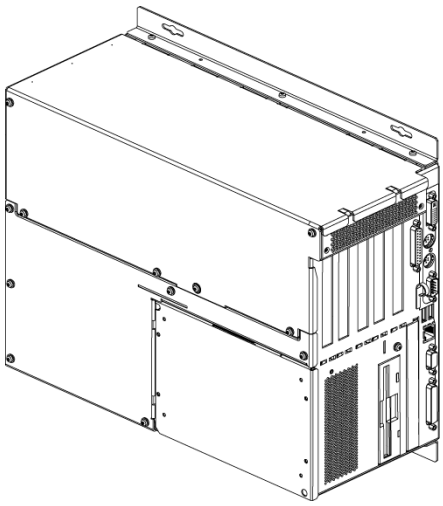
4.4.2 Permitted mounting positions

Range of validity

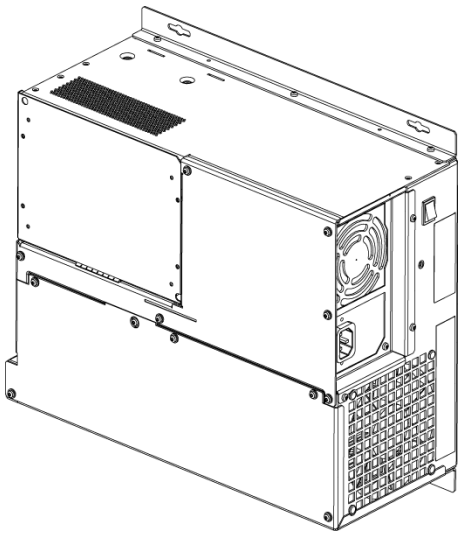
The following applies to distributed configurations only. You can information about central configurations in the operating instructions for the operator unit.

Mounting position of the PC to UL60950/UL508/EN60950/CSA22.2 No. 60950

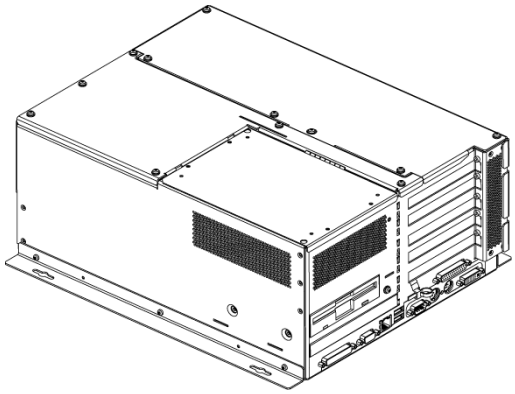
An inclination of ± 20° is allowed in each mounting position.



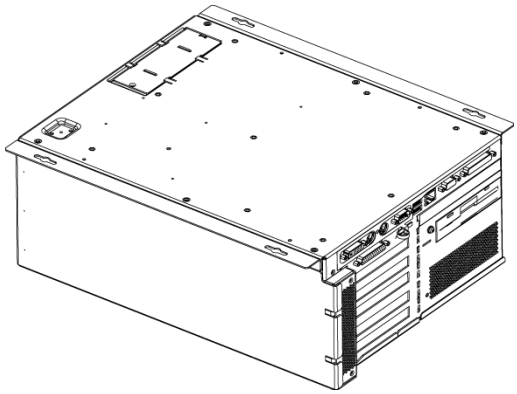
Position 1 (preferred)



Position 2



Position 3 (desktop)

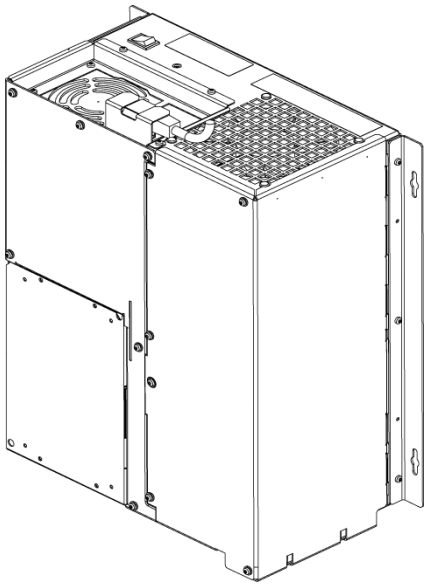


Position 4 (ceiling)

CD/DVD and floppy drives cannot be operated.

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

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

 Position 5 (interface towards the bottom) CD/DVD and floppy drives cannot be operated.	

Installation

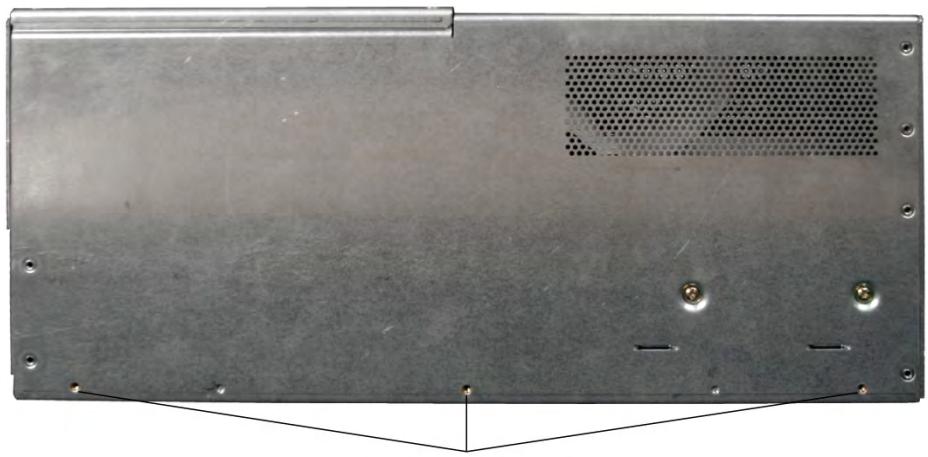
5

5.1 Installing the device

The device is particularly suitable for installation in control desks, switch cabinets and switchboards

Screwing on the bracket

Two brackets are included in the shipment, depending on the device version. You can mount these onto the PC with six screws M3 x 6.



(1)	Mount the bracket on the device, use the M3 screws included in your package, maximum screw depth 5 mm.

Instruction for ceiling or wall mounting

Example of mounting methods		
Stock	**Bore diameter**	**Attachment**
Concrete	8 mm diameter, 60 mm depth	Dowel: 8 mm, 50 mm screws 4 mm, 50 mm
Gypsum plaster board (min. thickness 13 mm)	14 mm diameter	Tilting dowel diameter 4 mm Minimum length 50 mm
Sheet metal (min. thickness 2 mm)	5 mm diameter	Metal screws diameter 4 mm Minimum length 15 mm

Warning

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

5.2 Dimensions

The mounting depth increases by 21 mm when a CD-ROM or CD-RW-/DVD drive is installed in the device.

Refer to the dimension diagrams in the "Specifications" section for the exact measurements.

Connecting

6

6.1 Overview

Introduction

Once you have mounted the device, connect it.

Warning

Do not touch power cables or communication cables during electrical storms and do not connect any cables.

Unplug the power cable from the socket to be sure the electricity is disconnected.

Caution

Connection sequence
Follow the described sequence when connecting the device to avoid damaging it.

Commissioning
Allow the device to adjust to the room temperature before connecting the device. Do no place the device near heat radiation. If moisture condensation occurs, wait at least about 12 hours before you switch on the device.

Risk of data loss!
Do not disconnect the power supply when the device is in operation. Disconnect the power only after the device has been correctly shut down.

Requirements

- The device has been installed in conformity with EMC guidelines.
- The device has been installed according to the information provided in these operation instructions.

Procedure

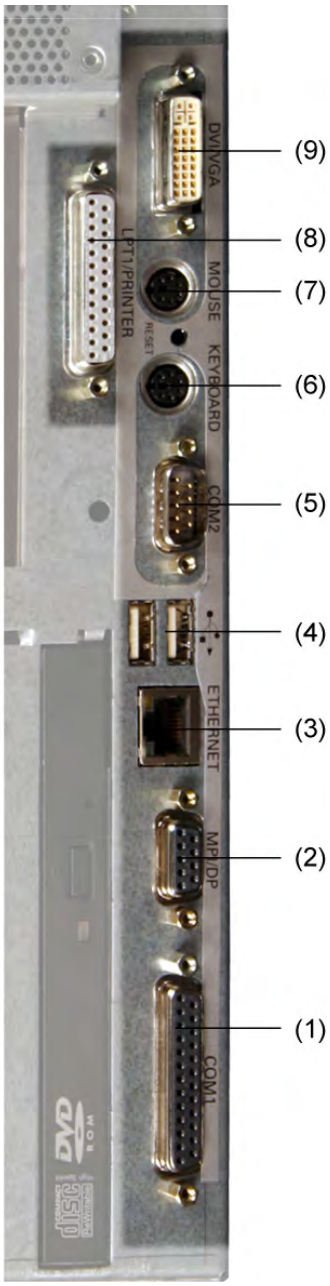
1. Connect the equipotential bonding.
2. Connect the peripherals:
   - Connect the monitor
   - Connect the PS/2 mouse
   - Connect the serial mouse
   - Connect the PS/2 keyboard
   - Connect USB device such as a USB mouse
   - Connect the printer

3. For distributed configuration only: Connect the cable between the computer unit and the operator unit. For additional information, refer to the operating instructions for the operator unit.
4. Connect the power cables.

6.2 Interfaces

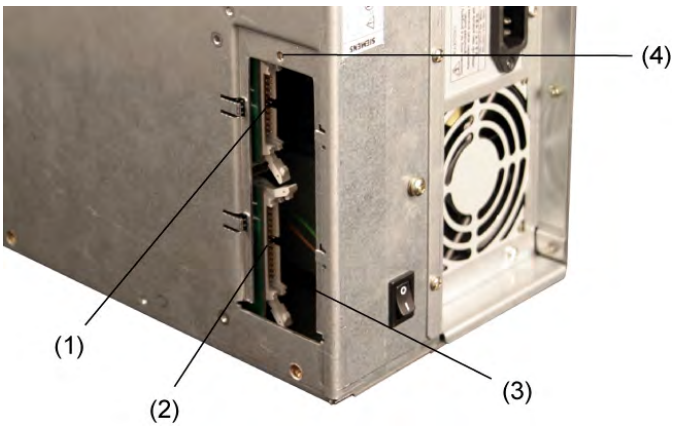
Interfaces

Arrangement of the ports on the front of the device



Pos	Description	Description
(1)	COM 1	Serial port 1 (V.24), 25-pin sub-D socket
(2)	PROFIBUS/MPI/DP	MPI interface (RS485, isolated potential), 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 1 (V.24), 9-pin d-Sub socket
(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 ports		
	(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 V DC
	2	0 V DC
	3	Protective conductor

6.3 Equipotential bonding

Differences in potential

Differences in potential arise between separated system parts, which in some cases leads to high equalization currents. When cable shields are applied on both sides and are grounded at different system parts, for example.

Causes of potential differences are different network feed-ins, for example.

Equipotential bonding requirements

Reduce the differences in potential by laying the equipotential bonding cables in such a way that the affected electronic components function perfectly. Please comply with the following guidelines when setting up equipotential bonding:

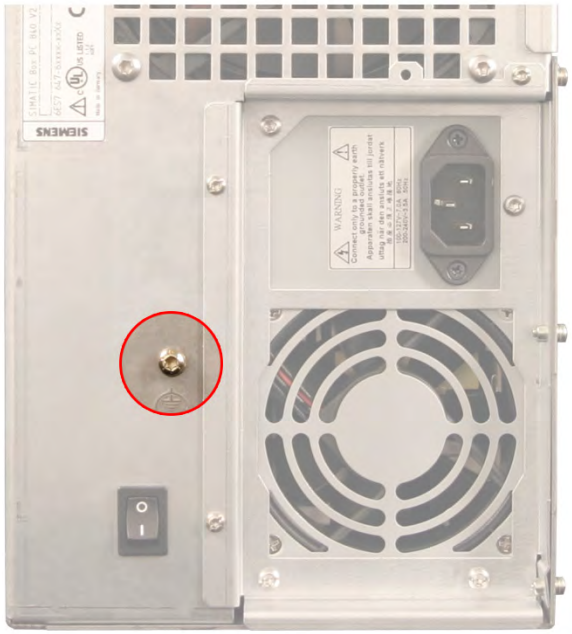
- The lower the impedance of the equipotential bonding cable, the greater the effectiveness of the equipotential bonding.
- When two system parts are connected by means of a shielded signal cable, and their shields are both connected to the ground or protected conductor, the following must be

observed: The impedance of the additonal equipotential bonding cable amounts to 10 % of the shield impedance, at the most.

- Make sure that the diameter of the equipotential bonding cable is proportional to the maximum equalization current. Equipotential bonding cables with a 16 mm diameter have proven themselves in practice. 2.
- Use equipotential bonding cables made of copper or galvanized steel. Connect the cables extensively with the ground or protective conductor. Protect the ground or protective conductor from corrosion.
- Lay the equipotential bonding cable in such a way that the area between the equipotential bonding cable and signal cables is as small as possible.

6.4 Connect the equipotential bonding

A low-impedance earth connection ensures that interference signals generated by external power supply cables, or signal cables, or by 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.	

6.5 Connecting I/O modules

6.5.1 Overview

When connecting the device for the first time, connect a PS/2 keyboard and PS/2 mouse. Connect any required USB components such as a USB hub.

Caution

Disconnect the device from mains before connecting peripherals.

Connect only peripherals approved for industrial applications according to EN 61000-6-2:2001. Using shielded cables and metal connectors for peripherals. Otherwise, the specified norms and specifications declared by Siemens AG are no longer valid. Fix the plugs of the interface cables to the PC housing with screws. This improves the electrical shielding.

Mouse

Connect a PS/2, USB or serial mouse.

6.5.2 Connect USB devices

Note

Caution

Wait at least 10 seconds before disconnected and reconnecting USB devices. This also applies to touch-screen front panels, especially touch panels. Short-circuits of the power on USB front connectors results in resetting the device.

Notice

When using standard USB peripherals, please bear in mind that their EMC immunity level is frequently designed for office applications only. These device may be used for commissioning and servicing. However, only industry-standard devices are allowed for industrial operation.

The USB peripherals are developed and marketed by individual vendors. The respective manufacturers offer support for the peripherals. Moreover, the terms of liability of the individual vendors or suppliers apply here. More information about connecting USB devices is available in the "Commissioning" section.

Procedure

1. Insert the USB cable into the USB port. The device is automatically detected by the Plug and Play operating system. The operating system may prompt you to install a driver when necessary.

Note

Do not connect devices, such as a printers, that do not have a USB port to the USB port.

6.6 Connect the 120 AC 230 V power supply

Principle

Connect the power supply as the final step.

You can optionally operate the device with automatic voltage switching on 120/230V AC or 24V DC. The Panel PC 870 V2 features a power switch.

Caution

Do not touch power lines or data transmission lines during electrical storms and do not connect any cables.

Unplug the power cable from the socket to be sure the electricity is disconnected.

The device features a safety-certified power cable. Connect the device only to a grounded outlet with a ground contact. Operate the device only on grounded power lines and not on impedance earthing lines such as IT networks.

Do not exceed the nominal voltage for the device with the local power voltage.

Localized information

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

If you do not use the safety-certified power cable, use a flexible cable with the following characteristics:

- At least 18 AWG conductor cross-section
- Grounded safety plug 15 A, 250 V.

Notice

Ensure that the cable set conforms to the respective national safety regulations and is appropriately labeled.

For USA and Canada:

A CSA or UL-listed power supply cable must be used in the United States and Canada USA.

Notice

Ensures that the plug conforms to the NEMA 5-15 regulation.

120V power supply

Use a flexible cable with the following characteristics:

- UL approval
- CSA label
- Type STJ with three conductors
- At least 18 AWG conductor cross-section
- Maximum 4.5 m length
- Parallel grounded safety plug 15 A, min. 125 V

230V power supply

Use a flexible cable with the following characteristics:

- UL approval
- CSA label
- Type STJ with three conductors
- At least 18 AWG conductor cross-section
- Maximum 4.5 m length
- Parallel grounded safety plug 15 A, min. 250 V

Procedure

1. Insert the supplied power cable into the AC/DC power socket of the computer unit.
2. Fasten the power plug with the locking device supplied in the package. This will prevent unintentional detachment of the IEC power connector on the computer unit.
3. Only for Panel PC 670: To prevent emitted interference, connect the supplied ferrite core . directly behind the device socket of the power supply cable. A ferrite core is supplied with the product package.

   When using a 105 W AC power supply, attach the ferrite core as diagrammed:

Figure 6-1 Attaching the ferrite core

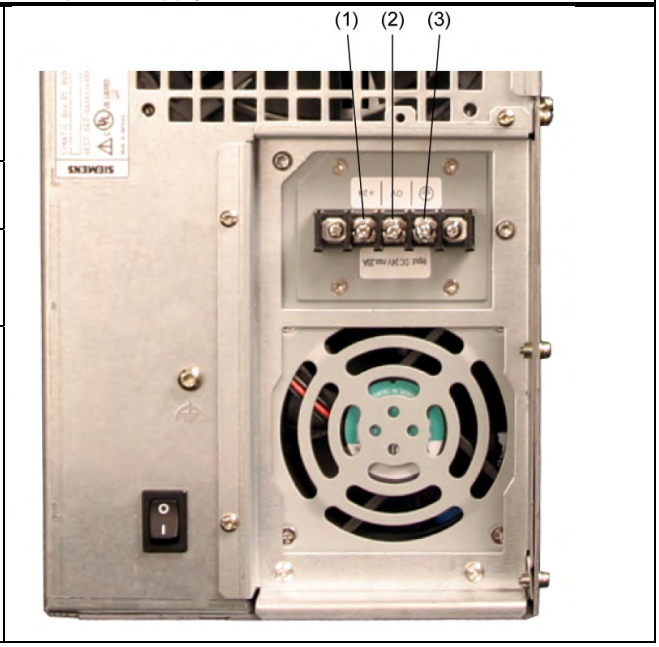
6.7 Connect the DC 24 V power supply

To be noted before you connect the device

Warning

The device may only be connected to 24 V DC power supply networks which are compliant with the requirements of safety extra low voltage directives (SELV); in addition, you need to install a protective conductor. The conductor cross-section of the cable must be adapted for withstanding the short-circuit current of the 24 DC power supply source in order to avoid damage to the cable. You may connect conductors with cross-section of up to 5 mm².

Connecting

Steps in connecting the device to the 24 V DC power supply		
1.	Make sure that the ON / OFF switch is in "0" position (Off) when you connect the 24 V power supply in order to avoid unintentional startup of the device.	
2.	Switch off the 24 V DC power supply source	
3.	Terminate the protective conductor (3) at the correspnding screw terminal.	
4.	Connect +24 V DC (1) and 0 V DC (2) to the screw terminals	

Commissioning

7

7.1 Overview

Note

Refer to the operating instructions for the operator unit for information about commissioning, operating and configuring the device. During commissioning, pay heed to the following information and special considerations about the BIOS settings and the Microsoft Windows operating systems.

Additional information about Microsoft Windows operating systems is available in the section "Servicing and maintenance".

7.2 BIOS settings

"USB Boot" und "USB legacy Keyboard/Mouse" are deactivated by default ("DISABLED") in the "Advanced" menu of the BIOS setup: A USB keyboard is not fully available before Windows starts up. There are not restrictions to using a USB keyboard when editing the BIOS. To be able to select an operating menu before Windows starts, however, connect a PS/2 keyboard. You can also activate the "USB legacy Keyboard/Mouse" feature.

