SIEMENS

SIMATIC

Industrial PC SIMATIC IPC547D

Operating Instructions

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Legal information

Warning notice system

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 relevant 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 product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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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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Preface

Purpose of the Operating Instructions

These operating instructions contain all the information you need for commissioning and operation of the SIMATIC IPC547D.

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

Validity of the Operating Instructions

These operating instructions are valid for all supplied versions of the SIMATIC IPC547D.

Conventions

The terms "PC" or "device" are sometimes used in place of the product name SIMATIC IPC547D in these operating instructions.

Basic knowledge required

Knowledge of personal computers and Microsoft operating systems is required. General knowledge in the field automation control engineering is recommended.

Position in the information landscape

The documentation for the SIMATIC IPC547D includes the following sections:

- SIMATIC IPC547D, Compact Operating Instructions
- SIMATIC IPC547D, Operating Instructions

The documentation is part of the "Documentation and Drivers" DVD supplied with the product.

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

History

Currently released versions of these operating instructions:

Version	Comments
06/2011	First edition

Guideline to the operating instructions

Content structure	Contents
Preface	Purpose, layout and description of the important topics
Table of contents	Detailed organization of the documentation, including the index of pages and chapters
Overview	• Description of the product: Characteristics and field of application • Scope of supply • Structure of the product/system: Operator control and connection elements • Accessories
Safety instructions	All generally valid safety aspects: • Legal requirements • Product/system view during installation • General information for commissioning • Notes on operation
Installing and connecting the device	• Application planning: Aspects of storage, transport, environmental and EMC conditions to be considered in the preparatory stage. • Installation: Product installation options and installation instructions • Connection: Options of connecting the product and wiring instructions • Integration: Options of integrating the product into existing or planned automation systems and networks.
Commissioning the device	Commissioning the product/system
Device functions	Monitoring and display functions
Expanding and assigning parameters to the device	Procedure for installing device expansions (modules, drives)
Maintaining and servicing the device	• Replacing hardware components • Restoring and setting up the operating system and BIOS (Recovery) • Installing drivers and software • Service and spare parts • Recycling and disposal
Technical specifications	• General specifications in compliance with relevant standards and current/voltage values • Guidelines and certifications, ESD guidelines, notes on retrofitting • Dimension drawings: Dimensions of the device and of modules • Detailed descriptions of boards and system resources
Appendix	• Service and Support • Troubleshooting: Problems, causes, remedy • BIOS setup
Abbreviations	Abbreviations of the technical terms used

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Overview

1

1.1 Product description

The SIMATIC IPC547D is a powerful industrial PC in 19" rack format design (4 HE). It is perfectly suited for high-performance industrial PC applications.

- Maximum performance
- Attractive price



Applications areas

The SIMATIC IPC offers system integrators, cabinet designers, system engineers and machine designers a 19" rack PC platform for high-performance applications and IT applications on the control/cell level for:

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

The SIMATIC IPC 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, therefore, it can also be used in building automation or in public facilities.

Highlights

The latest PC technology

- State-of-the-art Intel technology, 2nd Generation Intel Core i processors
- High performance and scalability
- PCI, PCIe x8 (1 lane), PCIe x16 slots (4 lanes), PCIe x16 slots
- SSD included in the scope of delivery

Industrial compatibility

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

Security of investment

- Guaranteed spare parts availability for at least 3 years

High system availability

- SIMATIC PC DiagMonitor - PC diagnostics / message software via OPC/SNMP/LAN
- Preventative data backup with the SIMATIC PC/PG Image Creator
- RAID1 – redundant data storage on two hard drives, also "hot swap" in connection with SATA removable racks.
- RAID5 – striping with parity on three hard disks, "hot swap" in connection with SATA removable racks
- Redundant power supply

Features

Basic data

Design	• 19" rack, 4 HU • Robust full metal rack design case, lacquered outside and coated inside • Prepared for mounting telescopic rails • Horizontal and vertical mounting position is possible • Tower installation by means of Tower Kit • Lockable front cover as access protection
Housing	• Dust protection by means of overpressure ventilation using bearing seated front fan through filter • Card retainers secure PC modules for transport (vibration, shock)
Expansion slots	• 4 × PCI • 1 × PCIe x8 (1 Lane) • 1 × PCIe x16 (4 lanes) • 1 × PCIe x16 You can use modules with a length of up to 312 mm.
Drive bays	• 3 X 5.25" at the front • 1 X 3.5" at the front • 2 X 3.5" internal
Power supply	100 to 240 V AC
Power supply, redundant	2 × 100 to 240 V AC
Interfaces, see design of the device	

Monitoring and safety functions

Temperature	• Violation of high/low limits of permitted operating temperature
Fan	• RPM monitoring, wear monitoring
Watchdog	• Monitoring functions for program execution • Monitoring time can be parameterized in software • Restart can be parameterized in the event of a fault • Warnings can be analyzed by application program (local, via LAN)
Status LEDs, front	• POWER – internal power supply available, PC switched on • HDD – access to hard drive • TEMP – temperature status • FAN – fan status
Status LEDs, on back	• Redundant power supply

Operating system

Operating system	• Without • Pre-installed, included on Restore DVD: – Microsoft Windows XP Pro (32-bit), MUI [1] – Microsoft Windows 7 Ultimate (32-bit and 64-bit), MUI [1] – Microsoft Windows Server 2008 (32-bit), MUI [1] – Microsoft Windows Server 2008 R2 (64-bit) including 5 clients, MUI [1]

[1] 5 languages (English, German, French, Italian, Spanish)

Languages that can be installed

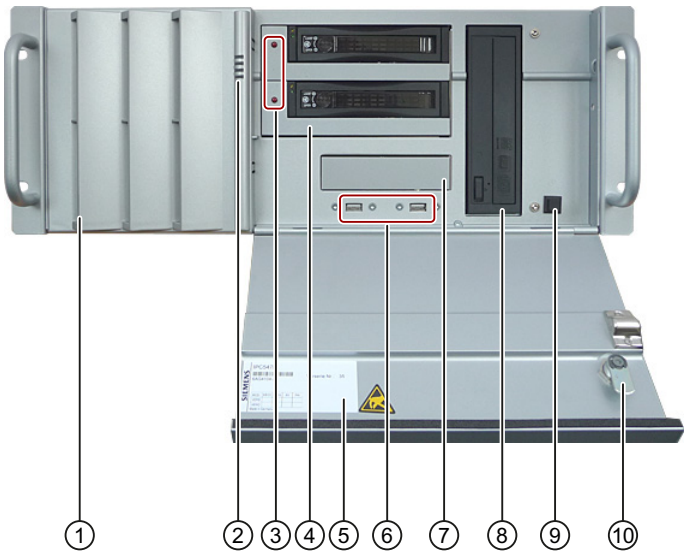
You will find the languages that can be installed on the Recovery DVD.

Language	Windows XP Pro	Windows 7 Ultimate	Windows Server 2008	Windows Server 2008 R2
German	X	X	X	X
English	X	X	X	X
French	X	X	X	X
Italian	X	X	X	X
Spanish	X	X	X	X
Japanese	X	X	X	X
Chinese Hong Kong	X	X	X	X
Chinese (simplified)	X	X	X	X
Chinese Taiwan		X		X
Korean	X		X	
Russian	X	X	X	X

1.2 Design of the device

1.2.1 Exterior design

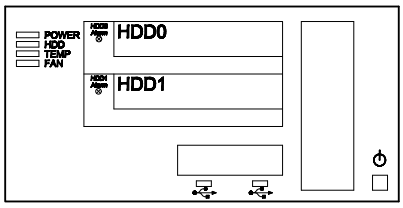
Front view



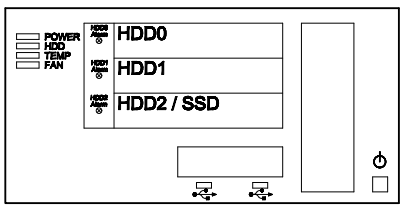
① Front cover
② Status displays
③ HDD alarm LEDs, for RAID systems in removable rack
④ Installation options for DVD ROM drives, DVD burners and removable racks
⑤ Rating plate
⑥ USB ports
⑦ Installation option for 3.5" device
⑧ Installation options for DVD ROM drives, DVD burners
⑨ On/off button
⑩ Front cover with lock

Drive labeling

In a RAID system with a removable rack, one of the following labels is located on the inside of the front panel cover of the device.

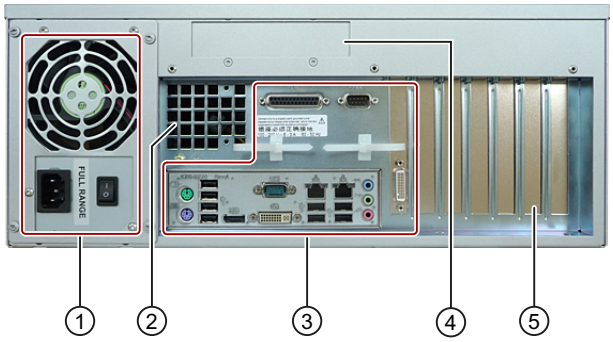


RAID1



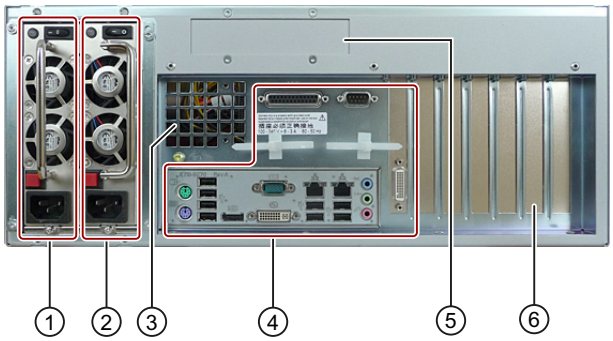
RAID5/RAID1+SSD

Rear view



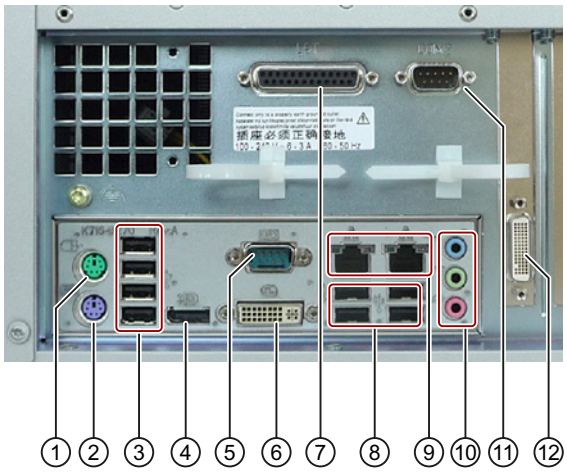
① Power supply
② Air outlet
③ Interfaces
④ Blanking plate, allows installation of external interfaces
⑤ Expansion slots for:
- 4 × PCI
- 1 × PCIe x8 (1 Lane)
- 1 × PCIe x16 (4 lanes)
- 1 × PCIe x16

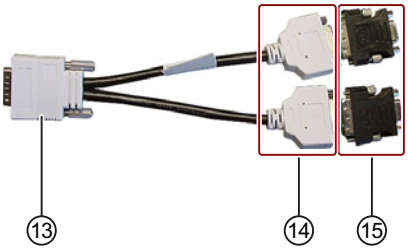
Rear view with redundant power supply



① Power supply 1
② Power supply 2
③ Air outlet
④ Interfaces
⑤ Blanking plate, allows installation of external interfaces
⑥ Expansion slots for:
- 4 × PCI
- 1 × PCIe x8 (1 Lane)
- 1 × PCIe x16 (4 lanes)
- 1 × PCIe x16

Interfaces





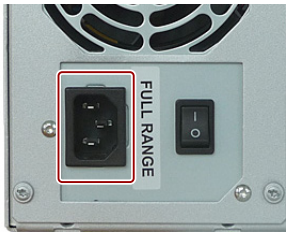
①	MOUSE	Connection for a PS/2 mouse
②	KEYBOARD	Connection for a PS/2 keyboard
③	USB	Connection for USB devices
④	Display Port	Connection for a monitor with display port
⑤	COM1	Serial interface 1 (V.24), 9-pin D-sub socket
⑥	DVI-I	Connection for CRT or LCD monitor with DVI interface, VGA via DVI/VGA adapter (optional)
⑦	LPT	Parallel interface, 25-pin (optional)
⑧	USB	Connectors for USB devices
⑨	Ethernet 1, 2	RJ45 Ethernet connectors for 10/100/1000 Mbps [1)] Ethernet 1 is iAMT-capable.
⑩	Line in (blue) Line out (green) Micro (pink)	Connector for analog audio source, 3.5 mm jack socket connector for active speakers or headset, 3.5 mm jack socket for microphone, 3.5 mm jack socket
⑪	COM2	Serial interface 2 (V.24), 9-pin D-sub socket (optional)
⑫	DMS59	Connection to the dual-head graphics module (optional)
⑬	Dual-head adapter [2)]	DMS59 connector for dual-head graphics module (optional)
⑭	DVI-I [2)]	DVI-I connection
⑮	VGA [2)]	VGA connection, adapter installed

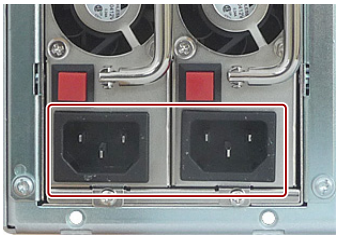
1 To identify them clearly, the LAN interfaces are numbered on the housing. The numbering by the operating system may deviate from this.

2 Using the graphic card

Power supply

The following figure shows the connectors for the power supply for devices with single or redundant power supply.





1.2.2 Operator controls

WARNING

No mains disconnection

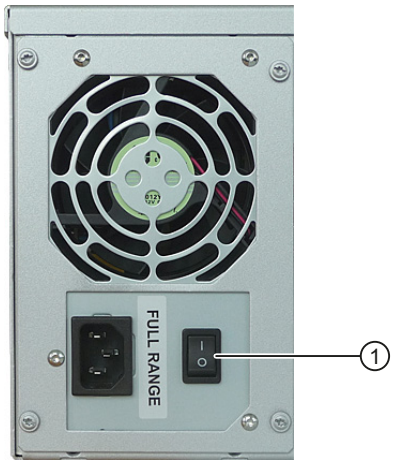
The on/off button and on/off switch(es) do not disconnect the device from the mains.

In the case of damage to the device or connecting cables, there is a risk of fire. Risk of electric shock in the case of improper opening of the device.

Always pull out the power plug when the device is not in use. Disconnect the device from the network by additional measures, for example, with an isolating switch.

On/off switch

The following figure shows the location of the on/off switch and the location of the alarm reset button for a device with redundant power supply.





① On/off switch

② Alarm reset button can be used to switch off the warning signal

On/off button

Note

The on/off button is only effective if the power supply is switched on via the on/off switch at the rear of the device.

NOTICE

On/off button has no function when "Power Failure Recovery" is active

Depending on the BIOS setup, "Power Failure Recovery" entry, the PC switches on automatically or you must press the on/off button on the front. The BIOS setting only becomes effective when the device is without mains voltage for at least 20 seconds.

Automatic startup may endanger the operation of the machine or plant, for example, after a power failure. Take this into account when designing the plant.

The following figure shows the position of the on/off button at the front of the device.



The on/off/reset buttons have three functions:

- Switch on the PC, 1 × press briefly
- Shut down the operating system and switch off PC, 1 × press briefly
- Switch off PC without shutting down the operating system, press for more than 4 seconds – hardware reset

CAUTION

Data loss

The device is restarted in the case of a hardware reset. Data in the main memory is deleted. Data on the hard disk drive may be lost.

The device is damaged.

Perform a hardware reset only in the case of an emergency. Close all running programs. Make sure that there is no more read or write access to drives and I/O.

1.2.3 Status displays

Front status displays

Note the labeling of the status display on the front cover.



Pos	Display	Meaning	LED	Description
①	POWER	PC operating status display	OFF	Hibernate, switched off or unplugged
			GREEN flashing	Windows standby
			GREEN	PC in operation
②	HDD	Display for hard disk access	OFF	No access
			GREEN	Access
③	TEMP	Temperature status	OFF	No error
			RED flashing	Critical temperature (CPU temperature, device temperature)
④	FAN	Fan status	RED flashing	• CPU heat sink fan fault • Housing fan fault • Power supply fan fault

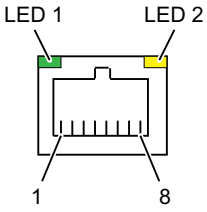
The HDD alarm LEDs are located behind the hinged front panel in a RAID system with removable rack.

Display	Meaning	LED	Description
HDD0 alarm HDD1 alarm HDD2 alarm [1]	Hard disk alarm in conjunction with RAID and monitoring software	OFF	RAID is OK
		A RED LED is lit up	Associated HDD not OK
		All RED LEDs are flashing	RAID synchronized
		All RED LEDs are lit up	RAID not OK, the monitoring software failed to locate the faulty hard disk. It may be possible to determine the defective hard disk with the RAID software, see chapter "RAID system (Page 42)" in the operating instructions.

[1] Only for RAID5/RAID1+SSD

Rear status displays

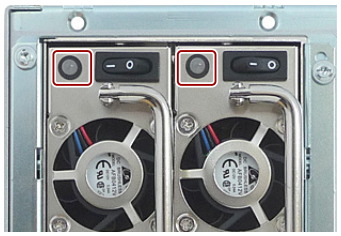
The following figure shows the location of the LEDs on the Ethernet interface.



Display	Meaning	LED	Description
Ethernet LAN 1, 2 [1]	Green LED Link status display	OFF	• No cable connected • Cable disabled • Interface disabled
		GREEN	Active cable connected
	Yellow LED Activity status display	OFF	• No cable connected • Cable disabled • Interface disabled • No activity
		YELLOW	Data transfer active

[1] To identify them clearly, the LAN interfaces are numbered on the housing. The numbering by the operating system may deviate from this.

The following figure shows the location of the "Power" LEDs on a device with redundant power supply.



The LED has the following meaning:

- Lit green: Power supply module is in operation
  When there is no redundancy, an acoustic signal sounds continuously. Redundancy is in effect when both power supply units are in operation.
- Not lit: Power supply module is out of service

Safety information 2

2.1 General safety instructions

Open equipment and machinery directive

⚠ WARNING

The device is open equipment

The device is open equipment. This means that the device may only be installed in enclosures or cabinets which provide front panel access for operating the device.

The enclosure or cabinet in which the device is installed may only be accessed with a key or tool and only by trained personnel.

Life-threatening voltages are present with an open control cabinet

When you open the control cabinet, some areas or components may be carrying life-threatening voltages.

If you touch these areas or components, you may be killed by electric shock.

Switch off the power supply to the cabinet before opening it.

Device must be operated only in machinery that conforms to the machinery directive

The "Machinery Directive" regulates, among other things, the precautions for commissioning and operating machines within the European Economic Area.

Failure to observe the guidelines represents a violation of the Machinery Directive. In addition, personal injury and property damage cannot be ruled out, depending on the operated machine.

Commission the device only in a machine that meets the provisions of Directive 2006/42/EC.

System expansions

CAUTION

Damage through system expansions

Device and system expansions may be faulty and can affect the entire machine or plant.

The installation of expansions can damage the device, machine or plant. Device and system expansions may violate safety rules and regulations regarding radio interference suppression. If you install or exchange system expansions and damage your device, the warranty becomes void.

Note the following for system expansions:

- Only install system expansion devices designed for this device. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.
- Observe the information on electromagnetic compatibility (Page 90).

⚠ CAUTION

Risk of fire

Expansion modules generate additional heat.

The device can overheat or cause a fire.

Observe the safety and installation regulations of the expansion or PCIe modules. If necessary, install the device in an enclosure that meets the requirements of paragraphs 4.6 and 4.7.3 of the standards EN 60950-1:2006 and DIN EN 60950-1:2006-11.

Battery and rechargeable battery

⚠ WARNING

Risk of explosion and release of harmful substances

Improper handling of lithium batteries can result in an explosion of the batteries.

Explosion of the batteries and the released pollutants can cause severe physical injury. Worn batteries jeopardize the function of the device.

Note the following when handling lithium batteries:

- Replace a used battery in good time; see chapter "Replacing the backup battery (Page 70)" in the operating instructions.
- Replace the lithium battery only with an identical battery or types recommended by the manufacturer (order no.: A5E30314053).
- Do not throw lithium batteries into fire, do not solder on the cell body, do not recharge, do not open, do not short-circuit, do not reverse polarity, do not heat above 100°C and protect from direct sunlight, moisture and condensation.

High frequency radiation

CAUTION

Unintentional operating situations

High frequency radiation, e g. from a cellular phone, interferes with device functions and can result in malfunctioning of the device.

Persons are injured and the plant is damaged.

Avoid high-frequency radiation:

- Remove radiation sources from the environment of the device.
- Switch off radiating devices.
- Reduce the radio output of radiating devices.
- Observe the information on electromagnetic compatibility (Page 90).

ESD Guidelines



Electrostatic sensitive devices can be labeled with an appropriate symbol.

CAUTION
Electrostatic sensitive devices (ESD) When you touch electrostatic sensitive components, you can destroy them through voltages that are far below the human perception threshold. If you work with components that can be destroyed by electrostatic discharge, observe the ESD guidelines (Page 91).

Headphones

⚠ CAUTION
Impaired hearing due to excessive sound pressure The setting of the volume and the equalizer can increase the sound pressure in the headphones. Other factors not mentioned by the manufacturer can also influence the sound pressure, for example the operating system. equalizer software, firmware and driver. Excessive sound pressure from headphones can result in impaired hearing or even loss of hearing. Set the volume control and equalizer to the lowest value before you put on the headphones. Keep checking the volume control setting. Only use headphones and software approved by the manufacturer.

Access protection

⚠ CAUTION
Protection against access by unauthorized persons An unauthorized user can operate the device incorrectly and bypass logon by restarting the device. Operator actions by unauthorized persons jeopardize operational reliability. Take the following safety precautions: • Lock the front panel cover. • Do not use keyboards with an on/off button (Power button). • If the device has a on/off button, assign the parameters of the function of the on/off button to meet your requirements under Windows. You can find the settings in the "Power Options" menu.

2.2 Notes on use

⚠ WARNING

Dangers relating to unprotected machines or plant

According to the results of a risk analysis, an unprotected machine poses a threat. These dangers can lead to personal injury.

According to the risk analysis, you can avoid these potential dangers to persons by taking the following measures:

- Additional protective mechanisms on the machine or system. In particular, the programming, paramater assignment and wiring of the inserted I/O modules must be executed in accordance with the safety performance identified by the necessary risk analysis (SIL, PL or Cat.).
- The proper use of the device must be verified by a function test on the system. This test can detect programming, parameter assignment and wiring errors.
- Documentation of the test results that you can enter in the relevant safety verification documents, if necessary.

CAUTION

Ambient conditions

Ambient conditions for which is the device is not suitable can cause faults or damage the device.

Note the following:

- Operate the device only in closed rooms. Failure to comply nullifies the warranty.
- Operate the device only in accordance with the ambient conditions specified in the technical specifications.
- Protect the device against dust, moisture and heat.
- Do not expose the device to direct sunlight or other strong sources of light.

