Operating Instructions Edition 05/2006

Industrial PC
Microbox PC 420

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Operating Instructions

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Safety Guidelines

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

Danger

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

Warning

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

Caution

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

Caution

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

Notice

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

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

Qualified Personnel

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

Prescribed Usage

Note the following:

Warning

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

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.

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Table of contents

Introduction

<div style="text-align: right; font-size: 2em;">1</div>

Purpose of the Manual

These operating instructions contain all the information you need for commissioning and using the SIMATIC Microbox PC 420.

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 this manual

This documentation is valid for all supplied variations of the SIMATIC Microbox PC 420 and describes the state of the product package as of May 2006.

Position in the Information Landscape

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

Conventions

The abbreviations "Microbox PC" and "device" are also used within this manual for the product name, SIMATIC Microbox PC 420.

History

Currently released versions of this operating manual:

Edition	Comment
09/2004	First edition
08/2005	Second Edition; Supplement Windows XP Professional, USB Strain-relief Connection
05/2006	Third release; troubleshooting, additional information, Notes on vertical mounting onto standard rails, for example driver installation under Windows XP Embedded

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 / Configuration	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 the vital components, allocation of system resources and use of the BIOS Setup
Appendix	Guidelines and certifications, service and support, notes on retrofitting.
ESD Guidelines	General ESD guidelines.

Safety Instructions

<div style="text-align: right; font-size: 3em;">2</div>

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, VDE, EN and cULus. 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!

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

ESD guidelines

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

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

- Always discharge yourself of static electricity before handling modules which are sensitive to ESD (for example, by touching a grounded object).

- All devices and tools must be free of static charge.

- Always pull the mains connector and disconnect the battery before 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

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3.1 Overview

The SIMATIC Microbox PC provides high-level industrial performance.

- Compact design
- Maintenance-free operation
- Rugged
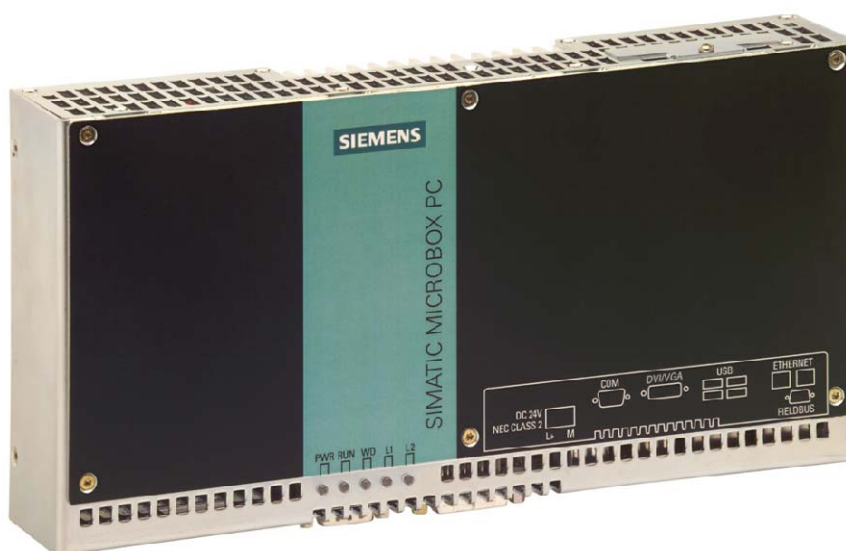
Figure 3-1   SIMATIC Microbox PC 420

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

3.3 Features

Basic data	
Installation / mounting	• DIN rail • Wall mounting
Processor	• Intel Celeron 400 MHz, 100 FSB, SLC 256 KB or • Intel Celeron 650 MHz, 100 FSB, SLC 256 KB or • Intel Pentium III 933 MHz, 133 FSB, SLC 512 KB
Main memory	• 128 MByte SDRAM PC133 or • 256 MByte SDRAM PC133 • 512 MByte SDRAM PC133
Free slots for expansion	up to 3 x PC/104 *Plus* (with expansion frames)
Graphic controller	• Integrated S3 - ProSavage 4 AGP controller • CRT resolution of 640x480 pixel up to 1600x1200 pixel (1600x1200 to 60Hz) • DVI resolution of 640x480 pixel up to 1024x768 pixel • 8/16/32 MB graphics memory taken from RAM (UMA)
Power supply	24 V DC (20.4 to 28.8 V)
Conditions of use	• Operation without fan
Drives and storage media	
Compact Flash card	• 256 MByte optional or • 512 MByte optional or • 1 GByte optional
Hard disk drive	≥ 40 GB UDMA100 EIDE (optional)
Floppy/CDROM drive	Connected via external USB port
USB stick	Connected via external USB port
Interfaces	
Serial	COM1 (RS232)
Graphics	DVI-I: combined DVI and VGA
USB	2 x USB 2.0, high current 2 x USB 2.0, high current
Ethernet	2 x 10/100 Mbps (RJ 45)
PROFIBUS DP	12 Mbps (isolated potential, compatible to CP 5611), optional
CAN interface	on request
Keyboard, mouse	Connected via external USB port

Monitoring and safety functions	
Temperature	• When permitted temperature range is exceeded • Warnings can be analyzed by application program (local, via LAN) Functions are optionally available.
Watchdog	Monitoring function for program execution (optionally available)
LED display	5 LEDs for displaying system status 2 of these can be programmed by the user[1]
Transient voltage interruption	up to 15 ms
Buffer memory	128 KB battery buffered SRAM[1]

Software	
Operating systems	
Available	• Without • Windows XP Embedded preinstalled • Windows XP Professional MUI preinstalled [2] • RMOS3 V3.30 (CD-ROM)
Project-specific	• LINUX • QNX • VxWorks • Others on request

[1]Contact Customer Support for information about addressing the LEDs or the SRAM under a Windows operating system.

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

3.4 Configuration

Device Configuration	Order No.																	
SIMATIC Microbox PC 420	6	O	G	4	0	4	0	-	0	O	**x**	**x**	0	-	0	**x**	**x**	0
Celeron 400 MHz, 100 MHz FSB											**O**							
Celeron 400 MHz, 100 MHz FSB, PROFIBUS DP12											**B**							
Celeron 400 MHz, 100 MHz FSB, CAN interface											**C**							
Celeron 650 MHz, 100 MHz FSB											**D**							
Celeron 650 MHz, 100 MHz FSB, PROFIBUS DP12											**E**							
Pentium III, 933 MHz, 133 MHz FSB											**G**							
Pentium III, 933 MHz, 133 MHz FSB, PROFIBUS DP12											**H**							
128 MByte SDRAM-133												**1**						
256 MByte SDRAM-133												**2**						
512 MByte SDRAM-133												**3**						
40 GB EIDE hard disk																**O**		
256 MB Compact Flash card																**M**		
512 MB Compact Flash card																**N**		
1 GB Compact Flash card																**P**		
Without mass storage																**X**		
Windows XP Embedded preinstalled [1]																	**O**	
Windows XP Professional MUI preinstalled [2]																	**B**	
Without operating system																	**X**	

[1] Together with 512 MB, 1 GB Compact Flash card or 40 GB EIDE hard disk
[2] Together with 40 GB EIDE hard disk

Accessories	Order No.																	
Expansion kit PC/104	6	O	G	4	0	7	0	-	0	B	O	0	0	-	0	X	O	0
256 MB Compact Flash card	6	E	S	7	6	4	8	-	2	B	F	0	0	-	0	X	C	0
512 MB Compact Flash card	6	E	S	7	6	4	8	-	2	B	F	0	0	-	0	X	D	0
1 GB Compact Flash card	6	E	S	7	6	4	8	-	2	B	F	0	0	-	0	X	E	0
SIMATIC USB Flash Drive, USB 2.0, 512 MB	6	E	S	7	6	4	8	-	0	D	C	2	0	-	0	O	O	0
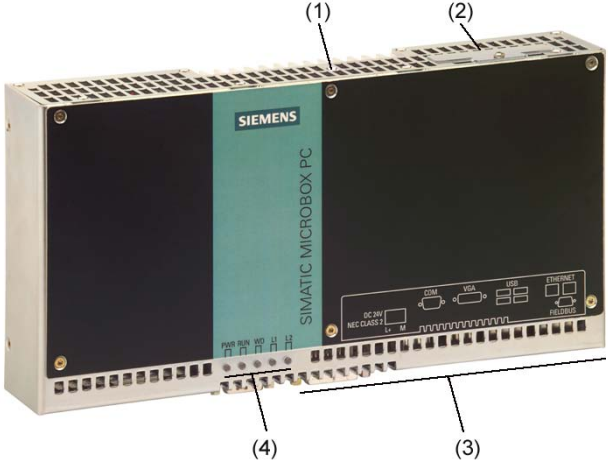
3.5 Windows XP Embedded

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 the RAM	In the RAM
Safecard on Motherboard (SOM)	Available	Available
Pagefile	150% RAM expansion	Not available
System Restore Core	Available	Available
MUI	GER/FRA/ITA/SPA	Not available
Administrator Account	Available	Available
User Account	Available	Available
Explorer Shell	Available	Available
Internet Explorer (IE) 6.0	Available	Available
Internet Information Server (IIS)	Available as of SP2	Available as of SP2
Terminal Services	Available	Available
Bluetooth	Available as of SP2	Available as of SP2
Wireless Network Support	Available as of SP2	Available as of SP2
Windows Firewall	Available as of SP2	Available as of SP2
Windows Security Center	Available as of SP2	Available as of SP2
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 1.1	Available	Not available
ASP.NET 1.1	Available	Not available
Windows .NET Messenger	Available	Not available
Codepages/User Locale/Keyboard	Available	Selection available
Disk Management Services	Available	Available
Windows Installer Service	Available	Available
Class Installer	Available	Available
CoDevice Installer	Available	Available
Windows Movie Maker	Available	Not available
Media Player 9.0	Available	Available
Windows Media Player Tour	Available	Not available
DirectX	SP1: V8.1 / SP2: V9.0b	SP1: V8.1 / SP2: V9.0b
Accessories	Available	Available
Help files for all components	Available	Not available
Games	Available	Not available
Fonts	309	120
Windows XP Tour	Available	Not available

3.6 Design

3.6.1 External Design

Device components	Pos	Description
	(1)	Reset button The reset button can be actuated with a pin or an opened up paper clip, for example. The button signal triggers a hardware reset. The PC performs a restart (cold start).
	(2)	Cover plate for Compact Flash module
	(3)	Interfaces
	(4)	Status displays

Caution
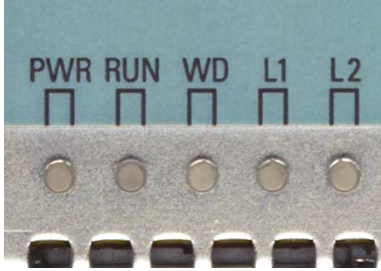
Data may be lost when the PC performs a hardware reset.

3.6.2 Connection components

Ports and power supply

Connector locations

Pos	Name	Description
(1)	24 VDC	Connection for a 24 V DC power supply
(2)	COM 1	Serial port 1 (RS232), 9-pin Cannon socket
(3)	DVI/VGA	DVI/VGA connection for CRT or LCD monitor with DVI interface
(4)	USB	2 USB 2.0 connectors high speed / low current
(5)	USB	2 USB 2.0 connectors high speed / high current
(6)	Ethernet	RJ45 Ethernet connection 1 (exclusive PCI interrupt) for 10/100 Mbps
(7)	Ethernet	RJ45 Ethernet connection 2 (shared PCI interrupt) for 10/100 Mbps
(8)	PROFIBUS DP/MPI Other field bus	PROFIBUS DP/MPI interface (RS 485 isolated), 9-pin Cannon socket or other field busses (on request)
(9)	USB strain-relief fastener	The USB strain-relief must be fastened to the device housing with a oval-head screw (M4 thread). The USB cable is fastened to the strain-relief with a cable binder.
(10)	Protective earth terminal	The protective earth terminal (M4 thread) which is integrated into the device needs to be connected to the protective earth conductor. The minimum conductor cross-section may not be less than 2.5 mm^2.

3.6.3   Status displays

Status displays	Display	Meaning	LEDs	Description
	PWR	Power supply	OFF YELLOW	Isolated from supply voltage Supply voltage available
	RUN	Operation	OFF GREEN	No access to PCI bus Access to PCI, onboard and ISA peripherals
	WD	Watchdog status display	OFF GREEN RED	Watchdog disabled Watchdog enabled, monitoring time not expired Watchdog enabled, monitoring time not expired
	L 1	LED 1	YELLOW	Can be controlled by user programs[1]
	L 2	LED 2	YELLOW	Can be controlled by user programs[1]

[1]Contact Customer Support for information about addressing the LEDs L1 and L2 under a Windows operating system.

Application Planning 4

4.1 Transport

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

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

Caution

Risk of damage to the device!

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

If condensation develops, wait at least 12 hours before switching on the device.

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 No.	6AG 40 04-0A ...
Ethernet address 1	
Ethernet address 2	
Microsoft Windows Product Key	

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.

- 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**.

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

Figure 4-1   COA Label XP Embedded
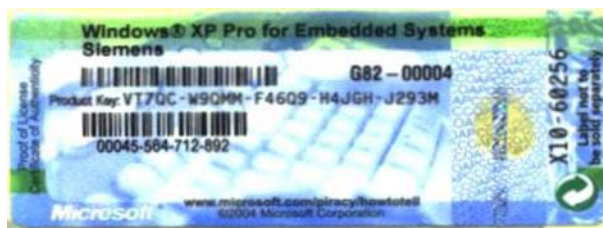
Figure 4-2   COA Label XP Professional

4.3 Ambient and Environmental Conditions

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

- Note the climatic and mechanical environmental conditions specified in the technical data in your operating manual.

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

- Avoid extreme environmental operating 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 vent slots of the device.

- Always observe the mounting positions permitted for this device.

4.4 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 cabinets.

Horizontal (preferred position)	Vertical
Permissible temperatures: Operating with Compact flash card: 0 to +50°C Operating with the hard disk: +5 to +40°C	Permissible temperatures: Operating with Compact flash card: 0 to +45°C Operating with the hard disk: +5 to +40°C

Mounting

<div align="right">

5

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5.1   Mounting the device

Mounting Types
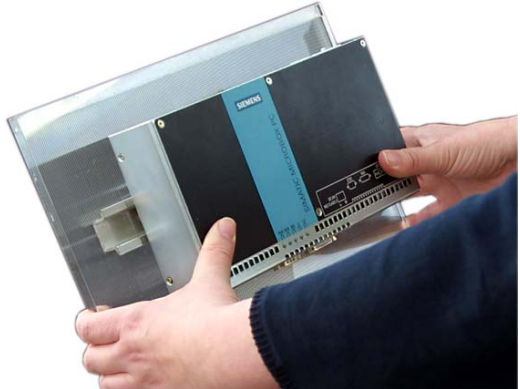
Microbox PC can be mounted on DIN rails or with mounting brackets.

5.2 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.

Remove device from the DIN rail

- Push down the Microbox PC 420 until the device is released from the clamps.
- Swing the Microbox PC 420 away from the DIN rails.

5.3 Mounting with mounting brackets

Removing Mounting Clamps from the Device

Two mounting clamps are factory installed on the Microbox PC 420 for DIN rail assembly. 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.	
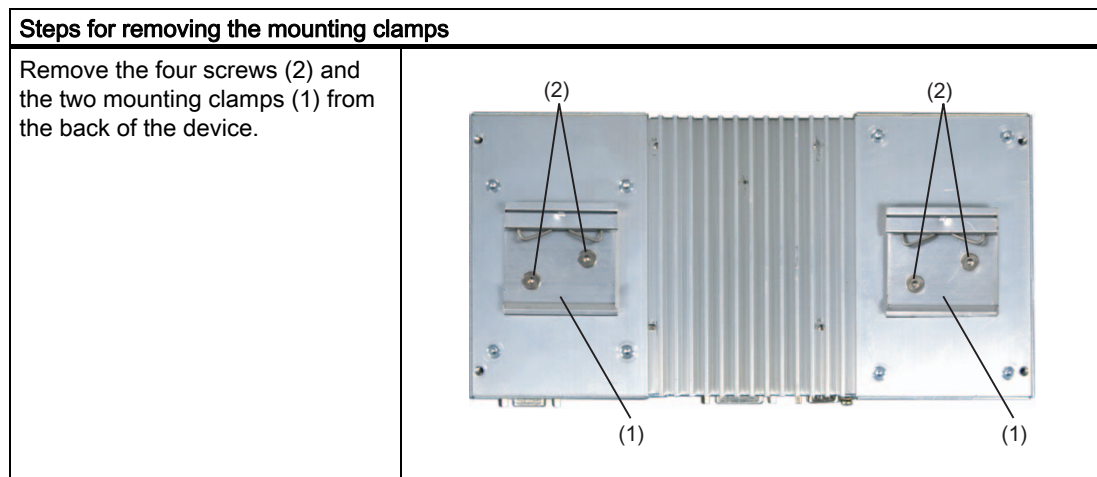
Installing brackets on the device

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

Steps for installing the mounting brackets	
Install the mounting brackets on the device.	
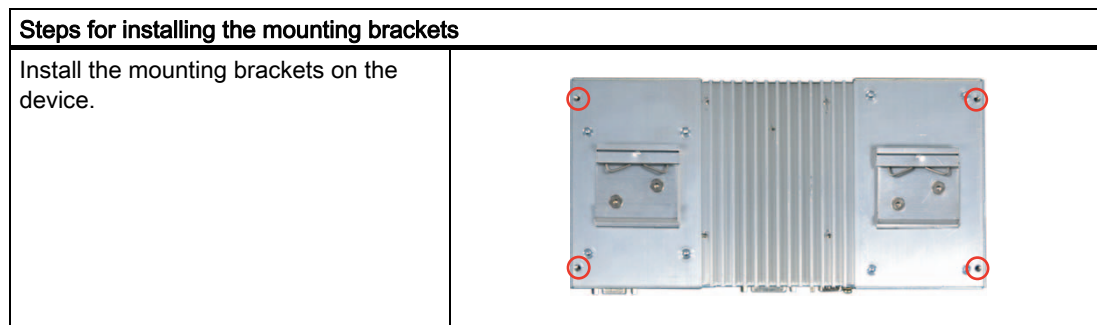
Mounting/demounting the device

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

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

⚠️ **Warning**

Ensure that the wall or ceiling can hold four times the total weight of the Microbox PC (including the mounting brackets and additional expansion modules).

