Operating Instructions Edition 09/2005

Industrial PC

Rack PC IL 43

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Operating Instructions

Edition 09/2005
A5E00432875-01

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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Order No.: A5E00432875-01
Edition 09/2005

Table of contents

Introduction

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1.1 Preface

Purpose of this document

These operating instructions contain all the information you need for commissioning and using the SIMATIC Rack PC IL 43.

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.

Where this documentation is valid

This documentation is valid for all supplied variations of the SIMATIC Rack PC IL 43 and describes the state of delivery as of September 2005.

Position in the information scheme

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

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

Conventions

The abbreviation Rack PC or device is also used within this documentation for the product name SIMATIC Rack PC IL 43.

History

Currently released versions of this operating manual:

Edition	Remarks
09/05	First edition

1.2 Guide for the operating instructions

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

Safety information

2

2.1 General safety instructions

Caution

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

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

Repairs

Only authorized personnel are permitted to repair the device.

Warning

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

System expansions

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

Caution

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

Battery

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

Caution

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

Warning

Risk of explosion and release of harmful substances!

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

ESD guidelines

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

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

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

Description

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3.1 Overview

The SIMATIC Rack PC IL 43 is a powerful industrial PC in 19" rack format design (4HE). It is perfectly suited for high-performance industrial PC applications.

- High-level performance
- Attractive price

3.2 Areas of application

The SIMATIC Rack PC IL 43 offers system integrators, cabinet designers, system engineers and machine designers a 19" rack PC platform for high-performance IT applications on the control and cell levels. It can be used for:

- Process and visualization applications
- Industrial image processing
- Quality assurance / surveillance tasks
- Measurement, control and rule-based tasks
- Data acquisition and management

The SIMATIC Rack PC IL 43 has CE certification for use in the industrial sector as well as in residential and commercial areas, and small businesses. In addition to the industrial applications, it can also be used in building services automation or in facilities open to the public.

3.3 Highlights

Highlights

Latest PC technology:

- State-of-the-art Intel technology
- High performance and scalability
- PCI-, PCIe x1-, PCIe x16 slots

Industrial suitability:

- Dust protection
- Service-friendly
- CE certification for industrial and office use
- Transport safety for expansion cards
- Monitoring functions

Investment security:

- Guaranteed spare parts availability for at least 3 years

High system availability:

- Preventative data back-up with the SIMATIC PC/PG Image Creator
- RAID1 – redundant data storage on two hard drives, also "hot swap" in connection with SATA mounting frames.

3.4 Function

- Integrated, assigned monitoring functions
  - Fan speed (CPU, power supply and front fan)
  - Temperature (case, processor)
  - Program execution (watchdog)
- RAID1 for automatic data mirroring of two serial ATA hard drives
- Intel Hyper Treading (HT) processor technology

Thanks to efficient resource utilization, the Intel Pentium 4 with hyper threading (HT) technology can process two tasks (threads) simultaneously, as in this case it behaves like two virtual processors. The following requirements must be met by the system:

- Processor with HT technology
- Activated HT technology support in system BIOS
- An HT technology capable, optimized operating system
- Customer applications optimized for HT technology

3.5 Features

General features	
Installation design	• 19” rack, 4 HE • Robust full metal rack design case, lacquered outside and coated inside • Prepared for mounting telescopic rails • Horizontal and vertical installation is possible • Tower installation by means of tower kit • Lockable front cover as access protection
Enclosure	• Dust protection by means of overpressure ventilation using bearing seated front fan through filter • Card retainer for reliable operation of PC modules under vibration and shock conditions
Drive bays	• Front: 3 x 5.25" and 2 x 3.5" • Internal: 2x 3.5"
Slots for expansion cards	• 4 x PCI long • 2 x PCIe x1 long • 1 x PCIe x16 long
Graphics	• Onboard Intel® GMA950 graphics controller Chipset integrated 2-D and 3-D engine, up to 2048 x 1536 at 75 Hz Dynamic Video Memory Technology up to 800 x 600 at 120 Hz / 32 bit color up to 1280x1024 at 100 Hz / 32 bit color up to 2048 x1536 at 75 Hz / 16 bit colors

General features	
	• in PCIe x16 slot (optional) PCIe x16 graphic card (dual head: 2x VGA), 64 MB RAM Up to 2048 x 1536 at 75 Hz / 32-bit color depth
Interfaces	
Ethernet	10/100/1000 Mbps (RJ45)
USB	4 x front, 2 x back; high-current
Serial	COM1 (V.24), COM2 (V.24) optional
Parallel	LPT1
VGA	1 x
Keyboard	PS/2
Mouse	PS/2
Power supply	100 - 230 V AC, wide range; with short-term buffering against power failure: max. 16 ms at 0.85 rated voltage

Monitoring functions	
Temperature	• Overshoot/undershoot of permissible operating temperature
Fan	• RPM monitoring, wear monitoring
Watchdog	• Monitoring of program execution • Monitoring time can be parameterized in software • Restart can be parameterized in the event of a fault
Voltage monitoring	• Monitoring of +5 V, +12 V and battery voltage
Status LEDs	• POWER (internal power supply unit, PC switched On) • HARDDISK (access to hard disk) • STATUS (temperature status)

Standard versions	
Processor	Intel Pentium 4 CPU no. 551 (3.4 GHz, 800 FSB, with Hyper Threading, EM64T)
RAM expansion	256 MB SDRAM DDR2 533 (PC2 4200) Single Channel 4 slots for maximum 4 GB
Disk drives	
Floppy disk	1.44 MB
Hard disk drives	120 GB SATA, 3.5", internal installation
Operating system	without

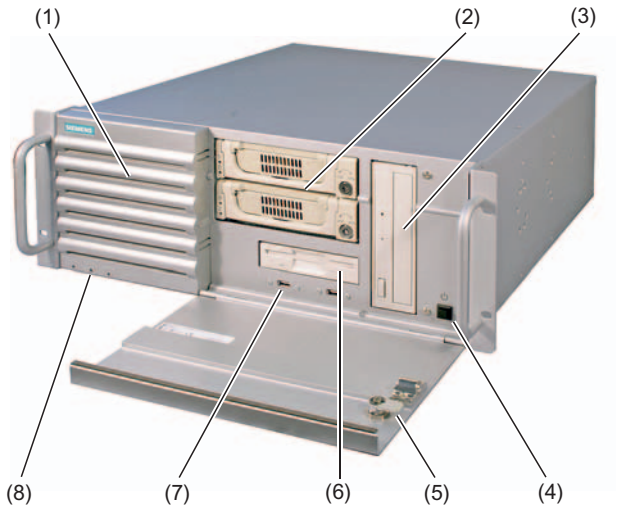
Optional accessories	
Processor	Intel Celeron D CPU no. 331 (2.66 GHz, 533 MHz FSB, EM64T)
RAM expansion	Up to 3 GB, dual-channel

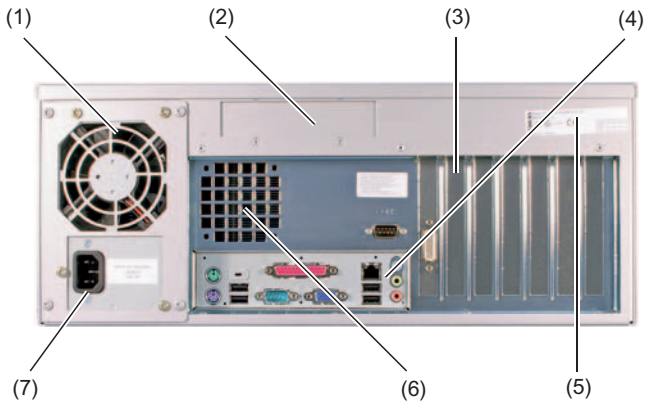
Optional accessories	
Disk drives	
DVD ROM	Read: DVD ROM: Single layer 16x, Dual Layer 8x DVD+R/RW, DVD-R/RW 8x, DVD-RAM 2x CD-ROM, CD-R 32x, CD-RW 20x
DVD ROM/CD RW	Read: DVD ROM: Single Layer 16x, Dual Layer 8x DVD-R/-RW/+R/+RW 8x CD-ROM 52x, CD-R/RW 32x Writing: CD-R 52x, CD-RW 32x
DVD burner	Read: DVD ROM: Single Layer 16x, Dual Layer 12x DVD-R/+R: Single Layer 16x, Dual Layer 7x DVD-RW/+RW 13x CD-ROM/CD-R 48x, CD-RW 40x Writing: DVD+R 16x, DVD+RW 8x, DVD-R 16x, DVD-RW 6x, DVD+R9 (DL) 8x, DVD-R DL 6x CD-R 48x, CD-RW 32x
Hard disk drives	• 2x 120 GB SATA; 3.5" • 1x or 2x 120 GB SATA; 3.5“, in removable racks • RAID1; 3.5" (mirrored drives) internal • RAID1; 3.5" (mirrored drives) in removable racks "Hot swap"
Operating system	Preinstalled / supplied on Restore CD • Windows 2000 Professional MUI* • Windows XP Professional MUI* • Windows Server 2003 including 5Client MUI* *MUI: **M**ulti language **U**ser **I**nterface; 5 languages (German, English, French, Spanish, Italian)

Optional expansions	
SIMATIC PC Image Creator SW	Software tool for saving data locally

3.6 Design

3.6.1 External structure

Front view of the device	Pos	Description
	(1)	Front panel with aperture for ventilation of the device (filter mat and fan are located behind this front panel)
	(2)	Option for installing DVD-ROM, DVD-ROM/CD-RW drives, DVD burner and removable racks for hard disks
	(3)	Option for installing DVD-ROM, DVD-ROM/CD-RW drive, DVD burner
	(4)	On/off button
	(5)	Front door with lock, provides protection against dirt and unauthorized access. Keep the door closed during normal operation.
	(6)	Floppy disk
	(7)	USB ports
	(8)	Status displays

Rear view of the device	Pos	Description
	(1)	Power unit fan
	(2)	Option for installing a cover for external ports
	(3)	Expansion slots 4 x PCI, 2x PCIe x1, 1x PCIe x16
	(4)	Connecting elements
	(5)	Rating plate (may also be mounted on the inside of the front panel door)
	(6)	Fan aperture Installation option for 60 mm fan
	(7)	Power supply connection

3.6.2 Operator controls

Operator control on/off button	Pos	Description
	(1)	The on/off/reset buttons have three functions: - Switch on the PC (press briefly 1x) - Shut down the operating system and PC (press briefly 1x) - Switch off the PC without shutting down the operating system (press and hold more than 4 seconds) = hardware reset

Caution

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

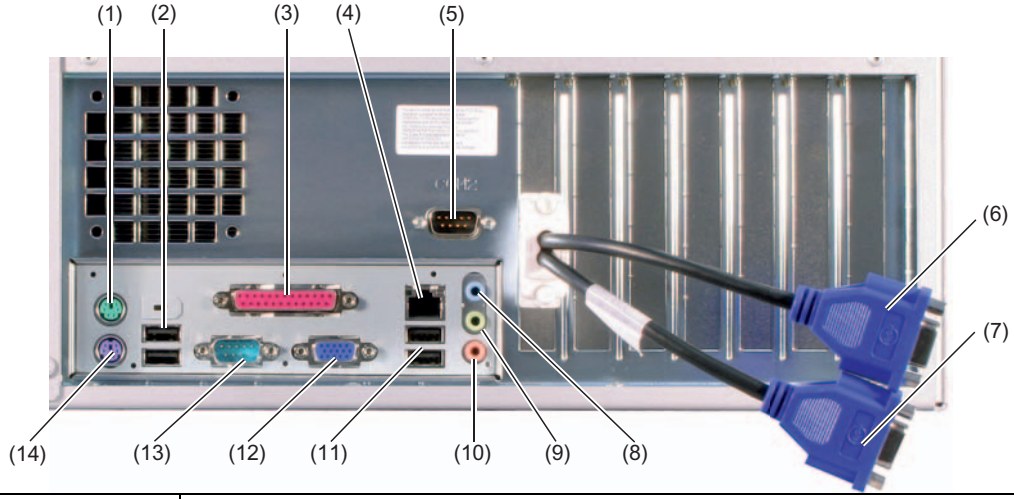
Warning

The on/off button signal does not switch off power to the PC!