Caution

Activate the "USB legacy Keyboard/Mouse" feature only when a USB keyboard or mouse is connected. When the "USB legacy Keyboard/Mouse" feature is activated ("ENABLED"), the ISA bus is not available. Problems may occur with ISA/PCI expansion cards. In this case, change the USB segment address in the "USB Segment Location" field.

Note

To edit the BIOS on the operator device with a touchscreen, connect a USB keyboard or an external PS/2 keyboard.

7.3 Microsoft Windows operating system

7.3.1 Releases

The device is released for the following operating systems:

Panel PC 870 V2

- Windows 2000 Professional Multi-Language, German, English, French, Italian, Spanish, Japanese, Korean, Chinese simplified and Chinese traditional
- Windows XP Professional Multi-Language, German, English, French, Italian, Spanish, Japanese, Korean, Chinese simplified and Chinese traditional

7.3.2 Windows 2000

Restrictions

Notice

If you have an external PS/2 keyboard and a USB keyboard connected at the same time, the keyboard LEDs on the external keyboards may not be correctly refreshed in some circumstances.

Service pack

After a new installation or recovery of Windows 2000, install at least Service Pack 4. Service Pack 4 is supplied in the product package.

Note

If you are using SIMATIC WinCC, pay heed to the operating system releases. For additional information, refer to the documentation of the SIMATIC WinCC.

Automatic logon

When automatic logon is used, a defined user is automatically logged on with a defined password. No logon dialog appears when the operating system starts up. For additional information, refer to the Windows help.

7.3.3 Windows XP

Restrictions

Note

If you have an external PS/2 keyboard and a USB keyboard connected at the same time, the keyboard LEDs on the external keyboards may not be correctly refreshed in some circumstances.

7.4 USB

Introduction

Readily available USB peripherals can be easily and flexibly connected via the USB port. For example, you can connect a USB keyboard and a USB mouse. If a USB keyboard features a USB port (USB hub) itself, you can connect other USB peripherals, such as a mouse, directly to the keyboard.

USB port

There are several types of USB peripherals:

- Low power devices: maximum 100 mA power consumption, e.g. mouse and keyboard
- High power devices: maximum 500 mA power consumption, e.g. hard disk and floppy drive

The general USB specifications apply to the USB ports on the computer unit.

Using USB peripherals

Notice

When installing a USB device for the first time, ensure you have the required device driver. Before removing an intelligent USB device, deactivate the device in the operating system using the dialog "Unplug or Eject Hardware". For additional information, refer to the documentation of the operating system.

For distributed configuration only: When using a USB hub, make sure you do not exceed the maximum cable length of 1.8 meters to the USB hub. Only connect additional USB devices to the USB hub with maximum cable length of 1.8 meters. More information is available in the simplified block diagram.

Simplified block diagram

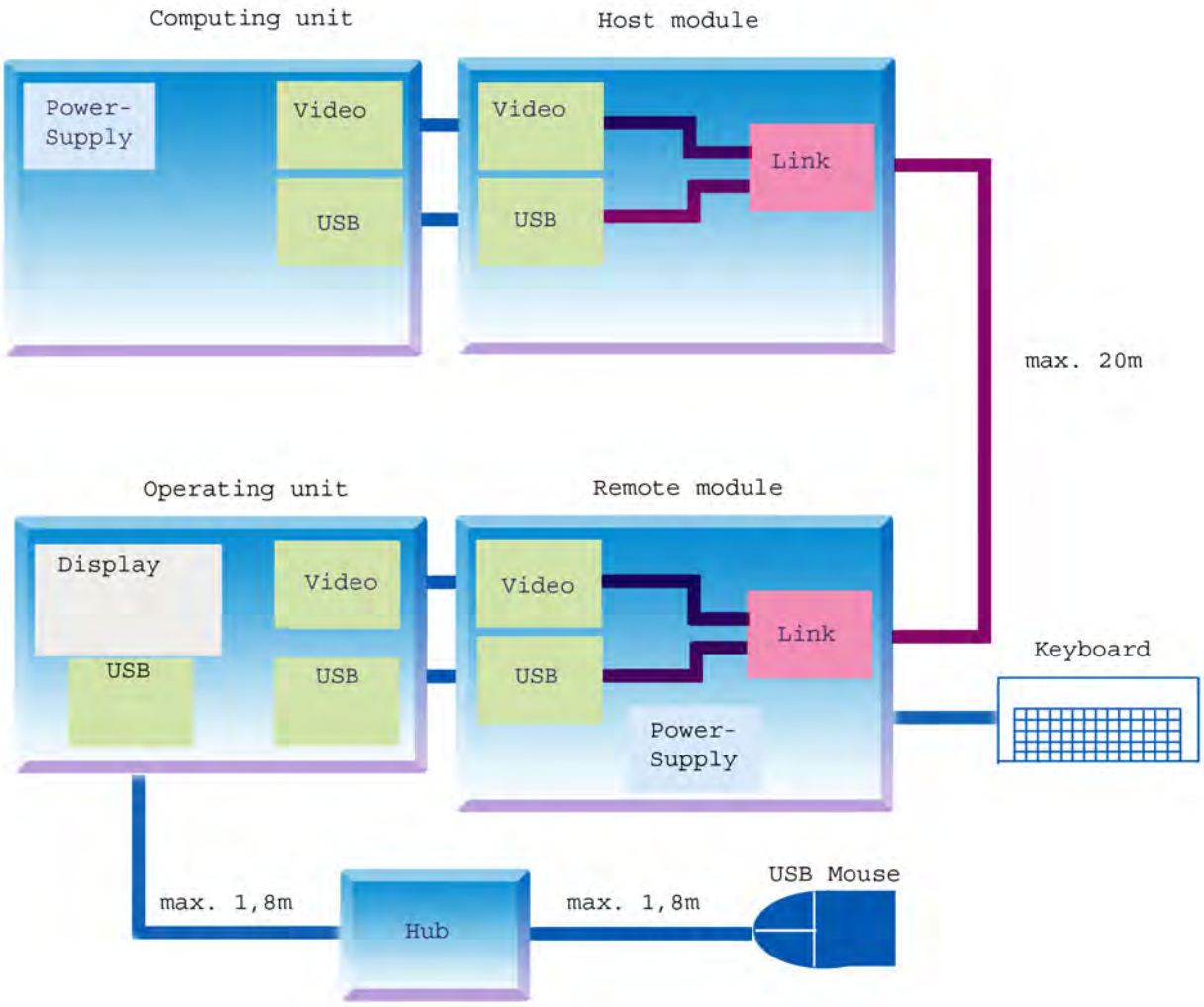


Figure 7-1 Basic device functions in a distributed configuration

Operation

8

8.1 Operator controls

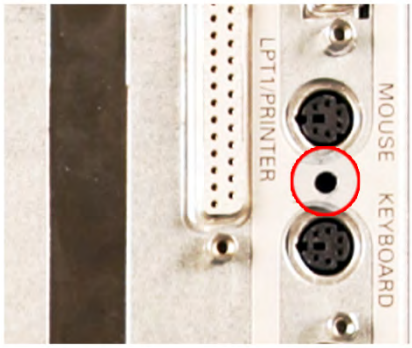
On / Off switch

On / Off switch	Description
	The On / Off switch does not isolate 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 isolate 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!

8.2 Floppy drive

Introduction

The device is standard equipped with a 3.5" floppy drive. You can use the floppy drive to save programs and data and transfer data from the floppy disk to the device.

Diskette types

The follows diskettes are supported:

Double sided double density	Double sided high density
3.5 inch	3.5 inch
720 KB	1.44 MB, 135 TPI

Caution

Data loss!

Do not press the ejection button when the green access LED of the drive is lit.

Integration

9

9.1 Overview

Introduction

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

Ethernet

The integrated Ethernet interface (10/100 Mbps) can be used for communication. and data exchange to automation devices such as SIMATIC S7.
You require suitable software for this: STEP7, WinCC, ProTool, WinCC flexible, WinAC, SIMATIC NET.

PROFIBUS / MPI

The optional potentially isolated Profibus interface, 12 Mbps, can be used to interconnect a distributed configuration Field devices or to interconnect to SIMATIC S7.

You require suitable software for this: STEP7, WinCC, ProTool, WinCC flexible, WinAC, SIMATIC NET.

Further information

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

Internet address: https://mall.ad.siemens.com

9.2 Device in SIMATIC S7 network

9.2.1 PROFIBUS/MPI/DP network

You can connect the device to an S7 automation system or a PROFIBUS DP network via the MPI/DP interface. You can connected up to 32 PC, PG or AS devices to a network segment. The use of repeaters allows you to interconnect to several MPI/PROFIBUS DP network

segments. The complete MPI/PROFIBUS DP network consists of a maximum of 127 stations.

The device is physically connected to the MPI/PROFIBUS DP network via an isolated RS485 interface on the PC motherboard. The potential is isolated within the safety low voltage circuit (SELV).

The transmission rate is limited to 187.5 Kbps with the 5 meter MPI cable for connecting to the SIMATIC S7-CPU. To achieve baud rates over 1.5 Mbps, you require a 12 Mbps PROFIBUS cable with the order number 6ES7901-4BD00-0XA0. In the PROFIBUS DP MPI network, you can achieve data transmission rates of 9.6 Kbps to 12 Mbps.

9.2.2 Connecting an S7 automation system

Interconnection

The device is interconnected via the MPI/DP interface as follows:

- With MPI networks S7 200, S7 300 and S7 400
- PROFIBUS-DP networks with DP components

Hardware requirements

You can use the following components to interconnect or network, for example, with PROFIBUS:

- RS 485 interface, MPI/DP interface, onboard
- Shielded two-wire cable: Bus cable or network cable

Note

Refer to the SIMATIC Network catalog IK PI for more information about SIMATIC Network PC cards.

Procedure

1. Detach the device from mains.

Caution

Risk of damage to the device!

Before inserting the cables, neutralize the static charge of your body, the device and the connecting cables. You can do this by briefly touching the metal housing.

2. Insert the bus cable or network cable into the MPI/DP socket.
3. Connect the device to the mains again.

9.3 Networking via Industrial Ethernet

You can establish a network between the device and other computers using Industrial Ethernet. The RJ45 Ethernet interface is a Twisted-Pair (TP) Interface for data transfer rates of 10/100 Mbps. This on-board interface is compatible with Intel pro/100+ PCI adapters.

The Plug & Play interface is automatically recognized in Windows. Protocols are configured in the Windows system control.

Notice

A Class 5 Ethernet cable is required for operation with 100 Mbps.

Refer to the SIMATIC Network catalog IK PI for more information about SIMATIC Network PC cards.

9.4 Establishing a data connection

Windows supports point-to-point connections via the LPT or COM port. The cables are standard, commercially available products. For additional information, refer to the Windows help for the operating system.

Functions

10

10.1 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.

To enable these functions, the following features are available for the devices SOM software (Safecard on Motherboard) and on the CD the DiagMonitor software (optional).

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>\...**

10.2 Temperature monitoring

Temperature monitoring

The temperature is recorded by means of three thermocouples. A sensor monitors the processor temperature, another sensor monitors the temperature in the area of the processor module and a third sensor monitors the temperature around the drive.

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

Reaction	Option
Device and CPU fans for the 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.

10.3 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:

Reaction	Option
WD acknowledgement	None
Trigger a PC reset	adjustable
SOM or DiagMonitor- software is activated	None

WD monitoring 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!

10.4 Fan monitoring

Device fan and processor fan operation are monitored. When a fan fails, the following reactions are triggered:

Reaction	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 the SOM program.
- Restart of the device.

10.5 Safecard on Motherboard (SOM)

This application is used to monitor PC hardware (temperature, watchdog and fans) and to display the current measured values. The application can be configured on a GUI, and temperature monitoring, the watchdog function and fan monitoring can be enabled.

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

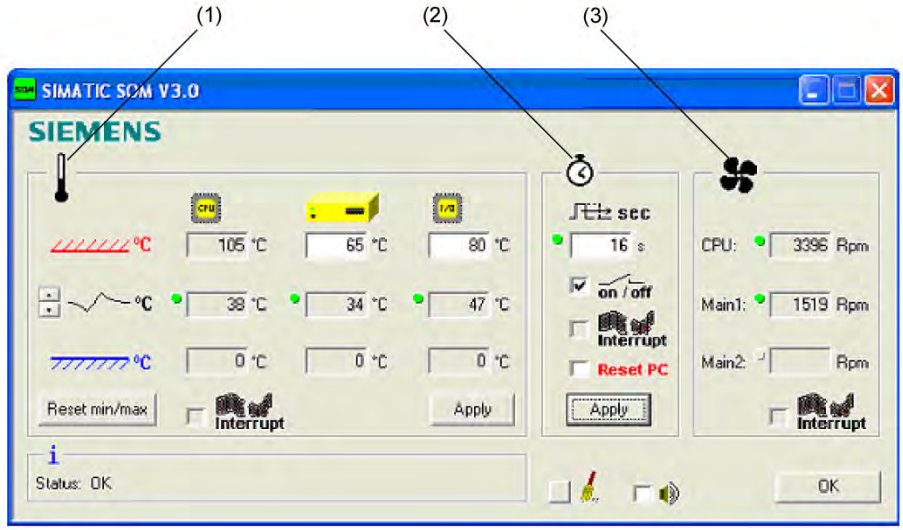


Figure 10-1 Safecard On Motherboard with three thermocouples

1	Temperature range:	You are here shown the current temperature and limit values. 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. You can set a check box to enable polling or interrupt mode for the temperature monitoring function.
2	Watchdog area:	Here, you can configure the watchdog function in your monitoring application. You can specify the watchdog time, assign an interrupt, activate a PC reset and activate / deactivate the watchdog.
3	Fan area:	In this area you can visualize the current speed of the fans.

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.

Maintenance and servicing 11

11.1 Installing and removing hardware components

11.1.1 Repairs

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, first switch it off and then disconnect the power plug.
- Install only system expansion devices designed for this computer. If you install other expansion devices, you may damage the system or violate the safety requirements and regulations on RF suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

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

Notice

Note the EGB instructions.

Limitation of Liability

All technical specifications and licenses apply only to expansions approved by SIEMENS.

No liability can be accepted for impairment of functions caused by the use of devices and components of other manufacturers.

Tools

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

11.1.2 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 PCB 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

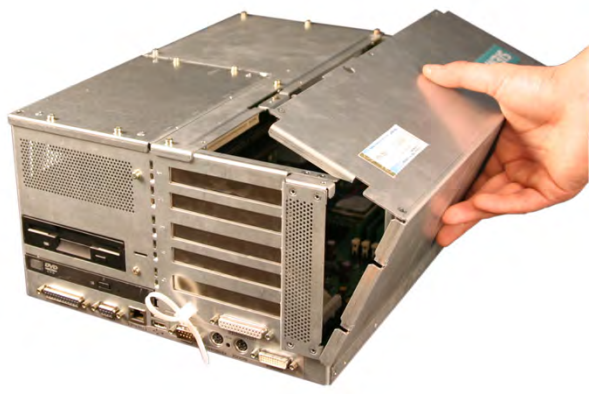
You can perform all installation tasks on the device using Torx T6, Torx T10 and Torx T20 screwdrivers and a Philips screwdriver.

Preparation

Isolate the device from mains.

Open the device

Steps in opening the device		
1	Remove the five screws (1).	

2	Swing the lid to the front and remove it.	

11.1.3 Installing memory modules

Memory expansion options

The motherboard is equipped with three 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 3 GB. Either one, two or three modules can be installed.

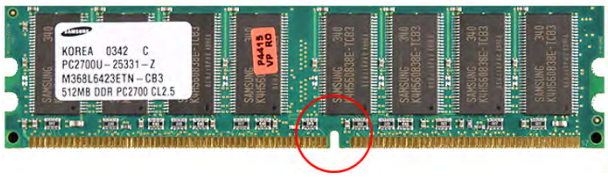
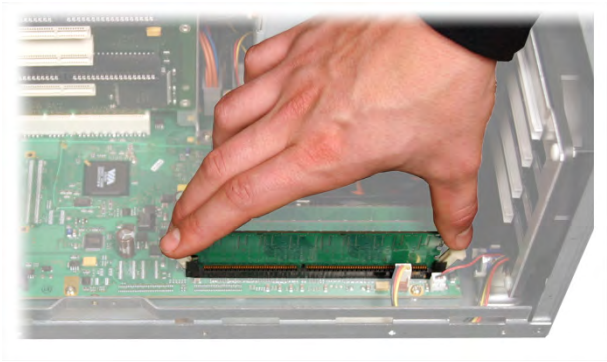
Preparation

Isolate the device from mains and disconnect all connecting cables.

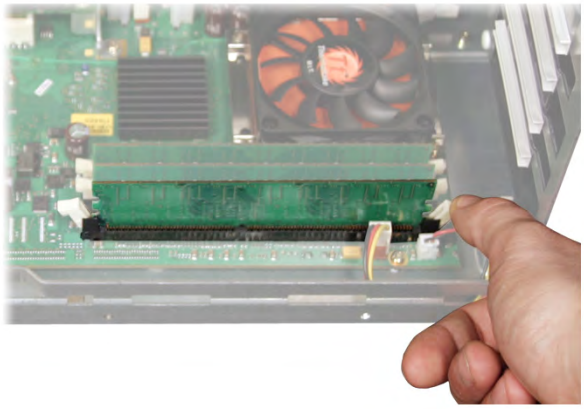
Caution

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 the 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 attempting to insert it.	
3	Push the module carefully into the slot until the interlocks engage	
4	Close the device.	

Removing a memory module

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

Display of the current memory configuration

The changed memory configuration is detected automatically. The allocation of the ”base memory and extended memory” is automatically displayed when you switch on the device.

11.1.4 Installing PCI / AT cards

11.1.4.1 Notes on the modules

Notes on modules-Specifications

The device is designed for use with modules conforming to AT/PCI specifications. Operation is possible with 5V and 3.3 V PCI modules. The permitted module dimensions are found in the dimensional drawings.

Note about long PCI modules

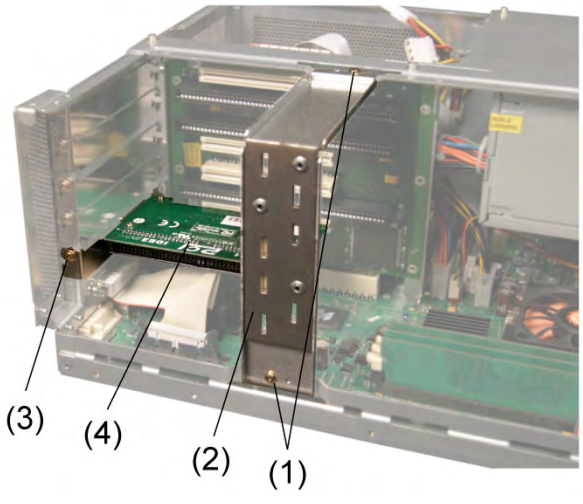
Before long PCI cards can be inserted into the guide rails, they must be fitted with an extender (this should form part of the scope of supply of long PCI boards).