Note

Use in industrial environments

The device has been designed for use in a normal industrial environment in accordance with IEC 60721-3-3 (pollutant class 3C2 for chemical influences, 3S2 for sand and dust). Without additional measures, such as a supply of clean air, the PC cannot be operated in locations with harsh operating conditions caused by acidic vapors or gases.

Installing and connecting the device 3

3.1 Preparing for installation

3.1.1 Unpacking and checking the delivery

Procedure

1. When accepting a delivery, please check the packaging for visible transport damage.
2. If any transport damage is present at the time of delivery, lodge a complaint at the shipping company in charge. Have the shipper confirm the transport damage immediately.
3. Unpack the device at its installation location.
4. Keep the original packaging in case you have to transport the unit again.

NOTICE
Damage to the device during transport and storage If a device is transported or stored without packaging, shocks, vibrations, pressure and moisture may impact the unprotected unit. A damaged packaging indicates that ambient conditions have already had a massive impact on the device. The device may be damaged. Do not dispose of the original packaging. Pack the device during transportation and storage.

5. Check the contents of the packaging and any accessories you may have ordered for completeness and damage.
6. If the contents of the packaging are incomplete, damaged or do not match your order, inform the responsible delivery service immediately. Fax the enclosed form "SIMATIC IPC/PG Quality Control Report".

⚠ WARNING

Electric shock and fire hazard due to damaged device

A damaged device can be under hazardous voltage and trigger a fire in the machine or plant. A damaged device has unpredictable properties and states.

Death or serious injury could occur.

Make sure that the damaged device is not inadvertently installed and put into operation. Label the damaged device and keep it locked away. Send off the device for immediate repair.

CAUTION

Damage from condensation

If the device is subjected to low temperatures or extreme fluctuations in temperature during transportation, for example in cold weather, moisture could build up on or inside the HMI device.

Moisture can result in short-circuits in electrical circuits and damage the device.

In order to prevent damage to the device, proceed as follows:

- Store the device in a dry place.
- Bring the device to room temperature before starting it up.
- Do not expose the device to direct heat radiation from a heating device.
- If condensation develops, wait approximately 12 hours or until the device is completely dry before switching it on.

7. Please keep the enclosed documentation in a safe place. It belongs to the device. You need the documentation when you commission the device for the first time.
8. Write down the identification data of the device.

3.1.2 Identification data of the device

The device can be clearly identified with the help of this identification data in case of repairs or theft.

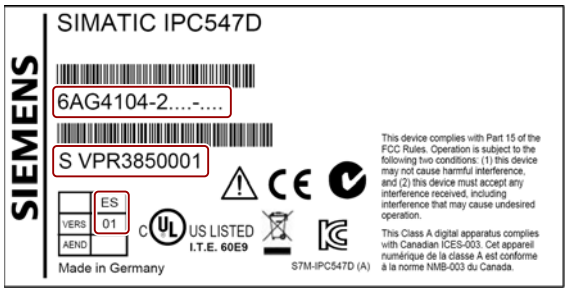
Enter the identification data in the following table:

Order number	6AG4
Serial number	S VP
Product version	ES
Windows "Product Key"	
Ethernet address 1 (MAC)	
Ethernet address 2 (MAC)	

Take the information from the rating plate, COA label and component label on the inside of the front panel cover of the device.

Procedure

1. Take down the order number, serial number and product version (ES) from the rating plate.



2. Write down the Windows "Product Key" from the COA label on the inside of the front cover.



3. Write down the Ethernet addresses from the component label.

SIMATIC IPC547D
Order No.: 6AG4-....-...
Serial No.: SVP...
Core i5 CPU No. 2400 ...
RAID1 (2x500GB ...
1 GB DDR3 ...
DVD+/-RW
seriell (COM2) ...
Windows Server 2008 ...
110/230 VAC Industrie ...

Onboard MAC-Adresses:
Ethernet LAN 1: 000E8C8E81CE
Ethernet LAN 2: 000E8C8E07C8

Slot 1 .....
Slot 2 .....
Slot 3 .....
Slot 4 .....
Slot 5 .....
Slot 6 .....
Slot 7 .....

Service & Support
//www.siemens.com/asis

The Ethernet addresses can also be found in the BIOS setup (F2) under "Main > System Information", entries "LAN 1 MAC" and "LAN 2 MAC".

3.2 Installing the device

3.2.1 Installation information

⚠ WARNING

Danger, high voltage

A high voltage may be present in the switchgear cabinet and could cause a dangerous electric shock.

It may result in death or serious physical injury.

Isolate the power supply to the switchgear cabinet before opening it. Ensure that the power to the switchgear cabinet cannot be turned on accidentally.

CAUTION

Risk of fire

If you install the device in an unapproved mounting position or if you do not observe the ambient conditions, the device can overheat. UL approval and conformity with the low-voltage directive (EN 60950-1:2006 and DIN EN 60950-1:2006-11) become void.

Overheating can cause a fire. Proper functioning of the device is no longer guaranteed.

Before you install the device, note the following general installation information.

Note

The device fulfills the requirements for a fire protection housing according to EN 60950-1. Therefore, it can be installed without additional fire protection.

- Install the device only in one of the described permitted mounting positions.
- Provide adequate volume in the switchgear cabinet for air circulation and heat transport. Keep at least 10 cm distance between the device and switchgear cabinet.
- Do not cover the vent slots of the device.
- Ensure that the maximum air intake temperature, measured 10 cm before the air intake opening, does not exceed 40° C. The maximum air intake temperature must be accounted for especially when sizing closed switchgear cabinets.
- The minimum distance between the device and the housing is 10 cm on the air output end.
- Install the device in such a way that it does not pose a danger, for example, by falling over.

3.2.2 Mounting location and position

Optional mounting locations

The device can be mounted in control desks, switching cabinets and 19" rack systems, both horizontally and vertically.

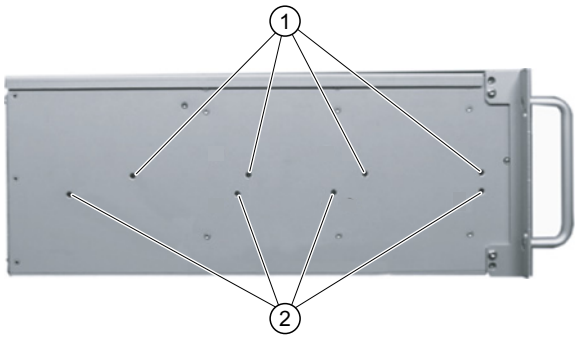
Possible mounting positions

You can mount the device as follows:

- Mounting with mounting brackets, horizontal
- Mounting on device bases, horizontal
- Tower installation, vertical: a separate tower kit can be ordered for tower installation (not available in some countries).
- Mounting on telescopic rails

  When telescopic rails are used for mounting, the device can be withdrawn fully from the cabinet or rack. For detailed information on telescopic rails, see the sections "Technical specifications of the telescopic rails (Page 102)" and "Dimensional drawing for the use of telescopic rails (Page 94)".

  The following figure shows the position of the mounting holes for angle brackets or telescopic rails.



① Threaded holes for type 3659 telescopic rails from the Rittal company

② Threaded holes for type 20110-072 telescopic rails from the Schroff company

⚠ CAUTION

Risk of physical injury

The device is too heavy to be mounted exclusively with the 19 inch brackets of the front panel.

The device may fall down, injure people and get damaged.

Secure the device using additional measures. The mounting screws of the telescopic rails may not protrude more than 5 mm into the device..

Note

For vertical operation, mount the device on a horizontal metal base and secure it from falling over. The following device 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 Cabinet manufacturer's instructions regarding device bases.

3.3 Connecting the device

3.3.1 Connection information

⚠ WARNING

Complete isolation

The on/off switch does not isolate the device from the mains.

In the case of damage to the device or connecting cables, there is a risk of fire. Risk of electric shock in the case of improper opening of the device.

Disconnect the device from the mains as follows:

- Always remove the power plug when you are not using the device. The power plug must be freely accessible.
- Use a central isolating switch in the case of cabinet installation.
- Always ensure that the socket on the device or the safety socket of the building installation is freely accessible and located as close as possible to the device, especially if the power plug is secured by a power plug lock.

⚠ WARNING

Risk of lightning strikes

A lightning flash may enter the mains cables and data transmission cables and jump to a person.

Death, serious injury and burns can be caused by lightning.

Take the following precautions:

- Pull out the power plug in good time when a thunderstorm is approaching.
- Do not touch mains cables and data transmission cables during a thunderstorm.
- Keep sufficient distance from electric cables, distributors, systems, etc.

CAUTION
Fault caused by I/O devices The connection of I/O devices can cause faults in the device. The result may be personal injury and damage to the machine or plant. Note the following when connecting I/O devices: • Read the documentation of the I/O devices. Follow all instructions in the documentation. • Connect only I/O devices which are approved for industrial applications in accordance with EN 61000-6-2/IEC 61000-6-2. • Peripheral devices that are incapable of hot-plugging may only be connected after the device has been disconnected from the power supply.

CAUTION
Damage through regenerative feedback Regenerative feedback of voltage to ground by a connected or installed component destroys the device. Connected or built-in I/Os, for example, a USB drive, are not permitted to supply any voltage to the device. Regenerative feedback is generally not permitted.

3.3.2 Connection of equipotential bonding

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

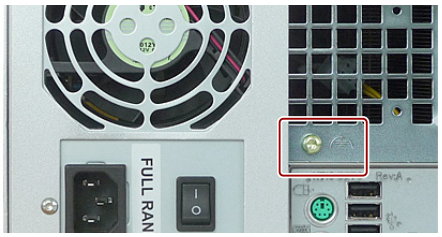
The equipotential bonding connection on a device has a large surface and makes contact over a large area. The equipotential bonding connection is identified by the following symbol:



Requirement

- T20 screwdriver

Procedure



1. Connect the marked equipotential bonding connection to the PE conductor of the switchgear cabinet where the device is installed.

   The minimum cross-section of the equipotential bonding line is 5 mm^2.

3.3.3 Connecting the power supply

Note before you connect the device

⚠ WARNING

Injury to persons or damage to property when operated on an incorrect power supply network

If you connect the device to an unsuitable power supply, the device receives voltages and currents that are too high or too low.

Injuries to persons, malfunctions or a damage to the device can result.

Note the following information regarding the power supply network:

- The permitted nominal voltage of the device must correspond to the local mains voltage.
- Do not operate the device via non-grounded or impedance-grounded networks (IT networks).
- Operate the device only in grounded power networks (TN networks in accordance with VDE 0100, Part 300 or IEC 60364-3).

NOTICE

Operation with uninterruptible power supply

An uninterruptible AC power supply (UPS) must be used when this device is operated with a PFC (Power Factor Correction) circuit that supplies a sinusoidal output voltage in normal and buffer mode.

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

Note

The power supply of the device contains a PFC (Power Factor Correction) circuit to conform to the EMC directive.

Country-specific information

Outside of the USA and Canada, 230 V supply voltage:

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

For USA and Canada:

Use a CSA or UL-listed power supply cable for operation in the United States and Canada.

The connector must be compliant with NEMA 5-15.

120 V supply voltage

Use a flexible cable with UL approval and CSA marking as well as the following features:

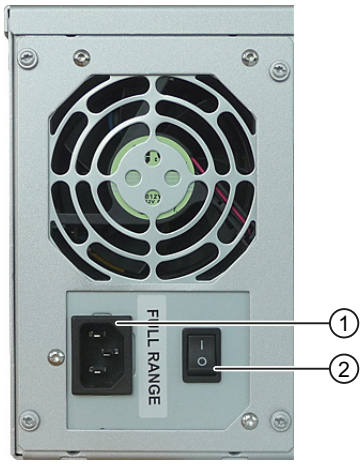
- Type SJT with three conductors
- At least 18 AWG conductor cross-section
- Max. length of 4.5 m
- Parallel safety plug 15 A, min. 125 V.

240 V supply voltage

Use a flexible cable with UL approval and CSA marking as well as the following features:

- Type SJT with three conductors
- At least 18 AWG conductor cross-section
- Max. length of 4.5 m
- Tandem safety plug 15 A, min. 250 V.

Procedure - connecting the power supply

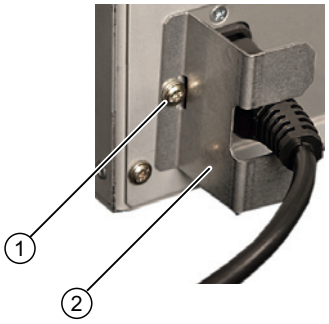


1. Make sure that the on/off switch ② is in the '0' (off) position.

   This prevents unintentional startup of the device when you plug in the power cable.
2. Connect the power cable to socket ①.
3. Insert the power cable in the electrical socket.
4. Switch on the on/off switch ②.

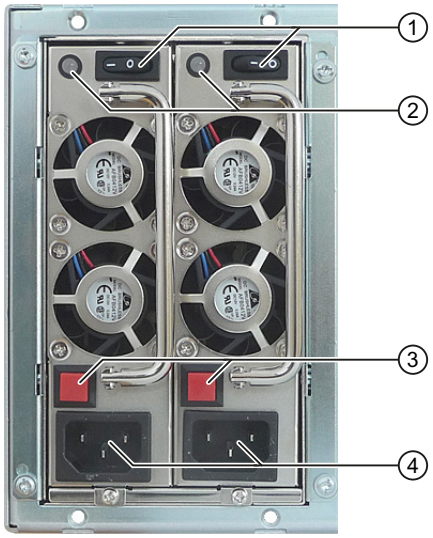
Secure the power plug

To prevent unintentional removal of the power cable, you can secure the plug as follows:



1. Remove the retaining screw ①.
2. Screw on the latch for the power plug ②.

Procedure - connecting redundant power supply



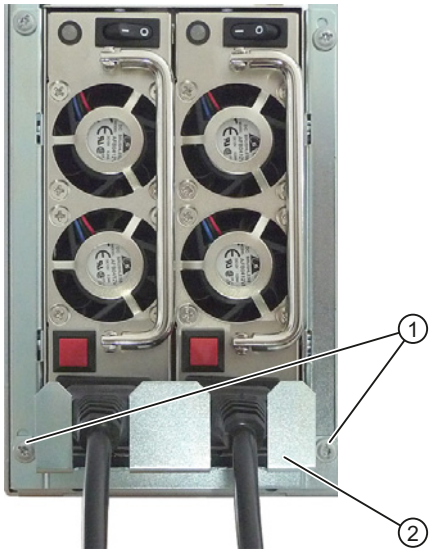
1. Turn off both on/off switches ①.
2. Connect a power cable to the two sockets ④.
3. Turn on the two on/off switches ①.

   The LEDs on the power supply modules ② light up green.

   Note:
   If only one of the power supply modules works, a warning signal sounds. You turn off the warning signal by pressing the ③ button on the working power supply module.

Securing the power plug of the redundant power supply

To prevent unintentional removal of the power cable, you can secure the power plug as follows:



1. Remove the retaining screws ①.
2. Screw on the latch for the power plug ②.

3.3.4 Connect device to networks

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

Ethernet

Wake on LAN and Remote Boot are supported.

You can use the integrated Ethernet interfaces (10/100/1000 Mbps) for communication and data exchange with automation devices, such as SIMATIC S7.

You need the "SOFTNET S7" software package for this.

PROFINET

PROFINET can be operated via:

- Standard Ethernet interfaces (RT)

SIMATIC NET

Use this software package to create, operate and configure an innovative network for Field & Control level. Information on this can be found on the SIMATIC NET Manual Collection CD. The software package and the documentation are not included in the product package.

Additional information

You can find additional information on the Internet at: Technical Support (http://www.siemens.de/automation/csi_en_WW)

3.3.5 Multi-monitoring

You can operate up to four monitors in combination with the integrated graphics controller or with the optional NVS300 graphics card. Parameter assignment is performed via the Control Panel in Windows.

Commissioning the device 4

4.1 Requirements for commissioning

The following requirements have to be met before you can start commissioning:

- I/O devices, keyboard, mouse and monitor are connected.
- The power supply is connected.

The device can be supplied without an operating system. The following sections describe commissioning with an operating system.

4.2 Switch on the device

4.2.1 Initial commissioning

Following the initial switch on, the operating system is set up automatically on the device.

CAUTION
Faulty installation If you change the default values in the BIOS setup or if you turn off the device during installation, you disrupt the installation and the operating system is not installed correctly. The operating safety of the device and the plant is at risk. Do not switch off the device during the entire installation process. Do not change the default values in the BIOS setup.

Procedure

1. Press the on/off button.

   The green POWER LED lights up. The module carries out a self-test. During the self-test, the following message appears:

   ```
   Press <F2> to go to Setup Utility

   Press <F12> to go to Boot Manager
   ```

2. Wait for the message to disappear.
3. Follow the instructions on the screen.

4. Make the region and language settings.

   If you want your system language to be international, select English. You can find information on retroactively changing the regional and language settings in the chapter "Setting up the language selection by means of the Multilanguage User Interface (MUI) (Page 85)".

   Note

   Once the operating system has been set up, the device may restart.

5. Type in the product key as required.

   The product key is located on the "Certificate of Authentication", in the "Product Key" line.

Result

The interface of the operating system is displayed every time you turn on the device and after the startup routine.

Warning from the Windows Security Center

A warning from the Windows Security Center is displayed the first time you switch on your device. The Security Center checks the status of the device in regard to the three important security aspects listed below. If a problem is detected (an outdated antivirus program, for example), the Security Center issues a warning and makes recommendations on how you can better protect the device.

- **Firewall**: The Windows Firewall adds protection to the device by blocking network or Internet access to the device by unauthorized users. Windows checks if the device is protected by a software firewall.
  The firewall is enabled by default in the factory state.
- **Antivirus software**: Antivirus programs add protection to the device by searching for and eliminating viruses and other security threats. Windows checks if a full-range, up-to-date antivirus program is running on the device.
  No antivirus software is installed in the factory state.
- **Automatic updates**: Using the Automatic Update feature allows Windows to regularly search for the latest critical updates for the device and to install them automatically. This feature is disabled in the factory state.
- **Real-time protection (Windows 7 only):** Windows Defender displays warnings if spyware or possibly unwanted software is installed or executed on the computer. You will also receive a warning if programs attempt to modify important Windows settings.

Configure the Security Center according to your requirements.

4.3 Information on optional features

4.3.1 DVD burner

The DVD burner drive is an optional feature for the device.

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. You can write to CD-R, CD-RW, DVD+R, DVD-R, DVD-RW, DVD+RW, DVD-RAM and dual-layer media.

Burner software

Depending on the operating system, you need to install additional software (burner software) to use the full functionality of the DVD burner. 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 disks should be inserted in the drive. This is because disks with errors can interrupt the automatic hard drive recognition. This makes it impossible to correctly display the possible burner functions.

Notes on burning optical disks

Burner operation is only permitted in an environment free of shock and vibration.

NOTICE
Danger of data errors when burning disks It cannot be ruled out that the smallest vibrations in the environment and varying quality of raw discs could result in data errors when burning data media, even when no error message occurs. Data comparison is the only guarantee that data has been written correctly. Perform data comparison each time you burn a disc.

4.3.2 Removable hard disks

The removable racks support hot plugging in connection with RAID1 or RAID5 during operation. If, however, you have configured a non-RAID system, you need to turn off the device before replacing it.

⚠ CAUTION

Damage to the hard disk

If you replace an active hard disk, the hard disk and data are corrupted.

The device can no longer be operated without problems.

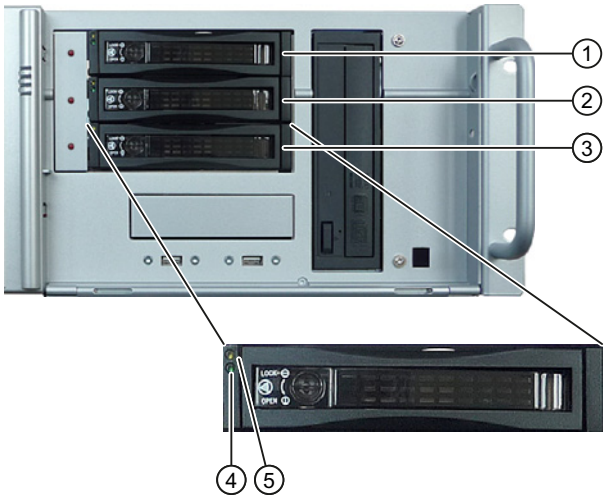
Replace the hard disk in the removable rack only if the HDD activity display of the device is not lit up. Observe the ESD guidelines (Page 91). Always replace the faulty drive with a new drive of the same type and capacity.

NOTICE

Always lock the hard disk cartridge in the removable rack to ensure reliable operation of the device.

Determining a defective hard disk in the RAID system

The following figure shows a RAID5 system with three hard disks in removable racks and a RAID1 system with two hard disks in removable racks and SSD. An HDD alarm LED is located left of each hard disk in the removable rack.



① Removable rack 0

② Removable rack 1

③ Removable rack 2

④ Power LED; power supply applied

⑤ HDD status display

The table below shows the assignment of the removable rack positions in the device to the RAID system reports:

Status display [1]	RAID BIOS	RAID software	SATA interface	Installation location	Housing labeling [2]
HDD0 alarm	Port 0	Device port 0	SATA0	Removable rack 0	0
HDD1 alarm	Port 1	Device port 1	SATA1	Removable rack 1	1
HDD2 alarm	Port 2	Device port 2	SATA2	Removable rack 2	2

1 If the hard disk is defective and the SIMATIC monitoring software is installed, the LEDs light up individually or simultaneously.

2 A label with the housing details is attached to the hinged front panel.

Procedure

Proceed as follows:

1. Determine which hard disk the RAID controller has reported as being faulty (hard disk at port 0, 1 or 2, see "Identifying a defective hard drive" above).
2. Remove the drive from the removable rack (see "Expansions and parameter assignment", section "Installing drives or removable racks (Page 62)").
3. Always replace the defective disk with a new one of the same type and capacity. Take care not to touch the contacts.
4. Reinstall the drive in the removable rack.

Information about the recovery of the RAID system is available in the chapter "RAID System (Page 42)".

4.3.3 System with two hard disks

The system with two hard disks is an optional feature for the device.

When the device ships, the second hard disk is connected to SATA port 1. This hard disk drive is not set up. This gives you the option of backing up your data to this hard disk. For information on hard disk capacities, refer to your order documentation.

Booting from the slave hard disk

In order to allow booting from the second hard disk, you need to configure it as the primary boot device.

Procedure

1. Select "Boot > Hard Drive > <Drive name> e.g. STxxxxxxxxx- SATA1".
2. Press the "+" key and move the entry upward in the boot sequence.

