# SIEMENS

**SIMATIC**

**Industrial PC
SIMATIC Microbox PC 427B**

Operating Instructions

## Safety Guidelines

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

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

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

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

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

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

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

## Qualified Personnel

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

## Prescribed Usage

Note the following:

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

## Trademarks

All names identified by ® are registered trademarks of the Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

## Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

(A   )                                                                                                            .

# Table of contents

# Introduction 1

## Objective of this documentation

These operating instructions contain all the information you need to commission and use the SIMATIC Microbox PC 427B.

It is intended both for programming and testing/debugging personnel who commission the device itself and connect it with other units (automation systems, further programming devices), as well as for service and maintenance personnel who install expansions or carry out fault/error analyses.

## Scope of validity of this document

These operating instructions are valid for all delivery variants of the SIMATIC Microbox PC 427B and describe the delivery status as of July 2008.

## Position in the information landscape

These operating instructions are available on the "Documentation and Drivers" DVD included with your product.

For further instructions on how to handle the software, please refer to the corresponding documentation.

## Conventions

The abbreviations "Microbox PC" and "device" are also used within this manual for the product name, SIMATIC Microbox PC 427B. The abbreviations CP will be used for CP 1616 onboard and Vista for Windows Vista Ultimate.

## History

Currently released versions of this operating manual:

| Edition | Comment |
|---|---|
| 04/2007 | First edition |
| 07/2008 | • Remedy<br>• New operating system: Windows Vista Ultimate<br>• Functionality: additionally CP 1616 onboard |

# 1.1 Guideline to the Operating Instructions

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

# Safety information/instructions

# 2

## 2.1 General safety instructions

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

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

### Repairs

Only authorized personnel are permitted to repair the device.

| ⚠ WARNING |
|---|
| Unauthorized opening of and improper repairs to the device may result in substantial damage to equipment or endanger the user. |

### System expansions

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

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

**Battery**

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

| ⚠ CAUTION |
|---|
| There is the risk of an explosion if the battery is not replaced as directed. Replace the battery 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! |
| For this reason, do not burn lithium batteries, do not solder on the cell body, do not open, do not short circuit, do not reverse polarity, do not heat above 100°C, dispose of correctly, and protect against direct sunlight, dampness and dew. |

**ESD directives**

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



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

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

# Description

# 3

## 3.1 Overview

The SIMATIC Microbox PC provides high-level industrial performance.

- Compact design
- Maintenance-free operation
- High degree of ruggedness



Figure 3-1    SIMATIC Microbox PC 427B

Figure 3-2    SIMATIC Microbox PC 427B (PROFINET version)

## 3.2 Applications

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

- Measuring and controlling of process and machine data (for example, automated washing systems, assembling machines, packaging machines)

- Operating and visualization tasks with separate display / monitor solutions (information terminals, large-scale displays in automotive production)

- Data logging and processing (for example, system data logging, distributed process control)

## 3.3 Features

| Basic data | |
|---|---|
| Installation / mounting | • Installation on a DIN rail <br> • Wall mounting <br> • Hanging assembly <br> • Upright mounting |
| Processor | • Intel Celeron M 900 MHz, 400 MHz FSB or <br> • Intel Celeron M 1GHz, 400 MHz FSB, SLC 512 KB or <br> • Intel Pentium M 1.4 GHz, 400 MHz FSB, SLC 2 MB |
| Main memory | • 256 MB DDR2 SDRAM SODIMM <br> • 512 MB DDR2 SDRAM SODIMM <br> • 1 GB DDR2 SDRAM SODIMM <br> • 2 GB DDR2 SDRAM SODIMM |
| Free slots for expansion | Up to 3 x PCI/104 modules or 3x PC/104-*Plus* module (PCI bus only); installed with expansion frame |
| Graphic controller | • Integrated Intel GMA900 graphics <br> • CRT resolution of 640x480 pixels up to 1600x1200 pixels <br> • DVI resolution of 640x480 pixels up to 1600x1200 pixels <br> • 8-128 MB graphics memory taken from RAM (dynamic UMA) |
| Power supply | 24 V DC (20.4 – 28.8 V) max. 4 A |
| Conditions of use | • Operation without fan |
| **Drives and storage media** | |
| Compact Flash card | • 256 MByte optional or <br> • 512 MByte optional or <br> • 1 GB optional or <br> • 2 GB optional or <br> • 4 GB optional |
| Hard disk | ≥ 80 GB SATA hard disk |
| Floppy/CDROM drive | Connected via external USB port |
| USB stick | Connected via external USB port |
| **Ports** | |
| Serial | COM1 (RS232) |
| Graphics | DVI-I: combined DVI and VGA |
| USB | 4 x USB 2.0 high current |
| Ethernet | 2 x RJ 45 (10/100/1000 Mbit/s) or <br> 1x RJ 45 for PROFINET versions |
| PROFIBUS DP | 12 Mbps (isolated potential, <br> compatible to CP 5611), optional |
| PROFINET | 10/100 Mbps (CP 1616 onboard), three RJ45s; optional |
| CAN interface | on request |
| Keyboard, mouse | Connected via external USB port |

| Monitoring and safety functions | |
|---|---|
| Temperature | • When permitted temperature range is exceeded<br>• Warnings can be analyzed by application program (local, via LAN) |
| Watchdog | • Monitoring function for program execution<br>• Restart can be parameterized in the event of a fault<br>• Warnings can be analyzed by application program (local, via LAN) |
| LED display | 4 LEDs (or 5 for PROFINET versions) for displaying system status<br>2 of these can be programmed by the user[1] |
| Transient voltage interruption | Up to 15 ms buffer time at full load |
| Buffer memory | 2 MB battery-buffered SRAM[1] |

| Software | |
|---|---|
| **Operating systems** | |
| Available | • Without<br>• Windows XP Embedded status UPR1 (Update Rollup 1) including SP 2 with Feature Pack 2007 pre-installed<br>• Windows XP Professional MUI SP2 pre-installed [2]<br>• Windows Vista Ultimate MUI [2] |
| Project-specific | • LINUX<br>• QNX<br>• VxWorks<br>• Others on request<br>• RMOS3 V3.40 (ordered separately) |

[1]You can find additional information about addressing the LEDs or the SRAM under a Windows operating system in the section "Output register LED L1/L2". You can find example programs for addressing the LEDs under Windows XP and under RMOS3 under the FAQ at the Customer Support site of the Microbox.

[2] MUI: Multi Language User Interface; 5 languages (English, German, French, Spanish, Italian)

# 3.4 Windows XP Embedded

The Windows XP Embedded package is on Update Rollup 1 status (UPR 1), based on Service Pack 2 (SP 2) and Feature Pack 2007. The overview shows the most important device functions under Windows XP Embedded:

| Function | Hard disk version | Compact Flash card version |
|---|---|---|
| Enhanced Write Filter (EWF) | In RAM RAM(REG) | In RAM RAM(REG) |
| Safecard on Motherboard (SOM) | Available V 3.02 | Available V 3.02 |
| Pagefile | Deactivated in favor of the EWF | Deactivated in favor of the EWF |
| System Restore Core | Available | Available |
| File based Writefilter (FBWF) | Available | Available |
| Registryfilter | Available | Available |
| Device Update Agent (DUA) | Available | Available |
| HORM | Available | Available |
| Telnet Server | Available | Available |
| Windows Backup | Available | Available |
| User Mode Driver Framework (UMDF) | Available | Available |
| MUI | GER/FRA/ITA/SPA Default language: English | GER default language: English |
| Administrator Account | Available | Available |
| User Account | Available | Available |
| Explorer Shell | Available | Available |
| Internet Explorer (IE) | Available, IE7 | Available, IE7 |
| Internet Information Server (IIS) | Available V 5.1 | Available V 5.1 |
| Terminal Services | Available | Available |
| Bluetooth | Available | Available |
| Wireless Network Support | Available | Available |
| Windows Firewall | Available | Available |
| Windows Security Center | Available | Available |
| MSN Explorer | Available | Not available |
| Outlook Express | Available | Available |
| Administrative Tools | Available | Available |
| SMS Advanced Client | Available | Not available |
| Remote Desktop | Available | Available |
| Remote Assistance | Available | Available |
| .NET Framework | Available, V3.0 | Not available |
| ASP.NET | Available, V3.0 | Not available |
| Windows .NET Messenger | Available | Not available |
| Code pages/User Location/Keyboard | Available | Selection available |
| Disk Management Services | Available | Available |
| Windows Installer Service | Available | Available |

| Function | Hard disk version | Compact Flash card version |
|---|---|---|
| Class Installer | Available | Available |
| CoDevice Installer | Available | Available |
| Windows Movie Maker | Available | Not available |
| Media Player | Available, V11.0 | Available, V11.0 |
| Windows Media Player Tour | Available | Not available |
| DirectX | V9.0c | V9.0c |
| Accessories | Available | Available |
| Help files for all components | Available | Not available |
| Games | Available | Not available |
| Fonts | 310 | 116 |
| Windows XP Tour | Available | Not available |

## 3.5 Design

### 3.5.1 External Design

| Device components | Pos | Description |
|---|---|---|
|  | (1) | Cover plate for Compact Flash module |
| | (2) | Connection elements |
| | (3) | Status displays |

## 3.5.2      Connection components

**Ports and power supply**

| Location of connection elements (version with PROFIBUS or CAN) |
|---|



| Location of connection elements (version with PROFINET) |
|---|



| Pos | Name | Description |
|---|---|---|
| (1) | 24 VDC | Connection for a 24 V DC power supply |
| (2) | DVI/VGA | DVI/VGA connection for CRT or LCD monitor with DVI interface |
| (3) | Reset button | Use a pointed, insulated object to operate the reset button. The button signal triggers a hardware reset. The PC performs a restart (cold start). |
| (4) | USB | 4 USB 2.0 connections, high-speed / low current |
| (5) | ETHERNET | RJ45 Ethernet connection 1 (exclusive PCI interrupt) for 10/100/1000 Mbps |
| (6) | ETHERNET | RJ45 Ethernet connection 2 (shared PCI interrupt) for 10/100/1000 Mbps (not for PROFINET versions) |
| (7) | PROFIBUS DP/MPI | PROFIBUS DP/MPI interface (RS 485 isolated), 9-pin Cannon socket or CAN fieldbus (on request) |
|  | CAN fieldbus |  |
|  | PROFINET | CP 1616 onboard interface, three RJ45 sockets (optional product version) |
| (8) | COM | Serial port (RS232) 9-pin Cannon connector |
| (9) | USB strain-relief fastener | The USB strain relief must be fastened to the device enclosure with an oval-head screw (M4 thread). The USB cables can be fastened to the strain-relief assembly with a cable tie. |
| (10) | Protective earth terminal | The PE terminal (M4 thread) must be connected to the protective ground conductor of the plant, in which the device is to be installed. The minimum conductor cross-section may not be less than 2,5 mm$^2$. |

| CAUTION |
| --- |
| Data may be lost when the PC performs a hardware reset. |

## 3.5.3    Status displays

| Status displays | LED | Meaning | LED | Description |
| --- | --- | --- | --- | --- |
|  | PWR | Power supply | OFF<br>GREEN | Isolated from supply voltage<br>Supply voltage available |
| | WD | Watchdog status display | OFF<br>GREEN<br><br><br>RED | Watchdog disabled Watchdog enabled, monitoring time not expired<br>Watchdog enabled, monitoring time expired |
| | L1 | User LED L1 | YELLOW | Can be controlled by user programs[1] |
| | SF | Group errors | RED | Can be controlled by controller program (e.g. WinAC)[1] |
| | L2 | User LED L2 | YELLOW | Can be controlled by user programs[1] |
| | RUN/STOP | RUN<br>STOP | GREEN<br>YELLOW | Can be controlled by controller program (e.g. WinAC)[1] |

[1]You can find additional information about addressing the LEDs or the SRAM under a Windows operating system in the section "Output register LED L1/L2". You can find example programs for addressing the LEDs under Windows XP and under RMOS under the FAQ at the Customer Support site of the Microbox.

### See also

Output register LED 1 / 2 (read/write, address 404Eh) (Page 148)

## PROFINET status display

| PROFINET status display | | | |
|---|---|---|---|
|  | | | |
| **LED** | **Meaning** | **LED** | **Description** |
| SF PROFINET (optional) | Status display for CP 1616 onboard | OFF | • CP not available<br>• CP disabled<br>• No error, communication established<br>• Charging in progress |
| | | Flashes slowly | • Link status error<br>• IO controller: IO device cannot be addressed<br>• IO controller: Duplicate IP address |
| | | Flashes rapidly | Exception error: diagnostics via web or SNMP is no longer possible |
| | | AN | • Diagnostics information available<br>• No communication established. |

| Virtual status displays | | | |
|---|---|---|---|
| The two "virtual" CP 1616 LEDs are only visible in the SIMATIC software and can be read via SNMP. | | | |
| PROFINET | Virtual LEDs | RUN | CP is active |
| | | STOP | CP is in the stop state |
| | | Flashes | The states "flashes slowly" or "flashes rapidly" do not exist. |

# Application planning 4

## 4.1 Transport

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

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

| CAUTION |
| --- |
| **Risk of damage to the device!** |
| If you are transporting the device in extreme weather conditions with large fluctuations in temperature, care must be take to ensure that no moisture forms on or in the device (condensation). |
| If condensation has developed on the device, wait at least 12 hours before you switch it on. |

## 4.2 Unpacking and checking the delivery unit

**Unpacking the device**

Note the following when unpacking the unit:

- It is advisable not to dispose of the original packing material. Keep it in case you have to transport the unit again.

- Please keep the documentation in a safe place. It is required for initial commissioning and is part of the device.

- Check the delivery unit for any visible transport damage.

- Verify that the shipment contains the complete unit and your separately ordered accessories. Please inform your local dealer of any disagreements or transport damages.

**Noting the device identification data**

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

Enter the data in the following table:

| Serial number | S VP ... |
|---|---|
| Order Number of the device | 6ES 7647-7A ... |
| Microsoft Windows Product Key | |
| Ethernet address 1 | |
| Ethernet address 2 (not for PROFINET versions) | |
| CP 1616 onboard MAC address layer 2 | |
| CP 1616 onboard MAC address PROFINET | |

You can find the corresponding data here:

- Serial number: You can find the serial number on the rating plate on the back of the device.
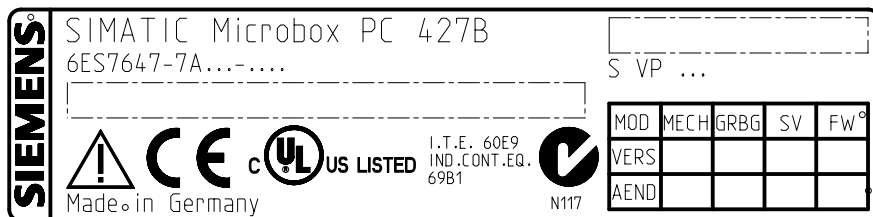


Figure 4-1    Rating plate

- Order number of the device

- Ethernet address: You can find the Ethernet address of the device in your BIOS Setup **(F2 function key)** under **Hardware Options > ETH 1 Address** or **ETH 2 Address** (not for PROFINET versions).

● Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA): The COA label is only present in pre-installed Windows XP Embedded or XP Professional and is affixed to the back of the device.



Figure 4-2    COA Label XP Embedded



Figure 4-3    COA Label XP Professional

# 4.3    Ambient and Environmental Conditions

When you plan your project, you should make allowances for:

- The climatic and mechanical environmental conditions specified in the specifications given in your operating instructions.

- The device is approved for operation in closed rooms only.

- Avoid extreme ambient conditions. Protect the device against dust, moisture and heat.

- Do not place the device in direct sunlight.

- Ensure at least 100 mm of space above and below the device and between other components or the sides of cabinets.

- Do not cover the ventilation slots of the device.

- Always observe the mounting positions permitted for this device.

- The connected or built-in peripherals should not introduce a counter emf in excess of 0.5 V into the device.

# Mounting 5

## 5.1 Permitted mounting positions

| NOTICE |
| --- |
| The device is approved for operation in closed rooms only. |
| Ensure at least 100 mm of space above and below the device and between other components or the sides of an enclosure. |

| Horizontal (preferred position) | Permitted temperatures |
| --- | --- |
|  | Operation with hard disk: +5 to +40°C<br>Used with CompactFlash card:<br>• without expansion modules: 0 to +50°C<br>• without expansion modules in RAL: 0 to +55°C<br>• with up to 3 expansion modules (max. load 9 W): 0 to +45°C<br>• with up to 3 expansion modules (max. load 9 W) in RAL: 0 to +50°C |
| **Vertical / portrait installation (power supply on top)** | |
|  | Operation with hard disk: +5 to +40°C<br>Used with CompactFlash card:<br>• without or with up to 3 expansion modules (max. load 9 W): 0 to +40°C<br>• without or with up to 3 expansion modules (max. load 9 W) in RAL: 0 to +45°C<br>**Notes**:<br>• When mounted on a DIN rail, the device should be secured to prevent shifting (e.g. with a DIN rail ground terminal).<br>• Portrait installation permitted in control cabinet only. |

| Suspended | |
|---|---|
|  | Used with CompactFlash card and without expansion modules:<br>0 to +40°C<br><br>**Note**:<br>Mounting brackets are required if the device is suspended. |
| **RAL** = Restricted Access Location<br>(e.g. installation of the unit in a lockable cabinet) | |

| **NOTICE** |
|---|
| The safety and installation instructions for the expansion modules should be followed if the device is expanded with PCI-104 / PC/104-plus modules.<br><br>If necessary, the device should be installed in an enclosure that meets the requirements of paragraphs 4.6 and 4.7.3 of IEC/UL/EN/DINEN60950-1. |

## 5.2 Mounting information

Before you install the device, read the following mounting instructions.

| **NOTICE** |
|---|
| Adhere to the SIMATIC assembly guidelines and the relevant DIN/VDE requirements or the country-specific regulations when mounting in switching cabinets. |

| **NOTICE** |
|---|
| Ensure that the device is classified as "Open Type" when using the device in the area of Industrial Control Equipment (UL508). A UL508 conform enclosure is therefore a mandatory requirement for approval or operation according to UL508. |

## 5.3 Mounting the device

### Mounting methods
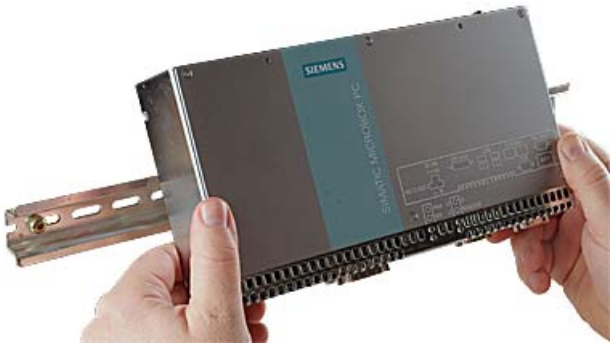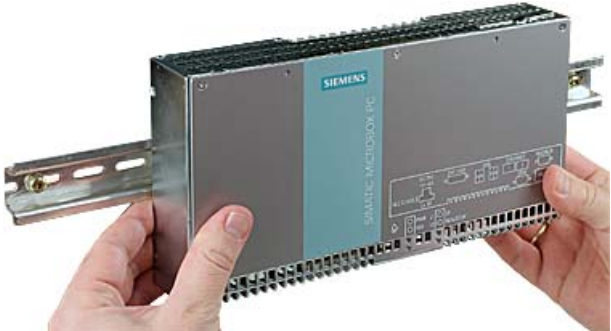
SIMATIC Microbox PC can be mounted on DIN rails, with mounting brackets and in an upright position.

## 5.4 Mounting on DIN rails

### Mounting the device on DIN rails

---

**Note**

Use of Siemens 35 mm standard mounting rail is recommended.

---

| Steps for mounting on DIN rails | | |
|---|---|---|
| 1. | Set the device inclined on the upper DIN rail. |  |
| 2. | Swing the device fully onto the rails until both clamps completely latch. |  |

---

**Note**

To ensure secure mounting on vertical mounting rails, a DIN rail ground terminal should be mounted beneath the device.

---

| NOTICE |
|---|
| The rails are secured to a wall or cabinet similar to mounting with mounting brackets. Ensure that the wall or ceiling can hold four times the total weight of the device (including the rails and additional expansion modules). See also section *Mounting with Mounting Brackets*. |
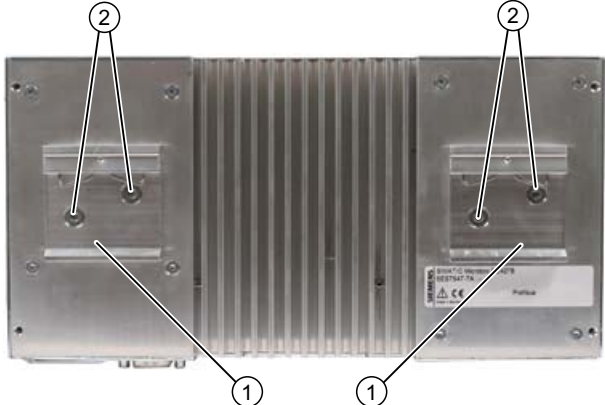
### Removing the device from the DIN rail

- Push down the device until the clamps release it.
- Swing the device out of the rails.

## 5.5 Mounting with mounting brackets
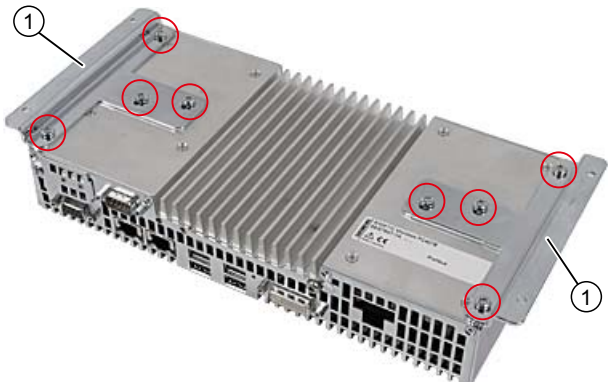
### Removing mounting clamps from the device

Two mounting clamps are factory installed on the device for DIN rail mounting. These need to be removed before mounting the mounting brackets.

| Steps for removing the mounting clamps |
|---|
| Remove the four screws (2) and the two mounting clamps (1) from the back of the device.  |

### Installing brackets on the device

Two mounting brackets are included in the device package. They can be installed on the device with four screws supplied.

| Steps for installing the mounting brackets |
|---|
| Install the mounting brackets on the device.  |

#### Note

#### Required tools

You need a TORX T15 screwdriver to remove the mounting clamps and mount the mounting brackets.

## Mounting/demounting the device

The dimensions of the device with mounting brackets are available in the dimensional drawings.

| Mounting examples | | |
|---|---|---|
| **Material** | **Bore diameter** | **Mounting** |
| Concrete | 8 mm diameter<br>60 mm depth | Dowel: 8 mm diameter<br>50 mm length<br>Screws: 4 mm diameter<br>50 mm length |
| Plasterboard<br>(min. 13 mm thick) | 14 mm diameter | Gravity toggle: 4 mm diameter<br>50 mm length |
| Metal<br>(min. 2 mm thick) | 5 mm diameter | Metal screws M 4: 4 mm diameter<br>15 mm length |

> ⚠ **WARNING**
>
> Ensure that the wall or ceiling can hold four times the total weight of the device (including the cabinet brackets and additional expansion modules).

## 5.6 Upright mounting

With the available optional vertical mounting kit you have the possibility to implement a place saving installation.

**Mounting the vertical mounting angle onto the device**



| (1) Device | (2) Screws | (3) Vertical mounting angle |

---
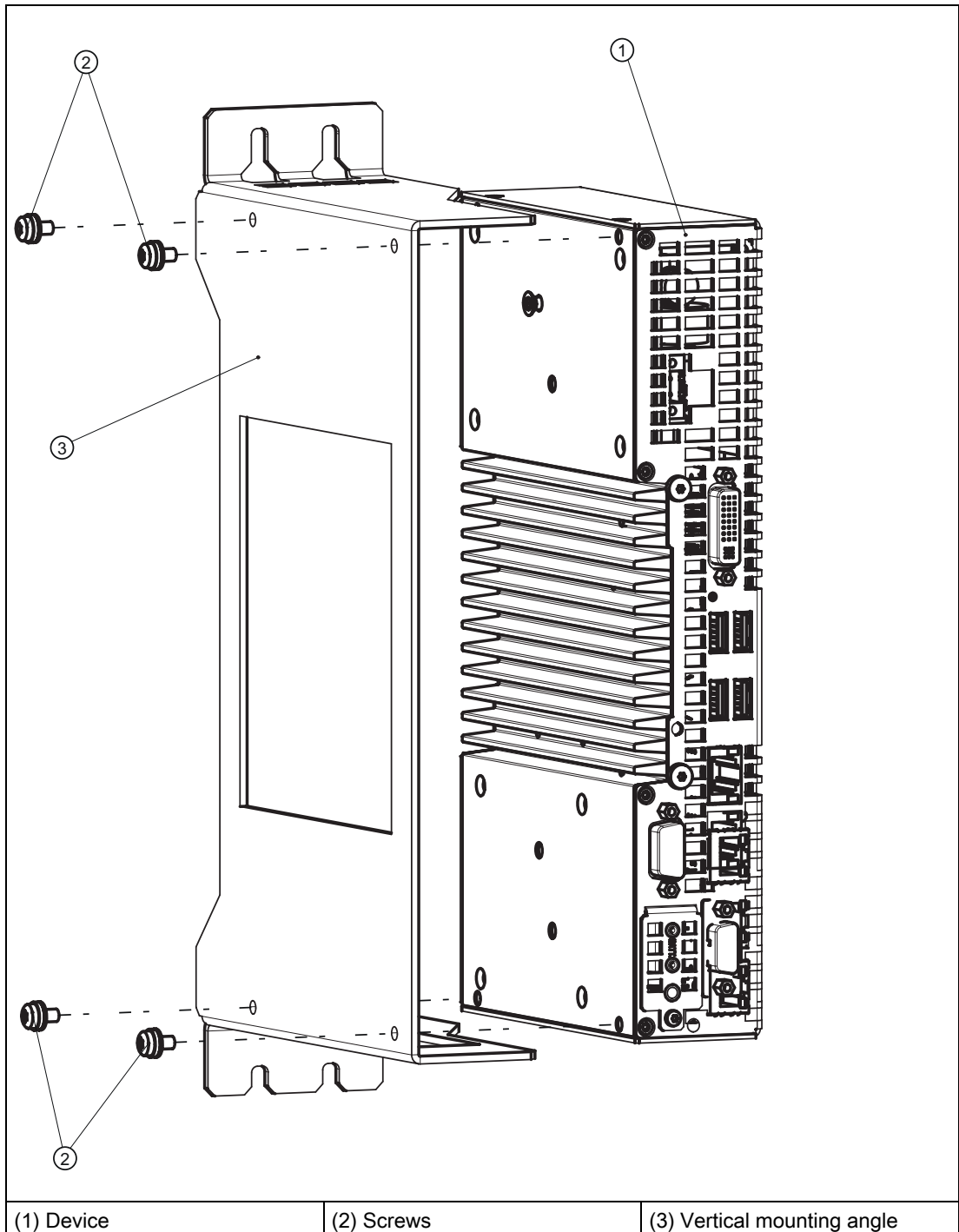
**Note**

- Information on installation and operation is available in the supplement of the accessories.
- Portait installation in control cabinet only with maximum ambient temperatures with a distance of 100 m lateral and top/bottom to next component:
    - for versions with CompactFlash: 45°C
    - for versions with hard disk: 40°C

---

# Connecting

# 6

## 6.1 Connecting peripheral equipment

| NOTICE |
| --- |
| Connect only I/O modules approved for industrial applications according to EN 61000-6-2. |

**Note**

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

| CAUTION |
| --- |
| Peripheral devices that are incapable of hot-plugging may only be connected after the device has been disconnected from the power supply. |

| CAUTION |
| --- |
| Strictly adhere to the specifications for peripheral equipment. |

**Note**

A DVI or CRT monitor should be connected and switched on when the device boots in order for it to be correctly detected by the BIOS and the operating system. The screen may otherwise remain dark.

| NOTICE |
| --- |
| The connected or built-in peripherals, such as USB drives, should not introduce a counter emf into the device. |
| A counter emf greater than 0.5 V to ground on the + 3.3 VDC / + 5 VDC / + 12 VDC power rail due to a connected or integrated component can prevent normal operation or even destroy components of the device. |

## 6.2 Connecting the 24 V DC power supply

### To be noted before you connect the device

Note the following in order to operate the device safely and according to regulation:
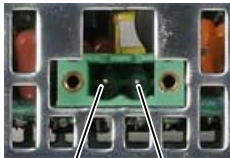
| ⚠ WARNING |
|---|
| The device should only be connected to a 24V DC power supply which satisfies the requirements of safe extra low voltage (SELV). |
| If the device is used on a wall, in an open rack or other similar locations, an NEC Class 2 current source is required in order to meet the UL requirements (UL 60950-1). In all other cases (IEC / EN / DIN EN 609501) either a current source of limited output (LPS = Low Power Source), or a line-side fuse or a line-side circuit breaker is necessary. The power needs to be limited to a value below 4.16 A. The fuse value required: Max. 4 A. |
| If the device is used in fire-proof enclosures to IEC/UL/EN/DIN/EN 60950-1, there are no requirements to limit the current of the supply voltage. |
| Use the special plug supplied to connect the supply voltage. Connect the PE conductors as described in the next section. |

| NOTICE |
|---|
| The permitted cable cross-section for the 24 VDC connection is 0.75 mm² to 2.5 mm². |

| NOTICE |
|---|
| If a CompactFlash card is used in the device, make sure that the card is seated correctly before you connect it. |

### Connecting

| Steps for connecting the device to the 24 V DC power supply | |
|---|---|
| 1. | Switch off the 24 V DC power source. |
| 2. | Connect the power supply using the plug (included in the package). |
| 3. | Connect the PE conductor. |

(P24 in)          (M in)

### See also

Protective ground connection (Page 35)

# 6.3 Protective ground connection

The PE terminal (M4 thread) on the device (large surface, large-area contact) must be connected to the PE conductor on the cabinet or system in which the PC is to be installed. The conductor cross-section must not be less than 2.5 mm$^2$.