Connecting

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6.1 Connecting peripheral equipment

Notice

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

Note

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

Caution

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 PC boots in order for it to be correctly detected by the BIOS and the operating system.

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).

When the device is operated on a wall, in an open rack or other similar locations, an NEC Class 2 current source is required for the compliance of the UL requirements (in accordance with UL 60950-1). In all other cases (in accordance with IEC / EN / DIN EN 60950-1) either a power source of limited performance (LPS = Low Power Source), or a line-side fuse or a line-side power switch is necessary. The power needs to be limited to a value lower than 8 A. Recommended fuse rating: 4 A.

Use the special plug supplied to connect the supply voltage.

Operation in closed cabinets or fireproofing cabinets (including the operation of a cabinet in accordance with UL508) ther are no requirements for current limiting of the supply voltage.

Notice
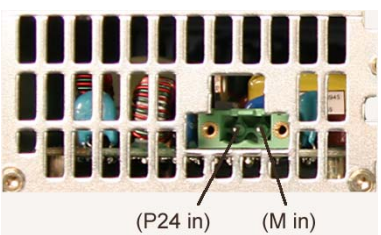
The permitted cable cross-section for the 24 V DC connection is 0.75 mm² to 2.5 mm².

Notice

If a Compact Flash card is used in the device, be sure that the card is properly installed before you connect it.

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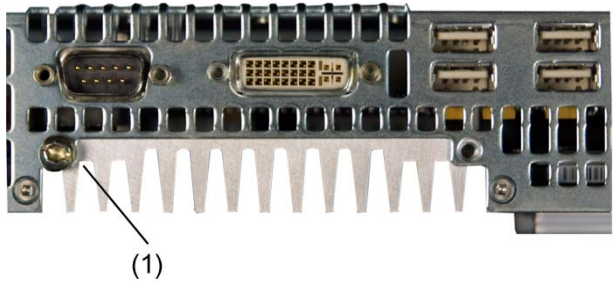
Steps for connecting the device to the 24 V DC power supply	
1.	Switch off the 24 V DC power source.
2.	Connect the power supply using the plug (included in the package).

(P24 in)   (M in)

6.3 Protective ground connection

A low-impedance earth connection ensures that interference signals generated by external power supply cables, signal cables or cables to the I/O modules are safely discharged to earth.
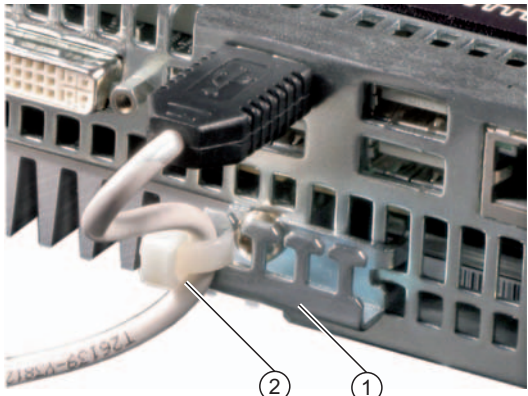
Required tool for protective earth terminal: TORX T20 screwdriver

Protective earth terminal	
The protective earth terminal (M4 threads) (1) on the device (large surface, large-area contact) has to be connected with the protective earth conductor of the cabinet or plant in which the PC is to be installed. The minimum conductor cross-section may not be less than 2.5 mm^2.	(1)

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.

Required tool for fastening the USB strain-relief: TORX T20 screwdriver

Steps for Connecting the USB Strain-relief		
1	Fasten the USB strain-relief (1) to the device housing 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.	(2) (1)

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 (preinstalled on Compact Flash card or the hard disk)
- with the Windows XP Professional operating system (preinstalled 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. The Enhanced Write Filter is disabled by default as of Windows XP Embedded SP2. 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 XPe 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 display the boot menu

2. Wait until the 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 necessary information and the operating system is configured, you are prompted by the system to reboot the PC. Respond to this prompt with **Yes**.

Note

System startup can take longer than usual for the basic commissioning.

When you switch on the PC now, 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 basic commissioning.

Switch off the device

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

Note

If the Enhanced Write Filter is active and no files have been written to the Compact Flash card, then the device can be switched off by isolating it from the power supply.

7.3 Commissioning - Windows XP Professional

7.3.1 Basic commissioning - initial startup

Configuring the Operating System

When the computer starts up for the **first** time, the Windows XP Professional operating system that is preinstalled 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 display the boot menu

2. Wait until the 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 automatically restarts and displays the user interface of the operating system.

Note

System startup can take longer than usual for the basic commissioning.

When you switch on the PC now, the user interface of the Windows XP Professional 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 basic 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

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.

The default setting on your device is Windows XP MUI with English menus and dialog boxes 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.
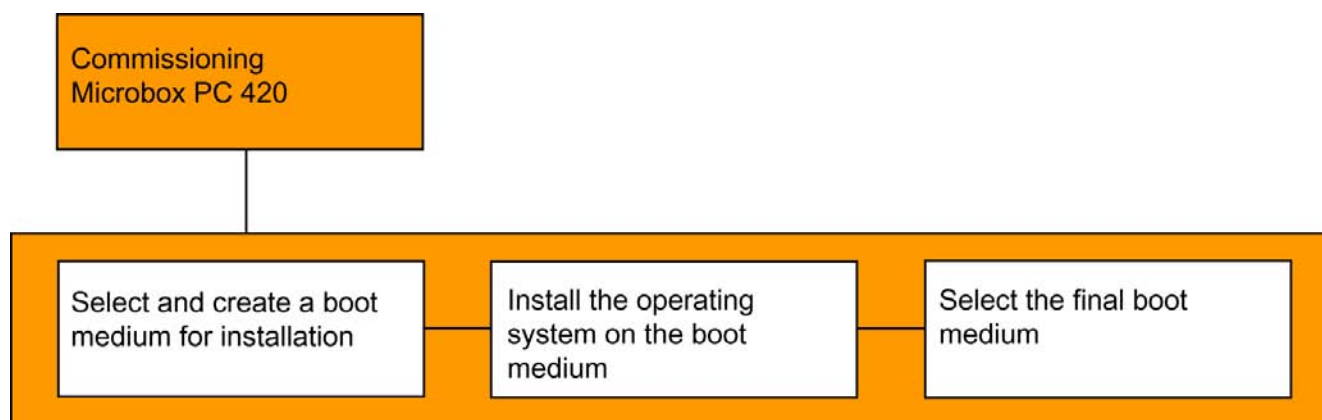
The following provides an overview of the steps involved in commissioning:

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).
	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 the final boot medium.	In the BIOS Setup, select the medium on which the operating system has been installed.

Further information

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

Integration

<div style="text-align: right; font-size: 3em;">8</div>

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

Ethernet

The integrated Ethernet interface (10/100 Mbps) can, for example, be used for communication with automation devices such as SIMATIC S7.

PROFIBUS / MPI

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

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).

Further information

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

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

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 and Windows XP Professional..

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

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.

When the temperature exceeds one of the two defined temperature thresholds, the following error reactions are triggered:

Response	Option
The SOM or DiagMonitor software is enabled	None

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

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

Note

If a temperature alarm occurs, the CPU performance is reduced to 25% using a stop clock mechanism.

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 initiated:

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 does not take place, set Bit 7 to the value 0 in the General Purpose Ports (GPP) output register (address 404D) .

WD monitoring times TWD

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

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

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 SIMATIC PC is equipped with two temperature sensors which are automatically detected by the application.
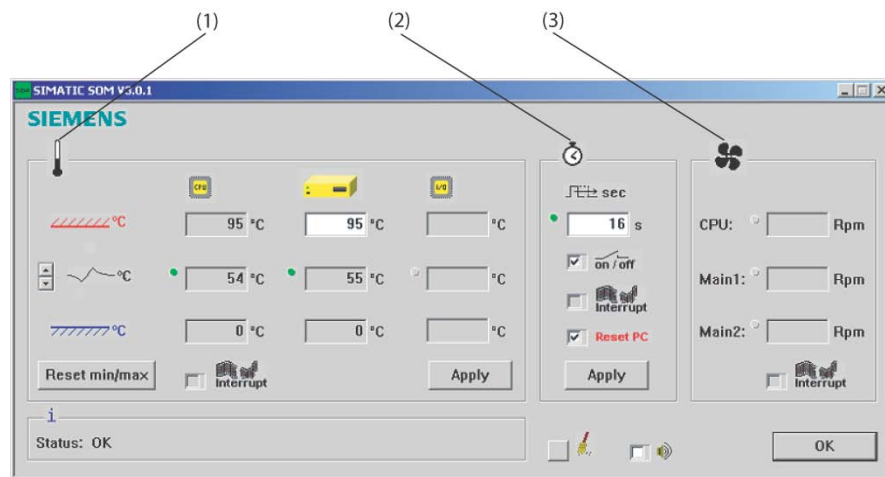
Figure 9-1   Safecard On Motherboard

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

As from Windows XP Embedded SP2 the EWF is deactivated by default. After the operating system has been set up, you should back up your date and then activate 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 (modified files are accepted)	`ewfmgr c: -commitanddisable`
Write-protect drive C: disable (modified files are lost)	`ewfmgr c: -disable`
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 active, changes made after the boot sequence are saved in drive C: 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.

Notice

Data loss

If you do not restart the system after the `commitanddisable` option, your data are lost.

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 behavior 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.

Expansions and configuration

10

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 for handling components which are sensitive to electrostatic charge.
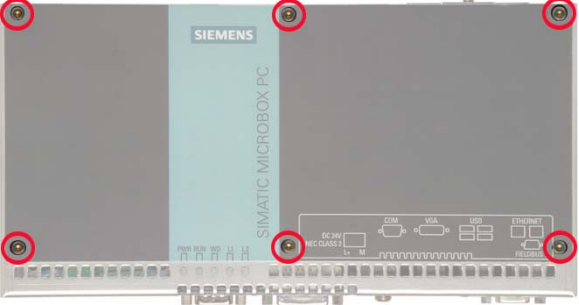
Tools

- 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. A 144-pin SO-DIMM SDRAM PC133 memory module can be used. This allows you to expand the memory capacity of the Microbox PC to a maximum of 512 MByte.

Note

We recommend using the original spare parts for memory configuration.
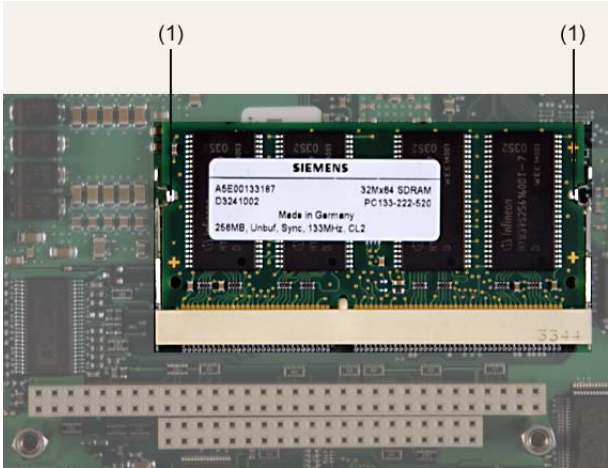
Preparation

Isolate the device from power supply.

Caution

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

Removing a memory module

Steps for removing 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

Steps for installing a memory module	
1	Set the memory module in the slot tilting forward.
2	Push the memory module back until it locks into place.
3	Close the device.

Display of the current memory configuration

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

10.3   Installing PC/104 modules

10.3.1   Notes on the modules

Notes on module specifications

The device is designed to operate with PC/104 modules and PC/104 *Plus* modules in conformity to the specifications of the PC/104 consortium.

- PC/104 modules: ISA compatible (104-pin plug)
- PC/104 *Plus* modules: PCI compatible (120-pin plug)

Note

The necessary expansion frames for the installation of PC/104 and PC/104 *Plus* modules can be ordered via the A&D online ordering system, as a 6-pack with the order number 6AG4070-0BA00-0XA0.

10.3.2   Mounting a PC/104 module

Tools

Use hexagon head screws (5 mm) to mount the spacing bolts of the PC/104 module. If this is the only PC/104 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 PC/104 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.
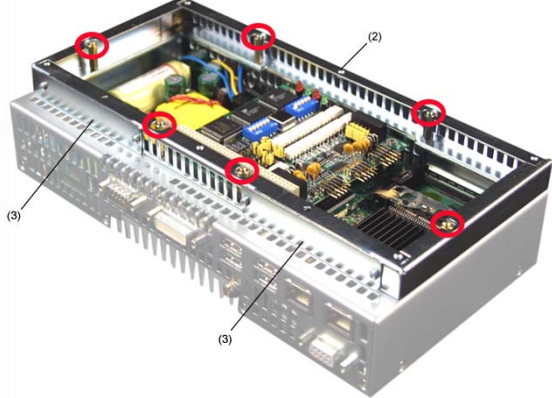
Caution

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

Mounting a PC/104 module

Steps for mounting an expansion module (PC/104 module):	
1	Open the device (remove front panel).
2	Insert the PC/104 module in the slots. (1) PCI connector (2) ISA connector
3	Secure the PC/104 module with four screws or spacing bolts.
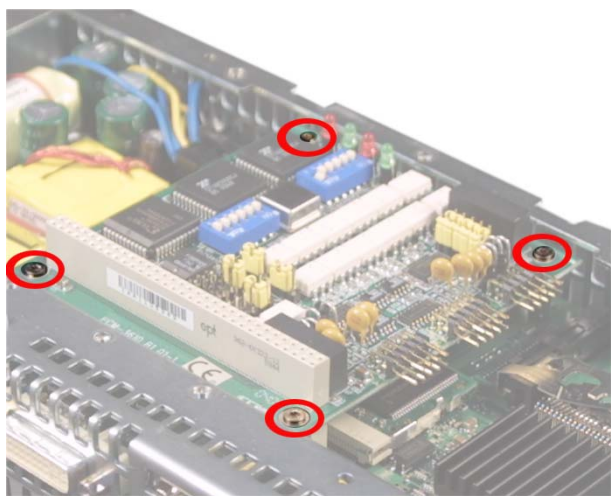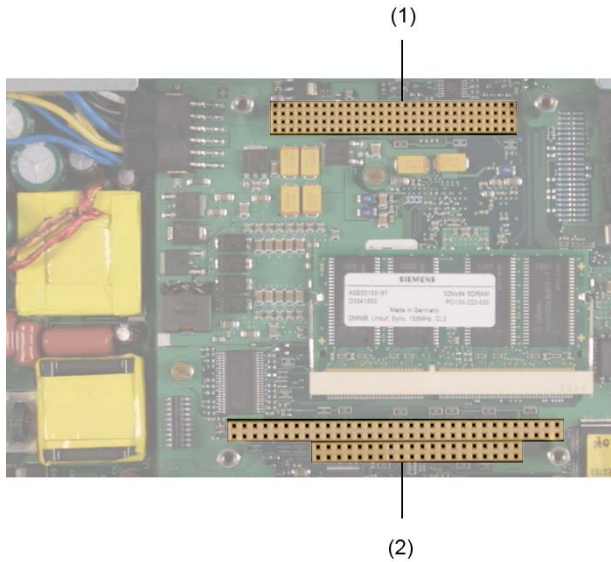
Steps for mounting an expansion module (PC/104 module):	
4	Mount the expansion frame (2) and secure it with six spacing bolts. Mount the slot plate (3) if there any external connectors.
5	Mount the front panel on the expansion frame.

Mounting additional PC/104 modules

The device can be equipped with a maximum of 3 PC/104 modules. An additional expansion frame is required for each PC/104 module.

Follow the installation procedure described in the section *Mounting a PC/104 module* (steps 2 to 4).

Note

PC/104-*Plus* modules must be mounted before PC/104 modules.

Configuring/installing a PC/104 module

You may need to make settings in the BIOS Setup and select an interrupt and address for a PC/104 module. For detailed information about installation, refer to the manufacturer documentation for the respective module.

Note about resource allocation for PC/104-*Plus*

Device		Req # /Gnt #	INTA#	INTB#	INTC#	INTD#
max. 3 PC104*Plus*modules Resources depending on selection	1	4	INT B	INT C	INT D	INT A
	2	5	INT A	INT B	INT C	INT D
	3	5	INT D	INT A	INT B	INT C
	4	5	INT C	INT D	INT A	INT B

Note

Since selections 2, 3 and 4 share the Req/Gnt resource, only one PC/104-*Plus* module that is master-capable on the PCI bus can be inserted here. With selection 1, a total of two PC/104-*Plus* modules that are master-capable on the PCI bus can be installed.

10.4 Installing/removing a Compact Flash card

Memory expansion options

The device features a card reader slot for Compact Flash cards (types I / II). We recommend Compact Flash cards for industrial application (from the company SANDISK, for example).

Preparation

Isolate the Microbox PC from power supply.