11.1.4.2 Installing expansion modules

Preparation

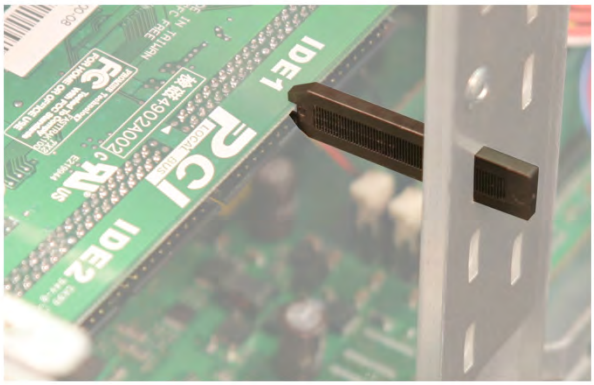
Isolate the device from mains

Expansion module installation

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

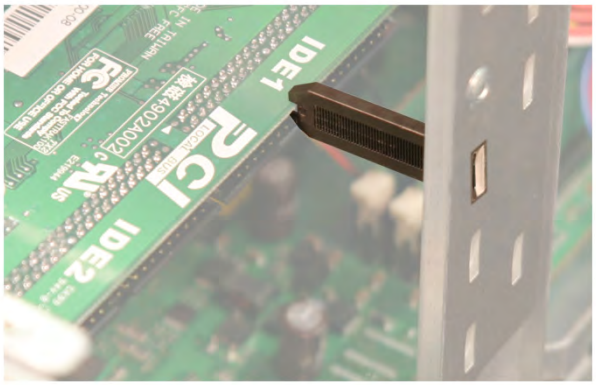
Inserting the slider

To insert the slider:

How to install a module bracket		
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 on the module! Hence, do not apply excessive force on the slider when you push it onto the module.

2	Cut off the rest of the slider element: Use a knife to apply a cut on the slider at the upper edge of the bracket and then break this section off. Cut off the residual element using a 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" sections.

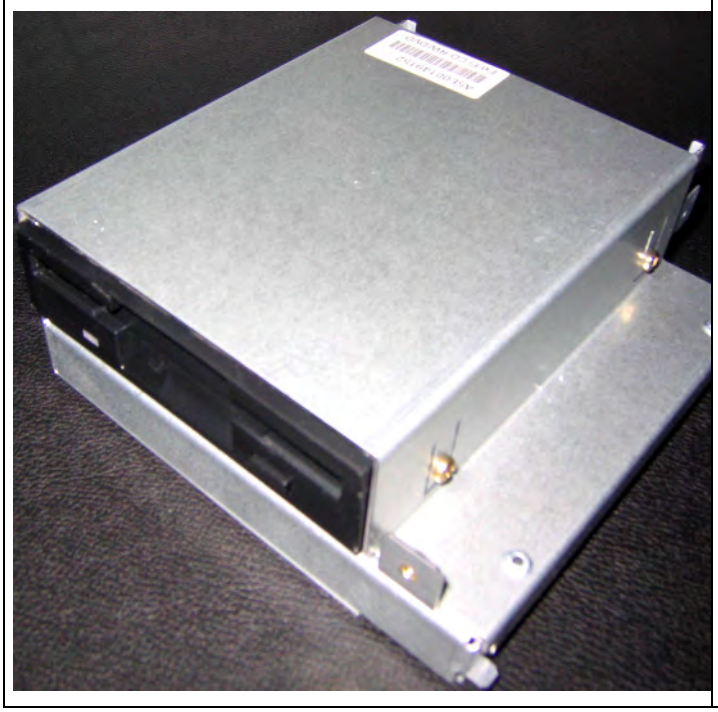
11.1.5 Disk drives

11.1.5.1 Options of installing disk drives

Drive bay for DVD and hard disk drives

DVD drive above, hard disk drive below	Description
	2 brackets in the illustration right, above the ribbon cable 1 slot for 3.5" hard disk 2 slots for 2.5" hard disks

Drive bay for floppy drive

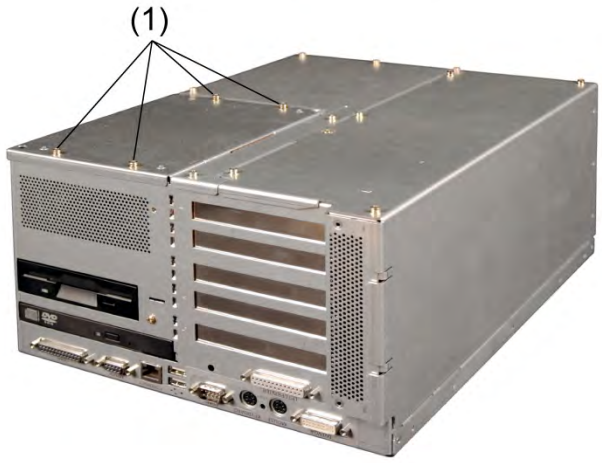
Floppy drive	Description
	Bracket below in the middle of the illustration

11.1.5.2 Example: Removing drive bays

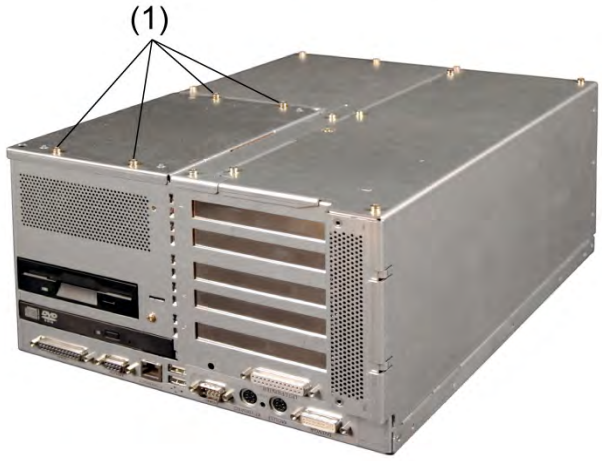
Preparation

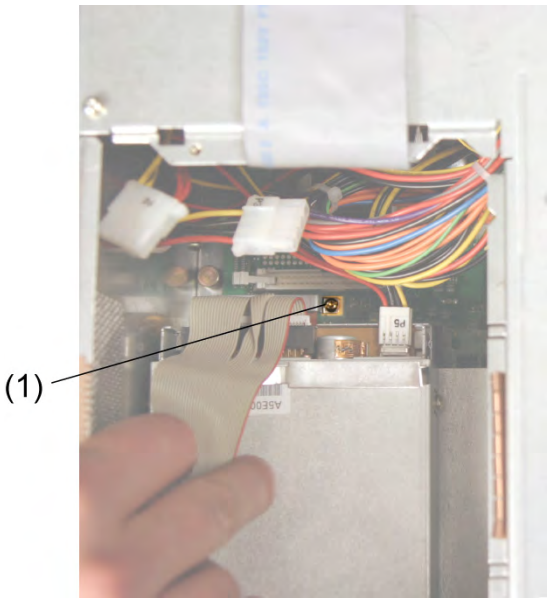
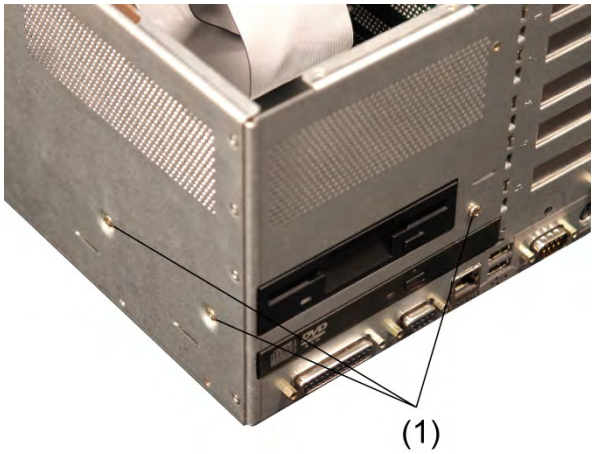
Isolate the device from mains and disconnect all connecting cables.

Remove the hard disk bay

How to remove the disk bay		
1	Remove the four screws (1).	
2	Remove the hard disk bay and place it onto the device.	

Removing the drive bay for the floppy / DVD drive

How to remove the disk bay		
1	Remove the four screws (1).	
2	Remove the HD bay and place it onto the device.	

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. Unplug the cable of the DVD/CD drive.	
4	Remove the three screws (1).	
5	Lift the drive bay out.	

11.1.5.3 Removing and installing a DVD-ROM drive

Procedure

1. Unscrew the 4 screws holding the drive and slide the drive out.
2. Loosen the 2 screws on the housing at the front of the drive.

Figure 11-1 DVD-ROM drive with housing

3. Flip up the housing cover (1) 90°.

Figure 11-2 DVD-ROM drive removed, housing flipped up

4. Remove the connector of the ribbon cable from the socket (2).
5. Loosen the 3 screws (3) with a TX6 key.
6. Remove the DVD-ROM drive from the bracket.
7. Loosen the 2 screws (5).
8. Remove the board (6).

Reverse the procedure to install the DVD-ROM drive.

11.1.5.4 Removing and installing a hard disk

Procedure

1. Unscrew the 4 screws holding the drive and slide the drive out. The hard disk is fixed to the underside of the drive,

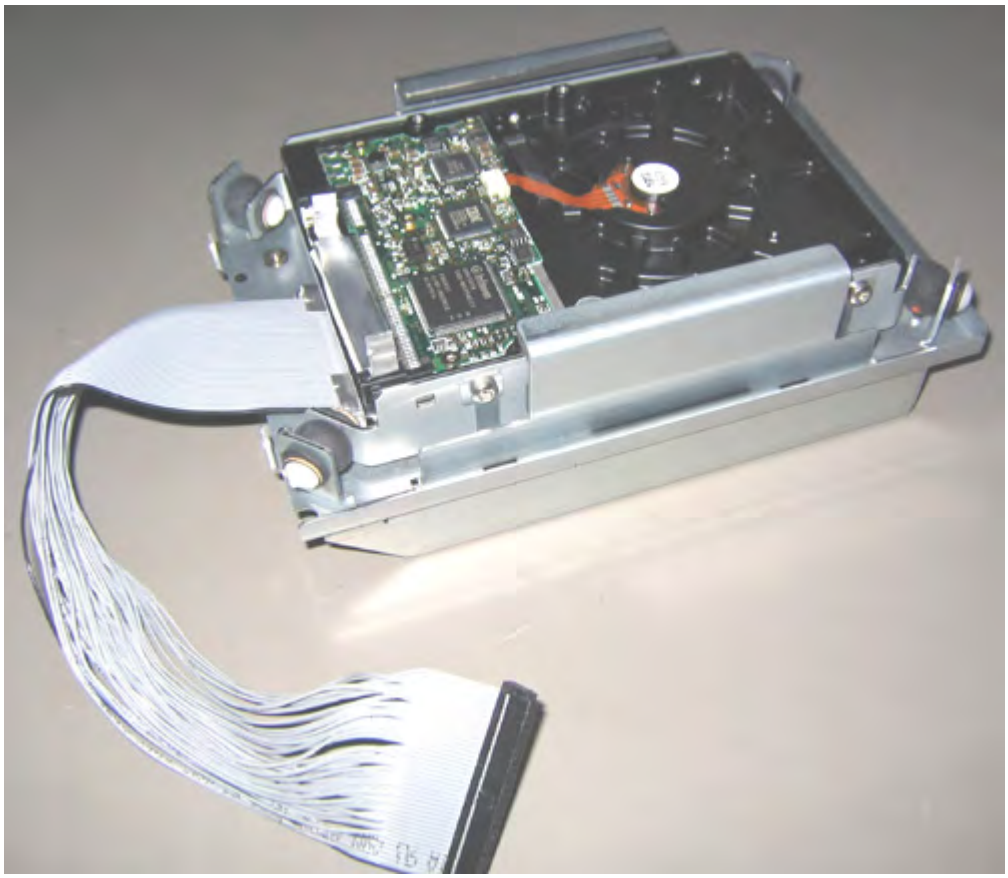


Figure 11-3 Removed hard disk

2. Loosen the 4 screws with which the hard disk is fixed to the housing.
3. Remove the hard disk from the bracket.

Reverse the procedure to install the hard disk.

11.1.6 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!

Hence, 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 dewing.

Disposal

Caution

Batteries must be disposed of in accordance with local regulations.

Preparation

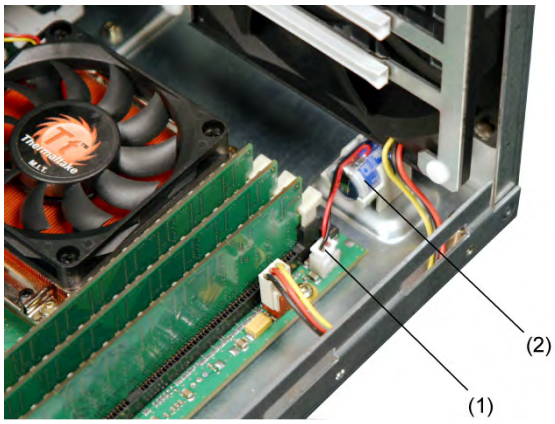
Note

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. Isolate the device from mains and disconnect all connecting cables.

Replacing the battery

Procedure:

How to replace the battery		
1	Open the device	
2	Disconnect the plug (1) and take the battery (2) out of the retainer.	
3	Mount a new battery into the retainer and reconnect the plug.	
4	Close the device.	

BIOS Setup readjustment

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

11.1.7 Installing and removing the power supply

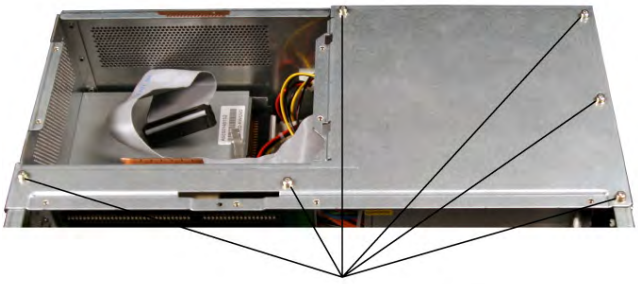
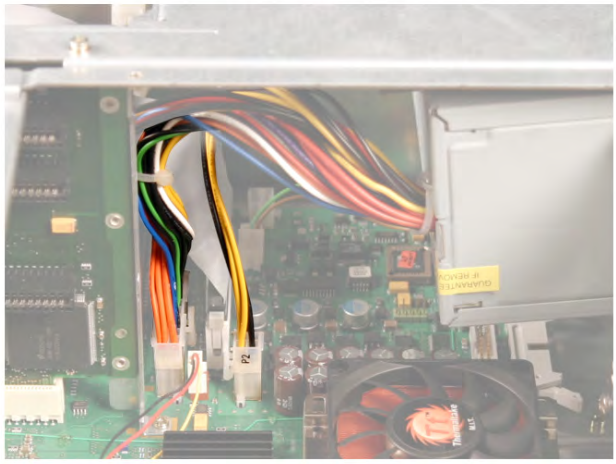
Warning

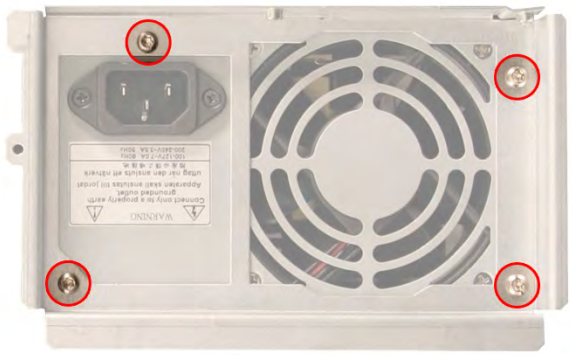
Only qualified personnel is authorized to exchange the power supply module.

Preparation

1. Isolate the device from mains and disconnect all connecting 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 six screws (1) and the cover of the power supply module.	 (1)
3	Disconnect the power supply cables of all drives.	
4	Remove the three Torx T10 mounting screws (1).	 (1)
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).	

11.2 Installing software

11.2.1 Overview

Introduction

Restart the device systematically after exchanging the hard disk. Or reinstall the software as required.

Procedure

1. Format and partition the hard disk as required.
2. Transfer the saved data back to drives C and D using the backup utility. Use the Restore CD, for example, to transfer the original image back to the device's hard disk.
3. You can also restore the operating system using the Microsoft Recovery CD or install an operating system yourself.
4. Install the required Windows Service Packs. Refer to the "Commissioning" section for more information.
5. For new Windows 2000 installations, install the chipset driver before installing any other drivers.
6. Install any other required drivers.
7. Install any other required software.
8. Configure the drivers and applications as needed. Refer to the section "Additional drivers and applications" in the operating instructions for the operator unit for more information.
9. Defragment the hard disk.

Caution

Defragmenting a hard disk destroys all of the authorizations saved on the disk. Therefore, transfer all authorizations for installed SIMATIC software on the disk to another medium such as a floppy disk. For additional information, refer to the documentation of the SIMATIC software.

10. Save the hard disk data to a CD.

Note

To verify that the data on the CD is in order, transfer the data on the CD back to an empty hard disk and quickly test the device by switching it on.

11.2.2 Supplied software CDs

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

Recovery CD:

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

Documentation and Drivers CD:

Contains the documentation and the hardware drivers.

Restore CD:

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

11.2.3 Partitioning under Windows 2000/XP Professional

After you have installed a new hard disk drive, 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 FAT16 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 show the boot menu

. 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 format drive C:.

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
```

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

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

without data loss.

11.2.4 Compatibility of the Restore CD

Caution

Use the supplied Restore CDs for the device. Verify that the order number of the Restore CD matches that of the device. You can find the order number of the device on the rating label.

Do not used the supplied images for any other device. The chipsets and drivers differ.

11.2.5 Restoring the software to factory state by means of the Restore CD

The Restore CD (not included in all delivery versions) can be used to restore the factors setting of the software. The CD contains the necessary images and tools for transferring the factory software to the hard disk drive of your PC. 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

Authorization or to retrieve the 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 backup your authorization, please contact the Customer Support Hotline. There you can obtain information necessary for your software authorization.

Caution

When you select the "Restore system partition only" option, all data on drive C: (System) will be deleted. All data, user settings and all authorizations or License Keys on drive C: on drive C: will be lost in the process! All date on drive C: of your hard disk drive 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.

Factory state restoring

To restore the factory state, proceed as follows:

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

<F2> to enter SETUP or <ESC> to show 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 Keyswill bedeleted** from the hard disk and are therefore lost.

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

11.2.6 Installing Microsoft Windows operating systems

11.2.6.1 Installation from the Recovery CD for Microsoft Windows 2000

This CD contains encrypted data that can only be transfered 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.

Windows 2000 Setup sequence

If a Windows operating system is already installed or if the PC has been started with a user bootdisk, 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:

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

. 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 /bist

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

10. Now follow the instructions on the screen.

Selecting the language for Windows 2000

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

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 > tab **General**, field **Setting for the current user** and field **Language settings for the system** and in the tab **Input Locals**, field **Keyboard layout.**

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

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

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

11.2.6.2 Installation from the Recovery CD for Microsoft Windows XP

This CD contains encrypted data that can only be transfered 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.

Windows XP Professional Setup sequence

If a Windows operating system is already installed or if the PC has been started with a user bootdisk, 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 show the boot menu

. 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 from 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.exe /bist
```

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

10. Now follow the instructions on the screen.

Selecting the language 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 another language.

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, with US keyboard layout. You change the language in the Control Panel. Select

Start > Control Panel > Date & Time, **Language, and Regional Options > Add other languages** tab **Languages,** field **Language used in menus and dialogs.**

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.

11.2.6.3 Operating system not installed

The device can be purchased without an operating system. If you want to install the operating system yourself, read the information available about the Windows 2000 operating system in the Internet at http://www.siemens.com/simatichmi.

Notice

You will need to integrate the required software components yourself when you install one of the operating systems. Note the following in this regard:

— The device has features that a standard PC does not, for example, a touchscreen and front panel function keys.

— Siemens AG can only guarantee the availability of these features for operating systems that have been released.

— Siemens AG only provides support within a stictly defined framework.