The PE terminal is needed to protect the device and ensures that interference signals generated by external power cables, signal cables or cables to the I/O modules are safely discharged to earth.

Required tool for protective earth terminal: TORX T20 screwdriver

| Protective earth terminal |
| --- |
| Connect the PE terminal (M4 thread) (1) on the device to the PE conductor on the cabinet or system in which the PC is to be installed. The minimum conductor cross-section may not be less than 2,5 mm$^2$.  |
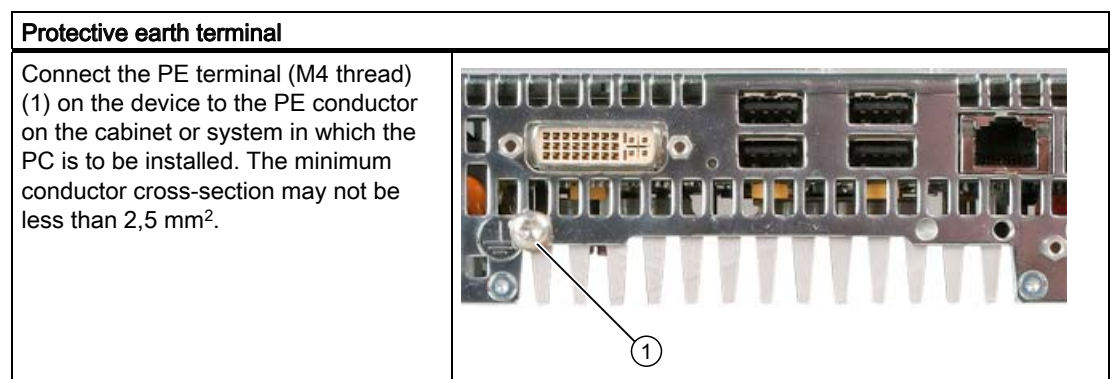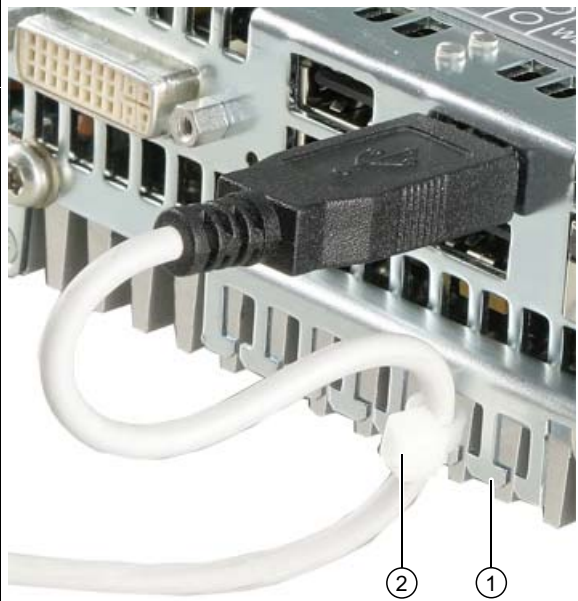
# 6.4     USB strain-relief

The USB strain-relief provided as an accessory is used to prevent accidental loosening of the USB cable from the device. A cable binder (not included in the package) is needed to use this accessory.

To fix the USB strain relief, you will need a TORX T20 screwdriver.
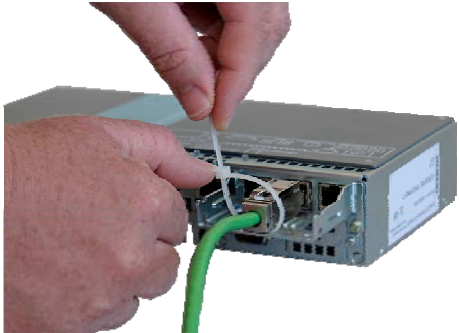
| **Steps for connecting the USB strain-relief** | |
|---|---|
| 1. | Fasten the USB strain-relief (1) to the device enclosure with a oval-head screw (M4 thread). |
| 2. | Thread the cable binder (2) through the comb of the USB strain-relief to clamp the USB cable. |

# 6.5 Connecting PROFINET strain relief

The PROFINET strain relief provided in the package is used to prevent accidental loosening of the cable from the device. A cable tie (not included in the package) is needed for each interface.

To fix the PROFINET strain relief, you will need a TORX T10 screwdriver.

| Steps for connecting the PROFINET strain relief | |
| --- | --- |
| 1 Remove the PROFINET interface plate. |  |
| 2 Attach the PROFINET strain relief. | |
| 3 Attach the cable using the cable tie. |  |

# Commissioning 7

## 7.1 Note before commissioning

### Factory state

The SIMATIC Microbox PC s available in the following versions:

- With the Windows XP Embedded operating system (pre-installed on Compact Flash card or the hard disk)
- With the Windows XP Professional operating system (pre-installed on the hard disk)
- Without operating system

### Connections before commissioning

Before connecting the device to the power supply, a DVI or CRT monitor should be connected in order for it to be correctly detected by the BIOS and the operating system during startup.

| ⚠ CAUTION |
| --- |
| **Risk of damage to the device** |
| If condensation has developed, wait at least 12 hours before commissioning the device. |

| NOTICE |
| --- |
| **Windows XP Embedded: Read the EWF information** |
| A configurable write filter is available (Enhanced Write Filter) with Windows XP Embedded. Please be aware of this when activating and using the EWF information, otherwise you may experience data loss. |

# 7.2 Commissioning - Windows XP Embedded

## 7.2.1 Basic commissioning - initial startup

### Configuring the operating system

When the computer starts up for the **first** time, the Windows XP operating system on the Compact Flash card or hard disk is configured automatically. Proceed as follows:

1. Connect the device to the 24 V DC power supply. The PC performs a self-test (POST). During the self-test, this message appears:

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

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

   | NOTICE |
   | --- |
   | The device may not be switched off at any time during the installation process. |
   | **Do not** change the default BIOS settings, otherwise the operating system setup may become corrupted. |

3. Restart
   After you have entered all the necessary information and the operating system is configured,
   you are prompted to restart the system. Respond to this prompt with **Yes**.

   **Note**

   System startup can take considerably longer than usual for the initial commissioning. Only a blue screen is displayed for several minutes.

When you switch on the PC now, the logon window or the user interface of the Windows XP Embedded operating system is automatically opened when the startup routine is completed.

**Note**

To prevent data loss, it is advisable to create an image of your system partition after initial commissioning.

### Switch off the device

When you work with Windows XP Embedded, always shut down the PC with the command **Start > Shut Down**.

**Note**

The Enhanced Write Filter should be enabled following the installation of Windows XP Embedded on a CompactFlash card. When this is enabled, the device can be switched off by disconnecting the power supply.

## 7.3        Startup - Windows XP Professional / Vista Ultimate

### 7.3.1        Basic commissioning - initial startup

#### Configuring the operating system

When the computer starts up for the **first** time, the Windows XP Professional / Vista Ultimate operating system on the hard disk is configured automatically. Proceed as follows:

1.  Connect the device to the 24 V DC power supply. The PC performs a self-test (POST). During the self-test, this message appears:

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

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

    | NOTICE |
    | --- |
    | The device may not be switched off at any time during the installation process. |
    | Do **not** change the default BIOS settings, otherwise the operating system setup may become corrupted. |

3.  Automatic restart
    After you have entered all necessary information and the operating system is configured, the PC is automatically restarted and displays the user interface of the operating system.

    #### Note

    System startup can take considerably longer than usual for the initial commissioning.

    When you switch on the PC now, the user interface of the Windows XP Professional / Vista Ultimate operating system is automatically opened when the startup routine is completed.

    #### Note

    To prevent data loss, it is advisable to create an image of your system partition after initial commissioning.

#### Switch off the device

When you work with Windows XP Professional, always shut down the PC with the command **Start > Shut Down**.

## 7.3.2 Setting up the language selection for Windows XP Professional / XP Embedded

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

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

---

**Start > Control Panel > Regional and Language Options**
**Languages,** tab **Language used in menus and dialogs**
field.

For the **Regional and Language Options** set the default as **non-Unicode programs** under **Advanced** in addition to the language for menus and dialogs.

---

# 7.4 Commissioning - other operating systems

## 7.4.1 Commissioning - guide

The desired operating system can be installed on the hard disk or a Compact Flash card. A variety of USB devices (hard disk, external floppy or CD-ROM drive, USB stick) or Compact Flash cards can be used as boot media.

```
┌─────────────────────┐
│ Commission          │
│ Microbox PC 427B    │
└─────────────────────┘
          │
┌─────────────────────────────────────────────────────────────────┐
│ ┌──────────────┐   ┌──────────────┐   ┌──────────────┐           │
│ │ Select /     │   │ Install the  │   │ Select the   │           │
│ │ create       │   │ operating    │   │ final        │           │
│ │ installation │   │ system from  │   │ boot medium  │           │
│ │ boot medium  │   │ boot medium  │   │              │           │
│ └──────────────┘   └──────────────┘   └──────────────┘           │
└─────────────────────────────────────────────────────────────────┘
```
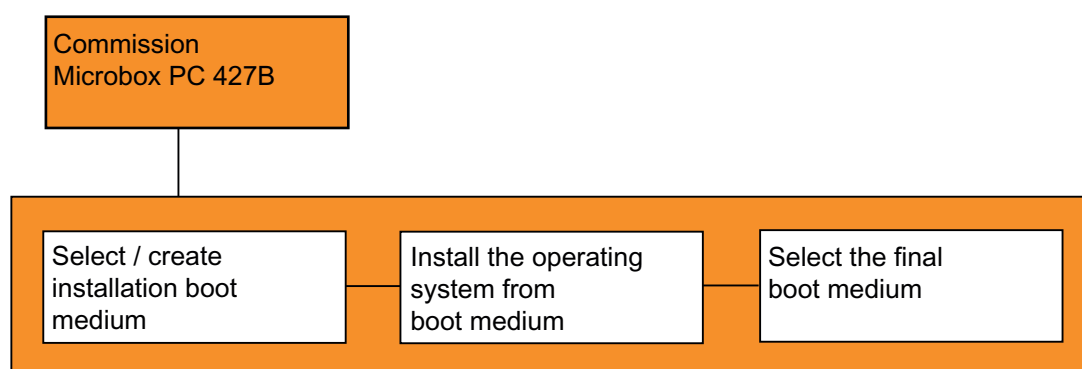
The following provides an overview of the steps involved in commissioning:

| Steps | | Description |
|---|---|---|
| 1 | Select and create a boot medium for installation. | Select a suitable boot medium for the operating system to be used in the BIOS Setup (CD-ROM drive, Compact Flash card, hard disk or USB device). See section *Boot Menu* in the *Detailed Descriptions* chapter. |
| | | If no boot medium is available, one must be created based on the instructions provided by the respective operating system documentation. |
| | | For example, you can use the SIMATIC PC/PG Image Creator tool to make a USB stick a bootable medium. |
| 2 | Install the operating system on the boot medium. | Install the operating system based on the instructions provided by the respective documentation. |
| 3 | Select final boot medium | In the BIOS Setup, select the medium on which the operating system has been installed. |

### Additional information

Further information about installation and commissioning is available in the documentation of the respective operating system.

# Integration into an Automation System

# 8

Options of integration in existing or planned system environments/networks:

## Ethernet

The integrated Ethernet port (10/100/1000 Mbps) can also be used for communication and for data exchange with automation devices such as SIMATIC S7.
For this purpose you require the "SIMATIC NET" software package.

## PROFIBUS/MPI

The optional electrically isolated PROFIBUS interface (12 Mbps) can be used to interconnect distributed field devices or for coupling to SIMATIC S7.

The "SOFTNET for PROFIBUS" software package is required for coupling to S7 automation systems.

## PROFINET

The CP 1616 onboard enables industrial PCs to be connected to Industrial Ethernet. Only one CP 1616 can be installed in a PG/PC. Detailed information can be found in the next section or in the chapter "Detailed descriptions > CP 1616 onboard.

## Device driver CP 16xx.sys

The device driver enables the Windows network protocols to be connected to the Ethernet PROFINET controller "CP 1616 onboard" which is optional on the SIMATIC PCs. The PROFINET interface will act like a 100 Mbit Ethernet interface with a MAC address when you use this driver. The three RJ45 sockets are connected with each other via a switch.

The driver and the documentation can be found in the supplied Documentation and Drivers CD.

## PROFINET IO application

You can create, run or configure PROFINET IO applications with the "Development Kit DK-16xx PN IO". It must be installed in addition to the device driver CP 16xx.sys. This kit and the documentation is available free of charge at the following Internet address:
http://www.automation.siemens.com/net/html_00/produkte/040_cp_1616_devlopkit.htm

## SIMATIC NET PC software

You can create, run and configure the SIMATIC installation with this software package. Information on this can be found on the SIMATIC NET Manual Collection CD. The software package and the documentation are not included in the package.

## CAN

CAN interface for connection to CAN field systems (on request).

## RS232

The serial port can be used for data communication (via terminal applications, for example).

## Additional information

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

http://mall.ad.siemens.com

# 8.1 PROFINET

## CP 1616 onboard

The basic characteristics of the PCS 1616 onboard are:

- Optimized for PROFINET IO
- With Ethernet realtime ASIC ERTEC 400
- Three RJ45 sockets for connecting terminal devices or addition network components
- Integrated 3-port real-time switch
- Automatic hardware detection

| CAUTION |
|---|
| A maximum of one CP 1616/1604 module can be installed in one PG/PC. If you want to use an additional CP 1616/1604 module, the CP 1616 onboard option must be disabled via the entry "Onboard Profinet" in the BIOS Setup under Main > Hardware Options. |

## Additional documentation on PROFINET

Get an overview of the information available on the topic of PROFINET.

| Document name | What is contained in this document? |
|---|---|
| This documentation is **not** included in the product package: | |
| **Getting Started**<br>PROFINET IO Getting Started: Manual Collection | The documents use concrete examples to provide step-by-step instructions on how to commission a fully functional application. |
| **Manual**<br>PROFINET System Description | This gives you the basic knowledge about the PROFINET IO topics:<br>Network components, data exchange and communication, PROFINET IO, component-based automation, application example of PROFINET IO and component-based automation. |
| **Manual**<br>From PROFIBUS DP to PROFINET IO | Read this document if you want to convert an installed PROFIBUS system to a PROFINET system. |
| **Readme file** for CP 1616/CP 1604 and DK-16xx PN IO | This provides the latest information about the SIMATIC NET products CP 1616/CP 1604, CP 1616 onboard, the developer kit. |
| **Configuration Manual**<br>Commissioning PC Stations | This provides you will all the information necessary for commissioning and configuring a PC as a PROFINET IO controller or IO device. |
| **Manual**<br>SIMATIC NET Industrial Communication with PG/PC: Volume 1 - Basics<br>SIMATIC NET Industrial Communication with PG/PC: Volume 2 - Interfaces | This manual introduces you to industrial communication and explains the available communication protocols. It also describes the OPC interface as an alternative to the IO-based user programming interface. |

| Document name | What is contained in this document? |
|---|---|
| **S7 CPs for Industrial Ethernet** <br> Configuring and Commissioning | This provides the following support: <br> - For commissioning S7 stations <br> - For establishing effective communication |
| **Manual** <br> SIMATIC NET - Twisted Pair and Fiber-Optic Networks | Configure and build your Industrial Ethernet networks based on this document. |
| This documentation is part of the supplied Documentation and Drivers CD: | |
| **Operating instructions** <br> CP 1616/CP 1604/CP 1616 onboard | This provides you with all information required for operation. |
| **Installation guide** <br> Device Driver CP16xx.sys | Read this guide if you want to install the NDIS device driver, CP16xx.sys. |

## Further information

You can find the information on specific products in the Internet at the address: http://www.siemens.de/simatic-net

# Functions

<div style="text-align: right; font-size: 3em;">9</div>

## 9.1 Monitoring functions

### 9.1.1 Overview

The following individual functions are implemented:

- Temperature monitoring
- Watchdog

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

The SOM software (Safecard On Motherboard) and DiagMonitor software on CD (optional) are available for Windows XP Embedded, Windows XP Professional and Windows Vista Ultimate.

The DiagMonitor software contains the monitoring software, the software for the stations to be monitored and a library for creating user-specific applications with Windows XP or XP Embedded.

### 9.1.2 Temperature monitoring/display

#### Temperature monitoring

The temperature is recorded by two temperature sensors. One sensor monitors the processor temperature and the other monitors the temperature near the RAM module.

If one of the two temperature values exceeds the configure temperature threshold (CPU: 100°C, Motherboard: 95°C), the following fault reactions are triggered:

| Reaction | Option |
|---|---|
| The SOM or DiagMonitor software is enabled | None |

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

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

## 9.1.3 Watchdog (WD)

### Function

If the user program does not respond to the watchdog within the predetermined monitoring time, the watchdog monitors the program process and informs the user about various reactions.

After POWER ON of the device or after a HW RESET (cold restart), the watchdog is in idle state, i.e. a reaction of the WD will not be triggered and the Watchdog LED is switched off.

### Watchdog reactions

If the WD is not triggered again within the set time (by application with the help of the SOM drive), the following reactions are triggered:

| Reaction | Option |
|---|---|
| Switch watchdog LED to red | None |
| Trigger a PC reset | Configurable |
| Enable the SOM or DiagMonitor software | None |

#### Note

If the desired device reset is not performed, go the Advanced menu of the BIOS Setup and set the SafeCard functions to Enabled. Contact Customer Support for a detailed description of the Watchdog functions.

### WD monitoring times

The monitoring times are defined as follows:

Normal mode: 94 ms, 210 ms, 340 ms, 460 ms, 590 ms, 710 ms, 840 ms and 960 ms.
Macro mode: 2s, 4s, 6s, 8s, 16s, 32s, 48s and 64s.

#### Note
#### Default mode

The macro mode is selected as the default during SOM operation.

#### Note

The watchdog is retriggered if the monitoring time is changed at the active watchdog (that is while the watchdog is running)!

### See also

Watchdog enable register / 066h select register (read/write, address 062h) (Page 146)

## 9.1.4    Safecard on Motherboard (SOM)

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

Your device is equipped with three temperature sensors which are automatically detected by the application.
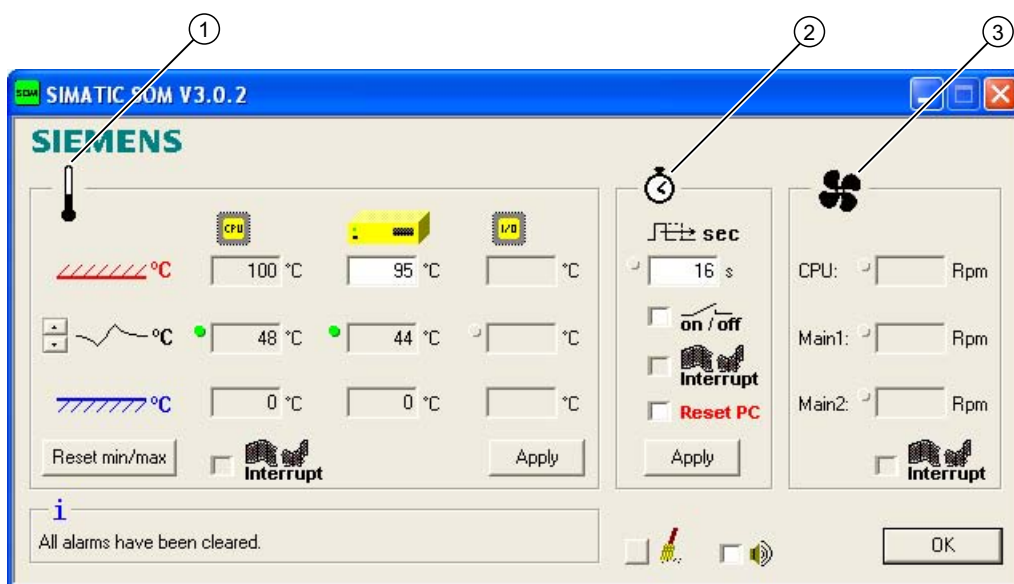


Figure 9-1       Safecard On Motherboard

| 1 | Temperature range: | Here the current temperature and limit values are shown. You can toggle the temperature display mode to indicate either the current temperature, or the min./max. values measured since the start of the application. |
|---|---|---|
| 2 | Watchdog area: | Here, you can configure the watchdog function in your monitoring application. You can specify the watchdog time, activate a PC reset and activate / deactivate the watchdog. |
| 3 | Fan area: | This option is not enabled because the device does not have a fan. |

# 9.2 Enhanced Write Filter (EWF)

## Purpose and function

The EWF (Enhanced Write Filter) is a function that is only available with Windows XP Embedded operating systems. It provides write protection that can be configured by the user.

The Enhanced Write Filter allows you to boot Windows XP Embedded from write-protected media (such as CD-ROM), to write protect individual partitions and adapt the performance of the file system to your needs (when using Compact Flash cards, for example).

EWF can be used to minimize write access to Compact Flash cards. This is important because the write cycles on Compact Flash cards are limited due to technical reasons. We therefore recommend using EWF if you work with Compact Flash cards.

### Note

The Enhanced Write Filter is disabled by default for Windows XP embedded with SP2. After the operating system has been set up, you should back up your date and then enable the EWF.

## Set EWF

The EWFMGR.EXE program can be used to install, enable or disable the EWF. Use the command prompt to call up the program. The following functions are available:

| Function | Command |
|---|---|
| Write-protect drive C: Switching on | `ewfmgr c: -enable` |
| Write-protect drive C: disable<br> (modified files are accepted) | `ewfmgr c: -commitanddisable` |
| Modified files on drive C: Accept | `ewfmgr c: -commit` |
| Display information about the EWF drive | `ewfmgr c:` |
| Display help | `ewfmgr c: /h` |

### Note

The EWF commands affecting the write protection do not become active until after the next booting process.

## Special features for the use of Enhanced Write Filters (EWF)

- In the event of a power failure, if the EWF is enabled changes made after the boot sequence on drive C: are lost.
  To prevent data loss in the event of a power failure, the use of a USV is recommended.

- You can save the files in the EWF RAM overlay to the Compact Flash card or the hard disk before you shut down the device. To do so, enter the following command in the command prompt:

```
ewfmgr c: -commitanddisable
```

Then restart the system.
```
ewfmgr c: -enable
```
Then restart the system.

---

**Note**

When the system is set to automatically adjust the clock for daylight saving time adjustment, systems without central time management and with activated EWF set the clock forward or backward by one hour in the daylight saving time or standard time period each time the system boots.

The reason for this reaction is that Windows XPe has a registry entry that detects if the clock has been adjusted for daylight saving time. Since this file is also protected against modification by the EWF, the marker is lost during the boot sequence and the adjustment is made again.

We therefore recommend that you deactivate the automatic adjustment and change the clock manually.

Procedure:

1. Switch off the EWF filter (ewfmgr c: -commitanddisable) and reboot the system.
2. Deactivate automatic adjustment in the Control Panel. In the Time Zone tab opened with the menu command Start > Control Panel > Date and Time, remove the check mark from the "Automatically adjust clock for daylight saving changes" check box.
3. Enable EWF again (ewfmgr c: -enable) and reboot the system.

---

## 9.3 SRAM buffer memory

For applications to be able to store data following a power failure, the motherboard features a battery-buffered CMOS-RAM. If the supply voltage fails longer than 5 ms, this is indicated by the DC FAIL signal.

At least 10 ms are available for copying the data to the buffered RAM. During this time, 128 Kb can be saved with a full load and even more with a smaller configuration, in other words, a lesser load.

A maximum 2048 Kb memory window is displayed via a PCI address register. The base address is initialized by the BIOS.

A corresponding function is implemented there for using the CMOS-RAM under WinAC RTX.

| NOTICE |
|---|
| If replacement of the battery takes longer than 30 seconds, the data saved in the CMOS RAM and in the buffered SRAM is lost. |

## 9.4 Battery monitoring

The installed buffer battery has a service life of at least 5 years. The status can be checked with two-tier battery monitoring. The information can be read from an I/O register and evaluated.

When the first warning level is reached, the remaining service life of the battery for buffering CMOS data and buffered SRAM is at least 1 month.

## 9.5 Operation without monitor and keyboard

The device can be operated without a monitor and keyboard. The device startup is guaranteed without these peripherals. A USB keyboard and mouse and an analog CRT monitor can be later connected for diagnostics.

A digital DVI monitor can only be subsequently activated when the Windows XP embedded or Windows XP Professional operating system has fully booted.

# Expansions and configurations

<div style="text-align: right; font-size: 2em;">10</div>

## 10.1 Open the device (front panel)

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

| ⚠ CAUTION |
| --- |
| **The device contains electronic components which may be destroyed by electrostatic charge.** |
| You therefore need to take precautionary measures before you open the device. Refer to the ESD directives on handling components which are sensitive to electrostatic charge. |
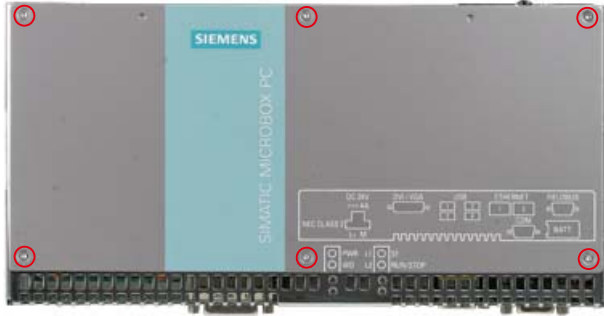
### Tools

- Cover and top cover plate: Torx T8
- Hard disk mounting: Torx T10
- Protective earth terminal: Torx T20
- Spacing bolts PC/104: Hexagon head 5mm

### Preparation

Isolate the device from power supply.

**Open the device**

| Steps in opening the device (front panel) | |
|---|---|
| 1 | Remove the six screws.  |
| 2 | Remove the front panel. |

## 10.2 Memory expansion

### 10.2.1 Installing the memory module

**Memory expansion options**

The motherboard is equipped with one slot for a memory module. An SO-DIMM DDR2 memory module can be used. This allows you to expand the memory capacity of your device to a maximum of 2 GB.

---

**Note**

We recommend using the original spare parts for memory configuration.

---

**Preparation**

Disconnect the device from the power supply.

| CAUTION |
| --- |
| The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatic sensitive components. |

**Removing a memory module**

| How to remove a memory module | |
| --- | --- |
| **1** | Open the device. |
| **2** | Open the clamps (1). Tilt the memory module forward.  |
| **3** | Carefully remove the memory module. |
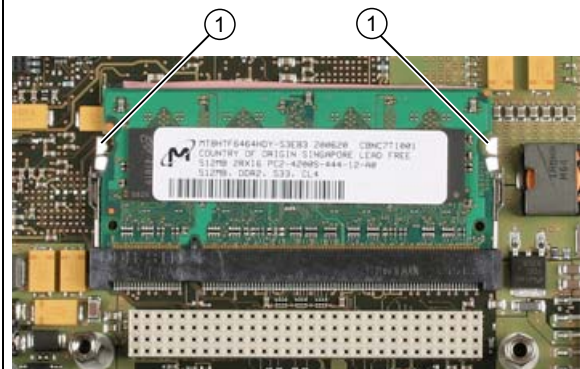
## Installing a memory module

| How to install a memory module | | |
|---|---|---|
| **1** | Set the memory module in the mount tilting forward. |  |
| **2** | Push the memory module back until it locks into place. | |
| **3** | Close the device. | |

## Display of the current memory configuration

The new memory configuration is detected automatically. System RAM, Extended RAM and Cache SRAM are displayed during device startup.

## 10.3 Mounting PCI-104 / PC/104 Plus modules

### 10.3.1 Notes on the modules

**Notes on module specifications**

The device is designed for use with modules conforming to specifications of the PC/104 Consortium.

- PCI-104 modules: PCI compatible (120-pin plug)
- PC/104 *Plus* modules that use only the 120-pin plug (PCI bus)

---

**Note**

The necessary expansion frames for mounting these modules can be ordered as a 6-pack with the order number 6AG4070-0BA00-0XA0 via the A&D online ordering system.

---

| NOTICE |
|---|
| When expanding the device with PCI-104 / PC/104 Plus modules, adhere to the safety and mounting regulations for the expansion modules. |
| The device may be mounted in an enclosure that meets the requirements of Sections 4.6 and 4.7.3 of IEC/UL/EN/DINEN60950-1. |

### 10.3.2 Mounting PCI-104 or PC/104 Plus modules

**Tools**

Use hexagon head screws (5 mm) to mount the spacing bolts of the PCI-104- or PC/104-*Plus* module. If this is the only PCI-104 or PC/104-*Plus* module you wish to mount, you can also use screws (M3) instead of the spacing bolts.

**Preparation**

- Isolate the device from power supply.
- Two blanking plates are mounted on the expansion frame. If the PCI-104 or PC/104-*Plus* module features external ports, you can use these blinding plates to mount the connectors. You can also use a slot plate with existing connector perforations. The dimensional drawings provide the required measurements.
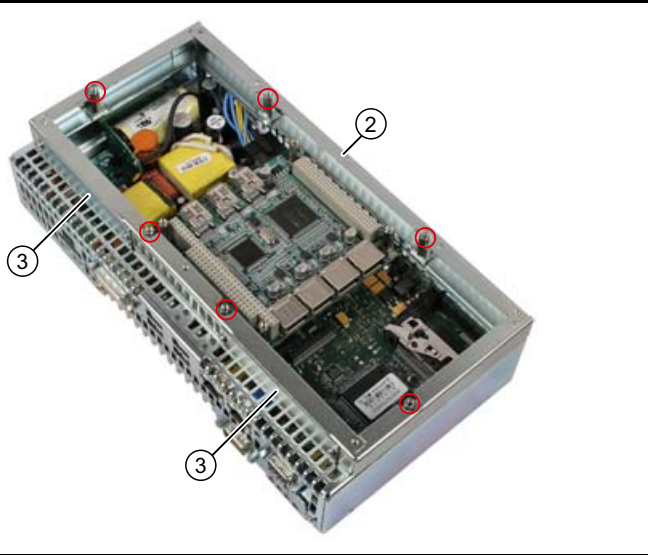
| CAUTION |
|---|
| The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatic sensitive components. |

## Mounting PCI-104 or PC/104-*Plus* modules

| Steps for mounting an expansion module | |
|---|---|
| **1** | Open the device (remove front panel). |
| **2** | Insert module in slot (1)<br> |
| **3** | Secure the module with four screws or spacing bolts.<br> |

| Steps for mounting an expansion module | |
|---|---|
| **4** | Mount the expansion frame (2) and secure it with six spacing bolts. Mount the slot plate (3) if there any external connectors.  |
| **5** | Mount the front panel on the expansion frame. |

## Mounting additional PCI-104 or PC/104-*Plus* modules

The device can be equipped with a maximum of PCI-104 or PC/104-*Plus* modules. An additional expansion frame is required for each module.