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

Open the board slot

Steps for opening the board slot.	
Turn the cover plate (1) of the board slot 180 degrees counter-clockwise.	(1)
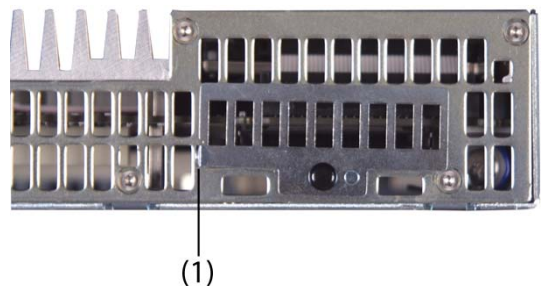
Installing a Compact Flash card

Steps for installing a Compact Flash card		
1	Open the board slot.	
2	Insert the Compact Flash card in the slot (2) with the connector facing in until it locks into place.	(2)
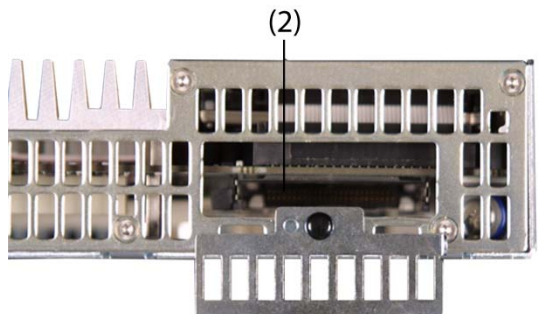
Note

The Compact Flash slot is coded against reversed insertion. Insert the Compact Flash card so that its upper side (label side) is facing the front panel of the Microbox PC.
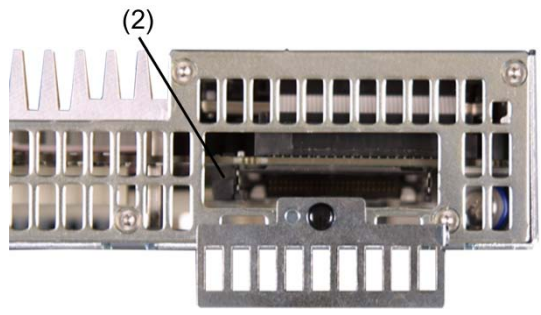
⚠️ **Caution**

If the Compact Flash card meets resistance, flip it over. Never insert the Compact Flash card with force.

3	Close the board slot.

Removing a Compact Flash card

Steps for removing a Compact Flash card	
1	Open the board slot.
2	Press the eject button (2) and pull out the Compact Flash card.	
3	Close the board slot.	

Maintenance and service

<div style="text-align: right; font-size: 3em;">11</div>

11.1 Removing and installing hardware components

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.

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)

11.1.1   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.
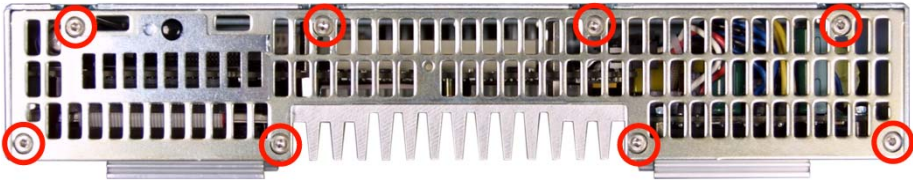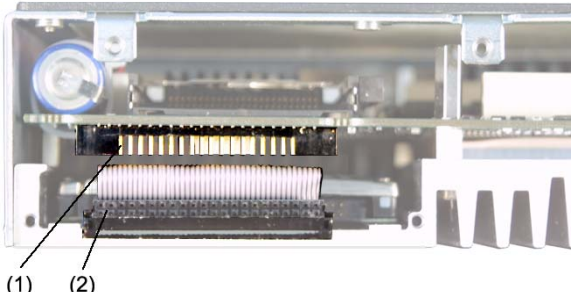
Preparation
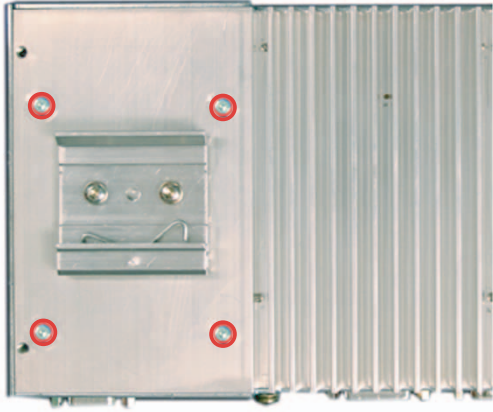
1. Isolate the Microbox PC from power supply.

2. Unplug all peripherals (mouse, keyboard, monitor, etc.) from the Microbox PC.

Removing the hard disk

Notice

Note the ESB instructions.

Steps for replacing the hard disk	
1	Unscrew and remove the 8 screws in the upper sheet metal cover.
2	Remove the plug (2) from the socket (1).

Steps for replacing the hard disk		
3	Remove the 4 screws holding the hard disk to the back of the housing.	
4	Carefully pull out the hard disk from the housing.	

Installing hard disk

To install a hard disk, perform the actions described in "Removing the hard disk" in the reverse order.

11.1.2 Replace the backup battery

To be noted before you replace the battery

Note

The life span of a backup battery is approximately 3 - 5 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
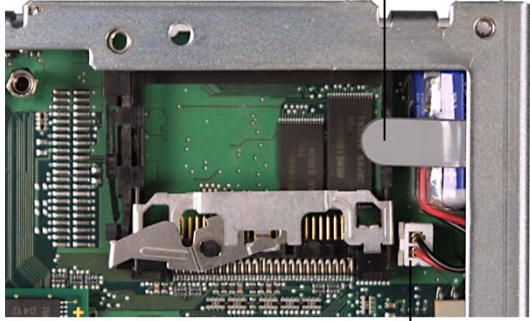
The configuration data and contents of the SRAM in the device are lost when the battery is replaced.

---

1. Note down the current settings of the BIOS Setup.
   A list in which you can note down this information is found in the BIOS manual.

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

Replacing the battery

Proceed as follows:

Steps for replacing the battery		
1.	Open the device.	
2.	Pull out the battery plug (1).	
3.	Carefully bend up the battery mount (2) and remove the battery.	

Reconfiguring the BIOS Setup

After you have replaced the battery, the configuration data of the device are deleted and you need to reconfigure these in the BIOS Setup.

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), and can be obtained on request from customer support.

11.2.1.2 Restoring the software to factory state using the Restore CD

You can reinstall the original factory software (can be obtained from customer support) using the Restore CD. The CD contains the necessary images and tools for transferring the factory software to the hard disk or CD 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:

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

- Restoring the entire CF card.

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 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 in the drive and reboot the device. When the BIOS message appears, press

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

After initialization, a boot menu is displayed.

3. Select "CD-ROM Drive" with the cursor keys. Close the boot menu and restart the computer.

4. Now follow the instructions on the screen.

Caution

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

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

Note

In order for the device to communicate with a USB CD-ROM drive, the "Legacy USB Support" option must be set to "Enabled" in the Advanced menu of the BIOS.

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 software to factory state using the Restore DVD**
  The Restore CD contains a hard disk image file with the original software (operating system with installed hardware drivers) and is contained in the Windows XP Professional delivery variant.

- **Setting up the operating system via the Recovery CD**
  The Recovery CD contains the tools for setting up the hard disk and 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 require 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:

- or only drive C:. 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 factory 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 Bootmenu

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

3. Select "CD-ROM Drive" with the cursor keys. Close the boot menu and restart the computer.

4. Now follow the instructions on the screen.

Caution

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

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

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

The **M**ultilanguage **U**ser **I**nterface (MUI) allows you to set up the Windows XP Professional 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.

11.2.2.3 Setting up the operating system via the Recovery CD

The Recovery CD contains the tools for setting up the hard disk and the Windows XP Professional operating system. After the required data have been copied to the hard disk, you can run the Windows XP Professional Setup program to install the operating system. The Recovery CD can be obtained from the Customer Support.

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

Data Transfer

You have two options for transferring the data from the Recovery CD to the device:

- Booting from the Recovery CD (described below as from Step 1)

Notice

Data loss

If you boot from the Recovery CD, all the existing data, programs, user settings, authorizations and license keys on the drives will be deleted and are therefore lost.

- Execution of the OEMSETUP.EXE program on the Recovery CD. A Windows operating system has to be installed on the device for this (described below as in Step 4)

Note

This requires that a USB CD-ROM drive is connected to the device for both types on data transfer.

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.

Configuring the Operating System

Proceed as follows to configure the operating system:

1. Insert the Recovery CD in the drive and reboot the device. When the BIOS message

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

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

2. Select "CD-ROM Drive" with the cursor keys. Close the boot menu and restart the computer.

3. The "Microsoft Windows 98 Startup Menu" selection screen is displayed during booting. Select

1. Boot for CD Recovery

If your hard disk is not yet configured, first select

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

4. Confirm the

```
SIEMENS End User License Agreement
```

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

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

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

Note

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

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

---

7. Acknowledge the concluding message.

8. Start the Windows Setup program with

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

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

9. Now follow the instructions on the screen.

Setting up the language selection for Windows XP Professional

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

To install the MUI, start

```
"MUI-german"
```

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

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

11.3 Partitioning the hard disk

11.3.1 Setting up the partitions under Windows XP Embedded

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

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	
1. Partition	System	455 MB	867 MB	NTFS (compressed)
2. Partition	DATA	Rest *	Rest *	NTFS (compressed)

* Due to the 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	15 GB	NTFS (not compressed)
2. Partition	DATA	Rest	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

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 includes the following partitions:

Partition	Name	Size	File system
1. Partition	system	15 GB	NTFS (not compressed)
2. Partition	DATA	Rest	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.

11.3.3 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.

11.4 Installing updates

11.4.1 Updating the operating system

Windows XP Embedded

An update of the operating systems is only possible with a new version of the Restore CD. Please contact customer support for more information about its availability.

Windows XP Professional

Monthly updates for the Windows XP Professional operating system are available on the Internet under **http://www.microsoft.de**

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.

Other operating systems

Please contact the corresponding manufacturer.

11.4.2 Installing or updating application programs and drivers

A USB drive has to be connected in order to install the software from a CD or floppy disk under Windows XP Embedded/Windows XP Professional.

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 respective 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.

11.5 Data backup

11.5.1 Creating an image

Data backup under Windows XP Embedded/Windows XP Professional

To back up data under Windows XP Embedded / Windows XP Professional, we recommend the software tool **SIMATIC PC/PG Image Creator**. This tool enables you to easily back up and restore the full content of Compact Flash cards or hard disks as well as individual partitions (images).

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

Alarm, error and system messages

<div style="text-align: right; font-size: 3em;">12</div>

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.

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

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

On-screen error messages

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

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

Troubleshooting

<div style="text-align: right; font-size: 3em;">13</div>

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.	1. Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. 2. Check whether the monitor cable has been properly connected to the system unit and to the monitor.
		If the monitor screen still remains dark after you have performed these checks, please contact your technical support team.
The mouse pointer does not appear on the screen.	The mouse driver is not loaded.	Check whether the mouse driver is properly installed and present when you start the application program. For more detailed information, refer to the manuals for the mouse or application programs.
	The mouse is not connected.	Check whether the mouse cord is properly connected to the system unit. If you use an adapter or extension on the mouse cable, also check the connectors.
		If the mouse pointer still does not appear on the screen after you have performed these checks and measures, please contact your technical support team.
Wrong time and/or date on the PC.		1. Press <F2> within the boot sequence to open the BIOS Setup. 2. Set the time and date in the setup menu.
Although the BIOS setting is OK, the time and data are still wrong.	The backup battery is dead.	In this case, please contact your technical support team.

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 display is blurred when a flat panel is connected to DVI-I.	The graphics controller adjusts the monitor resolution.	1. Press <F2> during the boot sequence to open the BIOS Setup. 2. Select the Hardware Options submenu. 3. Set the resolution of the connected flat panel as the boot display.

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

Technical specifications

14

14.1 General specifications

General specifications	
Order nos.	see the order documents
Dimensions	262x133x47 (WxHxD in mm)
Weight	Approx. 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) 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; CSA C22.2 No. 60950-00; UL 508; CSA C22.2 No. 142
Electromagnetic compatibility (EMC)	
Emitted interference	EN 55022 Class B, FCC class A
Noise immunity: Mains borne disturbance variables on supply lines	+/- 2 kV to IEC 61000-4-4; Burst +/-1 kV to IEC 61000-4-5; surge symmetric +/- 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 ± /-2 kV to IEC 61000-4-4; Burst; length > 3 m ± /-2 kV to IEC 61000-4-5; Surge; length > 30 m
Immunity to discharges of static electricity	+/-6 kV contact discharge according to IEC 61000-4-2 -8 kV air discharge according to IEC 61000-4-2
Immunity to RF interference	10 V/m 80 - 1000 MHz, 80% AM according to IEC 61000-4-3 10 V/m 900 MHz and 1.89 GHz, 50% relative duty cycle according to IEC 61000-4-3 10 V 9 KHz - 80 MHz, according to IEC 61000-4-6
Magnetic field	30A/m 50 Hz according to IEC 61000-4-8

General specifications	
Climatic Conditions	
Temperature	Tested to IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14
-in operation	Horizontal mounting positions:
	Operating with Compact flash card: 0 to +50°C
	Operating with the hard disk: +5 to +40°C
	Vertical mounting positions:
	Operating with Compact flash card: 0 to +45°C
	Operating with the hard disk: +5 to +40° C
-Storage/transport	–20° C to +60° C
- Gradient	Operating mode: Max. 10°C/h; Storage: 20°C/h; no condensation
Relative humidity	tested to IEC 60068-2-78, IEC 60068-2-30
-Operation	5% to 80% at 25° C (no condensation)
-Storage/transport	5% to 95% at 25° C (no condensation)
Mech. Ambient conditions	
Vibration	Tested to DIN IEC 60068-2-6
-in operation [2] [3]	10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s^2
-Storage/Transport	5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s^2
Resistance to shock	tested to IEC 60068-2-27, IEC 60068-2-29
-in operation	without hard disk drive: 150 m/s^2, 11 ms;
	with hard disk drive: 50 m/s ^{2}, 30 ms
-Storage/transport	250 m/s^2 , 6 ms
Special Features	
Quality assurance	acc. to ISO 9001
Motherboard	
Processor	Intel Celeron ULV 400 MHz
	Intel Celeron ULV 650 MHz
	Intel Pentium III LV 933 MHz
Internal processor cache	Intel Celeron: 16+16 KB L1 cache, 256 KB L2 cache;
	Intel Pentium III: 16+16 KB L1 cache, 512 KB L2 cache
Front Side Bus	Intel Celeron: 100 MHz
	Intel Pentium III: 133 MHz
Main memory	SO-DIMM SDRAM Module with 133 MHz; 128/256/512 MB
Buffer memory	128 KB SRAM
Free expansion slots	Max. 3 PC/104 *Plus* modules
Disk drives	
Hard disk	1x 2.5" optional
Graphic controller	
Graphic connector	Combined DVI and VGA
Graphics controller	S3 ProSavage 4 compatible UMA controller
Graphics memory	8/16/32 MB Shared Memory (adjustable in the system BIOS)
Resolutions/frequencies/colors	CRT: Max. 1280x1024x32 / 75Hz or max. 1600x1200x16 / 60Hz
	DVI LCD: Max. 1024x768x32/60Hz

General specifications		
Interfaces		
COM1	RS232, max. 115 Kbps., 9-pin Cannon, male	
DVI	VGA integrated in the DVI-I	
Keyboard	USB support	
Mouse	USB support	
USB	2x USB 2.0 high speed / high current	
	2x USB 2.0 high speed / low 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	
Ethernet	2x VIA VT6105LOM / VT6106S, 10/100 Mbps with RJ45	
CAN (on request)	Philips SJA1000	
Status displays on the device		
PWR (yellow)	Indicates correct supply voltage of 3.3 V, 5 V and 12 V from the integrated power unit	
RUN (green)	Indicates the module is accessing the PCI bus and that the PCI is providing the FRAME signal (access to PCI, onboard and ISA peripherals)	
WD	Not active	Watchdog disabled
	green	Watchdog enabled, monitoring time not expire
	red	Watchdog enabled, monitoring time expired
L1 (yellow)	Can be controlled by user programs	
L2 (yellow)	Can be controlled by user programs	

[1] The feed of the 24 V supply voltage from the line-side power unit must be generated as functional extra-low voltage with safe electrical isolation (isolated) in accordance with IEC 60364-4-41.