Note

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

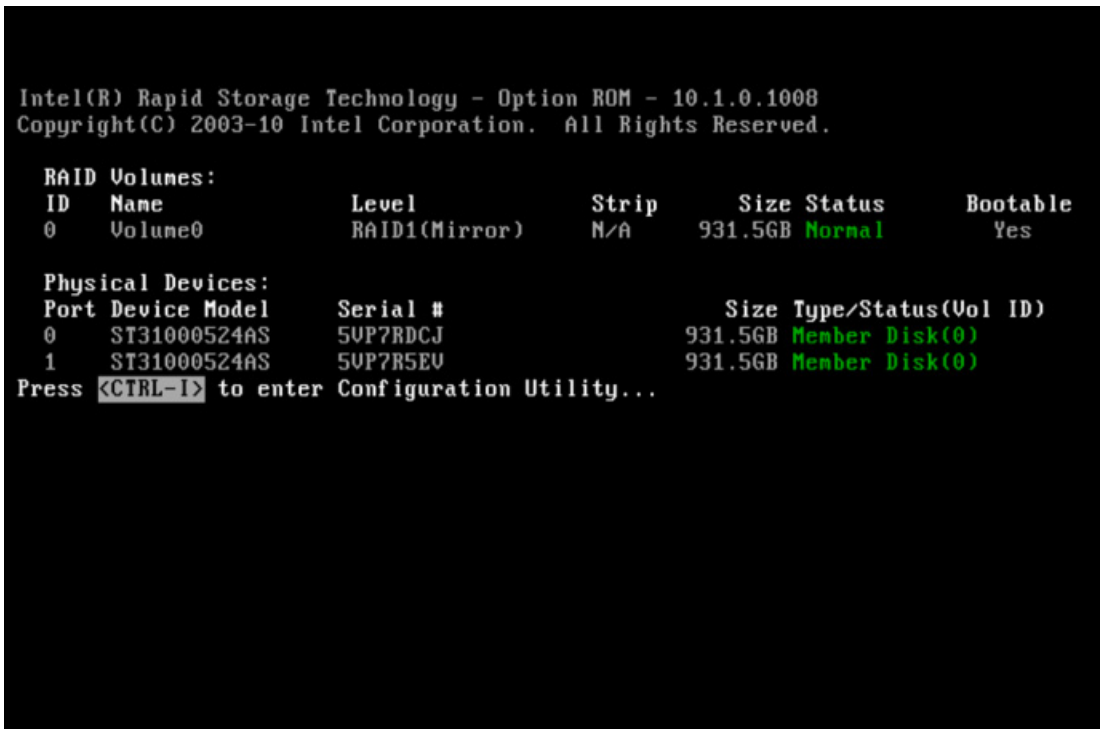
4.3.4 RAID system

4.3.4.1 RAID1 system

This is a RAID1 system configuration (data mirroring with two hard disks). This means that if there is a defective hard disk or there are cable problems, the system can continue to operate in one channel achieving a high degree of system availability.

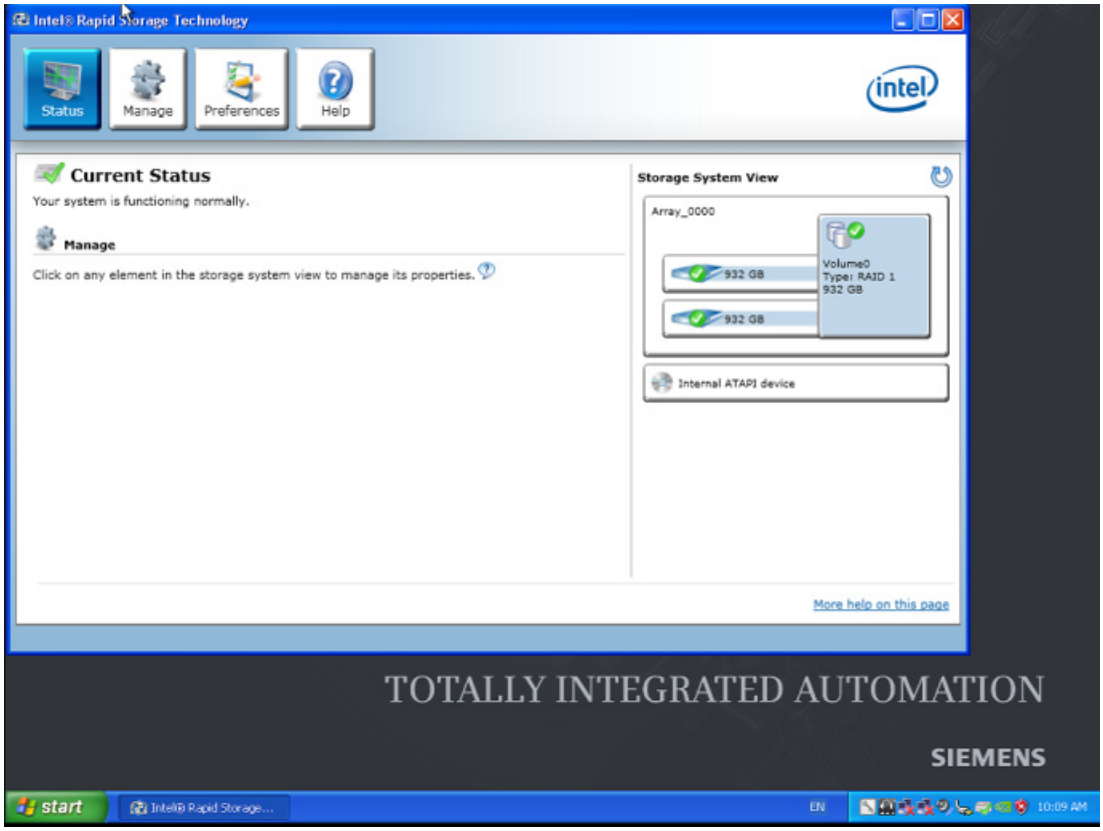
Note

You will find information about the Intel RAID controller in the RAID documentation in the "Drivers\RAID\Intel" directory on the "Documentation and Drivers" DVD that ships with the product.



Functions for managing the RAID system

The pre-installed RAID system software offers enhanced functionality for RAID system operation and management. You start the software with "Start > Programs > Intel Rapid Storage Technology".



The "Manage -> Advanced" command returns details of the RAID system.

Use the "Help > System Report > Save" command to create a report with details of the RAID system.

NOTICE
By default, the status of the RAID system is displayed in the Windows Event Viewer and in a log file of the program. If an error occurs, a hard disk drive can be synchronized at the operating system level. It may take a very long time (hours or even days in the case of a high hard disk load) to synchronize a new hard disk in the background, depending on its size and on the system load. The redundant system state RAID 1 is reached again only after synchronization is completed.

Comments about faults

NOTICE
Input delay The data is synchronized during a drive failure. Depending on the work load of the processor and hard disks, the system may react with some delay. Execution of keyboard, mouse or touch screen commands may be briefly delayed in extreme situations. This could result in operator errors on the machine or plant. Do not operate safety-critical functions during a drive failure.

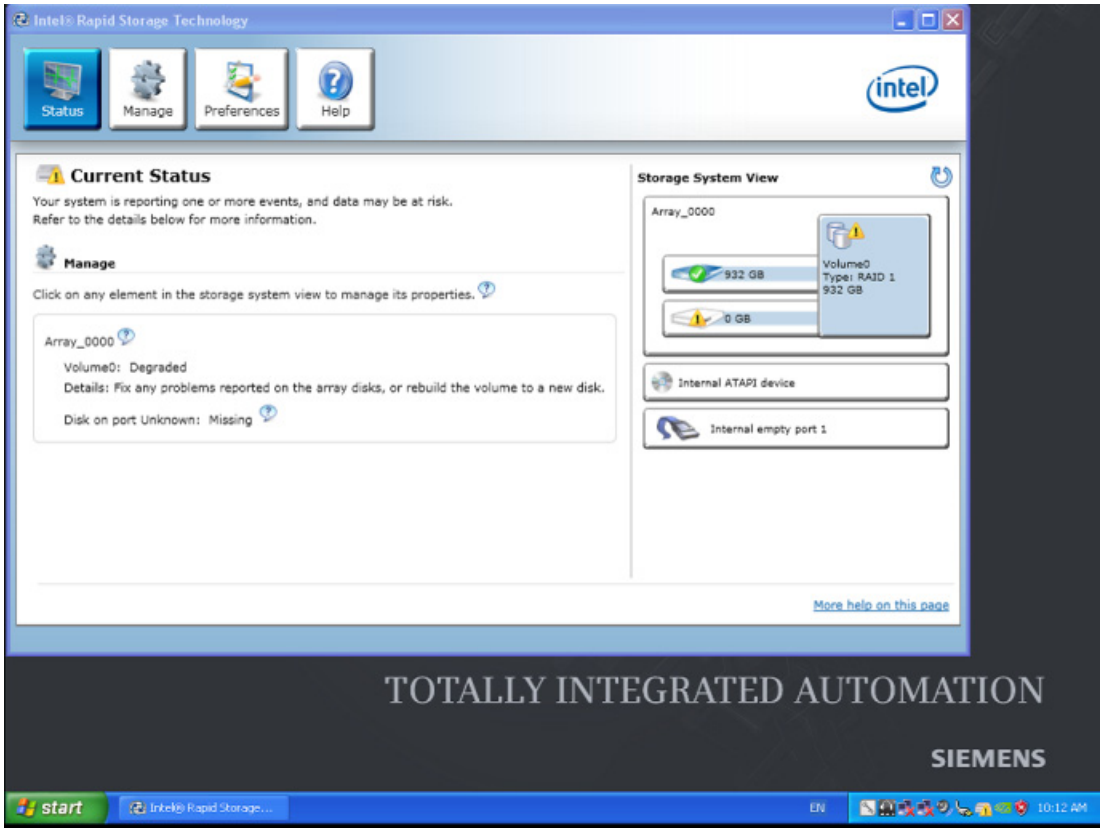
Replacing a faulty drive in a RAID system

Replace faulty RAID drives with a new drive in order to recover secure RAID1 state.

The RAID software indicates the following:

- A defective drive
- Details of the functioning hard disk.

  The functioning hard disk is indicated by BIOS with its port number or by the RAID software with its device port number.



Note

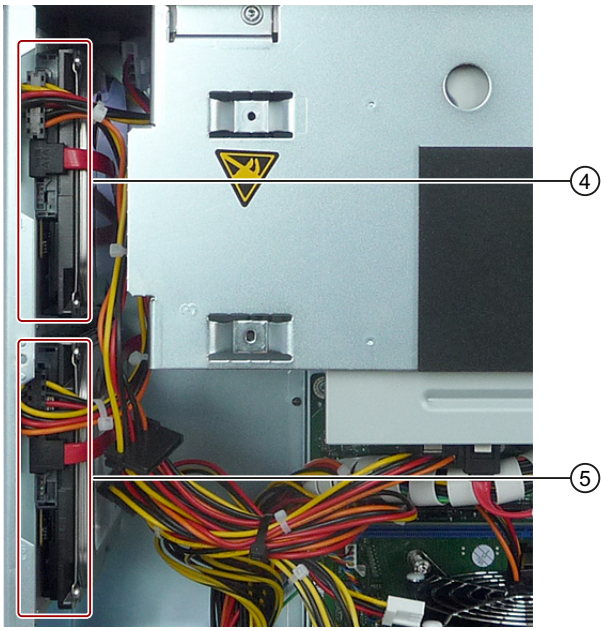
The following figures and notes apply only to the delivery state of the device, assuming that no changes or expansions have been made.

Installation location

The following figure shows a RAID1 system with two hard disks in the removable rack and SSD.



① Hard disk in removable rack
② Hard disk in removable rack
③ SSD in removable rack



④ Hard disk on side panel
⑤ Hard disk on side panel

LED	RAID BIOS	RAID software	SATA connection on the motherboard	Installation location	Enclosure labeling
HDD0 alarm	Port 0	Device port 0	SATA0	Removable rack ①	0
HDD1 alarm	Port 1	Device port 1	SATA1	Removable rack ②	1
HDD2 alarm	Port 2	Device port 2	SATA2	Removable rack ③	2
-	Port 0	Device port 0	SATA0	Side wall ④	0
-	Port 1	Device port 1	SATA1	Side wall ⑤	1

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

NOTICE
Hot swapping In devices with removable rack, you can replace the drive without turning off the device. Replacement in devices without a removable rack may only take place when the device is turned off. The new hard disk can be integrated into the RAID system at operating system level with the RAID software. Synchronization may take several hours, depending on system load.

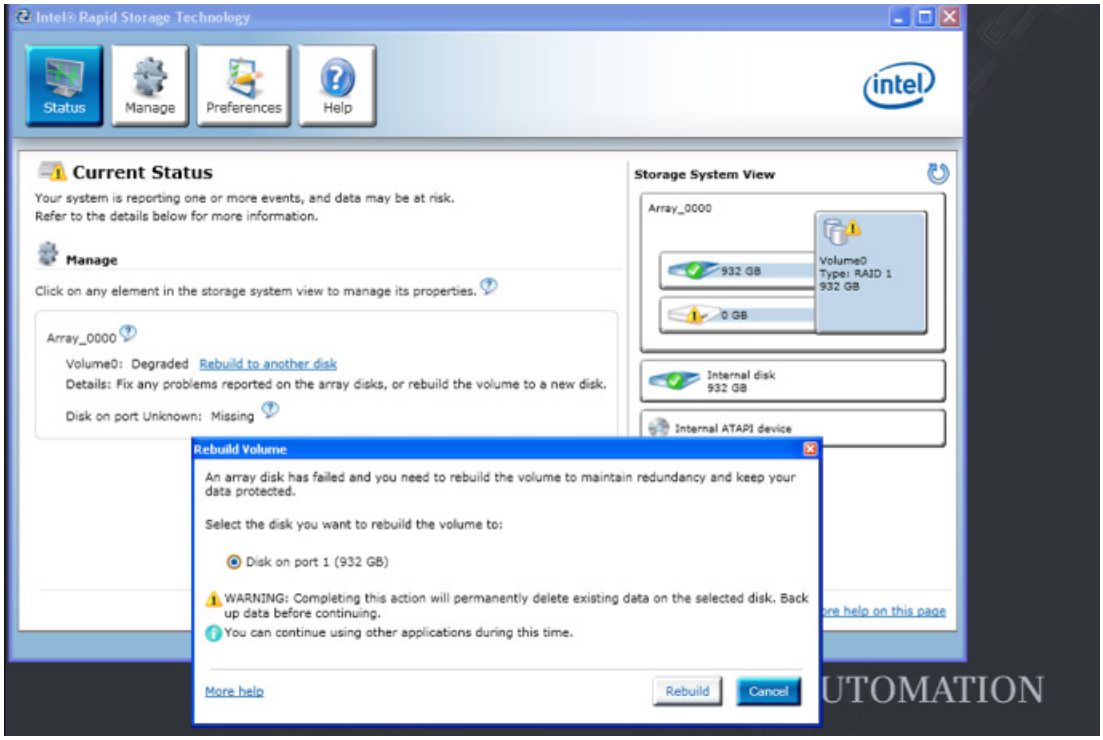
Points to note if the hard disk is replaced when the computer is turned off

Only a hard disk that was active and functioning correctly when you booted can later be included in the RAID system.

To be able to boot from the RAID system, you must place this first in the list of bootable sources in the BIOS "Boot" setup menu. Otherwise, the system will boot from the hard disk you have just installed and the message "Operating system not found" will be displayed.

Integrating a new hard drive

Use the symbol "Run Hardware Scan now " to search for and display the new hard disk. You can also choose to reboot the device. In this case, the RAID software automatically integrates the new HDD. The "Rebuild to another Disk" link synchronizes the RAID system.



If you shut down and restart the system without installing a functioning new hard disk, "unused" is displayed for the corresponding SATA port. In this case, you will need to shut down the system again and boot with the functioning hard disk. The new hard disk is then assigned to a SATA port and can be included in the RAID system. The "Rebuild to another Disk" command initiates synchronization of the RAID1 system.

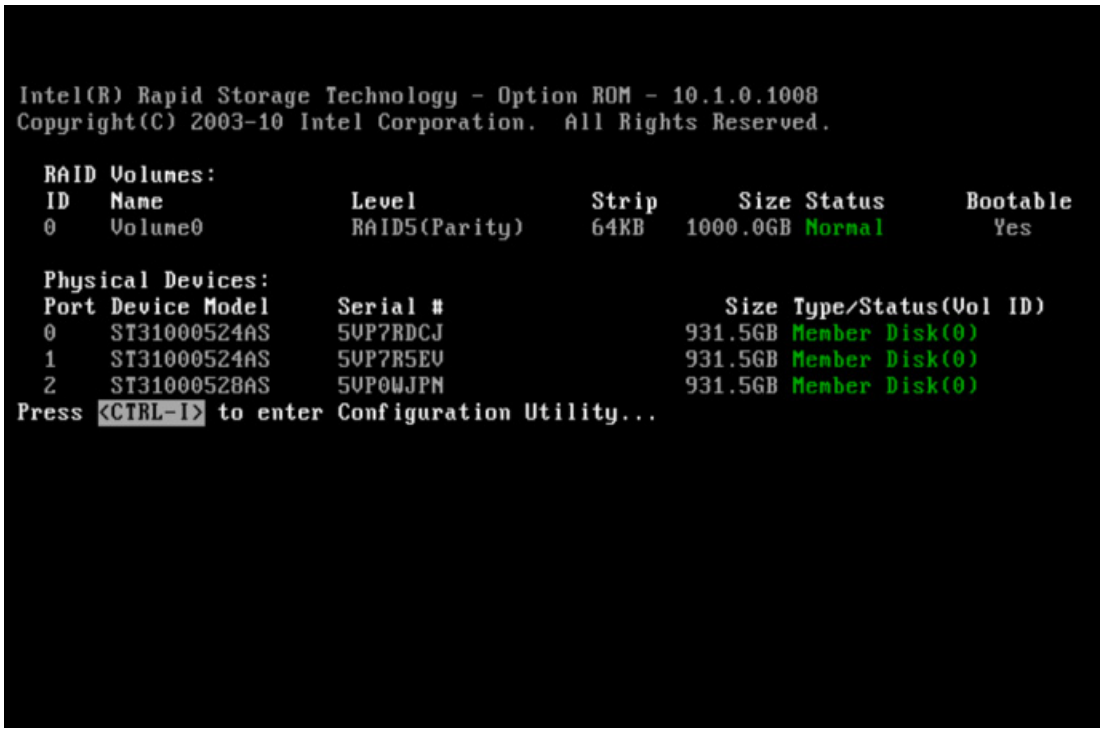
A defective drive is still displayed during the rebuilding process. This drive disappears from the display when the rebuild process is complete.

4.3.4.2 RAID5 system

This is a RAID5 system configuration (striping with parity). This means that if there is a defective hard disk or there are cable problems, the system can continue to operate in one channel achieving a high degree of system availability.

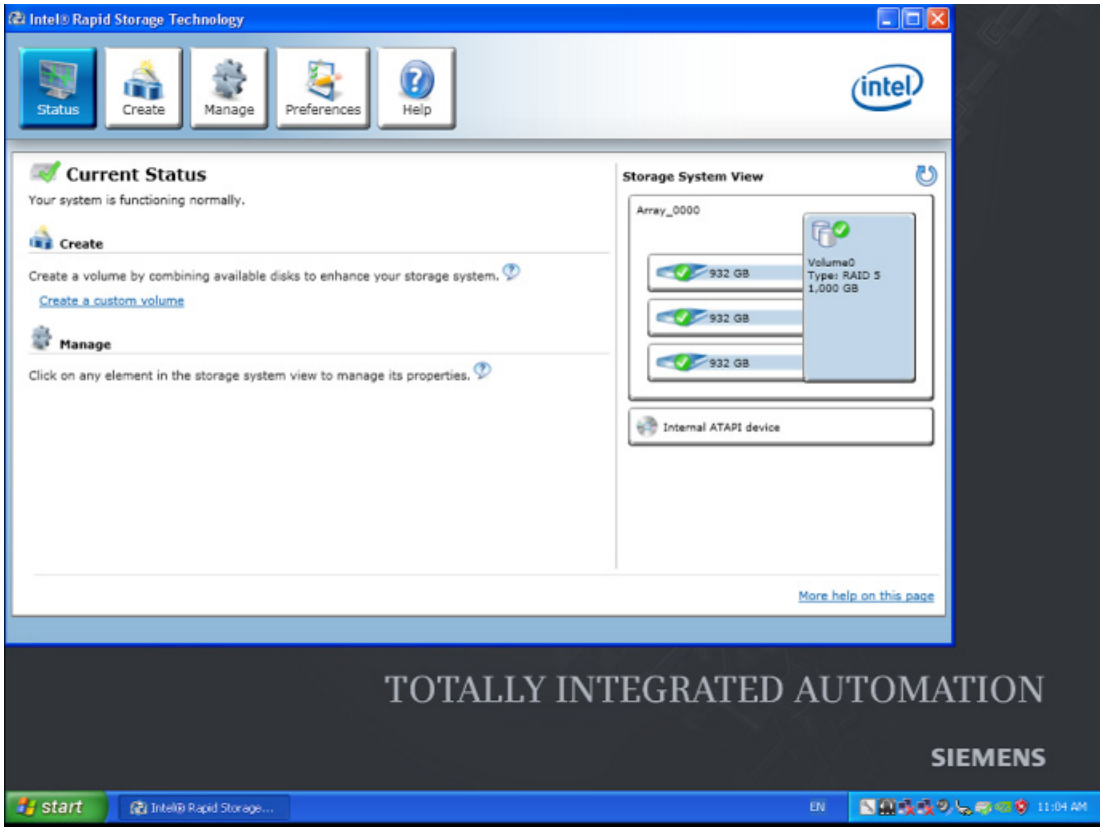
Note

You will find information about the Intel RAID controller in the RAID documentation in the "Drivers\RAID\Intel" directory on the "Documentation and Drivers" DVD that ships with the product.



Functions for managing the RAID system

The pre-installed RAID system software offers enhanced functionality for RAID system operation and management. You start it with "Start > Programs > Intel Matrix Storage Manager".



The "View -> Advanced Mode" command returns details of the RAID system.

The "View -> System Report" command can be used to create a report with details of the RAID system.

NOTICE
By default, the entries of the RAID status take place in the Windows Event Viewer and in a log file of the program. If an error occurs, a hard disk drive can be synchronized at the operating system level. If the new hard disk is synchronized in the background, this may take several hours, depending on the size of the disk and the system load. The redundant system state RAID Level 5 is only recovered if synchronization has been successfully 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 touch screen may be delayed for a brief period.