— You cannot operate the device with an operating system that does not provide USB support, such as MS DOS.

11.2.7 Installing individual drivers

Introduction

The "Documentation & Drivers" CD contains the required drivers for the device.

Procedure

1. Start "cdstart.exe" on the CD in the folder "InstallshieldPC670_870" and follow the instructions that appear on the screen. The drivers are copied to the device's hard disk into a "c:\drivers.xxx" folder where "xxx" represents the respective operating system:
2. Start "setup.exe" in the folder that corresponds to your operating system.

Note

For more information about newly installing drivers, refer to the Internet pages at http://www.ad.siemens.de. Read the operating instructions for the operator unit for information about how to configure the additional factory-installed drivers and applications.

11.2.8 Operating with two hard disk drives

Two 2.5“ hard disks are installed depending on the device features. The slave hard disk drive is not set up. This gives you the option of backing up you dat to this hard disk drive. 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 drive capacities, refer to your order documentation.

Booting from the slave drive

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. Make 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 bothe drives are asigned by the relevant operating system. Yo 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 th drive as required (master setting, see the label on the drive.)

11.2.9 Installing Raid controller software

New software installation

To install new RAID software, first install the drivers and applications of the RAID system.

Create a special driver diskette before beginning the installation. The driver diskette will be needed at a certain point for the Windows installation. Press the function key <F6>.

Procedure

1. Start the RAID application on the supplied "Documentation & Drivers" CD in the folder "\Drivers\Raid\Promise".
2. Follow the instructions provided by the supplied documentation on the "Documentation & Drivers" CD.

Note

Detailed documentation of the RAID system is currently in progress. Read the in the supplement for the device.

11.2.10 Installing burner/DVD software

Notes on installing the burner/DVD software are available on the supplied CD-ROM.

11.2.11 Backing up the hard disk

The device's hard disk is divided into two partitions, volumes C and D. The operating system is installed on volume C. Volume D can be used for user data.

Backup the complete hard disk regularly, for example, using "PC/PG Image Creator".

Caution

Date errors writing to CD-RW

The quality of raw disc differs considerably. Data errors cannot, therefore, be entirely excluded. To be on the safe side, verify the data after writing it to disc.

Save the backup of the hard disk on specific types of disks. Hard disk backups are only compatible for device generations the order numbers of which have the same origin, for example, 6AV74… or 6AV75….

Recommission the device every time you upgrade to a new device generation.

Alarm, error and system messages

12

12.1 Boot error messages

During startup (Boot sequence) the BIOS first performs a **P**ower **O**n **S**elf **T**est (POST) 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 graphic controller is initialized and any error messages are output to the screen.

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

Error messages on the screen

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.
Incorrect Drive A type Run SETUP	Check the SETUP entries for drive A.
Incorrect Drive B type Run SETUP	Check the SETUP entries for drive B.
Diskette drive A error	Error accessing drive A. Contact your technical support team.

Diskette drive B error	Error accessing drive B. 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.
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 • Incorrect entries in SETUP for the BOOT drive
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 beep codes

The following lists the POST codes in the order of their appearance:

Meaning of the BEEP sequences:

For example 1-2 = Beep – Pause – Beep Beep

Beep sequence	hex	Description
1-1-1-3	02	Test whether the CPU is in real mode
1-2-4-1	1C	Reset the interrupt controller
4-1-3-2	C9	Checksum test
1-2-1-3	12	Restore the controller register
1-2-1-4	13	PCI Bus Master Reset
1-4-2-3	36	Check shutdown code
1-3-2-1	24	Switch the ES to special mode
1-1-1-4	03	Switch off NMI
1-1-3-3	0A	Pre-initialization of the CPU
1-1-2-1	04	Determine the CPU type
3-3-4-3	AE	Edit boot flag
1-1-2-3	06	Initialize basic hardware
1-2-3-1	18	Initialize timers
1-1-3-1	08	Initialize the chip set
4-1-2-1	C4	Reset system error message
1-2-1-2	11	Initialize Registry
1-1-4-3	0E	Initialize IO
1-1-4-1	0C	Initialize cache
1-2-2-3	16	EPROM checksum test
1-2-2-4	17	Initialize external cache before autosizing memory
1-3-3-1	28	Determine RAM size
1-4-3-3	3A	Determine cache size
1-3-3-3	2A	Set 512 kB base RAM to 0
1-3-4-1	2C	Test address channels in basic RAM
1-3-4-3	2E	Check first 64 KB in basic RAM
1-3-4-4	2F	Initialize external cache before shadowing BIOS
1-4-3-1	38	BIOS shadow
1-3-1-1	20	Refresh circuit test
1-3-3-2	29	Initialize the POST memory manager
1-4-1-4	33	Initialize the dispatch manager
4-1-1-2	C1	Initialize the POST Error Manager
1-1-3-2	09	Start Power On Self Test
1-1-3-3	0A	Initialize CPU
1-1-3-4	0B	Switch on cache
1-1-4-4	0F	Initialize hard disk
1-2-1-1	10	Initialize power management
1-2-2-1	14	Initialize block 8742
1-2-3-3	1A	Initialize the DMA circuits
1-2-4-1	1C	Reset the interrupt controller
1-4-1-3	32	Determine the clock pulse speed
4-1-1-2	69	Initialize the handler for SMM
1-4-2-1	34	Test the CMOS RAM

2-3-3-4	6B	Load user-defined Setup data to CMOS memory
1-4-4-1	3C	Configure the advanced chip set
1-4-4-2	3D	Load alternative registers with CMOS values
2-1-1-3	42	Initialize the interrupt vectors
2-1-2-3	46	Test the copyright
2-1-2-2	45	Initialize all motherboard devices
2-1-3-2	49	Initialize the PCI interface
2-1-3-1	48	Check the configuration
2-1-3-3	4A	Initialize the video interface
2-1-4-1	4C	Copy the video BIOS to RAM
1-3-2-1	24	Switch the ES to special mode
2-2-3-2	59	Initialize display fonts and language
2-2-2-2	55	Enable USB interfaces
1-3-1-3	22	Test block 8742
2-2-1-3	52	Keyboard available?
2-2-2-1	54	Switch the keyboard click on/off
2-4-2-3	76	Check the keyboard
2-2-3-1	58	Test for unexpected interrupts
2-1-3-4	4B	Output any Switch off boot messages
2-1-4-3	4E	Display the copyright note
2-2-1-1	50	Display the CPU type
2-2-3-3	5A	Display the F2 message for "SETUP"
2-2-3-4	5B	Switch off the cache if applicable (SETUP setting)
2-2-4-1	5C	Test the system memory
2-3-1-1	60	Test extended memory
2-3-1-3	62	Test the A20 address channel
2-3-2-1	64	Area for user-specific initializations
2-3-2-3	66	Determine and the cache size and enable it
2-3-3-1	68	Configure and test the cache
2-3-3-3	6A	Display the cache configuration
2-3-4-1	6C	Show the configuration and size of shadow RAM
2-3-4-3	6E	Display non-disposable segment
2-1-4-4	4F	Initialize MultiBoot
2-4-1-1	70	Display POST error
2-4-1-3	72	Check SETUP irregularities
2-4-4-1	7C	Set the IRQ vectors
2-4-4-3	7E	Check whether the CO processor is present
3-2-2-3	96	Switch the ES back
3-1-1-1	80	Disable IO circuits
3-1-2-4	87	Configure on-board devices
3-1-3-1	88	Diverse initialization routines
3-1-3-3	8A	Initialize the external BIOS data area
3-1-2-2	85	Determine the PCI circuits

3-1-1-3	82	Determine the serial ports
3-1-2-1	84	Determine the parallel port
3-1-2-3	86	Re-enable the IO circuits
3-1-1-4	83	Configure the IDE controller
3-1-3-2	89	Enable NMI
3-1-4-1	8C	Initialize the floppy controller
3-2-1-1	90	Initialize the hard disk controller
3-1-3-4	8B	Test the internal mouse port
3-2-2-2	95	Test the CP
3-2-1-3	92	Area for user-specific initialization routines
3-2-3-1	98	Search for BIOS expansions
2-3-3-2	69	Initialize power management
3-2-4-2	9D	Security engine
3-2-4-3	9E	Enable the hardware IRQ
3-3-1-1	A0	Set the time and date
3-3-1-3	A2	Preset the keylock
3-3-2-1	A4	Configure the keyboard interface
4-1-1-3	C2	Stop the error manager
4-1-1-4	C3	Show any possible errors
3-3-3-1	A8	Delete the F2 message
3-3-3-3	AA	Was F2 pressed?
3-3-4-1	AC	Output any F1/F2 messages
3-3-4-3	AE	Cancel the self-test flag
3-4-1-1	B0	Check for errors
3-4-1-3	B2	End of the self-test
3-4-2-2	B5	Disable the <ESC> and <F2> keys
3-4-4-3	BE	Clear the screen
3-4-2-3	B6	Password prompt (option)
3-4-4-1	BC	Clear the parity flag
3-4-4-2	BD	Display the boot menu (optional)
3-4-4-4	BF	Check virus and backup reminders
3-1-4-4	8F	Determine the number of ATA disk drives
3-2-1-2	91	Configure the EIDE bus based on the connected drives
3-2-4-4	9F	Determine the number of ATA disk drives
3-4-3-2	B9	Prepare the boot sequence
4-1-1-1	C0	Boot via Interrupt 19
1-1-1-1	00	Message when startup is completed

When the INSERT key is pressed during the boot sequence, the BIOS outputs three short beeps. This signal indicates that initialization of the special PC hardware has been skipped.

If your device does not power up properly, you can advise the hotline of the hex code of the POST or BEEP sequence.

Troubleshooting and FAQs

13

13.1 General problems

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

Problem	Possible cause	To correct or avoid error
The device is not operational	Missing power supply to the device	Check the power supply, the power cord or the power connector
The external monitor remains dark	The monitor is switched off.	Switch on the monitor.
	The monitor is in "powersave" mode.	Press any key on the keyboard.
	The brightness button has been set to dark.	Set the screen brightness button to obtain more light. 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	Check whether the mouse driver is properly installed and present when you start the application program. For more detailed information, refer to the manuals for the mouse or application programs.
	The mouse is not connected	Check whether the mouse cord is properly connected to the system unit. If you use an adapter or extension on the mouse cable, also check the connectors.
		If the mouse pointer still does not appear on the screen after you have performed these checks and measures, please contact your technical support team.
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.
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.	Switch on USB 2.0.
DVD/CD: 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. Switch off the device 2. Insert 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 cause	To correct or avoid error
The PC crashes during startup.	• Double assignment of I/O addresses • Double assignment of hardware interrupts and/or DMA channels • Signal frequencies or signal levels are not adhered to • Different connector assignments • No “Reset Configuration” in BIOS-SETUP	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 setup. 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.

13.3 Temperature error

Cause

Temperature errors do not occur during the normal approved use of the device. If a temperature error does occur, however, check for the following possible causes:

- Are the ventilation slots blocked?
- Is the fan working?
- Is the ambient temperature higher than the allowed value?
- Has the total capacity for the power supply been exceeded?

Remedy

The temperature error is retained until the temperatures have fallen below the thresholds and the error message has been acknowledged by the SOM program.

Specifications

14

14.1 Specifications

14.1.1 General specifications

General specifications	
Order nos.	see the order documents
Dimensions	390x285x166 (WxHxD in mm)
Weight	Approximately 10 kg
Supply voltage (AC)	120 V to 230 V AC (85 to 264 V AC)
Supply voltage (DC)	24 V DC (20.4 to 28.8 V DC)*5
Line voltage frequency	50 - 60 Hz
Brief power failure to Namur	AC: min.20 ms (at 93 to 264 V AC) (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 (efficiency approx. 70%) *3
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. 230W.
max. current output (DC)	+5 V/22 A * +3.3 V/16 A * * 140 W total allowed +12 V/4.4 A Peak 8.0A –12 V/0.5 A –5 V/0.5 A +5 Vaux/1 A The total voltage amounts to max. 180W.
Noise emission	< 55 dB(A) to DIN 45635-1
Degree of protection	IP 20
Safety	
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

Electromagnetic Compatibility (EMC)	
Emitted interference (AC)	EN 55011 Class A, EN 61000-3-2 Class D EN 61000-3-3;
Emitted interference (DC)	EN 55022 Class A, FCC Class A
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV; (to IEC 61000–4–4; Burst) ± 1 kV; (to IEC 61000–4–5; Surge sym.) ± 2 kV; (to IEC 61000–4–5; Surge asym.)
Noise immunity on signal lines	± 1 kV;(to IEC 61000–4–4; Burst; length < 3 m) ± 2 kV; (to IEC 61000–4–4; Burst; length > 3 m) ± 2 kV; (to IEC 61000–4–5; surge; length > 30 m)
Immunity to discharges of static electricity	± 6 kV contact discharge; (to IEC 61000–4–2) ± 8 kV air discharge; (to IEC 61000–4–2)
Immunity to RF interference	10 V/m 80–1000 MHz, 80% AM (to IEC 61000–4–3) 10 V/m 900 MHz u. 1.89 GHz, 50% ED (to IEC 61000–4–3) 10 V 9 KHz-80MHz (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,
-In operation	+ 5 °C to + 45 °C
-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
-in operation	5 % to 80 % at 25 °C (no condensation)
-Storage/transport	5 % to 95 % at 25 °C (no condensation)
Mech. Ambient conditions	
Vibration Operation *1 *2 Storage/transport	tested to DIN IEC 60068–2–6 10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s2 5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s2
Shock resistance -In operation -Storage/transport	tested according to IEC 60068–2–27, IEC 60068–2–29 50 m/s2, 30 ms, 250 m/s2, 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 45°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
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. 3 GB SDRAM DDR266 (PC2100) For memory expansion, refer to the order documentation
Free expansion slots	2 shared ISA/PCI, long 2 x PCI, long 1 ISA, long

Max. permissible current input per ISA slot Max. permissible current input 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 total power consumption (all slots) may not exceed 50 W
Disk drives	
Floppy drive*3	3.5” (1.44 MB) / 3.5”
Hard disk drive	3.5” EIDE, UDMA, for hard disk capacity, refer to the order documentation
CD–ROM, DVD–ROM/CD–RW*2	EIDE, UDMA33, for information on features, refer to the order documentation
Graphics	
Graphic controller	VIA ProSavage8
Graphic controller memory	Graphic memory 8, 16 or 32 MB SDRAM, uses system memory
Resolutions/frequencies/color depth	CRT: up to 1600x1200 at 60 Hz / 16-bit colors CRT: 1280 x 1024 at 100 Hz / 32-bit colors LCD: 1280 x 1024 / 18-bit
Interfaces	
COM1	Serial port 1, 25-pin D-sub connector
COM2	Serial port 2, 9-pin D-sub connector
LPT1	Parallel port (standard, EPP mode) Connection for printer with parallel port
DVI	Port for external CRT / LCD monitor
Keyboard	PS/2 keyboard connection
Mouse	PS/2 mouse connection
USB 2.0	2 x external at the interface side
PROFIBUS / MPI interface potential isolated * - Transmission rate - Operating mode - Physical interface - Memory address area - Interrupts	9-pin d-sub socket - 9.6 Kbps to 12 Mbps, configurable per SW - potential isolated: Data lines A,B Control lines RTS AS, RTS_PG 5 V power supply (max. 90 mA) - grounded: Shielding of the DP12 cable - RS485, potential isolated - configured automatically - configured automatically
Ethernet	Ethernet interface (RJ45), VIA MAC. VT6103 PHy
Status displays on device	
	FD access (at the FD drive on the side of the housing) CD-ROM access (at the CD drive, if installed)

1) 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/s2

2) 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

3) DC power supply only together with Pentium 4 Mobile 2.2 GHz processor

14.1.2 Power requirements of the components

Standard system

Component	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					
Disk drive	0.6 A					
1 x 3.5`` hard disk drives	0.3 A		0.5 A			
2 x 2.5`` hard disk drives						
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 accumulated power loss on DC power supply	180 W					
Permitted accumulated power loss on AC power supply	230 W					

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

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

[3] Depending on the selected device configuration

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

14.1.3 AC power supply

Technical specifications

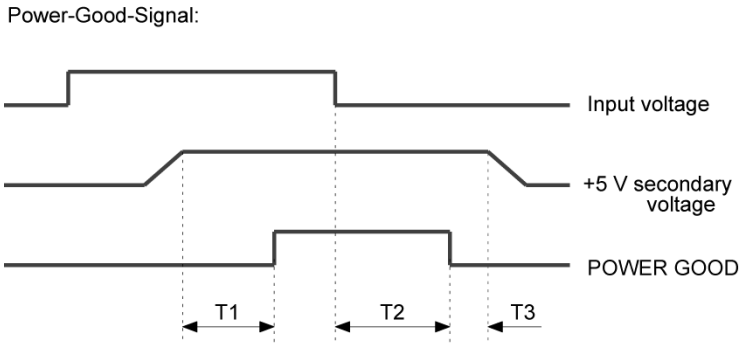
Input voltage	AC 120-230 V (AC 85-264 V)
Frequency	50 - 60 Hz
Power consumption	360 W
Power failure buffering	20 ms
Maximum continuous output power	230 W
Degree of protection	IP20 (in installed state)
Protection class	VDE 0106

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

14.1.4 DC power supply

Technical specifications

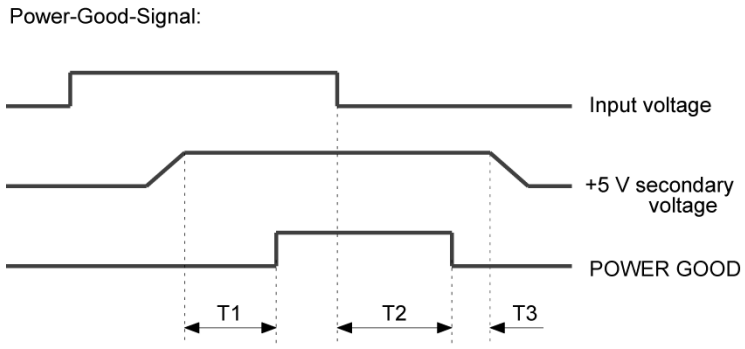
Input voltage	24 V DC (20.4 to 28.8 V DC)
Power consumption	265 W
Power failure buffering	1 ms at the rated voltage
Maximum continuous output power	180 W
Degree of protection	IP20 (in installed state)
Protection class	VDE 0106