[2] with hard disk drive and DIN rail installation: none permitted

[3] with hard disk drive and wall installation: 10 to 58 Hz: 0.035 mm; 58 to 200 Hz: 4.9 m/s^2

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)
	Low current	100 mA	--	--	--	
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 PC/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. 61 W
Power failure buffering	hold-up time > 15 ms (after > 5 ms DC_FAIL is active)
Maximum continuous output power	50 W
Degree of protection	IP 20
Safety class	None

Dimension drawings

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15.1 Overview of the dimensional drawings

This section contains the following dimensional drawings:

- Dimensional drawings of the device
- Dimensional drawings of the device with cabinet brackets
- Dimensional drawings of the device with expansion frames
- Dimensional drawing of the blanking plate
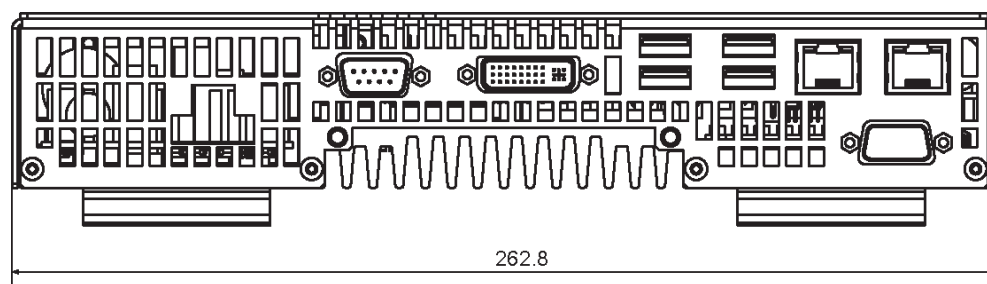
Figure 15-1   Dimensional drawing of the device: Front view
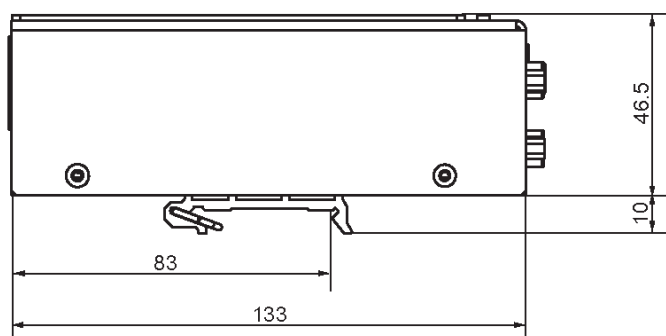
Figure 15-2   Dimensional drawing of the device: Side view

15.2 Dimensional drawing of the device with mounting brackets
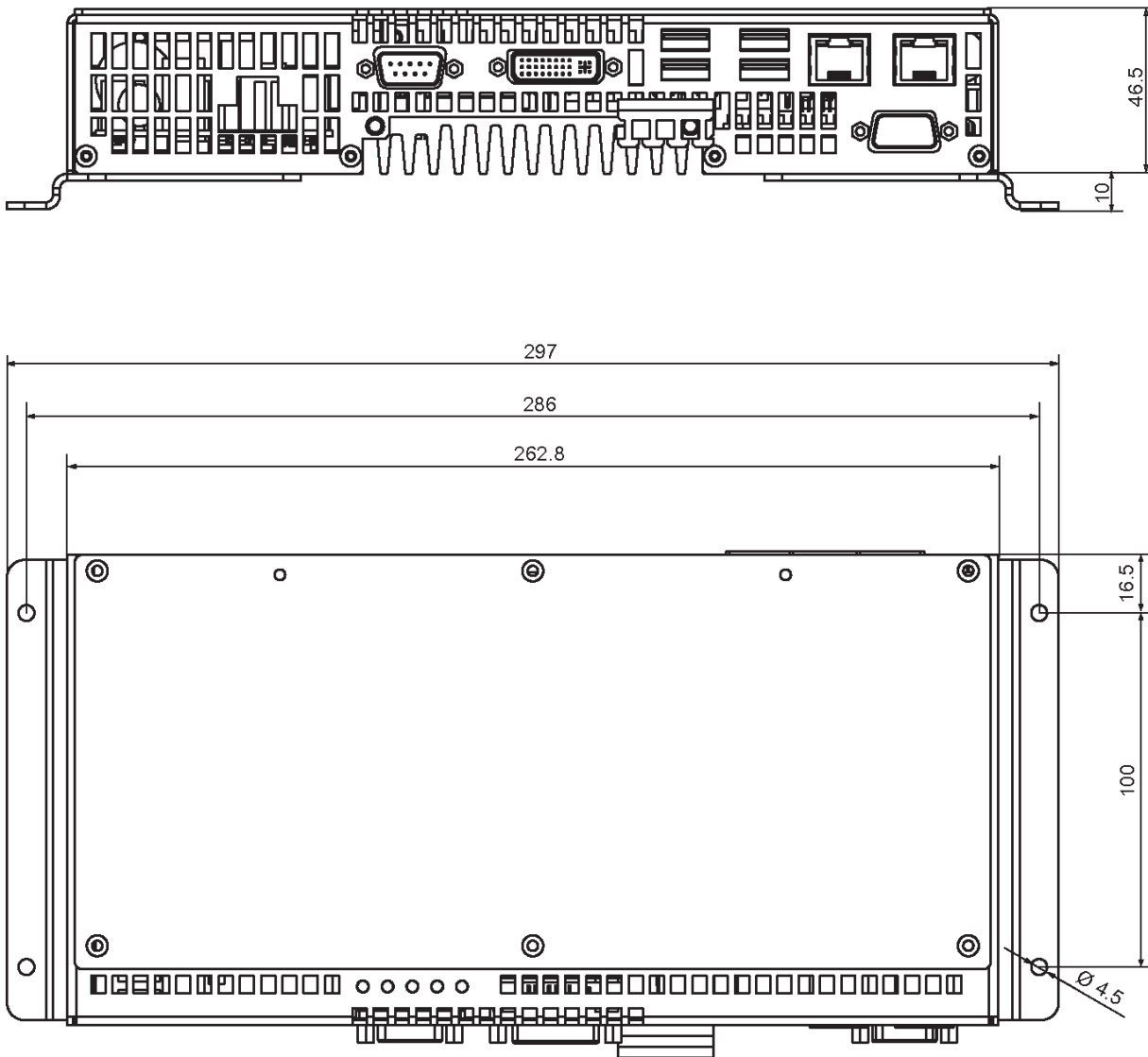
Figure 15-3   Dimensional drawing of the device with mounting brackets Front view and top view
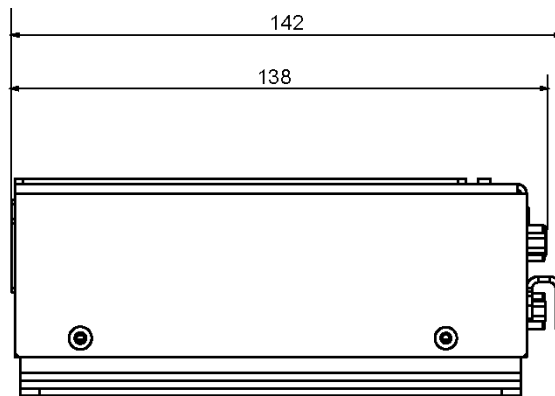
Figure 15-4   Dimensional drawing of the device with mounting brackets Side view

15.3   Dimensional drawing of the device with expansion frames

Version 1-fach

Version 2-fach

Version 3-fach
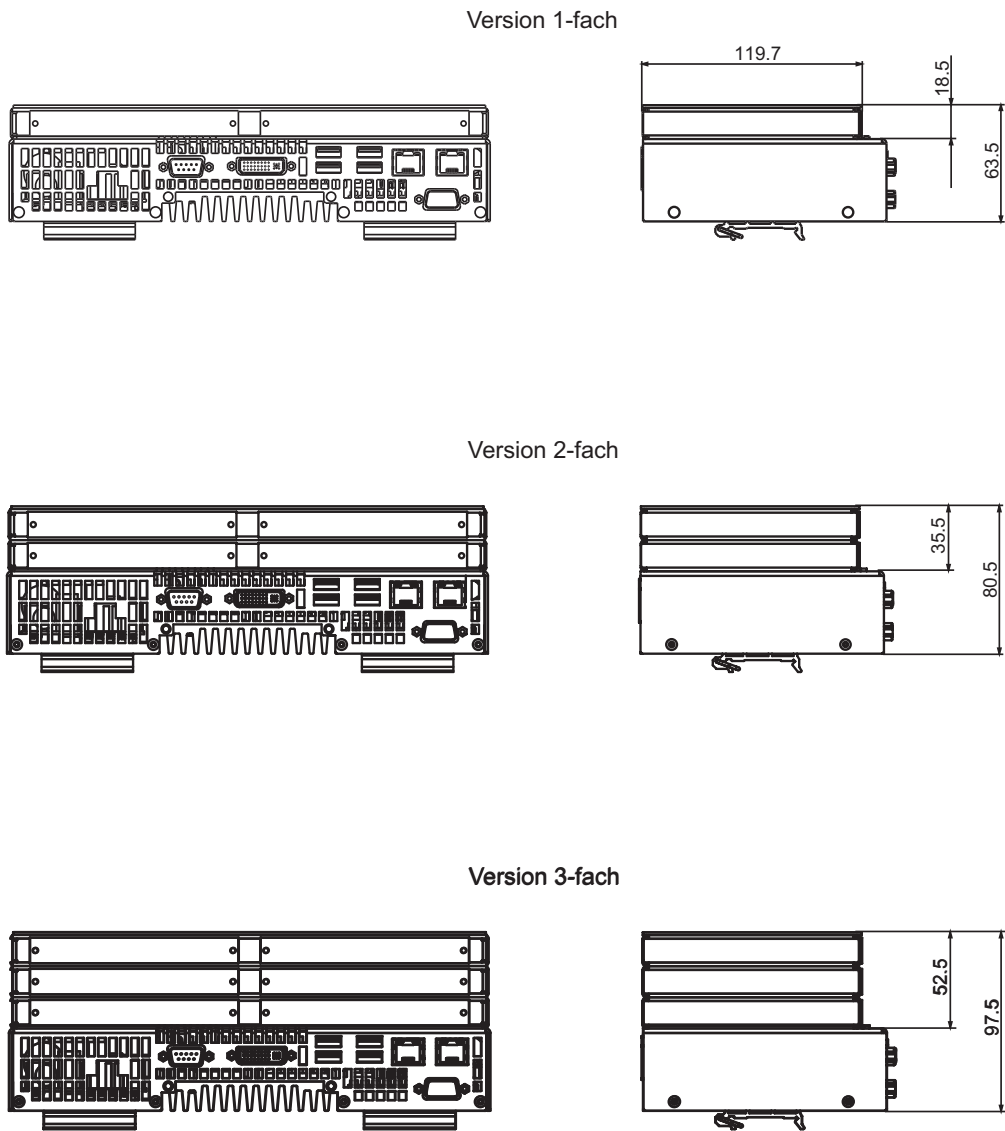
Figure 15-5   Dimensional drawings of the device with expansion frames

15.4 Dimension drawing of the blanking plate
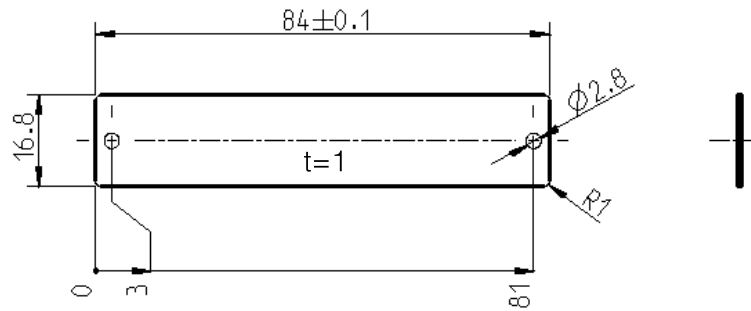
Figure 15-6   Dimensional drawing of the blinding plate

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.
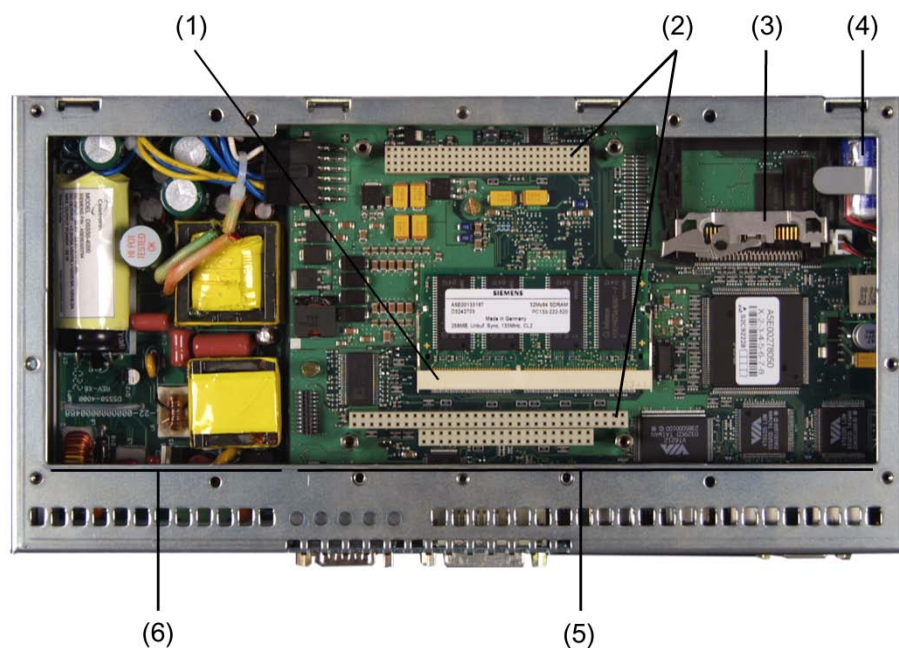
Figure 16-1   Internal layout of the device

(1)	Slot for a memory module	(4)	Backup battery
(2)	Slot for max. 3 PC/104 modules	(5)	Motherboard
(3)	Slot for Compact Flash card	(6)	DC/DC converter
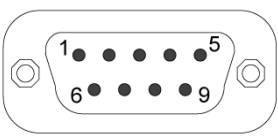
16.1.2 Technical features of the motherboard

Component / port	Description	Parameters
Chipset	VIA PN133T (Twister-T)	
BIOS	Phoenix BIOS 4.0 Release 6.0	
CPU	Intel Celeron ULV / Intel Pentium III LV	400 MHz/650 MHz/933 MHz
Memory	SO-DIMM module SDRAM PC133	128 MB, 256 MB or 512 MB
Graphic controller	S3 ProSavage 4 compatible UMA controller	8/16/32 MByte graphics memory taken from RAM (UMA); default settings is 8 MByte

16.1.3 External interfaces

Interface	Position	Description	
COM1	external	9-pin male	V24
USB	external	Four USB channels 2 * low current 2 * high current	USB 1.1 USB 2.0
PROFIBUS /MPI /DP12 (optional)	external	9-pin female	
CAN (optional)	external	9-pin female	CAN
Ethernet	external	2 * RJ45	10/100 Mbps
DVI-I	external	DVI-I standard socket	
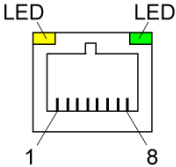
16.1.3.1 COM

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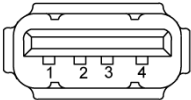
16.1.3.2 DVI-I

DV-I port, standard socket		
Pin No.	**Designation**	**Meaning**
1	TMDS Data2-	DVI data channel (O)
2	TMDS Data2+	DVI data channel (O)
3	TMDS Data2/4 shield	Shield channel
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	Shield channel
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	Shield channel
20	NC	
21	NC	
22	TMDS clock shield	Shield channel
23	TMDS clock+	DVI clock channel (O)
24	TMDS clock-	DVI clock channel (O)
G19	Analog red (R)	Analog red signal (O)
G19	Analog green (G)	Analog green signal (O)
G19	Analog blue (B)	Analog blue signal (O)
G19	Analog horizontal sync (HSYNC)	Analog horizontal sync signal (O)
G19	Analog ground (analog R, G, & return) (GND)	Analog ground
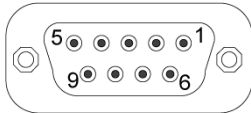
16.1.3.3 Ethernet

Ethernet port, 2* RJ45

Pin No.	Designation	Meaning
1	TxD+	Transmitted data+ (O)
2	TxD-	Transmitted data- (O)
3	RxD+	Received data+ (I)
4	SYMR	Internal 75 Ohm terminating resistor
5	SYMR	Internal 75 Ohm terminating resistor
6	RxD-	Received data- (I)
7	SYMR	Internal 75 Ohm terminating resistor
8	SYMR	Internal 75 Ohm terminating resistor
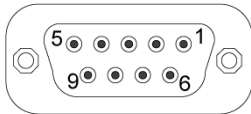
16.1.3.4 USB

USB port, 4 channels (2* low current, 2* high current)

Pin No.	Designation	Meaning
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 port, 9-pin (socket)		
Pin No.	**Designation**	**Meaning**
1-2	NC	Not connected
3	LTG_B	Data channel (I/O)
4	RTS_AS	AS Request to send (O)
5	GND	Ground isolated
6	P5V_dp_fused	+5 V (fused) isolated
7	NC	Not connected
8	LTG_A	Data channel (I/O)
9	RTS_PG	PG Request to send (O)

16.1.3.6   CAN bus

CAN bus port, 9-pin (socket)		
Pin No.	**Designation**	**Meaning**
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

Interface	Position	Connector	Description
Compact Flash card (3.3V / True IDE mode)	Internal	X3	50-pin CF socket, types I / II
PC/104	Internal	X80/X81	40p/64p PC/104 socket
PC/104-*Plus*	Internal	X7	120-pin PC/104-*Plus* socket

16.1.4.1 Compact Flash

Compact Flash port, X3		
Pin No.	Designation	Meaning
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	+ 3.3V power

16.1.4.2 PC/104 port

PC/104 port	X81		X80	
Pin No.	A	B	C	D
0	--	--	GND	GND
1	IOCHCHK#	GND	SBHE#	MEMCS16#
2	SD7	RESETDRV	LA23	IOCS16#
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	--	LA20	--
6	SD3	--	LA19	--
7	SD2	-12V	LA18	--
8	SD1	--	LA17	DACK0#
9	SD0	+12V	MEMR#	DRQ0
10	IOCHRDY	--	MEMW#	DACK5#
11	AEN	SMEMW#	SD8	DRQ5
12	SA19	SMEMR#	SD9	DACK6#
13	SA18	IOW#	SD10	DRQ6
14	SA17	IOR#	SD11	DACK7#
15	SA16	DACK3#	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1#	SD14	--
18	SA13	DRQ1	SD15	GND
19	SA12	REFRESH#	--	GND
20	SA11	SYSCLK	--	--
21	SA10	IRQ7	--	--
22	SA9	--	--	--
23	SA8	IRQ5	--	--
24	SA7	IRQ4	--	--
25	SA6	IRQ3	--	--
26	SA5	--	--	--
27	SA4	TC	--	--
28	SA3	BALE	--	--
29	SA2	+5V	--	--
30	SA1	OSC	--	--
31	SA0	GND	--	--
32	GND	GND	--	--

16.1.4.3   PC/104-Plus port

PC/104-*Plus* port, X7			
Pin No.	A	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

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

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

Changing the device configuration

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

16.2.2   Starting BIOS Setup

Starting BIOS Setup

Start the setup program as follows:

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

With the default setting of your PC, the display shown below appears following power-on, for example:

```
Phoenix BIOS 4.0 Release 6.0 A5E000xxxxx-ES0x

Copyright 1985–2004 Phoenix Technologies Ltd. All Rights Reserved.

SIMATIC Microbox PC 420 xx.xx.xx

CPU = Intel® Pentium®3 CPU 933 MHz

639K System RAM Passed

127MB Extended RAM Passed

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

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

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

3. Press the F2 key as long as the BIOS prompt appears on the 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 context-sensitive help in the respective menu.
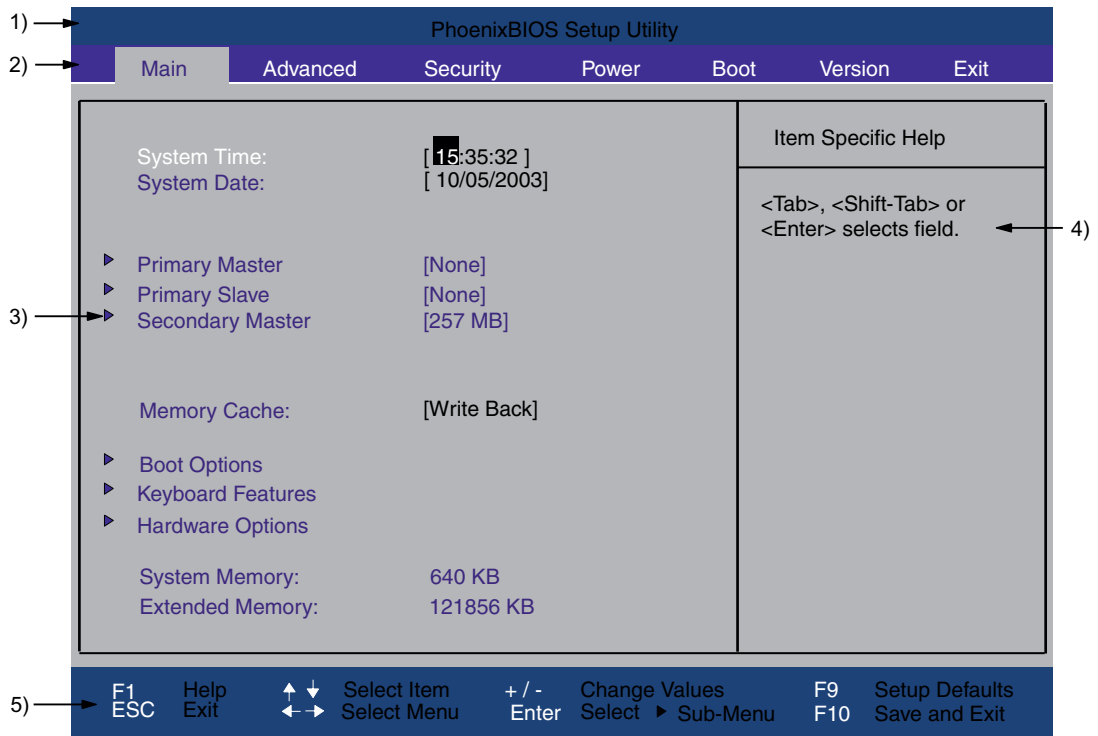
Figure 16-2   Setup Main menu

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

Menu layout

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

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

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

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

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

16.2.4 Main menu


```
                    PhoenixBIOS Setup Utility

     Main      Advanced    Security    Power    Boot    Version    Exit

                                                       Item Specific Help

     System Time:           [ 15 35:32 ]
     System Date:           [ 10/05/2003]              <Tab>,<Shift-Tab> or
                                                       <Enter> selects field.

  ▶  Primary Master        [None]
  ▶  Primary Slave         [None]
  ▶  Secondary Master      [257 MB]


     Memory Cache:          [Write Back]

  ▶  Boot Options
  ▶  Keyboard Features
  ▶  Hardware Options

     System Memory:         640 KB
     Extended Memory:       121856 KB


  F1    Help      ▲ ▼   Select Item    + / -    Change Values       F9     Setup Defaults
  ESC   Exit      ◄ ►   Select Menu    Enter    Select  ▶ Sub-Menu  F10    Save and Exit
```

1)

Figure 16-3   Example of Main menu

(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	
Primary Master	Type of installed disk drives
Primary Slave	Type of installed disk drives
Secondary Master	Type of installed disk drives
Boot options	Used for setting the boot options.
Keyboard Features	Used for setting the keyboard interface (for instance, NUM lock, keyboard auto repeat 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.

Primary Master, Primary Slave, Secondary Master

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

```
                         PhoenixBIOS Setup Utility
     ┌────────┐
     │  Main  │
┌────┴────────┴──────────────────────────────┬──────────────────────────┐
│                                             │                          │
│      Primary Master [4326 MB]               │    Item Specific Help    │
│                                             │                          │
│                                             │  [Auto] (recommended)    │
│                                             │  Autotypes installed     │
│                                             │  IDE-devices.            │
│  Type:                    [ Auto ]          │                          │
│                                             │  [User]                  │
│                                             │  Enter parameters of     │
│                 LBA Format                  │  IDE-devices installed   │
│                                             │  at this connection.     │
│  Total Sectors:           [19640880]        │                          │
│  Maximum Capacity:        10056 MB          │                          │
│                                             │                          │
│  Multi-Sector Transfers:  [16 Sectors]      │                          │
│  LBA Mode Control:        [Enabled]         │                          │
│  32 Bit I/O:              [Disabled]        │                          │
│  Transfer Mode:           [FPIO 4 / DMA 2]  │                          │
│  Ultra DMA Mode:          [Mode 2]          │                          │
│  Smart Monitoring:        [Disabled]        │                          │
│                                             │                          │
├─────────────────────────────────────────────┴──────────────────────────┤
│  F1    Help      ↑ ↓   Select Item    + / -   Change Values    F9   Setup Defaults │
│  ESC   Exit      ← →   Select Menu    Enter   Select ▶ Sub-Menu F10  Save and Exit │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 16-4   Primary Master submenu

"Type" Field	The parameters which you can select here are usually saved on the respective IDE drive. The 'Auto' setting in the 'Type' field means that these values are automatically read from the drive and written to memory **(Autodetect).**
	If Type is selected for a drive that cannot be detected, a time-out is triggered within approximately 1 minute and the entries remain unchanged. You should always check that the interfaces for which you select 'Auto' are in fact connected to drives.
	Select "User" if you want to define the hard disk drive. You also need to configure the other options, for example, Cylinder, Heads, Sectors/Track, or other properties of the hard disk drive.
	Select "None" if you have not connected a disk drive. This setting reduces the system waiting time.
Option "Multi-Sector Transfers"	The number of blocks (sectors) transmitted per interrupt are set with the option "Multi-Sector Transfers." The value depends on the drive and should be set only to "Auto" in the "Type" field.
	Disabled 2,4,8,16 sectors
Option "LBA Mode Control"	If the LBA Mode Control field (enabled, disabled) is set to 'Enabled', the system supports hard disks with capacities greater than 528 MB. The value depends on the drive and should be set only to "Auto" in the "Type" field.
In the 32-bit IO field	In the field 32-bit I/O you define the drive access mode
	Disabled	16–bit access
	Enabled	32–bit access (default)
Option "Transfer Mode" and "Ultra DMA Mode"	The settings in these fields define the interface data transfer rate. The value depends on the drive and should be set only to "Auto" in the "Type" field.
	You leave the submenu using the ESC key.
Smart Monitoring	Disabled	Monitoring function of hard disk disabled
	Enabled	Monitoring function of hard disk enabled

The "Memory Cache" field

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

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Version	Exit

```
                                                          Item Specific Help
  System Time:              [ 15:35:32 ]
  System Date:              [ 10/05/2003 ]                <Tab>, <Shift+Tab> or
                                                          <Enter> selects filed.

▶ Primary Master           [None]
▶ Primary Slave            [None]
▶ Secondary Master         [257 MB]
                                        Disabled
                                        Write Through
  Memory Cache:            [Write       Write Back

▶ Boot Options
▶ Keyboard Features
▶ Hardware Options

  System Memory:            640 KB
  Extended Memory:          121856 KB

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

Figure 16-5   Memory cache field

The cache is a high-speed memory buffer between the CPU and memory (DRAM). Repeated memory access operations are executed in the fast cache, and not in the main memory, provided the feature is enabled. In some cases it may be necessary to disable the cache for certain hardware and software because desired program runtimes or wait times may be shortened 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 submenu appears when you select the "Boot Options" field in the main menu:

```
                        PhoenixBIOS Setup Utility

        Main

        Boot Options                              Item Specific Help

  Quick Boot Mode:          [Enabled]            Allows the system to
                                                 skip certain tests
                                                 while booting.
  Setup Prompt:             [Enabled]            This will decrease time
  Post Errors:              [All, but not Keyboard]   needed to boot the system.


  Summary Screen:           [Disabled]




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

Figure 16-6   Boot Options submenu

Quick Boot Mode	Some hardware tests (memory test) are skipped to speed up the boot sequence.
Setup prompt	The message PRESS <F2> to enter Setup is output at the bottom of the screen during the system run-up phase.
Post Errors	The boot sequence is stopped if an error is detected; you must press F1 to acknowledge. Enter "Disabled" to avoid the necessity of acknowledging errors, for example, if no keyboard is connected. The default setting [All, but not keyboard] allows the startup with error messages, although possible keyboard errors are eliminated.
Summary screen	The most important system parameters are displayed when the system boot phase completes.

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

"Hardware Options" field

The following submenu appears when you select the "Hardware Options" field in the main menu:

	PhoenixBIOS Setup Utility	
Main		

Hardware Options		Item Specific Help
Eth 1 Address:	0800068F9BD5	Enable or disable the PCI - Multi Point Interface (MPI/DP)
Eth 1 Remote Boot:	[Disabled]	
Eth 2 Enable:	[Enabled]	
Eth 2 Address:	0800068F9E69	
Eth 2 Remote Boot:	[Disabled]	
PCI - MPI / DP:	[Enabled]	
Boot - Display	[Auto]	

1) ─── PCI - MPI / DP:

| F1 | Help | ↑ ↓ | Select Item | + / - | Change Values | F9 | Setup Defaults |
| ESC | Exit | ← → | Select Menu | Enter | Select ▶ Sub-Menu | F10 | Save and Exit |

Figure 16-9   Hardware Options submenu

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

Entry	Meaning	
Eth 1 Address	Shows the individual address on the first Ethernet port.	
Eth 1 Remote Boot	[Enabled]	You can boot from a LAN connected to the first Ethernet port. The respective boot source is displayed as PXE/RPL 2.32 in the boot sequence menu.
	[Disabled]	You cannot boot from a LAN connected to the first Ethernet port.
Eth 2 Enable	[Enabled]	The second Ethernet port is enabled.
	[Disabled]	The second Ethernet port is disabled.
Eth 2 Address	Shows the individual address on the second Ethernet port.	
Eth 2 Remote Boot	[Enabled]	You can boot from a LAN connected to the second Ethernet port. The respective boot source is displayed as PXE/RPL 2.32 in the boot sequence menu.
	[Disabled]	You cannot boot from a LAN connected to the second Ethernet port.
PCI–MPI/DP [1]	[Enabled]	Enables the CP5611-compatible MPI/DP interface. The resources are managed by the BIOS PCI Plug&Play mechanism.
	[Disabled]	The CP5611 compatible MPI/DP interface is disabled.

Entry	Meaning	
Boot Display	[Auto]	The optimal setting is determined and set.
	[DVI-CRT XGA]	1024x768
	[DVI-CRT SVGA]	800x600
	[DVI-CRT VGA]	640x480

[1] Optional product feature

16.2.5   Advanced Menu

Menu layout

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

                                                          Item Specific Help

        Installed O/S:                      [ Other ]
        Reset Configuration Data:           [ No ]            Select the operating system
                                                              installed on your system which
    ▶   PCI Configuration                                     you will use most commonly.
    ▶   I/O Device Configuration
                                                              Note: An incorrect setting can
        Local Bus IDE adapter:              [Both]            cause some operating systems
        Legacy USB Support:                 [Enabled]         to display unexpected
                                                              behaviour.
        Frame Buffer Size:                  [8 MB]
        Memory gap at 15 MByte:             [Disabled]
        SafeCard functions:                 [Disabled]
        SRAM length and base address:       [Disabled]



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

Figure 16-10   Example of Advanced menu

Settings in the Advanced Menu

Installed O/S	Plug&Play means that all modules are automatically detected and installed, providing they support the Plug&Play functionality.	
	[Other]	BIOS handles the entire Plug&Play capability, default setting.
	[Win95]	The operating system handles the Plug&Play functions.

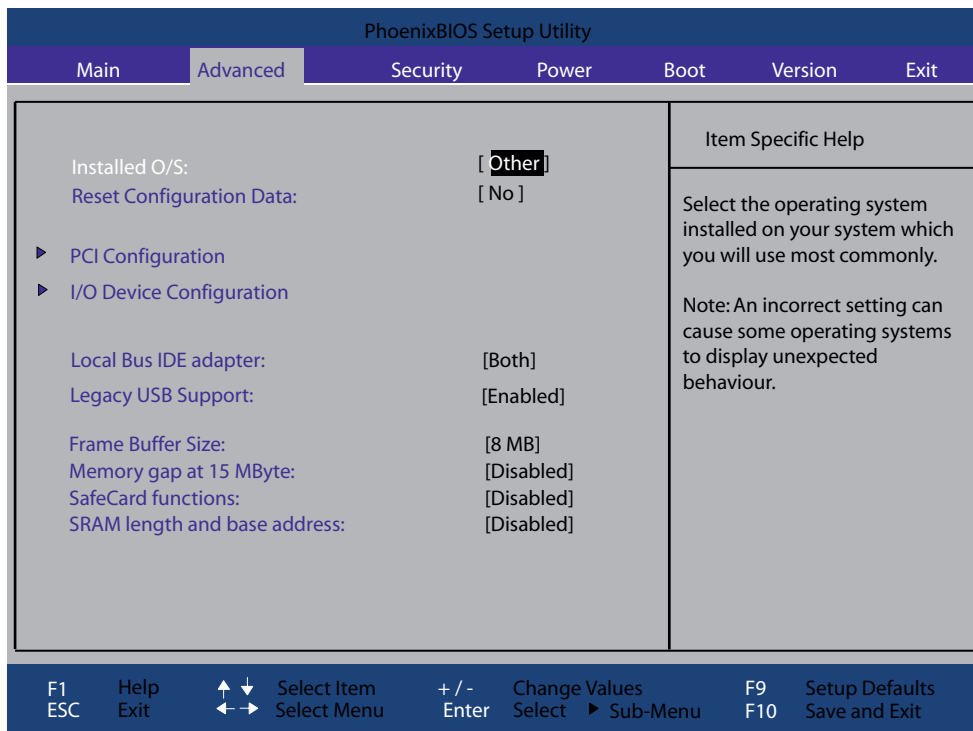|	[Win98]	The operating system handles some of the Plug&Play functions.
	[WinMe]	The operating system handles the Plug&Play functions.
	[Win2000]	The operating system handles the Plug&Play functions.
	[Win XPE]	The operating system handles the Plug&Play functions.
Reset configuration data	[Yes]	All installations under Plug&Play are deleted and the configuration is retriggered the next time the system boots. The entry is then reset to [No]. System components that do not support Plug&Play have to be entered manually.
	[No]	The Plug&Play system components are initialized after the next system start.
Local Bus IDE adapter	[Primary]	One IDE interface for max. two drives.
	[Secondary]	One IDE interface for max. two drives.
	[Both]	Two IDE interfaces for max. four drives.
	[Disabled]	No local IDE interface.
Legacy USB support	[Enabled]	USB ports are accessible.
	[Disabled]	USB ports are not accessible.
Frame buffer size	[None]	No graphics memory can be taken from RAM.
	[8 MB]	8 MB of the RAM is used for the graphics memory.
	[16 MB]	16 MB of the RAM is used for the graphics memory.
	[32 MB]	32 MB of the RAM is used for the graphics memory.
Memory gap at 15 MB	[Disabled]	The onboard RAM is fully available.
	[Enabled]	A 1 MB area of the RAM beginning at 15 MB (address F0 0000 – FF FFFF) can be used by auxiliary ISA cards.
SafeCard functions	[Disabled]	The SafeCard functions are disabled.
	[Enabled]	The SafeCard functions are enabled.
SRAM length and base address	[Enabled]	Length and base address of the SRAMs can be specified.
	[Disabled]	Length and base address of the SRAMs cannot be specified.
CAN bus I/O address [1]	[5000]	Adjustable CAN Bus I/O address. Possible values: 5000, 5400, 5800, 5C00

[1] Optional product feature

"COM Configuration" submenu

PhoenixBIOS Setup Utility		
Advanced		
I/O Device Configuration		Item Specific Help
Internal COM1:	[Enabled]	
Base I/O address:	[3F8]	
Interrupt:	[IRQ 4]	

F1	Help	↑ ↓	Select Item	+ / -	Change Values	F9	Setup Defaults
ESC	Exit	←→	Select Menu	Enter	Select ▶ Sub-Menu	F10	Save and Exit
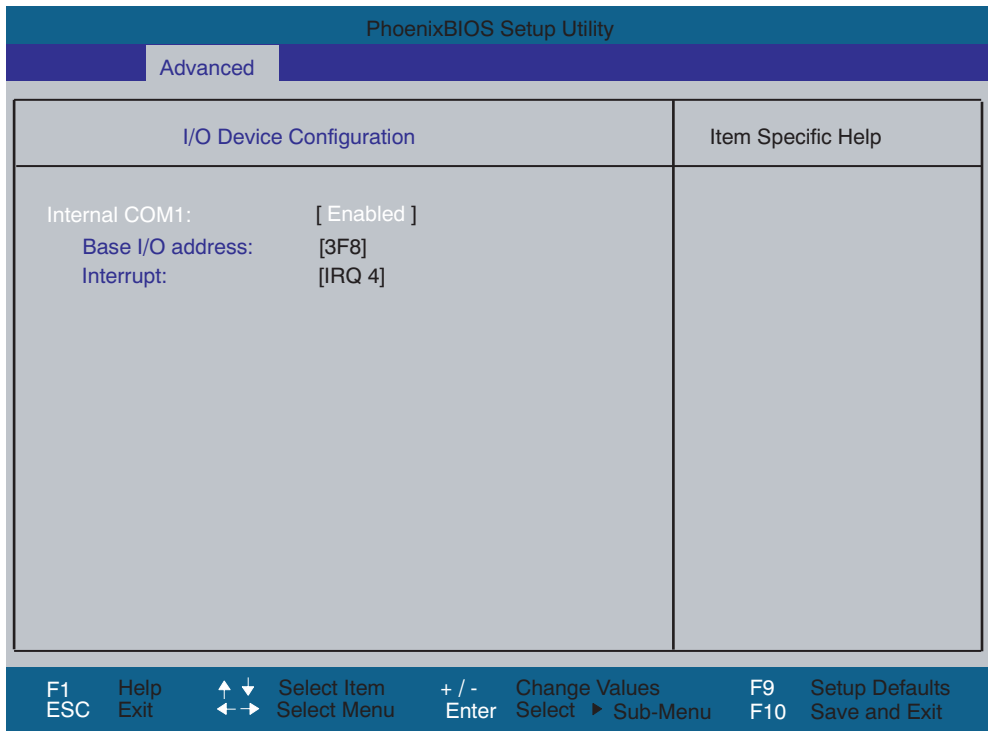
Figure 16-11 COM Configuration submenu

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

PhoenixBIOS Setup Utility	
Advanced	

PCI Configuration	Item Specific Help
▶ PCI Device, Slot #1 ▶ PCI Device, Slot #2 ▶ PCI Device, Slot #3 ▶ PCI Device, Slot #4 ▶ PCI/PNP ISA IRQ Resource Exclusion PCI IRQ line 1: [Auto Select] PCI IRQ line 2: [Auto Select] PCI IRQ line 3: [Auto Select] PCI IRQ line 4: [Auto Select]	Setup items for configuring the specific PCI device.