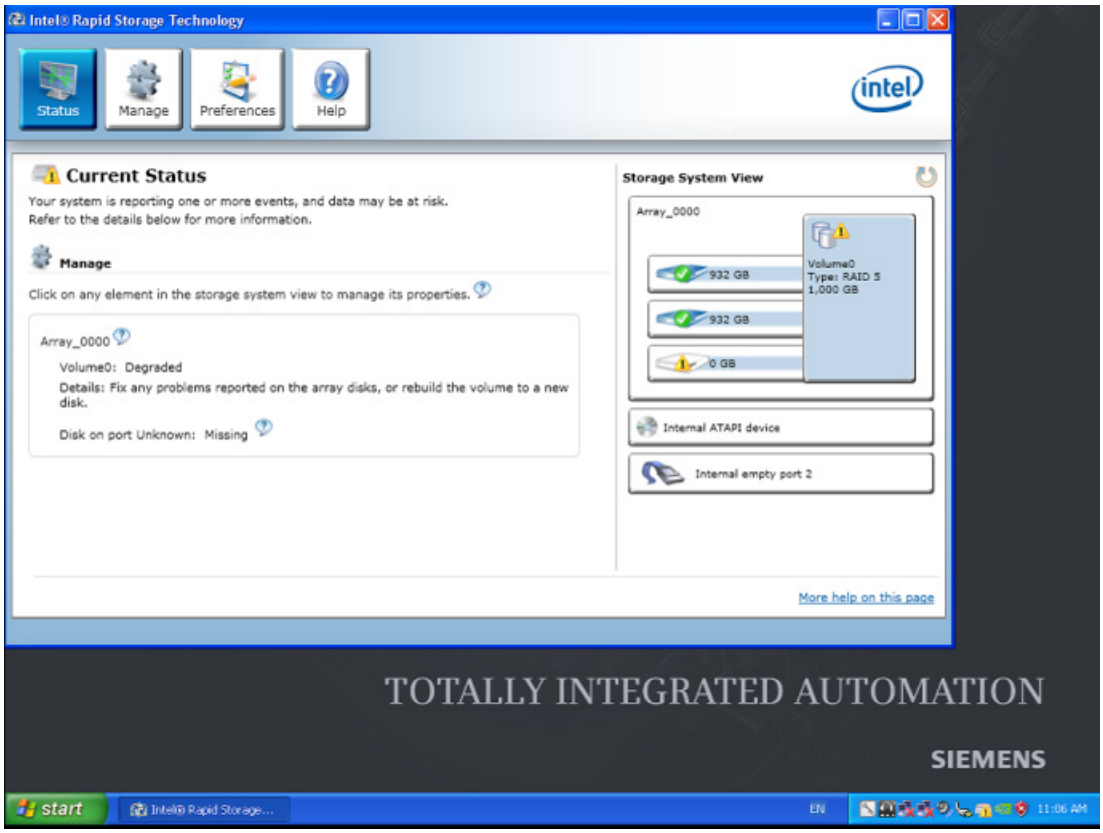
Replacing a faulty drive in a RAID system

Replace faulty drive with a new drive in order to recover secure RAID5 state.

The RAID software indicates the following:

- A defective drive
- Details of the functioning hard disk

  The functioning hard disk is indicated by BIOS with its port number or by the RAID software with its device port number.



Note

The following figure and notes apply only to the delivery state of the device, assuming that no changes or expansions have been made.

A RAID5 system, in contrast to a RAID1 system, is available only with hard disks in the removable rack.



LED	RAID BIOS	RAID software	SATA connection on the motherboard	Installation location	Enclosure labeling
HDD0 alarm	Port 0	Device port 0	SATA0	Removable rack ①	0
HDD1 alarm	Port 1	Device port 1	SATA1	Removable rack ②	1
HDD2 alarm	Port 2	Device port 2	SATA2	Removable rack ③	2

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

NOTICE

Hot swapping

In devices with removable rack, you can replace the drive without turning off the device.

Replacement in devices without a removable rack may only take place when the device is turned off.

The new hard disk can be integrated into the RAID system at operating system level with the RAID software. This is not possible at BIOS level.

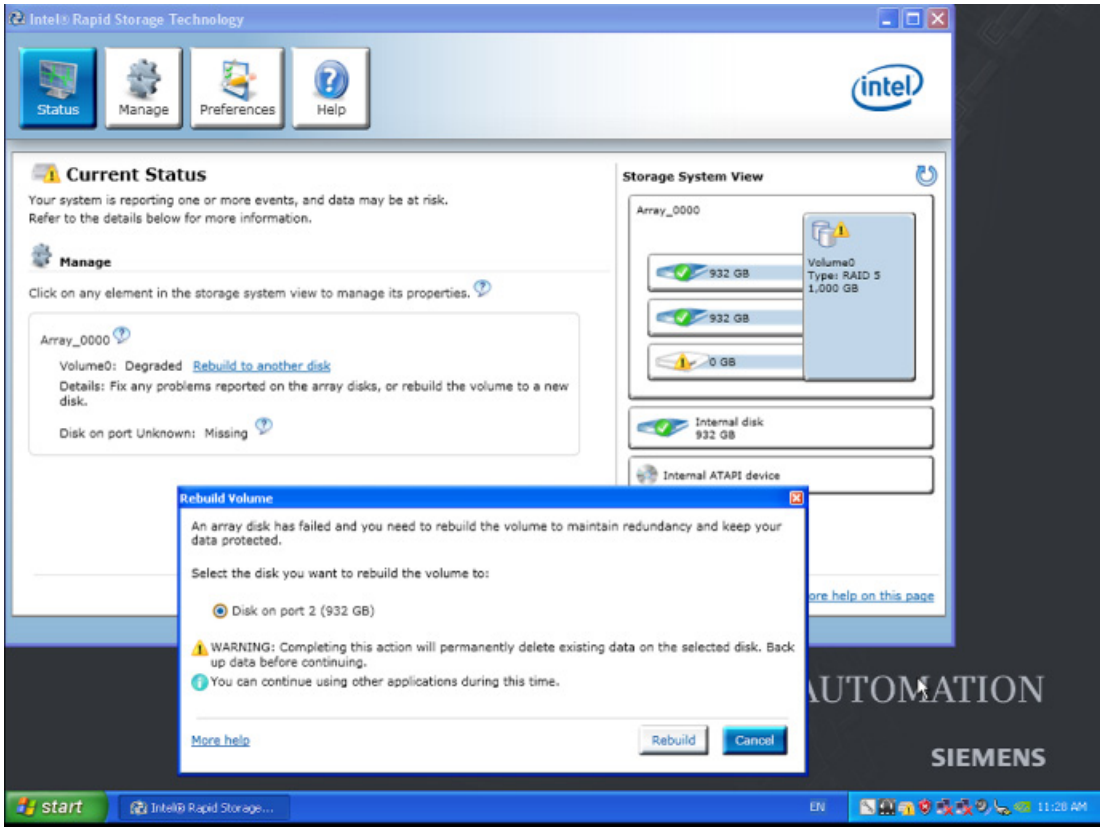
Points to note if the hard disk is replaced when the computer is turned off

Only a hard disk that was active and functioning correctly when you booted can later be included in the RAID system.

To be able to boot from the RAID system, you must place this first in the list of bootable sources in the BIOS "Boot" setup menu. Otherwise, the system will boot from the hard disk you have just installed and the message "Operating system not found" will be displayed.

Integrating a new hard drive

Use the symbol "Run Hardware Scan now " to search for and display the new hard disk. You can also choose to reboot the device. In this case, the RAID software automatically integrates the new HDD. The "Rebuild to another Disk" link synchronizes the RAID system.



If you shut down and restart the system without installing a functioning new hard disk, "unused" is displayed for the corresponding SATA port. In this case, you will need to shut down the system again and boot with the functioning hard disk. The new hard disk is then assigned to a SATA port and can be included in the RAID system. The "Rebuild to another Disk" link initiates synchronization of the RAID1 system.

A defective drive is still displayed during the rebuilding process. This drive disappears from the display when the rebuild process is complete.

4.4 Switching off the device

- If you work with Windows, always shut down the PC by clicking "Start > Shut down".
- If you do not work with Windows, press the on/off button for 4 seconds.

  The green POWER LED goes out.

If the device will not be used for a long period time, turn the on/off switch on the power supply unit to "0".

Disconnect the mains connector to isolate the device from mains.

Extended device functions

5

5.1 Overview of the monitoring functions

The device comes equipped with monitoring functions, even in the basic version. The following functions are available for displaying, monitoring and controlling when the appropriate software in installed:

- Temperature monitoring (over-temperature, under-temperature or cable break at a temperature sensor)
- Fan monitoring (fan speed too low, fan failure, or a break in a tachometer line)
- Monitoring of hard disks with S.M.A.R.T functionality even in a RAID system
- Watchdog (hardware or software reset of the computer)
- Operating hours meter (information on the cumulative run time)
- Battery monitoring (charge level of the CMOS battery is displayed)
- AMT (Active Management Technology)

SIMATIC IPC DiagBase software

Use the functions of the SIMATIC IPC DiagBase software, which is provided in the scope of delivery, for local monitoring. Use the "DiagBase Management Explorer" application for clear control. Use the DiagBase Alarm Manager to receive notifications about individual alarms.

Note

Additional information on the functionality of the SIMATIC IPC DiagBase software is available in the online help.

SIMATIC IPC DiagMonitor software

The SIMATIC IPC DiagMonitor software is available on CD (not included in the product package). This monitoring software includes:

- The software for the stations to be monitored.
- A library for creating user-specific applications.

5.2 Temperature monitoring and temperature display

The temperature is detected at critical device locations by temperature sensors. A temperature sensor monitors the processor temperature. Other temperature sensors monitor further critical points.

If the device is being operated close to its limits, the "TEMP" LED flashes.
If a temperature value exceeds the configured temperature threshold, the following error reactions are triggered:

Reaction
The "TEMP" LED lights up red
Device fan to maximum speed (power supply fans are regulated by the power supply itself)
The SIMATIC monitoring software is activated, if installed

Note

When the device is operated according to instructions, no temperature error occurs.

In the event of a temperature error, check the following possible causes:

- Ventilation openings are covered
- Filter is heavily polluted
- Fan has failed
- The ambient temperature is above the permitted value
- Output power of the power supply is exceeded

The temperature error remains stored until the temperatures drop below the temperature thresholds once again. You can reset the temperature error with one of the following measures:

- Acknowledgment of the error message by the monitoring software
- Short-term disconnection of the device from the power supply

5.3 Fan monitoring

The operation of the front, CPU and power supply fans is monitored.

If a fan fails, the following reactions are triggered:

Reaction
The "FAN" LED lights up red
The SIMATIC monitoring software is activated, if installed.

The fan error remains stored until the cause of the fan failure has been rectified. You can reset the error message with one of the following measures:

- Acknowledgment of the error message with the DiagBase or DiagMonitor software.
- Restart the device.

5.4 Watchdog (WD)

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

The watchdog can only be activated using the monitoring software. The watchdog is idle when the device is switched on or after a HW RESET (cold restart), which means that no reaction of the watchdog is triggered. If the watchdog is activated and was not retriggered by the monitoring software within the set time, a watchdog alarm is triggered.

5.5 Battery monitoring

The installed backup battery has a limited service life, see chapter "Replacing the backup battery (Page 70)". Two-tier battery monitoring checks the status of the backup battery. The SIMATIC DiagBase and SIMATIC DiagMonitor diagnostic software determines the status of the backup battery.

When the first warning level is reached, the battery for buffering CMOS data still has a remaining service life of at least one month.

5.6 Active Management Technology (AMT)

AMT (Active Management Technology) is technology for the remote maintenance of computers (simply called AMT-PC in the remainder of the document) and it includes the following functions:

- Keyboard–Video–Mouse (KVM) redirection: Using KVM that is integrated in the AMT hardware you access the AMT PC remotely. With KVM, you can also control AMT PCs that have no or a defective operating system. A KVM remote session is always possible with the KVM server integrated in the firmware. This means you can restart the PC and change the BIOS setup remotely.
- Remote power management: AMT PCs can be turned on and off and restarted from another PC.
- SOL (Serial over LAN): Redirection of the data of a serial interface to the network. The main use of the function is text-based remote control of an AMT PC using a console.

- IDE redirection: An ISO file on the help desk PC can be mounted on the AMT PC and used as a DVD drive.

  An ISO file contains a memory image of the content of a CD or DVD structured in the ISO 9660 format.
- Remote reboot: An AMT PC can be booted from a bootable ISO file made available by another PC.

SIMATIC IPC Remote Manager

The "SIMATIC IPC Remote Manager" software is available for utilization of the AMT functions with SIMATIC IPCs. The software can be ordered from the Siemens online ordering system. For detailed information about "SIMATIC IPC Remote Manager", refer to the corresponding product documentation.

Typical areas of application and functions of the SIMATIC IPC Remote Manager:

- Remote maintenance of SIMATIC IPC with AMT, for example for service purposes in the case of a defective operating system or for adapting BIOS settings.
- Diagnostics without on-site use
- Convenient service: Access to AMT clients, such as headless systems, without additional hardware
- Resource management

Requirement

- A device with a Core i5 or Core i7 processor
- A functioning and configured management engine
- A functioning and configured Ethernet connection
- A help desk PC with a functioning and configured Ethernet connection for the full AMT functionality

Configuration of the AMT PC

You configure AMT using the BIOS setup and the MEBx (Management Engine BIOS Extension). MEBx is a BIOS extension for configuring AMT.

When the BIOS appears briefly during startup, press the <Ctrl+P> keyboard shortcut. The "MEBx" dialog opens.

See also

Technical specifications (Page 89)

Installing hardware expansions

6

6.1 Opening the device

CAUTION
Malfunctions and electric shock through repair
Improper repairs jeopardize operational reliability and damage the device.
The results are personal injuries and damage to the plant.
Take the following precautions: • Always disconnect the power plug before you open the device. • Close the device after every repair.

⚠ CAUTION
Electrostatic sensitive devices (ESD)
The device contains electronic components which are destroyed by electrostatic charges. This can result in malfunctions and damage to the machine or plant.
Therefore, make sure you take precautionary measures even when you open the device, for example, when opening device doors, device covers or the housing cover. For more information, refer to the chapter "ESD guidelines (Page 91)"

Limitation of Liability

All technical specifications and approvals apply only to expansions which are approved by the Siemens AG. We are not liable for functional limitations caused by the use of third-party devices or components.

Observe the installation instructions for the components. UL approval of the device only applies when UL-approved components are used according to their "Conditions of Acceptability".

Requirement

- The device is disconnected from the power network.
- All connection cables are unplugged.
- T10 screwdriver

Procedure



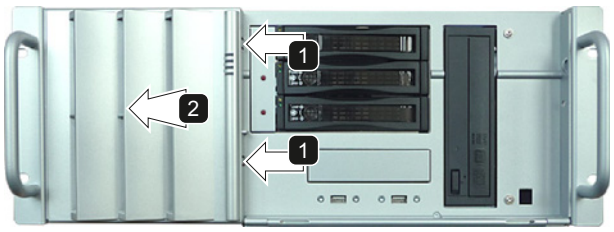
1. Remove the retaining screws ①.
2. Lift the cover from the back and remove it.
3. Open the front cover if necessary, see chapter Opening the front cover (Page 58).

6.2 Opening the front cover

Requirement

- The front panel cover is open.

Procedure



1. Press the marked hooks at the same time to release the front cover.
2. Move the front cover in the direction of the arrow.

6.3 Memory expansion

The motherboard is equipped with four slots for memory modules. Use the modules to expand the memory capacity of your device to a maximum of 32 GB. You can use approximately 3.2 GB of this memory in a 32-bit operating system and much more in a 64-bit operating system.

A detailed description of possible memory expansion options is available in the "Technical manual of the motherboard" on the "Documentation and Drivers" DVD that ships with the product.

6.4 Expansion modules

6.4.1 Notes on the modules

Note the following:

- Module specification

  The device is designed for use with modules conforming to PCI specification 2.3 and PCIe specification 1.0a (32-bit; 33 MHz, Rev. 2.3). 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 module dimensions are specified in the section Dimensional drawings for the installation of expansion modules (Page 94).

  Note

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

- Long PCI, PCIe modules

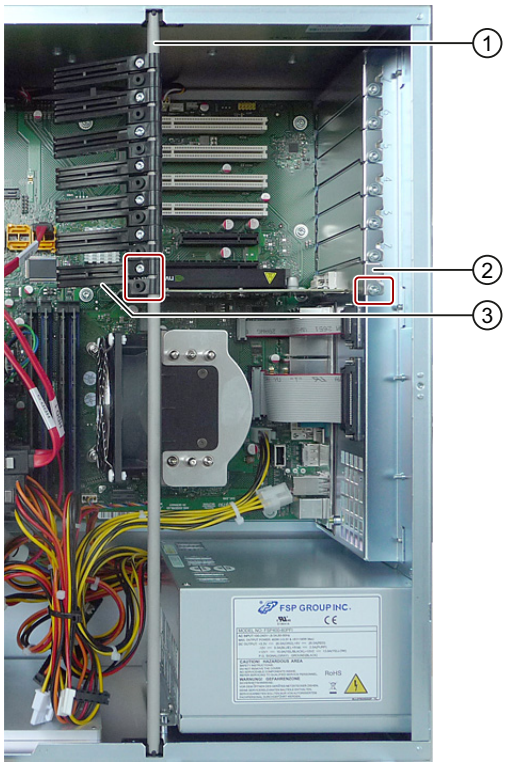
  To insert long modules into the guide rails, they must be equipped with an extender. The extender should be included in the product package for long modules.

6.4.2 Installing expansion modules

Requirement

- The device is disconnected from the power network.
- The device is opened.

Procedure



1. Hold the rod ① on both ends and pull it out with the module brackets facing up.
2. Remove the cover plate ② of the slot for the expansion module.
3. Insert the expansion module ② into the slot.
4. Secure the expansion module with the designated screw.
5. Install the rod with the module brackets.
6. Remove the bracket ③ and place it on the expansion module.
7. Secure the bracket with the designated screw.

   If you are installing a short expansion module, remove the locking screw from the retainer and install it in the opposite hole.
8. Close the device.

Note

The device comes with three long brackets for modules with low mounting height. Use the long brackets instead of the ones installed.

6.5 Disk drives

6.5.1 Installation options for drives

The drive module consists of horizontal slots and the vertical slot. A DVD-ROM, a DVD burner and a removable rack may be installed in the slots, depending on the order.



① Horizontal slots 5.25"
② Vertical slot

6.5.2 Removing the drive module

Requirement

- The device is disconnected from the power network.
- The device is opened.
- T10 screwdriver

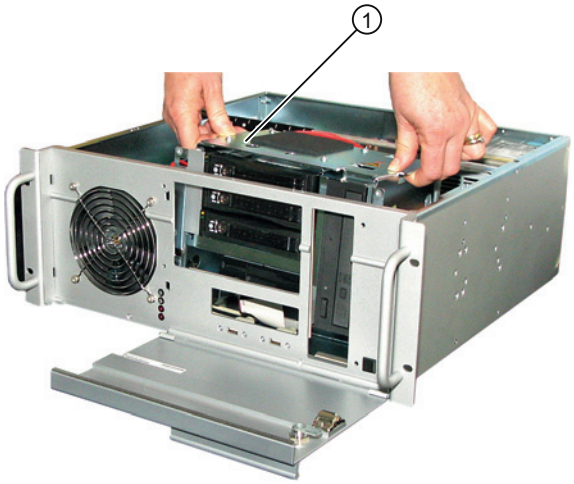
Procedure

1. Open the hinged front panel.
2. Open the front cover.
3. Remove the highlighted screws.



4. Remove the power supply and data cables from the drives.

5. Lift the drive module ① out of the device until you can access the cables.



6. Disconnect the connection cables.
7. Lift the drive module completely out of the device.

6.5.3 Installing drives or removable racks

Requirement

- The drive module has been removed.
- T10 screwdriver

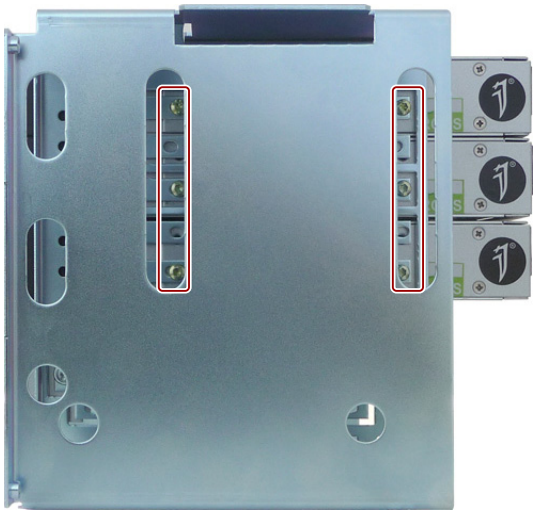
Procedure

1. If you are installing a 3.5" drive, attach two mounting brackets or a 3.5"/5.25" mounting rack for the drive.
2. Remove the drive in the vertical slot, if installed.

   The only way to get at the mounting screws on the right side of the drive is through the openings of the vertical slot.
3. Push the drive or the removable rack into the slot from the front.

4. Secure the drive or the removable rack to the slot with 4 screws.

   The screws to be installed on the right side of the slot for a maximum configuration are highlighted in the following figure.



5. Install the driver module again.
6. Connect the power and data cables to the drive.

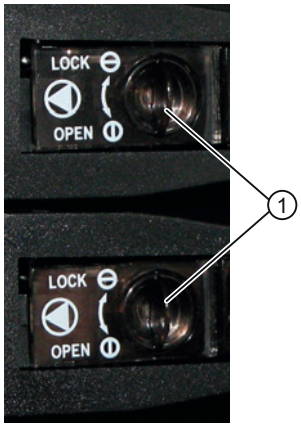
6.5.4 Removing and installing the drive from the removable rack

Requirement

- T10 screwdriver

Procedure - Removing drive from the removable rack

1. Turn the locking switch ① to the "OPEN" position.

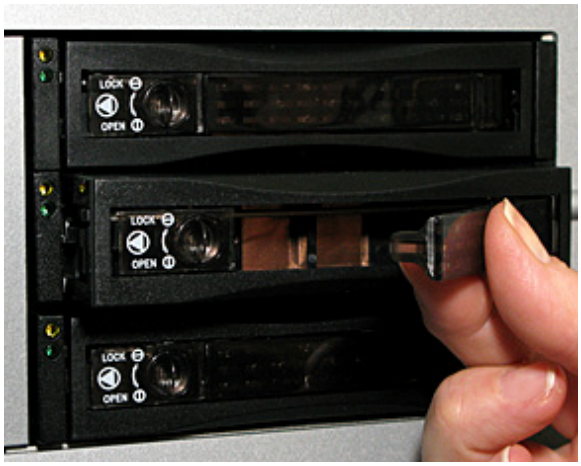


2. Press .

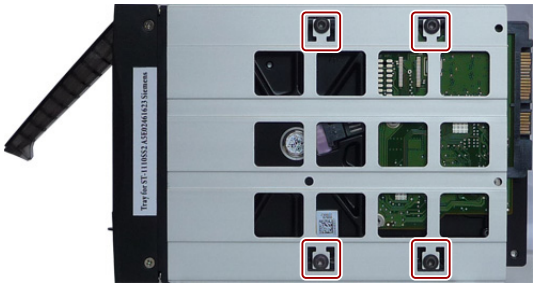


The lever of the hard disk drive cartridge opens.

3. Pull the lever out until you feel the hard disk cartridge release and then pull it out completely.



4. Loosen the four screws on the base of the hard disk cartridge.



5. Pull the drive out of the hard disk cartridge.

Procedure - Installing a drive in the removable rack

1. Carefully push the drive into the hard disk cartridge.

   Do not touch the contacts.

2. Secure the drive with the four screws on the base of the hard disk cartridge. Use only the original screws.

NOTICE
Damage to the hard disk cartridge You can damage the hard disk cartridge by closing the lever prematurely. Always slide the hard disk cartridge completely into the removable rack before you close the lever.