3.6.3 Connecting elements

Interfaces

Layout of the interfaces on the rear of the device



Pos	Name	Description
(1)	MOUSE	Connection for a PS/2 mouse
(2)	USB C and D	USB connector
(3)	LPT	Parallel interface, 25-pin
(4)	LAN	RJ 45 Ethernet connection 10/100/1000 Mbps
(5)	COM 2	Serial port 1 (V.24), 9-pin Cannon connector (optional)
(6)	VGA 1	Dual Head VGA adapter (optional)
(7)	VGA 2	Dual Head VGA adapter (optional)
(8)	Micro (input)	Microphone connection
(9)	Audio (output)	Headphone connection
(10)	Audio (input)	Connection for linear audio source
(11)	USB A and B	USB connector
(12)	VGA	Connection for VGA monitor
(13)	COM 1	Serial port 1 (V.24), 9-pin Cannon connector
(14)	KEYBOARD	Connection for a PS/2 keyboard

Power supply

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

3.6.4 Status displays

Status displays

	Display	Meaning	LED	Description
(1)	POWER	PC status display	OFF YELLOW GREEN	• Hibernate, switched off or power off • Windows standby • PC in operation
(2)	HARDDISK	Display for hard disk access	OFF GREEN	• no access • Access
(3)	STATUS	Fan status	FLASH RED	• CPU temperature critical • CPU heatsink fan fault • Enclosure fan fault • Power supply fan fault

Deployment planning

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4.1 Transport

Although the Rack PC has a 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 shipment of 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, make sure that condensation does not develop 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 points when you unpack the unit

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

Noting the device identification data

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

Enter the following data in the table below:

- Serial number: The serial number (S VP) is located on the type plate either on the rear panel of the device or on the inside of the front door.

Figure 4-1 Rating plate

- Order number of the device
- Ethernet address: You find the Ethernet address of the device in your BIOS Setup **(F2 function key)** , under **Info > (F1 function key) > LAN Address**.
- Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA). The COA label is found on the inside of the front door.
  You may need the Product Key in case you reinstall the operating system.

Figure 4-2 COA label

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

Device equipment

You will find a list of device equipment on a sign behind the front door.

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.
- Avoid extreme ambient conditions as much as possible. Protect your PC from dust, moisture, and heat.
- The device has been designed for usage in a normal industrial environment according to IEC 60721-3-3 (pollutant class 3C2 for chemical influence, 3S2 for sand and dust.) SIMATIC Rack PCs may not be used in severe operating environments, for example locations with acidic vapors or gasses, without additional protective measures (such as the provision of clean air.)
- Keep the PC out of direct sunlight.
- Mount the PC as safely as possible to prevent danger (for example, of falling over).
- The device satisfies protection class IP 30 on the front panel.
- The clearance in the area of the ventilation slots must be at least 50 mm, so that the PC is sufficiently ventilated.
- Do not cover the vent slots of the device.
- The device enclosure satisfies fire protection requirements to EN 60950. It may therefore be installed without additional fire-proofing measures.

Warning

If these conditions are not upheld while mounting the system, the approvals according to UL 60950, EN 60950 are forfeited and there is a danger of overheating and personal injury.

Installation

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5.1 Installing the device

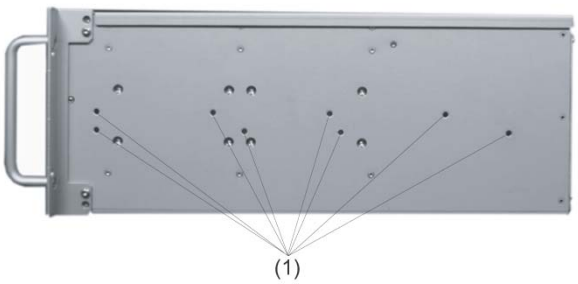
Possible areas of installation

The device may be installed in control desks, switching cabinets and 19`` rack systems, both horizontally and vertically.

Possible mounting methods

Options of mounting the device

- Mounting on angle brackets
- Installation on device bases
- Tower installation: a separate tower kit can be ordered for tower installation.
- Installing with telescopic rails
  When telescopic rails are used, the devices can be completely removed from the cabinet or rack.
  Refer to the sections "Technical data of the telescopic rails" and "Dimensional drawing for the use of telescopic rails" for more detailed information.



Position of the mounting holes (1) for angle brackets or telescopic rails

Caution

The mounting screws of the telescopic rails may not protrude into the enclosure by more than 5 mm.

Note

For vertical operation, install the device on a horizontal metal base and secure it against tipping. The following decide bases are available from Rittal for this purpose:
Rittal Type TE 7000.620, Rittal Type VR 3861.580, Rittal Type DK 7063.710.

Please refer to the case manufacturer's instructions regarding device bases.

Caution

Danger of bodily harm!

It is not permitted to install the device only on the 19" brackets of the front panel.

Connecting

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6.1 Connecting peripherals

Note before connecting

Notice

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

Note

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

Caution

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

Caution

Strictly adhere to the specifications for I/O modules.

6.2 Connecting the device to power

To be noted before you connect the device

Note

The long-range power supply module is designed for operation on 100-240 networks. It is not necessary to adjust the voltage range.

Warning

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

Warning

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

Operation on ungrounded or impedance-grounded power networks (IT networks) is prohibited.

Warning

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

Caution

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

A master mains disconnect switch must be installed if the device is mounted in a switch cabinet. Always ensure free and easy access to the power inlet on the device, or that the safety power outlet of the building installation is freely accessible and located close to the device.

Localized information

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

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

For the USA and Canada:

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

The connector must be compliant with NEMA 5-15.

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

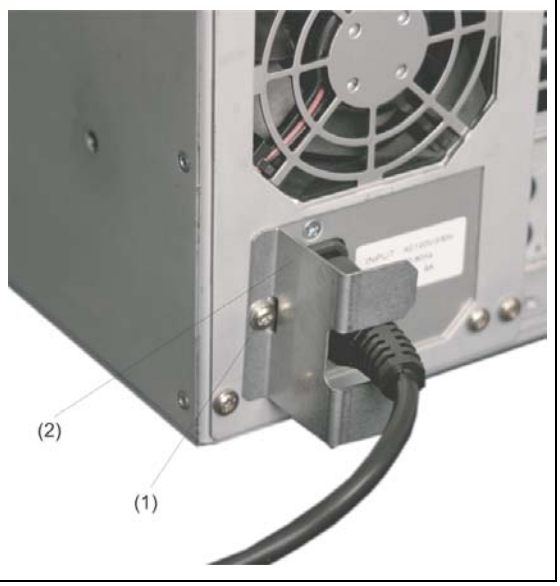
240 V supply voltage
Use a flexible power cord with UL approval and with CSA label, and with the following features: Type SJT with three leads, min. 18 AWG conductor cross-section, max. 4.5 m long and tandem ground contact connector 15 A, min. 250 V.

Connecting

Steps for connecting the device to mains		
1	Connect the IEC connector.	
2	Connect the power cord to the mains outlet, then switch on the mains isolation switch (if this exists). The yellow power LED (standby) on the front panel of the PC lights up.	

Secure the power plug

You can secure the power plug in order to avoid unintentional disconnection of the power cord.

Steps in securing the power plug		
1	Remove the fastening screw (1) on the power supply module.	
2	Power plug clamp (2) screw it to the power supply module	

Warning

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

Commissioning

7

7.1 Prerequisites for commissioning

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

Caution

Risk of damage to the device!

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

7.2 Basic commissioning - initial power-up

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

1. Press the on/off button. The green power LED lights up. The PC performs a POST. During this self-test, this message appears:

```
Press <F2> to enter SETUP
```

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

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

Notice

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

Do not change the default BIOS settings as this will disrupt the operating system installation.

4. Automatic restart

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

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

Switch off the device

Note

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

Press the on/off button behind the front panel door. The green power LED is switched off. Disconnect the mains connector to isolate the device from mains.

7.3 Notes on operation

7.3.1 DVD ROM/CD RW

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

Burner/DVD player software

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

Notice

When first starting the burner software, no data carriers should be inserted in the drive. This is because data carriers with errors can interrupt the automatic hard drive recognition. The correct display of the possible burning function will therefore not be given.

Notes on burning optical data carriers

Caution

Danger of data errors when burning optical data carriers

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

7.3.2 DVD burner

The DVD burner drive is an optional feature. Recording methods supported by the disk drive: Disc-at-once, Track-at-once, Session-at-once, Packet writing. CD-R, CD-RW, DVD+R, DVD-R, DVD-RW and DVD+RW and dual layer media can be used.

Burner software

To utilize the full functionality of the DVD burner, you need to install additional software (burner software). This software is included on the CD supplied with the device. Insert the CD in the drive, run setup and follow the instructions on the screen.

Notice

When first starting the burner software, no data carriers should be inserted in the drive. This is because data carriers with errors can interrupt the automatic hard drive recognition. This makes it impossible to correctly display the possible burner functions.

Notes on burning optical data carriers

Caution

Danger of data errors when burning data carriers!

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

7.3.3 Removable hard disks

The removable disk racks can also be hot swapped in connection to RAID1.

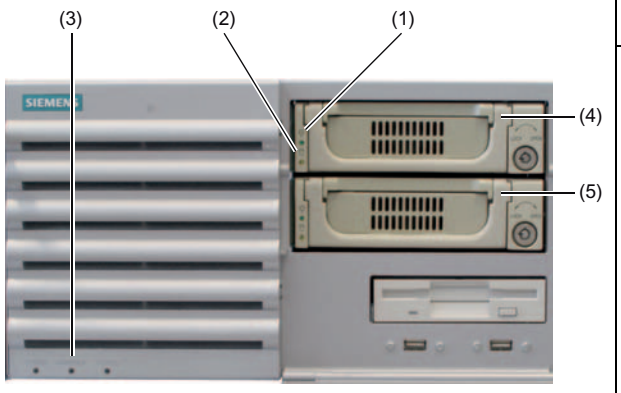
Replacing a hard disk

Caution

Hard drives may only be swapped out of the removable frames when the disks are inactive and the device status displays are off.

How to remove the hard disk drive:

1. Establish which hard disk drive of the RAID controller was reported as faulty (hard disk drive to channel 1 or 2).



(1)	Power LED voltage supply available
(2)	HDD activity display This display is always off. Please note the activity display HARDDISK (3) on the front of the device.

The following table details the layout of the removable frames in the device according to the RAID system reports:

RAID BIOS	RAID Software	SATA interface	Installation location
Port 0	Device Port 0	SATA1	(4) Removable frame 1
Port 2	Device Port 2	SATA3	(5) Removable frame 2

You will find information regarding the reconfiguration of the RAID association in the next section.

1. Set the key switch to the "OPEN" position.
2. Push up the bezel of the hard disk cartridge.
3. Remove the hard disk cartridge.

Notes on operation

Notice

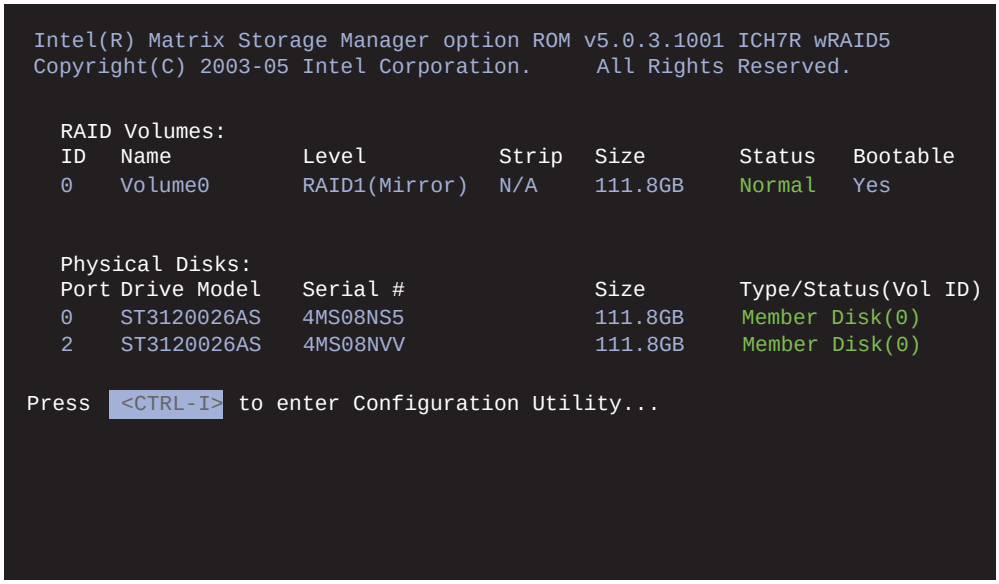
To ensure reliable operation of the devices in a removable disk rack, you need to interlock the hard disk cartridge with the disk rack.