Follow the mounting procedure described in the previous section (steps 2 to 4).

## Configuring/installing a PCI-104 or PC/104-*Plus* module

You may need to make settings in the BIOS Setup. For detailed information about installation, refer to the manufacturer documentation for the respective module.

# 10.4     Installing/removing Compact Flash cards

## 10.4.1     Installation options for Compact Flash cards

### Memory expansion options

The device features an accessible slot for Compact Flash cards (types I / II). As an alternative to a hard disk, you can optionally order a fixed-mounted, inaccessible Compact Flash card drive.

Only use SIMATIC PC Compact Flash cards for industrial application.



Figure 10-1     SIMATIC PC Compact Flash

## 10.4.2 Installing/removing an accessible Compact Flash card

### Preparation

Disconnect the device from the power supply.

| ⚠ CAUTION |
| --- |
| The electronic components on the PCBs are highly sensitive to electrostatic discharge. Always take appropriate precautionary measures when handling these components. Refer to the ESD directives on handling electrostatic sensitive components. |

### Opening the module receptacle
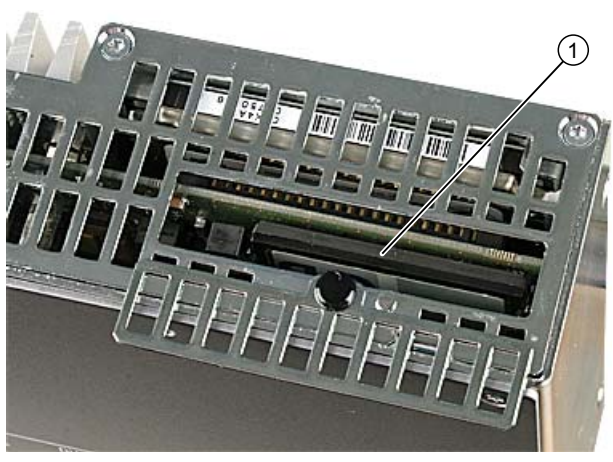
| Steps for opening the module receptacle | |
| --- | --- |
| Turn the cover plate (1) of the module receptacle 180 degrees counter-clockwise. |  |
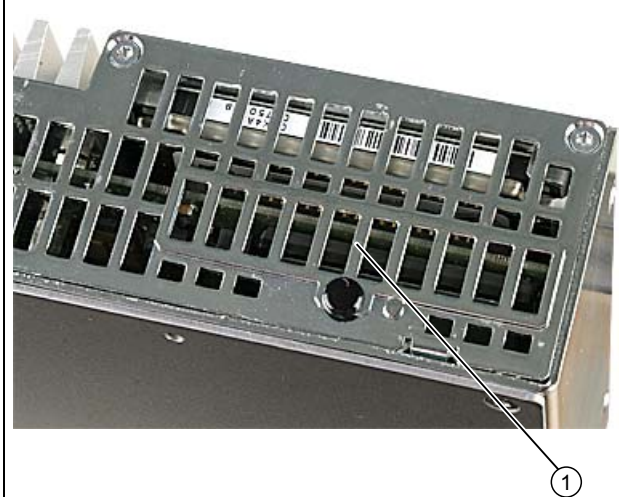
**Installing the Compact Flash card**

| Steps for installing a Compact Flash card | |
|---|---|
| **1** | Open the module receptacle. |
| **2** | Insert the Compact Flash card in the slot (2) with the connector facing in until it locks into place.  |
| **3** | Close the module receptacle again. |
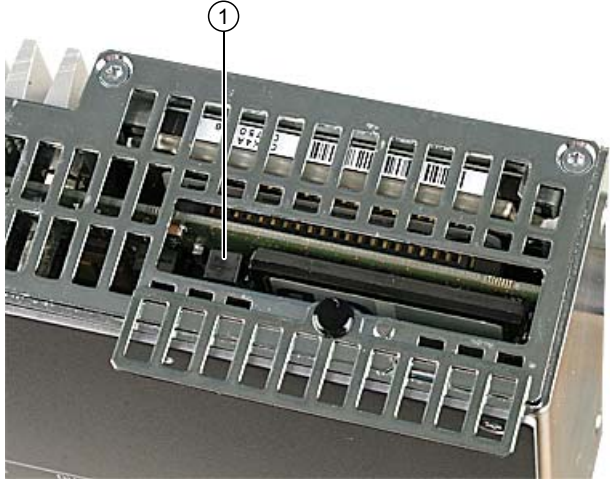
**Note**

The Compact Flash slot is coded against reversed insertion. Insert it so that its upper side (label side) is facing the front panel of the Microbox PC.
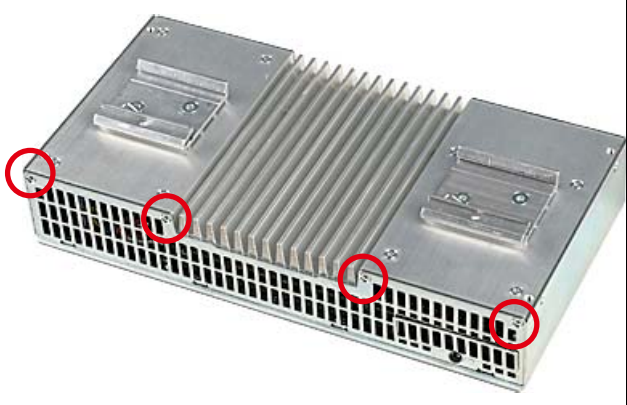
| ⚠ **CAUTION** |
|---|
| If the Compact Flash card meets resistance, flip it over. Never insert the Compact Flash card with force. |

## Removing the Compact Flash card

| Steps for removing a Compact Flash card | |
|---|---|
| **1** | Open the module receptacle. |
| **2** | Press the eject button (2) and pull out the Compact Flash card. |
| **3** | Close the module receptacle again. |

## 10.4.3    Installing/removing a built-in Compact Flash card

**Removing/installing a built-in Compact Flash card**

| Steps for removing a built-in Compact Flash card | | |
|---|---|---|
| **1** | Remove the four screws of the cover plate and remove it |  |
| **2** | Carefully remove the Compact Flash card from the mount. |  |
| **3** | Fasten the cover plate again. | |

To install, carry out the above steps in reverse order.

# Maintenance and service

# 11

## 11.1 Removing and installing 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. |

- Always separate the device from the mains before opening it.
- Only install system expansion devices designed for this device. If you install other expansion devices, you may damage the device 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 ESB instructions. |

#### Limitation of Liability

All specifications and approvals are only valid when the expansion component feature the CE symbol. Observe the installation instructions for the expansion components.

UL approval of the device only applies when the UL-approved components their "Conditions of Acceptability" have been followed.

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

## Tools

- Torx T8 (cover and upper sheet metal cover)
- Torx T10 (hard disk mounting)
- Torx T20 (Protective earth terminal)
- Hexagon head 5mm (spacing bolts PC/104)

## 11.1.2    Preventive maintenance

To maintain high system availability, we recommend the preventative exchange of those PC components that are subject to wear. The table below indicates the intervals for this exchange.

| Component | Exchange interval: |
|---|---|
| Hard disk | 3 years |
| CMOS backup battery | 5 years |

## 11.1.3 Replacing a hard disk

| ⚠ CAUTION |
| --- |
| Replacement of the hard disk may only be carried out by authorized qualified personnel. |

### Tools

You will need size TORX T8 and T10 screwdrivers to mount the hard disk and a 5mm Allen wrench for installing/removing PC/104 modules.

You will need a TORX T20 screwdriver to loosen the protective earth terminal.

### Preparation
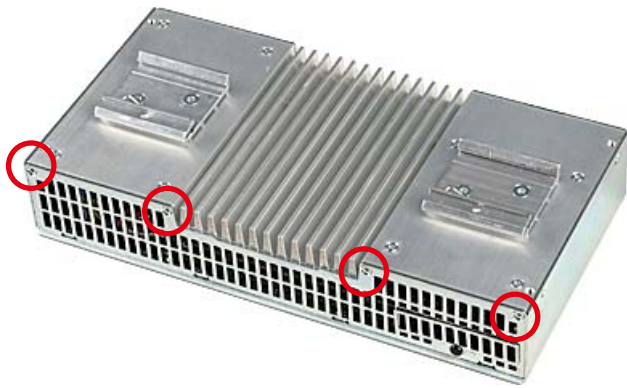
1. Disconnect the device from the power supply.

2. Unplug all peripherals (mouse, keyboard, monitor, for example) from the device.

### Removing the hard disk
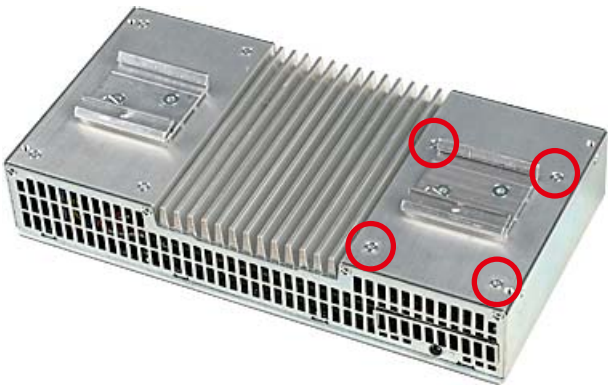
| NOTICE |
| --- |
| Note the ESD instructions. |

| Steps for removing the hard disk | |
| --- | --- |
| 1 | Remove the four screws of the cover plate and remove it |  |

| Steps for removing the hard disk | | |
|---|---|---|
| **2** | Remove the 4 screws holding the hard disk to the back of the enclosure. |  |
| **3** | Carefully pull out the hard disk from the enclosure. |  |
| **4** | Take the hard disk from the mount |  |
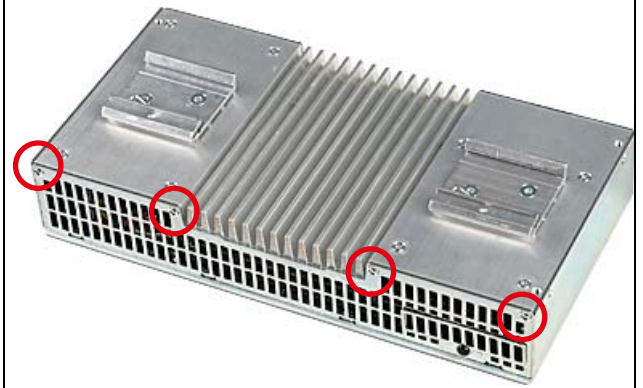
## Installing hard disk

Carry out the described tasks in the reverse order.

## 11.1.4    Replace the backup battery

**To be noted before you replace the battery**

> **Note**
>
> The service life of a backup battery is approximately 5 - 8 years, depending on the operating conditions.

> **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.: A5E00331143).

**Disposal**

> **CAUTION**
>
> Depleted batteries must be disposed of in accordance with local regulations.

**Preparation**

> **Note**
>
> The configuration data and contents of the SRAM in the device are buffered for at least 30 seconds.
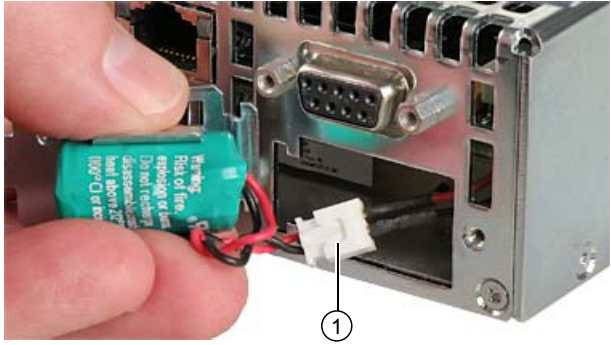
1.  Note down the current settings of the BIOS setup or save the settings as a user profile in the Exit menu of the BIOS setup.
    A list in which you can note this information is available in the BIOS description.

2.  Disconnect the device from the power supply.

**Tool**

You will need a TORX T8 screwdriver to open the battery compartment.

## Replacing the battery

Proceed as follows:

| Steps for replacing the battery | | |
|---|---|---|
| **1** | Open the battery compartment. |  |
| **2** | Remove the battery holder. |  |
| **3** | Pull out the battery plug (1). | |
| **4** | Take the old battery out of the holder. | |
| **5** | Place a new battery in the holder and reconnect the battery plug. | |
| **6** | Close the battery compartment. | |

## Reconfiguring the BIOS Setup

If the battery replacement takes longer than 30 seconds, the configuration data of the device will be lost. You will have to reconfigure the BIOS setup in this case.

## 11.2      Reinstalling the operating system

### 11.2.1      Windows XP Embedded

#### 11.2.1.1      General installation procedure

If your software becomes corrupt for any reason, you can reinstall it from the Restore CD. The Restore CD contains an image file for the hard disk or CF card with the original software (operating system with installed hardware drivers).

---

**Note**

You require a USB keyboard and a USB CD-ROM drive to reinstall the operating system.

---

#### 11.2.1.2      Restoring the software to factory state using the Restore DVD

You can restore the original factory software using the Restore CD/DVD. The CD/DVD contains the necessary images and tools for transferring the factory software to the hard disk or CF card of your PC. The following options are available for restoring software:

- You can restore the entire hard disk with drive C: (system) and drive D:
- You can restore drive C: only. This allows you to retain any user data on drive D.
- Restoring the entire CF card.

| CAUTION |
|---|
| If "Restore system partition only" is set all data on drive C: (system) will be deleted. All data, user settings and all authorizations or license keys on drive C: will be lost in the process! All data on drive C: of your hard disk 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. |

## Restoring the factory state

To restore the factory state, proceed as follows:

1. Connect a USB CD-ROM drive to the device.

2. Insert the Restore CD/DVD in the drive and reboot the device. When the BIOS message appears, press

   ```
   Press <F2> to enter Setup or <ESC> to show the Boot menu
   ```

   the F2 key.

3. Select the Boot menu and move the entry "CD-ROM Drive" to the first position.

4. Close the BIOS setup with the "Exit Saving Changes" entry.

5. Follow the on-screen instructions.

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

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

**Note**

The "Legacy USB Support" option has to be set to "Enabled" in the Advanced menu of the BIOS so that the device can address a USB CD-ROM drive.

## 11.2.2 Windows XP Professional

### 11.2.2.1 General installation procedure

If your software becomes corrupt for any reason, you have two possibilities:

- **Restoring the factory state of the software by means of the Restore DVD**
  The Restore DVD contains an image of the original supplied software (operating system with installed drivers) and is included in the Windows XP Professional variant.

- **Setting up the operating system with the Recovery CD**
  The recovery CD contains the tools required to set up the hard drive as well as the Windows XP Professional operating system. After the required data have been copied to the hard disk, you can run Windows XP professional Setup to install the operating system.
  The Recovery CD can be obtained from the Customer Support.

---

**Note**

You will need a USB keyboard in order to reinstall the operating system.

---

### 11.2.2.2 Restoring the Software to Factory State Using the Restore DVD

You can reinstall the original factory software (included in the Windows XP Professional supply variant) using the Restore DVD. The DVD contains the necessary images and tools for transferring the factory software to the hard disk of your PC. The following options are available for restoring software:

- You can restore the entire hard disk with drive C: (system) and drive D:

- You can restore drive C: only. This allows you to retain any user data on drive D.

| CAUTION |
|---|
| With the option "Restore system partition only", all data on drive C: (system) will be deleted. All data, user settings and all authorizations or license keys on drive C: will be lost in the process! All data on drive C: of your hard disk 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. |

## Restoring the delivery state

To restore the factory state, proceed as follows:

1. Connect a USB DVD-ROM drive to the device.

2. Insert the Restore DVD in the drive and reboot the device. When the BIOS message
   ```
   Press <F2> to enter Setup or <ESC> to show the Boot menu
   ```
   appears, press the F2 key.

3. Select the Boot menu and move the entry "CD-ROM Drive" to the first position.

4. Close the BIOS setup with the "Exit Saving Changes" entry.

5. Follow the on-screen instructions.

---

**CAUTION**

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

---

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

---

**Note**

The "Legacy USB Support" option has to be set to "Enabled" in the Advanced menu of the BIOS so that the device can address a USB DVD-ROM drive.

---

## Setting up the language selection for Windows XP Professional / XP Embedded

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

Default language of your Windows XP Professional / XP Embedded MUI installation is English and a US keyboard layout. You can change the language in the Control Panel. Select:

---

**Start > Control Panel > Regional and Language Options  Languages,**
tab  **Language used in menus and dialogs** field.

For the **Regional and Language Options** set the default as **non-Unicode programs** under **Advanced** in addition to the language for menus and dialogs.

---

### 11.2.2.3 Setting up the operating system via the Recovery CD/DVD

Use the supplied Recovery CD/DVD to install Windows to suit your particular requirements. The operating system used is Windows Preinstall Environment (WinPE). You also need the included Documentation and Drivers CD.

---

**Note**

Prerequisite is that you connect a USB CD-ROM drive to the device and have set the "Legacy USB Support" option to "Enabled" in the BIOS setup.

---

#### Booting with the Recovery CD/DVD

1. Insert the Restore CD/DVD in your drive and reboot the device. When the BIOS message
   `Press <F2> to enter Setup or <ESC> to show Bootmenu`
   appears, press the ESC key. The "Boot Menu" is displayed when initialization is completed.

2. Follow the on-screen instructions until the "Siemens SIMATIC Recovery" window opens.

#### Partition setup

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

---

With Windows XP operating systems, the factory state features two partitions with an NTFS file system on the hard disk. To restore the partitions to factory state, proceed as follows:

1. Boot from the Recovery CD/DVD and then follow the on-screen instructions until the Recovery functions window is displayed.

2. Start the DiskPart tool in the "Siemens SIMATIC Recovery" window. Enter the following commands in the displayed command interface:

| | |
|---|---|
| list disk | Displays all available hard disks. |
| select disk 0 | Selects the disk where you wish to change the configuration. 0 selects the first hard disk. |
| list partition | Displays all partitions on the selected hard disk. |
| clean | Completely wipes the selected hard disk. All information stored there is lost. |
| create partition primary size=n | Creates a primary partition with the n MB on the selected hard disk. Factory state values: n = 10000 for Windows 2000 or XP |
| select partition 1 | Select the primary partition |
| active | Activates the selected partition |
| exit | Closes DiskPart. |

Additional DiskPart functions:

| | |
|---|---|
| Help | Shows all available DiskPart commands. When a command is supplemented with other parameters, the command is described with additional information.<br>Example: create partition help |

### Note

Once you have change the configuration of your hard disk with DiskPart, you will need to reboot the PC for the changes to go into effect.

Boot again from the Recovery CD/DVD to format the partitions.

### Format primary partition

1. Boot from the Recovery CD/DVD to format the partitions. Follow the screen instructions until the Recovery functions window is displayed.

2. Select "Start command prompt" in the Recovery functions window. In the command interface that opens, enter the following command:
   `format DL:/FS:File System`
   DL = Drive letter of the partition to be formatted. Valid values: C, D, E, F etc.
   File system = Specifies the type of file system. Valid values: FAT, FAT32, NTFS.

NTFS is the factory setting for all Windows operating systems.

Example for a master hard disk on the IDE bus

`format C:/FS:NTFS`

format /? Shows all parameters of the command.

## Installation of the operating system.

The recovery CD/DVD contains encrypted data that can only be transferred to this system.

1. Boot from the Recovery CD/DVD and then follow the on-screen instructions until the Recovery functions window is displayed.

2. Select "Recovery Windows ..." in the "Siemens SIMATIC Recovery" window.

3. Follow the instructions on the screen.

### Note

Note that there must still be free space on the drive after the selected recovery data has been transferred:
1500 MB for Windows XP

4. Select "Start command prompt" in the Recovery functions window.

5. Enter the following command in the displayed command prompt interface:
   Drive:
   cd \I386
   Winnt32.bat
   Drive: Drive letter of the folder containing the I386 directory.

6. The preparation of the Windows installation is displayed.

7. When this is completed, close the command prompt with the `exit` command.

8. Close the Siemens SIMATIC Recovery window with the "Finish" button.

9. The Windows installation is completed following an automatic restart of the system.

10. Follow the instructions on the screen.

---

### Note

If you want to use Windows XP as a professional you should have the following manual (not included in the scope of delivery) available:
Microsoft Windows XP Professional, the technical reference" (MSPress Nr 934).

This manual contains information specifically for administrators involved in installing, managing and integrating Windows in networks or multi-user environments.

---

### Setting up the language selection for Windows XP Professional

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

To install the MUI, start

| |
|---|
| "MUI-german" |

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

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

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

## 11.2.3 Recovery of Windows Vista

To recover Windows Vista, there is a full graphical user interface available. It may take several minutes before the first input window appears. In this window, you can set the time and currency formats and select the keyboard language.

English is the basic language and other languages can be installed later with the MUI. The MUI is on the recovery DVD.
Now follow the on-screen instructions. It may take several minutes before the next prompt for the product key is displayed.

### Note

Due to the previous activation, you do not need to enter the product key (COA number). This is entered automatically during the installation.

### Setting up and formatting partitions

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

In the next dialog box, you can set up the hard disk according to your requirements and add controllers that are not yet known to the system.
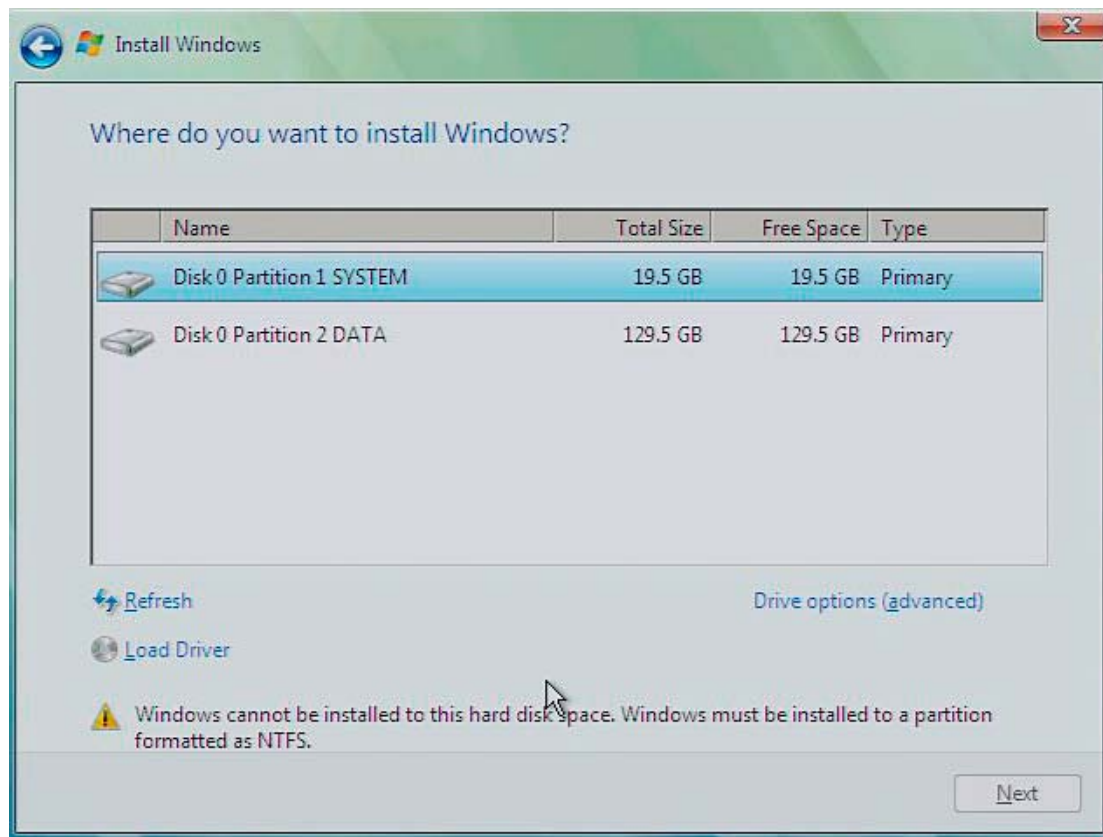
| Options | Meaning |
|---|---|
| Drive options (advanced) | Further functions are displayed with which you can set up the hard disk. |
| Load Driver | To add new drivers, for example the driver for RAID. |



| Options | Meaning |
|---|---|
| Refresh | Updating |
| Delete | Deleting a partition |
| Format | Formatting a partition |
| New | Creating new partitions |
| Load Driver | To add new drivers, for example the driver for RAID |
| Extend | Changing the partition size |
| ⚠️ | Any error messages that occur are displayed behind this icon, for example if the hard disk was not formatted in the required "NTFS" format. |
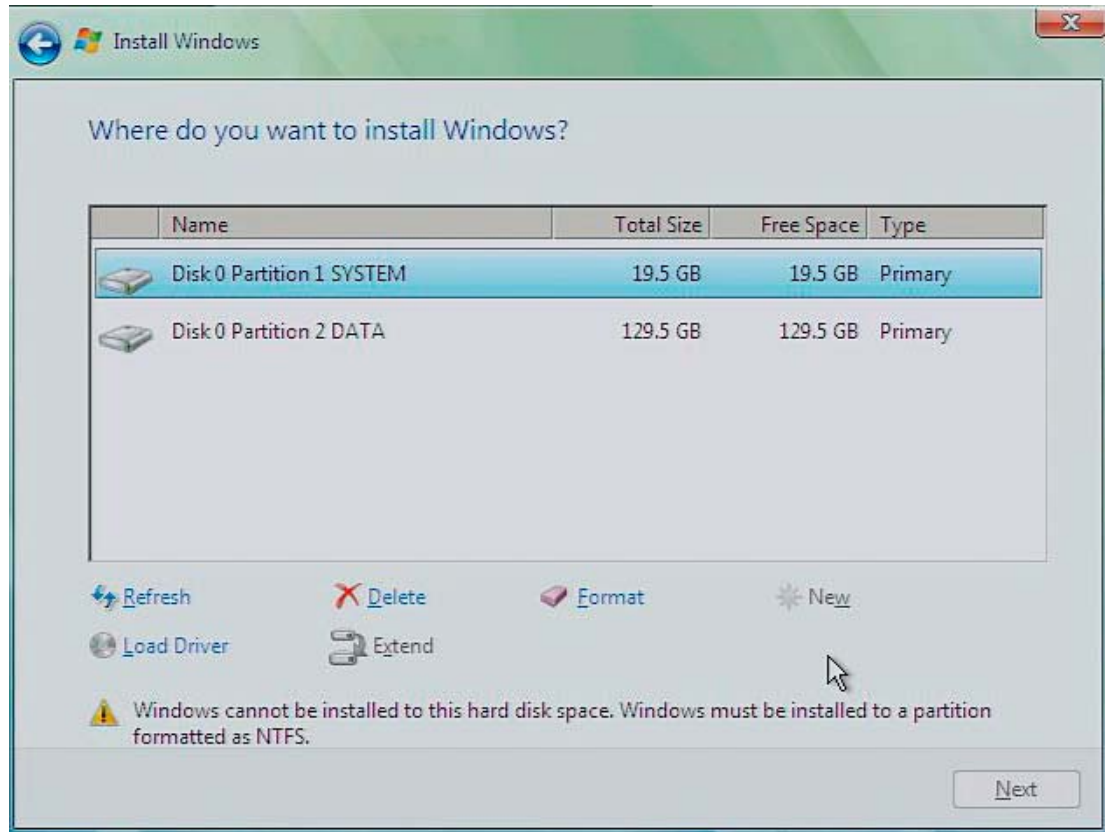
The first partition should be at least 25 GB. The operating system must be installed on this partition. You can use the rest of the hard disk as a data partition. Both partitions must be installed as the NTFS file system.

When shipped, the partitions are set up as follows:

| Partition | Operating system | Name | Size | File system |
|---|---|---|---|---|
| First | Windows Vista | SYSTEM | 25 GB | NTFS not compressed |
| Second | Windows Vista | DATA | Remainder | NTFS not compressed |

Following a reboot, Windows Vista is installed on the hard disk. This process takes at least 20 minutes.

Now follow the instructions on the screen.

---

**Note**

If you want to use Microsoft Windows as a professional user, you will need the following manual (not supplied):
Windows Vista Inside Out

This manual contains information specifically for administrators involved in installing, managing and integrating Windows in networks or multi-user environments.

---

### Setting up language options in Windows Vista

With the Multilanguage User Interface (MUI), you can set up the Windows menus and dialogs for additional languages. When shipped, Windows Vista is installed with English menus and dialogs. You can change this in the Control Panel with the "Regional and Language options" or "Time and Date" dialogs.

Here, you can change all system formats:
Start > Control Panel > Clock, Language, and Region > Change display language > Regional and Language options

Here, you can only change the date and time formats:
Start > Control Panel > Clock, Language, and Region > Change display language > Time and Date

If you want to install additional languages, you can install these later in the Control Panel, as follows. You will find the necessary files on the recovery DVD in the "Languagepacks" folder.

Start > Control Panel > Clock, Language, and Region > Change display language > Regional and Language options > Keyboards and Languages

Further languages can be integrated via Windows Update.

# 11.3 Partitioning data media

## 11.3.1 Setting up the partitions under Windows XP Embedded

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

### Partitioning the Compact Flash card

The factory state of the Compact Flash card includes the following partitions:

| Partition | Name | Size of the card | | | | File system |
|---|---|---|---|---|---|---|
| | | 512 MB | 1 GB | 2 GB | 4 GB | |
| 1. Partition | SYSTEM | 455 MB | 900 MB | 1536 MB | 2560 MB | NTFS (compressed) |
| 2. Partition | DATA | Remainder * | Remainder * | Remainder * | Remainder * | NTFS (compressed) |

* Due to partitioning/formatting, the actual Compact Flash capacity does not correspond to the memory size specified on the Compact Flash.