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

Figure 16-12 PCI Configuration submenu

"PCI Devices" field

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

```
                        PhoenixBIOS Setup Utility
        Advanced

         PCI Devices, Slot  #1                      Item Specific Help


                                                    Initialize device
       Option Rom Scan        [Enabled]             expansion ROM
       Enable Master:         [Enabled]
       Latency Timer          [0040h]









   F1    Help      ↑ ↓  Select Item    + / -   Change Values      F9   Setup Defaults
   ESC   Exit      ← →  Select Menu     Enter  Select ▶ Sub-Menu  F10  Save and Exit
```
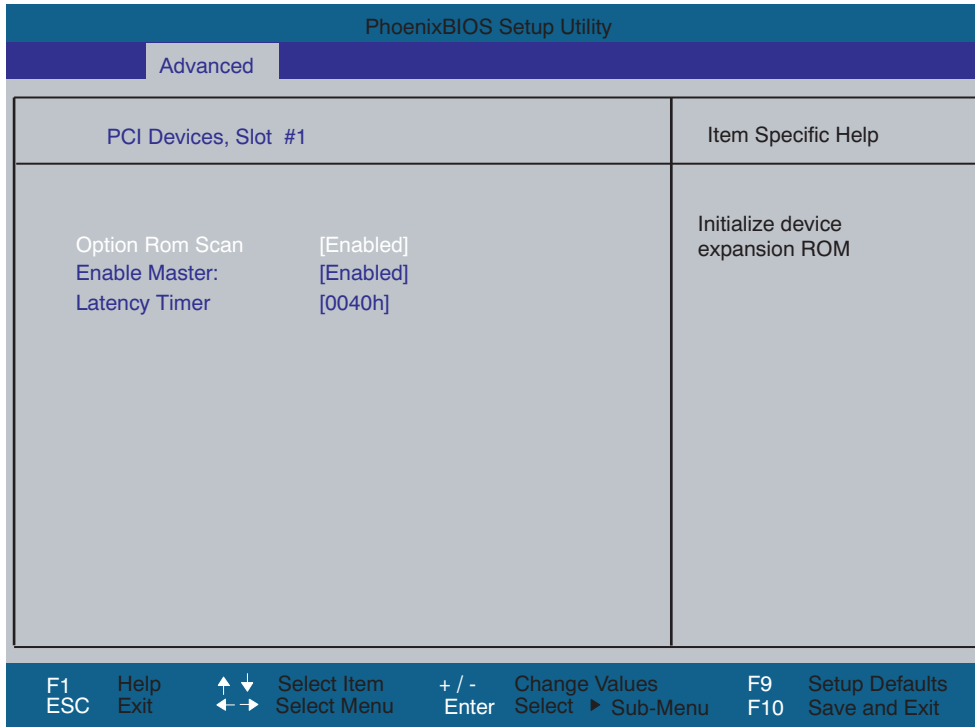
Figure 16-13   PCI Devices submenu

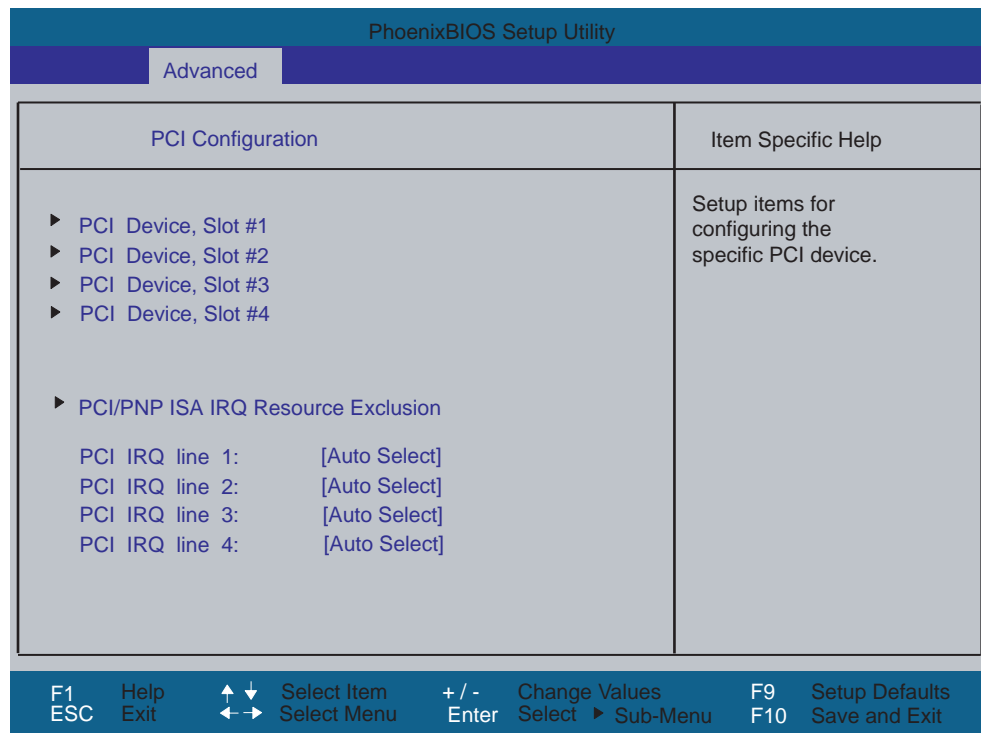| ROM scan option:	[Enabled]	The Option ROM of the PCI module (if present) is enabled
	[Disabled]	The ROM option of a PCI module is disabled.
Enable Master	[Enabled]	This slot can be assigned master functions.
	[Disabled]	This slot can only operate as a PCI slave.
Latency Timer	[Default]	The number of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

Note

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:      [Reserved]                            IRQ for use by legacy
   IRQ 5:      [Available]                           ISA devices.
   IRQ 7:      [Available]
   IRQ 9:      [Available]
   IRQ 10:     [Reserved]
   IRQ 11:     [Available]




   F1    Help     ↑ ↓  Select Item    + / -   Change Values      F9   Setup Defaults
   ESC   Exit     ← →  Select Menu    Enter   Select  ▶ Sub-Menu F10  Save and Exit
```
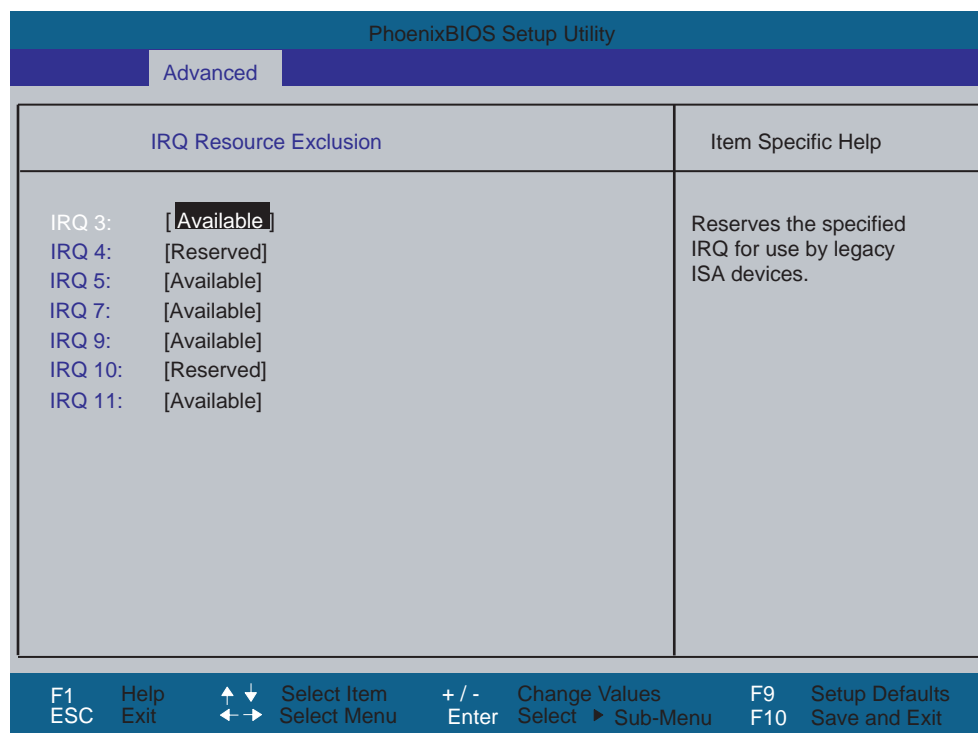
Figure 16-14   IRQ Resource Exclusion submenu

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

Note

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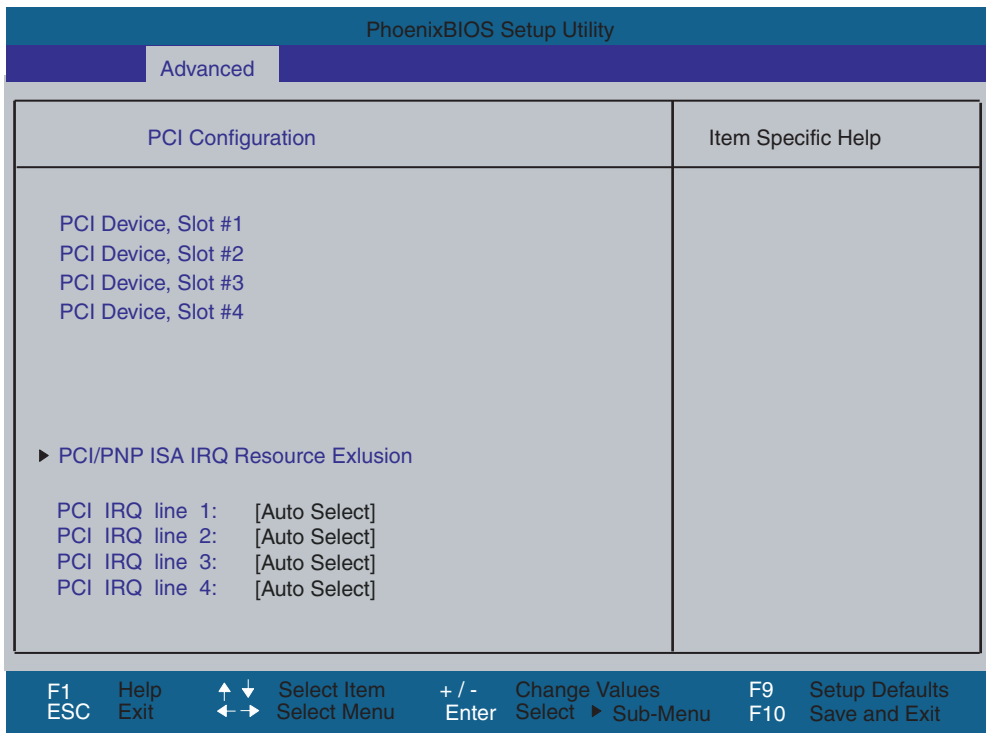

"PCI IRQ channel" field

```
                    PhoenixBIOS Setup Utility
        ┌──────────┐
        │ Advanced │
        └──────────┘

        PCI Configuration                          Item Specific Help


     PCI Device, Slot #1
     PCI Device, Slot #2
     PCI Device, Slot #3
     PCI Device, Slot #4




  ▶ PCI/PNP ISA IRQ Resource Exlusion

     PCI  IRQ  line  1:     [Auto Select]
     PCI  IRQ  line  2:     [Auto Select]
     PCI  IRQ  line  3:     [Auto Select]
     PCI  IRQ  line  4:     [Auto Select]


  F1    Help       ▲ ▼   Select Item    + / -   Change Values     F9    Setup Defaults
  ESC   Exit       ◄ ►   Select Menu    Enter   Select ▶ Sub-Menu F10   Save and Exit
```

Figure 16-15 The PCI IRQ channel field

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

Assignment of the PCI IRQ channels to the PCI slots.

16.2.6 Security menu

You can only edit the fields enclosed in square brackets. Two passwords can be assigned to protect your Microbox PC from unauthorized use. The Supervisor password can be used to prevent access to the floppy disk drive for normal users and to restrict access to the hard disk drive.
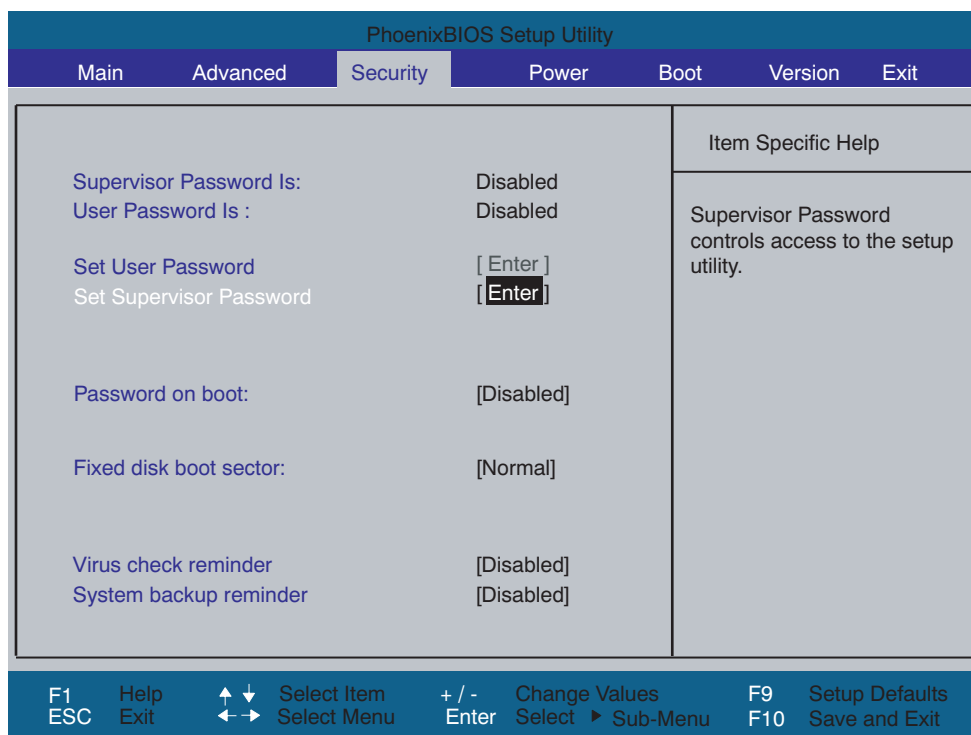
PhoenixBIOS Setup Utility			
Main　　Advanced　　Security　　Power　　Boot　　Version　　Exit			

	Item Specific Help
Supervisor Password Is:　　Disabled User Password Is :　　Disabled Set User Password　　[Enter] Set Supervisor Password　　[Enter] Password on boot:　　[Disabled] Fixed disk boot sector:　　[Normal] Virus check reminder　　[Disabled] System backup reminder　　[Disabled]	Supervisor Password controls access to the setup utility.

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

Figure 16-16　Security menu

Supervisor Password is	Disabled	The password is disabled.
	Enabled	Certain Setup fields are thus configurable by the user, including the supervisor password.
	The field resets automatically from [Disabled] to [Enabled] when the password is entered.	
User Password is	Disabled	The password is disabled.
	Enabled	Certain Setup fields are thus configurable by the user, including the user password.
	The field resets automatically from [Disabled] to [Enabled] when the password is entered.	
Set Supervisor Password	This field opens the dialog box for entering a password. Once it has been entered, the supervisor password can be changed or deleted by pressing "Return" and thus deactivated.	
Set User Password	This field opens the dialog box for entering a password. Once it has been entered correctly, the user password can be changed or deleted by pressing "Return" and thus deactivated.	

Password on boot	[Disabled]	No password required for system boot
	[Enabled]	Supervisor or user password must be entered for system boot.
Fixed disk boot sector	[Normal]	All types of hard disk access are permitted.
	[Write protect]	The user cannot install an operating system. This is a way of protecting against boot viruses.
Virus check reminder	Outputs a virus check prompt when booting.	
	[Disabled]	No message during system startup
	[Daily]	Daily
	[Weekly]	Each Monday
	[Monthly]	Every first of the month
System backup reminder	Outputs a message when booting requesting a system backup.	
	[Disabled]	No message during system startup
	[Daily]	Daily
	[Weekly]	Each Monday
	[Monthly]	Every first of the month

16.2.7   Power menu

This menu has the following layout:

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Version	Exit