3. Close the lever of the hard disk cartridge again.



4. Return the locking switch to the "LOCK" position.

   An audible tone signals that the removable rack is locked into position.

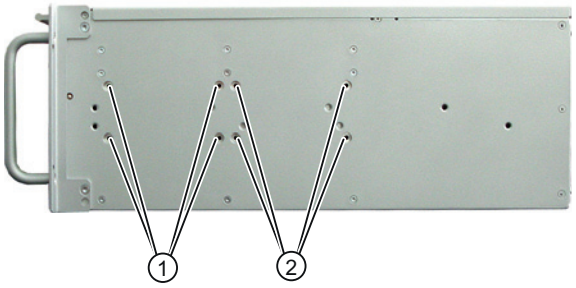
6.5.5 Removing and installing internal hard disks

Requirement

- The device is disconnected from the power network.
- The device is opened.

Procedure for removing the hard disk drive

1. Disconnect the power supply and data cables from the drive.
2. Loosen the four screws ① or ② on the drive bay plate and remove the drive from the housing.



Procedure for installing the hard disk drive

1. Place the drive onto the drive bay plate and secure the drive with four screws ① or ②.
2. Connect the power and data cables to the drive.

Device maintenance and repair 7

7.1 Removing and installing hardware components

7.1.1 Repair information

Carrying out repairs

Only qualified personnel are permitted to repair the device.

⚠ WARNING

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

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

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

⚠ CAUTION

Electrostatic sensitive devices (ESD)

The device contains electronic components which are destroyed by electrostatic charges. This can result in malfunctions and damage to the machine or plant.

Therefore, make sure you take precautionary measures even when you open the device, for example, when opening device doors, device covers or the housing cover. For more information, refer to the chapter "ESD guidelines (Page 91)"

Limitation of Liability

All technical specifications and approvals of the device only apply if you use expansion components that have a valid CE approval (CE mark). The installation instructions for expansion components in the associated documentation must be observed.

UL approval of the device only applies when the UL-approved components are used according to their "Conditions of Acceptability".

We are not liable for functional limitations caused by the use of third-party devices or components.

Tools

You can make all repairs on the device with the following tools:

- T20 screwdriver for
  - Device backplane
  - Device fan
  - PE terminal
- T10 screwdriver for all of the remaining screws
- Side cutter

7.1.2 Maintenance

To maintain high system availability, we recommend the preventative replacement of those PC components that are subject to wear in accordance with the intervals for replacement indicated in the table below.

Component	Replacement interval:
Drive	3 years
CMOS backup battery	5 years
Fan	3 years
Filter mat	Depending on the degree of soiling

To maintain high system availability, we recommend the preventative replacement of those PC components that are subject to wear in accordance with the intervals for replacement indicated in the table below.

7.1.3 Replacing filters

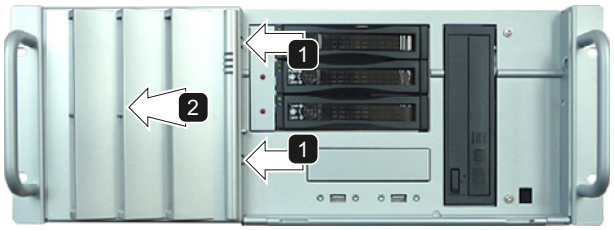
Requirement

- The device is disconnected from the power network
- The front panel cover is open
- A filter mat

  The order number is A5E02399219.

Procedure

1. Press the marked hooks at the same time to release the front cover.



2. Move the front cover in the direction of the arrow.
3. Remove the front panel.
4. Remove the filter from the front cover.

7.1.4 Removing the device fan

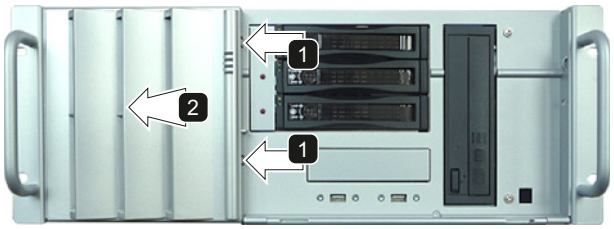
Requirement

- The device is disconnected from the power network
- The front panel cover is open
- T20 screwdriver
- A fan

  Use only a fan of the same type.

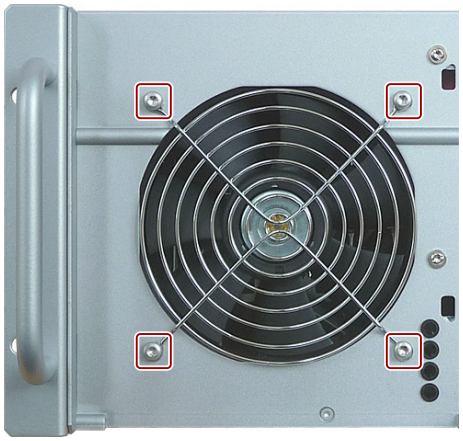
Procedure - Removing the fan

1. Press the marked hooks at the same time to release the front cover.



2. Move the front cover in the direction of the arrow.
3. Remove the front panel.
4. Open the housing cover.
5. Pull the fan plug from the motherboard.

6. Remove the highlighted screws.



7. Take the fan out of the enclosure.

Procedure - Installing the fan

To install the fan, follow the steps for removing it in reverse order. During installation, make sure that the arrow on the fan housing points away from the fan bracket.

7.1.5 Replacing the backup battery

Note before you replace the battery

Note

Batteries are wearing parts. Backup batteries should be replaced at intervals of 5 years in order to maintain PC functionality.

CAUTION
Risk of damage! The lithium battery may only be replaced with an identical battery or with a type recommended by the manufacturer. Information on original spare parts for SIMATIC IPCs is available at After sales information system from SIMATIC IPC (http://www.siemens.com/asis)

Disposal

CAUTION
Depleted batteries must be disposed of in accordance 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 setup settings with the SIMATIC IPC BIOS Manager.

Replacing the battery

The location of the backup battery on the motherboard and the procedure for replacing it is described in the "Technical manual of the motherboard" on the "Documentation and Drivers" DVD that ships with the product.

Reconfiguring the BIOS setup

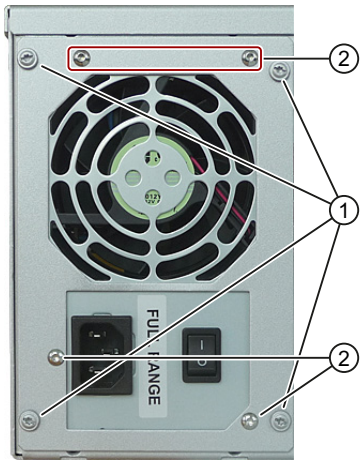
When a battery is replaced, the configuration data of the device is deleted and must be reconfigured in the BIOS setup.

7.1.6 Removing the power supply

Requirement

- The device is disconnected from the power network.
- The device is opened.
- All connection cables are unplugged
- T10 screwdriver

Procedure



1. Disconnect the power supply cables of the drives and the motherboard.
2. Remove the cable ties securing the power cables in the housing.
3. Remove the retaining screws ①.
4. Pull out the power supply of the housing from the back.
5. Remove the screws ②.

7.1.7 Removing module of the redundant power supply

Requirement

- The device is disconnected from the power network.
- All cables on the device are pulled out.
- T10 screwdriver

Procedure



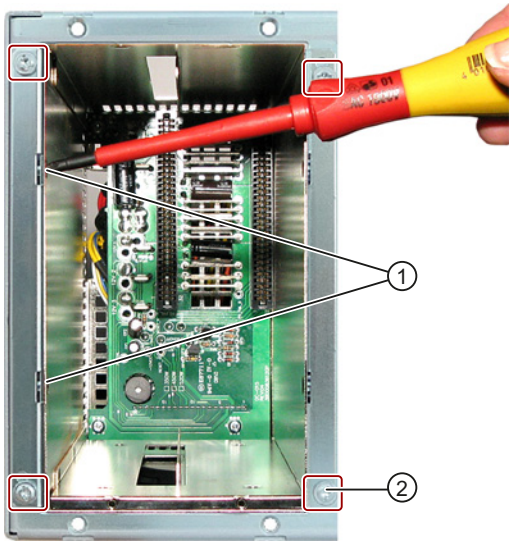
1. Remove the highlighted screws.
2. Pull out the power supply module from the housing using the handle.

7.1.8 Completely removing the redundant power supply

Requirement

- The device is disconnected from the power network.
- All cables on the device are pulled out.
- The device is opened.
- T10 screwdriver

Procedure



1. Remove the modules of the redundant power supply.
2. Remove the power supply cables for the drives and the motherboard from the housing of the redundant power supply.
3. Remove the cable ties securing the power cables in the housing.
4. Remove the screws ①.
5. Remove the highlighted screws ②.
6. Remove the housing of the redundant power supply from the device.

7.1.9 Removing the motherboard

Requirement

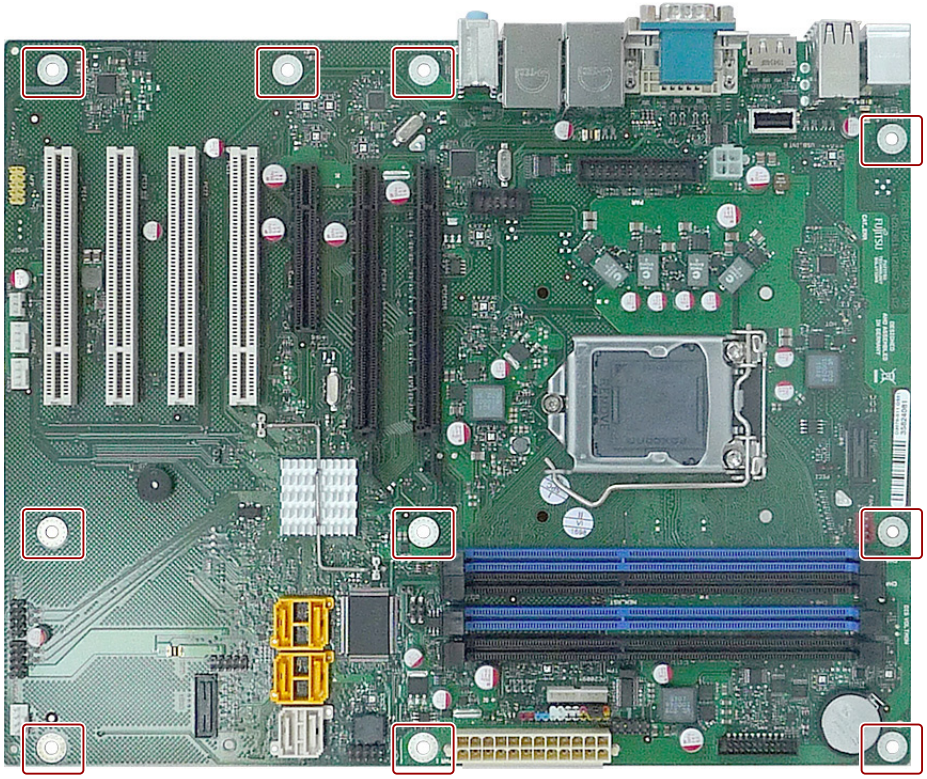
- The device is disconnected from the power network.
- The device is opened.
- A motherboard

  The motherboard as spare part is supplied without processor and memory modules.

Procedure

1. Remove the modules from the slots.
2. Note the assignment of all cables to the motherboard.

3. Disconnect all cables from the motherboard.
4. Remove the ten screws indicated in the following figure.



7.1.10 Replacing the processor

Requirement

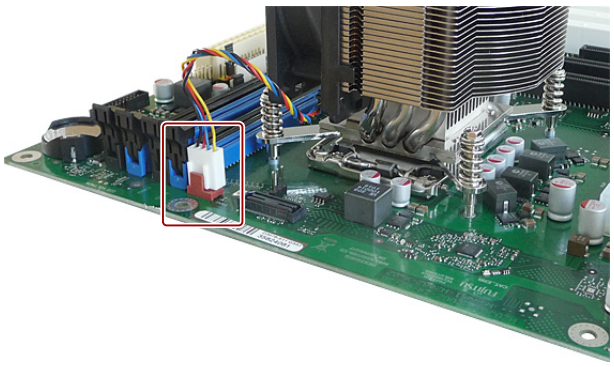
- The device is disconnected from the power network.
- The device is opened.
- A suitable processor

  Only an approved processor is permitted to be installed on the motherboard of the device. If the processor type is changed, the BIOS must be updated so that the suitable microcode is loaded. Information about original spare parts for SIMATIC IPCs is available on the Internet at:

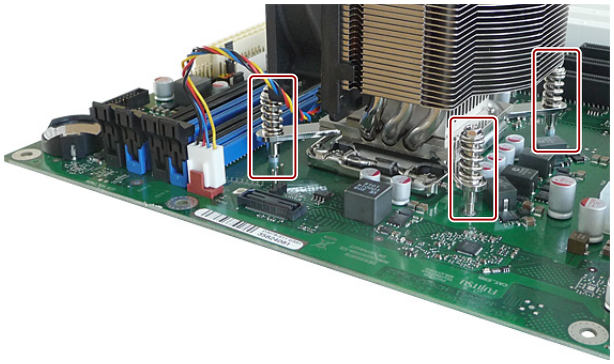
  – After sales information system from SIMATIC IPC (http://www.siemens.com/asis).
  – Contacts (http://www.siemens.com/automation/partner)

Procedure

1. Unlatch the fan rack on the heat sink and remove it.
2. Remove the highlighted fan connector.

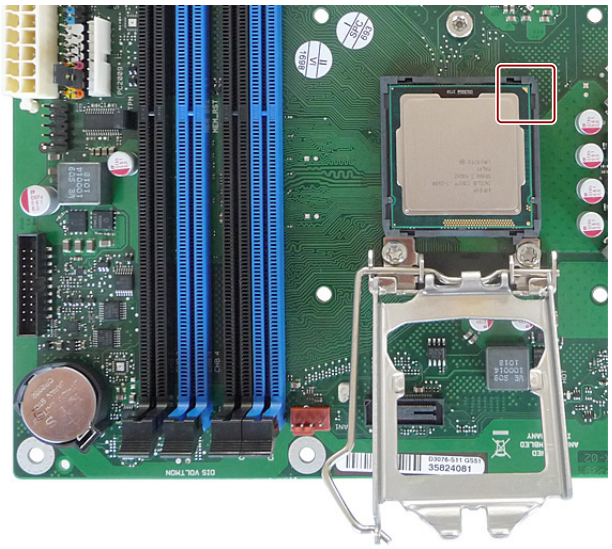


3. Remove the highlighted screws.



   The fourth screw is hidden by the heat sink in the figure.
4. Remove the heat sink.
5. Unlock the socket and lift the socket cover.

6. Remove the processor.
7. Install the new processor on the socket, as shown in the figure.



During positioning, make sure to take the highlighted arrow on the processor into consideration.

The next steps are available in the "Technical manual of the motherboard" on the "Documentation and Drivers" DVD shipped with the product.

Processor type and clock frequency

If you use a processor of a different type, perform a BIOS update. The microcode matching the processor is loaded in the process.

NOTICE
Damage to the processor due to high clock frequency If the installed processor is operated with a higher clock frequency than permitted, it can be destroyed or cause loss of data. Operate the processor only at a clock frequency that is equal to or less than the permitted clock frequency.

7.2 Installing the software

7.2.1 General installation procedure

If your software no longer functions correctly, you can reinstall it from either the Recovery DVD, the "Documentation and Drivers" DVD or the Restore DVD.

Recovery DVD:

The recovery DVD contains the installation program with tools for configuring the hard drives and installing the operating system and the languages supported by the operating system (MUI package).

The basic language of the installed operating system is English. To add other languages, install these languages from the Recovery DVD at a later time.

"Documentation and Drivers" DVD:

The "Documentation and Drivers" DVD contains the documentation and the hardware drivers.

Restore DVD:

The Restore DVD is included in the scope of delivery when you have ordered a device with operating system. The DVD contains a hard disk image file with the original software package: Operating system with installed hardware drivers and monitoring software, e.g. DiagBase.

7.2.2 Restoring the delivery state

You can restore the original factory software using the Restore DVD. The DVD contains the necessary images and tools for transferring the factory software to the hard disk of your device. Restoration of the entire hard disk with drive C: (system) and drive D: or only drive C: is possible. This allows you to retain any user data on drive D:.

Retrieving authorizations or license keys from the hard disk

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

CAUTION
If "Restore system partition only" is set all data on drive C: (system partition) will be deleted. All data, user settings and all authorizations or license keys on drive C: are lost! All data on drive C: of the hard disk will be deleted. Setup formats the hard disk and installs the original factory software. If "Restore entire hard disk" is set ALL data, user settings, authorizations or license keys will be lost on the hard disk.

Procedure

1. Insert the Restore DVD into the DVD drive.
2. Restart the device with the on/off button.
3. Press the <F12> key when the following BIOS message appears.

   ```
   Press <F2> to go to Setup Utility

   Press <F12> to go to Boot Manager
   ```

   The "Boot Menu" is displayed when initialization is completed.
4. Select the optical drive with your cursor keys which is identified with a "P" in front of the SATA port number.

   Example:

   ```
   P3 - OPTIARC DVD-ROM DDU1681S.
   ```
5. Follow the on-screen instructions.

CAUTION
All existing data, programs, user settings, authorizations and license keys on the drives will be deleted and are thereby lost.

7.2.3 Installing Windows

7.2.3.1 Installing Windows XP

Note

Specific information on the use of the Windows XP Professional operating system is available in the following manual (not included in the product package):

Microsoft Windows XP Professional, Technical Reference (MSPress No. 934)

Requirement

You need the recovery DVD for the Windows XP operating system. It is included in the product package.

If you use a storage controller that is unknown to the operating system, for example, RAID or AHCI controller, copy the corresponding controller driver to a 3.5 inch floppy disk and keep this driver disk at hand. If your device does not have 3.5 inch floppy disk drive, connect a USB floppy disk drive. The controller driver is required during installation.

You can create a driver disk for the onboard RAID or AHCI controllers with the "Documentation and Drivers" DVD. Additional information is available in the section Installation of drivers and software (Page 86).

Procedure

1. Insert the Recovery DVD into the DVD drive.
2. Restart the device with the on/off button.
3. Press the <F12> key when the following BIOS message appears.

   ```
   Press F2 to go to Setup Utility

   Press F12 to go to Boot Manager
   ```

   After initialization, a boot menu is displayed.
4. In the boot menu, select the optical drive using the cursor keys. It is identified by a "P" in front of the SATA port number.

   Example:

   ```
   P3 - OPTIARC DVD-ROM DDU1681S
   ```
5. Confirm the selection by pressing ENTER.
6. **Immediately** press any key when you see the following prompt to install the operating system from the Recovery DVD.

   ```
   Press any key to boot from CD ..
   ```

   The Windows XP installation program (blue screen) appears after a few seconds.
7. Follow the instructions of the Windows XP installation program. You can find additional information on this in the section: Windows XP installation program

Windows XP installation program

The language of the installation program and the Windows XP Professional operating system is preset to English. You can change the language of Windows XP Professional once you have installed it. You can find information on this in section: Setting up the language selection by means of the Multilanguage User Interface (MUI) (Page 85).

Setting up partitions and integrating storage controllers unknown to the operating system

During the installation, you can create partitions and integrate storage controllers needed for the installation which are unknown to the operating system. Follow the instructions of the Windows XP installation program for this purpose. More information on integrating storage controllers is available in the section: Information for systems with RAID or AHCI controller.

The recommended minimum size of the partition on which you want to install Windows XP varies depending on how much work memory and which additional software you want to use. Information on partitioning of the data medium in the delivery state is provided in the following table.

Partitions in the delivery state for Windows XP

Partition	Name	Size	File system
First	SYSTEM	40 GB	NTFS not compressed
Second	DATA	Remainder	NTFS not compressed

Procedure for systems with RAID or AHCI controller

Data carrier controllers that are unknown to the operating system must be made known to the operating system during installation. Proceed as follows:

1. Connect a USB floppy drive and insert the floppy disk with the controller driver.
2. Start the Windows installation process as described above.
3. To start installation of the storage controller, press the <F6> key at the start of the Windows setup program (blue screen).

   After a few seconds, a dialog for installation of the storage controllers appears.
4. Select the corresponding driver on the driver disk.

Note

Select the following drivers for the onboard RAID or AHCI controller:

- For AHCI controller: "Intel(R) Desktop/Workstation/Server Express Chipset SATA RAID Controller"
- For RAID controller: "Intel(R) Desktop/Workstation/Server Express Chipset SATA AHCI Controller"

7.2.3.2 Installation of Windows 7, Windows Server 2008 or Windows Server 2008 R2

Note

Specific information on using the Windows operating systems is available in the following manuals (not included in the product package):

- Windows 7 Technical Reference (MS Press No. 5913)
- Windows Server 2008 Technical Reference (MS Press No. 5919)

Requirement

You need the Recovery DVD for the operating system you want to install. It is included in the product package.

If you use storage controllers that are unknown to the operating system, for example a RAID or AHCI controller, copy the respective controller driver to a USB stick and keep this USB stick to hand. The controller driver is required during installation.

Procedure

1. Insert the Recovery DVD into the DVD drive.
2. Restart the device with the on/off button.
3. Press the <F12> key when the following BIOS message appears.

   ```
   Press F2 to go to Setup Ulility

   Press F12 to go to Boot Manager
   ```

   After initialization, a boot menu is displayed.
4. In the boot menu, select the optical drive using the cursor keys. It is identified by a "P" in front of the SATA port number.

   Example:

   ```
   P3 - OPTIARC DVD-ROM DDU1681S
   ```
5. Confirm the selection by pressing ENTER.
6. **Immediately** press any key when you see the following prompt to install the operating system from the Recovery DVD.

   ```
   Press any key to boot from CD or DVD ..
   ```

   After a few seconds, you will see the "Install Windows" installation program.
7. Now follow the instructions in the installation program. You can find additional information on this in the section: "Install Windows" installation program.

"Install Windows" installation program

The language of the installation program and the operating system you want to install has been preset to English. You can change the language of the operating system after the installation. You can find information on this in section: Setting up the language selection by means of the Multilanguage User Interface (MUI) (Page 85).

Setting up partitions and integrating storage controllers unknown to the operating system

You can set up partitions during the installation process and integrate storage controllers that are unknown to the operating system. To do so, select "Custom (advanced)" when prompted for the installation type in the "Install Windows" installation program.