### Partitioning the hard disk

The factory state of the hard disk with Windows XP Embedded includes the following partitions:

| Partition | Name | Size | File system |
|---|---|---|---|
| 1. Partition | SYSTEM | 20 GB | NTFS (not compressed) |
| 2. Partition | DATA | Remainder | NTFS (not compressed) |

To restore the original partition to its factory state, we recommend the software tool **SIMATIC PC/PG Image Creator.** Detailed information about using this tool is available in the manufacturer documentation.

## 11.3.2    Setting up the partitions under Windows XP Professional / Vista Ultimate

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

### Partitioning the hard disk

The factory state of the hard disk with Windows XP Professional / Vista Ultimate includes the following partitions:

| Partition | Name | Size | File system |
|-----------|------|------|-------------|
| 1. Partition | SYSTEM | 15 or 20 GB | NTFS (not compressed) |
| 2. Partition | DATA | Remainder | NTFS (not compressed) |

To restore the original partition to its factory state, we recommend the software tool **SIMATIC PC/PG Image Creator.** Detailed information about using this tool is available in the manufacturer documentation.

## 11.4 Install drivers and software

### 11.4.1 Driver installation under Windows XP Embedded

The driver installation under Windows XP Embedded is conducted in the same way as under XP Professional. Pay attention to the installation instructions of the driver manufacturer.

When drivers are being installed under Windows XP Embedded, you may see a message that the Windows XP Installation CD or SP2 CD is required.

In this case, insert the Restore DVD. The required files are in the \Drivers_XPE folder.

Disable the Enhanced Write Filter before installing drivers and enable it again when you are finished.

### 11.4.2 Installing drivers and software

| NOTICE |
| --- |
| Before you install new drivers or updates for multilingual operating systems, (MUI versions), reset the regional settings for menus and dialogs and the default language to US English. |

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

1. Place the CD into the drive.

2. Start the program with "START".

3. Select "Drivers & Updates" from the index.

4. Select the operating system in "Drivers & Updates".

5. Install the required driver.

| NOTICE |
| --- |
| For new Windows XP Professional / Vista Ultimate installations, the chipset driver must be installed before you install any other drivers. |

# 11.5 Installing updates

## 11.5.1 Updating the operating system

### Windows

The latest updates for Windows operating systems are available on the Internet at **http://www.microsoft.com**

| NOTICE |
| --- |
| Before you install new drivers or operating system updates for Windows MUI versions, set the default language to US English in the regional settings for menus and dialogs. |

### Other operating systems

Please contact the corresponding manufacturer.

## 11.5.2 Installing or updating application programs and drivers

A USB drive has to be connected to install the software from a CD and/or disk under Windows XP Embedded / Windows XP Professional / Windows Vista Ultimate.

Drivers for USB floppy disk and CD-ROM drives are included in Windows XP Embedded/Windows XP Professional and do not have to be installed from other sources.

For information about installation of SIMATIC software packages, refer to the corresponding manufacturer documentation.

For updates of drivers and application programs from third-party manufacturers, contact the respective manufacturer.

| NOTICE |
| --- |
| Before you install new drivers or operating system updates at Windows XP Professional MUI versions, the regional settings for menus and dialogs and the default language have to be reset to US English. |

# 11.6     Data backup

## 11.6.1     Creating an image

**Data backup under Windows XP Embedded / Windows XP Professional / Vista Ultimate**

To back up data under Windows XP Embedded / Windows XP Professional / Vista Ultimate, we recommend the software tool **SIMATIC PC/PG Image Creator**. This tool provides comfortable and efficient functions for backup and restoring the full content of Compact Flash cards, of HDDs and of individual partitions (images.)

The Image Creator only supports the burning of DVD media.

The software can be ordered from the Siemens A&D online ordering system. For detailed information about SIMATIC PC/PG Image Creator, refer to the corresponding product documentation.

## 11.7    CP 1616 onboard

### NDIS device driver

Read the information in the description Installation_CP16xx.pdf document on the supplied Documentation and Drivers CD.

### PROFINET IO

Please observe the information on the SIMATIC devices and SIMATIC NET documentation listed in the chapter "Integration".

# Alarm, error, and system messages

# 12

## 12.1 Boot error messages

During startup (the boot process), the BIOS first performs a Power On Self Test (POST) and checks whether certain functional units of the PC are operating error-free. The boot sequence is immediately interrupted if critical errors occur.

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

The error messages output by system BIOS are listed below. For information on error messages output by the operating system or application programs, refer to the corresponding manuals.

### On-screen error messages

| On-screen error message | Meaning / tip |
|---|---|
| Address conflict | Plug and Play problem.<br>Contact your technical support team. |
| Combination not supported | Plug and Play problem.<br>Contact your technical support team. |
| IO device IRQ conflict | Plug and Play problem.<br>Contact your technical support team. |
| Invalid System Configuration Data | Plug and Play problem.<br>• Set the RESET CONFIGURATION DATA option in the "Advanced" menu of Setup.<br>• Contact your Technical Support. |
| Allocation Error for ... | Plug and Play problem<br>• Undo the last hardware change.<br>• Contact your Technical Support. |
| System battery is dead. Replace and run SETUP | The battery on the CPU module is defective or dead.<br>Contact your technical support team. |
| System CMOS checksum bad Run SETUP | Call SETUP, adjust and then save the settings. Contact Technical Support if this message persists in further retries to startup the system. |
| Failure Fixed Disk | HDD access error.<br>Check the configuration in SETUP.<br>Contact Technical Support. |
| Keyboard error | Check whether the keyboard is properly connected. |
| Key seizure | Check whether a key on the keyboard has seized. |

| On-screen error message | Meaning / tip |
|---|---|
| System RAM Failed at offset: | Memory error.<br> Contact Technical Support. |
| Shadow RAM Failed at offset: | Memory error.<br> Contact Technical Support. |
| Extended RAM Failed at offset: | Memory error.<br> Contact Technical Support. |
| Failing Bits: | Memory error.<br> Contact Technical Support. |
| Operating system not found | Possible causes:<br>• No operating system installed<br>• Incorrect active boot partition<br>• Wrong boot drive settings in SETUP |
| Previous boot incomplete<br>Default configuration used | Abort of the previous BOOT procedure, for example, due to a power failure. Correct the entries in SETUP. |
| System timer error | Hardware error.<br>Contact Technical Support |
| Real-time clock error | Clock chip error.<br>Contact Technical Support. |
| Keyboard controller error | Controller error.<br>Contact your technical support team. |

# Troubleshooting

# 13

## 13.1    General problems

This chapter provides you with tips on how to locate and troubleshoot common problems.

| Problem | Possible cause | To correct or avoid error |
|---|---|---|
| The device is not operational. | There is no power supply to the device. | Check your computer configuration: |
| The 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 monitor 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.<br>• 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. | | • Press <F2> within the boot sequence to open BIOS Setup.<br>• Set the time and date in the setup menu. |
| Although the BIOS setting is OK, the time and data are still wrong. | The backup battery is dead. | In this case, please contact your technical support team. |

| Problem | Possible cause | To correct or avoid error |
|---|---|---|
| USB device not responding | Operating system does not support the USB port. | No remedy. |
| | The operating system does not have a suitable driver for the USB device. | Install a suitable driver; the correct driver can often be downloaded from the homepage of the device's manufacturer. The EWF for Windows XP Embedded must be first disabled for this. |

## 13.2 Problems when using modules of third-party manufacturers

| Problem | Possible cause | To correct or avoid error |
|---|---|---|
| The PC crashes during startup. | • I/O addresses are assigned twice.<br>• Hardware interrupts and/or DMA channels are assigned twice<br>• Signal frequencies or signal levels are not adhered to<br>• Different connector pin assignments<br>• No "Reset Configuration" in BIOS SETUP | Check your computer configuration:<br>• If the computer configuration corresponds with factory state, please contact your technical support team.<br>• If the computer configuration has changed, restore the original factory settings. Remove all third-party modules, then restart the PC. If the error no longer occurs, the third-party module was the cause of the fault. Replace this module with a Siemens module or contact the module supplier.<br>• Force a "Reset Configuration" using the BIOS Setup.<br><br>If the PC still crashes, contact your technical support team. |

# Technical specifications

# 14

## 14.1 General specifications

| General specifications | |
|---|---|
| Order numbers | see the order documents |
| Dimensions | 262x133x47 (WxHxD in mm) |
| Weight | Approximately 2 kg |
| Supply voltage (DC) | 24 V DC [1] (20.4 to 28.8 V DC) |
| Brief power failure according to Namur | min. 15 ms (at 20.4 V) <br> Max. 10 events per hour; min. 1 s recovery time |
| Maximum power consumption | 2.5 A (at 24 V) |
| Noise emission | <40dB (A) to DIN 45635-1 |
| Degree of protection | IP 20 to IEC 60529 |
| **Safety** | |
| Protection class | Protection class I to IEC 61140 |
| Safety specifications | EN 60950-1; UL 60950; CAN/CSA-C22.2 No. 60950-1; UL 508; CAN/CSA-C22.2 No. 142 or CAN/CSA-C22.2 No.14-05 |
| **Electromagnetic compatibility (EMC)** | |
| Emitted interference | EN 55022 Class B, FCC class A |
| Noise immunity: <br> Mains borne disturbance variables on supply lines | +/- 2 kV to IEC 61000-4-4; Burst <br> +/-1 kV to IEC 61000-4-5; surge symmetric <br> +/- 2 kV to IEC 61000-4-5; Surge asymmetric |
| Noise immunity on signal lines | ± -1 kV to IEC 61000-4-4; Burst; Length < 3 m <br> ± /-2 kV to IEC 61000-4-4; Burst; length > 3 m <br> ± /-2 kV to IEC 61000-4-5; Surge; length > 30 m |
| Immunity to discharges of static electricity | +/-6 kV contact discharge according to IEC 61000-4-2 <br> -8 kV air discharge according to IEC 61000-4-2 |
| Immunity to RF interference | 10 V/m 80 – 1000 MHz and 1.4 - 2 GHz, 80% AM to IEC 61000-4-3 <br> 1 V/m 2 - 2.7 GHz, 80% AM to IEC 61000-4-3 <br> 10 V 9 KHz – 80 MHz, 80% AM to IEC 61000-4-6 |
| Magnetic field | 100 A/m 50/60 Hz according to IEC 61000-4-8 |

| General specifications | |
|---|---|
| **Climatic Conditions** | |
| Temperature<br><br>- in operation | Tested according to IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14<br><br>**Horizontal mounting position:**<br><br>Operation with hard disk: +5 to +40°C<br>Operating with CompactFlash card:<ul><li>Without expansion modules: 0 to +50°C</li><li>Without expansion modules in RAL: 0 to +55°C</li><li>With expansion modules: 0 to +45°C</li><li>With expansion modules in RAL: 0 to +50°C</li></ul><br>**Vertical / portrait mounting position:**<br><br>Operation with hard disk: +5 to +40°C<br>Operating with CompactFlash card:<ul><li>Without/with expansion modules: 0 to +40°C</li><li>Without/with expansion modules in RAL: 0 to +45°C</li></ul><br>**Horizontal mounting position:** |
| - Storage/transport<br>- Gradient | Operation with CompactFlash card and without expansion modules: 0 to +40°C<br><br>–20°C to +60°C<br>Operating mode: Max. 10°C/h; Storage: 20°C/h; no condensation<br>**RAL** = Restricted Access Location<br>(installation of device in operating facilities with restricted access - for example, a locked control cabinet) |
| Relative humidity<br> - in operation<br> -Storage/transport | tested to IEC 60068-2-78, IEC 60068-2-30<br>5% to 80% at 25° C (no condensation)<br>5% to 95% at 25° C (no condensation) |
| **Mech. Ambient conditions** | |
| Vibration<br>-in operation [2] [3]<br>-Storage/Transport | Tested to DIN IEC 60068-2-6<br>5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s$^2$<br>5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s$^2$ |
| Resistance to shock<br>- Operation<br><br>- Storage/transport | tested to IEC 60068-2-27, IEC 60068-2-29<br>without hard disk drive: 150 m/s$^2$, 11 ms;<br>with hard disk drive: 50 m/s$^2$, 30 ms<br><br>250 m/s$^2$, 6 ms |
| **Special Features** | |
| Quality assurance | acc. to ISO 9001 |

| General specifications | |
| --- | --- |
| **Motherboard** | |
| Processor | Intel Celeron M ULV 900 MHz |
| | Intel Celeron M ULV 373, 1 GHz, 512 KB Second Level Cache |
| | Intel Pentium M LV 738, 1.4 GHz, 2 MB Second Level Cache |
| Front Side Bus | 400 MHz |
| Main memory | SO-DIMM Module; 256/512/1024/2048 MB DDR2-SDRAM |
| Buffer memory | 2 MB SRAM (128 KB of this can be backed up in the buffer time of the power supply) |
| Free expansion slots | Up to 3 PCI-104 or PC/104-*Plus* modules can be used (max. permitted power loss: 3 W per module, 9 W total) |
| **Drives / storage media** | |
| Hard disk | 1x 2,5" SATA-HD optional |
| Compact Flash card | 256/512/1024/2048/4096 MB |
| **Graphic controller** | |
| Graphic connector | Combined DVI and VGA |
| Graphics controller | Intel GMA900 |
| Graphics memory | 8 - 128 MB Shared Memory |
| Resolutions/frequencies/colors | CRT: 640 x 480 to 1600 x 1200 / 60 - 120Hz DVI-LCD: 640 x 480 to 1600 x 1200 / 60Hz |
| **Ports** | |
| COM1; COM2 (optional) | RS232, max. 115 Kbps., 9-pin Cannon, male |
| DVI | VGA integrated in the DVI-I |
| Keyboard | USB support |
| Mouse | USB support |
| USB | 4x USB 2.0 high-speed / high current |
| PROFIBUS / MPI interface, isolated | 9-pin Cannon socket, 2-row |
| -Transmission speed -Operating modes | 9.6 Kbps to 12 Mbps DP master: DP-V0, DP-V1 with SOFTNET-DP DP slave: DP-V0, DP-V1 with SOFTNET DP slave |
| PROFINET [4] | 3x RJ45 connector, CP 1616 compatible onboard interface based on ERTEC 400, 10/100 Mbps electrically isolated * |
| Ethernet | 2x Ethernet ports (RJ45) Intel 82573L 10/100/1000 Mbps, isolated Teaming-capable |
| CAN (on request) | Philips SJA1000 |

| General specifications | | |
|---|---|---|
| **Status displays on the device** | | |
| PWR | GREEN | Indicates correct supply voltage of 3.3 V, 5 V and 12 V from the integrated power unit |
| WD | OFF | Watchdog disabled |
| | GREEN | Watchdog enabled, monitoring time not expire |
| | RED | Watchdog enabled, monitoring time expired |
| L1 (LED 1) | YELLOW | Can be controlled by user programs |
| SF (Group fault) | RED | Can be controlled by controller program (e.g. WinAC) |
| L2 (LED 2) | YELLOW | Can be controlled by user programs |
| RUN STOP | GREEN YELLOW | Can be controlled by controller program (e.g. WinAC) |
| SF PROFINET (optional) | OFF | • CP not available<br>• CP disabled<br>• No error, communication established<br>• Charging in progress |
| | Flashes slowly | • Link status error<br>• IO controller: IO device cannot be addressed<br>• IO controller: Duplicate IP address |
| | Flashes rapidly | • Exception error: diagnostics via web or SNMP is no longer possible |
| | AN | • Diagnostics information available<br>• No communication established. |

[1] The generation of the 24 DC V supply voltage by the line-side SV must be made as functional extra-low voltage with safe electrical isolation according to
IEC 60364-4-41 or as SELV in conformity to IEC/UL/EN/DIN-EN 60950-1 and LPS / NEC Class 2.

[2] wiht hard disk and DIN rail mounting or portrait installation: none permitted

[3] With hard disk and wall installation: 10 to 58 Hz: 0.0375 mm; 58 to 200 Hz: 4.9 m/s$^2$

[4] For unique labeling, the LAN interfaces are numbered on the enclosure. The operating system numbering may be different.

## 14.2    Power requirements of the components

**Maximum power consumption of the auxiliary components**

| Auxiliary components | | Maximum permitted power consumption | | | | Max. total power |
|---|---|---|---|---|---|---|
| | | +5 V | +3.3 V | +12 V | -12 V | |
| USB device | High current | 500 mA | -- | -- | -- | 6 W (for all USB devices) |
| PC/104 modules | Per slot | 1.5 A | 1.5 A | 0.3 A | 0.2 A | 9 W (for the whole device) |
| | Total | 2 A | 2 A | 0.5 A | 0.5 A | |

| NOTICE |
|---|
| **Device can overheat!** |
| For thermal reasons, a 3 watt power loss per PCI/104 slot should not be exceeded. |

## 14.3    Integrated DC power supply

### Technical specifications

| Input voltage | 24 V DC (20.4 to 28.8 V DC) |
|---|---|
| Power consumption | max. 60 W |
| Power failure buffering | Hold-up time > 15 ms<br>(after > 5 ms DC_FAIL becomes active) |
| Maximum continuous output power | 50 W |
| Degree of protection | IP 20 |
| Protection class | Safety class I (A protective conductor must be connected to the device) |

**Note**

**Inrush current**

The maximum inrush current is 10 A for 30ms (for source impedance 0.5 Ω)

# Dimension drawings 15

## 15.1 Overview of the dimensional drawings

This section contains the following dimension drawings:

- Dimension drawings of the device
- Dimension drawings of the device with mounting brackets
- Dimensional drawings of the device with expansion frames
- Dimension drawing of the blanking plate

**Note**

The dimensions are always given in in mm and inch (above: Millimeter, below: Inch

## 15.2 Dimension drawings of the device
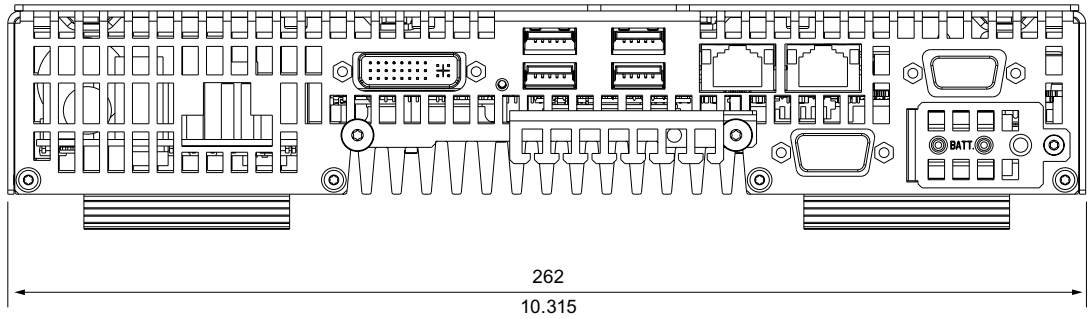


Figure 15-1    Dimensional drawing of the device: Front view
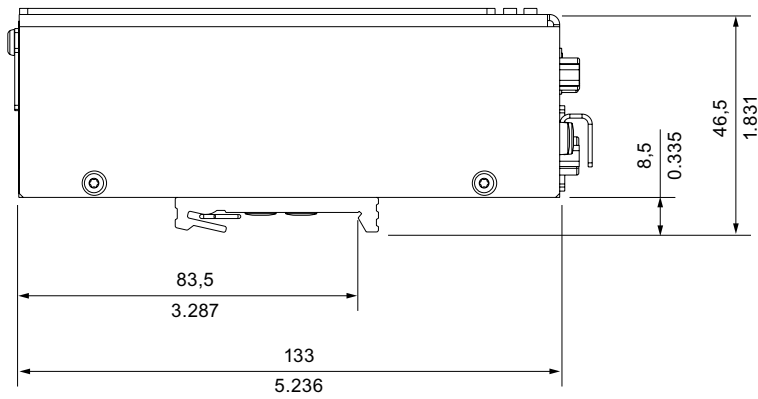


Figure 15-2    Dimensional drawing of the device: Side view

## 15.3 Dimension drawings of the device with mounting brackets
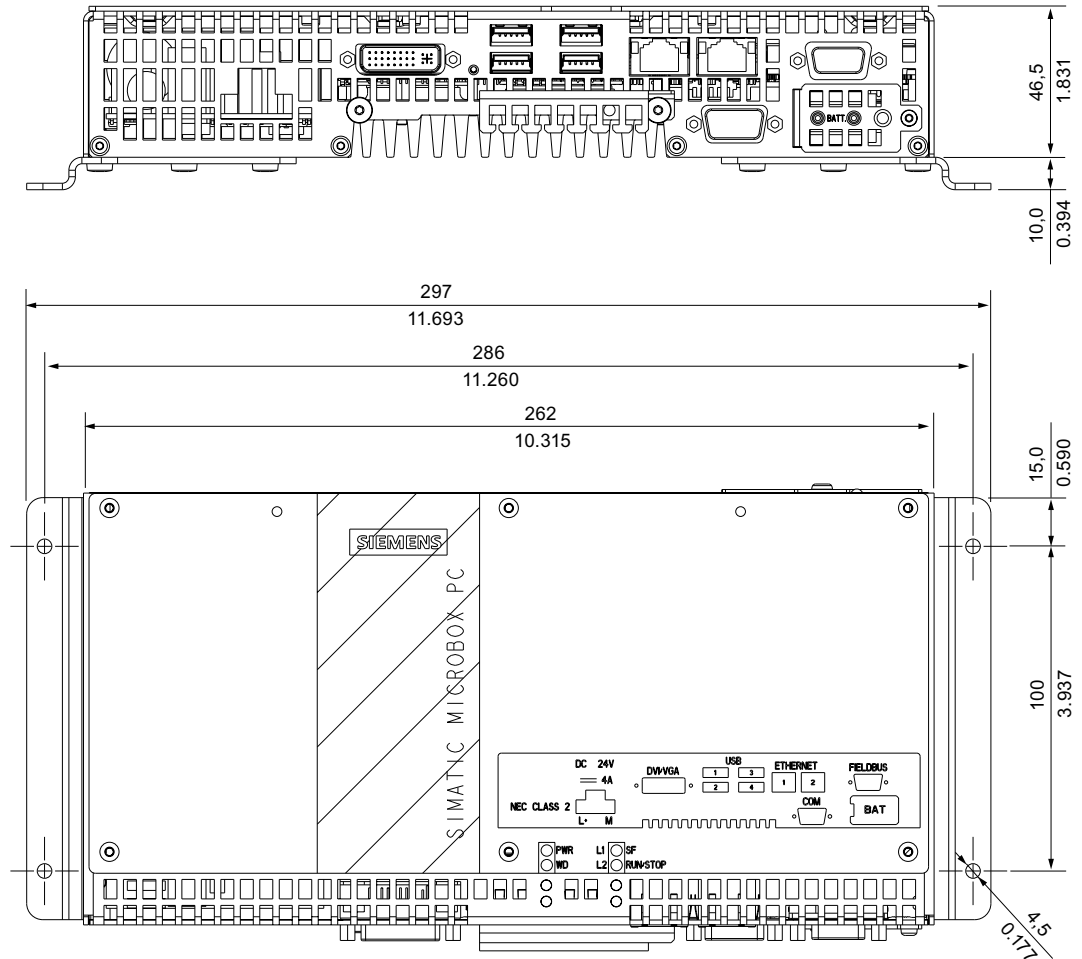


Figure 15-3     Dimensional drawing of the device with mounting brackets Front view and top view
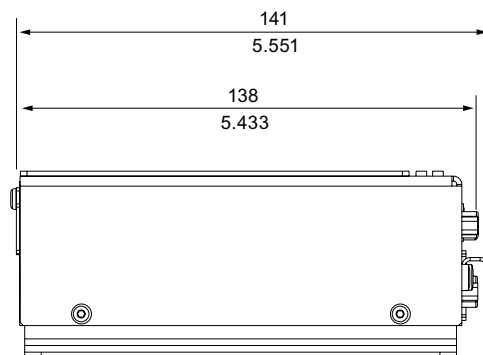


Figure 15-4     Dimensional drawing of the device with mounting brackets Side view

## 15.4 Dimensional drawings of the device with vertical mounting angles
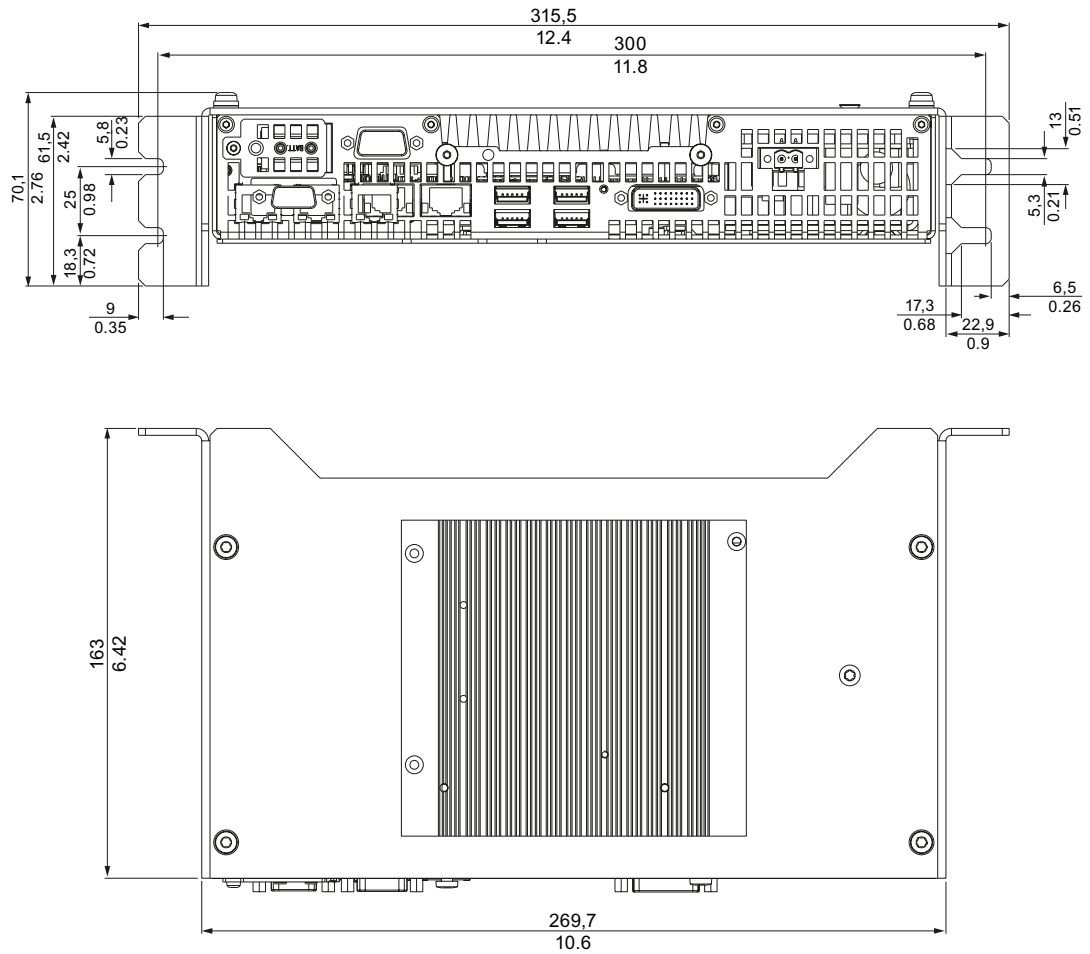


Figure 15-5    Dimensional drawings of the device with vertical mounting angles

## 15.5 Dimensional drawings of the device with expansion frames
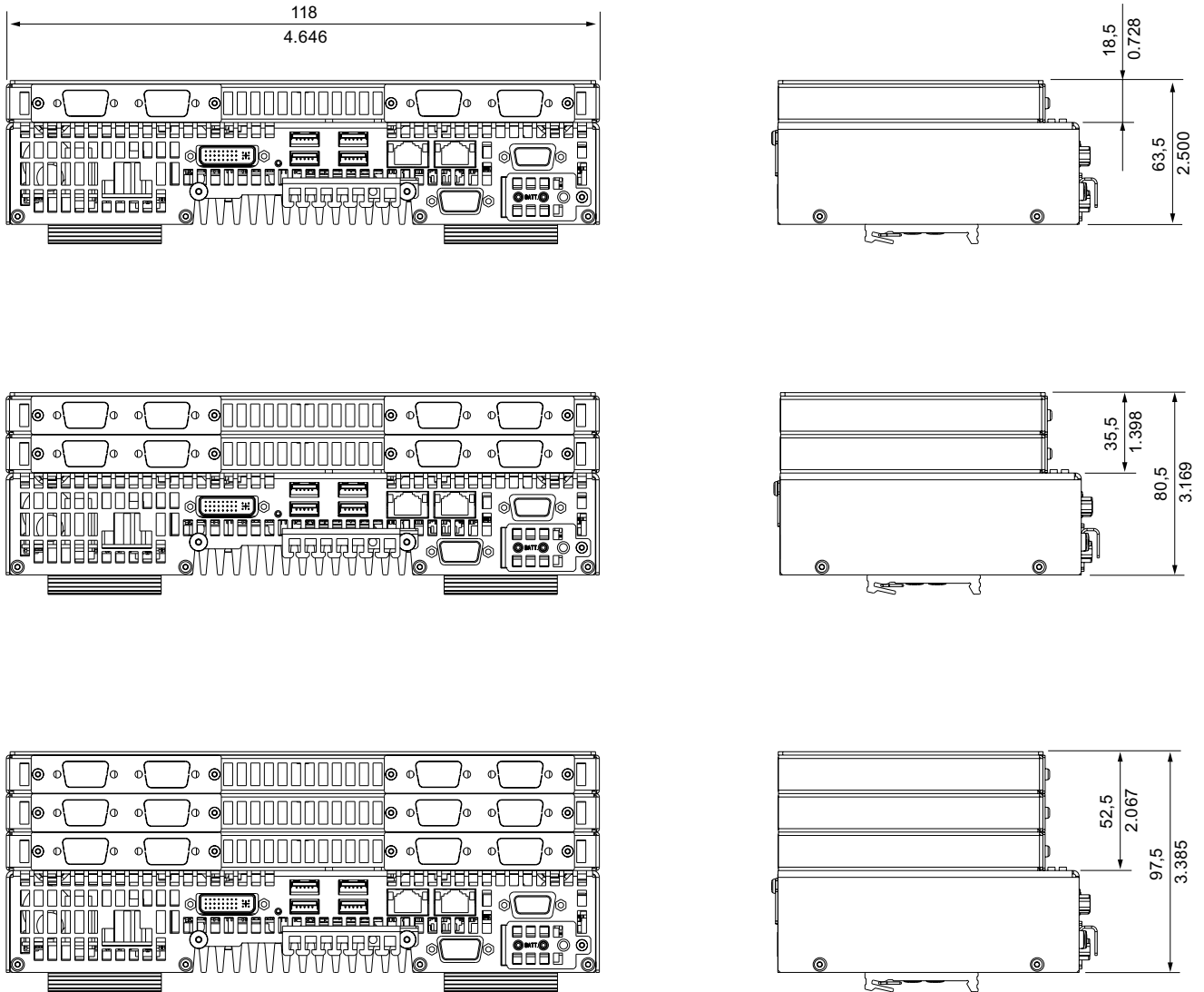
Figure 15-6    Dimensional drawings of the device with expansion frames