7.3.4 RAID system

This is a RAID1 system configuration (mirroring with two hard disks). This enables the system to continue to operate when there is a problem with a faulty hard drive or cable in a channel and therefore increases the availability of the system.

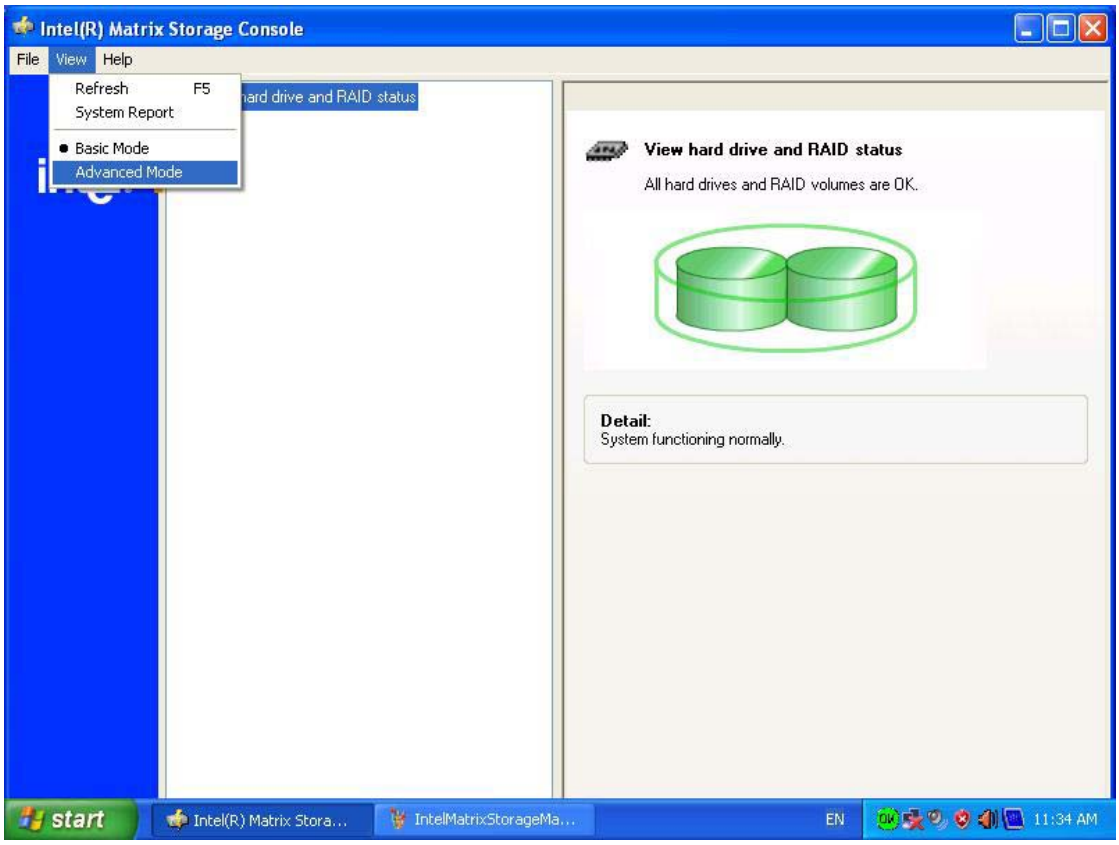
Note

You can find information regarding Intel RAID controllers in the RAID documentation on the supplied "Documentation and Drivers" CD in the Drivers\RAID\Intel directory.



Functions for RAID system management

The preinstalled software of the RAID system offers enhanced functions for using and managing the RAID system. It can be started via "Start > Programs > Intel Matrix storage manager.



The command "View -> Advanced Mode" displays the details of the RAID association.

The command "View -> System Report" produces a report with details of the RAID association.

Notice

The details of the RAID status are produced by default as a Windows event display and written to the program's log file.

In case of malfunction, a drive can be synchronized at the operating system level. It may take up to several hours to synchronize a new disk in the background, depending on the size of the hard disk and on system load.

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

Comments about faults

Notice

Input delay

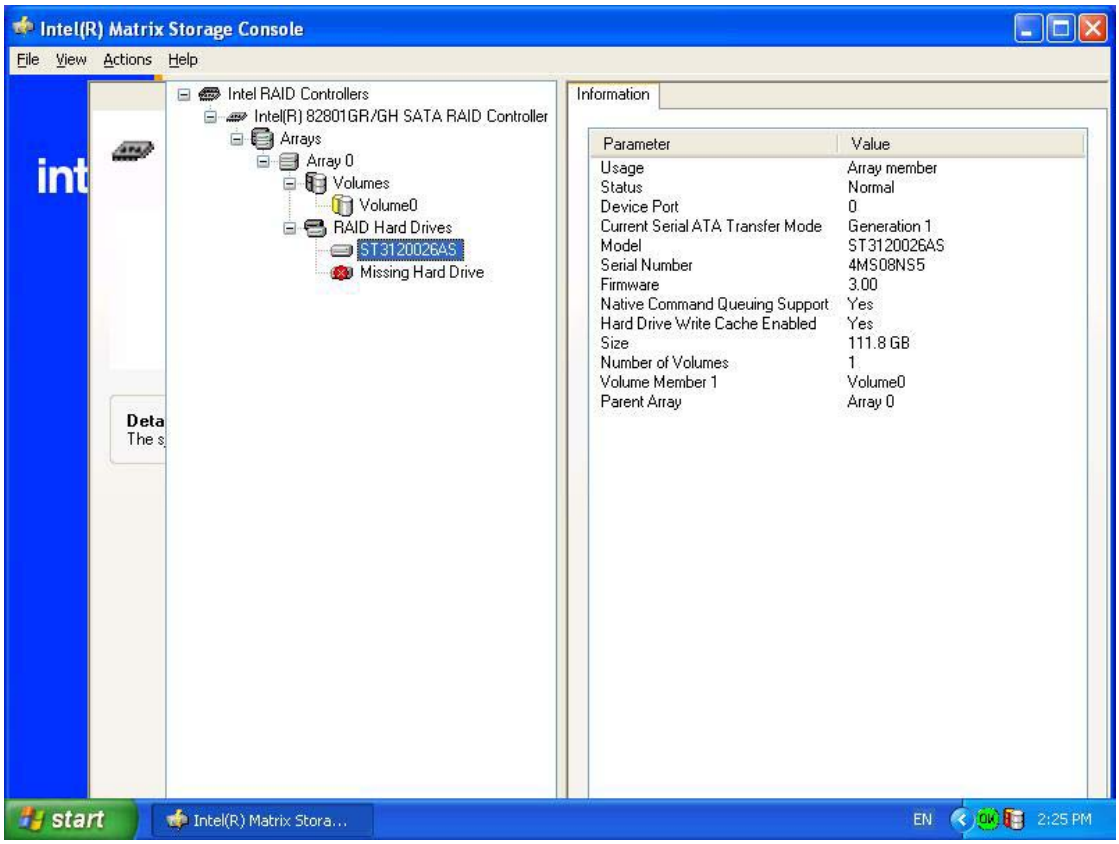
Depending on the load on the processor and the hard disk activity at the time, the system may become briefly overloaded when a disk fails due to the synchronization process.

In extreme cases, input from the keyboard and touchscreen may be delayed for a brief period.

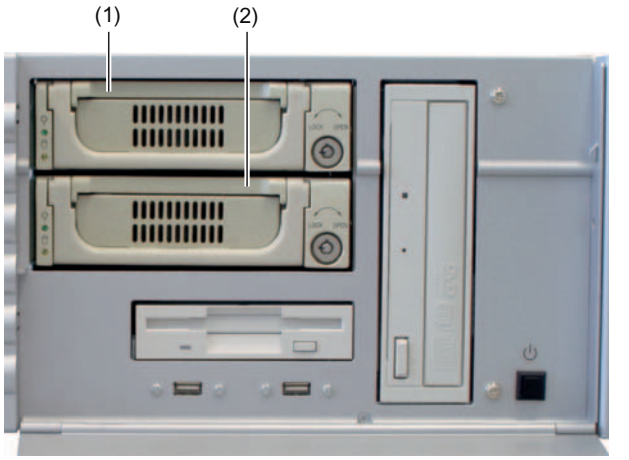
Replace faulty drive in RAID system

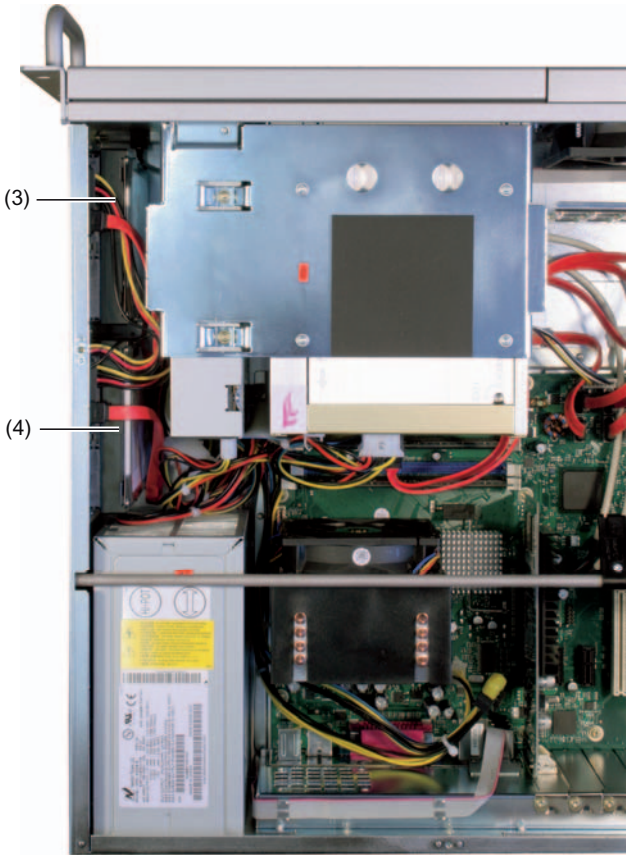
In order to return to the safe RAID1 state after a malfunction, the faulty drive must be replaced with a new drive. The RAID software reports which drive is faulty and gives details of the functioning drive.

The functioning drive is displayed by BIOS together with its port number and by the RAID software with its RAID device port number.



The functioning drive can be localized by means of the following table.





RAID BIOS	RAID Software	SATA interface	Installation location
Port 0	Device Port 0	SATA1	(1) Removable frame 1
Port 2	Device Port 2	SATA3	(2) Removable frame 2
Port 0	Device Port 0	SATA1	(3) Side panel 1
Port 2	Device Port 2	SATA3	(4) Side panel 2

Please replace the faulty drive with a new one of the same type and capacity.