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

14.2 Dimensional drawings

14.2.1 Dimensional drawing of the device

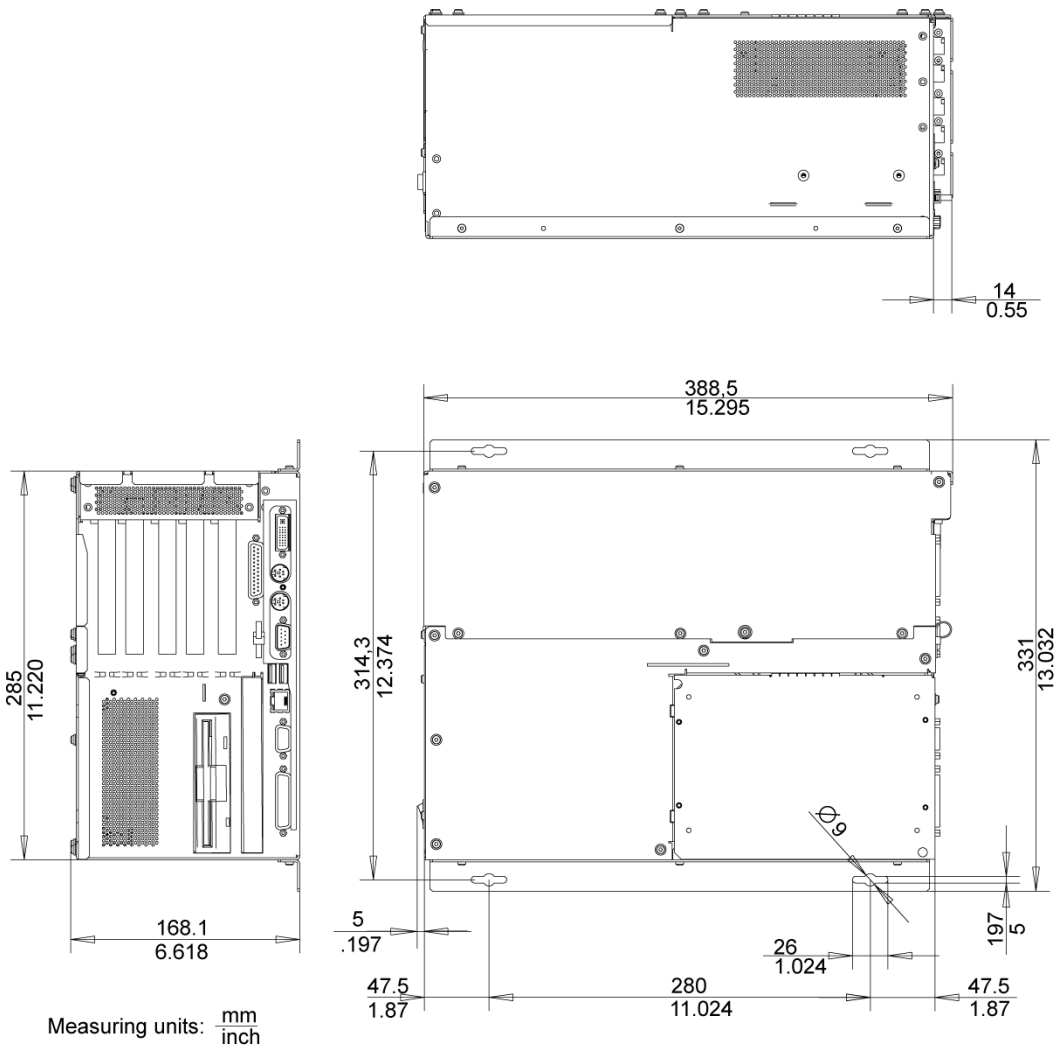


Figure 14-1 Dimensional drawing for installation with angle bracket

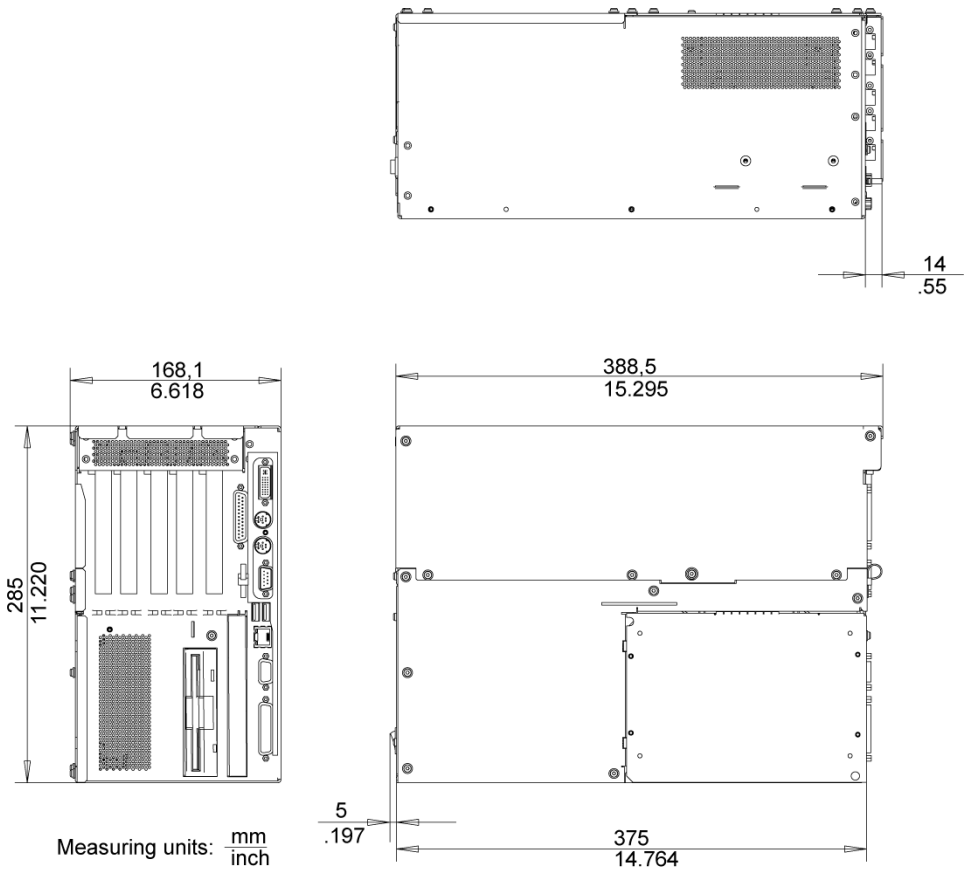
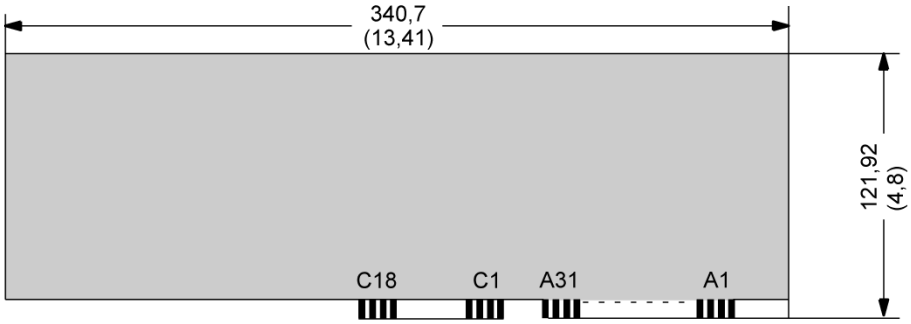


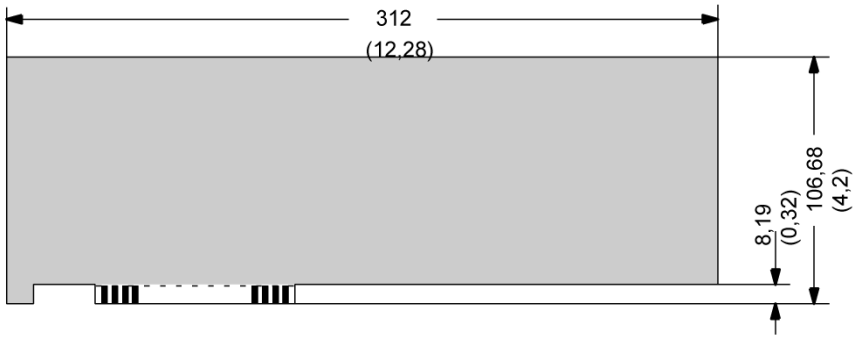
Figure 14-2 Dimensional drawing for installation without angle bracket

14.2.2 Dimensional drawings for the installation of expansion modules



All measurments in mm
All measurments ( ) in inch

Figure 14-3 AT format module



All measurments in mm
All measurments ( ) in inch

Figure 14-4 Long format PCI module

Detailed descriptions

15

15.1 Motherboard

15.1.1 Technical features of the motherboard

Component / interface	Description	Parameters
Chipset	Single chipset	VIA P4N266A (VT8703A and VT8235)
BIOS	Update by means of software	Phoenix NuBIOS V4, modified by Siemens
CPU	Pentium IV / Mobile P4 / Intel ® Celeron (design mPGA478)	Upgradable - 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 moduls - 66/100/133 MHz bus clock [3] - 128 MB to 3 GB/DIMM variable
Graphic controller	integrated in the chipset	Compatibel with S3 Pro Savage, graphic memory 8, 16 oder 32 MB SDRAM, uses system memory - DVI intrerface (X303) -CRT: Up to 1600x1200 pixels, 60Hz, 16-bit colors. Up to 1280x1024 pixels, 100Hz, 32-bit colors. -LCD: LVDS or DVI up to 1280x1024 / 18-bit TFT
Hard disk drive [4] [Primary EIDE port]	As master or slave on ATA 33/66/100 mode	- UDMA capable
CD-ROM[4] DVD-ROM/CD-RW[4]	Master on secondary EIDE port	- DMA capable
Floppy [4]	FD- drive interface	- 1.44 MB
Keyboard	PS/2 keyboard port	- Standard
Mouse	PS/2 mouse port	- Standard
Serial	COM1/25-pin COM2/9-pin	- V.24
Parallel	Standard, bidirectional, EPP mode	- 25-pin subminiature connector
PROFIBUS/MPI [2]	Communication port SIMATIC S7	- potentially isolated DP12 [1](CP5611-compatible)

Component / interface	Description	Parameters
USB	Universal Serial Bus	- high-current (500 mA) USB ports, 5 channels: 2 x external at the interface side, 3 x internal
Ethernet	10BaseT/100Base-TX (compatible with VIA Rhein family)	-10/100 Mbps, potentially isolated[1]

[1] Electrically isolated within the safety extra-low voltage circuit (SELV)

[2] Optional product feature

[3]Depending on the CPU type

[4] Depending on the selected device configuration

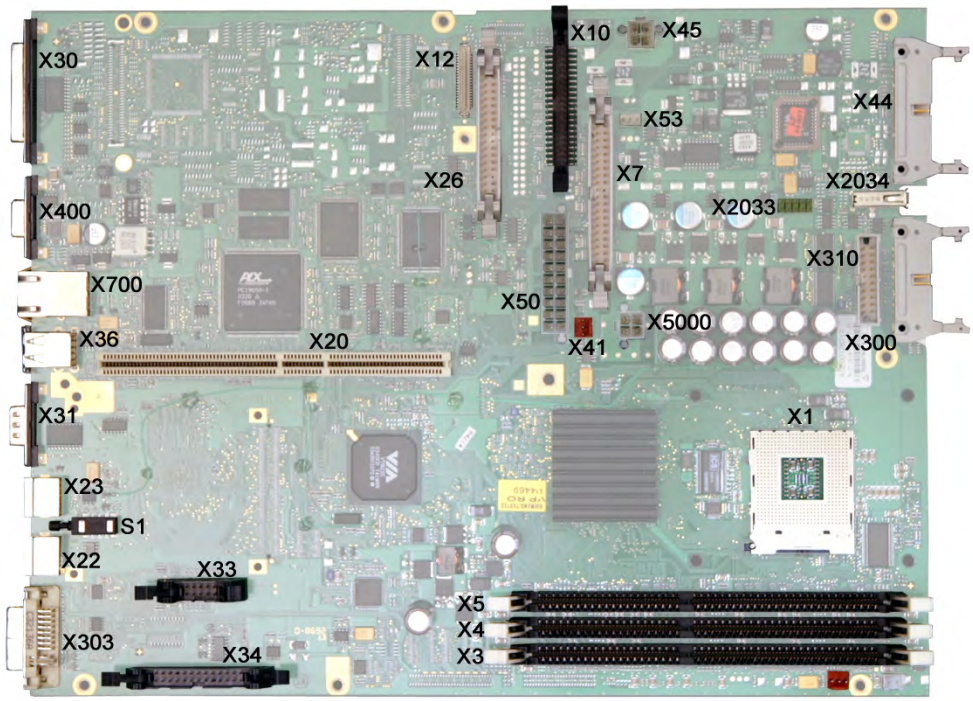
15.1.2 Position of the ports on the motherboard

Interfaces

The motherboard contains the following interfaces:

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

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



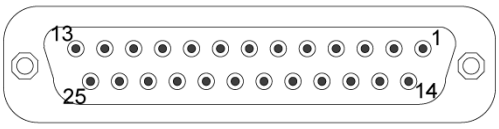
15.1.3 External ports

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, potentially isolated interface
Ethernet	external	X700	RJ45
DVI	external	X303	26-pin socket

Serial port COM1, X30

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

Serial port COM 1 (socket)



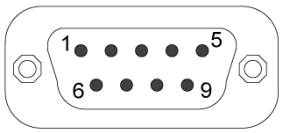
PinNo.	Designation	Meaning	Input/output
1	–	Shielding	–
2	TxD (D1)	Serial transmit data	Output
3	RxD (D2)	Serial receive data	Input
4	RTS (S2)	Request to send	Output
5	CTS (M2)	Clear to send	Input
6	DSR (M1)	Data set ready	Input
7	GND (E2)	Functional ground (reference potential)	–
8	DCD (M5)	Data carrier detect	Input
9	–	–	–
10–17	–	Unassigned	–
18	–	–	–
19	–	–	–

20	DTR (S1)	Data terminal ready	Output
21	–	–	–
22	RI (M3)	Incoming call	Input
23–25	–	Unassigned	–

COM 2 Serial Port (V24/Mouse), X31

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

COM 2 Serial Port (V24/Mouse)

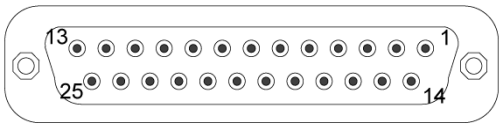


PinNo.	Designation	Meaning	Input/output
1	DCD (M5)	Receiving signal level carrier	Input
2	RxD (D2)	Received data	Input
3	TxD (D1)	Transmitted data	Output
4	DTR (S1)	Data terminal ready	Output
5	GND (E2)	Functional ground (reference potential)	–
6	DSR (M1)	Data set ready	Input
7	RTS (S2)	Request to send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

Parallel port LPT1, X134

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

Parallel port LPT1

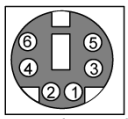


PinNo.	Designation	Meaning	Input/output
1	/ Strobe (CLK)	Data message	Output (open collector)
2	Data - Bit 0	Data channel 0	Output (TTL level)
3	Data - Bit 1	Data channel 1	Output (TTL level)
4	Data - Bit 2	Data channel 2	Output (TTL level)
5	Data - Bit 3	Data channel 3	Output (TTL level)
6	Data - Bit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

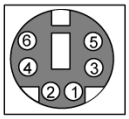
PS/2 mouse port, X22

Pin assignment of the port:

PS/2, X22	Pin no.	Designation	Meaning	Input/output
 View onto the socket	1	DAT	Data channel, mouse	Input/output
	2	–	Unassigned	–
	3	GND	Ground	–
	4	P5VFK	+ 5 V (fused)	Output
	5	CLK	Clock channel, mouse	Input/output
	6	–	Unassigned	–

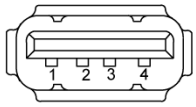
PS/2 keyboard port, X23

Pin assignment of the port:

PS/2, X23	Pin no.	Designation	Meaning	Input/output
 View onto the socket	1	DAT	Data channel, keyboard	Input/output
	2	–	Unassigned	–
	3	GND	Ground	–
	4	P5VFK	+ 5 V (fused)	Output
	5	CLK	Clock channel, keyboard	Input/output
	6	–	Unassigned	–

USB ports, X36

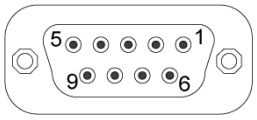
The Universal Serial Bus port has the following pinout:

USB port			
			
Pin no.	**Designation**	**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).

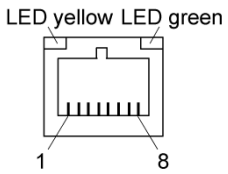
PROFIBUS/MPI interface, X400

The PROFIBUS/MPI socket has the following pinout:

PROFIBUS/MPI interface [1)]			
			
PinNo.	**Designation**	**Meaning**	**Input/output**
1	–	Unassigned	–
2	–	Unassigned	–
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	–	Unassigned	–
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

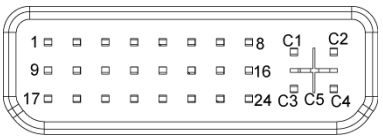
RJ45 Ethernetconnection, X700

RJ45 Ethernetconnection			
			
PinNo.	**Designation**	**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	–
	LED yellow	Connection	–
	LED green	Activity	–

[1] is not necessary for data transfer

DVI interface, X303

The DVI socket has the following pinout:

DVI interface			
			
PinNo.	**Designation**	**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	Unassigned	–
5	NC	Unassigned	–
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	Unassigned	–
13	NC	Unassigned	–
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	Unassigned	–
21	NC	Unassigned	–
22	GND	Ground	–
23	TXCP	TDMS clock +	Output
24	TXCN	TDMS clock -	Output

15.1.4 Front interfaces

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 port
USB	Internal	X2033	Internal USB 2.0 port (USB channel 5)

Display interfaces

This interface can be used to connect TFT displays with LVDS 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. 2.x 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 based on 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 transmissionrate of 455 MHz. Allowances must be made for the special channels features of differential line pairs in accordance with LVDS specifications.

Display interface (1st LVDS channel), X300

Pin No.	Designation	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	Chassis ground	-
10	GND	Chassis ground	-
11	RXIN2-	LVDS output signal bit 2 (-)	Output
12	RXIN2+	LVDS output signal bit 2 (+)	Output
13	GND	Chassis ground	-
14	GND	Chassis ground	-
15	RXCLKIN-	LVDS cycle clock signal (-)	Output
16	RXCLKIN+	LVDS cycle clock signal (+)	Output
17	GND	Chassis ground	-
18	GND	Chassis ground	-
19	NC	Unassigned	-
20	NC	Unassigned	-

Display interface (2nd LVDS channel), X300

Pin No.	Designation	Meaning	Input /Output
1	GND	Chassis ground	-
2	GND	Chassis ground	-
3	RXIN10-	LVDS input signal bit 0 (-)	Output
4	RXIN10+	LVDS input signal bit 0 (+)	Output
5	GND	Chassis ground	Output
6	GND	Chassis ground	Output
7	RXIN11-	LVDS input signal bit 1 (-)	Output
8	RXIN11+	LVDS input signal bit 1 (+)	Output
9	GND	Chassis ground	-
10	GND	Chassis ground	-
11	RXIN12-	LVDS input signal bit 2 (-)	Output

12	RXIN12+	LVDS input signal bit 2 (+)	Output
13	GND	Chassis ground	-
14	GND	Chassis ground	-
15	RXCLKIN1-	LVDS cycle clock signal (-)	Output
16	RXCLKIN1+	LVDS cycle clock signal (+)	Output
17	GND	Chassis 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 confiure one of 15 possible displays automatically. The display select inputs are connected to pull–up resistors, i.e. if these inputs are not interconnected, they carry a hi signal. The input must be connected to GND iif a lo 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-bit, LVDS channel 1
5	low	high	low	high	reserved
6	low	high	high	low	1024 x 768 (XGA), TFT, 18-bit, LVDS channel 1
7	low	high	high	high	800 x 600 (SVGA), TFT, 18-bit, 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 in addition to the display and COM2 port for the connection of operator panels. The maximum cable length is 50 cm at a USB data rate of 12 Mbps.