## 15.6 Dimension drawing of the blanking plate
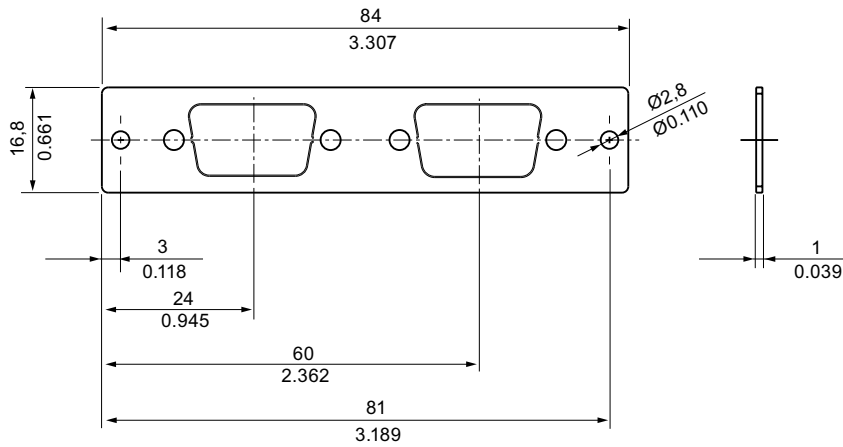
Figure 15-7    Dimensional drawing of the blinding plate

# Detailed descriptions

# 16

## 16.1 Internal components

### 16.1.1 Overview of internal components

The basic components of the device are

- the motherboard with processor, the chipset, one slot for a RAM module, internal and external ports, the Flash BIOS and

- a DC/DC converter for the power supply of the device
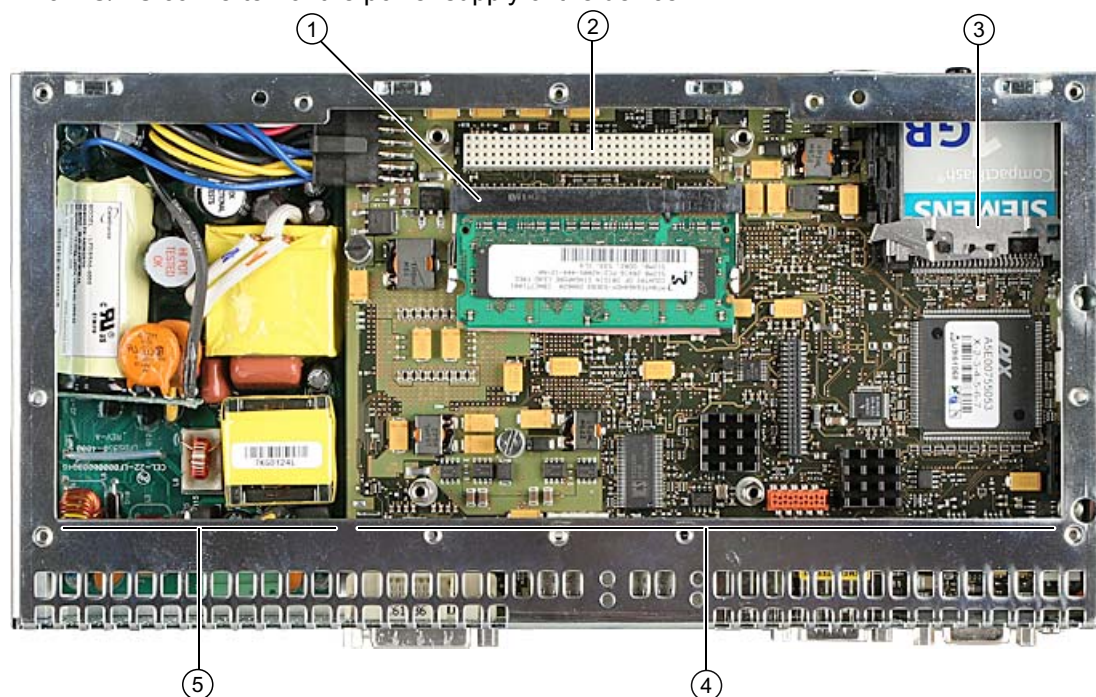


Figure 16-1    Internal layout of the device

| (1) | Slot for a memory module | (4) | Motherboard |
|-----|--------------------------|-----|-------------|
| (2) | Slot for up to three PCI-104 or PC/104-*Plus* modules | (5) | DC/DC converter |
| (3) | Slot for Compact Flash card | | |
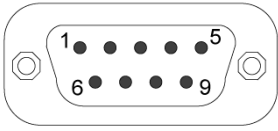
## 16.1.2 Technical features of the motherboard

| Component / port | Description | Parameters |
|---|---|---|
| Chipset | Intel 910GML + Intel ICH6 m | |
| BIOS | Phoenix BIOS 4.0 Release 6.0 | |
| CPU | Intel Celeron M<br>Intel Celeron M<br>Intel Pentium M | 900 MHz<br>1 GHz<br>1.4 GHz |
| Memory | SO-DIMM module | 256 MB to 2 GB DDR2-SDRAM |
| Graphics | Intel GMA900 | 8 - 128 MB graphics memory taken dynamic from RAM |

## 16.1.3     External ports

| Port | Position | Description | |
|---|---|---|---|
| COM1 | external | 9-pin male | V24 |
| USB | external | Four USB channels | USB 1.1 |
| | | 4 x high current | USB 2.0 |
| PROFIBUS /MPI /DP12(optional) | external | 9-pin female | |
| PROFINET (optional) | external | 3 x R45 | CP 1616 compatible |
| CAN (optional) | external | 9-pin female | CAN |
| Ethernet | external | 2 x RJ45<br>1x RJ45 (for PROFINET versions) | 10/100/1000 Mbps |
| DVI-I | external | DVI-I standard socket | |
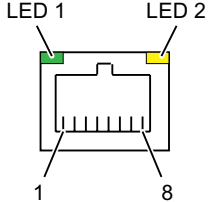
### 16.1.3.1    COM1

| Serial port COM1, 9-pin (plug) | | |
|---|---|---|
|  | | |
| **Pin no.** | **Short description** | **Description** |
| 1 | DCD | Data carrier detect (I) |
| 2 | RxD | Received data (I) |
| 3 | TxD | Transmitted data (O) |
| 4 | DTR | Data terminal ready (O) |
| 5 | GND | Ground |
| 6 | DSR | Data set ready (I) |
| 7 | RTS | Request to send (O) |
| 8 | CTS | Clear to send (I) |
| 9 | RI | Incoming call (I) |
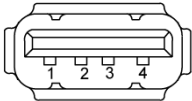
## 16.1.3.2   DVI-I

| DV-I port, standard socket | | |
|---|---|---|
|  | | |
| Pin no. | Short description | Description |
| 1 | TMDS Data2- | DVI data channel (O) |
| 2 | TMDS Data2+ | DVI data channel (O) |
| 3 | TMDS Data2/4 shield | Cable shield |
| 4 | NC* | |
| 5 | NC | |
| 6 | DDC clock (SCL) | Display data channel – clock (I/O) |
| 7 | DDC data (SDA) | Display data channel – data (I/O) |
| 8 | Analog vertical sync (VSYNC) | Analog vertical sync signal (O) |
| 9 | TMDS Data1- | DVI data channel (O) |
| 10 | TMDS Data1+ | DVI data channel (O) |
| 11 | TMDS Data1/3 shield | Cable shield |
| 12 | NC | |
| 13 | NC | |
| 14 | +5V power (VCC) | +5V power for DCC (O) |
| 15 | Ground (return for +5V, Hsync and Vsync) (GND) | Analog ground |
| 16 | Hot Plug Detect | |
| 17 | TMDS data 0- | DVI data channel (O) |
| 18 | TMDS data 0+ | DVI data channel (O) |
| 19 | TMDS Data0/5 shield | Cable shield |
| 20 | NC | |
| 21 | NC | |
| 22 | TMDS clock shield | Cable shield |
| 23 | TMDS clock+ | DVI clock channel (O) |
| 24 | TMDS clock- | DVI clock channel (O) |
| C1 | Analog red (R) | Analog red signal (O) |
| C2 | Analog green (G) | Analog green signal (O) |
| C3 | Analog blue (B) | Analog blue signal (O) |
| C4 | Analog horizontal sync (HSYNC) | Analog horizontal sync signal (O) |
| C5 | Analog ground (analog R, G, & return) (GND) | Analog ground |

### 16.1.3.3 Ethernet

| Ethernet RJ45 connection | | | |
|---|---|---|---|
| LED 1 LED 2  1 8 | | | |
| **Pinno.** | **Short description** | **Description** | **Input / output** |
| 1 | BI_DA+ | Bi-directional data A+ | Input/output |
| 2 | BI_DA- | Bi-directional data A- | Input/output |
| 3 | BI_DB+ | Bi-directional data B+ | Input/output |
| 4 | BI_DC+ | Bi-directional data C+ | Input/output |
| 5 | BI_DC- | Bi-directional data C- | Input/output |
| 6 | BI_DB- | Bi-directional data B- | Input/output |
| 7 | BI_DD+ | Bi-directional data D+ | Input/output |
| 8 | BI_DD- | Bi-directional data D- | Input/output |
| S | | Shield | – |
| | LED 1 | Off: 10 Mbps<br>Lit in green: 100 Mbps<br>Lit in orange: 1000 Mbps | – |
| | LED 2 | Lit: Active connection<br>(to a hub, for example)<br>Flashing: Activity | – |

### 16.1.3.4 USB

| USB port, 4 channel high current | | |
|---|---|---|
|  | | |
| **Pin no.** | **Short description** | **Description** |
| 1 | USB_P5V_fused (O) | + 5 V (fused) for external USB interface |
| 2 | USB_D0M (I/O) | Data+, USB channel 0 |
| 3 | USB_D0P (I/O) | Data-, USB channel 0 |
| 4 | USB_GND | Ground for external USB interface |

### 16.1.3.5 PROFIBUS
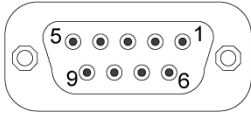
**PROFIBUS interface, 9-pin (socket)**

| Pin no. | Short description | Description |
|---------|-------------------|-------------|
| 1-2 | NC | Not connected |
| 3 | LTG_B | Data line (I/O) |
| 4 | RTS_AS | Turn on PLC transmitter (O) |
| 5 | GND | Ground isolated |
| 6 | P5V_dp_fused | +5 V (fused) isolated |
| 7 | NC | Not connected |
| 8 | LTG_A | Data line (I/O) |
| 9 | RTS_PG | PG Request to send (O) |

### 16.1.3.6 PROFINET

**PROFINET LAN X1 Port P1, P2, P3**

**PROFINET interface**

| Pinno. | Short name | Meaning | Input / output |
|--------|-----------|---------|----------------|
| 1 | RD+ | Receive data * | Input |
| 2 | RD- | Receive data * | Input |
| 3 | TD+ | Transmit data * | Output |
| 4, 5 [1)] | SYMR | Internal 75 Ohm terminating resistor | _ |
| 6 | TD- | Receive data * | Output |
| 7, 8 [1)] | SYMT- | Internal 75 Ohm terminating resistor | _ |
| S | | Shield | |
| | LED 1 | Lights up green: link | |
| | LED 2 | Lights up yellow: Activity | |
| * Auto Negotiation and auto cross over is supported | | | |

### 16.1.3.7    CAN bus

| CAN bus port, 9-pin (socket) | | |
|---|---|---|
| Pin no. | Short description | Description |
| 1 | - | Reserved |
| 2 | CAN_L | CAN bus signal (L active) |
| 3 | CAN_GND | CAN station ground |
| 4 | - | Reserved |
| 5 | - | Reserved |
| 6 | - | Reserved |
| 7 | CAN H | CAN bus signal (H active) |
| 8 | - | Reserved |
| 9 | - | Reserved |

| NOTICE |
|---|
| The permitted maximum length of the CAN bus cable is 30 meters. |

## 16.1.4 Internal interfaces

| Port | Position | Connector | Description |
|---|---|---|---|
| Compact Flash card (True IDE mode) | Internal | X3 | 50-pin CF socket, types I / II |
| PCI -104 | Internal | | PCI interface |

### 16.1.4.1 Compact Flash card interface

| Compact Flash card interface, X3 | | |
|---|---|---|
| Pin no. | Short description | Description |
| 41 | RESET# | Reset (output) |
| 7 | CS0# | Chip select 0(output) |
| 32 | CS1# | Chip select 1(output) |
| 34 | IORD# | I/O read (output) |
| 35 | IOWR# | I/O write (output) |
| 20, 19, 18, | A0-A2 | Address bit 0-2 (output) |
| 17, 16, 15, 14, 12, 11, 10, 8 | A3-A10 | Address bit 3-10 (output) to ground |
| 21, 22, 23, 2, 3, 4, 5, 6, 47, 48, 49, 27, 28, 29, 30, 31 | D0-D15 | Data bits 0-15 (in/out) |
| 37 | INTRQ | Interrupt request (input) |
| 9 | OE# /ATA SEL# | Enables True IDE mode |
| 24 | IOCS16# | I/O-chip select 16 (input) |
| 39 | CSEL# | Cable select (output) |
| 42 | IORDY | I/O ready (input) |
| 46 | PDIAG# | Passed diagnostic |
| 45 | DASP# | Drive active/slave present (not connected) |
| 26, 25 | CD1#, CD2# | Card detect (not connected) |
| 33, 40 | VS1#, VS2# | Voltage sense (not connected) |
| 43 | DMARQ | DMA request (input) |
| 44 | DMACK# | DMA acknowledge (output) |
| 36 | WE# | Write enable |
| 1, 50 | GND | Ground |
| 13, 38 | VCC | + 5V power |

## 16.1.4.2    PCI-104 or PC/104-Plus interface (PCI part)

| PCI-104 or PCI part of the PC/104-Plus interface, X7 | | | |
|---|---|---|---|
| Pin no. | O | B | C | D |
| 1 | GND | Reserved | +5 | AD00 |
| 2 | VI/O 5V | AD02 | AD01 | +5V |
| 3 | AD05 | GND | AD04 | AD03 |
| 4 | C/BE0# | AD07 | GND | AD06 |
| 5 | GND | AD09 | AD08 | GND |
| 6 | AD11 | VI/O | AD10 | M66EN |
| 7 | AD14 | AD13 | GND | AD12 |
| 8 | +3.3V | C/BE1# | AD15 | +3.3V |
| 9 | SERR# | GND | -- | PAR |
| 10 | GND | PERR# | +3.3V | -- |
| 11 | STOP# | +3.3V | LOCK# | GND |
| 12 | +3.3V | TRDY# | GND | DEVSEL# |
| 13 | FRAME# | GND | IRDY# | +3.3V |
| 14 | GND | AD16 | +3.3V | C/BE2# |
| 15 | AD18 | +3.3V | AD17 | GND |
| 16 | AD21 | AD20 | GND | AD19 |
| 17 | +3.3V | AD23 | AD22 | +3.3V |
| 18 | IDSEL0 = AD28 | GND | IDSEL1= AD29 | IDSEL2 = AD30 |
| 19 | AD24 | C/BE3# | VI/O | IDSEL3 = AD31 |
| 20 | GND | AD26 | AD25 | GND |
| 21 | AD29 | +5V | AD28 | AD27 |
| 22 | +5V | AD30 | GND | AD31 |
| 23 | REQ0# | GND | REQ1# | VI/O |
| 24 | GND | REQ2# | +5V | GNT0# |
| 25 | GNT1# | VI/O | GNT2# | GND |
| 26 | +5V | CLK0 | GND | CLK1 |
| 27 | CLK2 | +5V | CLK3 | GND |
| 28 | GND | INTD# | +5V | RST# |
| 29 | +12V | INTA# | INTB# | INTC# |
| 30 | -12V | Reserved | Reserved | GND |

# 16.2 BIOS Setup

## 16.2.1 Overview

### BIOS Setup program

BIOS Setup program is stored in ROM BIOS. System configuration data are stored in battery-backed RAM of the device.

SETUP can be used to define the hardware configuration (for example, the hard disk type) and system properties. SETUP is also used to set the time and date of the realtime clock.

### Changing the device configuration

Your device configuration is preset for operating with the included software. You should only change the default values if you have modified the technical configuration your device, or if a fault occurs when the unit is powered up.

## 16.2.2 Starting BIOS Setup

### Starting BIOS Setup

Start the setup program as follows:

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

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

```
PhoenixBIOS 4.0 Release 6.0 cME FirstBIOS Desktop Pro    -A5E00906400-ES006

Copyright 1985-2003 Phoenix Technologies Ltd.
All Rights Reserved


SIMATIC Microbox PC 427B Version V07.01.06

CPU = Intel(R) Celeron(R) M processor        1.00GHz
503M System RAM Passed
512K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
Fixed Disk 0: FUJITSU MHW2080BH
Mouse initialized







Press <F2> to enter SETUP or <ESC> to show Bootmenu
```

   On completion of the POST, the BIOS gives you the opportunity of starting the SETUP program. The following message appears on the screen:
   ```
   Press <F2> to enter SETUP or <ESC> to show the Boot menu
   ```

1. Press F2 key as long as BIOS prompt appears on screen.

## 16.2.3   BIOS Setup menus

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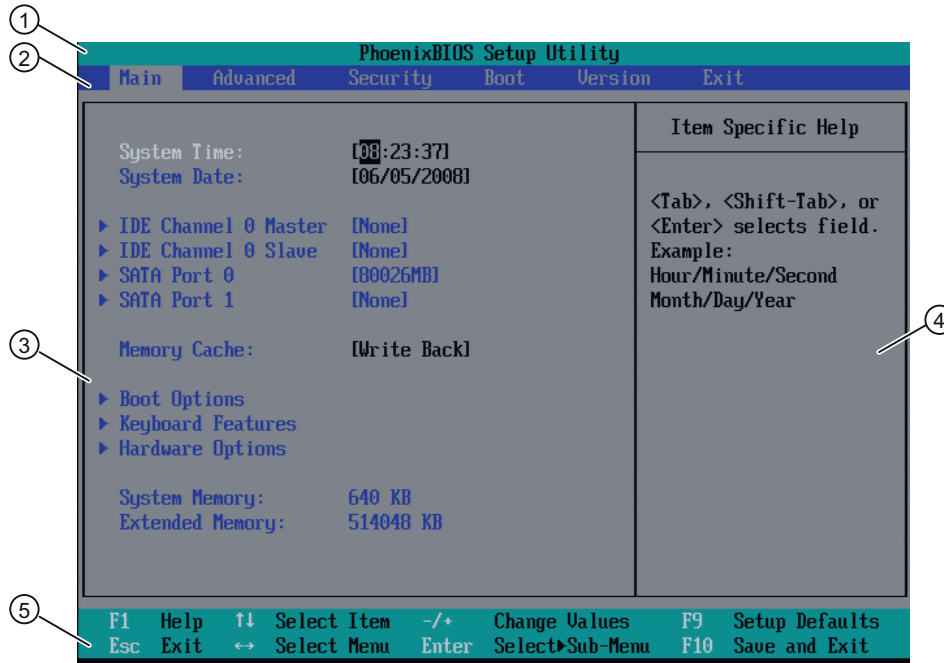


Figure 16-2    BIOS SETUP menu (example)

| (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], [Boot], [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 following figures represent examples of specific device configurations. The screen content may deviate slightly depending on the equipment actually supplied.

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 | Description |
|---|---|
| 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. |
| Boot | This is where the boot priority is specified. |
| Version | Information about the programming device (for example, release status) can be found here. |
| Exit | Used for terminating and saving. |

## 16.2.4 Main menu

```
                    PhoenixBIOS Setup Utility
  Main    Advanced    Security    Boot    Version    Exit

                                          ┌──────────────────────┐
                                          │   Item Specific Help  │
   System Time:        [08:26:04]         │                      │
   System Date:        [06/05/2008]       │                      │
                                          │ <Tab>, <Shift-Tab>, or│
 ▶ IDE Channel 0 Master  [None]           │ <Enter> selects field.│
 ▶ IDE Channel 0 Slave   [None]           │ Example:             │
 ▶ SATA Port 0           [80026MB]        │ Hour/Minute/Second   │
 ▶ SATA Port 1           [None]           │ Month/Day/Year       │
                                          │                      │
   Memory Cache:        [Write Back]      │                      │
                                          │                      │
 ▶ Boot Options                           │                      │
 ▶ Keyboard Features                      │                      │
 ▶ Hardware Options                       │                      │
                                          │                      │
   System Memory:       640 KB            │                      │
   Extended Memory:     514048 KB         │                      │
                                          └──────────────────────┘

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

Figure 16-3    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 |
| Memory Cache | Used for setting the cache options |
| by submenus | |
| IDE Channel 0 Master | Type of installed disk drives |
| IDE Channel 0 Slave | Type of installed disk drives |
| SATA Port 0 | Type of installed disk drives |
| SATA Port 1 | Type of installed disk drives |
| Boot options | Used for setting the boot options |
| Keyboard Features | Used to setup the keyboard interface (for example, NUM lock, Typematic rate) |
| Hardware Options | Used for setting the hardware options |

## System time 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.

## IDE Channel 0 Master, IDE Channel 0 Slave

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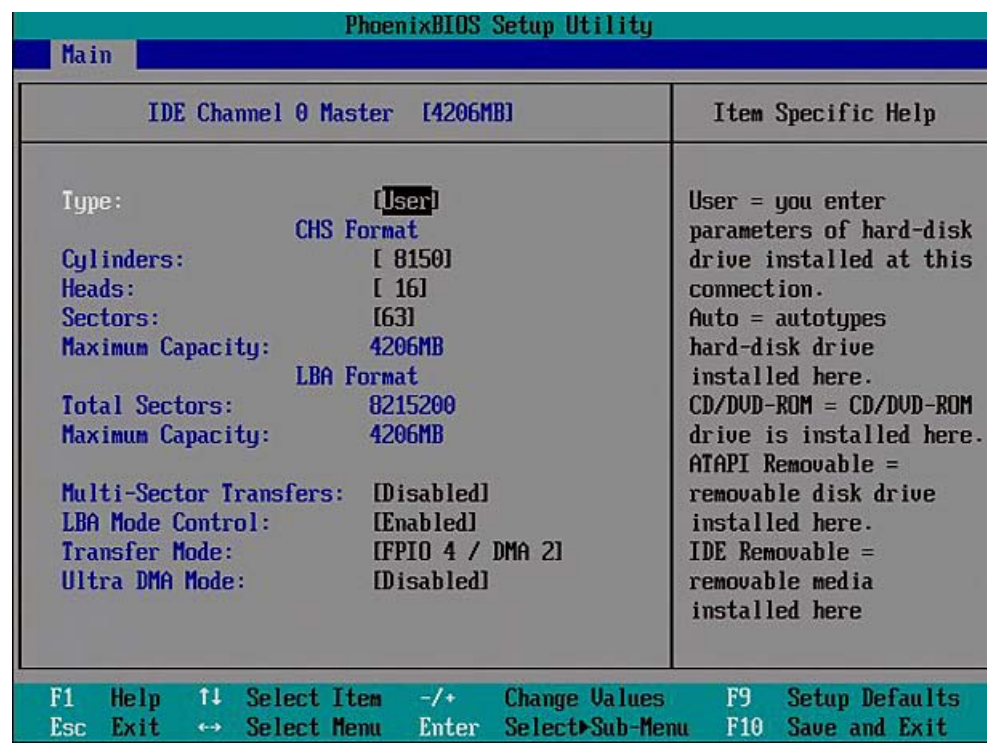


Figure 16-4    IDE Channel 0 Master (example)

| Type | [User] | Select "User" to enter a user-specific definition of the hard disk type. Configure all the other options, for example, Cylinder, Heads, Sectors/Track, or other properties of the hard disk drive. |
|---|---|---|
| | [Auto] | 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. |
| | | If Type is selected for a drive that does not exist, a timeout is triggered within approximately 1 minute and the entries remain unchanged. It makes sense only to set "Auto" for interfaces to which a drive is connected. |
| | [CD/DVD-ROM] | CD/DVD-ROM is connected |
| | ATAPI Removable | A removable data volume is connected |
| | None | Select "None" if you have not connected a disk drive. This setting reduces system waiting time. |
| Multi-Sector Transfer | The number of blocks (sectors) transferred per interrupt are defined at the "Multi-Sector Transfer" option. The value depends on the drive and should only be set by way of "Auto" setting at the "Type" field. | |
| | Disabled | 2, 4, 8, 16 sectors |
| LBA Mode Control | The "Enabled" setting at the "LBA Mode Control" (enabled, disabled) option means that hard disk capacities greater than 528 MB are supported. The value depends on the drive and should only be set by way of "Auto" setting at the "Type" field. | |
| Transfer Mode or Ultra DMA Mode | Define the data transmission rate of the interface in these fields. The value depends on the drive and should only be set by way of "Auto" setting at the "Type" field. | |
| | Exit the submenu by pressing ESC. | |

### SATA Port 0, SATA Port 1

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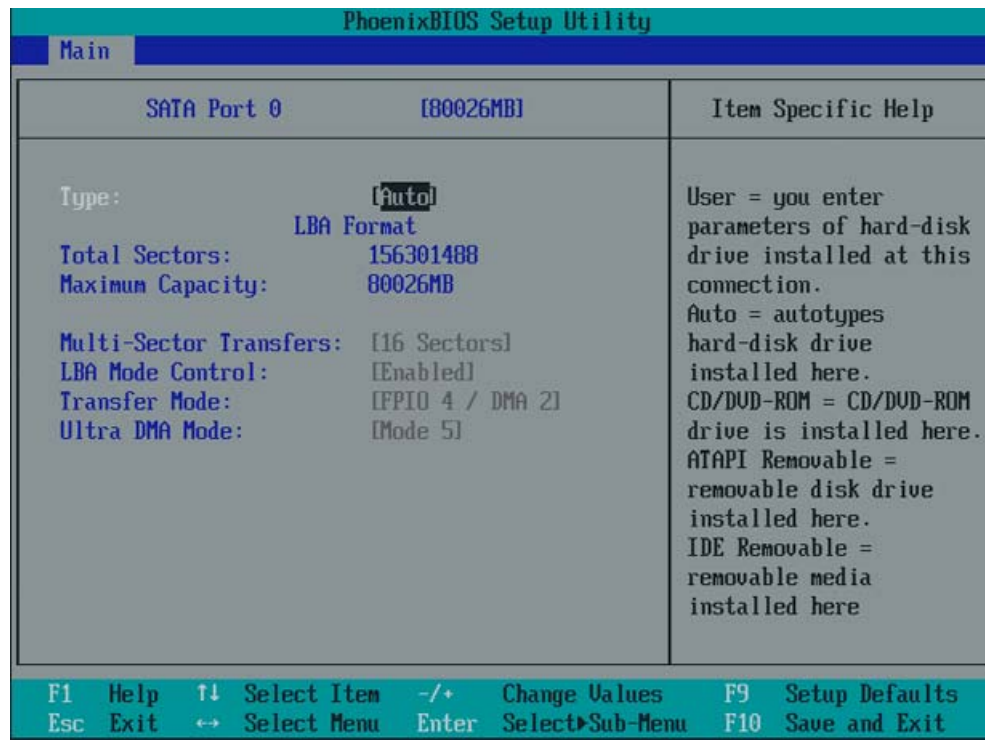


Figure 16-5    SATA Port 0 (example)

| Type | [User] | Select "User" to enter a user-specific definition of the hard disk type. Configure all the other options, for example, Cylinder, Heads, Sectors/Track, or other properties of the hard disk drive. |
|---|---|---|
| | [Auto] | 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. |
| | | If Type is selected for a drive that does not exist, a timeout is triggered within approximately 1 minute and the entries remain unchanged. It makes sense only to set "Auto" for interfaces to which a drive is connected. |
| | [CD/DVD-ROM] | CD/DVD-ROM is connected |
| | [ATAPI Removable] | A removable data volume is connected |
| | [None] | Select "None" if you have not connected a disk drive. This setting reduces system waiting time. |
| Multi-Sector Transfer | The number of blocks (sectors) transferred per interrupt are defined at the "Multi-Sector Transfer" option. The value depends on the drive and should only be set by way of "Auto" setting at the "Type" field. | |
| | Disabled | 2, 4, 8, 16 sectors |

| LBA Mode Control | The "Enabled" setting at the "LBA Mode Control" (enabled, disabled) option means that hard disk capacities greater than 528 MB are supported. The value depends on the drive and should only be set by way of "Auto" setting at the "Type" field. |
|---|---|
| Transfer Mode or Ultra DMA Mode | Define the data transmission rate of the interface in these fields. The value depends on the drive and should only be set by way of "Auto" setting at the "Type" field. Exit the submenu by pressing ESC. |

## "Memory Cache" field

The following shortcut menu appears when you select the option "Memory cache" in the main menu:
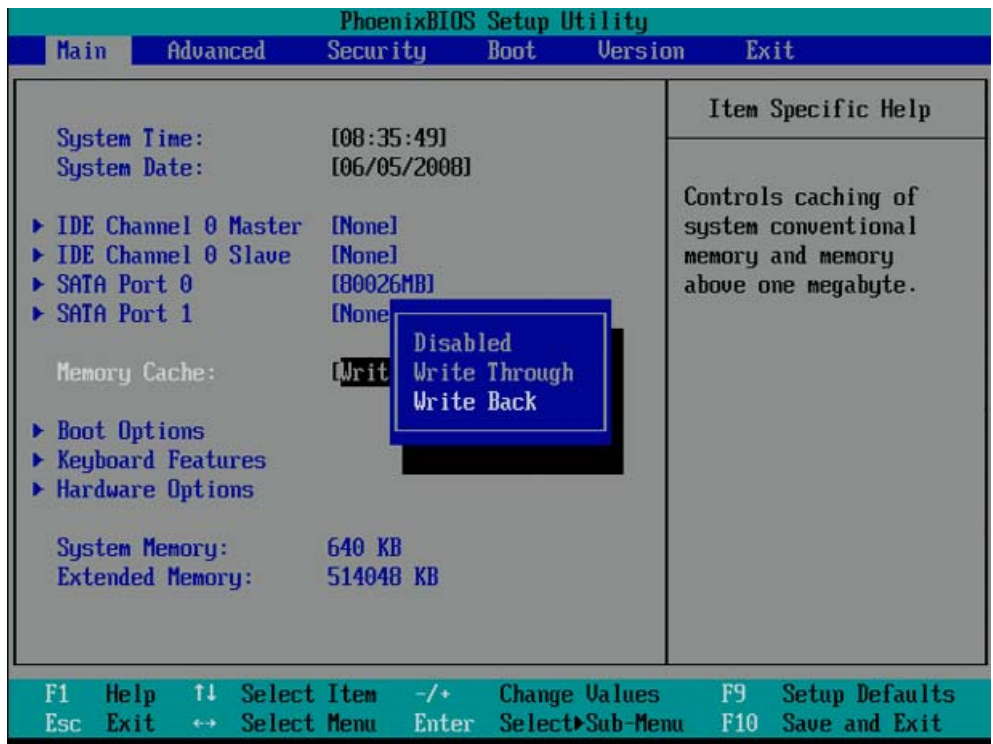


Figure 16-6    "Memory Cache" field (example)

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

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

**"Boot Options" field**

The following shortcut menu appears when you select the option "Boot Options" in the main menu:



```
                        PhoenixBIOS Setup Utility
  Main

                   Boot Options                    Item Specific Help

    QuickBoot Mode:      [Enabled]             Allows the system to
                                               skip certain tests
    SETUP prompt:        [Enabled]             while booting.  This
    POST Errors:         [All, but not keyboard] will decrease the
                                               time needed to boot
    Summary screen:      [Enabled]             the system.
    Diagnostic screen:   [Enabled]






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

Figure 16-7    "Boot Options" field

| Quick Boot Mode | Some hardware tests are skipped to speed up the boot sequence. | |
|---|---|---|
| SETUP prompt | During the system load phase, the message "Press <F2> to enter Setup or <Esc> to show boot menu" is output on the bottom of the screen. | |
| POST errors | The boot sequence is stopped if an error is detected; you must press F1 to acknowledge. | |
| | [Disabled] | No error confirmation is required, for example, when no keyboard is connected. |
| | [All, but not keyboard] | Show all errors except for keyboard errors. |
| Summary screen | The most important system parameters are displayed when the system run-up phase completes. | |
| Diagnostic screen | Shows the diagnostics messages on the monitor during booting. | |

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

Example of a summary screen:



```
                PhoenixBIOS Setup Utility

CPU Type        : Celeron(R) M processor 1.00GHz

System Memory : 640 KB            System ROM   : E73F - FFFF
Ext.Memory    : 514048 KB         BIOS Date    : 05/14/08
Shadow Ram    : 384 KB
Cache Ram     : 512 KB            COM Ports    : 03F8
                                  Display Type : EGA \ VGA
Hard Disk 0   : None
Hard Disk 1   : None
Hard Disk 2   : 80026MB
Hard Disk 3   : None




Press Any Key to Continue
```

Figure 16-8    Summary screen (example)

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

## "Keyboard Features" field

The following shortcut menu appears when you select the option "Keyboard Features" in the main menu:

```
                    PhoenixBIOS Setup Utility
  Main

          Keyboard Features                   Item Specific Help

  NumLock:                    [On]           Selects Power-On state
  Keyboard auto-repeat rate:  [30/sec]       for Numlock on next boot
  Keyboard auto-repeat delay: [1/2 sec]





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

Figure 16-9    "Keyboard Features" submenu (example)

| Numlock | Switches Numlock on or off following power on. This status is saved to non-volatile memory if "Auto" is set. |
|---|---|
| Keyboard auto-repeat rate | Increase in automatic key repeat rate |
| Keyboard auto-repeat delay | On-delay of automatic keyboard repeat |

**"Hardware Options" field**

If you select the "Hardware Options" field in the Main menu, the following submenu will be displayed (depending on the product model):

```
                     PhoenixBIOS Setup Utility
   Main

        Hardware Options                    Item Specific Help

   Onboard Profinet:           [Enabled]    Enables or disables
   MAC-Address Layer 2:        08000698A9A5  the CP 1616 onboard
   MAC-Address PROFINET:       08000698A9A6  PROFINET-Interface.

   Onboard Ethernet 1:         [Enabled]
   Onboard Ethernet 1 Address: 000E8C80A5A3
   Onboard Ethernet 1 Remote Boot: [Disabled]


   Dual view DVI/CRT:          [Disabled]

   SRAM Memory Block:          [2 MB]



   F1   Help    ↑↓  Select Item  -/+   Change Values   F9   Setup Defaults
   Esc  Exit    ↔   Select Menu   Enter Select▶Sub-Menu F10  Save and Exit
```
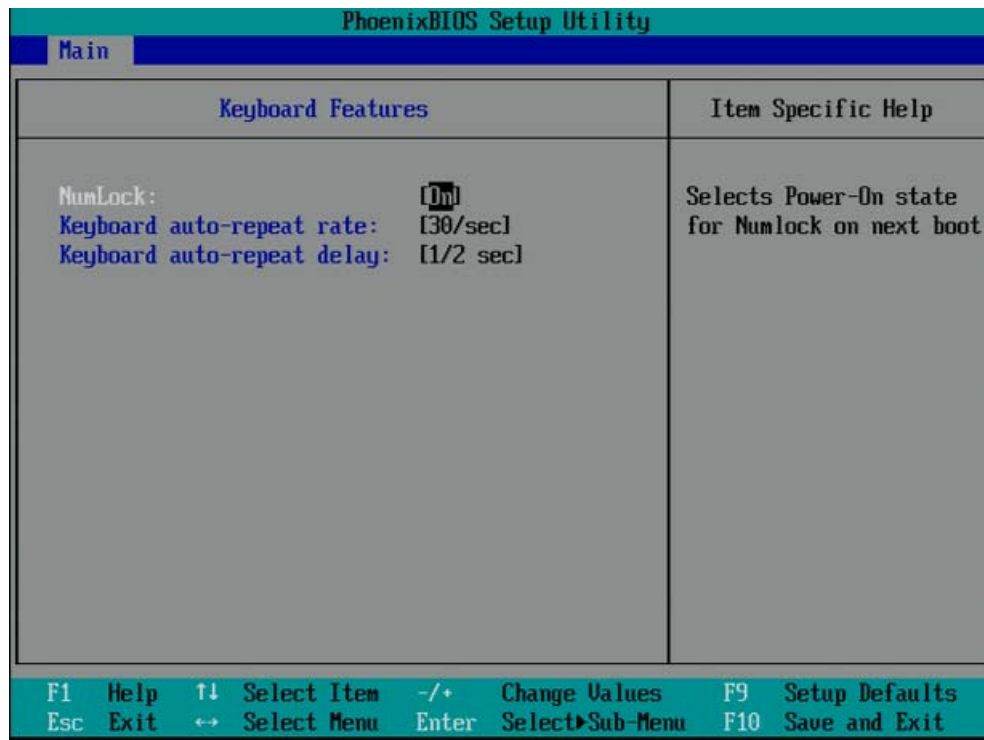
Figure 16-10  "Hardware Options" field (example for PROFINET)

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

| Entry | Meaning | |
|---|---|---|
| PCI-MPI/DP * | [Enabled] | Sharing the MPI/DP interface. The resources are managed by the BIOS PCI Plug and Play mechanism. |
| | [Disabled] | The MPI/DP interface is disabled. |
| Onboard Profinet * | [Enabled] | CP 1616 onboard is enabled |
| | [Disabled] | CP 1616 onboard is disabled |
| MAC Address Layer 2 * | | This address is for NDIS applications. Example: 000E8C8E8C0A |
| MAC Address Profinet * | | This is the main address for PROFINET applications Example: 000E8C8E8C0B. The MAC addresses of the individual ports are derived from the "MAC Address Profinet". They are not shown in the BIOS setup. Example: P1=000E8C8E8C0B+1, P2=000E8C8E8C0B+2, P3=000E8C8E8C0B+3 |
| Onboard Ethernet 1/2 * | [Enabled] | The Ethernet port on the motherboard is enabled. |
| | [Disabled] | The Ethernet port on the motherboard is disabled. |
| Onboard Ethernet 1/2 * Address | Shows the individual Ethernet address. | |

| Entry | Meaning | |
|---|---|---|
| Onboard Ethernet 1/2 Remote Boot * | [Enabled] | Booting via a connected LAN is possible. |
| | [Disabled] | Booting via LAN is not possible. |
| Dual view DVI/CRT | [Enabled] | Dual view DVI/CRT is available via the DVI-I socket. |
| | [Disabled] | Only one monitor can be enabled via the DVI/VGA socket. |
| SRAM Memory Block | [2 MB] | SRAM is memory-mapped in the PCI address space (standard setting) |
| | [64 kB] | SRAM is memory-mapped in the D segment (addresses 0Dxxxxh) |
| * This menu command depends on the device configuration | | |

**Note**

The second Ethernet interface support is OS dependent. For DOS based applications (e.g. Image Creator) please use the first Ethernet interface.

## 16.2.5 Advanced Menu

### Menu layout
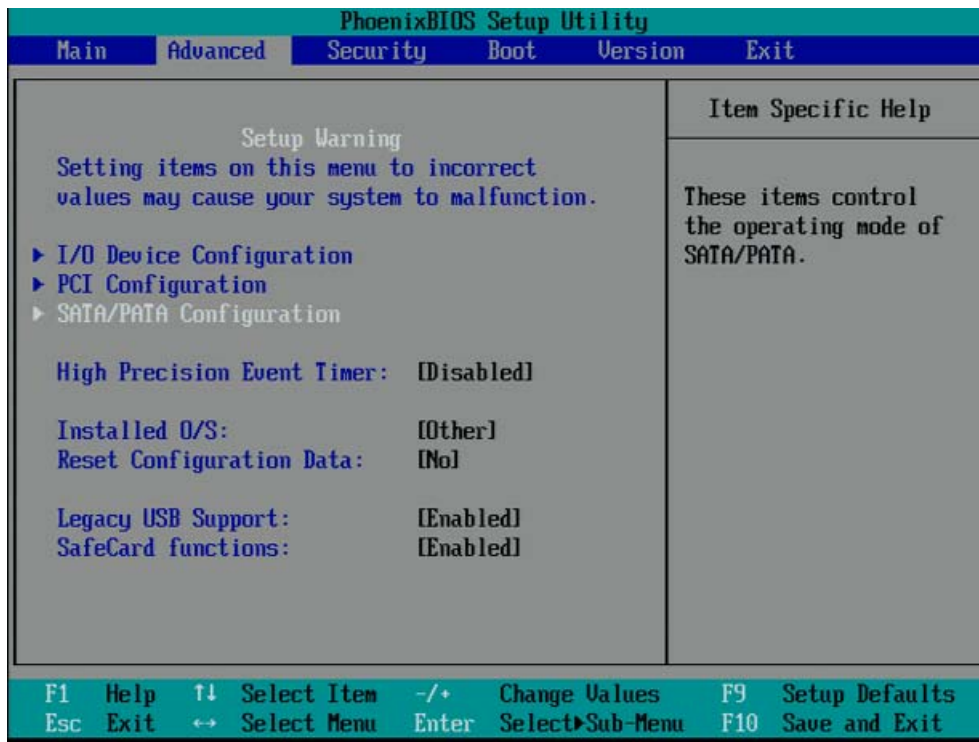


Figure 16-11  "Advanced" menu (example)

### Settings in the Advanced Menu

| High Precision Event Timer | [Disabled] | High-resolution timer for multimedia disabled. |
|---|---|---|
| | [Enabled] | High-resolution timer for multimedia enabled. |
| Installed O/S | Plug-and-Play means that all modules are automatically detected and installed, provided the modules support this functionality. | |
| | [Other] | BIOS handles the entire Plug&Play capability, default setting. |
| | [WinXP/2000] | The operating system handles the Plug-and-Play functions. |
| Reset Configuration Data | [Yes] | All Plug-and-Play data are deleted and the configuration is initialized at the next system restart. The entry is then reset to [No]. System components that do not support Plug&Play have to be entered manually. |
| | [No] | The Plug&Play system components are initialized after the next system start. |
| Legacy USB support | [Disabled] | Disables Legacy Universal Serial Bus support |
| | [Enabled] | Enables Legacy Universal Serial Bus support |
| | | 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. |

| 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. | |

## "I/O Device Configuration" submenu



Figure 16-12  "I/O device configuration" submenu
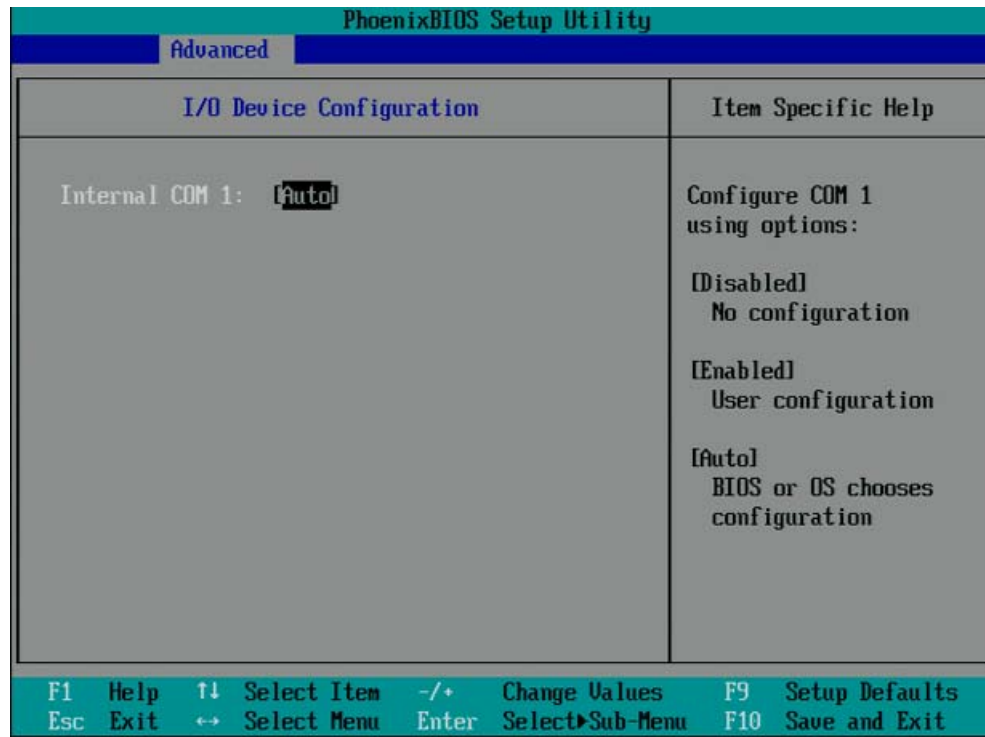
The resources used by an interface are released when you disable the interface in question.

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

**"PCI Configuration" submenu**
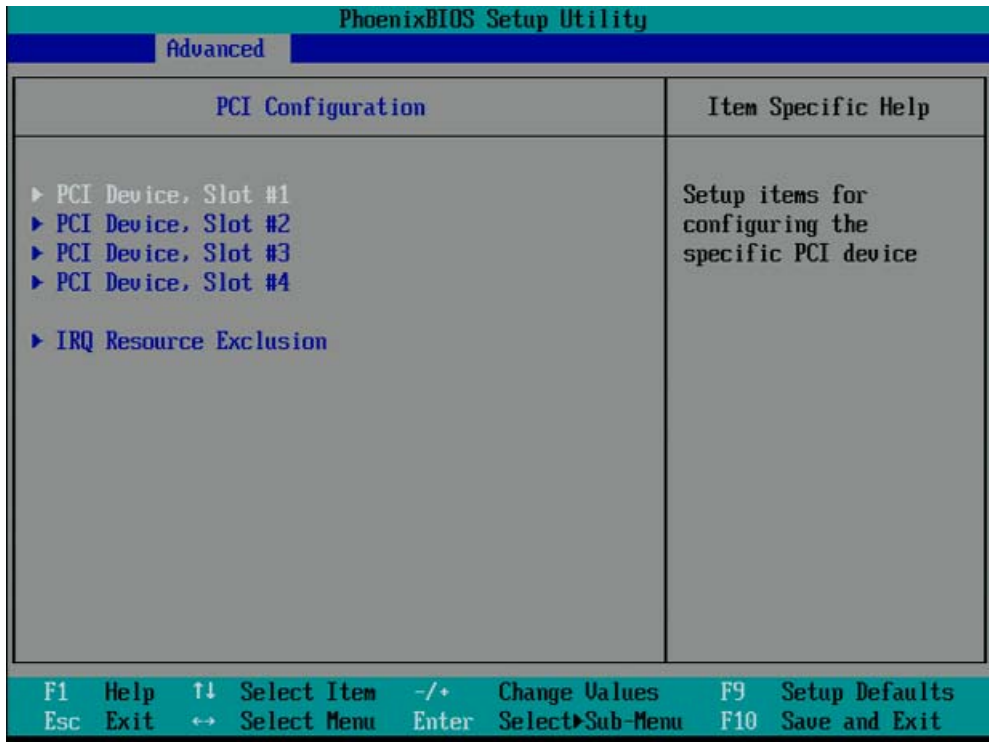


Figure 16-13  PCI Configuration submenu (example)

## "PCI Devices" field

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

```
                         PhoenixBIOS Setup Utility
          Advanced

              PCI Device, Slot #1                    Item Specific Help

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


     F1    Help    ↑↓  Select Item   -/+    Change Values    F9   Setup Defaults
     Esc   Exit    ↔   Select Menu    Enter  Select▶Sub-Menu  F10  Save and Exit
```
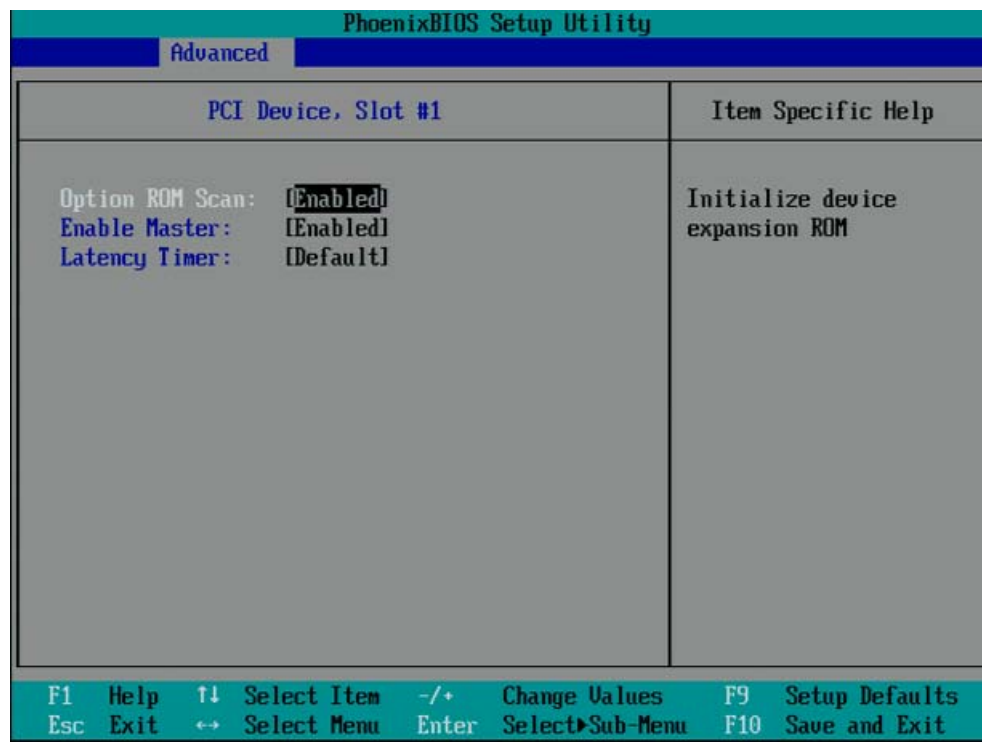
Figure 16-14  Field PCI Devices, Slot #1

| ROM scan option: | [Enabled] | The ROM option of the PCI module (if present) is enabled |
| | [Disabled] | The ROM option of a PCI module is disabled. |
| Enable Master | [Enabled] | This slot can be assigned PCI 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] | These settings are used to 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**

```
                      PhoenixBIOS Setup Utility
        Advanced

           IRQ Resource Exclusion              Item Specific Help


        IRQ 3:   [Available]              Reserves the specified
        IRQ 4:   [Available]              IRQ for use by legacy
        IRQ 5:   [Available]              ISA devices.
        IRQ 7:   [Available]
        IRQ 9:   [Available]              IRQ 9 will only be
        IRQ 10:  [Available]              available when using
                                          a none ACPI operating
                                          system.










   F1    Help   ↑↓  Select Item  -/+   Change Values   F9   Setup Defaults
   Esc   Exit   ↔   Select Menu   Enter Select▶Sub-Menu F10  Save and Exit
```
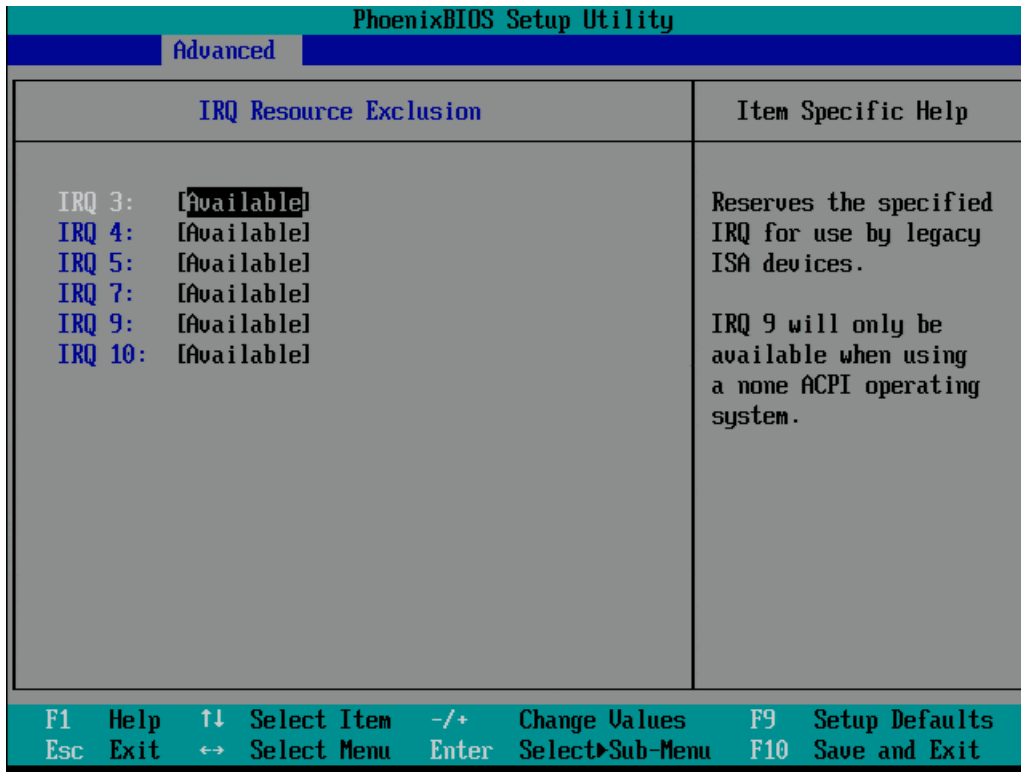
Figure 16-15  IRQ Resource Exclusion submenu

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

---

**Note**

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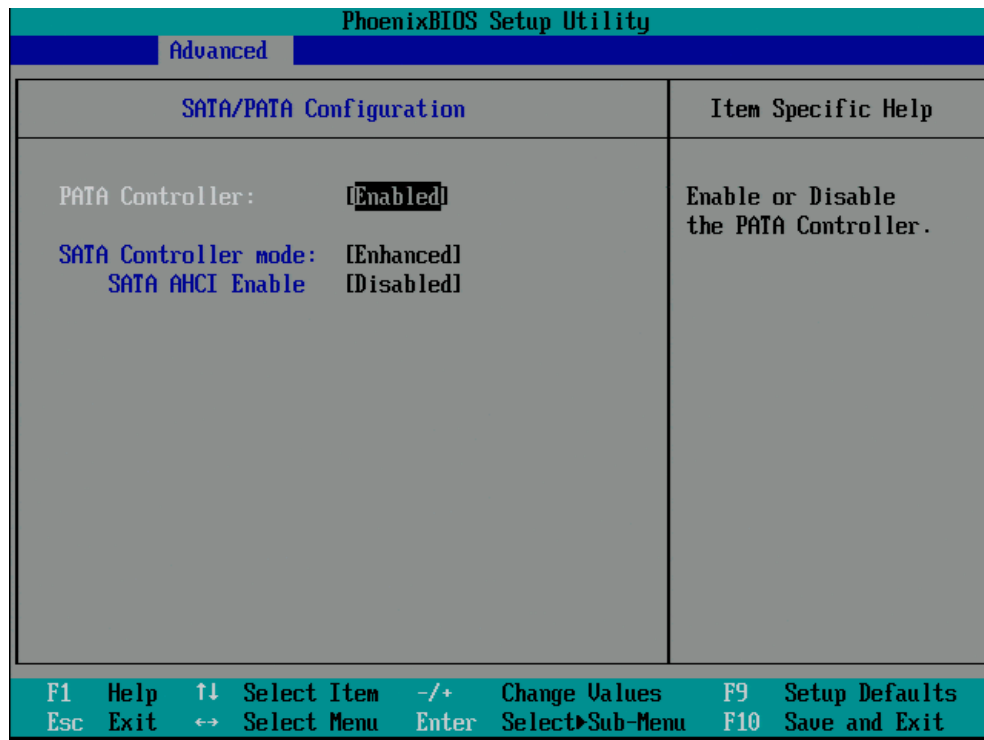
---

## "SATA/PATA Configuration" submenu

```
                    PhoenixBIOS Setup Utility
        Advanced

           SATA/PATA Configuration            Item Specific Help

    PATA Controller:        [Enabled]        Enable or Disable
                                             the PATA Controller.
    SATA Controller mode:   [Enhanced]
        SATA AHCI Enable    [Disabled]




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

Figure 16-16  SATA/PATA Configuration

| PATA Controller: | [Enabled] [Disabled] | Disables or enables the PATA controller |
|---|---|---|
| SATA Controller mode | [Enhanced] | Extended operating mode of the IDE controller for Windows or newer operating systems (default setting) |
| | [Compatible] | Compatible operating mode of the IDE controllers for older operating systems |
| AHCI Support | [Disabled] [Enabled] | Another operating mode of the IDE controller **Important**: Do not change this setting after installing the operating system. |

## 16.2.6    Security menu

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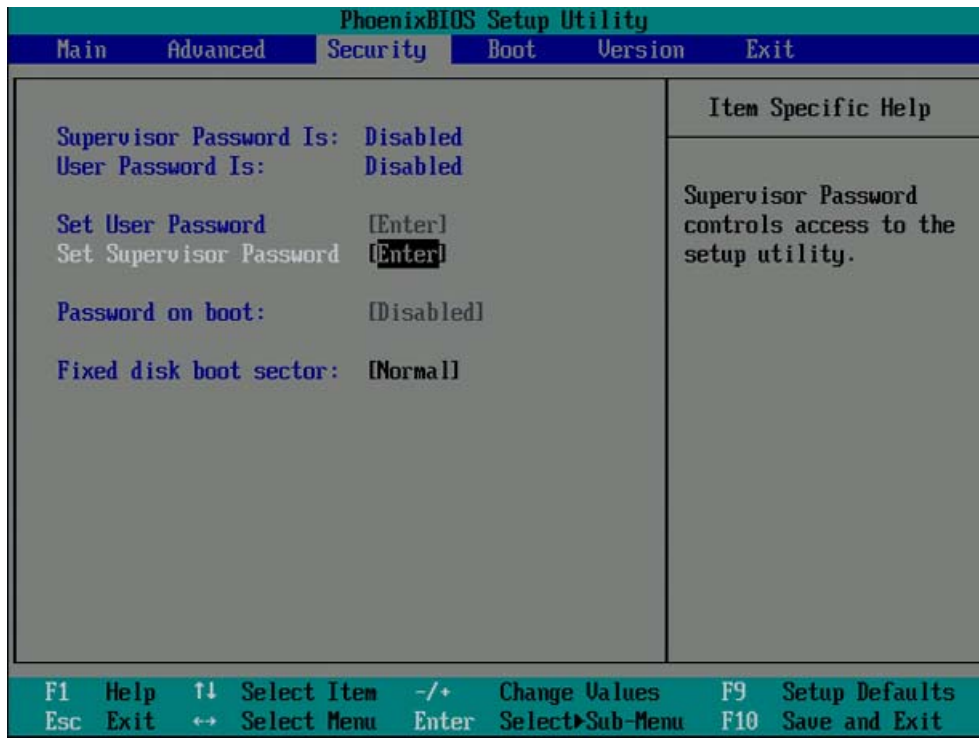


Figure 16-17   Security menu (example)

| User password is | Disabled | The password is disabled. |
|---|---|---|
| | Enabled | Certain Setup fields are 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 password input dialog. Authorized logged on users can change the supervisor password, or delete and deactivate it by pressing "Return." | |
| Set User Password | This field opens the password input dialog. Logged on users can change the password, or clear and deactivate it by pressing "Return." | |
| Password on boot | [Disabled] | No password prompt for booting. |
| | [Enabled] | Supervisor or user password must be entered for system boot. |
| Fixed disk boot sector | [Normal] | All types of hard-disk access are permitted. |
| | [Write protect] | the user cannot install an operating system. This is a way of protecting against boot viruses. |

### 16.2.7 Boot menu

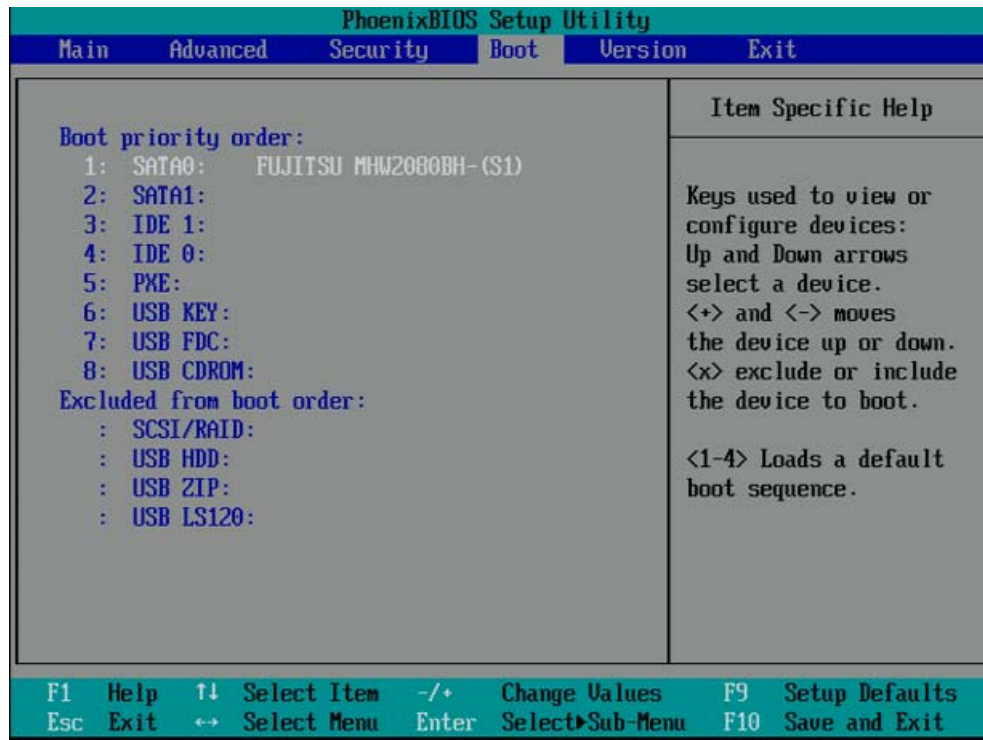This menu allows you to assign a priority for the boot devices.