The following dialog windows are then available:

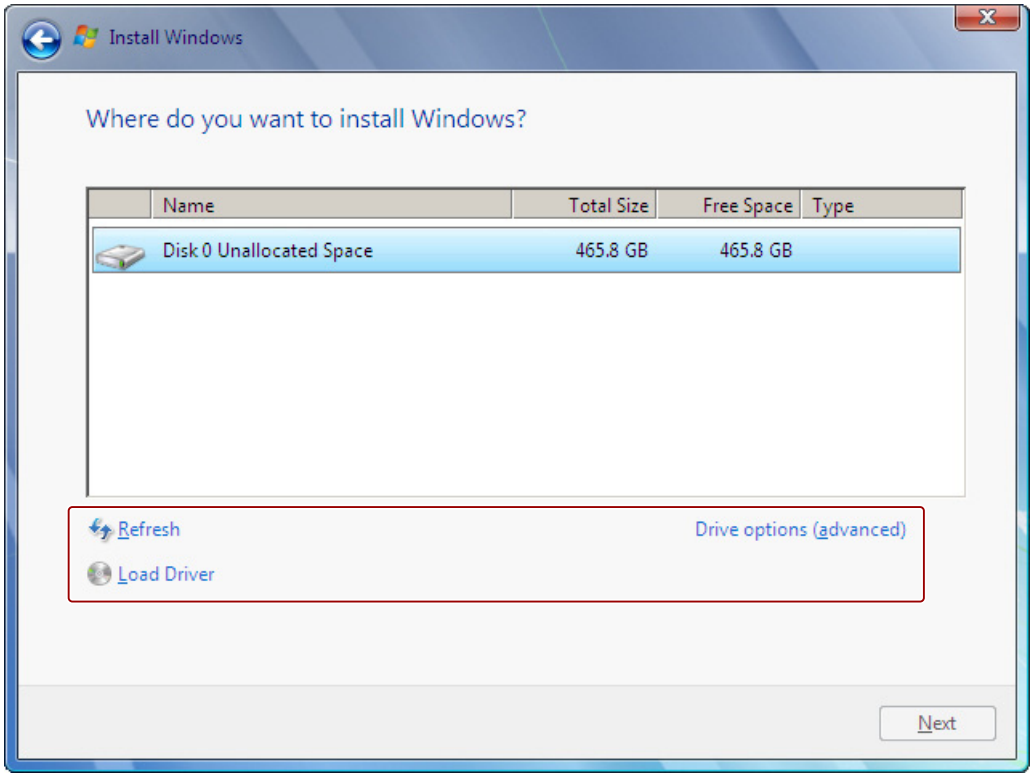


Figure 7-1 Example: Windows installation window

Refresh	Updating
Load Driver	Integration of controller drivers unknown to the operating system and required for installation. Please read the information in the section "Information for systems with RAID or AHCI controller".
Drive options (advanced)	For display of additional functions that you can use to set up the data medium, see figure "Windows installation window "Drive options (advanced)"".

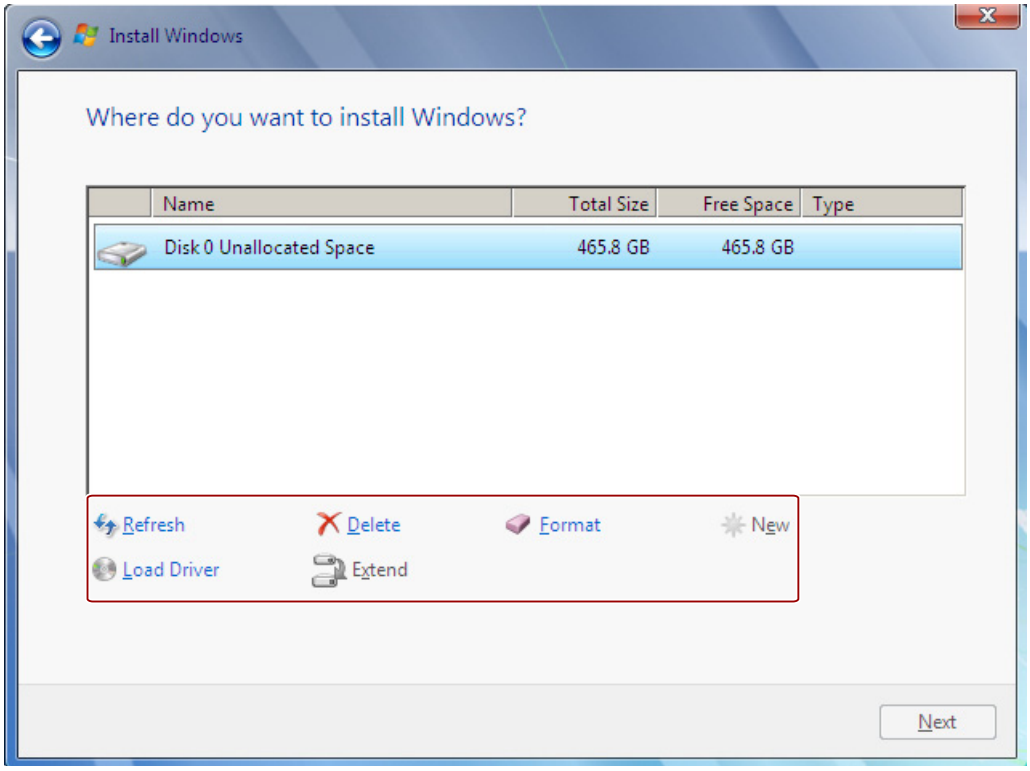


Figure 7-2 Example: Windows installation window "Drive options (advanced)"

Refresh	Updating
Load Driver	Integration of controller drivers unknown to the operating system and required for installation. Please read the information in the section "Information for systems with RAID or AHCI controller".
Delete	Deleting a partition
Extend	Changing the partition size
Format	Formatting a partition
New	Creating new partitions
	Identification for error messages, for example, if the data medium was not formatted in the required "NTFS" format.

Note

If you want to install the operating system on a data medium connected to a storage controller unknown to the operating system, you have to integrate the driver of the storage controller. Integrate this driver before you partition the data medium and before you install the operating system. For more information on integrating the storage controller, refer to the section "Information for systems with RAID or AHCI controller (optional)".

1. Make sure that the partition on which you want to install the operating system is large enough and is set up with a NTFS file system.

   The recommended minimum size of this partition varies, depending on the operating system, how much RAM you have available and how much additional software you want to use. Information on how the data medium is partitioned in its delivery state is available in the following tables.
2. Select the partition on which you want to install the operating system.
3. Click "Next".

Installation is started.

The Windows operating system is installed on the data medium.

Partitions in delivery state for Windows 7 32-bit and Windows Server 2008 32-bit

Partition	Name	Size	File system
First	SYSTEM	40 GB	NTFS not compressed
Second	DATA	Remainder	NTFS not compressed

Partitions in delivery state for Windows 7 64-bit and Windows Server 2008 R2 64-bit

Partition	Name	Size	File system
First	SYSTEM RESERVED	100 MB	Automatically set up by installation program
Second	SYSTEM	40 GB	NTFS not compressed
Third	DATA	Remainder	NTFS not compressed

Information for systems with RAID or AHCI controller

Data carrier controllers unknown to the operating system must be made known to the operating system prior to installation in the "Install Windows" installation program. Proceed as follows:

Requirement

You have copied the relevant controller driver to a USB stick.

1. Connect the USB stick with the controller driver to the device.
2. Start the "Install Windows" installation program as described above.
3. Select "Load Drivers" in the Windows installation window.
4. Select the respective driver on the USB stick.

7.2.4 Setting up the language selection by means of the Multilanguage User Interface (MUI)

You can set the display of menus, dialogs or other information, such as date and time, to a different language. For this purpose, you can either select one of the preinstalled languages or install a new language package.

The following command sequences are described in English. Depending on the default setting, they can be displayed in another language.

Setting up the language selection for Windows XP Professional

Note

Specific information for setting up the language for Windows XP Professional is available in the following manual (not included in the product package):

- "Microsoft Windows XP Professional, Technical Reference" (MSPress No 934)

Changing the settings for language, region and formats of a registered user account

1. Choose:

   "Start > Control Panel > Regional and Language"

2. You can make the desired changes in the "Regional Settings", "Languages" and "Advanced" tabs.

Installing new language packages

1. Start the "MUISETUP.EXE" program in the "MUI" folder from the Recovery DVD.

   All languages that can be installed are displayed.

Setting up the language selection for Windows 7, Windows Server 2008 and Windows Server 2008 R2

Note

Specific information for setting up the language selection for Windows operating systems is available in the following manuals (not included in the product package):

- Windows 7 Technical Reference (MS Press No. 5913)
- Windows Server 2008 Technical Reference (MS Press No. 5919)

Changing the settings for language, region and formats of a registered user account

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Regional and Language Options"

2. You can make the desired changes in the "Formats" and "Location und Keyboards and Languages" tabs.

Changing the settings for language, region and formats of the system account and the standard user account

You can change the settings for language, region and formats of the system account (for example, the language in the user login dialog) and the settings of the standard user account (standard setting for new users). The settings of the registered user are copied to the system account and the standard user account for this purpose.

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Regional and Language Options"

2. You can make the required changes in the "Administrative" tab. You copy the settings by clicking the respective button.

Installing new language packages

Some language packages are available on the Recovery DVD in the "Languagepacks" folder.

1. Choose:

   "Start > Control Panel > Clock, Language, and Region > Regional and Language Options"

2. Select the "Keyboards and Languages" tab.
3. Click the "Install/uninstall languages" button and make the required changes.

7.2.5 Installation of drivers and software

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

Install the drivers and software from the "Documentation and Drivers" DVD that ships with the product. Procedure:

1. Insert the DVD.
2. Start the "START" program.
3. Select "Drivers & Updates" from the index.
4. Select the operating system in "Drivers & Updates".
5. Install the required driver.

NOTICE
The driver for the chipset has to be installed before all other drivers with a new installation of Windows XP, Windows Server 2008 or Windows 7.

7.2.6 Installing the Intel RAID controller software

The software installation of the onboard RAID controller takes place with its driver installation. Additional information on this is available in the section "Installation of drivers and software".

7.2.7 Installing the burner or DVD software (optional)

Note

Installation

Information about installation of the burner / DVD software is available on the supplied CD.

7.2.8 Update installation

7.2.8.1 Updating the operating system

Windows

The latest updates for the Windows operating system are available on the Internet under Microsoft Side Guide (http://www.microsoft.com), "Download > Microsoft Update".

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

Other operating systems

Contact the corresponding manufacturer.

7.2.8.2 Installing or updating user programs and drivers

A corresponding drive must be installed or connected for the installation of software under Windows.

The USB floppy disk and CD-ROM drivers are included in Windows and do not have to be installed from other sources.

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

Contact the relevant manufacturer to obtain updates of drivers and user programs that you purchased from third-party vendors.

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

7.2.9 Creating an image

We recommend the software tool SIMATIC IPC Image&Partition Creator for data backup under Windows. This tool provides comfortable and efficient functions for backup and restoring the full content of Compact Flash cards, of HDDs and of individual partitions (images.)

Note

Hardware support

Older versions of the SIMATIC IPC Image&Partition Creator do not support the hardware of the SIMATIC IPC. Support is only available as of version 3.x.

You can order this software from Industry Mall, the ordering system for automation and drive technology (http://mall.automation.siemens.com). For detailed information on the SIMATIC IPC Image&Partition Creator, refer to the corresponding product documentation.

Technical specifications

8

8.1 Certificates and approvals

CE approval

The device meets the general and safety-related requirements of the EMC Directive (2004/108/EC "Electromagnetic Compatibility") and conforms to the harmonized European standards (EN) for programmable logic controllers published in the official gazettes of the European Union:

- 94/9/EC "Equipment and protective systems for use in potentially explosive atmospheres" (explosion protection directive)

EC Declaration of Conformity

The EC declarations of conformity are available for the relevant authorities at the following address:

Siemens Aktiengesellschaft
Industry Sector
I IA AS RD ST PLC
P.O. Box 1963
D-92209 Amberg, Germany

DIN ISO 9001 certificate

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

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

EQ-Net certificate no.: DE-001108 QM

Software license agreements

If the device is supplied with installed software, observe the corresponding license agreements.

UL approval

The following approval is available for the device: Underwriters Laboratories (UL) to standard UL 60950-1, File no. E11 5352 and Canadian National Standard CAN/CSA-C22.2 No. 60950-1-07 (I.T.E).

FCC and Canada

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 requirements of EN 61000--6--3:2007 Generic standards - Emission standard for residential areas, business and commercial operations, and small businesses.

8.2 Guidelines and declarations

8.2.1 Electromagnetic compatibility

This product meets the requirements of EC Directive 2004/108/EC "Electromagnetic Compatibility".

The device is designed for the following areas of application corresponding to the CE marking:

Scope of application	Requirements for	
	Interference emission	Immunity to interference
Industrial area	EN 61000-6-4 : 2007	EN 61000-6-2 : 2005
Residential and commercial areas and small businesses	EN 61000-6-3 : 2007	EN 61000-6-1 : 2007

The devices comply with the standards EN 61000-3-2:2006 +A1:2009 +A2:2009 (harmonic currents) and EN 61000-3-3:2008 (voltage fluctuations and flicker).

8.2.2 Low-voltage guideline

The devices complies with the requirements of the EC Directive 2006/95/EC "Low Voltage Directive". Compliance with this standard has been verified according to EN 60950-1:2006 + A11:2009.

8.2.3 ESD guideline

What does ESD mean?

An electronic module is equipped with highly integrated components. Due to their design, electronic components are highly sensitive to overvoltage and thus to the discharge of static electricity. Such electronic components or modules are labeled as electrostatic sensitive devices.

The following abbreviations are commonly used for electrostatic sensitive devices:

- ESD – Electrostatic sensitive device
- ESD – Electrostatic Sensitive Device as a common international designation

Electrostatic sensitive devices can be labeled with an appropriate symbol.

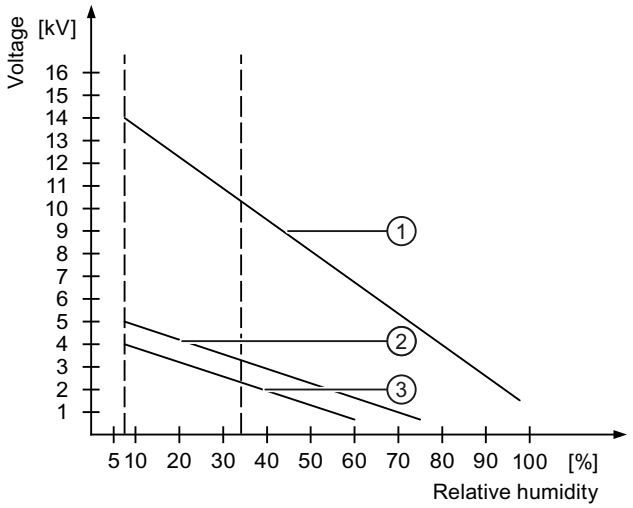


CAUTION
Damage to ESD from touch Electrostatic sensitive devices, ESD, can be destroyed by voltages which are far below the human perception limit. If you touch a component or electrical connections of a module without discharging any electrostatic energy, these voltages may arise. The damage to a module by an overvoltage can often not be immediately detected and only becomes evident after an extended period of operation. The consequences are incalculable and range from unforeseeable malfunctions to a total failure of the machine or plant. Avoid touching components directly. Make sure that persons, the workstation and the packaging are properly grounded.

Charge

Every person without a conductive connection to the electrical potential of his/her surroundings can be electrostatically charged.

The material with which this person comes into contact is of particular significance. The figure shows the maximum electrostatic voltages with which a person is charged, depending on humidity and material. These values conform to the specifications of IEC 61000-4-2.



① Synthetic materials
② Wool
③ Antistatic materials such as wood or concrete

CAUTION
Grounding measures There is no equipotential bonding without grounding. An electrostatic charge is not discharged and may damage the ESD. Protect yourself against discharge of static electricity. When working with electrostatic sensitive devices, make sure that the person and the workplace are properly grounded.

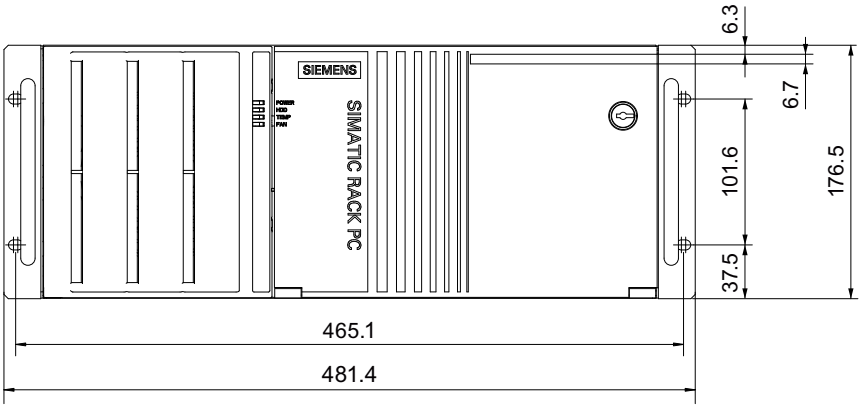
Protective measures against discharge of static electricity

- Disconnect the power supply before you install or remove modules which are sensitive to ESD.
- Pay attention to good grounding:
  - When handling electrostatical sensitive devices, make sure that persons, the workstation and devices, tools and packaging used are properly grounded. In this manner, you avoid static discharge.
- Avoid direct contact:
  - As a general rule, do not touch electrostatic sensitive devices, except in the case of unavoidable maintenance work.
  - Hold the modules at their edge so that you do not touch the connector pins or conductor paths. In this way, the discharge energy does not reach and damage the sensitive components.
  - Discharge your body electrostatically before you take a measurement at a module. Do so by touching grounded metallic parts. Always use grounded measuring instruments.

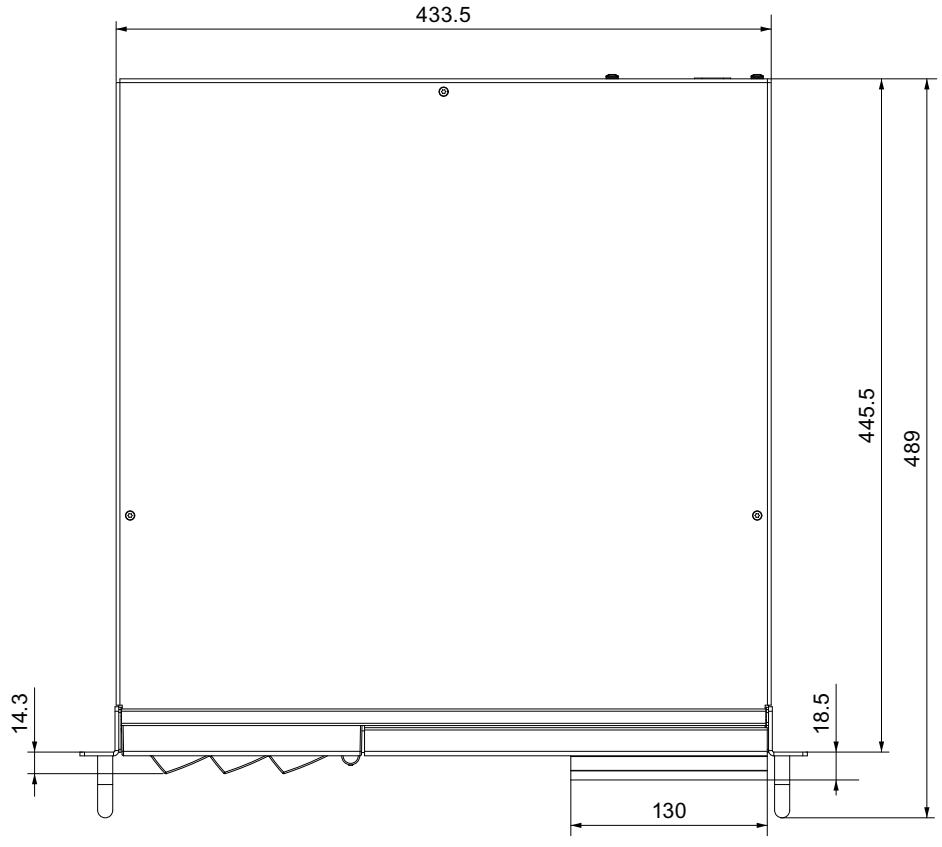
8.3 Dimension drawings

8.3.1 Dimension drawing of the device

Front view and plan view

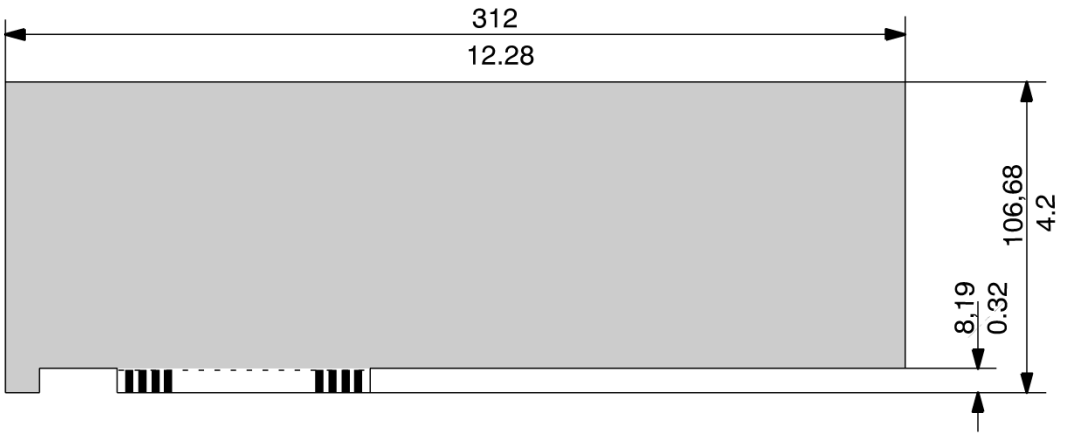


All dimensions in mm.



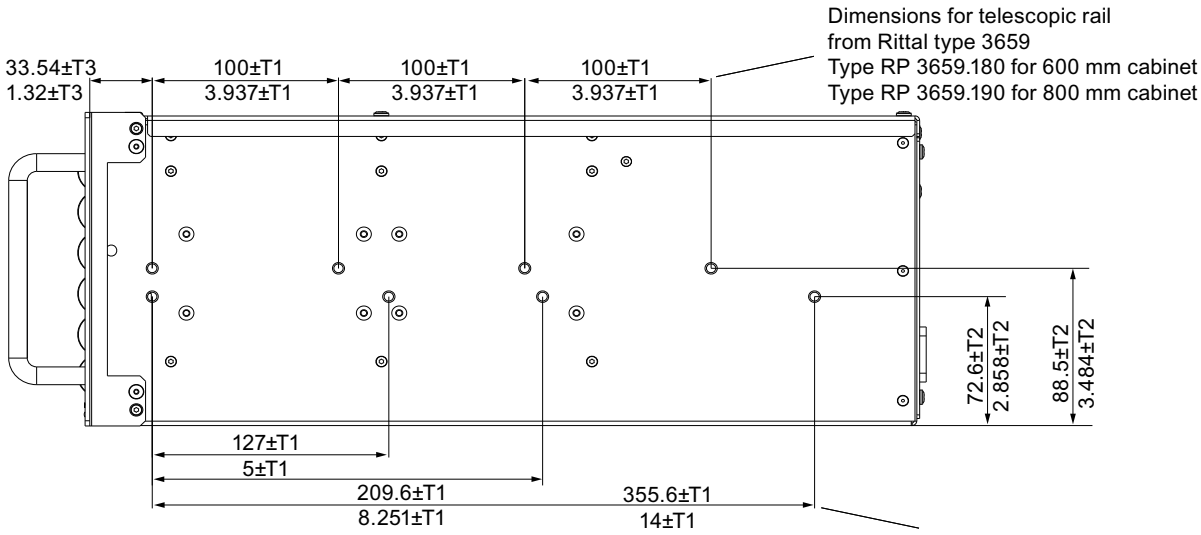
8.3.2 Dimensional drawings for the installation of expansion modules

Long PCI module, PCIe module



Dimensions: mm / Inch

8.3.3 Dimension drawing for the use of telescopic rails



Dimensions: mm / inches (“)

T1=Tolerances of ± 0,1 mm / 0.004 “ T2=Tolerances of ± 0,3 mm / 0.01 “ T3=Tolerances of ± 0,5 mm / 0.02 “

8.4 Technical specifications

8.4.1 General technical specifications

NOTICE
Applicability of technical specifications The following technical specifications only apply under the following conditions: • The device is in good working order. • The fan cover and filter mat are installed. • The device is closed.