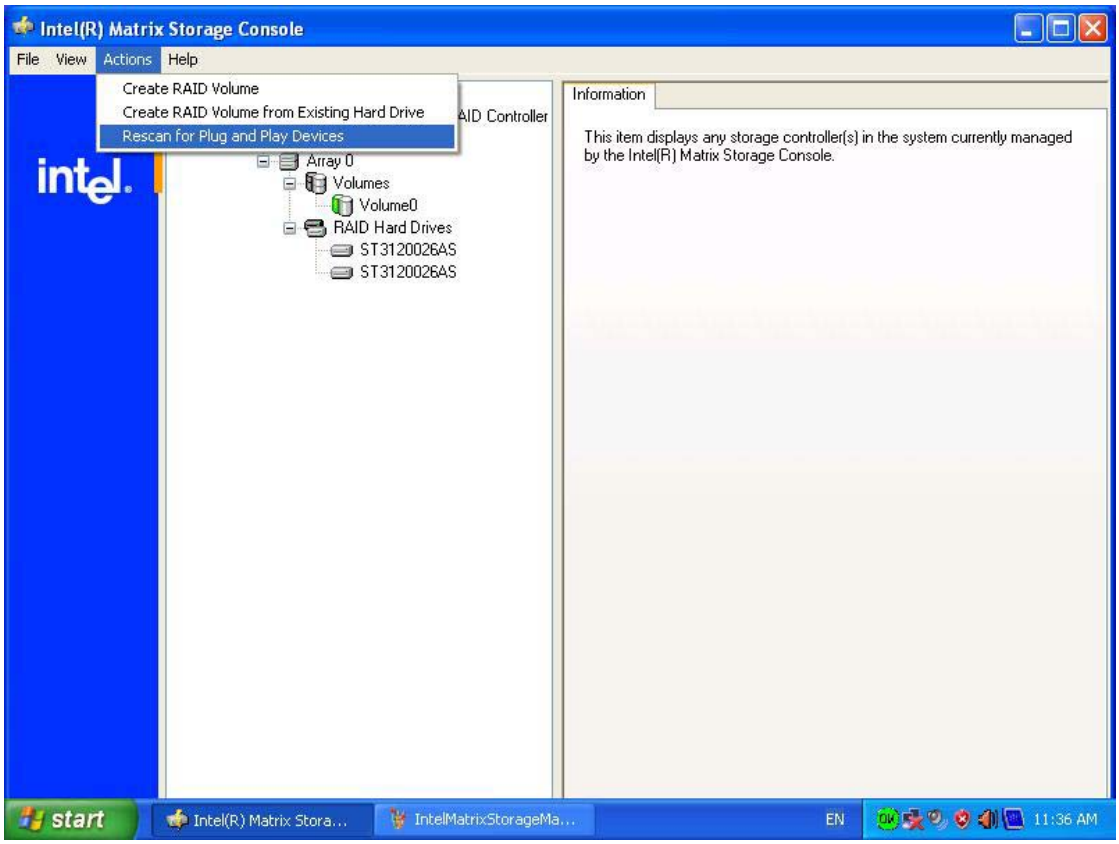
Notice

You can exchange the drive without switching the device off (hot swap) on devices with removable frames.
For devices without removable frames, drives may only be exchanged in switched off state.

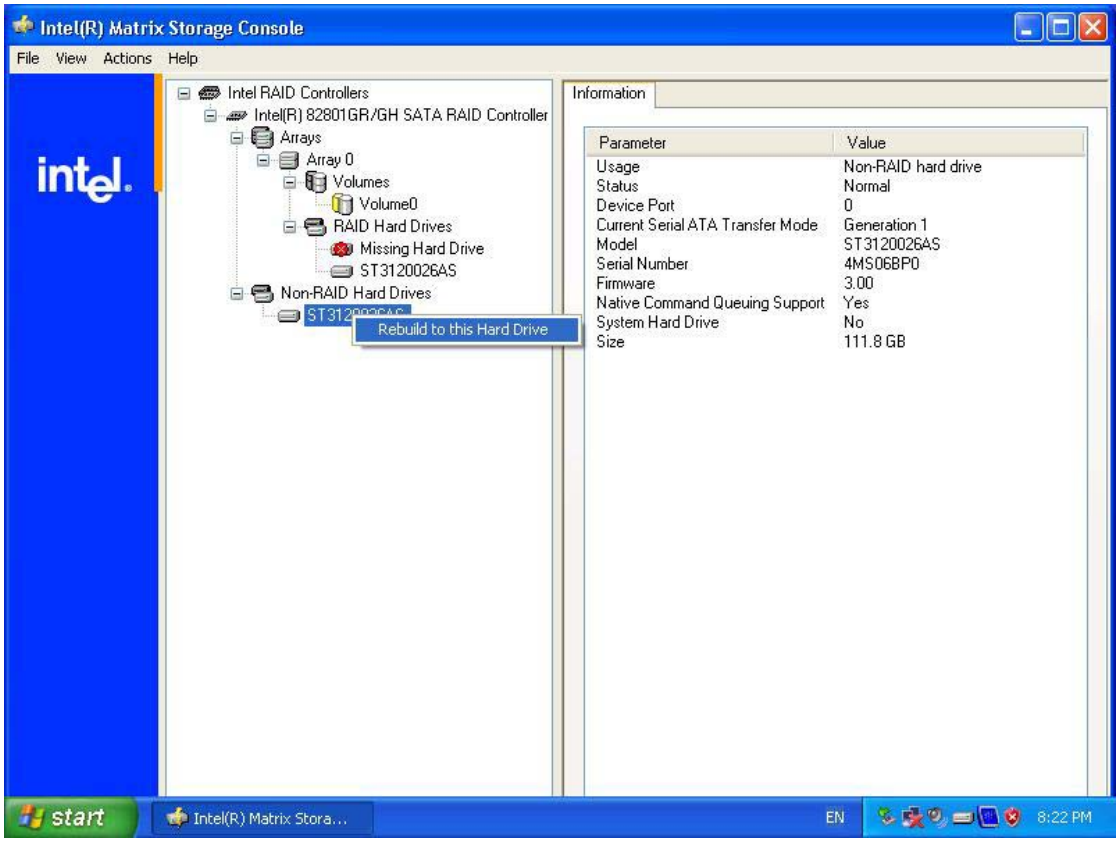
The new drive can be configured into the RAID association at operating system level by means of the RAID software. This is not possible as BIOS level.

Associate new hard drive

The command "Rescan for Plug and Play Devices" searches for and displays new drives.



The command "Rebuild to this Hard drive" starts the synchronization of the RAID1 association.



Integration

8

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

Ethernet

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

Further information

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

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

Functions

9

9.1 Overview of the following monitoring functions

The individual functions are implemented:

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

Notice

The "SystemGuard" and "DeskView" software cannot be installed simultaneously. Simultaneous installation and operation can result in errors because both programs access the same interfaces.

A description of the drivers and SystemGuard is available on the enclosed "Documentation and Drivers" CD in the utilities directory.

9.2 Temperature monitoring/display

Temperature monitoring

Temperature errors do not occur under normal operation. If a temperature does occur, check for the following possible causes:

- Are the fan apertures covered?
- Is the filter dirty?
- Is the fan functioning correctly?
- Is the ambient temperature within the specified range?
- Is the total output of the power supply within the specified limit?

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

- The error alarm is acknowledged by pressing the Info button on the SystemGuard user interface.
- Restart of the device.

9.3 Watchdog (WD)

function

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

You can find additional information on the supplied "Documentation and Drivers" CD in the utilities\sysguard directory.

9.4 Fan monitoring

The operation of the front fan, processor fan and power unit are monitored. If a fan fails, the status LED on the front panel is activated.

You can find additional information on the supplied "Documentation and Drivers" CD in the utilities\sysguard directory.

Expansions and configuration

10

10.1 Open the device

Caution

Work on the open device may only be carried out by authorized and qualified personnel. The device must always be kept closed, otherwise device safety cannot be ensured.

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

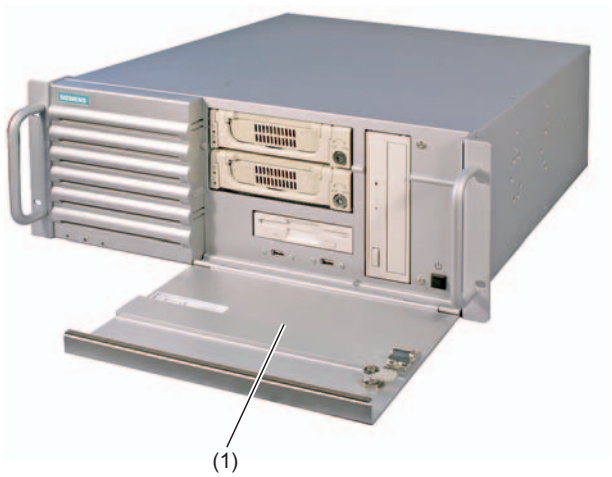
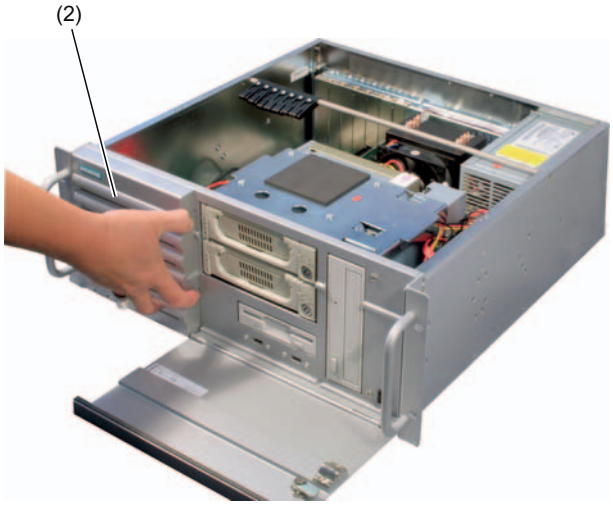
All mechanical installation tasks on the device can be carried out with Torx T10 and TORX T15 screwdrivers (only for hard drive securing screws.)

Preparation

Isolate the device from mains.

Open the device

Steps for opening the enclosure cover		
1	Remove the mounting screws (1).	
2	Lift up the lid from the back and remove it.	

Steps for opening the device front		
1	Tilt the front door (1) forward.	
2	Remove the fan cover (2).	

10.2 Memory expansion

Memory expansion options

The motherboard is equipped with four slots for memory modules. This allows you to expand the memory capacity of your Rack PC to a maximum of 4 GB.

You will find a detailed description of possible memory expansion options in the motherboard technical manual D2156-S on the supplied "Documentation and Drivers" CD.

10.3 Installing expansion cards

10.3.1 Notes on the modules

Notes on module specifications

The device is designed for use with modules conforming to ATX-/PCI-/PCIe specifications. The dimensions of the cards may not exceed the specified dimensions. If the height is exceeded, you may experience contact problems, malfunctions and difficulties with the assembly. The permitted dimensions of the modules are found in the dimensional drawings section.

Notice

The performance is limited for PCI modules with 5V supply voltage. The output of the modules may not exceed 25W in total.

Note about long PCI, PCIe modules

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

Notes on the allocation of resources

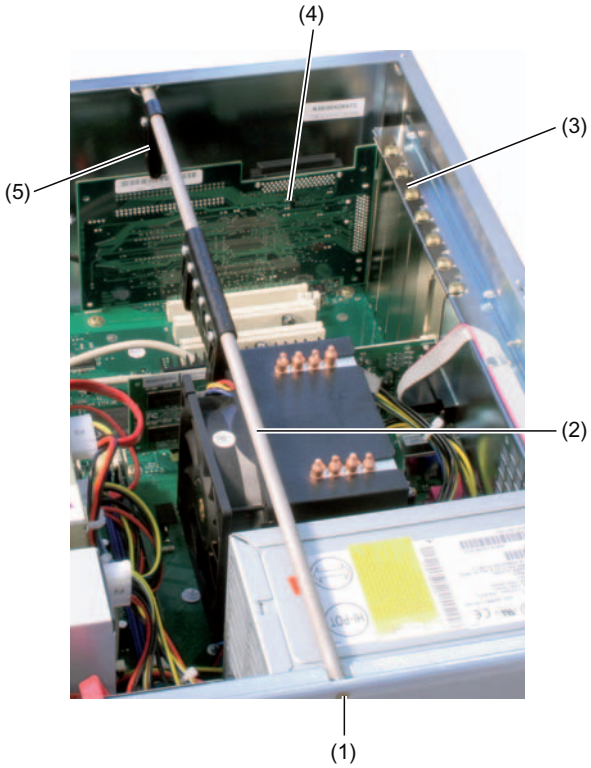
Due to the number of functions on the motherboard, there are no reserved interrupts for PCI modules. If the new expansion module requires exclusive resources, you have to disable the functions on the motherboard. You will find notes on the allocated resources in the motherboard technical manual D2156-S on the supplied "Documentation and Drivers" CD.

10.3.2 Installing an expansion module

Preparation

Isolate the device from mains

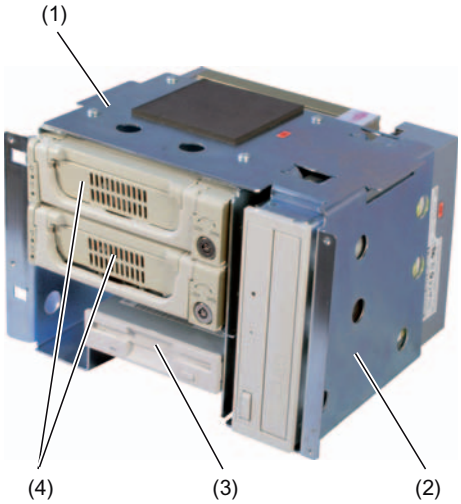
Installing expansion modules

Steps for installing an expansion module:		
1	Open the device.	
2	Remove the fastening screws (1) and lift out the module bracket (2)	
3	Remove the relevant steel slot cover (3).	
4	Insert the expansion module (4) into the relevant slot.	
5	Screw down the steel slot cover (3) for the expansion module.	
6	Insert the module bracket again.	
7	Loosen free module bracket (5), mount and screw down on the expansion module	
8	Close the device.	