Pin No.	Designation	Meaning	Input /Output
1	GND	Chassis ground	-
2	P12V	Inverter power supply	Output
3	BL_ON	Backlight ON (5 V = ON)	Output
4	P5V_fused	+5 V fused	Output
5	GND	Chassis ground	-
6	P3V3_fused	+3.3 V VCC (fused)	Output
7	K_CLK	Clock channel, keyboard	Output
8	K_DATA	Data channel, keyboard	Input /Output
9	M_CLK	Clock channel, mouse	Output
10	K_DATA	Data channel, mouse	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	Chassis 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

15.1.5 Internal interfaces

Pin assignment of the internal interfaces

Interface	Position	Connector	Description
Memory	Internal	X3, X4, X5	3 DIMM sockets, 64-Bit
Processor	Internal	X1	socket for FCPGA mobile processor
Bus expansion	Internal	X20	Socket for extended bus, 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 (compatible with 82078) 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 connection 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 backup battery, 2-pin male connector
Power supply connection for 17" front components with DC 12 V 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 10 to 15" fronts
LVDS channel 2	Internal	X310	Expansion of the LVDS display interface X300 for dual-channel LVDS displays (resolution 1024 x 768 or 1280 x 1024)
I/O interface for front components	Internal	X44	
USB port	Internal	X2033	
USB port for front components	Internal	X2034	USB port (front USB channels 3 and 5)

Connector for CD-ROM drive X 12

Pin No.	Designation	Meaning	Input /Output
1	Reserved	Reserved	-
2	Reserved	Reserved	-
3	Reserved	Reserved	-
4	GND	Chassis 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	Chassis ground	-
24	IOR_N	Read signal	Output
25	IOW_N	Write signal	Output
26	GND	Chassis 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	Addess 0	Output
32	AD_2	Addess 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	Chassis 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

Port to floppy disk drive, X26

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

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

Pin-out of the CPU fan power supply, X41

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

Pin-out of the main fan power supply, X42

Pin No.	Designation	Meaning	Input /Output
1	GND	Chassis 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.	Designation	Meaning	Input /Output
1	GND	Chassis ground	-
2	GND	Chassis ground	-
3	+12 V	12 V power supply	Input
4	-12 V	12 V power supply	Input

Connector for CMOS 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.	Designation	Meaning	Input /Output
1	+	Plus pole	Input
2	-	Minus pole	-

On / Off switch connector, X53

Pin No.	Designation	Meaning	Input /Output
1	Power On	On signal	Input
2	GND	Chassis ground	-

Pin assignment of the internal USB port connector, X2033

Pin No.	Designation	Meaning	Input /Output
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	Chassis ground	–
8	GND	Chassis ground	–
9	GND	Chassis ground	–
10	GND	Chassis ground	–

Pin-out of the USB 2.0 port, X2034

Pin No.	Designation	Meaning	Input /Output
1	VCC	+ 5 V, fused	
2	USB5	USB5_M	
3	USB5	USB5_P	
4	GND	Chassis ground	
S1	S	Shielding	
S2	S1	Shielding	

Note

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

15.2 Bus board

15.2.1 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. Expansion boards (Rev. 3.1) and PCI specification (Rev. 2.0 for 5 V and 3.3 V modules). All PCI slots are master–enabled. The expansion modules are supplied with power via the bus board to motherboard connection.

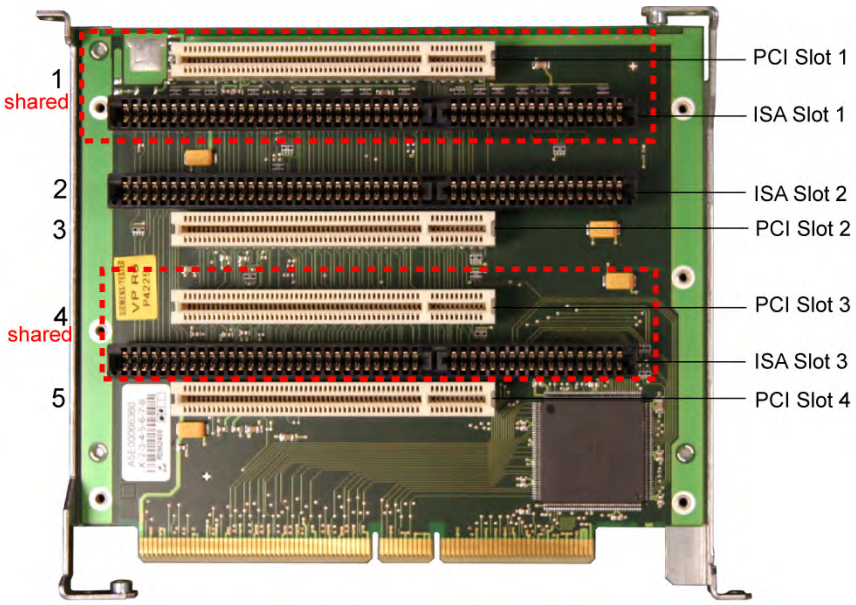


Figure 15-1 Bus board

15.2.2 Assignment of the PCI IRQ channels to the PCI slots.

Assignment of the PCI IRQ channels to the PCI slots.

	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

15.2.3 Exclusive PCI hardware interrupt

Applications demanding a high-performance interrupt require a high-speed hardware interrupt reaction. In order to allow high-speed reaction of the hardware, the PCI HW interrupt maybe used only by one resource. 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 device) 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 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.

? This means that it may not be used.

Interrupts not reserved by the system can be assigned twice.

15.2.4 Interface to motherboard

Overview

- ISA Slot
- PCI Slot

ISA slot pin assignment

Pin No.	Designation	Type*	Pin No.	Designation	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
A11	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
A21	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.	Designation	Type*	Pin No.	Designation	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.

PCI slot pin assignment

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

	5V System Environment Side B Side A	
16	CLK	+5V (I/O)
17	Ground	GNT#
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

	5V System Environment Side B Side A	
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V (I/O)	+5V (I/O)
60	ACK64#	REQ64#
61	+5V	+5V
62	+5V	+5V

15.3 Cables

SIMATIC S7 cable for MPI/DP

The 6ES7901-0BF00-0AA0 cable is used to connect the device to a SIMATIC S7 automation device. Refer to the "Integration" section for more information.

15.4 System resources

15.4.1 Currently allocated system resources

The system resources (hardware address, memory configuration, IRQ, DMA channel) are assigned dynamically by the Windows OS, depending on the hardware configuration, drivers and connected peripheral devices. Dialogs show the current allocation of the system resources or existing conflicts.

Note

For additional information, search for the terms "System information" and "Diagnostics" in the Windows help.

15.4.2 System resources used by the BIOS/DOS

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

15.4.2.1 I/O address allocation

I/O address (hex)		Size (bytes)	Description of the basic function	possible alternative function
from	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	
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	

I/O address (hex)		Size (bytes)	Description of the basic function	possible alternative function
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
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	
8870	8897	39	RAID controller (optional)	
8898	FEFF	30311	unused	
1880	886F	28655	unused	
FF00	FF0F	16	EIDE bus master register	

15.4.2.2 Interrupt assignment

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 VGA
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 channels	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.

15.4.2.3 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	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	Monochrome 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
000D 8000	000D FFFF	32K	unused (device or ISA hardware)	via EMM High DOS Memory
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-15M=1M	System memory or Memory Hole	
0100 0000	1FFF FFFF	Max. 3 GB - 16 MB	System memory, 512 Kbytes of top of memory are reserved for USB.	via ISA memory setup (memory hole)
2000 0000	FFF7 FFFF		PCI memory address space	Depends on memory configuration
FFF8 0000	FFFF FFFF		Firmware HUB	For PCI expansion cards

15.5 BIOS Setup

15.5.1 Overview

BIOS SETUPprogram

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.

15.5.2 Starting BIOS Setup

Starting BIOS Setup

Start the setup program as follows:

Reset the device (warm or cold restart).

In the figures shown, the default settings differ based on the device versions. With the default settings, **for example,** the following screen appears after booting:

```
Phoenix BIOS 4.0 Release 6.0 A5E000xxxxx-ES0x
Copyright 1985–2002 Phoenix Technologies Ltd. All Rights Reserved.
Siemens SIMATIC Box PC 840 V2 Profibus Vxx.xx.xx
CPU = Intel® Pentium®4 CPU X.XX GHz (X.XX depending on the processor)
640K System RAM Passed
127MB Extended RAM Passed
Mouse initialized
Press <F2> to enter SETUP or <ESC> to display the boot menu
```