Order numbers	6AG4104-2....-.... (for details, refer to the ordering documentation)
Dimensions	433.5 × 176.5 × 445.5 (W × H × D in mm) You will find detailed information on dimensions in the chapter "Dimension drawing of the device (Page 93)".
Weight	Min. 16 kg, max. 23 kg
Supply voltage (V_N)	• 100 V AC to 240 V AC (-15%, +10%) • Redundant power supply: 2 × 100 V AC to 240 V AC (-15%, +10%)
Input current AC	• Continuous current up to 6 A (at 100 V) 3 A (at 240 V) • During startup up to 30 A and 5 ms
Frequency	50 to 60 Hz minimum 47 Hz to maximum 63 Hz, sinusoidal
Transient voltage interruption	20 ms at 93 V max. 10 events per hour; recovery time of at least 1 s
Power consumption	With 210 W secondary: Redundant AC power supply: Max. 300 W at 70% efficiency AC power supply: Max. 270 W at 80% efficiency
Power loss/heat emission	300 W = 300 J/s = 0.28 BTU/s 270 W = 270 J/s = 0.26 BTU/s
Current output (DC)	+5 V/26 A, +3.3 V/24 A in total 190 W permitted +12 V/15 A, +12 V/15 A, -12 V/0.2 A, +5 Vaux/2 A The total sum of all voltages is max. 210 W.
Noise emission	< 45 dB (A) to DIN 45635 (40 dB(A) at 20 °C, Windows idle mode)
Degree of protection	• IP 30 with closed front cover • IP 20 on the rear according to EN 60529
Dust protection	With the front panel closed in accordance with IEC 60529 Filter class G2 EN 779, 99 % of particles > 0.5 mm are filtered

Safety	
Protection class	Protection class I compliant with IEC 61140
Safety regulations	IEC60950-1, EN60950-1, UL60950-1, CSA C22.2 No 60950-1-07

Electromagnetic compatibility

Emitted interference (AC)	EN 61000-6-3; EN 61000-6-4; CISPR 22/EN 55022 Class B; FCC Class A; EN 61000-3-2 class D, EN 61000-3-3
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV; in accordance with IEC 61000-4-4; Burst ± 1 kV; in accordance with IEC 61000-4-5; Surge sym ± 2 kV; in accordance with IEC 61000-4-5; Surge asym
Noise immunity on signal lines	± 2 kV (in accordance with IEC 61000-4-4; Burst; length > 30 m) ± 1 kV (in accordance with IEC 61000-4-4; Burst; length < 30 m) ± 2 kV (in accordance with IEC 61000-4-5; Surge, length > 30 m)
Immunity to discharges of static electricity	± 4 kV, contact discharge (to IEC 61000-4-2) ± 8 kV, atmospheric discharge (to IEC 61000-4-2)
Immunity to RF interference	1 V/m, 2-2.7 GHz, 80% AM (to IEC 61000-4-3) 10 V/m, 80-1000 MHz und 1.4 - 2 GHz, 80% AM; (conforms to IEC 61000-4-3) 10 V, 10 kHz-80 MHz; (conforms to IEC 61000-4-6)
Magnetic field	100 A/m, 50 Hz / 60 Hz; (to IEC 61000-4-8)

Ambient conditions

Climatic ambient conditions	
Temperature	Tested in accordance with IEC 60068-2-2, IEC 60068-2-1, IEC 60068-2-14
• During operation • Gradient • Storage/transportation • Gradient	+5 °C to +40 °C [1] Max. 10 °C/h, no condensation –20 °C to +60 °C Max. 20 °C/h, no condensation
Relative humidity	Tested in accordance with IEC 60068-2-78, IEC 60068-2-30
• During operation • Gradient • Storage/transportation • 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
Atmospheric pressure	
• During operation • Storage/transportation	1080 to 795 hPa, corresponds to an elevation of -1000 to 2000 m 1080 to 660 hPa, corresponds to an elevation of -1000 to 3500 m

Mechanical ambient conditions	
Vibration • Operation[2)] • Storage/transportation	Tested in accordance with IEC 60068-2-6, 10 cycles 20 to 58 Hz, amplitude 0.015mm; 58 to 200 Hz: 2m/s^2 5 to 8.51 Hz, amplitude 3.5 mm; 8.51 to 500 Hz: 9.8 m/s^2
Resistance to shock • Operation[2)] • Storage/transportation	Tested in accordance with 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	In accordance with ISO 9001

1 No burner operation
At +5 °C to +35 °C without restrictions, even burner operation, CPU up to power loss 95 W, see notes on retrofitting

2 When using a hard disk in a removable rack, the device should generally be free of mechanical disturbances.
When using a DVD burner, the device should generally be free of mechanical disturbances during burning.

Motherboard

Processor	• Intel® Pentium Dual-Core G850 (2 cores, 2.9 GHz, 3 MB cache, EM64T, VT) • Intel® Core™ i5-2400 (4 cores/4 threads, 3.1 GHz Turbo Boost, 6 MB cache, EM64T, VT-x/VT-d, iAMT • Intel® Core™ i7 -2600 (4 cores/8 threads, 3.4 GHz, 8 MB cache, Turbo Boost 2.0, EM64T, VT-x/-d, iAMT)
Chipset	Q67 Express
RAID (on-board)	Intel® PCH with Intel® Rapid Storage Technology
Slots for RAM modules	4 X DIMM socket for DDR3, expandable up to max. 32 GB
Main memory	1 GB to 16 GB DDR3 1333 SDRAM (PC3-10600), max. 3.2 GB for 32-bit operating system and applications can be used (for equipment, see order documents)
Expansion slots	• 4 × PCI • 1 × PCIe x8 (1 lane) • 1 × PCIe x16 (4 lanes) • 1 × PCIe x16 You can use modules with a length of up to 312 mm.

Max. permitted power consumption PCIe x1, x8 (1 lane) and x16 (4 lanes) slot	3.3 V 3 A; 12 V 2.1 A; 3.3 Vaux 0.4 A
Max. permitted power consumption PCIe x4 module:	3.3V 3A; 12V 2.1A; 3.3Vaux 0.4A
Max. permitted power consumption PCIe x16 slot	PCIe x16 module: 3.3 V 3 A; 12 V 2.1 A; 3.3 Vaux 0.4 A 5 V, 5 A or 3.3 V, 7A; 12 V 0.5 A; –12 V 0.05 A; 3.3 Vaux 0.4 A
Max. permitted power consumption per PCI slot (5 V, 32-bit)	All voltages must not exceed 25 W in total.
Max. permitted power loss per PCI slot	All modules must not consume more than 25 W in total.
PCI modules with exclusive 5 V supply	Total power consumption of 80 W must not be exceeded. In total, the 3.3 V_{aux} current of 1.2 A must not be exceeded.
Max. permitted power loss over all slots	

Drives (for configuration details, refer to the order documentation)

Hard disk drive SATA	Internal installation or in removable rack [1]: • 500 GB or 1 TB, internal • RAID1 1 TB (2x 1 TB), internal • Solid state drive SATA 50 GB (SLC), internal • 500 GB in movable rack; front • 2x 500 GB in removable rack; front • RAID1 1 TB (2x 1 TB) in removable rack; front • RAID5 2 TB (3x 1 TB) in removable rack; at front [2] • Solid-state drive SATA 50 GB (SLC) in removable rack; at the front • RAID1 1 TB (2x 1 TB) + solid state drive SATA 50 GB (SLC) in removable rack, at the front
DVD-ROM	5.25" SATA Read: • DVD ROM: Single layer 16x, dual layer 12x • DVD+R/RW, DVD-R/RW 8x, DVD-RAM 2x • CD-ROM, CD-R 32x, CD-RW 20x

DVD burner [1]	5.25" SATA Read: • DVD ROM: Single layer 16x, dual layer 12x • DVD-R/+R: Single layer 16x, dual layer 12x • DVD-RW/+RW 13x • CD-ROM/CD-R 48x, CD-RW 40x Write: • DVD-RAM 12x • DVD+R 24x, DVD+RW 8x, DVD-R 24x, DVD-RW 6x, DVD+R9 (DL) 12x, DVD-R DL 12x • CD-R 48x, CD-RW 32x

1 When using a hard disk in a removable rack, the device should generally be free of mechanical disturbances.
When using a DVD burner, the device should generally be free of mechanical disturbances during burning.

2 RAID controller onboard

Graphics

Graphics memory	Dynamic Video Memory Technology (uses between 32 MB and 1.7 GB RAM)
Resolutions/frequencies/colors	• DVI (VGA via adapter) up to 1920 x 1200 pixels at 60 Hz, color depth up to 32 bit/pixels • Display port to 2560 x 1600 pixels at 60 Hz, color depth up to 32 bit/pixels
Graphics controller	Intel® HD Graphics or Intel® HD Graphics 2000 (integrated in processor)
Graphics module (optional)	PCIe x16 graphics card, dual head (2 x display port, 2 x VGA or 2 x DVI-D) [1] • Type: NVIDIA NVS 300 (512 MB graphics memory) • Maximum resolution: – DP 2560x1600 at 60 Hz/32 bit colors – DVI 1920x1200 at 60 Hz/32 bit colors – VGA 2048x1536 at 60 Hz/32 bit colors

1 Adapter for VGA and DVI-D supplied

Interfaces

COM 1	Serial interface 1 (V.24), 9-pin D-sub plug
COM 2 (optional)	Serial interface 2 (V.24), 9-pin D-sub plug
LPT (optional)	Parallel interface (Standard, EPP and ECP mode) Connection for printer with parallel port
VGA	Connection of an analog monitor (via adapter)
DisplayPort	For connecting a digital monitor
DVI-I	For connecting a digital monitor
2x DVI-D/VGA with Dual-Head graphics controller (optional)	For connecting two digital or analog monitors
Keyboard	PS/2 keyboard connection
Mouse	PS/2 mouse connection
USB	High speed USB 2.0 • USB (on rear panel): 8 x (500 mA high current) • USB (on front panel): 2 x (500 mA high current) • USB (internal): 2 x (500 mA high current) with mech. lock
Ethernet	2 x Ethernet interface (RJ45) Wake on LAN, remote boot and teaming supported. 10/100/1000 Mbps • Ethernet 1: 82579LM, AMT-capable. [1] • Ethernet 2: 82574 L
Audio • Micro • Line In • Line Out	Conexant CX20642, 5.1 channels, high definition audio codec 2 X 0.5 W/8 Ω

[1] AMT and teaming cannot be used simultaneously on the Ethernet interface.

Approvals

CE residential area (emission) CE industrial area (immunity) cUlus	EN61000-6-3:2007 EN61000-6-2:2005 60950-1

8.4.2 Power requirements of the components (maximum values)

Component	Voltage				
	+5 V	**+3.3 V**	**+12 V**	**-12 V**	**5 Vaux**
FSC D3076-S11 motherboard with processor and heat sink	5 A	2 A	15.5 A	0.1 A	0.3 A
Front fan			0.5 A		
Basic system [1)]	**5 A**	**2 A**	**16 A**	**0.01 A**	**0.5 A**
Expansions					
Hard disk drive SATA [1]	0.5 A		0.7 A		
DVD ROM [1]	0.9 A		0.8 A		
DVD burner [1]	1.1 A		1.4 A		
Single lines of current (max. permissible) [2]	30 A	28 A	23 A	0.5 A	2 A
Total power consumption, permissible	210 W				
Efficiency of the power supply [1]	• Redundant AC power supply: approx. 70% (230 VAC) / approx. 65% (120 VAC) • AC power supply: approx. 80% (230 VAC) / approx. 75% (120 VAC)				

1 Depends on the selected device configuration

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

The accumulated power of the +5 V and + 3.3 V voltages must not exceed 100 W with redundant AC power supplies.

8.4.3 Basic power supply

Voltage	Max. current	Voltage stability
+12 V	10 A	± 5 %
+12 V	13 A	± 5 %
–12 V	0.3 A	± 10 %
+5 V	25 A [1]	+ 5 %, – 4 %
+3.3 V	20 A [1]	+ 5 %, – 4 %
+5 V aux	2.5 A	+ 5 %, – 3 %

1 The total output of the +5 V and +3.3 V voltage must not exceed 190 W.

The inrush current is:

- For 110 V AC: Maximum 25 A, 5 ms
- For 240 V AC: Maximum 30 A, 5 ms

8.4.4 Redundant power supply

Voltage	Max. current	Voltage stability
+12 V	18 A [2]	± 5 %
+12 V	18 A [2]	± 5 %
+12 V	14 A [2]	± 5 %
–12 V	0.8 A	± 10 %
+5 V	20 A [1]	+ 5 %, – 4 %
+3.3 V	20 A [1]	+ 5 %, – 4 %
+5 V aux	2.0 A	+ 5 %, – 3 %

[1] The total output of the +5 V and +3.3 V voltage must not exceed 100 W.

[2] The total output of the +12 V voltage must not exceed 24 A.

The inrush current is:

- For 110 V AC: Maximum 25 A, 5 ms
- For 230 V AC: Maximum 30 A, 5 ms

8.4.5 Telescopic rails

Ultimate load per pair	At least 30 kg	
Full extraction length	At least 470 mm	
Rail thickness	Maximum 9.7 mm	
Mounting screws	M5 x 6 mm	

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

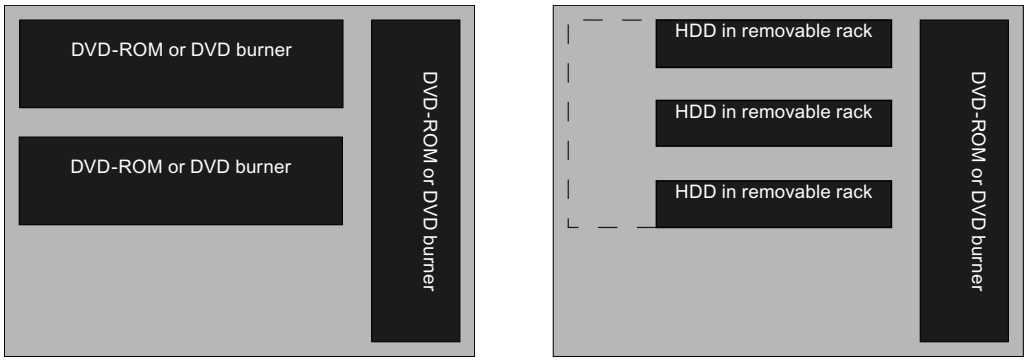
8.4.6 Approved configuration versions for different temperature ranges

Approved configuration versions

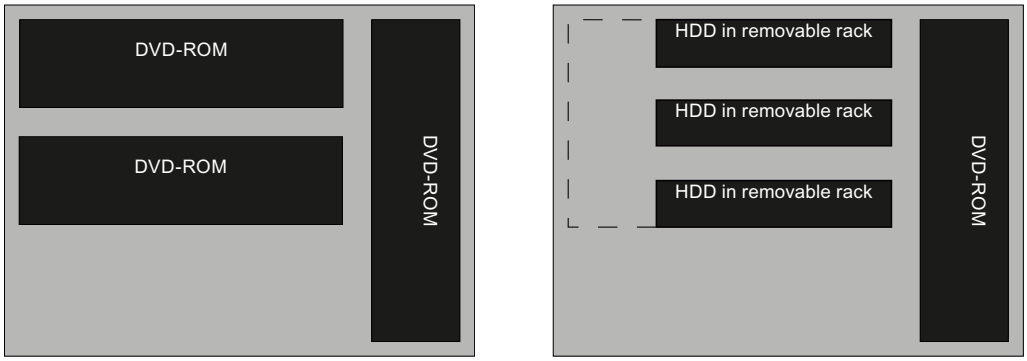
The section below describes the approved versions of the drive configuration for SIMATIC IPC and the resultant operating conditions.

A removable cartridge with hard disk can be installed instead of DVD drive(s). Devices equipped with removable HDD frames must not to be exposed to mechanical loads during operation, in accordance with DIN IEC 60068-2.

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



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



8.5 Hardware description

8.5.1 Motherboard

The motherboard consists of these main components:

- Processor and chipset
- Slots for memory modules
- Internal and external interfaces
- Flash BIOS
- Backup battery

You will find a detailed description of the motherboard as well as the interfaces in the technical manual of the D3076-S11 motherboard on the "Documentation and Drivers" DVD that ships with the product.

8.5.2 System resources

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

Microsoft Windows XP Pro (32-bit) Microsoft Windows Server 2008 (32-bit) / 2008 R2 (64-bit) incl. 5 clients	1. In the Windows Start menu, select "Start -> Run". 2. Enter "msinfo32" in the Open field and confirm your input with "OK".
Windows 7 Ultimate (32-bit and 64-bit)	1. In the Windows Start menu, select "Start > Search". 2. Enter "msinfo32" in the search function. 3. Open the application.

8.5.3 Interrupt assignment

Interrupt assignment depending on operating system

The functions are assigned different interrupts (IRQ), depending on the operating system. A distinction is made between PIC and APIC mode.

	IRQ Number																							Comment
IRQ (APIC-Mode)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
IRQ (PIC-Mode)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	◄								
Host PCI IRQ Lin / Function																	A	B	C	D	E	F	G	H	1)
Timer 0	X																								Fixed
PS/2Keyboard		X																							Fixed
Serial port 2				X																					Can be disabled
Serial port 1					X																				Can be disabled
RTC									X																Fixed
PS/2 mouse													X												Fixed
Numerik-Prozessor														X											Fixed
HD-Controller 1(Primary)															X										Fixed
HD-Controller 2(Secondary)																X									Fixed
SATA												Z								Y					Fixed
SMBus											Z								Y						Fixed
EHCI 1												Z					Y								Can be disabled
EHCI 2								Z																Y	Can be disabled
Ethernet 1 (LAN)											Z												Y		Can be disabled
Ethernet 2 (LAN)											Z								Y						Can be disabled
HD Audio											Z												Y		Can be disabled
Onboard Graphic												Z					Y								Can be disabled
Thermal Subsystem										Z									Y						Fixed

1 Host PCI-IRQ A to H is assigned to IRQ 16 to 23 permanently in APIC mode. Host PCI-IRQ A to H is automatically assigned to IRQ 0 to 15 in PIC mode by the BIOS. A specific assignment cannot be forced.

X Interrupt PIC and APIC mode

Y Interrupt APIC mode

Z BIOS Default Interrupt PIC mode, e.g. DOS

Slot-specific interrupt assignment

Interrupt routing of the slot connectors on the motherboard.

	IRQ Number																							Comment
ACPI IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
IRQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	◄	┼	┼	┼	┼	┼	┼	┼	
Host PCI IRQ Lin / Function																	A	B	C	D	E	F	G	H	1)
Slot 1 (PEG) PCI IRQ A												Z					Y								
PCI IRQ B												Z						Y							
PCI IRQ C											Z								Y						
PCI IRQ D												Z								Y					
Slot 2 (PCIe-X4 Slot x16) PCI IRQ A												Z								Y					
PCI IRQ B											Z						Y								
PCI IRQ C												Z							Y						
PCI IRQ D												Z						Y							
Slot 3 (PCIe-X1 Slot x8) PCI IRQ A												Z								Y					
PCI IRQ B												Z					Y								
PCI IRQ C											Z								Y						
PCI IRQ D												Z						Y							
Slot 4 (PCI) PCI IRQ A								Z														Y			
PCI IRQ B											Z								Y						
PCI IRQ C												Z								Y					
PCI IRQ D										Z											Y				
Slot 5 (PCI) PCI IRQ A												Z									Y				
PCI IRQ B								Z														Y			
PCI IRQ C										Z								Y							
PCI IRQ D											Z								Y						
Slot 6 (PCI) PCI IRQ A										Z								Y							
PCI IRQ B												Z								Y					
PCI IRQ C												Z									Y				
PCI IRQ D								Z														Y			
Slot 7 (PCI) PCI IRQ A											Z								Y						
PCI IRQ B												Z									Y				
PCI IRQ C								Z														Y			
PCI IRQ D										Z								Y							

1 Host PCI-IRQ A to H is assigned to IRQ 16 to 23 permanently in APIC mode. Host PCI-IRQ A to H is automatically assigned to IRQ 0 to 15 in PIC mode by the BIOS. A specific assignment cannot be forced.

Y Interrupt APIC mode

Z BIOS Default Interrupt PIC mode, e.g. DOS

Exclusive PCI hardware interrupt

Applications demanding high-performance interrupt handling require high-speed hardware interrupt reaction. The PCI hardware interrupt should be used only by one resource in order to ensure high-speed reaction of the hardware.

Setting up an exclusive interrupt on the device (APIC mode only)

Only on PCI slot 4 and PCI slot 5 can you use an exclusive interrupt.
Additional exclusive interrupts are not available for use at the slots.

Assigning exclusive interrupts in BIOS Setup (PIC mode only)

The interrupts are automatically assigned to the slots at system startup due to the default settings in system BIOS. Several slots may share the same interrupt, depending on the system configuration. This functionality is known as interrupt sharing.

Exclusive interrupts are not available in PIC mode. Disable specific system resources in order to obtain exclusive interrupts. BIOS assigns the PIC interrupts at random during restart of the system.

8.6 BIOS description

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

The BIOS is set to a default state suitable to the respective device configuration prior to delivery. The most important settings are shown in the table below.

Tab	Option	Setting
Advanced	Launch PXE OpROM	Disabled
	SATA configuration	AHCI mode or RAID [1]
	CPU Configuration > Power Technology	Disabled
	System Monitoring > Fan Control	Enhanced

[1] Optional for RAID systems

For a detailed description of how to call up and operate the BIOS setup and which menus and setting options are available, refer to the BIOS reference manual on the "Documentation and Drivers" DVD that ships with the manual.

NOTICE
After a BIOS update, you need to execute the "Restore Defaults" command. Executing the "Restore Defaults" command restores all BIOS settings to their original state. The operating system functions "Save to RAM" (standby) and "Save to Disk" (hibernate) are not approved for this device.