10.4 Installing disk drives

10.4.1 Options of installing disk drives

The driver carrier module consists of a horizontal and vertical driver carrier. A DVD-ROM, DVD-ROM/CD-RW, DVD burner, floppy drive or removable rack can be installed in the driver carrier module.

Driver carrier module	Pos	Description
	(1)	Horizontal drive carrier
	(2)	Vertical driver carrier
	(3)	Floppy Disk 3.5" (FD)
	(4)	5.25`` mounting bays for DVD/CD or hard drives in removable frames

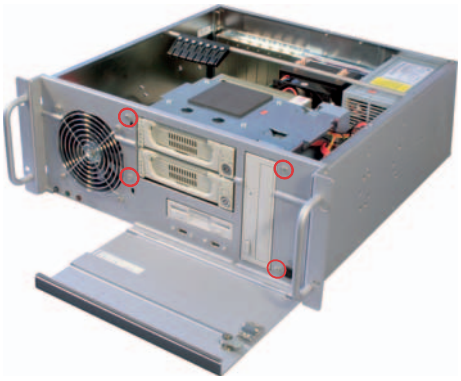
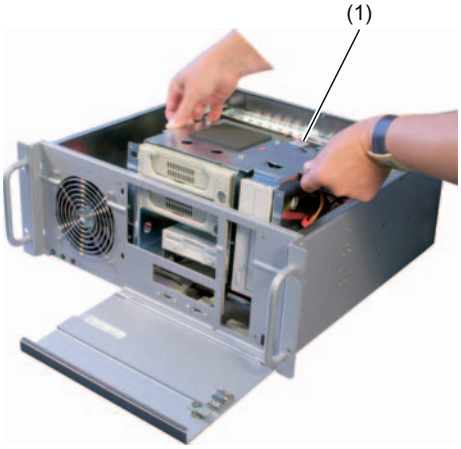
10.4.2 Installing and removing a disk drive or removable rack

Preparation

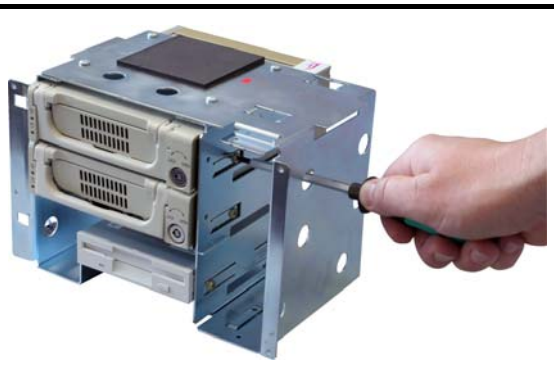
1. Unplug the device from mains and disconnect all cables.
2. Open the device.

Removing the drive carrier module

The driver carrier module consists of a horizontal and vertical driver carrier.

Steps for removing the drive carrier module		
1	Loosen the mounting screws of the drive carrier module.	
2	Disconnect the power cable and the data cable from the installed disk drives.	
3	Lift the drive carrier module (1) out of the device until you can access the cables of the floppy disk drive. Disconnect these cables.	
4	Remove the drive carrier completely from the device.	

Disk drive or removable disk rack installation

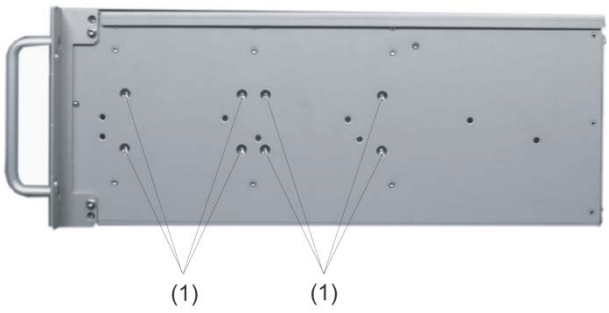
Steps for installing a disk drive in a horizontal drive carrier		
1	Slide the disk drive into the carrier from the front.	
2	Remove any vertical drive carrier The only way to get at the mounting screws on the right side of the drive is through the openings of the vertical carrier.	
3	Mount the disk drive into the drive carrier using four screws.	
4	Insert the drive carrier module again.	
5	Connect the power and data cables to the disk drive.	

10.4.3 Installing and removing a hard disk

Preparation

1. Unplug the device from mains and disconnect all cables.
2. Open the device.

Installing a disk drive

Steps for installing a disk drive		
1	Connect the power and data cables to the disk drive.	
2	Hold the drive on the drive carrier plate and secure it with 4 screws (1).	

Maintenance and service

11

11.1 Removing and installing hardware components

11.1.1 Repairs

Carrying out repairs

Only authorized personnel are permitted to repair the device.

Warning

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

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

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

Notice

Note the EGB instructions.

Limitation of Liability

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

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

Tools

All mechanical installation tasks on the device can be carried out with TORX T8, Torx T10 and TORX T15 screwdrivers as well as a side-cutter.

11.1.2 Replacing the backup battery

To be noted before you replace the battery

Caution

Risk of damage!

The lithium battery may only be replaced with an identical battery or with a type recommended by the manufacturer.

Disposal

Caution

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

Preparation

Note

The configuration data of the device are deleted when the battery is replaced. Note the current BIOS Setup settings. You can conveniently back up the BIOS settings by means of the SIMATIC PC BIOS manager.

Replacing the battery

The location of the backup battery on the motherboard and the procedure for replacing it is described in technical manual, D2156-S.pdf, on the supplied "Documentation and Drivers" CD.

Reconfiguring the BIOS Setup

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

11.1.3 Removing the power supply module

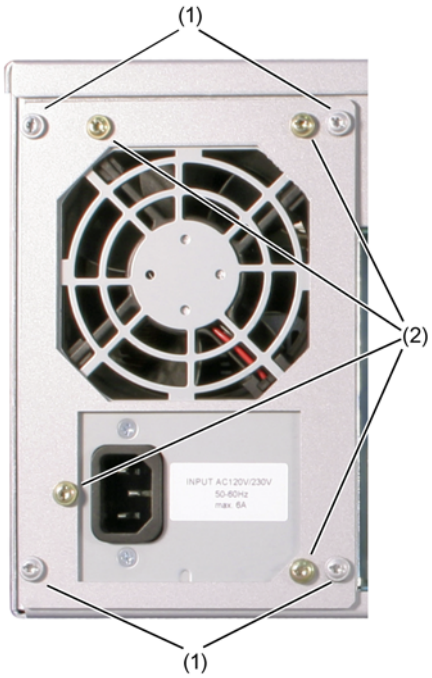
Warning

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

Preparation

1. Unplug the device from mains and disconnect all cables.
2. Open the device.

Removing the power supply module

How to remove the power supply module		
1.	Disconnect the power cables from the disk drives and motherboard.	
2.	Remove the tie-wraps holding the power cables in the housing.	
3.	Remove the mounting screws (TORX T10) (1).	
4.	Lift the power supply module out of the enclosure until you can access the power cable of the floppy disk drive.	
5.	Disconnect this power cable from the floppy disk drive.	
6.	Remove the screws (2) on the steel bracket.	

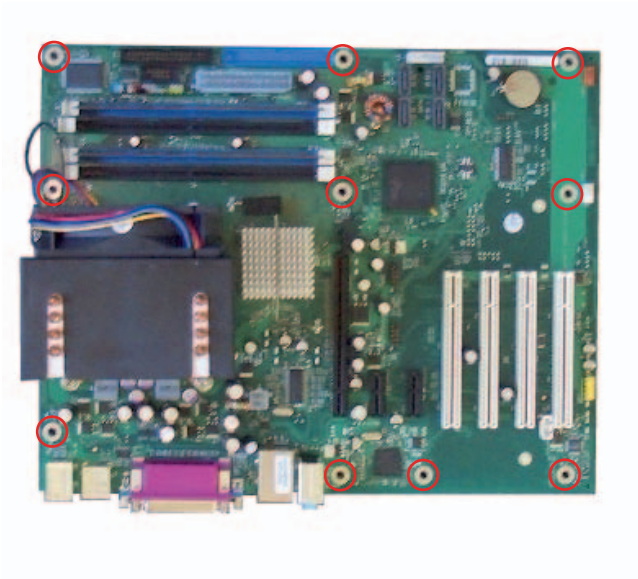
11.1.4 Removing the motherboard

Preparation

1. Unplug the device from mains and disconnect all cables.
2. Open the device.

Removing the motherboard

How to remove the motherboard	
1.	Remove all modules from their slots.
2.	Strip all cables off the motherboard, noting down their assignment while doing so.
3.	Remove ten screws from the motherboard.



A replacement motherboard is supplied without processor and memory modules.

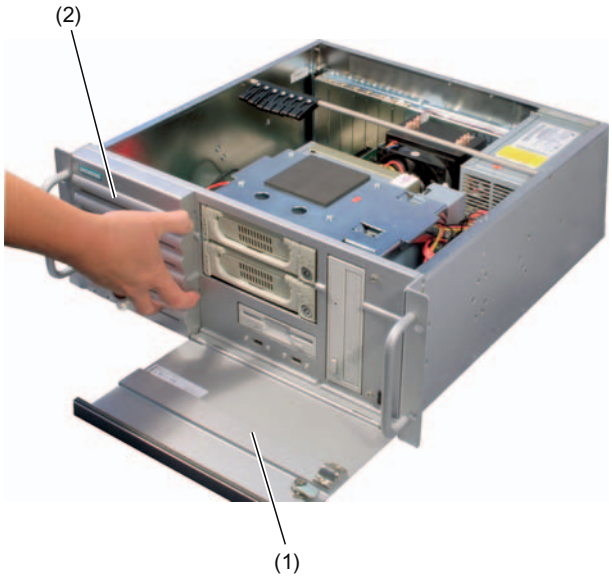
11.1.5 Remove filter and device fan

Preparing for equipment fan exchange

Unplug the device from mains.

Remove filter and fan

Filter meshes are available under the following order numbers: A5E00246975

Steps		
1.	Tilt the front door (1) downwards.	
2.	Remove filter cover (2) and remove filter. Please carry out the additional steps to remove the fan.	
3.	Open the device cover.	
4.	Unplug the fan connector from the motherboard.	
5.	Remove all fan screws.	

Installing the fan

Notice

Always install a fan of the same type!

Caution

Ensure that the arrow on the fan points away from the fan bracket.

11.1.6 Processor replacement

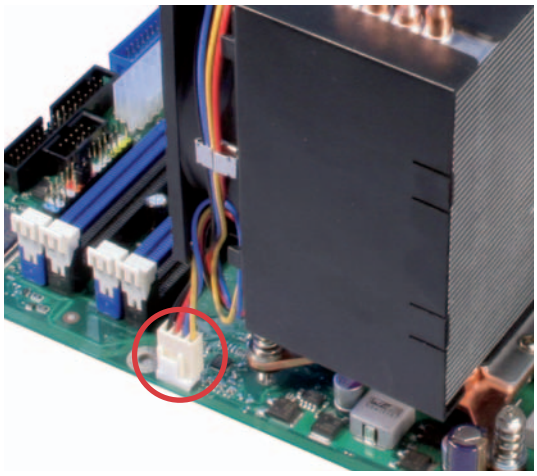
Caution

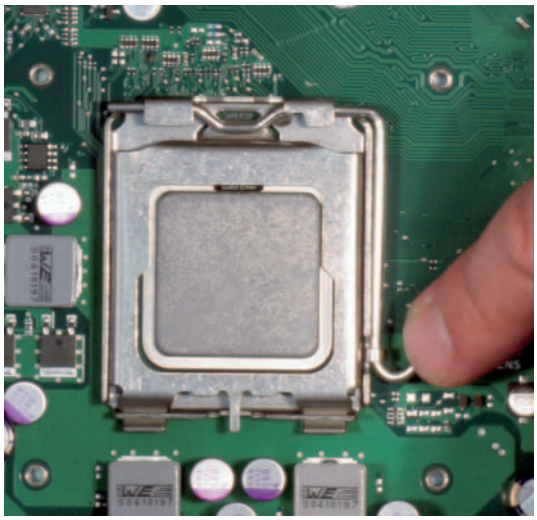
The processor replacement may only be carried out by authorized qualified personnel.