2. 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 display the boot menu
```

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

15.5.3 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 context-sensitive help in the respective menu.

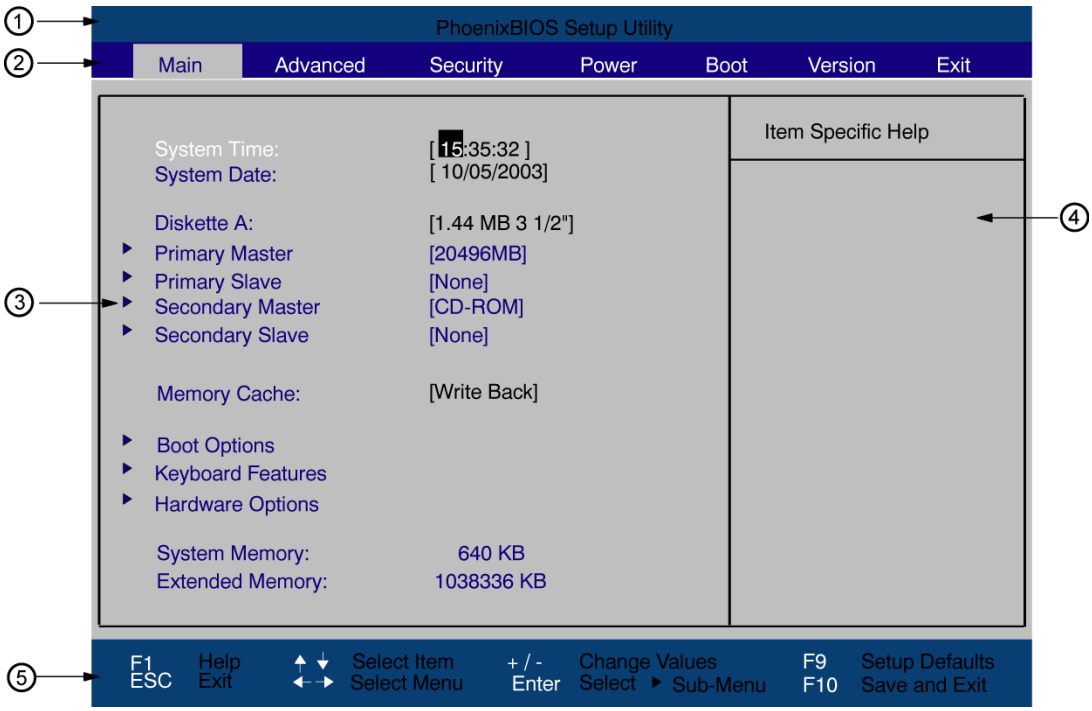


Figure 15-2 SETUP Main Menu (Example)

(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.
Project version	Information about the programming device (for example, release status) can be found here
Exit	Used for terminating and saving

15.5.4 Main menu

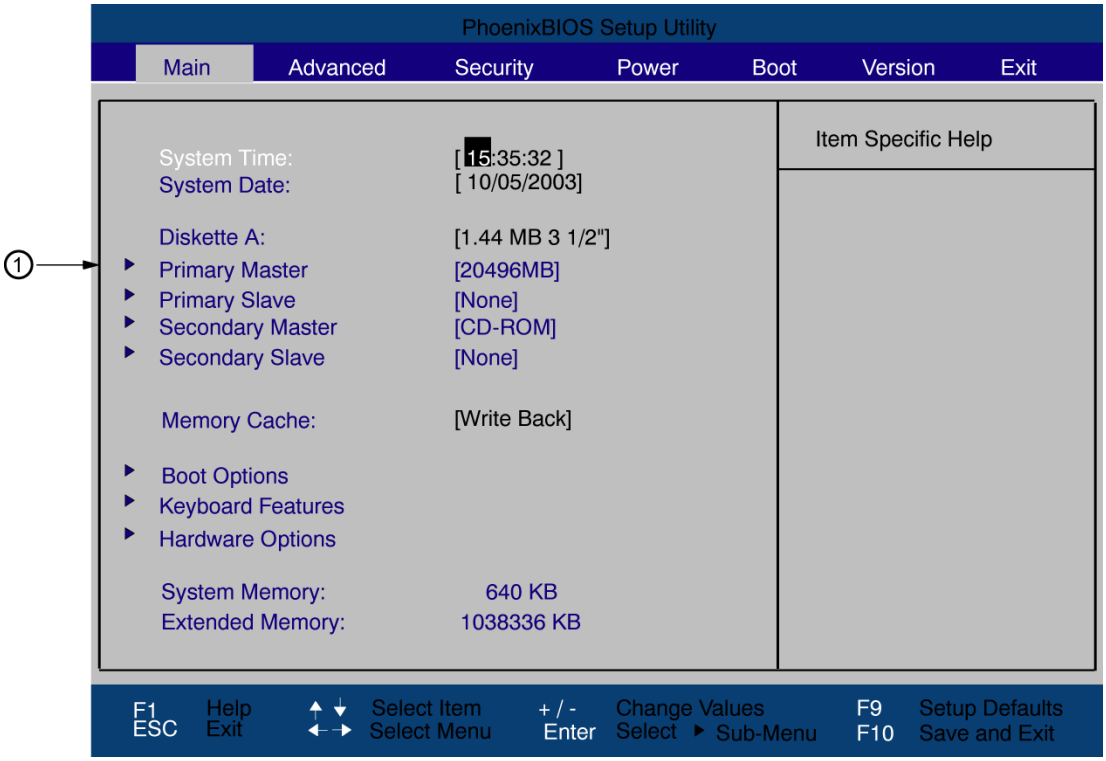


Figure 15-3 SETUP Main Menu (Example)

(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, auto report rate)
Hardware Options	Used for setting the hardware options

System Time and system date (Time-of-day and 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

.

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 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:

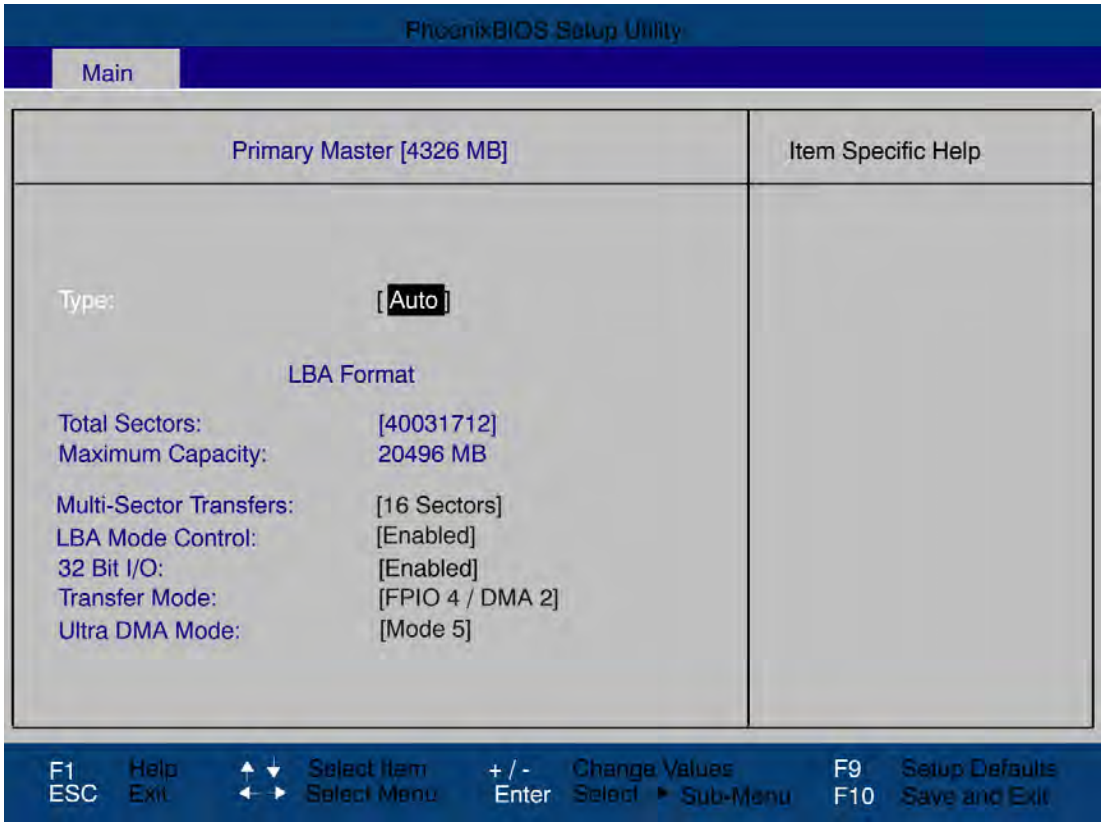


Figure 15-4 Primary Master (Example)

"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 **(Autodetect).** If Type is selected for a drive that cannot be detected, a time-out is triggered within 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 which are 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" option.
	Disabled 2,4,8,16 sectors
Option "LBA Mode Control"	“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" option.

In the 32-bit I/O option,	the type of access to the drive is defined:	
	Disabled	16-bit access
	Enabled	32-bit access
Option "Transfer Mode" and "Ultra DMA Mode"	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.	

The "Memory Cache" field

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

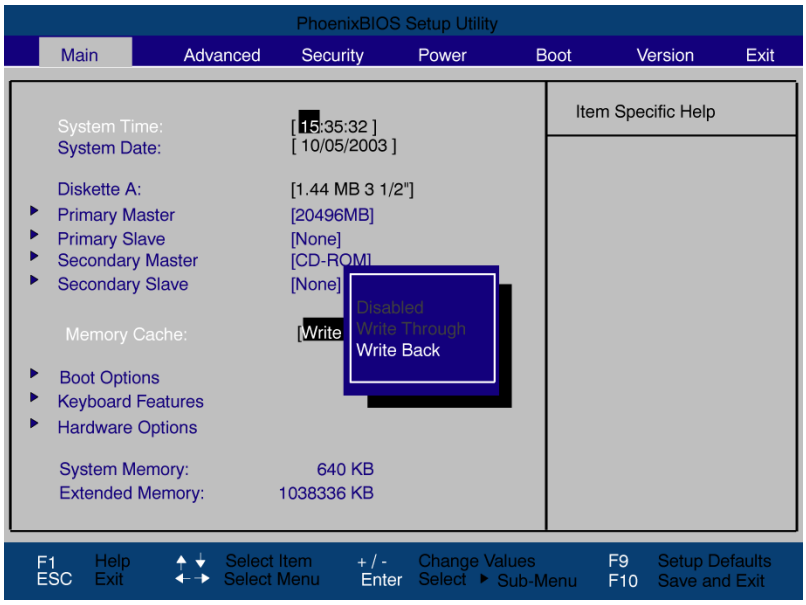


Figure 15-5 "Memory Cache" field

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 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)

The "Boot Options" field"

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

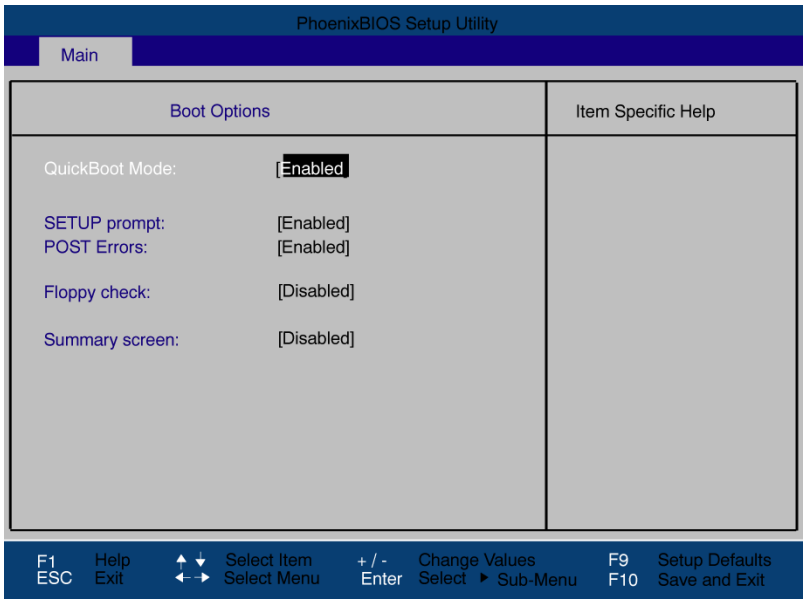


Figure 15-6 "Boot Options" field

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 display the 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 run-up phase completes.

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

Example of a summary screen:

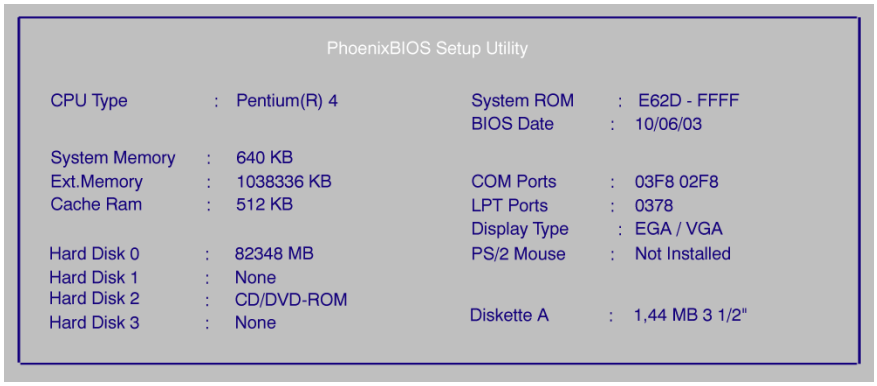


Figure 15-7 Summary Screen (Example)

The Summary screen appears when the system run-up phase completes.

The "Keyboard Features" field”

The following context menu appears when you select the option “Keyboard Features” in the main menu:

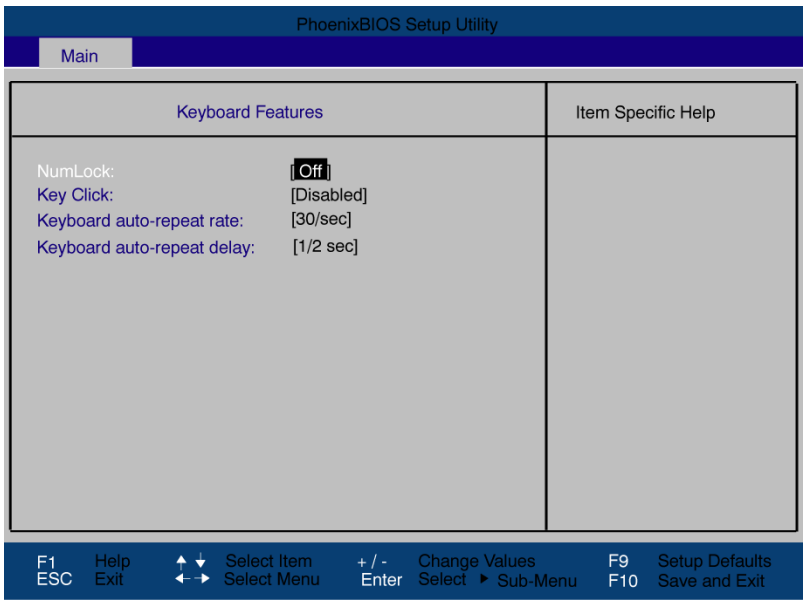


Figure 15-8 "Keyboard Features" submenu (Example)

Numlock	Switches Numlock on or off following power on. If "Auto" is set, this will be remembered the next time the device is switched on.
Key Click	A keystroke can be heard
Keyboard auto-repeat rate	Increase in automatic key repeat rate
Keyboard auto-repeat delay	On-delay of automatic keyboard repeat

The "Hardware Options" field”

The following context menu appears when you select the option “Hardware Options” in the main menu:

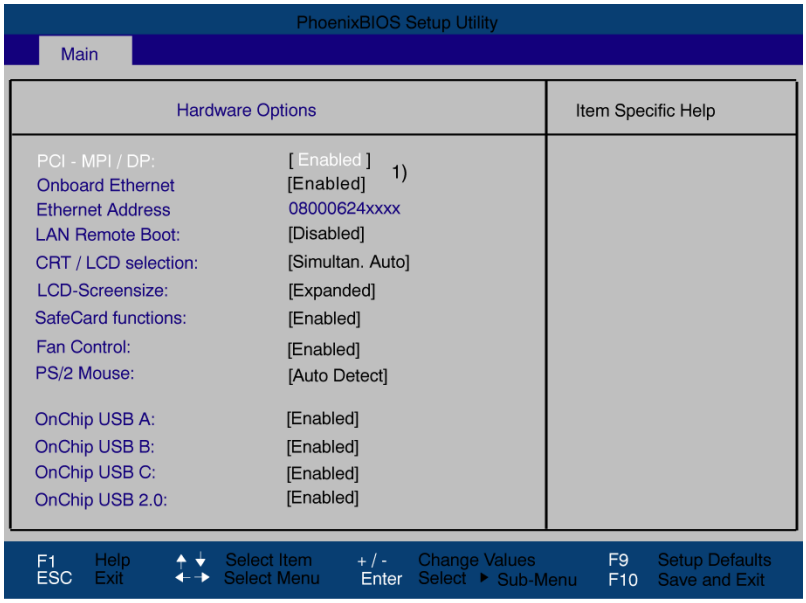


Figure 15-9 "Hardware Options" submenu (Example)

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 port on the motherboard is enabled.
	[Disabled]	The Ethernet port 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.	
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 are not output to an external monitor which is not connected until after the boot sequence.
	[Simultan. Forced CRT]	same as simultan auto, but in this case the CRT output is always enabled, irrespective whether CRT is connected or not.
	DVI LCD and LVDS displays can not 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 port is 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 can not 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.
OnChip 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.
OnChip 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.

15.5.5 Advanced menu

Menu layout

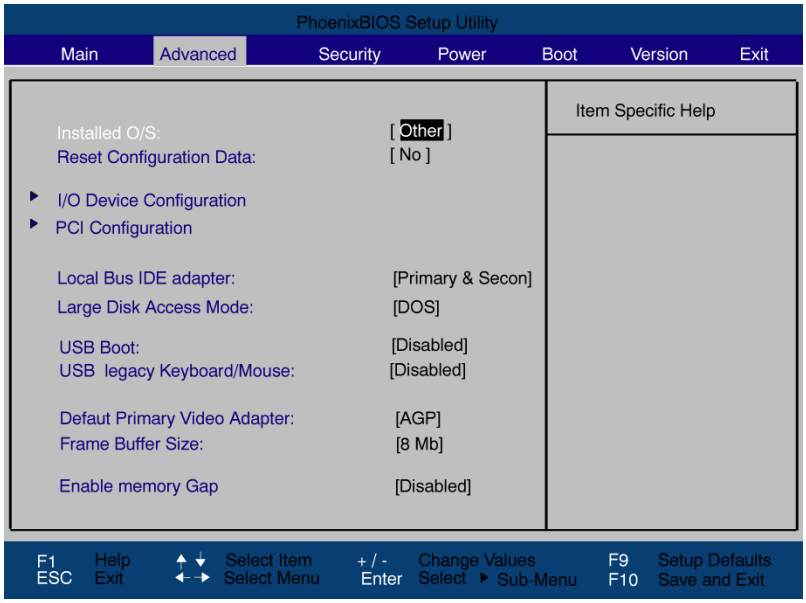


Figure 15-10 Advanced Menu

Settings in the Advanced Menu

Installed O/S	Plug and Play means that all modules are automatically detected and installed, providing they support the Plug and Play functionality.	
	[Other]	BIOS handles the entire Plug and Play capability, default setting.
	[Win95]	BIOS handles the entire Plug and Play capability
	[Win98]	The operating system handles some of the Plug and Play functions.
	[WinMe]	The operating system handles the Plug and Play functions.
	[WinMe/2000/ XP]	The operating system handles the Plug and Play functions.
Reset Configuration Data	[Yes]	All installations under Plug and 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 and Play have to be entered manually.
	[No]	The Plug and 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 an USB device.	

Legacy USB Support	[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 need 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.
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.

"COM/LPT configuration submenu"

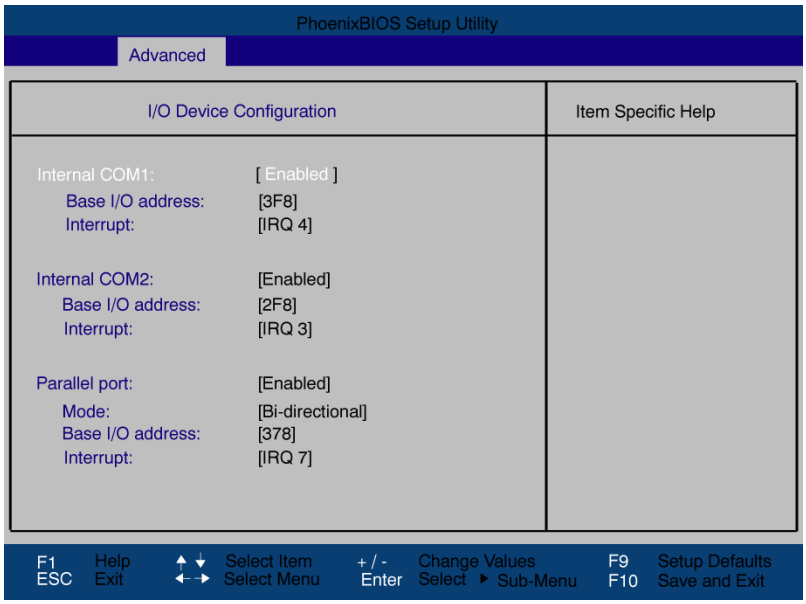


Figure 15-11 COM/LPT configuration submenu

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

The I/O addresses and interrupts are preassigned; 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”

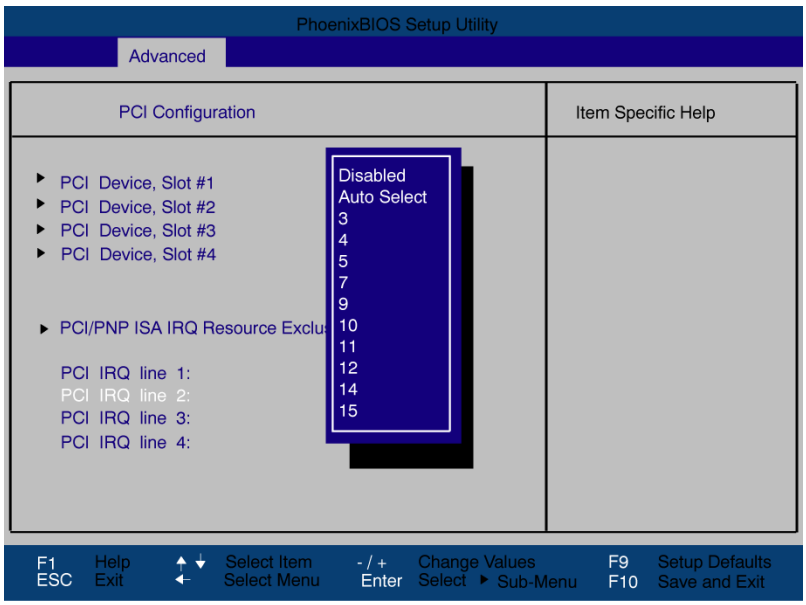


Figure 15-12 PCI Configuration submenu (Example)

"PCI Devices" field”

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

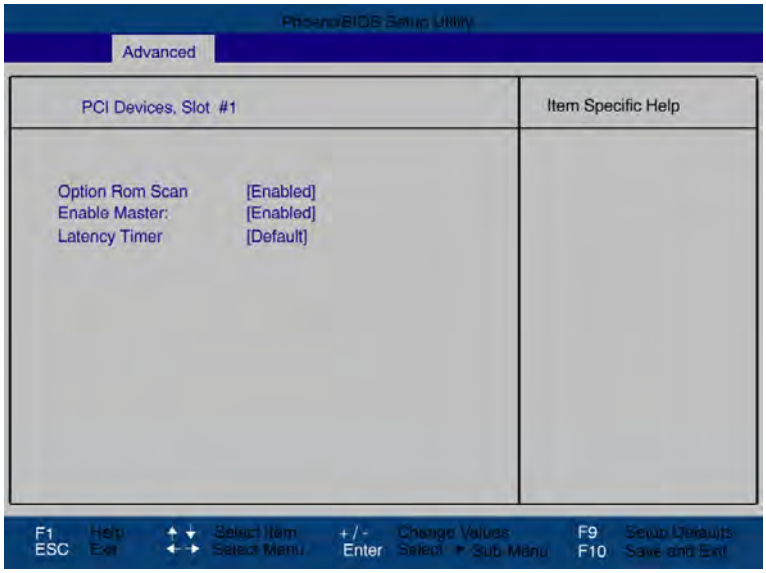


Figure 15-13 PCI Devices submenu, slot #1

ROM scan option:	[Enabled]	the Option ROM of the PCI module (if present) is enabled
	[Disabled]	the Option ROM of a PCI module is disabled.
Enable Master	[Enabled]	this slot can be assigned master functions
	[Disabled]	this slot can only operate as 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”

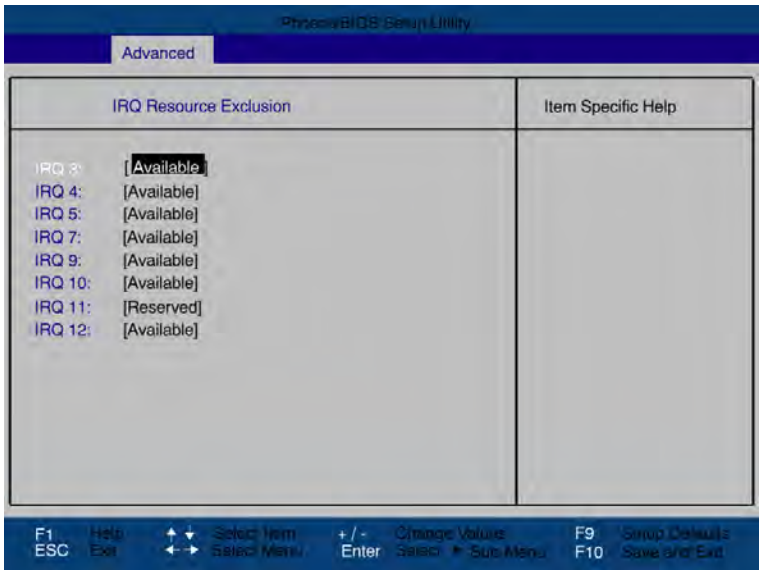


Figure 15-14 IRQ Resource Exclusion submenu (example)

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.

The "PCI IRQ channel" field"

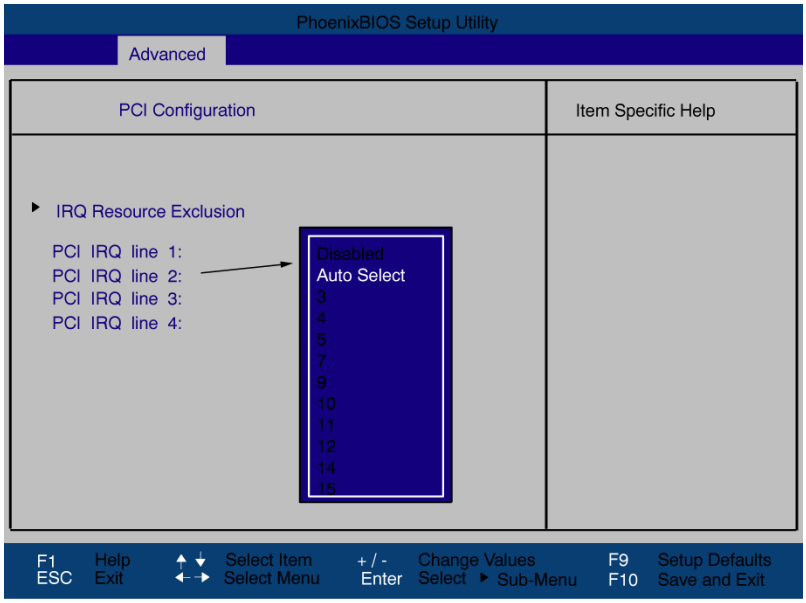


Figure 15-15 The PCI IRQ channel field

Disabled	No interrupt possible for this 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.

	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

Bold letters indicate the master interrupt of the slot module

15.5.6 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 prevent access to the floppy disk drive for normal users and to restrict access to the hard disk drive.

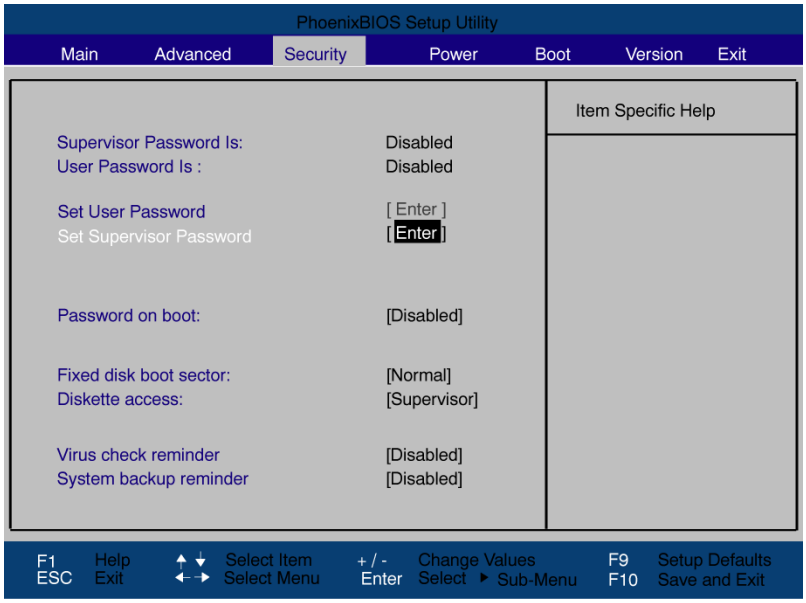


Figure 15-16 Security Menu

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 can not 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. Caution: This function can not be used under Windows NT/2000, since this operating system does not access the diskette via BIOS routines. Please use the Windows NT/2000/XP system programs for this purpose.
Virus check reminder	Outputs a virus check prompt when booting.	
	[Disabled]	No message during system startup.
	[Daily]	Daily
	[Weekly]	each 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]	each Monday
	[Monthly]	every first of the month

15.5.7 Power menu

This menu has the following layout.

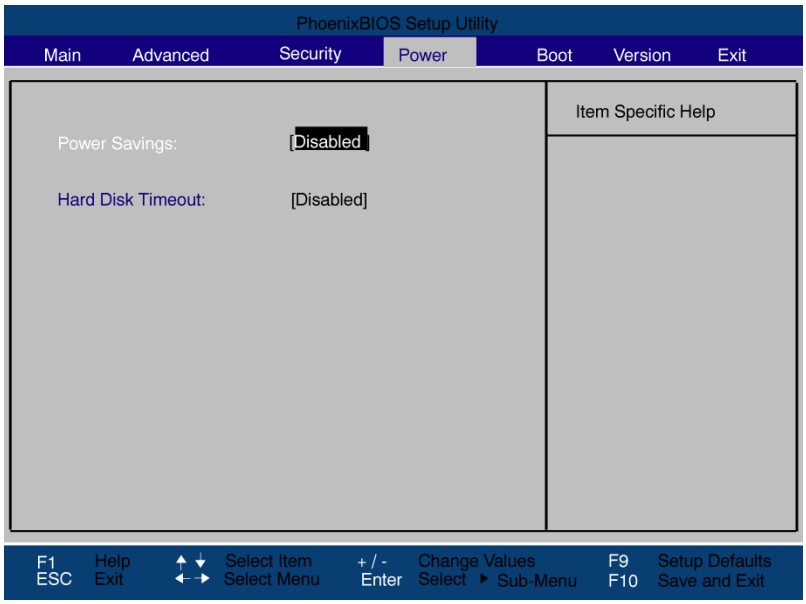


Figure 15-17 "Power" menu (Example)

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.

15.5.8 Boot menu

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

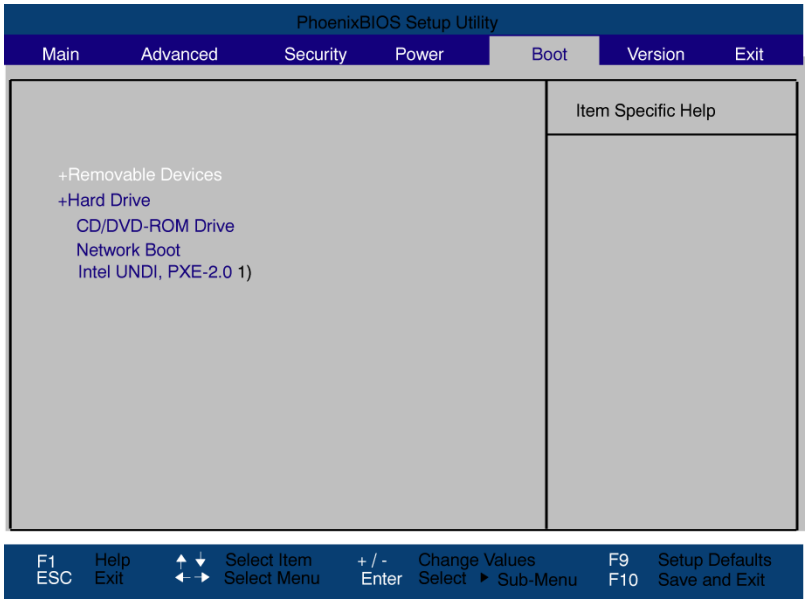


Figure 15-18 Boot Menu

[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 using the ↑ ↓ keys, move to the required 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, hit Enter to view the list of devices in the group.

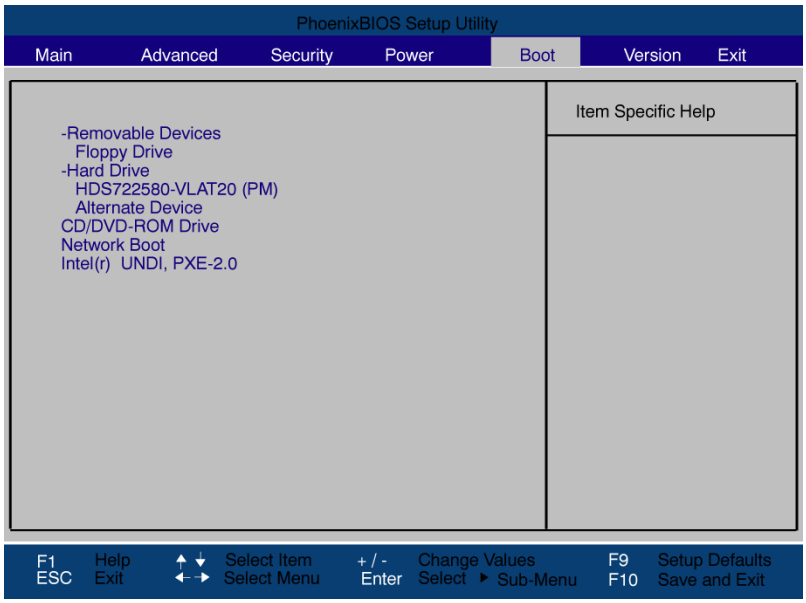


Figure 15-19 Boot menu (Example)

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.

15.5.9 Version menu

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

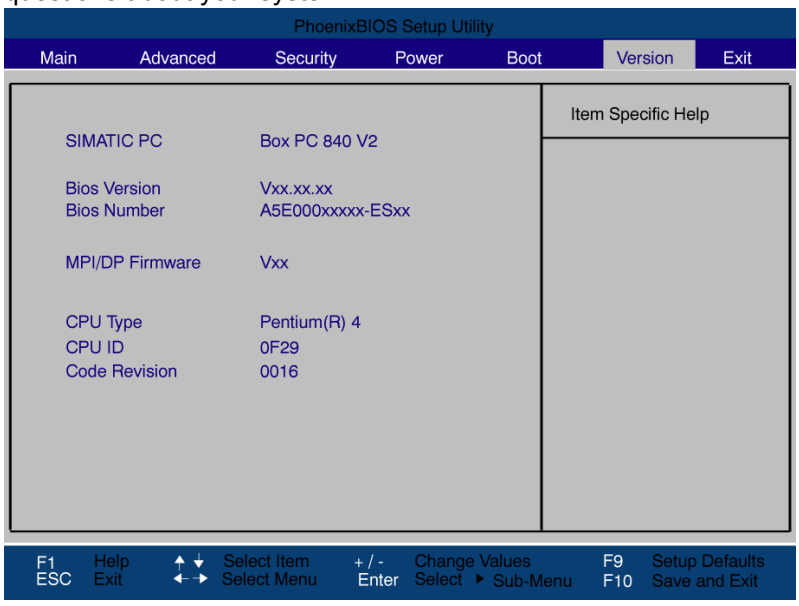


Figure 15-20 "Version" menu (Example)

15.5.10 Exit menu

The setup program is always closed from this menu.

Figure 15-21 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.

15.5.11 Default BIOS Setup entries

Your device configuration document

If you have made any modifications to the default Setup settings, 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-Defaults

System parameters	Defaults	Own 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	
Latency timer	Default	
IRQ exclusion		
IRQ3	Available	
IRQ4	Available	
IRQ5	Available	
IRQ7	Available	
IRQ9	Available	
IRQ10	Available	
IRQ11	Reserved	
IRQ12	Available	
PCI IRQ channel 1	Auto Select	
PCI IRQ channel 2	Auto Select	
PCI IRQ channel 3	Auto Select	
PCI IRQ channel 4	Auto Select	
Local Bus IDE adapter	Primary & Secondary	
Large Disk Access Mode	DOS	
Legacy USB Support	Disabled	
Default Primary Video Adapter	AGP	
Frame Buffer Size	8 MB	
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 disk drive		
CD/DVD-ROM Drive		
Network boot		
Intel® UNDI, PXE-2.0		

Project version		
SIMATIC		
BIOS Version		
BIOS Number		
MPI/DP Firmware		
CPU Type	Pentium®4	
CPU ID		
Code Revision		

Appendix 16

16.1 Certificates and guidelines

16.1.1 Guidelines and declarations

Notes on the CE Label

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

Guidelines for Handling Electrostatic Sensitive Devices (EMC)

AC voltage supply

This devices with AC 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:

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

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

DC power supply

This 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:

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

The system is also compliant with the standards 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 standard has been verified according to EN 60950.

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.

Observing the Installation Guidelines

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

Connecting peripherals

The requirements regarding noise immunity 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.

16.1.2 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 is shipped with preinstalled software. Please observe the corresponding license agreements.

Certification for the USA, Canada and Australia

Safety

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

16.1.3 ESD guideline

What ESD means

Almost all electronic modules are equipped with highly integrated components and elements in MOS technology. Due to their their technology, these electronic components are extremely sensitive to power surges and also to discharges of static electricity. These components are therefore marked as follows:

- **ESD:**components suceptible to **E**lectro**S**tatic **D**ischarge
- **ESD:** internationally recognized marking for components and modules susceptible to electrostatic discharge

The following symbols on switch cabinets, module carriers or packaging indicate their susceptibility to electrostatic discharge:

ESD components are destroyed by voltage and energy far below the limits of human perception. Such voltage can occur even when components or modules are touched by a person who is not charged with electrostatic energy. ESD components which were subject to such voltage are usually not recognized immediately as being defective, because the malfunction does not occur until after a longer period of operation.

Note