```
                                                          Item Specific Help

   Power Savings:              [Disabled]
                                                   Maximum Power Savings
                                                   conserves the greatest
   Hard Disk Timeout:          [Disabled]          amount of system power.
                                                   Maximum Performance
                                                   conserves power but allows
                                                   greatest system performance.
                                                   To alter these settings,
                                                   choose Customized. To turn
                                                   off power management,
                                                   choose Disabled.
```

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

Figure 16-17 Power Menu

Power Savings	[Disabled]	No energy saving functions.
	[Customized, Maximum Power Savings, Maximum Performance]	Freely selectable or default values for min./max. energy saving functions. You can set the parameters for Standby Time-out and Fixed Disk Timeout, or they are set automatically to their defaults.
Hard Disk Timeout	[Disabled]	The hard disk is not switched off.
	[1,6,8,10,15]	Minutes after the last access the hard disk drive is switched off. The next time it is accessed, the hard disk starts spinning again after a brief delay.

16.2.8 Boot Menu

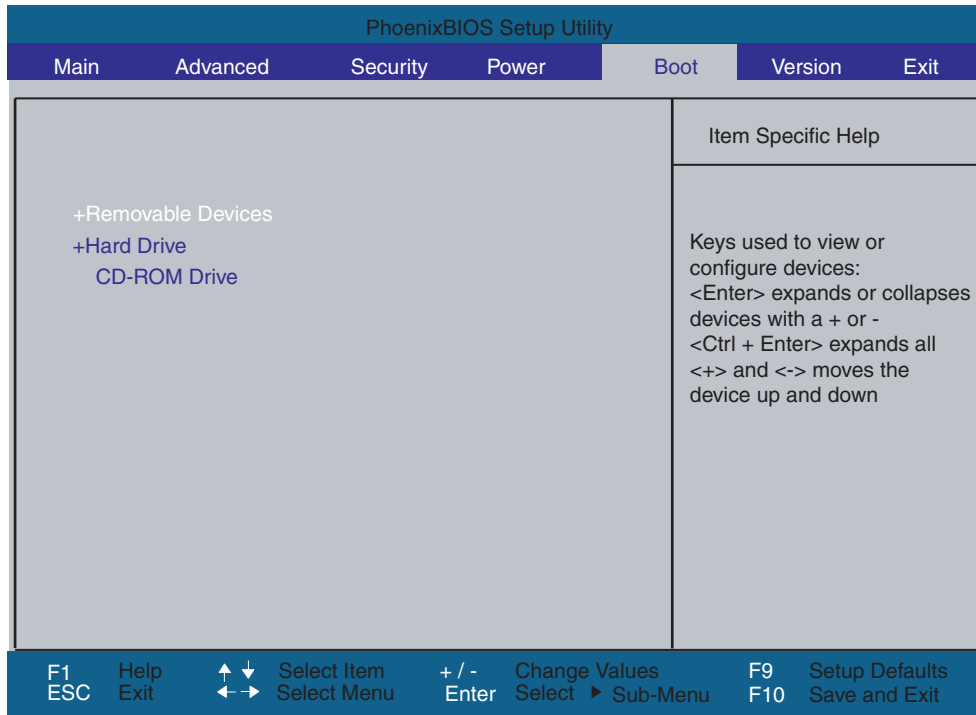This menu allows you to assign a priority for the boot devices.

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Version	Exit

```
+Removable Devices
+Hard Drive
   CD-ROM Drive
```

Item Specific Help

Keys used to view or
configure devices:
<Enter> expands or collapses
devices with a + or -
<Ctrl + Enter> expands all
<+> and <-> moves the
device up and down

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

Figure 16-18 Boot Menu

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

Note

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

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

```
┌─────────────────────────────────────────────────────────────────────┐
│                    PhoenixBIOS Setup Utility                          │
├─────────────────────────────────────────────────────────────────────┤
│   Main     Advanced    Security    Power      Boot    Version   Exit  │
├──────────────────────────────────────────────┬──────────────────────┤
│                                               │   Item Specific Help │
│                                               │                      │
│     -Removable Devices                        │  Keys used to view or│
│     -Hard Drive                               │  configure devices:  │
│       Alternate Device                        │  <Enter> expands or  │
│       FUJITSU MHM2100AT-(PM)                   │  collapses devices   │
│       SanDisk SDCFB-256-(PM)                   │  with a + or -       │
│     CD-ROM Drive                              │  <Ctrl + Enter>      │
│                                               │  expands all         │
│                                               │  <+> and <-> moves   │
│                                               │  the device up and   │
│                                               │  down                │
│                                               │                      │
├──────────────────────────────────────────────┴──────────────────────┤
│  F1   Help      ↑ ↓  Select Item   + / -   Change Values  F9  Setup   │
│  ESC  Exit      ← →  Select Menu   Enter   Select ▶ Sub-Menu  F10     │
│                                                     Save and Exit     │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 16-19   Example of the Boot menu

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

Note

You can only boot from the first device of each group due to a BIOS limitation.

16.2.9 Versions Menu

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

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Version	Exit

		Item Specific Help
SIMATIC	Microbox PC 420	If any items in this menu require changes, please consult your system Supervisor.
Bios Version	V08.01.01	
Bios Number	A5E00292235-ES002	
Board Revision	V01	
1) — MPI Firmware	V01	
CPU Type	Celeron (R)	
CPU Speed	400 MHz	
CPU ID	06B4	
Code Revision	0002	

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

Figure 16-20 Version menu

1) Optional product feature

16.2.10   Exit menu

The setup program is always closed from this menu:

PhoenixBIOS Setup Utility						
Main	Advanced	Security	Power	Boot	Version	Exit

Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes

Profile: [Standard]

Item Specific Help

[Standard]
  BIOS settings are
  stored in the bat-
  tery buffered CMOS.

[User]
  BIOS settings are
  stored in the none
  volantile FLASH.

[Manufacturer]
  This setting is for
  production purposes
  only. Do not use it.

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

Figure 16-21 Exit menu

Profile	[Default]	The BIOS settings are saved in the CMOS-RAM which is backed up by battery.
Exit Saving Changes	All changes are saved; a system restart is carried out with the new parameters. (Also called with the F10 key)	
Exit Discarding Changes	All changes are discarded and the system performs a restart based on the old parameters.	
Load Setup Defaults	All parameters are set to the default values. (Also called with the F9 key)	
Discard Changes	All your changes are discarded.	
Save Changes	Save all Setup settings.	

Profile	[User]	The BIOS settings are saved in the non-volatile FLASH memory and CMOS-RAM.
Exit Saving Changes	The current user settings are saved in the FLASH and CMOS. A FLASH cell records that the user profile is selected. The system then reboots. (Also called by the F10 key)	
Exit Discarding	All your changes are discarded. A FLASH cell records that the user profile is	

Changes	still active. The system then reboots.
Load Setup Defaults	Loads die BIOS default settings. The profile is not changed. (Also called with the F9 key)
Discard Changes	All your changes are discarded.
Save Changes	The current user settings are saved in the FLASH and CMOS.

Profile	[Manufacturer]	Profile for development purposes. Not used!
Exit Saving Changes	A FLASH cell records that the manufacturer profile is selected. The system then reboots. (Also called with the F10 key)	
Exit Discarding Changes	All your changes are discarded. The system then reboots.	
Load Setup Defaults	The manufacturer settings saved in the Flash are saved in the CMOS. (Also called with the F9 key)	
Discard Changes	All your changes are discarded.	
Save Changes	The manufacturer settings saved in the Flash are saved in the CMOS.	

16.2.11 BIOS Setup default settings

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 have made your entries.

Default BIOS Setup entries

System parameters	Defaults	Custom entries
Main		
System Time	hh:mm:ss	
System Date	MM/DD/YYYY	
Primary Master	40008 MB	
Primary Slave	None	
Secondary Master	512 MB	
Memory Cache	Write Back	
Boot options		
Quick Boot Mode	Enabled	
SETUP prompt	Enabled	
POST errors	All, but not keyboard	
Summary screen	Disabled	
Keyboard Features		
Num Lock	Auto	
Keyboard auto–repeat rate	30/sec	
Keyboard auto–repeat delay	½ sec	
Hardware Options		
Eth 1 Address	0800068F9DB5	
Eth 1 Remote Boot	Disabled	
Eth 2 Enable	Enabled	
Eth 2 Address	0800068F9E69	
Eth 2 Remote Boot	Disabled	
PCI – MPI/DP	Enabled	
Boot Display	Auto	

Advanced		
Installed O/S	Other	
Reset Configuration Data	No	
Local Bus IDE adapter	Both	
Legacy USB support	Enabled	
Frame Buffer Size	8 MB	
Memory gap at 15 MByte	Disabled	
SafeCard functions	Enabled	
SRAM length and base address	Disabled	
CAN bus I/O address	5000	

I/O Device Configuration		
Internal COM1	Enabled	
Base I/O address	3F8	
Interrupt	IRQ 4	

PCI configuration		
PCI Device, Slot#1		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency timer	0040h	
PCI Device, Slot#2		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency timer	0040h	
PCI Device, Slot#3		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency timer	0040h	
PCI Device, Slot#4		
ROM scan option:	Enabled	
Enable Master	Enabled	
Latency Timer	0040h	
PCI/PNP ISA IRQ Resource Exclusion		
IRQ3	Available	
IRQ4	Available	
IRQ5	Available	
IRQ7	Available	
IRQ9	Available	
IRQ10	Reserved	
IRQ11	Available	
PCI IRQ Line 1	Auto Select	

PCI configuration		
PCI IRQ Line 2	Auto Select	
PCI IRQ Line 3	Auto Select	
PCI IRQ Line 4	Auto Select	

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

Power		
Power Savings	Disabled	
Hard Disk Timeout	Disabled	

Boot		
Removable Devices		
Hard disk drive		
CD-ROM drive		

Version		
SIMATIC	Microbox PC 420	
BIOS Version	V08.01.02	
BIOS Number	A5E00292424-ES02	
Board Revision	V01	
MPI Firmware	V01	
CPU Type		
CPU speed		
CPU ID		
Code Revision		

Exit		
Profile	Standard	

16.3 System resources

16.3.1 Currently allocated system resources

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

Windows XP Embedded	**Start > Run :** in the **Run** dialog, enter *msinfo32* and confirm with **OK**.

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

PCI-Device #	Device	Req # /Gnt #	INTA#	INTB#	INTC#	INTD#
Internal	Northbridge (GFX) PN133T		x			
Internal	Southbridge Vt82C686B-CE USB1.1					x
1	VT6105LOM – Ethernet #1	1			x	
2	VT6105LOM – Ethernet #2	2	x			
3	VT6212 - USB1.1 #1	3	x			
	VT6212 - USB1.1 #2		x			
	VT6212 - USB2.0		x			
4	DP12 (PROFIBUS controller)	none		x		
5-7	Max. 3 modules PC/104 PCI resources depending on selection (1-4)	1 4	INT B	INT C	INT D	INT A
		2 5	INT A	INT B	INT C	INT D
		3 5	INT D	INT A	INT B	INT C
		4 5	INT C	INT D	INT A	INT B

fixed assignment

IRQ0 timer
IRQ1 keyboard PS2
IRQ2 slave interrupt
IRQ4 COM1
IRQ6 reserved (Floppy Controller)
IRQ8 real time clock
IRQ9 exclusively reserved for ACPI
IRQ10 free, if no CAN
IRQ12 reserved (PS/2 mouse)
IRQ13 Num. coprocessor
IRQ14 primary IDE
IRQ15 secondary IDE

Microbox
Interrupt
Logic

Master/slave

free assignment

IRQ3 free
IRQ5 free
IRQ7 free
IRQ11 free

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

BIOS
Setup

INTA INTB INTC INTD

*) IRQxx
depending on the BIOS
Setup settings

Note/Tip:
If one or more IRQxx are set by "Auto" to a fixed value,
a fixed interrupt assignment should also be set for the other IRQxx
Reason: otherwise it can happen that an already assigned IRQxx can be used again.

PCI bus

Graphic
Ethernet #2
USB1.1 #1
USB1.1 #2
USB2.0

DP12
(Profibus Ctrl.)
for Profibus version

Ethernet #1

USB1.1 Southbridge ***)

***) not used for Microbox PC 420, but assigned internally by chipset
(used for the front USB for Panel PC 477)

4. PC/104+ **) 3. PC/104+ 2. PC/104+ 1. PC/104+

INT0 INT0 INT0 INT0

**) can be set for 4x PC/104+, but
max. 3x PC/104+ modules permissible for Microbox PC 420

according to connector configuration
PC 104:

IRQ3*
IRQ4* (if COM1 disabled)
IRQ5*
IRQ7*
IRQ9*
IRQ10*
IRQ11*

by means of X80/81

Available for ISA bus

16.4   I/O address areas

Overview of the internal module registers

The following addresses are used for the internal registers:

Addresses	Input/output unit
062h	Watchdog enable register
066h	Watchdog trigger register
	SRAM base address register
	SRAM control register
	CAN base address register
404Dh	General purpose ports (GPP) output register
404Eh	Output register LED 1 / 2

16.4.1   Watchdog enable register (read/write address 062h)

Meaning of the bits

Watchdog enable register (r/w address 062h)								
Bit								**Meaning of the bits**
7	6	5	4	3	2	1	0	
								Watchdog enable bit (WDE)
							0	Watchdog switch is disabled
							1	Watchdog switch is enabled
								Watchdog Mode
						0		Standard
						1		Macro
								Address register selection
					0			SRAM base address register
					1			The SRAM control register or the CAN base address register
								Scaler watchdog time (Normal/Macro)
		0	0	0				94 ms/2s (default)
		0	0	1				210 ms/4s
		0	1	0				340 ms/6s
		0	1	1				460 ms/8s
		1	0	0				590 ms/16s
		1	0	1				710 ms/32s
		1	1	0				840 ms/48s
		1	1	1				960 ms/64s
								Trigger red 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)

16.4.2   Watchdog trigger register (read only, address 066h)

Watchdog trigger register

The watchdog is triggered by a read action (address 066h) by this register. The read result has no meaning (= dummy read).

16.4.3   SRAM base address register (write only, address 066h)

A maximum of 128 KB SRAM is available on the module. This can be overlaid on the SRAM base register in various address ranges. The length and enable of the address range is made through the SRAM control register. A limited selection can be preset in the BIOS Setup.

Note

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

Meaning of the bits

SRAM base address register (write only, address 066h, Address register selection 0)								
Bit								Meaning of the bits
7	6	5	4	3	2	1	0	
								Setting the SRAM base address

1) : Zugriff auf diesen Speicherbereich nur über
     Memory-Hole (bei F00000h -
2) : Größe des SRAM-Bereichs bedingt die Granularität
     Basisadresse.
3) : SRAM-Adresse 0h nur 128KByte-granular
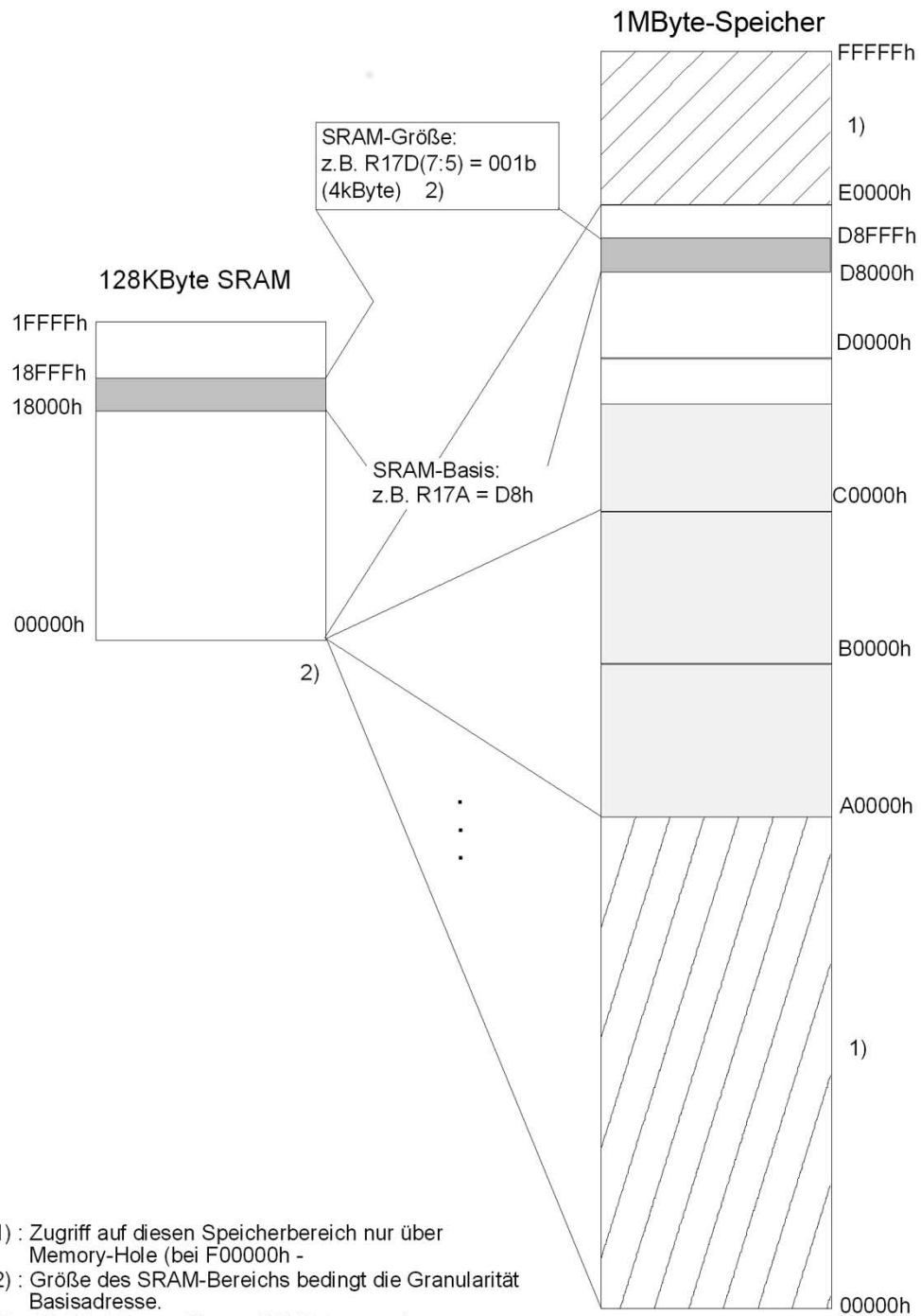
Figure 16-22 SRAM base register Memory areas

16.4.4   SRAM control register (write only, address 066h)

The length and enable of the SRAM address range is made through the SRAM control register (write only, address 066h).