Preparation

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

Removing the processor

How to remove the processor		
1.	Unhook the fan holder on the heat sink and pull off towards the front.	
2.	Disconnecting the processor fan connector	
3.	Loosen the four screws and remove the heat sink.	

How to remove the processor		
4.	Unlock the CPU socket and lift off socket cover.	
5.	Remove processor.	

Additional instructions can be found in the supplied Documentation & Drivers CD in the D2156-S manual.

Caution

Operating a processor at a frequency higher than it specified speed can result in damage to the device and the loss of data.

Only certified and approved processors can be used with the supplied motherboard. For more information contact your local Siemens representative.
http://www.siemens.com/automation/partner

11.2 Reinstalling the software

11.2.1 General installation procedure

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

Recovery CD:

The new recovery procedure is based on Windows PE (Preinstall Environment). The CD contains the Windows PE user interface with tools for configuring the hard drives and the operating system.

Documentation and Drivers CD:

Contains the documentation and the hardware drivers.

Restore DVD:

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

11.2.2 Restoring the Factory State of the Software Using the Restore DVD

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

Retrieving an authorization or license key from the hard disk

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

Caution

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

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

Restoring the factory state

To restore the factory state, proceed as follows:

- Place the Restore DVD into the drive and restart the device using the on/off switch.
- During the self-test phase, press the F12 key. After initialization, a "Boot Menu" is displayed.
- Select the optical drive with the cursor keys.
- Now follow the instructions on the screen.

Caution

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

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

11.2.3 Installing Windows

Use the Recovery CD to install Windows to meet your special requirements. The operating system used is Windows Preinstall Environment (WinPE). You will also need the supplied Documentation and Drivers CD.

Booting with the CD Recovery

1. To boot from the Recovery CD, press the F12 key during the BIOS self-test. After initialization, a boot menu is displayed, indicating all bootable devices.
2. Select the CD/DVD drive.
   Follow the instructions on the screen until the "Siemens SIMATIC Recovery“ window is displayed.

11.2.3.1 Setting up the partitions for Windows operating systems

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

Caution

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

Microsoft recommends using the NTFS file system on hard disk partitions for Windows operating systems. Proceed as follows:

Setting up partitions

1. Boot from the Recovery CD and then follow the screen instructions until the Recovery functions window is displayed.
2. Start the DiskPart program in the "Siemens SIMATIC Recovery“ window and enter the following commands in the displayed command interface:

list disk	Displays all available hard disks.
select disk 0	Selects the disk where you wish to change the configuration. 0 selects the first hard disk.
list partition	Displays all partitions on the selected hard disk.
clean	Completely wipes the selected hard disk. All information stored there is lost.
create partition primary size=n	Creates a primary partition with the n MB on the selected hard disk. Default values: n = 15000 for Windows 2000, XP, Windows Server 2003
select partition 1	Select the primary partition
active	Activates the selected partition
exit	Closes DiskPart.

Additional DiskPart functions:

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

Note

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

Boot again from the Recovery CD to format the partitions.

Format primary partition

1. Boot from the Recovery CD to format the partitions. Follow the screen instructions until the Recovery functions window is displayed.
2. Select "Start command prompt" in the Recovery functions window. In the command interface that opens, enter the following command:

   `format DL:/FS:File System`
   DL = Drive letter of the partition to be formatted. Valid values: C, D, E, F etc.
   File system = Specifies the type of file system. Valid values: FAT, FAT32, NTFS.

NTFS is the factory setting for all Windows operating systems.

Example for a master hard disk on the IDE bus

`format C:/FS:NTFS`

format /? Shows all parameters of the command.

11.2.3.2 Installing Microsoft Windows operating systems

This CD contains encrypted data that can only be transferred to this system.

1. Boot from the Recovery CD and then follow the screen instructions until the Recovery functions window is displayed.
2. Select "Recovery Windows ..." in the "Siemens SIMATIC Recovery" window.
3. Follow the instructions on the screen.

> **Note**
>
> Please note that free space must be available on the drive after the transfer of the selected recovery data:
> 500 MB for Windows 2000
> 1500 MB for Windows XP
> 1500 MB for Windows Server 2003

4. Select "Start command prompt" in the Recovery functions window.
5. Enter the following command in the displayed command prompt interface:
   Drive:
   cd \I386
   Winnt32.bat
   Drive: Drive letter of the folder containing the I386 directory.
6. The preparation of the Windows installation is displayed.
7. When this is completed, close the command prompt with the `exit` command.
8. Close the Siemens SIMATIC Recovery window with the "Finish" button.
9. The Windows installation is completed following an automatic restart of the system.
10. Follow the instructions on the screen.

Note

If you are using Microsoft Windows as a professional user, you should have the following manuals available (not supplied):
Microsoft Windows 2000 Professional Resource Kit (MSPress No 274) or
Microsoft Windows XP Professional, Technical Reference (MSPress No 934)
Microsoft Windows Server 2300, Planning Server Deployment for Windows Server 2003, Technical Reference (MSPress No. 420)

These manuals contain special information for administrators involved in installing, managing and integrating Windows in networks or multi-user environments.

Information for systems with RAID or RAID controllers (optional)

In systems with additional controllers that are unknown to the operating system, these controllers must be made known to the Windows operating system.

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

11.2.4 Setting up the language selection for Windows 2000 MUI

Setting up the language selection for Windows 2000 MUI

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

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

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

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

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

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

11.2.5 Language selection on Windows XP Professional and Windows Server 2003

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

The default language setting of your Windows installation is English and a US keyboard layout. You can change the language in the Control Panel with the dialog

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

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

11.2.6 Installing drivers and software

Notice

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

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

1. Place the CD in the CD ROM drive.
2. Run *START*.
3. Select *Drivers & Updates* in the tab.
4. Select the operating system in *Drivers & Updates*.
5. Install the desired driver.

Notice

For new Windows 2000 / XP / Server 2003 installations, the chipset driver must be installed before you install any other drivers.

11.2.7 Installing the RAID Controller software

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

11.2.8 Installing burner or DVD software

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

Troubleshooting

12

12.1 General problems

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

Problem	Possible cause	To correct or avoid error
The device is not operational	There is no power supply to the device.	Check the power supply, the network cable and the power plug.
	Device is being operated outside the specified ambient. conditions	• Check the ambient conditions. • After transport in cold weather, wait approximately 12 hours before switching on the device.
The external monitor remains dark.	The monitor is switched off.	Switch on the monitor.
	The monitor is in "power save" mode.	Press any key on the keyboard.
	The brightness button has been set to dark.	Increase the screen brightness. For detailed information, refer to the monitor operating instructions.
	The power cord or the monitor cable is not connected.	• Check whether the power cord has been properly connected to the monitor and to the system unit or to the grounded shockproof outlet. • Check whether the monitor cable has been properly connected to the system unit and to the monitor.
		If the monitor screen still remains dark after you have performed these checks, please contact your technical support team.
The mouse pointer does not appear on the screen.	The mouse driver is not loaded.	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.	The USB ports are disabled in your BIOS.	Use a different USB port or enable the port.
	USB 2.0 device connected but USB 2.0 is disabled.	Enable USB 2.0.
	Operating system does not support the USB port.	Enable USB Legacy Support for the mouse and keyboard. For all other devices you need USB drivers for the specific operating system.
DVD/CD: The front loader does not open.	The device is switched off or the open/close button is disabled by a software application.	Emergency removal of the data medium: 1. Switch off the device 2. Insert a pointed object, a pin for example, or an opened paper clip into the emergency extraction opening of the drive. Apply slight pressure to the contact until the front loader opens. 3. Pull the loader further out.
The RAID software reports the following error: • The RAID plug-in failed to load, because the drive is not installed. • The Serial ATA plug-in failed to load, because the driver is not installed correctly. • The Intel® Matrix Storage Console was unable to load a page for the following reason: – A plug-in did not provide a page for the selected device – A plug-in failed to load	RAID is not activated RAID is activated	In this case, the reports have no negative influence on device function and can be ignored. Please acknowledge the reports. In this case, please re-install the software from the supplied Documentation and Drivers CD.

12.2 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 incorrect. • Connector assignments deviate. • “Reset Configuration” in BIOS SETUP has not been carried out.	Check your computer configuration: • If the computer configuration corresponds with factory state, please contact your technical support team. • If the computer configuration has changed, restore the original factory settings. Remove all third-party modules, then restart the PC. If the error no longer occurs, the third-party module was the cause of the fault. Replace this module with a Siemens module or contact the module supplier. • Force a “Reset Configuration” using the BIOS setup.
		If the PC still crashes, contact your technical support team.

Technical data

13

13.1 General specifications

General technical data	
Order numbers	6AG4011-2...(for details, refer to the ordering documentation)
Dimensions	430.4x177.4x444.4 (WxHxD in mm). Detailed dimensional specifications are found in the "Dimensional drawings" section.
Weight	Approx. 19 kg
Supply voltage (U_N)	100 V AC to 240 V AC (90 to 264 V AC)
Line voltage frequency	50 – 60 Hz
Transient voltage interruption	16 ms at 0.85 U_N (max. 10 events per; min. recovery time 1s)
Power consumption (at 210 W secondary power)	310 W (efficiency approx. 68%)
Max. current output (AC)	+3.3 V/24 A +5V/26A max. 190 W total allowed -12V/15A +12V/15A -12V/0.2A +5Vaux/2A
Noise emission	< 45 dB(A) to DIN 45635
Degree of protection	IP 30 with closed front door, IP 20 at the back in conformity to EN 60529
Safety	
Protection class	Protection class I to IEC 61140
Safety specifications	EN60950-1, UL60950, CSA C22.2 No 60950-00
Electromagnetic compatibility (EMC)	
Emitted interference (AC)	EN 55022 Class A, FCC class A EN 61000-3-2 Class D, EN 61000-3-3
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV, (according to IEC 61000-4-4; Burst) ± 1 kV; (according to IEC 61000-4-5; Surge symm) ± 2 kV; (according to IEC 61000-4-5; Surge asymm)
Noise immunity on signal lines	± 1 kV;(according to IEC 61000-4-4; Burst; length < 10 m) ± 2 kV, (according to IEC 61000-4-5; Surge symm, length > 30 m)

General technical data	
Immunity to discharges of static electricity	± 4 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 and 1.4 - 2 GHz, 80% AM; (according to IEC 61000-4-3) 10 V, 10 kHz-80 MHz; (according to IEC 61000-4-6)
Magnetic field	100 A/m, 50 Hz/60 Hz; (according to IEC 61000-4-8)
Climatic Conditions	
Temperature	Tested to IEC 60068-2-2, IEC 60068-2-1, IEC 60068-2-14
- In operation - Gradient - Storage/transport - Gradient	+ 5 °C to + 40 °C without burner operation, + 5°C to + 35°C with restriction CPU up to 90W power dissipation See "Retrofitting instructions" max. 10°C/h no condensation – 20°C to +60°C max. 20°C/h no condensation
Relative humidity	tested to IEC 60068-2-78, IEC 60068-2-30
- In operation - Gradient - Storage/transport - Gradient	5% to 80% at 25 °C (no condensation) max. 10°C/h no condensation 5% to 95% at 25 °C (no condensation) max. 20°C/h no condensation
Mech. Ambient conditions	
Vibration - Operation [1], Storage/transport	Tested to IEC 60068-2-6, 10 cycles 20 - 58 Hz, Amplitude 0.015mm; 58 to 200 Hz: 2m/s^2 5 - 8.51 Hz, Amplitude 3.5 mm; 8.51 to 500 Hz: 9,8 m/s^2
Shock resistance - Operation [1] - Storage/transport	tested to DIN IEC 60068-2-27 half sine: 9.8 m/s^2, 20 ms, 100 shocks per axis half sine: 250 m/s^2, 6 ms, 1000 shocks per axis
Special Features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Design: LGA 775 Intel Pentium4 Proc. No. 551 (3.4GHz, 800 MHz FSB, HT, 1 MB 2LC, EM64T) Intel Celeron D Proc. No 331 (2.66GHz, 533 MHz FSB, 256 KB 2LC, EM64T)
Chipset	Intel 945G
RAID (onboard)	Intel ICH7R with Intel storage manager software
RAM	4 slots maximum 4 GB DDR 2 533 SDRAM (PC 2 4200)
Memory expansion	256 MB, up to 4 GB (configuration refer to order documents)
Expansion slots	4 PCI (max. 265 mm long) 2 PCIe x1 1 PCIe x16