Figure 16-18  Boot menu (example)

This screen shows all possible boot devices. The boot source with highest boot priority is shown at the top. To change the sequence:

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

With the x key, a selected boot source is moved in the "Boot priority order" or "Excluded from boot order" list.

#### Note

You can open the Boot menu and select the boot volume by pressing the ESC key during system startup.

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

Using the 1, 2, 3, 4 keys, you can select from 4 pre-defined boot sequences.

## 16.2.8 Version menu

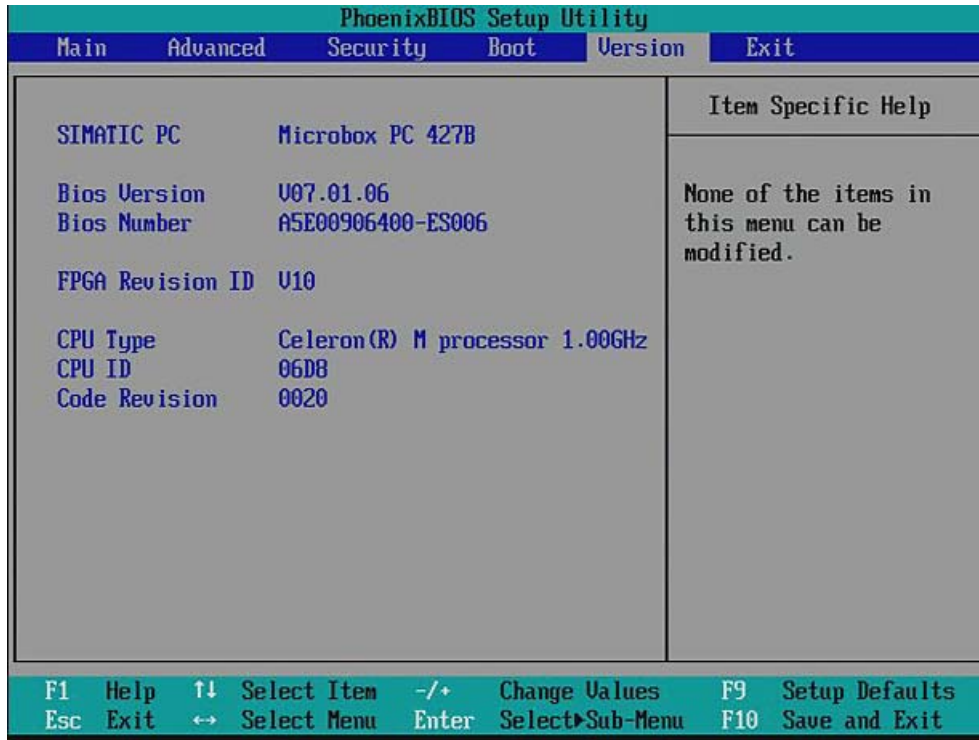This menu contains system information which should be made available to Technical Support.



Figure 16-19 Version menu (example)

## 16.2.9 Exit Menu

You always exit BIOS Setup in this menu.
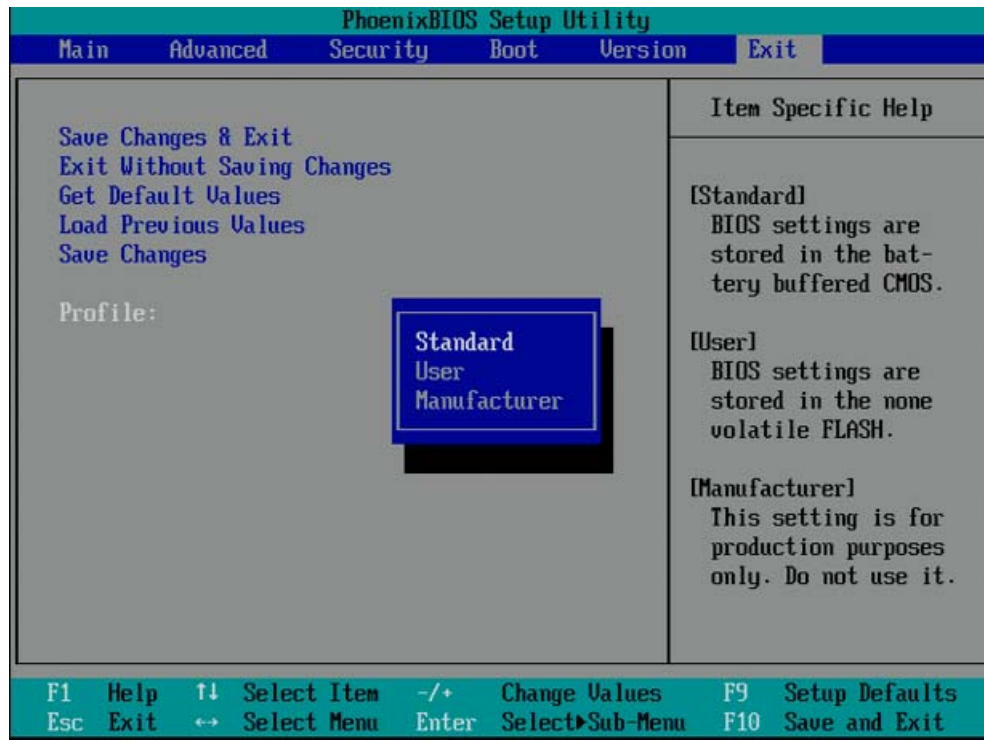


Figure 16-20  Exit menu

| Save Changes & Exit | All changes are saved and the system is restarted with the new parameters. | |
|---|---|---|
| Exit Without Saving Changes | All changes are discarded and the system is restarted with 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. | |
| Profiles | Standard | The BIOS settings are backed up to buffered CMOS |
| | User | The BIOS settings are saved in the non-volatile FLASH memory. |
| | Manufacturer | This setting is only used for production purposes. Do not use. |

## 16.2.10    Default BIOS Setup entries

### Documenting your device configuration

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

**Note**

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

### BIOS Setup default settings

| System parameters | Defaults | Custom entries |
|---|---|---|
| **Main** | | |
| System Time | hh:mm:ss | |
| System Date | MM/DD/YYYY | |
| IDE Channel 0 Master | | |
| IDE Channel 0 Slave | | |
| SATA Port 0 | | |
| SATA Port 1 | | |
| Memory Cache | Write Back | |
| Diagnostic screen | Enabled | |

| **Boot options** | | |
|---|---|---|
| Quick Boot Mode | Enabled | |
| SETUP prompt | Enabled | |
| POST errors | All, but not keyboard | |
| Summary screen | Enabled | |

| **Keyboard Features** | | |
|---|---|---|
| Numlock | On | |
| Keyboard auto-repeat rate | 30/sec | |
| Keyboard auto-repeat delay | ½ sec | |

| **Hardware Options** | | |
|---|---|---|
| PCI - MPI / DP [1] | Enabled | |
| Internal CAN [2] | Enabled | |
| CAN bus I/O address [2] | 5400 | |
| On-board Ethernet 1 | Enabled | |
| Onboard Ethernet 1 Address | 000E8Cxxxxxx | |
| On-board Ethernet 1 Remote Boot | Disabled | |
| Onboard Ethernet 2 [3] | Enabled | |
| Onboard Ethernet 2 Address [3] | 000E8Cxxxxxx | |

| Hardware Options | | |
|---|---|---|
| Onboard Ethernet 2 Remote Boot [3] | Disabled | |
| Onboard Profinet [4] | Enabled | |
| MAC address Layer 2 [4] | 000E8Cxxxxxx | |
| MAC address Profinet [4] | 000E8Cxxxxxx | |
| Dual view DVI/CRT | Disabled | |
| SRAM Memory Block | 2 MB | |

[1] for versions with PROFIBUS only
[2] for versions with CAN bus only
[3] not with PROFINET versions
[4] for versions with PROFINET only

| Advanced | | |
|---|---|---|
| High Precision Event Timer | Disabled | |
| Installed O/S | Other | |
| Reset Configuration Data | No | |
| Legacy USB support | Enabled | |
| SafeCard functions | Enabled | |

| I/O Device Configuration | | |
|---|---|---|
| Internal COM 1 | Enabled | |
| Base I/O address | 3F8 | |
| Interrupt | IRQ 4 | |

| 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 Resource Exclusion | | |
|---|---|---|
| IRQ 3 | Available | |
| IRQ 4 | Available | |
| IRQ 5 | Available | |
| IRQ 7 | Available | |
| IRQ 9 | Available | |
| IRQ 10 | Available | |

| SATA/PATA Configuration | | |
|---|---|---|
| PATA Controller: | Enabled | |
| SATA Controller mode | Enhanced | |
| AHCI Support | Disabled | |

| Security | | |
|---|---|---|
| Supervisor Password Is | Disabled | |
| User password is | Disabled | |
| Set User Password | Enter | |
| Set Supervisor Password | Enter | |
| Password on boot | Disabled | |
| Fixed disk boot sector | Standard | |

| Boot | | |
|---|---|---|
| Boot priority order: | | |
| Excluded from boot order: | | |

| Version | | |
|---|---|---|
| SIMATIC PC | Microbox PC 427B | |
| BIOS Version | V07.01.xx | |
| BIOS Number | A5E00906400-ES0xx | |
| CPU Type | Celeron® M processor 1GHz | |
| CPU ID | 06D8 or 06D6 | |
| Code Revision | 0020 | |

## 16.3 System resources

### 16.3.1 Currently allocated system resources

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

| | |
|---|---|
| Windows XP Embedded | **Start > Run :** In the **Open** dialog, enter *msinfo32* and confirm with **OK** |
| Windows Vista | **Start >** Enter "cmd" in the search function, then enter "msinfo32" in the input box |

## 16.3.2    System resources used by the BIOS/DOS

The following tables and pictures describe the system resources for the factory state of the device.

### 16.3.2.1    PCI Interrupt Lines

The interrupts are assigned to devices by BIOS. Exclusive non-shared interrupts are available for the first two PCI-104 or PC/104-*Plus* slots as well as for DP12 and the first Ethernet interface.
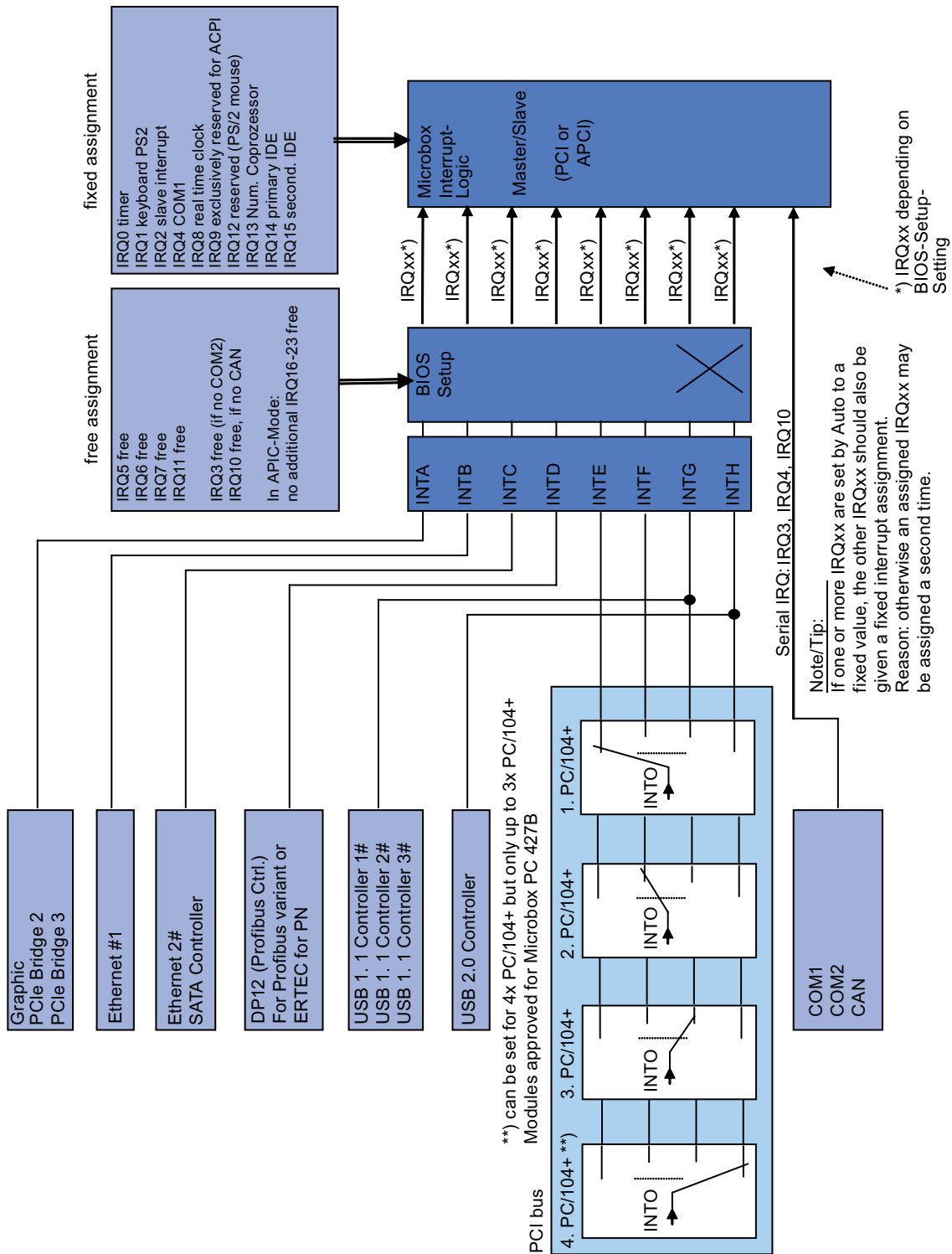
This means that applications or realtime operating system extensions can operate these devices exclusively and with high-performance without having to share the interrupt with other devices.

Table 16-1    Interrupt sharing in APIC mode

| Interrupt | | Interrupt type |
|---|---|---|
| IRQ0 | System timer | ISA-exclusive |
| IRQ1 | PS/2 keyboard controller emulation | ISA-exclusive |
| IRQ2 | Interrupt controller 2 | ISA-exclusive |
| IRQ3 | Reserved for Com Port 2 (COM2) | Free or ISA-exclusive (COM2) |
| IRQ4 | Com Port 1 (COM1) | ISA-exclusive |
| IRQ5 | Free | Free |
| IRQ6 | Reserved | Reserved |
| IRQ7 | Free | Free |
| IRQ8 | Realtime clock | ISA-exclusive |
| IRQ9 | ACPI-SCI (system control interrupt) | ISA/PCI-shareable |
| IRQ10 | CAN (optional) or free | ISA-exclusive (CAN) or free |
| IRQ11 | Free | Free |
| IRQ12 | PS/2 mouse controller emulation | ISA-exclusive |
| IRQ13 | Coprocessor | ISA-exclusive |
| IRQ14 | IDE controller 2 (enhanced mode) or IDE controller 1 (compatible mode) | ISA-exclusive |
| IRQ15 | IDE controller 1 (compatible mode) or free (enhanced mode) | ISA-exclusive |
| IRQ16 | Graphics, PCI Express Bridge | PCI-shared |
| IRQ17 | LAN1-exclusive | PCI-exclusive |
| IRQ18 | LAN2, IDE controller 1 (enhanced mode) | PCI-shared |
| IRQ19 | DP12/MPI exclusive | PCI-exclusive |
| IRQ20 | PCI104 slot 1 exclusive | PCI-exclusive |
| IRQ21 | PCI104 slot 2 exclusive | PCI-exclusive |
| IRQ22 | PCI104 slot 3, USB-UHCI controller (USB1.1) | PCI-shared |
| IRQ23 | PCI104 slot 4, USB-EHCI controller (USB2.0) | PCI-shared |

Table 16-2    Interrupt sharing in PIC mode

| Interrupt | | Interrupt type |
|---|---|---|
| IRQ0 | System timer | ISA-exclusive |
| IRQ1 | PS/2 keyboard controller emulation | ISA-exclusive |
| IRQ2 | Interrupt controller 2 (cascade) | ISA-exclusive |
| IRQ3 | Reserved for Com Port 2 (COM2) | Free or ISA exclusive (COM2) |
| IRQ4 | Com Port 1 (COM1) | ISA-exclusive |
| IRQ5 | LAN1-exclusive | PCI-exclusive |
| IRQ6 | Reserved | Reserved |
| IRQ7 | PCI104 slot 1/2 | PCI / PCI-exclusive |
| IRQ8 | Realtime clock | ISA-exclusive |
| IRQ9 | ACPI-SCI (system control interrupt) or free (no ACPI Besy) | ISA/PCI-shareable or free |
| IRQ10 | CAN (optional) or DP12/MPI (optional) or free | ISA-exclusive (CAN) / PCI-exclusive (DP12) or free |
| IRQ11 | Graphics, PCI-Express Bridge, LAN2, IDE controller 1, USB-UHCI controller (USB1.1), USB-EHCI controller (USB2.0), PCI104 slot 3/4 | PCI-shared |
| IRQ12 | PS/2 mouse controller emulation | ISA-exclusive |
| IRQ13 | Coprocessor | ISA-exclusive |
| IRQ14 | IDE controller 2 (enhanced mode) or IDE controller 1 (compatible mode) | ISA-exclusive (compatible mode) |
| IRQ15 | IDE controller 1 (compatible mode) or free (enhanced mode) | ISA-exclusive (compatible mode or PCI (enhanced mode) |

fixed assignment

IRQ0 timer
IRQ1 keyboard PS2
IRQ2 slave interrupt
IRQ4 COM1
IRQ8 real time clock
IRQ9 exclusively reserved for ACPI
IRQ12 reserved (PS/2 mouse)
IRQ13 Num. Coprozessor
IRQ14 primary IDE
IRQ15 second. IDE

Microbox Interrupt-Logic

Master/Slave

(PCI or APCI)

IRQxx*)
IRQxx*)
IRQxx*)
IRQxx*)
IRQxx*)
IRQxx*)
IRQxx*)
IRQxx*)

*) IRQxx depending on BIOS-Setup-Setting

free assignment

IRQ5 free
IRQ6 free
IRQ7 free
IRQ11 free

IRQ3 free (if no COM2)
IRQ10 free, if no CAN

In APIC-Mode:
no additional IRQ16-23 free

BIOS Setup

INTA
INTB
INTC
INTD
INTE
INTF
INTG
INTH

Serial IRQ: IRQ3, IRQ4, IRQ10

Note/Tip:
If one or more IRQxx are set by Auto to a fixed value, the other IRQxx should also be given a fixed interrupt assignment.
Reason: otherwise an assigned IRQxx may be assigned a second time.

Graphic
PCIe Bridge 2
PCIe Bridge 3

Ethernet #1

Ethernet 2#
SATA Controller

DP12 (Profibus Ctrl.)
For Profibus variant or ERTEC for PN

USB 1. 1 Controller 1#
USB 1. 1 Controller 2#
USB 1. 1 Controller 3#

USB 2.0 Controller

**) can be set for 4x PC/104+ but only up to 3x PC/104+
Modules approved for Microbox PC 427B

PCI bus

1. PC/104+
INT0

2. PC/104+
INT0

3. PC/104+
INT0

4. PC/104+ **)
INT0

COM1
COM2
CAN

# 16.4 I/O address areas

## 16.4.1 Overview of the internal module registers

**Overview of the internal module registers**

The following addresses are used for the internal registers:

| Addresses | Input/output unit |
|---|---|
| I/O 062h | Watchdog enable register / 066h select register |
| I/O 066h | Watchdog trigger register (Watchdog enable register bit 2=0) |
| | CAN base address register (Watchdog enable register bit 2=1) |
| I/O 404Eh - 404Fh | Output register LED 1/2 and SF LED / RUN/STOP LED |
| I/O 118Fh | Battery status register (read-only) |

## 16.4.2 Watchdog enable register / 066h select register (read/write, address 062h)

**Meaning of the bits**

| Watchdog enable register / 066h select register (r/w address 062h) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bit | | | | | | | | Meaning of the bits |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | | | | | | **Watchdog enable bit (WDE)** |
| | | | | | | | 0 | Watchdog circuit disabled |
| | | | | | | | 1 | Watchdog circuit enabled |
| | | | | | | | | **Watchdog Mode** |
| | | | | | | 0 | | Standard |
| | | | | | | 1 | | Macro |
| | | | | | | | | **066h select register selection** |
| | | | | | 0 | | | 066h is Watchdog trigger register |
| | | | | | 1 | | | 066h is CAN base address register |
| | | | | | | | | **Scaler watchdog time (Normal/Macro)** |
| | | 0 | 0 | 0 | | | | 94 ms / 2 s (default) |
| | | 0 | 0 | 1 | | | | 210 ms / 4 s |
| | | 0 | 1 | 0 | | | | 340 ms / 6 s |
| | | 0 | 1 | 1 | | | | 460 ms / 8 s |
| | | 1 | 0 | 0 | | | | 590 ms / 16 s |
| | | 1 | 0 | 1 | | | | 710 ms / 32 s |
| | | 1 | 1 | 0 | | | | 840 ms / 48 s |
| | | 1 | 1 | 1 | | | | 960 ms / 64 s |
| | | | | | | | | **Trigger red Watchdog LED** |
| | 0 | | | | | | | Red LED (WD) off |
| | 1 | | | | | | | Red LED (WD) on |
| | | | | | | | | **Watchdog error / Display and reset** |
| 0 | | | | | | | | WD inactive |
| 1 | | | | | | | | WD triggered Reset LED after watchdog alarm (Bit 7 = write 1) |

**See also**

Watchdog (WD) (Page 50)

## 16.4.3    Watchdog trigger register (read only, address 066h)

### Watchdog trigger register

The watchdog is triggered by a read action (address 066h) by this register. The result of the read access can be disregarded (i.e., dummy read).

## 16.4.4    CAN base address register (write only, address 066h)

A 512 byte window is created in the I/O area for the CAN controller (Philips SJA1000). The block itself only needs 32 or 128 bytes of this depending on the operating mode. The address window can be selected in 1024 byte steps between 4000h and 7C00h through the CAN base address register (write only, address 066h).

A limited selection can be preset in the BIOS Setup.

### Note

The CAN base address register shares its I/O address with other registers. The watchdog enable register / 066h select register therefore must be selected before access.

### Meaning of the bits

| CAN base address register (write only, address 066h, Address register selection 1) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Bit | | | | | | | | Description | |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
| | | | | | | 0 | 0 | Reserved (Write: 00) | |
| 0 | 1 | | | | | | | Reserved (Write:01) | |
| | | 0 | 0 | 0 | 0 | | | 40h | Sets the high byte of the CAN base address 01nnnn00 |
| | | . | . | . | . | | | . | |
| | | . | . | . | . | | | . | |
| | | 1 | 1 | 1 | 1 | | | 7Ch | |

## 16.4.5 Output register LED 1 / 2 (read/write, address 404Eh)

### Meaning of the bits

| Output register LED 1 / 2 (read/write address 404Eh) | | | | | | |
|---|---|---|---|---|---|---|
| Bits | | | | | | |
| 15 | 14 | 13 - 8 | 7 | 6 | 5 - 0 | |
| | 1 | | | 1 | | LED L1 / SF dark (default) |
| | 1 | | | 0 | | LED L1 / SF lights yellow |
| | 0 | | | 1 | | LED L1 / SF lights red (= group fault) |
| 1 | | | 1 | | | LED L2 / R/S dark (default) |
| 1 | | | 0 | | | LED L2 / R/S lights yellow (= STOP) |
| 0 | | | 1 | | | LED L2 / R/S lights green (= RUN) |
| | | xxxxxx | | | xxxxxx | Reserved (read/write) |

### Note

The L1 and L2 LEDs indicate by flashing alternatively yellow the progress of the BIOS self-test during the device startup. When the BIOS self-test is completed, the L1 and L2 LEDs go dark.

## 16.4.6 Battery status register (read-only, address 118Fh)

The status of the CMOS battery is monitored; the status (two-tier) can be read from the battery status register.

### Meaning of the bits

| Battery status register (read-only, address 118Fh) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bit | | | | | | | | Description |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| 0 | 0 | | | | | | | CMOS battery capacity is still sufficient. |
| 1 | 0 | | | | | | | CMOS battery capacity is exhausted (remaining capacity is sufficient for approx. one month) |
| 1 | 1 | | | | | | | CMOS battery is empty |

## 16.4.7    SRAM address register

The battery-buffered SRAM uses a 2 MB memory address area, which can be read via the PCI register.

**Meaning of the bits**

| SRAM address register | | |
| --- | --- | --- |
| PCI register address: SRAM base address register | PCI register content: SRAM memory address (default) | Length of the memory area |
| 8006 2010h | DC20 0000h Address is assigned dynamically (depending on device) | 20 0000h |

## 16.5 CP 1616 onboard communications processor

### 16.5.1 Introduction

The CP 1616 onboard allows the connection of industrial PCs to Industrial Ethernet.

The basic characteristics of the PCS 1616 onboard are:

- Optimized for PROFINET IO
- With Ethernet realtime ASIC ERTEC 400
- Three RJ45 sockets for connecting terminal devices or addition network components
- Integrated 3-port real-time switch
- Automatic hardware detection

#### 16.5.1.1 Network connections

**Ethernet**

The CP 1616 is designed for operation in Ethernet networks. Additional features are:

- The connectors are designed for 10BaseT and 100BaseTX.
- Data transfer rates of 10 and 100 Mbps in full/half duplex mode are supported.
- The handshake is performed automatically (auto negotiation).
- A 3-port realtime switch is located in the module.
- Autocrossing

**Three RJ45 connectors**

The CP 1616 is connected to the LAN (Local Area Network) via one of the three RJ45 sockets of the PC.

These three sockets lead to the integrated realtime switch.

## 16.5.1.2    Typical Communication Partners

### CP 1616 onboard as an IO controller

The following diagram shows a typical application: CP 1616 onboard as PROFINET IO controller on the IO controller layer.

The IO base controller user program runs on the PC. This program accesses the functions of the IO base user program interface.

Data traffic is routed via the communication processor to several SIMATIC S7 PROFINET IO devices, ET 200S over Industrial Ethernet.
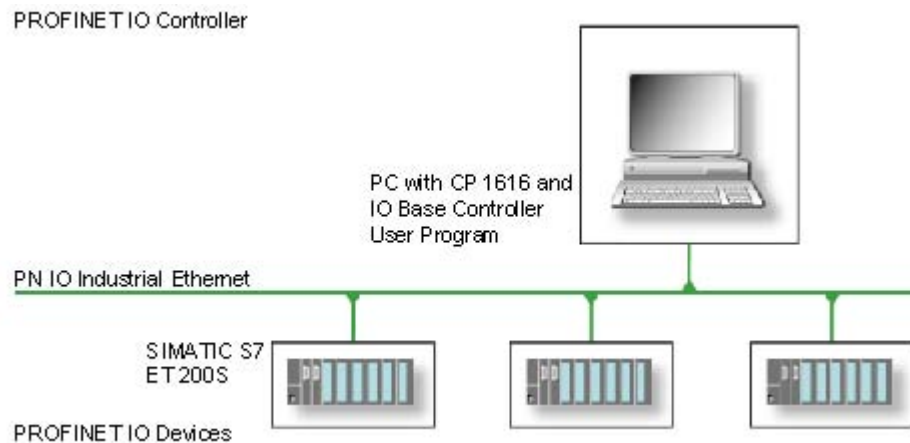
## CP 1616 onboard as IO device

The following diagram shows a typical application: Two PCs each with a CP as a PROFINET IO device on the IO device layer.

A PC with a CP as PROFINET IO controller, a SIMATIC S7-400 with a CP 443-1 as PROFINET IO controller and two SIMATIC S7 ET 200S PROFINET IO devices are also connected in the network.