Note

The SRAM control register shares its I/O address with other registers. The watchdog enable register therefore must be selected before access.

Meaning of the bits[1]

SRAM control register (write only, address 066h, Address register selection 1)								
Bit								Length in KB
7	6	5	4	3	2	1	0	
0	0	0						Disabled
0	0	1						4
0	1	0						8
0	1	1						16
1	0	0						32
1	0	1						64
1	1	0						128 [2]
1	1	1						Disabled
			0	0	0	0	0	Reserved (Write 0 0 0 0 0)

[1] Limited selection can be preset in the BIOS Setup.
[2] This setting only makes sense when the memory hole is activated.

16.4.5   CAN base address register (write only, address 066h)

A 512 byte windows 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 block can be accessed at several places in the address window by partial decoding the addresses. 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 usable addresses are defined as 0x0 to 0x1FF to avoid conflicts with expansion modules that use incomplete I/O address decoding. The addresses 200h to 3FFh should be used for PC104 modules with ISA partial decoding (10-bit).

Note

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

Meaning of the bits

CAN base address register (write only, address 066h, Address register selection 1)									
Bit								Meaning	
7	6	5	4	3	2	1	0		
						0	1	Reserved (Write: 01)	
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	

16.4.6   General Purpose Ports (GPP) output register (read/write, address 404Dh)

Meaning of the bits

General Purpose Ports output register (read/write, address 404Dh)								
Bits								Meaning
7	6	5	4	3	2	1	0	
					1			Write protection for BIOS Flash Memory is active (default)
					0			Write protection for BIOS Flash Memory is inactive
	1							SW reset for PROFIBUS ASIC ASPC2 is inactive (default)
	0							SW reset for PROFIBUS ASIC ASPC2 is active
1								Watchdog locking is active (default)
0								Watchdog locking is inactive
		1	1	1				Reserved (read/write)

Notice

Data loss

If SIMATIC products are installed on your device, the ASPC2 may not be reset by a user program under any circumstances.

16.4.7   Output register LED 1 / 2 (read/write address 404Eh)

Meaning of the bits

Output register LED 1 / 2 (read/write address 404Eh)								
Bits								Meaning
7	6	5	4	3	2	1	0	
	1							1= LED 1 is dark (default)
	0							0= LED 1 lit
1								1= LED 2 is dark (default)
0								0= LED 2 lit
		1	1	1	1	1	1	Reserved (read/write)

Appendix

17

17.1 Guidelines and Declarations

Notes on the CE Label

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

EMC Guideline

The devices fulfill the requirements for the EC directive "89/336/EEC Electromagnetic Compatibility", and the following field of application applies according to this CE label:

Area of Application	Requirements	
	Emitted interference	Noise immunity
Industry	EN 61000-6-4: 2001	EN 61000-6-2: 2001
Residential environment	EN 61000-6-3: 2001	EN 61000-6-1: 2001

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

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

17.2 Certificates and Approvals

DIN ISO 9001 certificate

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

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

EQ-Net certificate no.: 1323-01

Software License Agreement

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

Certification for the USA, Canada and Australia

Product safety

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

EMC

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

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

AUSTRALIA	
	This product meets the requirements of the AS/NZS 3548 Norm.

17.3 Service and support

Additional support

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

Find your contact partner at:

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

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

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

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

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

Training center

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

Phone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

Technical support

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

- Support request form on the web:
  http://www.siemens.de/automation/support-request

- Phone: +49 180 5050 222

- Fax: +49 180 5050 223

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

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

- BIOS version

- Order No. (MLFB) of the device

- Installed additional software

- Installed additional hardware

Service & support on the Internet

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

http://www.siemens.com/asis

There you will find:

* The newsletter which provides the latest information on your products

* Relevant documentation for your application which you can access via the search function in our service & support database.

* The current BIOS version

* A forum is available for users and specialists from all over the world to exchange experiences

* Your local Siemens partner for Automation & Drives in our partner database

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ESD Guidelines 18

18.1 ESD Guidelines

What does ESD mean?

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

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

Electrostatic sensitive modules are identified by the following symbol:

Caution

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

Electrical charge

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

The figure below shows the maximum electrostatic voltages that can accumulate in a person who is operating equipment when he/she comes into contact with the materials indicated. These values correspond with specifications to IEC 801-2.
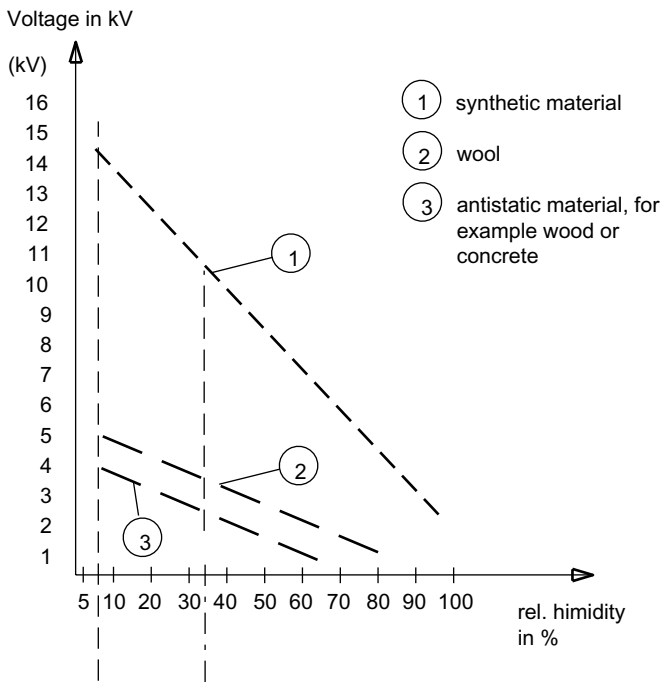
Figure 18-1   Electrostatic voltages on an operator

Basic protective measures against discharge of static electricity

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

-
  As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). When you touch modules, make sure that you do not touch either the pins on the modules or the printed conductors. This prevents any discharge of static electricity to sensitive component and thus avoids damage.

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

Abbreviations and glossary

<div align="right">19</div>

19.1   Abbreviations

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
ACPI	Advanced Configuration and Power Interface	Configuration interface, allows the operating system control over the power supply to all devices connected to the PC.
AG	Automation device	
AGP	Accelerated Graphics Port	High-speed bus system, used to interconnect computer peripherals with the motherboard.
APM	Advanced Power Management	Tool for monitoring and reducing power consumption of the PC.
AS	Automation system	
AT	Advanced Technology	Advanced technology introduced by IBM in the year 1984. The AT computer, successor of the XT computer, is based on an Intel 80286 processor. Now we refer to all PCs working operated a 16-bit or 32-bit processor as AT computers.
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 A set of vital software routines used to perform a hardware test after the startup of a computer, to load the operating system a to provide routines for the data transfer between hardware components.
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 label
CF	Compact Flash card	
CGA	Color Graphics Adapter	Standard monitor interface
CLK	Clock pulse	Clock signal for controllers
CMOS	Complementary Metal Oxide Semiconductors	Complementary metal oxide semiconductors. Computer chips featuring lower power consumption compared with common chipsets. They are, on the other hand, slower than conventional circuits.
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	Central unit. Core component of the computer; responsible for all data processing routines. The processor receives the relevant data and programs from work memory.
CSA	Canadian Standards Association	Canadian standardization organization
CTS	Clear To Send	Clear to send
DP	Distributed I/Os	
DRAM	Dynamic Random Access Memory	
DDRAM	Double Data Random Access Memory	Memory chip with high-speed interface
DC	Direct Current	DC current
DCD	Data Carrier Detect	Data carrier signal detection
DMA	Direct Memory Access	Direct memory access. Data transfer method for direct memory access, allowing data exchange between system components and the RAM without intervention of the CPU. This is controlled by the DMA controller, in order to reduce processor load and to significantly increase processing performance.
DOS	Disc Operating System	Operating system without GUI
DQS	Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagement mBH	
DSR	Data Set Ready	Ready for operation
DTR	Data Terminal Ready	Data terminal is ready. Control signal for data transfer.
DVD	Digital Versatile Disc	Digital versatile disk. Standard that describes a data carrier which is similar to a conventional CD, but allows read/write operations on both sides of the DVD; storage capacity up to 8.5 GB of data.
DVI	Digital Visual Interface	Digital display interface
ECC	Error Correction Code	Error correction code. Method for the correction of errors in RAM chips; used in high-performance PCs.
ECP	Extended capability port	Extended parallel port
EGA	Enhanced Graphics Adapter	PC to monitor interface
ESD	Components sensitive to electrostatic charge	
DM	Development manual	
EIDE	Enhanced Integrated Drive Electronics	An enhancement of the IDE standard. Enhanced IDE is the standard for a hardware interface. This interface is designed for disk drives operating with internal disk drive controllers. This allows standardization of interfaces for the system, ensuring enhanced functions (e.g. burst packet transfer and direct data access.) Enhanced IDE supports disk drives with a capacity of up to 8.4 GB (IDE supports only up to 528 MB).

Abbreviation	Term	Meaning
EISA	Extended Industry Standard Architecture	Enhanced ISA standard, introduced to the market in the year 1988; based on 32-bit data bus and 24-bit address bus; Competitor to the IBM 32-bit bus system MCA.
EMM	Expanded Memory Manager	Manages memory expansions
EN	European standard	
EPROM / EEPROM	Erasable Programmable Read-Only Memory / Electrically Erasable Programmable Read-Only Memory	Plug-in submodules with EPROM/EEPROM chips. S5/S7 user programs can be permanently stored on them, for example. This programmed module is then inserted into the prepared slots of the PCs / automation devices / PLCs.
EPP	Enhanced Parallel Port	Bi-directional Centronics interface
ESC	Escape Character	Control Characters
EWF	Enhanced Write Filter	
FAQ	Frequently Asked Questions	FAQs
FAT 32	File Allocation Table 32-bit	32-bit file allocation table. The table is maintained and managed by the operating system; provides details of the distribution of hard disk data.
FD	Floppy disk	Disk drive, 3.5"
FSB	Front Side Bus	Physical interface between the processor and PC RAM. It is used for communication between the motherboard and the other components in a computer system.
GND	Ground	Chassis ground
HD	Hard disk	Hard disk
HU	Height unit	
HMI	Human Machine Interface	User interface
HT	Hyper-Threading	Intel describes hyper-threading as the ability of a CPU to parallel process more than one application by duplicating and splitting specific resources (virtual CPUs).
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
IDE	Integrated Device Electronics	Interface for floppy drives; drives with internal electronic controller. This saves an extra adapter board.
IEC	International Electronical Commission	
IGBT	Insulated Gate Bipolar Transistor	Compact chip featuring short switching cycles and high current-carrying capacity.
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. PC bus system introduced by IBM in the year 1981; controls data flow between the processor and the interfaces/module cards.
IT	Information Technology	Information technology
LAN	Local Area Network	Computer network that is limited to a local area.

Abbreviation	Term	Meaning
LCD	Liquid Crystal Display	Liquid crystal display
LED	Light Emitting Diode	Light emitting diode
LPT	Line Printer	Printer port
LVDS	Low Voltage Differential Signaling	
LW	Disk drive	
MC	Memory Card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	Memory card with the format 32 x 24.5 mm
MPI	Multipoint-capable interface for programming devices	Programming interface of SIMATIC S7/M7. Allows central access to programmable modules, text-based displays and OPs. The nodes can intercommunicate.
MS-DOS	Microsoft Disc Operating System	Standard PC operating system, a single-user system
MTBF	Mean Time Between Failures	
MUI	Multilanguage User Interface	Language localization in Windows
NA	Not Applicable	
NAMUR	Normenarbeitsgemeinschaft für Mess- und Regelungstechnik in der chemischen Industrie	
NC	Not Connected	Not connected
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NMI	Non Maskable Interrupt	Interrupt the processor can not reject
NTFS	New Techniques File System	Secure file system for certain versions of Windows (NT, 2000, XP)
PC	Personal Computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCMCIA	Personal Computer Memory Card International Association	Association consisting of approx. 450 member companies of computer industry. Their focus is set on providing worldwide standards for miniaturization and flexible use of PC expansion cards, and thus to provide a basic technology to the market.
PI	Protective Earth	
PG	Programming device	Compact programming device which meets the special requirements of industry. The PG is fully equipped for programming SIMATIC PLCs.
POST	Power On Self Test	Self-test performed by the BIOS after the computer is switched on. Performs a RAM test and a graphic controller test, for example. The system outputs audible signals (beep codes) if the BIOS detects any errors; the relevant message indicating cause of error is output on the screen.
PS/2	Personal System 2	PC architecture introduced by IBM towards the end of the 1980 decade; was originally designed to replace the open system of the PC AT/XT format.
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network

Abbreviation	Term	Meaning
RAID	Redundant Array of Independent Disks	Redundant hard disk array. Data storage system which is used to store data alongside with the error correction codes (e.g. parity bits) on at least two hard disks, in order to increase system reliability and performance. The hard disk array is controlled by management programs and a hard disk controller for error correction. The RAID system is usually implemented in network servers.
RAM	Random Access Memory	Main or work memory of a computer with direct access, allowing read access to data and editing.
RI	Ring Input	Incoming call
ROM	Read-Only Memory	Semiconductor memory, can be also used for storing non-volatile data and programs in the manufacturing phase. Data stored on the ROM chip are read-only, and can neither be erased nor rewritten.
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
SCSI	Small Computer System Interface	Interface for connecting SCSI devices (e.g. hard disk or CD–ROM drives)
SDRAM	Synchronous DRAM	A design form of dynamic semiconductor chip (DRAM) that can be operated at a higher clock-pulse rate as conventional DRAM circuits. This is enabled by means of block access, where the DRAM specifies the relevant next memory address.
SELV	Safety Extra Low Voltage	Safety extra-low voltage
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SMS	Short Message Service	Short message via telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	SafeCard on Motherboard (SOM)	SafeCard On Motherboard consists of monitoring blocks on the motherboard, a driver and the SOM program. It provides functions for monitoring various temperatures and program execution (Watchdog).
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.	

Abbreviation	Term	Meaning
UMA	Unified Memory Architecture	
URL	Uniform Resource Locator	Designation of the full address of an Internet page
USB	Universal Serial Bus	A serial bus with a data transfer rate of max. 12 megabits per second (Mbps) for USB 1.1 or 480 Mbps for USB 2.0 for connecting peripherals to a computer. USB can connect up to 127 peripherals, such as external CD-ROM drives, printers, modems, mice, and keyboards, to the system through a single, general-purpose port.
UXGA	Ultra Extended Graphics Array	Graphic standard, maximum resolution 1600 x 1200 pixels
V.24		ITU-T standardized recommendation for data transfer via serial ports
VDE	Verein deutscher Elektrotechniker	
VGA	Video Graphics Array	Video adapter which meets industrial standard; can be used for any commonly available software
VRM	Voltage Regulator Module	
W2k	Windows 2000	
WAV	Wave Length Encoding	Loss-free file format for audio data
WD	Watchdog	Program monitoring with error detection and alarming.
WWW	World Wide Web	
XGA	Xtended Graphics Array	Graphic standard, maximum resolution 1024 x 768 pixels.

19.2   Glossary

Application

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

ATAPI CD–ROM Drive

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

Automation device (AG)

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

Automation system (AS)

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

Backup

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

Base memory

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

Baud

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

BEEP code

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

Boot diskette

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

Booting

Start or restart of the computer. Within the boot sequence, the operating system is transferred from the system data carrier to RAM.

Cache

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

CE Label

Communauté Européene (EC label of goods)

Chipset

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

Cold start

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

Cold restart

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

Configuration files

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

Configuration software

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

Compact Flash card (CF)

Compact Flash is a digital storage medium used in the form of a card without moving parts. The CF card contains a non-volatile memory and a controller. The CF card uses 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).

COM port

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

Controller

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

Device configuration

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

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.

Drop-down menu

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

ESD Directives

Directive for handling electrostatic sensitive devices.

EMC Guideline

Directive concerning Electromagnetic Compatibility.

Energy options

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

Energy management

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

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).

Ethernet

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

Formatting

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

Gender changer

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

Hard disks

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

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

Hyper-threading describes the ability of Intel CPUs to provide two virtual CPUs to the operating system and applications. The operating system and application must be optimized for hyper-threading in order to use this Pentium 4 processor capability.

Image

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

Interface

- The connection between individual hardware elements such as PLCs, programming devices, printers or monitors via physical connections (cables).

- The connection between different programs to enable them to interact.

Interface, MPI-capable

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

Interface, parallel

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

IT networks

Networks for Information technology

Legacy USB support

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

License key

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

License key diskette

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

LPT port

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

Main memory

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

Main menu

Usually the main menu/initial menu of a program.

Memory Card

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

Module

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

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 US American collection of regulations that generally correspond to the German VDE 0100 standards. All US American standards relating to the safety of electrical equipment and the corresponding "deviations" in IEC standards are based on the NEC with their national requirements.

NEC Class 2 specifies higher safety requirements for protection against electric shock as well as National Fire Protection Association (NFPA) requirements for fire protection. Power supply between 20 and 30 V DC have to have a real internal current limit that can stop a maximum output capacity of more than 100 VA under any circumstances.

Operating system

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

Packet writing

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

Password

Unique sequence of characters that is entered for user identification.

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.

PC card

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

PCMCIA

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

Plug&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.

Pixel

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

PROFIBUS / MPI

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

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.

RAM

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

Recovery CD

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

Reset

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

Restore CD

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

ROM

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

SCSI port

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

Serial interface

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

Session at once

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

SETUP (BIOS Setup)

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

STEP 7

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

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

User program

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

V.24- interface

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

Warm start

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

Windows

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

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