More information is located on the rating label. The rating label is described in the chapter "Planning use."

Protective measures against electrostatic charging

Most plastics can be charged easily. Therefore, keep plastics away from ESD components!

When working with electrostatically sensitive components, make sure that the person, the workstation and the packaging are properly grounded. Conduct the electrostaic charge away from your body by touching the mounting plate for the interfaces, for example.

Handling modules susceptible to electrostatic discharge

As a rule: Only touch ESD components if unavoidable due to necessary tasks.

Only touch the components when the following holds true:

- You are permanently grounded by means of an ESD armband.
- You are wearing ESD shoes or ESD shoes grounding protective strips in connection with ESD floors.

Discharge your body before touching ESD components. Touch a conductive object immediately beforehand, e.g. a bare metal part of a switch cabinet or the water pipe.

Do not allow chargeable, highly insulated materials, e.g. plastic films, insulating tabletops, synthetic clothing fibers, to come into contact with ESD components.

Place ESD components only on conductive surfaces (work surfaces with ESD surface, conductive ESD foam, ESD packing bag, ESD transport container).

Do not expose ESD components to visual display units, monitors or televisions. Maintain a distance of at least 10 cm to screens.

Handle flat components only by their edges. Do not touch component connectors or conductors. This prevents charges from reaching and damaging sensitive components.

Measuring and changing ESD modules

Measure the ESD component under the following conditions only:

- The measuring device is grounded with a protective conductor, for example.
- The probe on the potential-free measuring device has been discharged, e.g. by touching the bare metal of a part of the switch cabinet.
- Your body is discharged. To do so, touch a grounded metallic component.

Solder only with grounded soldering irons.

Shipping modules susceptible to electrostatic discharge

Always store or ship ESD components in conductive packaging, e.g. metallized plastic boxes or metal cans. Leave the components and parts in their packaging until installation.

If the packaging is not conductive, wrap the ESD component in a conductive material, e.g. rubber foam, ESD bag, household aluminum foil, or paper, before packing. Do not wrap the ESD component in plastic bags or plastic film.

In ESD components containing installed batteries, make sure that the conductive packaging does not touch the battery connectors or short circuit. Insulate the connectors with suitable material.

16.1.4 Electrostatic discharge from persons

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.

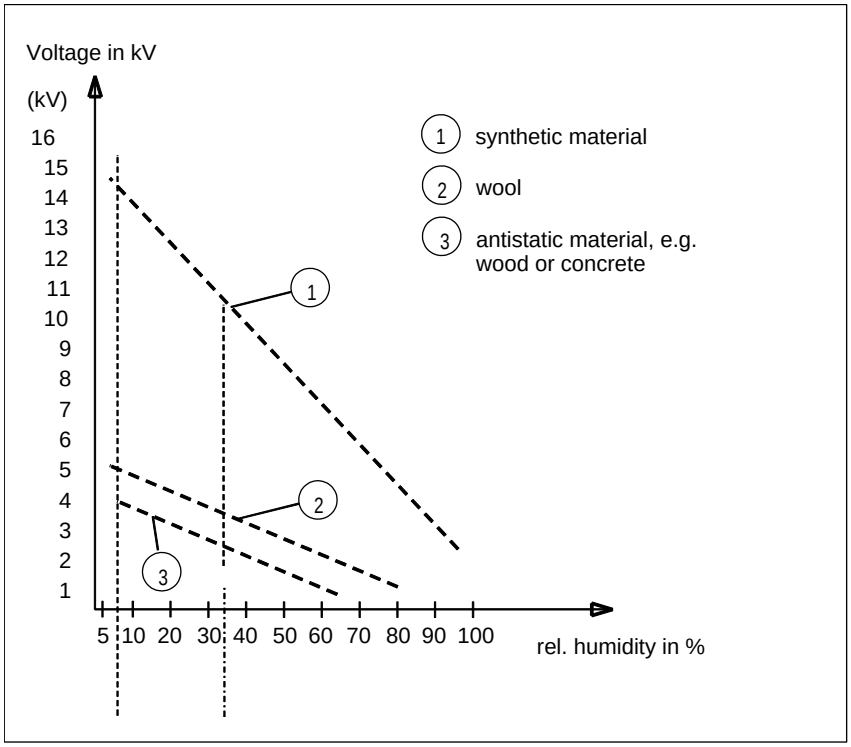


Figure 16-1 Electrostatic voltages with which an operator can be charged.

16.1.5 Permitted ordering variants

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

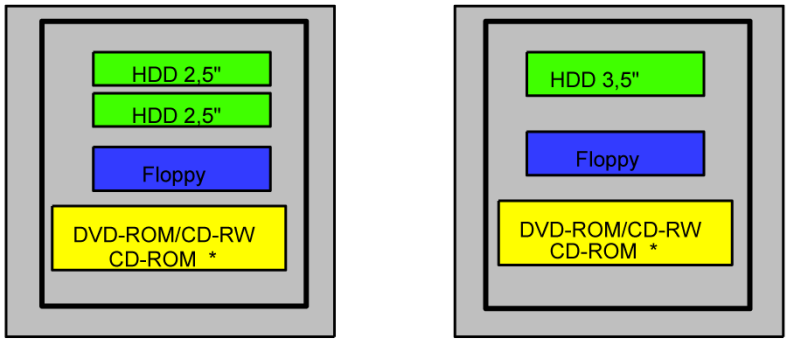


Figure 16-2 For the temperature range 5 to 45°C

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.

16.2 Abbreviations

CPU	Central Processing Unit
CSV	Comma Separated Values
CTS	Clear To Send
DC	Direct Current
DCD	Data Carrier Detect
DP	Distributed I/Os
DSN	Data Source Name
DSR	Data Set Ready
DTR	Data Terminal Ready
ESD	Electrostatic Discharge, the components and modules endangered by such.
EMC	Electromagnetic Compatibility
EN	European standard
ES	Engineering System
ESD	Electrostatic Sensitive Device
GND	Ground
HF	High Frequency
HMI	Human Machine Interface
IEC	International Electronic Commission
IF	Interface
LED	Light Emitting Diode
MMC	Multi-Media Card
MOS	Metal Oxide Semiconductor
MPI	Multipoint Interface (SIMATIC S7)
MTBF	Mean Time Between Failures
n. c.	Not connected
OP	Operator Panel
PC	Personal Computer
PG	Programming device
PPI	Multipoint Interface (SIMATIC S7)
RAM	Random Access Memory
RTS	Request To Send
RxD	Receive Data
SELV	Safety Extra Low Voltage
SP	Service pack
PLC	Programmable Logic Controller
STN	Super Twisted Nematic
Sub-D	Subminiature D (plug)
TCP/IP	Transmission Control Protocol/Internet Protocol
TFT	Thin Film Transistor
TxD	Transmit Data
UL	Underwriter’s Laboratory

16.3 Glossary

A

User program

The user program contains all instructions and declarations, as well as signal processing data which can be controlled by the plant or the process. It is assigned to a programmable module (Module, programmable) (e.g. CPU, FM) and can be granulated into smaller units (blocks).

Application

An application is a program which builds directly on the MS-DOS / Windows operating system. Applications on your PG or PC, for example, are STEP 7, STEP 7-Micro/WIN.

Main memory

This is a RAM area in the CPU which is accessed by the processor during user program execution.

"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 systems 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 systems (S5 or S7) consist of a central controller, one or more CPUs, and various I/O modules.

B

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.

Module

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

BEEP code

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

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 Me).

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. Within the boot sequence, the operating system is transferred from the system data carrier to RAM.

C

Cache

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

CE label

Communauté **E**uropéene (EC label of goods)

Chipset

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

COM port

A serial V.24 interface. The port is suitable for asynchronous data transfer.

Controller

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

D

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.

Drop-down menu

In programs supported by GUI, a menu bar is found on the top margin of the screen. The menu titles contained in this line can be set either as drop-down or pull-down menus. Drop-down menus “roll” down as soon as the mouse pointer passes over a menu title. Pull-down menus only “roll” down when the menu title is clicked on. Functions can then be selected from the menus by moving the mouse cursor or by clicking a menu item.

E

ESD guideline

Directive for handling **e**lectrostatic **s**ensitive **d**evices.

Guidelines for Handling Electrostatic Sensitive Devices (EMC)

Directive concerning **E**lectro**m**agnetic **C**ompatibility.

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.

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 drive and CPU), by restricting their activity based on the current system or component load. Energy management is of particular importance for mobile PCs.

Ethernet

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

F

Hard disk drives

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

Formatting

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

G

Gender Changer

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

Device configuration

The configuration of a 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. .

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.

Base memory

The base memory is a part of the main memory. Its size is 640 K for all programming devices. The size is entered in the SETUP menu under the entry “Base Memory” and is not changed even if the memory is extended.

H

RAM

The RAM is the total a read/write memory in a PG/PC.

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.

I

Image

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

Interface

see Interface

IT networks

Networks for **I**nformation **t**echnology

K

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. -> booting

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 .

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.

L

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

Die License Key diskette contains the authorizations or License Keys required to enable protected SIMATIC software.

LPT port

The LPT1 port (Centronics port) is a parallel interface that can be used to connect a printer.

M

Main menu

Usually the main menu / initial menu of a program.

Memory Card

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

N

Restart

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

P

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 CDROM drives can read packet-written CDs . There are restrictions to using this method in general data transfer.

Password

Unique sequence of characters that is entered for user identification.

PC Card

Trademark of the Personal Computer Memory Card International Association (PCMCIA). Designation for auxiliary cards that conform with PCMCIA specifications. The 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 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 disk drives, for example).

PCMCIA

Personal Computer Memory Card International Association Association consisting of approx. 450 member companies of 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.

Plug and Play

Generally, a reference to the ability of a computer to automatically configure the system for communication with peripheral devices (for example monitors, modems or printers). The user can plug in a peripheral and ”play” it at once without manually configuring the system. A Plug and Play PC requires both a BIOS that supports Plug and Play and a Plug and Play expansion card.

Pixel

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

PROFIBUS / MPI

Process **Fi**eld **Bus** (standard bus system for process applications)

R

Recovery CD

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

Reset

Hardware Reset: Reset / restart of the PC by means of button / switch.

Restore CD

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

ROM

Read-Only Memory ROM is read-only memory in which every memory location can be addressed individually. They contain factory set programs and data that are not lost in the event of a power failure.

S

SCSI interface

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

Interface

- An interface is the connection between individual hardware elements such as PLCs, programming devices, printers or monitors via physical connections (cables).
- An interface is also the connection between different programs, to enable them to interact.

Interface, MPI

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.

Interface, parallel

Information is transmitted byte for byte via a parallel interface (port). This means that the transmission rate is very fast. The PGs/PCs have one parallel interface (LPT1).

Serial interface

Data is transmitted one bit at a time via a serial port. They are used in all applications requiring minimum wiring and data transfer across greater distances.

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.

STEP 7

Programming software for the creation of user programs for SIMATIC S7 controllers.

T

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.

Drivers

These are programs which are part 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.

Troubleshooting

Error cause, cause analysis, remedy

V

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.

W

Warm start

The restart of a computer after a program was aborted. The operating system is loaded and restarted again. The keystroke 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.

Index

D

E

F

G

H

I

K

L

M

N

O

P

R

S

T

U

V

W