The IO base device user program runs on the IO device PC. This program accesses the functions of the IO base user program interface. Data traffic is routed via the CP 1616 onboard communication processor to a PC as PROFINET IO controller or an S7-400 automation system with CP 443-1 over Industrial Ethernet.
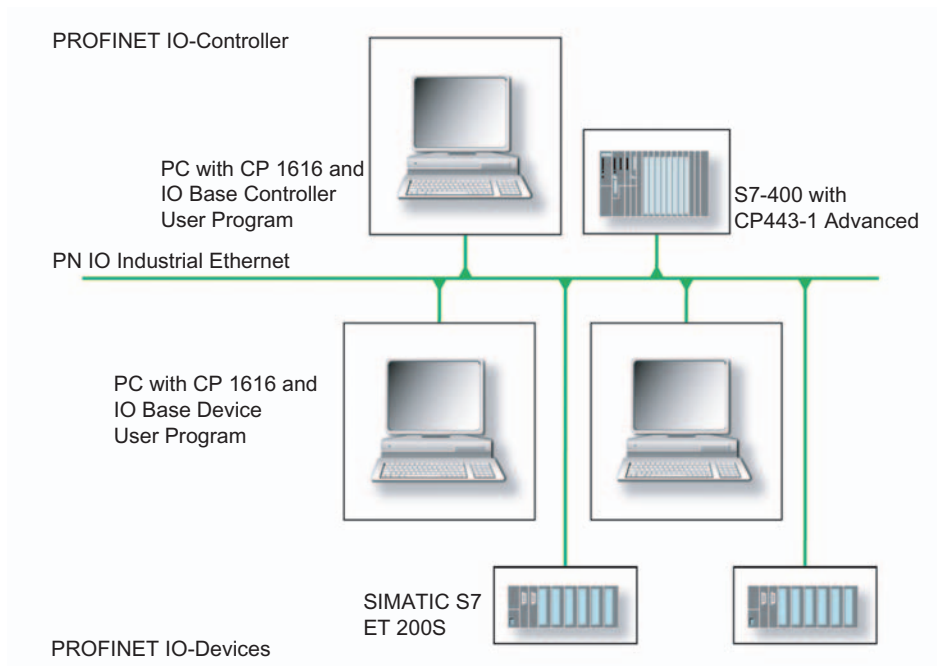
## 16.5.2 Firmware loader

### Scenario for using the firmware loader

The CP 1616 onboard is supplied with the latest version of the firmware. If new functions become available due to product development, you can make them available by performing a firmware download.

### Description

This section will familiarize you with the application area and use of the firmware loader. You can find additional, detailed information about the individual loader variants in the integrated help of the program.

### Firmware

This refers to the system program in the SIMATIC NET modules.

### Application area for the firmware loader

The firmware loader enables you to reload new firmware releases to SIMATIC NET modules. It is used for:

- PROFIBUS modules
- Industrial Ethernet modules
- Modules for gateways, for example IE/PB link

### Installation

The firmware loader is available on your PG/PC under Windows following the installation of STEP 7/NCM PC.

### Loader files

The firmware loader supports the following file types:

- <File>.FWL
  A file form that contains information in addition to the LAD file format, which is displayed by the firmware loader. The firmware loader can use this information to check if the firmware is compatible to the device.

- <File>.LAD
  A file format that only contains the system program to be loaded into the module.

Read the information provided along with the loader file, for example, in the readme file. This information is also displayed in the firmware loader when the FWL file is loaded.

## 16.5.2.1    Loading firmware

### Start downloading procedure

1.  In the Windows Start menu, select the menu command SIMATIC > STEP 7 > NCM S7 > Firmware Loader.
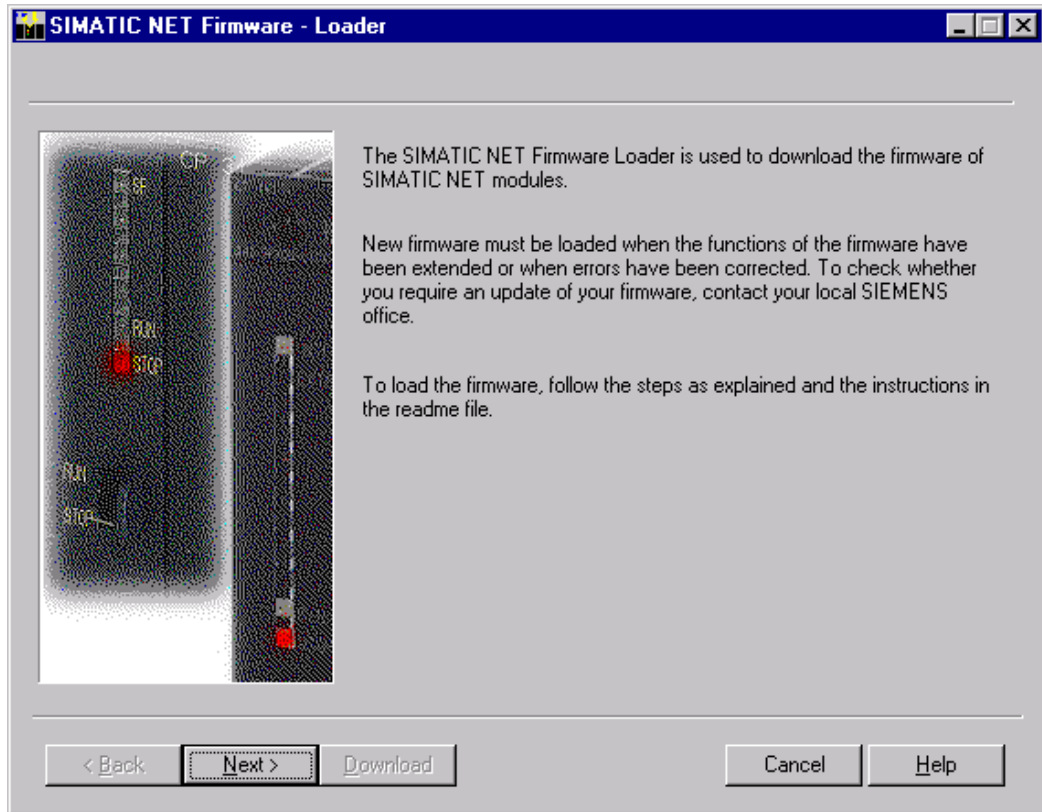


2.  Click "Next" and follow the instructions in the dialog fields that follow. A help function is integrated in the software as support.

| CAUTION |
| --- |
| Ensure that the loader file you are using for the update is suitable for the version of firmware on your module. If you have any doubts, contact your local Siemens consultant. |

| CAUTION |
| --- |
| Be aware that aborting the loading process may result in an inconsistent state in your module. |

You can find additional, detailed information about the individual loader variants in the integrated help.

| NOTICE |
| --- |
| When loading the firmware or commissioning the module, be aware that the CP 1616 onboard takes five MAC addresses (always in direct sequence). The first two are shown in the BIOS. |

```
                    PhoenixBIOS Setup Utility
  Main

        Hardware Options                   Item Specific Help

  Onboard Profinet:            [Enabled]   Enables or disables
  MAC-Address Layer 2:         08000698A9A5   the CP 1616 onboard
  MAC-Address PROFINET:        08000698A9A6   PROFINET-Interface.

  Onboard Ethernet 1:          [Enabled]
  Onboard Ethernet 1 Address:  000E8C80A5A3
  Onboard Ethernet 1 Remote Boot: [Disabled]


  Dual view DVI/CRT:           [Disabled]

  SRAM Memory Block:           [2 MB]




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

## Example

The lowest address is for the layer 2 communication. The second is for Ethernet/PROFINET communication.

## 16.5.3     Further actions in STEP 7/NCM PC

**Configuring**

Your PC is now ready, although you still have to configure the SIMATIC NET communication software. The rest of the procedure is described in the "Commissioning PC Stations" manual (on the Windows PC that also contains STEP 7/NCM PC: Start > Simatic > Documentation > English > Commissioning PC Stations).

# Appendix

<div style="text-align: right; font-size: 3em;">A</div>

## A.1 Guidelines and declarations

### Notes on the CE Label

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

### EMC Directive

The devices meet the requirements for the EC directive "2004/108/EEC Electromagnetic Compatibility," and the following fields of application applies according to this CE label:

| Area of application | Requirement for | |
|---|---|---|
| | Emitted interference | Immunity to interferences |
| Residential area, business and trade areas and small businesses. | EN 61000-6-3: 2007 | EN 61000-6-1: 2007 |
| Industry | EN 61000-6-4: 2007 | EN 61000-6-2: 2005 |

### Declaration of conformity

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

### Note the installation guidelines

The installation guidelines and safety instructions given in this documentation have to be noted during commissioning and operation.

### Connecting peripherals

Noise immunity requirements to EN 61000-6-2 are met if connected peripherals are suitable for industrial applications. Peripheral devices are only be connected via shielded cables.

## A.2    Certificates and approvals

### DIN ISO 9001 certificate

The Siemens quality management system for all production processes (development, production and sales) meets DIN ISO 9001:2000 requirements.

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

Q-Net certificate no.: DE-001108 QM

### Software License Agreement

The device is shipped with preinstalled software. Please observe the respective license agreements.

### Approvals for the USA, Canada and Australia

### Product safety

| The following approvals are available for the device: |
| --- |
| Underwriters Laboratories (UL) according to Standard UL 60950-1, Report E11 5352 and Canadian National Standard CAN/CSA-C22.2 No. 60950-1 (I.T.E) or according to UL508 and Canadian National Standard CAN/CSA-C22.2 No. 142 (IND.CONT.EQ) or according to Canadian National Standard CAN/CSA-C22.2 No. 14-05 |

### 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 B est conforme à la norme NMB-003 du Canada. |

| AUSTRALIA | |
|---|---|
|  | This product meets the requirements of the AS/NZS CISPR 22. |

# A.3   Service and support

## Local information

If you have questions about the products described in this document, you can find help at: http://www.siemens.com/automation/partner

## Technical documentation for SIMATIC products

Further documentation for SIMATIC products and systems can be found at: http://www.siemens.com/simatic-tech-doku-portal

## Easy Shopping at the Mall

Catalog & online ordering system http://www.siemens.com/automation/mall

## Training

All the training options are listed at: http://www.siemens.com/sitrain

Find a contact at: Phone: +49(911) 895-3200

## Technical support

Tel +49 180 5050 222
Fax +49 180 5050 223
http://www.siemens.com/automation/csi/service

A Web form for Support Request can be found at:

http://www.siemens.com/automation/support-request

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

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

## Online support

Information about the product, Support and Service, right through to the Technical Forum, can be found at: http://www.siemens.com/automation/service&support

## After-sales information system for SIMATIC PC / PG

Information about contacts, drivers, and BIOS updates, FAQs and Customer Support can be found at: http://www.siemens.com/asis

# ESD directives

<div style="text-align: right; font-size: xx-large;">B</div>

## B.1 ESD directives

### Definition of ESD

All electronic modules are equipped with large-scale integrated ICs or components. Due to their design, these electronic elements are highly sensitive to overvoltage, and thus to any electrostatic discharge.

The electrostatic sensitive components/modules are commonly referred to as ESD devices. This is also the international abbreviation for such devices.

ESD modules are identified by the following symbol:



| CAUTION |
|---|
| ESD devices can be destroyed by voltages well below the threshold of human perception. These static voltages develop when you touch a component or electrical connection of a device without having drained the static charges present on your body. The electrostatic discharge current may lead to latent failure of a module, that is, this damage may not be significant immediately, but in operation may cause malfunction. |

## Electrostatic charging

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

The figure below shows the maximum electrostatic voltage which may build up on a person coming into contact with the materials indicated. These values correspond to IEC 801-2 specifications.
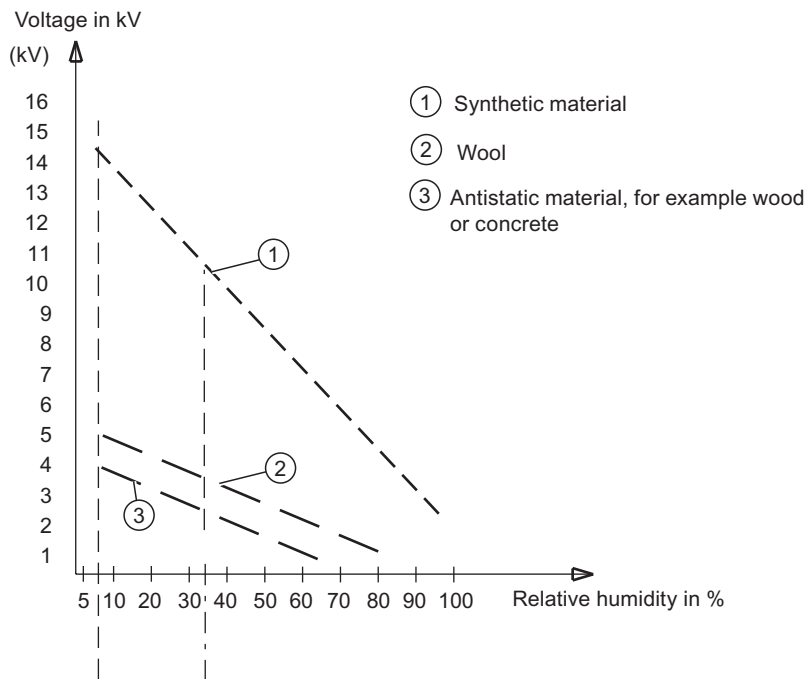


Figure B-1    Electrostatic voltages on an operator

## Basic protective measures against electrostatic discharge

- Ensure good equipotential bonding:
  When handling electrostatic sensitive devices, ensure that your body, the workplace and packaging are grounded. This prevents electrostatic charge.

- Avoid direct contact:
  As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). Handle the modules without touching any chip pins or PCB traces. In this way, the discharged energy can not affect the sensitive devices.

  Discharge your body before you start taking any measurements on a module. Do so by touching grounded metallic parts. Always use grounded measuring instruments.

# List of abbreviations/acronyms

## C.1   Abbreviations

| Abbreviation | Term | Meaning |
|---|---|---|
| AC | Alternating current | Alternating current |
| ACPI | Advanced Configuration and Power Interface | |
| PLC | Programmable controller | |
| AGP | Accelerated Graphics Port | High speed bus system |
| AHCI | Advanced Host Controller Interface | Standardized controller interface for SATA devices. This is supported in Microsoft Windows XP as of SP1 and IAA driver. |
| APIC | Advanced Programmable Interrupt Controller | Extended programmable interrupt controller |
| APM | Advanced Power Management | Tool for monitoring and reducing power consumption of the PC |
| AS | Automation system | |
| ASIS | After Sales Information System | |
| AT | Advanced Technology | |
| ATA | Advanced Technology Attachment | |
| ATX | AT-Bus-Extended | |
| AWG | American Wire Gauge | US standard for the cable diameter |
| BIOS | Basic Input Output System | Basic Input Output System |
| CAN | Controller Area Network | |
| CD-ROM | Compact Disc – Read Only Memory | Removable storage medium for large data volumes |
| CD-RW | Compact Disc – Rewritable | Rewritable CD |
| CE | Communauté Européenne (CE symbol) | The product is in conformance with all applicable EC directives |
| CF | Compact Flash | |
| CGA | Color Graphics Adapter | Standard monitor interface |
| CLK | Clock pulse | Clock signal for controllers |
| CMOS | Complementary Metal Oxide Semiconductors | Complementary metal oxide semiconductors |
| COA | Certificate of authentication | Microsoft Windows Product Key |

| Abbreviation | Term | Meaning |
|---|---|---|
| CoL | Certificate of License | License authorization |
| COM | Communications Port | Term for the serial interface |
| CP | Communication Processor | Communication computer |
| CPU | Central Processing Unit | CPU |
| CRT | Cathode Ray Tube | |
| CSA | Canadian Standards Association | Canadian organization for tests and certifications according to own or binational standards (with UL / USA) standards |
| CTS | Clear To Send | Clear to send |
| DRAM | Dynamic Random Access Memory | |
| DC | Direct Current | DC current |
| DCD | Data Carrier Detect | Data carrier signal detection |
| DMA | Direct Memory Access | Direct memory access |
| DOS | Disk Operating System | Operating system without GUI |
| DP | Distributed I/Os | |
| DQS | Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH | |
| DDRAM | Double Data Random Access Memory | Memory chip with high-speed interface |
| DSR | Data Set Ready | Ready for operation |
| DTR | Data Terminal Ready | Data terminal is ready |
| DVD | Digital Versatile Disk | Digital versatile disk |
| DVI | Digital Visual Interface | Digital display interface |
| DVI-I | Digital Visual Interface | Digital display interface with digital and VGA signals |
| ECC | Error Correction Code | Error correction code |
| ECP | Extended capability port | Extended parallel port |
| EGA | Enhanced Graphics Adapter | PC to monitor interface |
| ESD | Components sensitive to electrostatic charge | |
| DM | Electronic Manual | |
| EIDE | Enhanced Integrated Drive Electronics | An enhancement of the IDE standard |
| EISA | Extended Industry Standard Architecture | Extended ISA standard |
| EMM | Expanded Memory Manager | Manages memory expansions |
| EM64T | Extended Memory 64 technology | |
| EN | European standard | |
| EPROM / EEPROM | Erasable Programmable Read-Only Memory / Electrically Erasable Programmable Read-Only Memory | Plug-in submodules with EPROM/EEPROM chips |
| EPP | Enhanced Parallel Port | Bi-directional Centronics interface |
| ESC | Escape character | Control character |
| EWF | Enhanced Write Filter | |
| FAQ | Frequently Asked Questions | FAQs |
| FAT 32 | File Allocation Table 32-bit | 32-bit file allocation table |
| FD | Floppy disk | Disk drive, 3.5" |

| Abbreviation | Term | Meaning |
|---|---|---|
| FSB | Front Side Bus | |
| GND | Ground | Chassis ground |
| HD | Hard disk | Hard disk |
| HDA | High Definition Audio | |
| HDD | Hard Disk Drive | HDD |
| HU | Height unit | |
| HMI | Human Machine Interface | User interface |
| HT | Hyper-Threading | |
| HTML | Hyper Text Markup Language | Script language for creating Internet pages. |
| HTTP | Hypertext Transfer Protocol | Protocol for data transfer on the Internet |
| Hardware | Hardware | |
| I/O | Input/Output | Data input/output on computers |
| IAA | Intel Application Accelerator | |
| IDE | Integrated Device Electronics | |
| IEC | International Electronical Commission | |
| IGD | Integrated Graphics Device | |
| IP | Ingress Protection | Degree of protection |
| IR | Infrared | Infrared |
| IRDA | Infrared Data Association | Standard for data transfer via IR module |
| IRQ | Interrupt Request | Interrupt request |
| ISA | Industry Standard Architecture | Bus for expansion modules |
| ITE | Information Technology Equipment | |
| L2C | Level 2 cache | |
| LAN | Local Area Network | Computer network that is limited to a local area. |
| LCD | Liquid Crystal Display | Liquid crystal display |
| LEDs | Light Emitting Diode | Light emitting diode |
| LPT | Line Printer | Printer port |
| LVDS | Low Voltage Differential Signaling | |
| LW | Drive | |
| MAC | Media access control | Media access control |
| MC | Memory Card | Memory card in credit card format |
| MLFB | Machine-readable product designation | |
| MMC | Micro Memory Card | Memory card of the format 32 mm x 24.5 mm |
| MPI | Multipoint-capable interface for programming devices | |
| MS-DOS | Microsoft Disc Operating System | |
| MTBF | Mean Time Between Failures | |
| MUI | Multilanguage User Interface | Language localization in Windows |
| NA | Not Applicable | |

| Abbreviation | Term | Meaning |
|---|---|---|
| NAMUR | Normenarbeitsgemeinschaft for Mess- und Regelungstechnik in der chemischen Industrie (standardization body for instrumentation and control technology in the chemicals industry) | |
| NC | Not Connected | Not connected |
| NCQ | Native Command Queuing | Automatic re-sorting of the file and disk access, for increased performance |
| NEMA | National Electrical Manufacturers Association | Syndicate of manufacturers of electrical components in the USA |
| NMI | Non Maskable Interrupt | Interrupt the processor can not reject |
| NTFS | New Techniques File System | Secure file system for Windows versions (2000, XP, Vista) |
| ODD | Optical Disk Drive | |
| OPC | OLE for Process Control | Standardized interface for industrial processes |
| PATA | Parallel ATA | |
| PC | Personal computer | |
| PCI | Peripheral Component Interconnect | High-speed expansion bus |
| PCIe | Peripheral Component Interconnect express | High-speed serial, differential full-duplex PtP interface with high data rate. |
| PCMCIA | Personal Computer Memory Card International Association | |
| PI | Protective Earth | Protective conductor |
| PEG | PCI Express Graphics | |
| PG | Programming device | |
| PIC | Programmable Interrupt Controller | Programmable interrupt controller |
| POST | Power On Self Test | |
| PXE | Preboot Execution Environment | Software for running new PCs without hard disk data via the network |
| RAID | Redundant Array of Independent Disks | Redundant hard disk array |
| RAL | Restricted Access Location | Installation of device in operating facilities with restricted access - for example, a locked switchgear cabinet |
| RAM | Random Access Memory | |
| RI | Ring Input | Incoming call |
| ROM | Read-Only Memory | |
| RS 485 | Reconciliation Sublayer 485 | Bi-directional bus system designed for up to 32 nodes |
| RTC | Real Time Clock | Real-time clock |
| RTS | Reliable Transfer Service | Request to send |
| RxD | Receive Data | Data transfer signal |
| SATA | Serial Advanced Technology Attachment | |
| SCSI | Small Computer System Interface | |
| SDRAM | Synchronous DRAM | |
| SELV | Safety Extra Low Voltage | Safety extra low voltage |

| Abbreviation | Term | Meaning |
|---|---|---|
| SLC | Second Level Cache | |
| SMART | Self Monitoring Analysis and Reporting Technology | Hard disk error diagnostics program |
| SMS | Short Message Service | Short message via telecommunication network |
| SNMP | Simple Network Management Protocol | Network protocol |
| SO-DIMM | Small Outline Dual Inline Memory Module | |
| SOM | SafeCard on Motherboard (SOM) | |
| SPP | Standard Parallel Port | Synonym for parallel port |
| SVGA | Super Video Graphics Array | Enhanced VGA standard with at least 256 colors |
| SVP | Serial number of the device | |
| SW | Software | |
| TCO | Total Cost of Ownership | |
| TFT | Thin-Film-Transistor | Type of LCD flat-screen |
| TTY | Tele Type | Asynchronous data transfer |
| TxD | Transmit Data | Data transfer signal |
| TWD | Watchdog Time | Watchdog monitoring time |
| UL | Underwriters Laboratories Inc. | US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards |
| UMA | Unified Memory Architecture | Video memory |
| URL | Uniform Resource Locator | Designation of the full address of an Internet page |
| USB | Universal Serial Bus | |
| UXGA | Ultra Extended Graphics Array | Graphic standard, maximum resolution 1600x1200 pixels. |
| V.24 | | ITU-T standardized recommendation for data transfer via serial ports |
| VDE | Verein deutscher Elektrotechniker (Union of German Electrical Engineers) | |
| VGA | Video Graphics Array | Video adapter which meets industrial standard |
| VRM | Voltage Regulator Module | |
| VT | Virtualization Technology | Intel technology with which a virtually closed environment can be made available. |
| W2k | Windows 2000 | |
| WAV | Wave Length Encoding | Loss-free file format for audio data |
| WD | Watchdog | Program monitoring with error detection and alarming. |
| WLAN | Wireless LAN | LWireless local area network |
| WoL | Wake on Local Area Network | |
| WWW | World Wide Web | |
| XGA | Extended Graphics Array | Graphic standard, maximum resolution 1024x768 pixels. |

# Glossary

**AHCI mode**

AHCI is a standardized method to address the SATA controller. AHCI describes a structure in the RAM, which contains a general area for control and status, as well as a command list.

**APIC mode**

Advanced peripheral interrupt controller. 24 interrupt lines are available.

**ATAPI CD-ROM Drive**

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

**Automation system (AS)**

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

**Backup**

Duplicate of a program, data medium 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. Certain applications automatically generate backup copies of data files, and manage both the current and the previous versions on the hard disk.

**Baud**

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

**BEEP code**

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

**Boot disk**

A boot disk is a bootstrap disk with "Boot" sector. This can be used to load the operating system from the disk.

## Booting

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

## Cache

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

## CE label

Communauté Européene The CE mark confirms compliance of the product with corresponding EC Directives, for example, with the EMC Directive.

## Chipset

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

## Cold restart

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

## COM interface

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

## Compact Flash cards (CF)

Compact Flash is a digital storage medium in card format and without moving parts. The CF card contains the non-volatile memory and the controller. The interface of the CF card corresponds with the IDE interface. CF cards can be operated without additional electronics on PCMCIA or IDE hard disk controllers using a plug and socket adapter. There are two design forms: CF-I (42.6 x 36.4 x 3.3 mm) and CF-II (42.8 x 36.4 x 5 mm).

## Configuration files

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

## Configuration software

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

## Controller

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

## Device configuration

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

## Disc-at-once

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

## Drivers

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

## Dual Core CPU

Dual-core processors significantly increase the speed of computing and program execution compared to the previous generation of single-core processors with hyperthreading technology.

## EMC directive

Directive concerning Electromagnetic Compatibility. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

## Energy management

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

## Energy options

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

**Enhanced Write Filter (EWF)**

Configurable write filter that allows you, for example, to boot Windows XP Embedded from write-protected media (such as CD-ROM), to write protect individual partitions and adapt the performance of the file system to your needs (when using Compact Flash cards).

**ESD directive**

Directive for using electrostatic sensitive components.

**Ethernet**

Local network (bus structure) for text and data communication with a transfer rate of 10/100/1000 Mbps.

**Formatting**

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

**Gender changer**

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

**Hard disk drives**

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

**Hot swapping**

The SATA interface gives the device's hard drive system hot-swap capability. Prerequisite for this configuration is a RAID1 system with SATA RAID controller (onboard, or slot module), and at least two SATA removable cartridges. The advantage of hot swapping is that defective hard disks can be replaced without having to reboot the computer.

**Hub**

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

**Hyper Threading**

HT technology (multi-threading) enables the parallel computing of processes. HT is only effective when all relevant system components, such as processors, operating systems and applications are supported.

## IGD

Integrated Graphics Device. Graphics interface integrated in the chipset.

## Image

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

## Intel VT

The Intel Virtualization Technology (IVT) is the implementation of a secure closed environment for applications. Special (visualization) software an a VT-capable processor is required for its use.

## Interface

See Interface

- Physical interconnection (cable) of hardware elements such as PLCs, PCs, programming devices, printers or monitors.
- Interface for interactive software applications.

## Interface

See Interface

- Physical interconnection (cable) of hardware elements such as PLCs, PCs, programming devices, printers or monitors.
- Interface for interactive software applications.

## Interface, multi-point

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

## LAN

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

## Legacy USB support

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

**License key**

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

**License key disk**

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

**Low-voltage directive**

EC Product Safety Directive relating to the safety of products which are operated on low voltage (50 VAC to 1000 VAC, 70 VDC to 1500 VDC) and not specified in other directives. Compliance is confirmed by the CE symbol and the EC certificate of conformity.

**LPT interface**

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

**Memory card**

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

**Module**

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

**Module retainer**

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

**Motherboard**

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

## NEC Class 2

The "NEC", National Electrical Code, is the USA collection of regulations that generally correspond to German VDE 0100 standards. All USA standards governing the safety of electrical equipment and corresponding "deviations" in IEC standards are based on NEC in terms of their country-specific requirements.

NEC Class 2 specifies higher safety requirements for protection against electric shock and National Fire Protection Association (NFPA) requirements for fire protection. Power supplies operating within the range from 20 VDC to 30 VDC must be equipped with an internal current limiting circuit which safely prevents output power higher than 100 VA.

## Operating system

Generic term which describes all functions for controlling and monitoring user program execution, distribution of system resources to the user programs and the operating mode in cooperation with the hardware (for example Windows XP Professional).

## Packet writing

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

## PATA

Interface for hard disk drives and optical drives, with parallel data transmission rate up to 100 Mbps.

## PC card

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

## PC/104 / PC/104-Plus

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

## PCMCIA

Association consisting of approx. 450 member companies of the computer industry whose focus is set on providing worldwide standards for miniaturization and flexible use of PC expansion cards in order to provide basic technologies to the market.

## PEG interface

PCI Express for Graphics. Graphics interface with 16 PCIe lanes for expansions with graphics modules.

## PIC mode

Peripheral interrupt controller. 15 interrupt lines are available.

## Pixel

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

## Plug&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&Play PC requires both a BIOS that supports Plug&Play and a Plug&Play expansion card.

## POST

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

## PROFIBUS/MPI

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

## PROFINET

PROFINET is the name of the standard for Industrial Ethernet developed and maintained by the PROFIBUS user organization. PROFINET unites protocols and specifications with which Industrial Ethernet meets the requirements of industrial automation technology.

## Programmable controller (PLC)

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

## PXE server

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

## RAID

**R**edundant **A**rray of **I**ndependent **D**isks: Data storage system which is used to save data and the corresponding error correction codes (parity bits, for example) to at least two hard disk volumes in order to enhance reliability and performance. The hard disk array is controlled by management programs and a hard disk controller for error correction. The RAID system is usually implemented in network servers.

## Recovery CD

Contains the tools for configuring hard disks and the Windows operating system.

## Reset

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

## Restart

Warm restart of a computer without switching the power off (Ctrl + Alt + Del)

## Restore DVD

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

## ROM

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

## SCSI interface

Small Computer System Interface Interface for connecting SCSI devices such as hard disk drives or optical drives.

## Session at once

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

## SETUP (BIOS Setup)

A program in which information about the device configuration (that is the configuration of the hardware on the PC/PG) is defined. The device configuration of the PC/PG is preset with defaults. Changes must therefore be entered in the SETUP if a memory expansion, 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.

## Track-at-once

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

## Troubleshooting

Error cause, cause analysis, remedy

## V.24 interface

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

## Wake on LAN (WoL)

Wake on Local area network. This function enables the PC to be started via the LAN interface.

## Warm restart

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

## Windows

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

## WLAN

Wireless LAN is a local network that transmits data via radio waves, infrared light or another wireless technology. Wireless LAN is mainly used for mobile computer applications in office or factory environments.

# Index