General technical data	
max. permissible power consumption PCIe x1 slot	PCIe x1 modules: 3.3V 3A, 12V 2.1A; 3.3Vaux 0.4A
max. permissible power consumption PCIe x16 slot	PCIe x16 modules: 3.3V 3A, 12V 2.1A; 3.3Vaux 0.4A
Max. admissible power consumption per PCI slot	5V 5A or 3.3V 7A, 12V 0.5 A, -12V 0.05 A
Max. accumulated power dissipation per PCI slot	Accumulated power dissipation (all voltages) may not exceed 25 W.
PCI modules with exclusively 5V supply	The total consumption of all modules may not exceed 25W
Max. accumulated power dissipation of all slots	Accumulated power of 80 W may not be exceeded
Disk drives (For configuration details, refer to the order documentation)	
Floppy disk	3.5" (1.44 MB)
Hard disk	3.5" SATA 150, 120 GB
DVD ROM	5.25" ATAPI Read: DVD ROM: Single layer 16x, Dual Layer 8x DVD+R/RW, DVD-R/RW 8x, DVD-RAM 2x CD-ROM, CD-R 32x, CD-RW 20x
DVD ROM/CD RW	5.25” ATAPI Read: DVD-ROM: Single Layer 16x, Dual Layer 8x DVD-R/-RW/+R/+RW 8x CD-ROM 52x, CD-R/RW 32x Writing: CD-R 52x, CD-RW 32x
DVD burner	5.25" ATAPI Read: DVD-ROM: Single Layer 16x, Dual Layer 12x DVD-R/+R: Single Layer 16x, Dual Layer 7x DVD-RW/+RW 13x CD-ROM/CD-R 48x, CD-RW 40x Writing: DVD+R 16x, DVD+RW 8x, DVD-R 16x, DVD-RW 6x, DVD+R9 (DL) 8x, DVD-R DL 6x CD-R 48x, CD-RW 32x
Graphics	
Graphic controller	Intel® GMA950 graphics controller, chipset integrated 2-D and 3-D engine, up to 2048 x 1536 at 75 Hz
Graphic controller memory	Dynamic Video Memory Technology
Resolutions/frequencies/colors	up to 800 x 600 at 120 Hz / 32-bit color depth up to 1280 x 1024 at 100 Hz / 32-bit color depth up to 2048 x 1536 at 75 Hz / 16-bit color depth
Interfaces	
COM1	Serial port 1 (V.24), 9-pin Cannon connector
COM2 (optional)	Serial port 2 (V.24), 9-pin Cannon connector
LPT1	Parallel port (Standard, EPP and ECP mode) Connection for parallel port printer

General technical data	
VGA internal PCIe x16 Dual Head optional	1x 15-pin Cannon connector 2x 15-pin Cannon connector
Keyboard	PS/2 keyboard
Mouse	PS/2 mouse port
USB	6 channels (4 at back, 2 in front) high current, high speed USB 2.0
Ethernet	Broadcom BCM 5751 Ethernet interface (RJ45) 10/100/1000 Mbit/s
Audio - Mic in - Line in - Line out	Realtek ALC260 Audio Codec 2x 0.5W / 8 Ohm
Certifications	
CE residential area (emitted interference) CE industrial area (noise immunity) cUlus	EN61000-6-3:2001 EN61000-6-2:2001 60950
Status displays (LEDs)	
	POWER HARDDISK STATUS

1	When using a hard disk in a removable rack, the device should generally be free of mechanical disturbances. When using a DVD-ROM/CD-RW drive or DVD burner, the device should generally be free of mechanical disturbances during burning.

13.2 Power requirements of components (maximum values)

Standard system

Component	Voltage				
	+5 V	+3,3 V	+12 V	-12 V	5 Vaux
FSC D2156-S motherboard with processor heat sink Intel Pentium 4 processor no. 551 or Intel Celeron Processor no. 331	5 A	0,8 A	12 A	0,01 A	0,5 A
Front fan			0,5 A		
Disk drive	0,25 A				
Standard system	5,25 A	0,8 A	12,5 A	0,01 A	0,5 A
Expansions					
Hard disk drive SATA	0.5 A		0,7 A		
DVD ROM	0,9 A		0,8 A		
DVD ROM/CD RW	0,9 A		0,8 A		
DVD burner	1,1 A		1,4 A		
Single lines of current (max. permissible) [1]	26 A	24 A	30 A	0,2 A	2 A
Total power consumption, permissible	200 W				
Efficiency of the power supply	Approx. 68% (230V AC) / approx. 65 % (115 V AC)				
[1] The max. permitted accumulated power of the +5 V and + 3.3 V is 190 W.					

13.3 AC voltage supply

Output voltage

Voltage	Max. current	Voltage stability
+ 12 V	15 A	+/- 5 %
+ 12 V	15 A	+/- 5 %
- 12 V	0.2 A	+/- 10 %
+ 5 V	26 A [1]	+ 5 % / - 4 %
+ 3.3 V	24 A [1]	+ 5 % / - 4 %
+ 5 V aux	2 A	+ 5 % / - 3 %

[1] The max. permitted accumulated power of the +5 V and + 3.3 V is 190 W.

13.4 Technical data of the telescopic rails

Ultimate load per pair	Minimum 30 kg
Full extraction length	Minimum 470 mm
Rail thickness	Maximum 9.7 mm
Fixing screws	M5 x 6 mm

The mounting screws of the telescopic rails may not protrude by more than 5 mm into the enclosure.

Dimensional drawings

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14.1 Dimensional drawing of the device

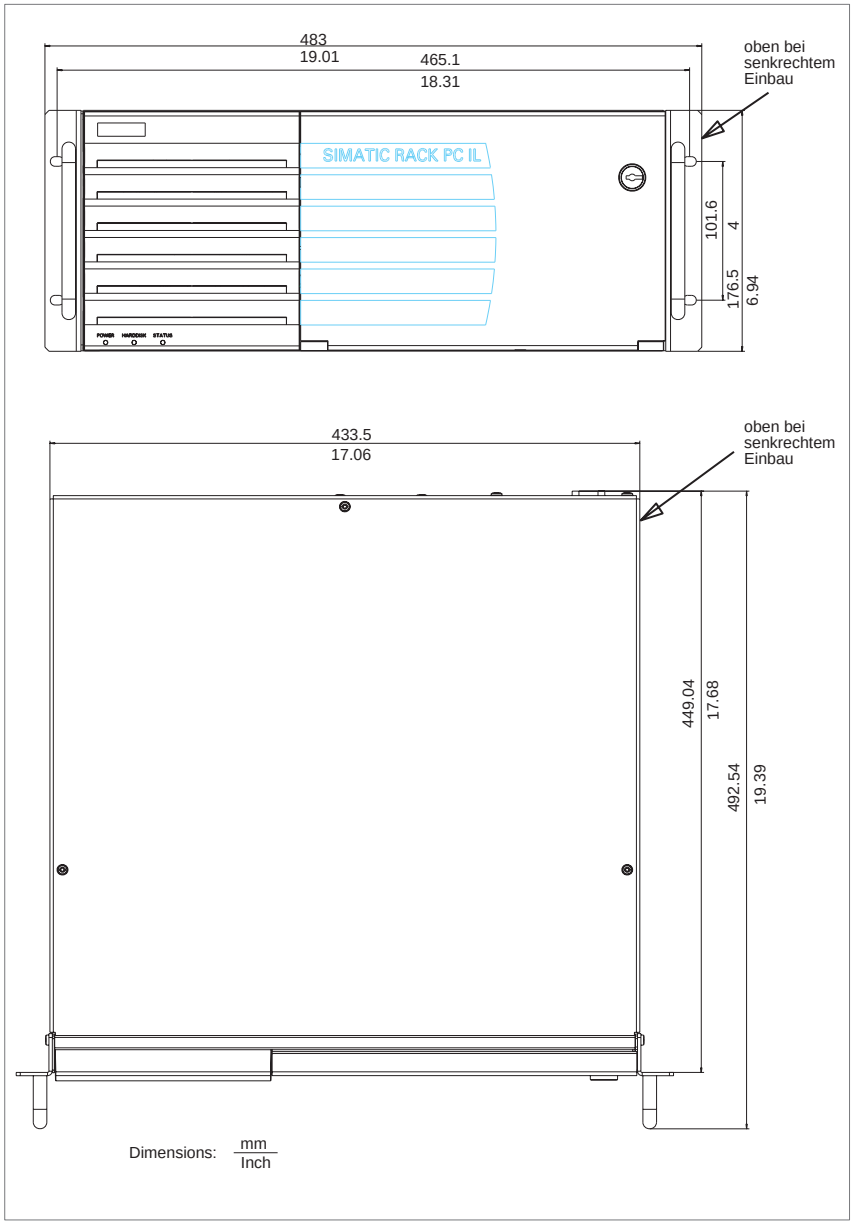

Figure 14-1 Dimensional drawing of the device

14.2 Dimensional drawing for the use of telescopic rails

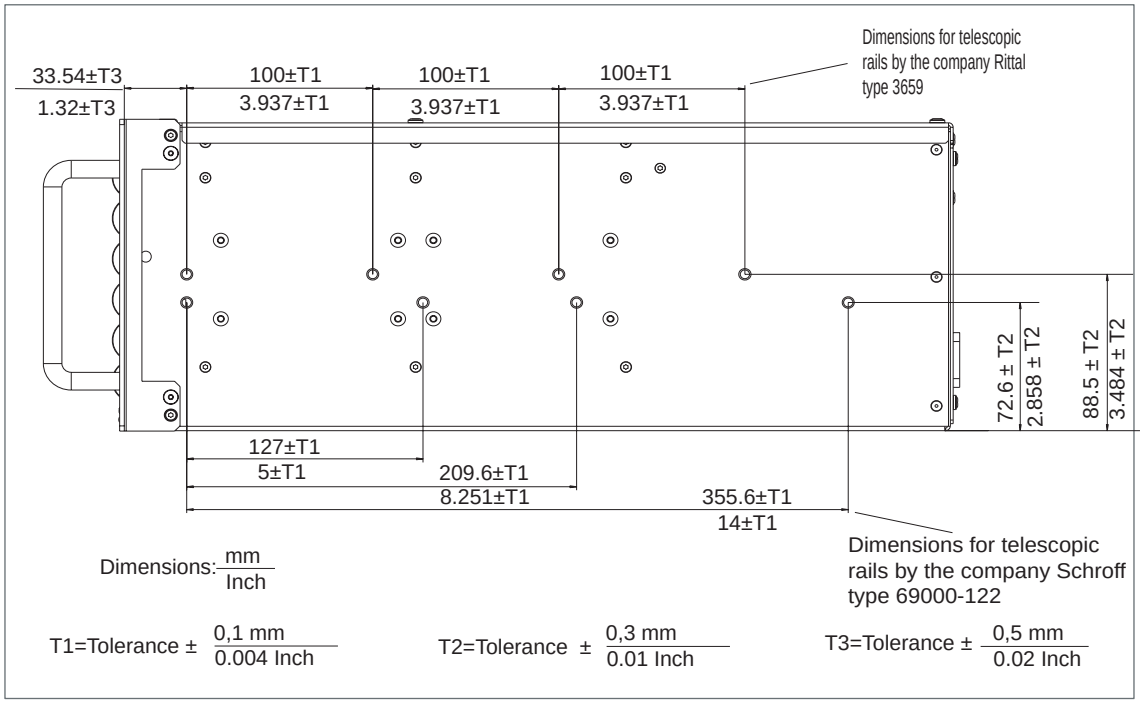

Figure 14-2 Dimensional drawing for the use of telescopic rails

14.3 Dimensional drawings for the installation of expansion modules

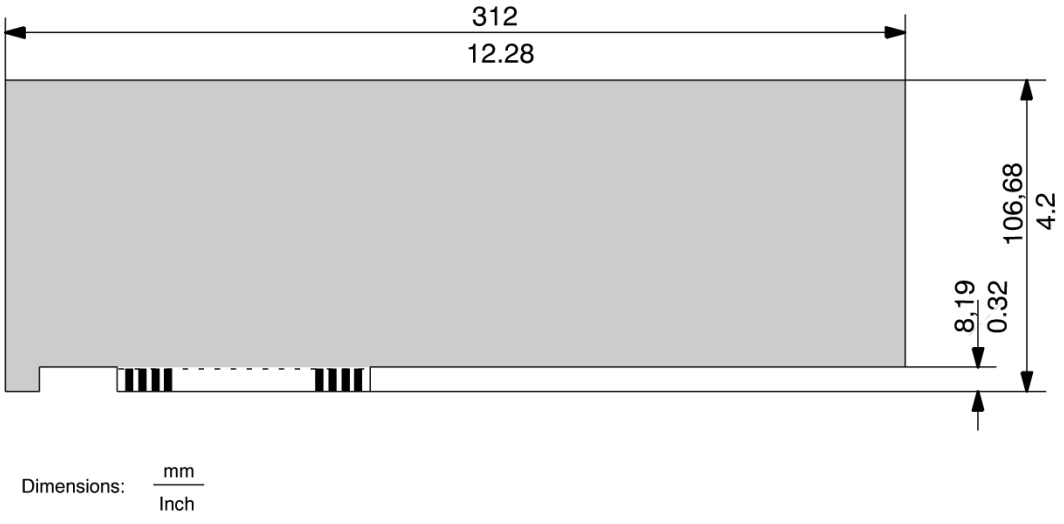

Figure 14-3 Long PCI module, PCIe module

Detailed descriptions

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15.1 Motherboard

The motherboard consists of the processor and the chipset, four slots for memory modules, internal and external ports, the Flash BIOS and the backup battery.