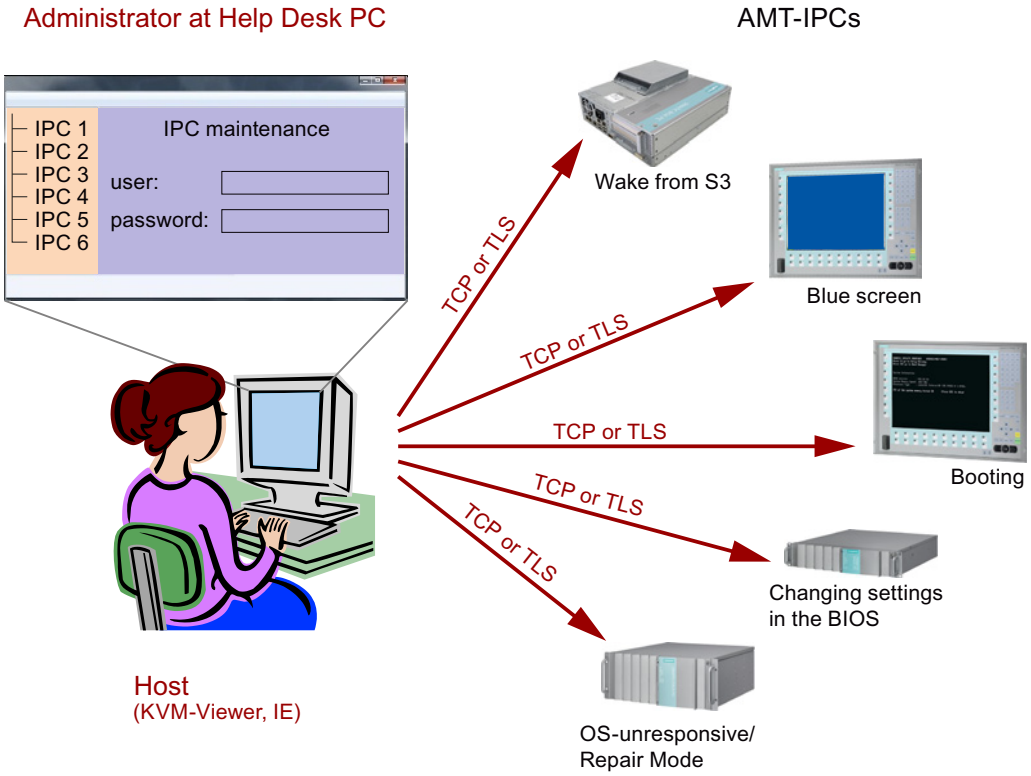
8.7 Active Management Technology (AMT)

8.7.1 AMT basics

The processors Intel Core i5 and Core i7 support Intel® vPro™ and Intel Active Management Technology at the hardware end.

An administrator at the Help Desk PC accesses the AMT PCs. Only the AMT PCs must have an integrated Intel AMT.

The following figure shows the possible structure of a network for remote management on the basis of SIMATIC AMT-PCs.



From a SIMATIC IPC which does not have Intel AMT functions, you can access networked SIMATIC IPCs with Intel AMT using the SIMATIC IPC Remote Manager and/or a web browser.

SIMATIC IPCs that support AMT feature two onboard Ethernet interfaces, each with a separate controller. You can configure the controller integrated in the chipset for use with Intel AMT. Further details about the controller can be found in the technical specification.

For security reasons, AMT is disabled when you receive a SIMATIC IPC. Enable AMT in the BIOS setup. Afterwards the Intel® Management Engine (Intel® ME) has to be activated and set for AMT. You make additional settings in the Management Engine:

- Configuring the network for access via AMT
- Creating a password

8.7.2 Overview of AMT

This section describes the required measures and settings on the local IPC so that the IPC can be controlled and maintained remotely from a management station known below as the help desk PC.

The local IPC is known below as the "AMT PC".

The sections contain the following information:

- AMT settings in the MEBx and in the BIOS setup
- Basic configuration of AMT
- Further useful notes

8.7.3 Enabling AMT, basic configuration

Procedure

For security reasons, AMT is not enabled on new devices.

To enable AMT, follow these steps:

1. Connect the AMT PC with the LAN.
2. If necessary, first reset AMT to the default status (see section "Unconfigure").
3. To access the BIOS, press the <F2> key while the device is booting.
4. In the Advanced menu, enable "Intel AMT Support", and "Intel AMT Setup Prompt".
5. Exit the BIOS with the <F10> key "Save and Exit". The AMT PC restarts.
6. To access the MEBx, press the <Ctrl+P> keyboard shortcut
7. In the login dialog, enter the standard password "admin".
8. Change the default password. The new password must include the following characters:
   - In total at least eight characters
   - One upper case letter
   - One lower case letter
   - One number
   - One of the special characters ! @ # $ % ^ & * @ # $ % ^ & *

   Note

   The underscore _ and the space characters are valid password characters, however they do not increase password complexity.

9. Enable "Intel (R) AMT Configuration > Manageability Feature Selection".
10. Enable "Intel (R) ME General Settings > Activate Network Access".

8.7.4 Advanced settings

The BIOS and the MEBx contain the most important basic settings for AMT. Additional tools are necessary if you want to make more advanced settings. If required, these must be downloaded from the relevant manufacturer's site. For information on the options and use of these tools, refer to the relevant documentation of the manufacturer.

- Manageability Commander and other tools of the Intel DTK (Manageability Developer Tool Kit): Programs from the Intel DTK that you can download from the Internet at "http://software.intel.com/en-us/manageability".
- AMT Web interface: For encrypted connections, the URL of the Web interface is "https://<Fully qualified domain name>:16993" and for unencrypted connections "http://<IP address>:16992".
- WinRM: A command line program that is part of Windows as of Windows Vista. This tool can be downloaded for older Windows versions.

8.7.5 Resetting with Un-configure

Note

If the AMT PC still has its factory settings, for example has just been purchased, you can skip this section.

If you have already configured AMT previously, it is best to discard all the previous AMT settings made in the MEBx.

NOTICE
All previous settings in the management engine are deleted. Correct operation in the plant may be at risk. Note down all the settings in the MEBx. Make the settings again as necessary following Unconfigure.

To reset the AMT settings, follow these steps:

1. Enable the "Un-configure ME" entry in "Advanced > Active Management Technology Support" in the BIOS.
2. Exit the BIOS with the <F10> key "Save and Exit". The AMT PC restarts.
3. After the restart, a user prompt appears asking whether you really want to discard all the settings in the management engine:



4. Confirm with "Y". On a German keyboard, this means pressing the <Z> key.

The device continues to boot with the factory settings of the management engine.

8.7.6 Determining the network address

To connect the AMT PC with the AMT server, the network address that uniquely localizes the AMT server on the AMT PC must be entered.

If DHCP is set for the automatic assignment of the network address in "Network Setup" in the MEBx of the AMT PC, the network address is not fixed.

Procedure

If the AMT server uses the same network address as the operating system of the AMT PC (most common situation):

1. You can obtain the address of the AMT server in the command line in Windows using "ipconfig" and in UNIX using "ifconfig".

If the AMT server and operating system do not use the same network address, ask your network administrator for the address you have been assigned.

8.7.7 Forcing user consent

When establishing a connection to the AMT PC, the KVM viewer may prompt the user to enter a six-figure code. This code is displayed on the screen of the AMT PC. The user of the AMT PC must inform the user of the KVM viewer of this code.

Procedure

To set up this code query on the KVM viewer, follow these steps:

1. Select "Intel(R) AMT Configuration > User Consent" in the MEBx.
2. Select the value "KVM" for "User Consent".

To allow a user with administrator privileges to avoid this code query, follow these steps:

1. Select "Intel(R) AMT Configuration > User Consent" in the MEBx.
2. Enable "Opt-in configurable from remote IT".

Technical support

A

A.1 Service and support

You can find additional information and support for the products described on the Internet at the following addresses:

- Technical support
  (http://www.siemens.de/automation/csi_en_WW)
- Support request form
  (http://www.siemens.com/automation/support-request)
- After-sales information system for SIMATIC PC / PG
  (http://www.siemens.com/asis)
- SIMATIC Documentation Collection
  (http://www.siemens.com/simatic-tech-doku-portal)
- Your local representative
  (http://www.automation.siemens.com/mcms/aspa-db/en/Pages/default.aspx)
- Training center
  (http://sitrain.automation.siemens.com/sitrainworld/?AppLang=en)
- Industry Mall
  (http://mall.automation.siemens.com)

When contacting your local representative or Technical Support, please have the following information at hand:

- Order number of the device (MLFB)
- BIOS version (industry PC) or image version (HMI device)
- Installed additional hardware
- Installed additional software

Tools & downloads

Please check regularly if updates and hotfixes are available for download to your device. The downloads are available on the Internet under "After Sales Information System SIMATIC PC/PG" (see above).

A.2 Problem solving

A.2.1 General information

This chapter provides you with tips on how to locate and/or troubleshoot problems which occur.

Problem	Possible cause	Possible remedy
The device is not operational	No power supply	• Check the power supply, the network cable and the power plug. • Check if the On/Off switch is in the correct position.
	Device is being operated outside the specified ambient conditions	• Check the ambient conditions. • After transport in cold weather, wait approximately 12 hours before switching on the device.
The 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 brightness using the brightness button. 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 and measures, 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 available when you start the user program. Detailed information about the mouse driver is available in the corresponding documentation.
	Mouse not connected.	• Check whether the mouse cord is properly connected to the system unit. • If you use an adapter or extension for the mouse cable, also check these connectors.
		If the mouse pointer still does not appear on the screen after you have performed these checks and actions, contact your technical support team.
Wrong time and/or date on the PC		1. Press <F2> during the booting process to open the BIOS Setup. 2. Set the time and date in the setup menu.

Problem	Possible cause	Possible remedy
Although the BIOS setting is OK, the time and data are still wrong.	The backup battery is dead.	Replace the backup battery.
USB device not responding.	The USB ports are disabled in BIOS.	Use a different USB port or enable the port.
	USB 2.0 device connected and USB 2.0 is disabled.	Enable USB 2.0.
	The operating system does not support the USB ports.	• Turn on USB Legacy Support for mouse and keyboard. • For other devices, you need the USB device drivers for the required operating system.
DVD/CD drive door, if present, 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, for example, an opened paper clip, into the emergency extraction opening of the drive. Apply pressure carefully until the door opens. 3. Pull the door out further with your hand.

A.2.2 RAID system and device startup

Problem	Possible cause	Possible remedy
The RAID software reports the following errors: • 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	The messages have no negative effect on the operation of the device and can be ignored. Acknowledge the messages. Install the software from the supplied "Documentation and Drivers" DVD

Problem	Possible cause	Possible remedy
After changing the hard disk, the system does not boot from the RAID system	RAID system does not have highest boot priority	BIOS setup, boot menu: • Permit RAID system in the boot priority • Set the RAID system to be first in the boot priority order.
After changing the hard disk, "unused" is indicated for the relevant SATA port	The system was booted without a functioning hard disk (the removable cartridge was possibly not turned on)	Reboot the system with a functioning hard disk
Computer does not boot or "Boot device not found" is displayed	• The boot device is not permitted • The boot device is not in first place of the boot priority in the BIOS setup • The boot data carrier is set up with GPT and UEFI boot is deactivated in the BIOS setup	• In the BIOS setup, "Boot" menu, permit the boot device in the boot priority • In the BIOS setup, "Boot" menu, change the boot priority of the boot device • Activate UEFI boot in the BIOS setup.
The startup of a Windows operating system on a GPT data carrier is aborted with the following error message: "Status: 0xc0000225 Info: The boot selection failed because a required device is inaccessible"	The boot parameters in the boot loader file "BCD" are incorrect or damaged.	Execute "Startup and Repair" from Microsoft Windows: 1. Insert the Recovery DVD into the optical drive. 2. Start the boot manager using the <F12> key during booting 3. Select the line with "UEFI" in front of the name of the optical drive 4. Click "Next" in the language selection window 5. In the following "Install Windows" dialog, click on "Repair your computer" or press the <R> key. The "System Recovery Options" dialog appears. The system is checked for errors. 6. Next, click "Repair and restart"

A.2.3 Using modules of third-party manufacturers

Problem	Possible cause	To correct or avoid error
The device crashes during startup	• Redundant I/O addresses • Redundant hardware interrupts and/or DMA channels • Fluctuation of signal frequencies or levels • Different pin assignment	Check your computer configuration: • If the computer configuration corresponds to the delivery state, contact your technical support team. • In the case of a change in the configuration, restore the delivery state. To do this, remove the third-party modules and restart the device. If the error no longer occurs, the third-party module being used was the cause of the fault. Replace the thrid-party module with a Siemens module or contact the module supplier.
		If the device still crashes, contact your technical support team.
	• Insufficient output of an external power supply, e.g. UPS	• Use a higher capacity power supply
The device does not start up or switches off immediately	• A counter voltage is fed into the device by connected or installed third-party components	Clarify the following with the supplier of the component: • The component can be operated without an external power supply. • The component can be reconfigured so that it only uses the external power supply or that of the device. • so that only the PC voltage supply or external voltage supply is used"

List of abbreviations

B

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

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

Abbreviation	Term	Meaning
HD	Hard disk	Hard disk
HDA	High Definition Audio	
HDD	Hard Disk Drive	Hard disk drive
HU	Height unit	
HMI	Human Machine Interface	User interface
HORM	Hibernate Once - Resume Many	
HT	Hyper-Threading	
HTML	Hyper Text Markup Language	Script language for creating Internet pages.
HTTP	Hypertext Transfer Protocol	Protocol for data transfer on the Internet
Hardware	Hardware	
IAMT	Intel Active Management Technology	Technology that permits the diagnostics, management and remote control of PCs
I/O	Input/Output	Data input/output on computers
IAA	Intel Application Accelerator	
IDE	Integrated Device Electronics	
IEC	International Electronical Commission	
IGD	Integrated Graphics Device	
IP	Ingress Protection	Degree of protection
IR	Infrared	Infrared
IRDA	Infrared Data Association	Standard for data transfer via IR module
IRQ	Interrupt Request	Interrupt request
ISA	Industry Standard Architecture	Bus for expansion modules
ITE	Information Technology Equipment	
L2C	Level 2 cache	
LAN	Local Area Network	Computer network that is limited to a local area.
LCD	Liquid Crystal Display	Liquid crystal display
LED	Light Emitting Diode	Light emitting diode
LPT	Line Printer	Printer port
LVDS	Low Voltage Differential Signaling	
LW	Drive	
MAC	Media access control	Media access control
MC	Memory Card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	Memory card of the format 32 mm x 24.5 mm
MPI	Multipoint-capable interface for programming devices	
MS-DOS	Microsoft Disc Operating System	
MTBF	Mean Time Between Failures	
MUI	Multilanguage User Interface	Language localization in Windows

Abbreviation	Term	Meaning
NA	Not Applicable	
NAMUR	Normenarbeitsgemeinschaft for Mess- und Regelungstechnik in der chemischen Industrie (standardization body for instrumentation and control technology in the chemicals industry)	
NC	Not Connected	Not connected
NCQ	Native Command Queuing	Automatic re-sorting of the file and disk access, for increased performance
NEMA	National Electrical Manufacturers Association	Syndicate of manufacturers of electrical components in the USA
NMI	Non Maskable Interrupt	Interrupt the processor can not reject
NTFS	New Techniques File System	Secure file system for Windows versions (2000, XP, 7)
ODD	Optical Disk Drive	
OPC	OLE for Process Control	Standardized interface for industrial processes
PATA	Parallel ATA	
PC	Personal computer	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCIe	Peripheral Component Interconnect express	High-speed serial, differential full-duplex PtP interface with high data rate.
PCMCIA	Personal Computer Memory Card International Association	
PI	Protective Earth	Protective conductor
PEG	PCI Express Graphics	
PFC	Power Factor Correction	Harmonic suppression for operation on public networks.
PG	Programming device	
PIC	Programmable Interrupt Controller	Programmable interrupt controller
POST	Power On Self Test	
PXE	Preboot Execution Environment	Software for running new PCs without hard disk data via the network
RAID	Redundant Array of Independent Disks	Redundant hard disk array
RAL	Restricted Access Location	Installation of device in operating facilities with restricted access - for example, a locked switchgear cabinet
RAM	Random Access Memory	
RI	Ring Input	Incoming call
ROM	Read-Only Memory	
RS 485	Reconciliation Sublayer 485	Bi-directional bus system designed for up to 32 nodes
RTC	Real Time Clock	Real-time clock
RTS	Reliable Transfer Service	Request to send
RxD	Receive Data	Data transfer signal

Abbreviation	Term	Meaning
SATA	Serial Advanced Technology Attachment	
SCSI	Small Computer System Interface	
SDRAM	Synchronous DRAM	
SELV	Safety Extra Low Voltage	Safety extra low voltage
SJT	Service [Grade] Junior (Hard Service) Thermoplastic	PVC armored cable
SLC	Second Level Cache	
SMART	Self Monitoring Analysis and Reporting Technology	Hard disk error diagnostics program
SMS	Short Message Service	Short message via telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	SafeCard on Motherboard (SOM)	
SPP	Standard Parallel Port	Synonym for parallel port
SRAM	Static Random Access Memory	Static RAM
SSD	Solid State Drive	
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
TXT	Trusted Execution Technology	Hardware implementation
TWD	Watchdog Time	Watchdog monitoring time
UEFI	Unified Extensible Firmware Interface	
UL	Underwriters Laboratories Inc.	US organization for tests and certifications according to own or binational standards (with CSA / Canada) standards
UMA	Unified Memory Architecture	Video memory
URL	Uniform Resource Locator	Designation of the full address of an Internet page
USB	Universal Serial Bus	
UXGA	Ultra Extended Graphics Array	Graphic standard, maximum resolution 1600x1200 pixels.
V.24		ITU-T standardized recommendation for data transfer via serial ports
VCC		Positive supply voltage of integrated circuits
VDE	Verein deutscher Elektrotechniker (Union of German Electrical Engineers)	

Abbreviation	Term	Meaning
VGA	Video Graphics Array	Video adapter which meets industrial standard
VRM	Voltage Regulator Module	
VT	Virtualization Technology	Intel technology with which a virtually closed environment can be made available.
VT-D	Virtualization Technology for Directed I/O	Enables the direct assignment of a device (e.g. network adapter) to a virtual device.
W2k	Windows 2000	
WAN	Wide Area Network	
WAV	Wave Length Encoding	Loss-free file format for audio data
WD	Watchdog	Program monitoring with error detection and alarming.
WLAN	Wireless LAN	LWireless local area network
WoL	Wake on Local Area Network	
WWW	World Wide Web	
XD	Execute Disable Capability	Hardware implementation
XGA	Extended Graphics Array	Graphic standard, maximum resolution 1024x768 pixels.

Glossary

AHCI mode

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

APIC mode

Advanced peripheral interrupt controller. 24 interrupt lines are available.

ATAPI CD-ROM Drive

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

Automation system (AS)

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

Backup

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

Baud

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

BEEP code

The device performs a self-test when it is switched on. If an error is detected during the POST (Power On Self-Test), a series of beep signals are issued. The beep tone series are a code for errors and are composed of 2 x 2 sequences.

Boot disk

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

Cache

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

CE marking

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

Chipset

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

Cold restart

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

COM interface

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

Compact Flash cards (CF)

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

Configuration files

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

Configuration software

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

Controller

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

Device configuration

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

Disc-at-once

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

DisplayPort

DisplayPort is a VESA standardized, universal and license-free connection standard for the transmission of image and sound signals. Areas of application are mainly the connection of screens and TVs to computers, DVD players and similar devices.

DP

Display **P**ort: New digital monitor interface.

Drivers

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

Dual Core CPU

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

DVD

Like the CD, the DVD is a digital, optical storage medium, but with a larger storage capacity. DVD is the abbreviation of Digital Versatile Disc. R "Recordable" stands for writable once, RW "Rewritable" means you can rewrite the DVD up to approximately 1000 times.

ECC

Error checking and correction is a method for detecting and correcting errors when saving and transferring data, frequently used in conjunction with RAM modules with and without ECC.

EMC directive

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

Energy management

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

Energy options

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

Enhanced Write Filter (EWF)

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

ESD directive

Directive for using electrostatic sensitive components.

Ethernet

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

Execute Disable Capability

Hardware implementation that prevents mutual memory accesses by programs and applications. It is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Extensible Firmware Interface (EFI)

Refers to the central interface between the firmware, the individual components of a computer and the operating system. EFI is located logically beneath the operating system and represents the successor to PC BIOS, focusing on 64-bit systems.

File Based Write Filter (FBWF)

Configurable write filter to protect individual files from write access.

Formatting

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

Gender changer

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

HORM

Hibernate once, resume many is a method for fast booting from a single Hibernate file that only needs to be created once. HORM ensures restoration of a uniform, saved system state when booting. This reduces the writing to a CompactFlash medium to a minimum, for example, when starting up and shutting down Windows Embedded Standard 2009.

Hot plug

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

Hub

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

Hyper Threading

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

IGD

Integrated Graphics Device. Graphics interface integrated in the chipset.

Image

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

Intel Active Management Technology

This technology permits the diagnostics, management and remote control of PCs. It is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Intel VT

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

Interface

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

Interface, multi-point

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

LAN

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

Legacy Boot Device

Conventional drives can be used as USB devices.

Legacy USB support

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

License key

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

License key disk

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

Low-voltage directive

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

LPT interface

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

Memory card

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

Module

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

Module 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 very short, compact and light modules on the market. The module bracket was not designed for these modules because standard fastening is sufficient for them.

Motherboard

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

Operating system

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

Packet writing

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

PATA

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

PC card

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

PC/104 / PC/104-Plus

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

PCIe

PCI-Express (Peripheral Component Interconnect Express) is an extension standard for connection of I/O devices with the chipset of a main processor. PCIe is the successor of PCI, PCI-X and AGP and offers a higher data transmission rate in comparison to its predecessors.

PCMCIA

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

PEG interface

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

PIC mode

Peripheral interrupt controller. 15 interrupt lines are available.

Pixel

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

Plug&Play

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

POST

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

PROFIBUS/MPI

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

PROFINET

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

Programmable controller (PLC)

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

PXE server

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

RAID

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

RAL

Restricted **A**ccess **L**ocation: Installation of the device in a production facility with restricted access, for example, a locked control cabinet.

Recovery DVD

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

Reset

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

Restart

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

Restore DVD

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

ROM

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

S.M.A.R.T

The Self-Monitoring, Analysis and Reporting Technology (SMART or S.M.A.R.T.) is an industry standard integrated in storage media. It makes for permanent monitoring of important parameters and early detection of imminent problems.

SATA

Serial ATA Interface for hard disk drives and optical drives with serial data transmission rates of up to 300 Mbps.

SCSI interface

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

Session at once

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

SETUP (BIOS Setup)

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

SSD (Solid State Drive)

A Solid State Drive is a drive that can be installed like any other drive; it does not contain a rotating disk or other moving parts because only semiconductor memory chips of similar capacity will be used. This design makes SSDs more rugged, provides shorter access times, low energy consumption and rapid data transfer.

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

Trusted Execution Technology

Hardware implementation that allows secured execution of programs and applications. It is only effective when all relevant system components, such as processors, operating systems and applications are supported.

Turbo Mode

In this mode individual processor cores can be clocked higher in accordance with the load from the user programs and as required. It is only supported by Core i5 and Core i7 processors.

V.24 interface

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

Wake on LAN (WoL)

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

Warm restart

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

WLAN

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

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