You will find a detailed description of the motherboard as well as the available interfaces in the motherboard technical manual D2156-S on the supplied "Documentation and Drivers" CD.

15.2 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 2000, XP or Server 2003	**Start > Run :** in the **Run** dialog, enter *msinfo32* and confirm with **OK**.

15.3 BIOS Setup

You can configure the system functions and hardware configuration in the BIOS.

The factory BIOS settings of the Rack PC deviate from the default BIOS settings as follows:

Tab	Option	Setting
Main	Boot Options -> Post Errors	No Halt On Any Errors
	Boot Options -> Quiet Boot	Disabled
Advanced	Peripheral Configuration -> USB BIOS Supported Devices	All
	Peripheral Configuration -> ATA controller config > S-ATA mode	RAID (optional for RAID systems)
	Peripheral Configuration -> LAN Remote Boot	Disabled
	Hyper-Threading	Disabled (on Windows 2000 systems)
Power	System Mode Config.	Performance
	APM Interface	Disabled
	APM Power saving	Disabled
	ACPI Save to RAM	Disabled
	Power Failure Recovery	Always on

The Bios5-06.pdf manual on the supplied "Documentation & Drivers" CD shows you how to access and change the BIOS setup. The manual also contains detailed descriptions of the menus and setting options offered by the BIOS setup.

Notice

Updating the BIOS or calling the ”Default settings” function changes the BIOS settings. If this occurs, configure the BIOS again according to the specifications in the table.

Pay special attention to the correct settings in the Power tab.

All menu items are disabled by default.

The operating system functions ”Save to RAM” (standby) and ”Save to Disk” (hibernate) are not approved for the Rack PC.

Appendix A

A.1 Guidelines and declarations

Notes on the CE Label

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

EMC Guidelines

This product fulfills the requirements for the EC directive ™89/336/EEC Electromagnetic Compatibility", and the following fields of application apply according to this CE label:

Area of application	Requirements for	
	Emitted interference	Noise Immunity
Industry	EN 61000-6-4: 2001	EN 61000-6-2: 2001
Residential and commercial areas and small businesses	EN 61000-6-3: 2001	EN 61000-6-1: 2001

The device complies with the standards EN 61000-3-2:2000 (harmonic currents) and EN 61000-3-3:1995 (voltage fluctuation and flicker.)

Low-voltage directive

The devices complies with the requirements of the EC Directive 73/23/EEC "Low Voltage Directive." Conformance with this standard has been verified according to EN 60950.

Declaration of conformity

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

Observing the Installation Guidelines

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

Connecting peripherals

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

A.2 Certificates and approvals

DIN ISO 9001 certificate

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

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

EQ-Net certificate no.: 1323-01

Software License Agreement

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

Certification for the USA, Canada and Australia

Safety

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

EMC

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

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

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

A.3 Service and support

Further 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.

You can locate your contact partner on this Internet URL:

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

A guide to our 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.

Telephone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

Technical Support

You can reach Technical Support for all A&D products using the Web form for Support Request available under
http://www.siemens.de/automation/support-request

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 services, you can also make use of all our online knowledge base on the Internet.

http://www.siemens.com/asis

There you find:

- The Newsletter contains the latest information on your products.
- Numerous documents are available by searching through Service & Support.
- The current BIOS version.
- A forum is available for users and specialists to exchange experiences.
- You can find your local contact for Automation & Drives in our contacts database.
- Information about on-site services, repairs, spare parts. Lots more is available on the ”Services” page.

You can find the latest information about industrial PCs at the following address

http://support.automation.siemens.com

A.4 Retrofitting instructions

Below you will find a description of the permissible configuration versions of the Rack PC IL 43 with drives and processors, and the resultant operational conditions.

Approved configuration versions for the temperature range 5 to 35° C

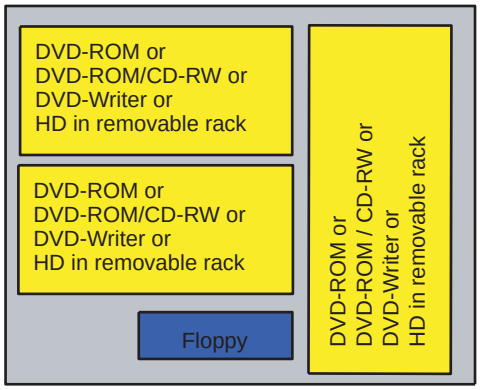

Figure A-1 For the temperature range 5 to 35° C

Celeron and P4 processors up to 90 W can be used. The maximum permissible power loss of expansion modules is 80 W.

A removable rack with hard disk can be installed instead of DVD drive(s).

Devices equipped with removable racks may not to be exposed to shock during operation as described by DIN IEC 60068-2.

Approved configuration versions for the temperature range 5 to 40° C

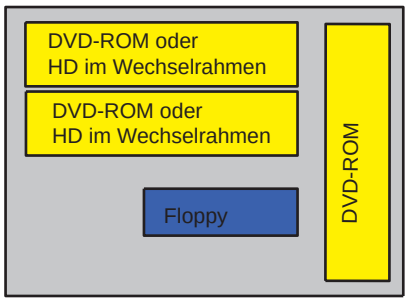

Figure A-2 Approved configuration versions for the temperature range 5 to 40° C

Celeron and P4 processors up to 90 W can be used. The maximum permissible power loss of expansion modules is 80 W.

A removable rack with hard disk can be installed instead of DVD drive(s).

Devices equipped with removable racks may not to be exposed to shock during operation as described by DIN IEC 60068-2.

ESD Guidelines

B

B.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.

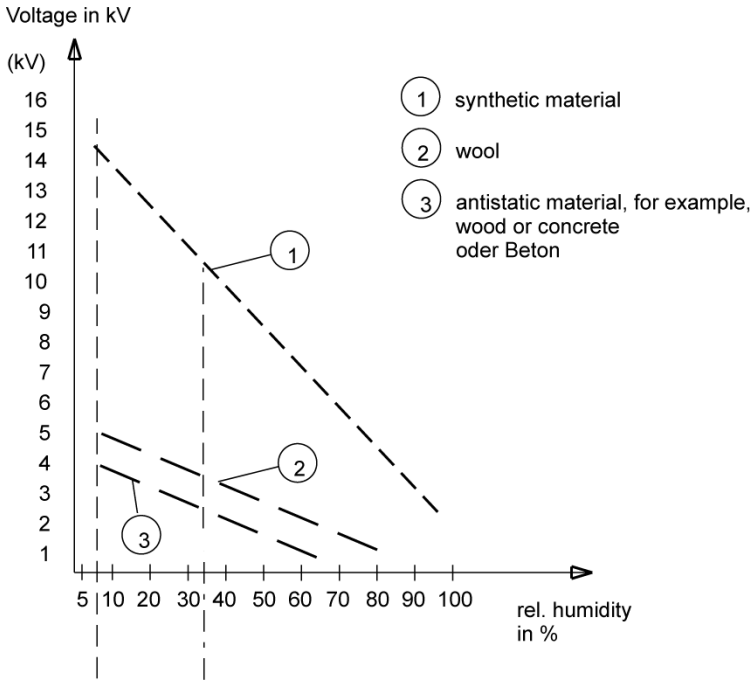

Figure B-1 Electrostatic voltages on an operator

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.
- Avoid Direct Contact
  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

C

C.1 Abbreviations

Abbreviation	Term	Definition
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.
APIC	Advanced Programmable Interrupt Controller	Supports multiprocessing.
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 computer.
ATA	Advanced Technology Attachment	Hard disk standard for integrating the hard disk controller directly on the hard disk, which reduces the costs of hard disks and interfaces and makes it easier to implement the firmware. -> IDE
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 and 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	

Abbreviation	Term	Definition
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
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
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	Electronic Manual	

Abbreviation	Term	Definition
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.)
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
EM64T	Extended Memory 64 technology	Processor works with 64 Bit data capacity. Dependant on application, this can provide increased performance. In order to use all of the advantages, the operating system, drivers and applications must support 64 bit operation.
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 character
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 drive
HDA	High Definition Audio	(Previously AZALIA). Successor of the AC97 Standard; bus between chipset and audio/modem device
HU	Height unit	
HMI	Human Machine Interface	User interface
HT	Hyper-Threading	HT technology enables the parallel processing of tasks. HT is only effective when all relevant system components, such as processors, operating systems and applications are supported.
HTML	Hyper Text Markup Language	Script language for creating Internet pages.
HTTP	Hypertext Transfer Protocol	Protocol for data transfer on the Internet

Abbreviation	Term	Definition
HW	Hardware	
I/O	Input/Output	Data input/output on computers
IDE	Integrated Device Electronics	An interface for hard disk drives in which the controller electronics are located on the drive itself. 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.
LCD	Liquid Crystal Display	Liquid crystal display
LEDs	Light Emitting Diode	LEDs
LPT	Line Printer	Printer port
LVDS	Low Voltage Differential Signaling	
LW	Disk drive	
MAC	Media access control	Media access control
MC	Memory Card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	Memory card with the format 32 x 24.5 mm
MPI	Multipoint-capable interface for programming devices	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)
OPC	OLE for Process Control	Standardized interface for industrial processes

Abbreviation	Term	Definition
PATA	Parallel ATA	An interface for hard disk drives and optical drives with parallel data transfer of up to 100 Mbps
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.
PE	Protective Earth	
PG	Programming device	Compact programming device which meets the special requirements of industry. The PG is fully equipped for programming SIMATIC PLCs.
PIC	Programmable Interrupt Controller	Programmable interrupt controller
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
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

Abbreviation	Term	Definition
RxD	Receive Data	Data transfer signal
SATA	Serial ATA	An interface for hard disk drives and optical drives with serial data transfer of up to 1.5 Mbps
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.	
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	

Abbreviation	Term	Definition
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.
WLAN	Wireless LAN	Wireless local network, which is mainly used in connection with mobile computers.
WWW	World Wide Web	
XGA	Xtended Graphics Array	Graphic standard, maximum resolution 1.024 x 768 pixels

Glossary

Application

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

ATAPI CD–ROM Drive

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

Automation device (AG)

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

Automation system (AS)

The programmable logical controllers (PLC) of the SIMATIC systems (S5 or S7) consist of a central controller, one or more CPUs, and various I/O modules.

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 marking

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

Chipset

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

Cold start

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

COM port

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

Configuration files

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

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.

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

Controller

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

Device configuration

The configuration of a 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.

EMC Guidelines

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

Energy management

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

Energy options

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

ESD Guidelines

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

Ethernet

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

Image

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

Interface

see Interface

Interface, MPI

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

Interface, parallel

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

Interfaces

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

IT networks

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

LAN

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

Legacy USB support

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

License key

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

License key diskette

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

LPT port

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

Main memory

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

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.

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 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).

PC/104 / PC/104-Plus

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

PCMCIA

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.

Pixel

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

PROFIBUS / MPI

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

RAM

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

Recovery CD

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

Remove module bracket

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

Reset

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

Restart

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

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 which can be controlled by the plant or the process. It is assigned to a programmable module (Module, programmable) (e.g. CPU, FM) and can be granulated into smaller units (blocks).

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 hot key CTRL+ ALT+ DEL can be used to perform a warm start.

Windows

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

WLAN

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

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