SIEMENS

SIMATIC

SIMATIC Rack PC 840

Manual

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Edition 04/2002

A5E00104826-03

Safety Guidelines

This manual contains notices intended to ensure personal safety, as well as to protect the products and connected equipment against damage. These notices are highlighted by the symbols shown below and graded according to severity by the following texts:



Danger

indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.



Warning

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.



Caution

indicates that minor personal injury can result if proper precautions are not taken.

Caution

indicates that property damage can result if proper precautions are not taken.

Notice

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Qualified Personnel

Only **qualified personnel** should be allowed to install, repair and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct Usage

Note the following:



Warning

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

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

Trademarks

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Organization Group Automation and Drives
Division Systems Engineering
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Disclaim of Liability

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

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Siemens Aktiengesellschaft

A5E00104826

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Preface

Purpose of the Manual

This manual contains all the information you need for commissioning and using the SIMATIC Rack PC 840.

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

Where is this Manual Valid?

This manual is valid for all supplied variations of the SIMATIC Rack PC 840 and describes the state of delivery as of April 2002.

Certifications, Standards and Approvals

Certifications

The device fulfils the following guidelines and certifications:

- EU guideline 73/23/EEC on low voltages
- EU guideline 89/336/EEC on electromagnetic compatibility
- Underwriters Laboratories (UL) to Standard UL 1950
- Canadian Standard Association (CSA) to Standard C22.2 No. 950

Standards and Approvals

The device fulfils the requirements for the CE approval. Approvals for UL and CSA are available.

Further information on the approvals, certificates, and licenses for your device is provided in Chapter 1.

Incorporation into the Communications Environment

This manual forms part of the supplied CD “Documentation and Drivers”.

For supplementary instructions on how to handle the software please refer to the corresponding manuals (for example, *Programming with STEP 7* Manual).

Structure of the Manual

In Chapters 1 to 4 the manual contains the most important instructions for starting up and using the SIMATIC Rack PC 840. Chapters 5 to 9 are reference sections you will only require in special cases.

Important Information

This chapter provides information about safety instructions, certificates, directives and approvals.

Introduction

Before using your device for the first time you should read Chapter 2 to obtain more information about the SIMATIC Rack PC 840 components and their function.

Setting Up and Operation

The basic commissioning steps can be found in Chapter 3. Furthermore, you will find instructions there on how to work with memory modules for automation devices and further ports.

Expansion

Chapter 4 describes how to expand your SIMATIC Rack PC 840 (for example, installation of memory expansions). Please observe the safety instructions.

Configuration

Modifications to the system hardware may make it necessary for you to adapt the original hardware configuration. Chapter 5 tells how to proceed in this case.

Error/Fault Dignostics

Chapter 6 will tell you how to deal with simple faults that you can diagnose and, in some cases, eliminate yourself.

Hardware-Informationen

Chapter 7 provides information on the system resources and connecting cables.

SCSI Controller

Chapter 8 provides the procedure for setting SCSI addresses and connecting SCSI devices.

Reinstallation of the Software

Chapter 9 shows how to proceed in case you have to reinstall software.

ESD Guidelines

The guidelines for handling electrostatic sensitive devices in Chapter A are of particular importance for service and maintenance engineers who install expansions or carry out error analysis with the SIMATIC Rack PC 840.

Technical Specifications

Appendix B lists the valid technical specifications for your device. Detailed information on how your Rack PC 840 is equipped can also be found in the BIOS message (Summary Screen) when your PC is booting up.

Retrofit Notes

Appendix C describes the permissible variants of equipment for Rack PC 840 including drives and processors and the resulting permissible operating conditions.

Glossary

The glossary explains important terms.

Alphabetical Index

The index will enable you to quickly find passages in the text pertaining to important keywords.

Conventions

The abbreviation Rack PC oder device is also used within this manual for the product designation SIMATIC Rack PC 840.

Further Support

If you have questions related to the use of the products which are not answered in this manual, please consult your Siemens representative in your local agency.

http://www.ad.siemens.de/partner

Training Center

Siemens offers a number of training courses to familiarize you with the SIMATIC S7 automation system. Please contact your regional training center or our central training center in D 90327 Nuremberg, Germany for details:

Telephone: +49 (911) 895-3200

http://www.sitrain.com/

SIMATIC Documentation on the Internet

You will find the documentation on the internet at:

http://www.ad.siemens.de/support

Use the Knowledge Manager to find the documentation you need quickly. If you have any questions or suggestions concerning the documentation you can use the ”Documentation” conference in the internet forum.

Automation an Drives, Service & Support

Available worldwide, around the clock:



SIMATIC Basic Hotline

Worldwide (Nuremberg)
Technical Support
(Free Contact)
Local time: Mo.–Fr. 7:00 to 17:00
Phone: +49 (180) 5050 222
Fax: +49 (180) 5050 223
E-mail: techsupport@ad.siemens.de
GMT: +1:00

Worldwide (Nuremberg)
Technical Support
(charged, only with SIMATIC Card)
Local time: Mo.–Fr. 0:00 to 24:00
Phone: +49 (911) 895-7777
Fax: +49 (911) 895-7001
GMT: +01:00

Europe / **Africa** (Nuremberg)
Authorization
Local time: Mo.–Fr. 7:00 to 17:00
Phone: +49 (911) 895-7200
Fax: +49 (911) 895-7201
E-mail: authorization@nbgm.siemens.de
GMT: +1:00

America (Johnson City)
Technical Support and Authorization
Local time: Mo.–Fr. 8:00 to 19:00
Phone: +1 423 461-2522
Fax: +1 423 461-2289
E-mail: simatic.hotline@sea.siemens.com
GMT: –5:00

Asia / **Australia** (Singapore)
Technical Support and Authorization
Local time: Mo.–Fr. 8:30 to 17:30
Phone: +65 740-7000
Fax: +65 740-7001
E-mail: simatic.hotline@sae.siemens.com.sg
GMT: +8:00

German and English are spoken on all the SIMATIC hotlines, French, Italian and Spanish are also spoken on the authorization hotline.

Service & Support on the Internet

In addition to our documentation, we offer our Know-how online on the internet at:

http://www.ad.siemens.de/support

where you will find the following:

- Current Product Information leaflets, FAQs (Frequently Asked Questions), Downloads, Tips and Tricks.
- A newsletter giving you the most up-to-date information on our products.
- The Knowledge Manager helps you find the documents you need.
- Users and specialists from all over the world share information in the forum.
- Your local customer service representative for Automation & Drives in our customer service representative data bank.
- Information on field service, repairs, spare parts and more under ”Services”.

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Important Information

1

1.1 Safety Instructions



Caution

The safety instructions given on the reverse of the title page of this manual must be observed. Before expanding your Rack PC refer to Chapter 4 and read the relevant safety instructions.

This device corresponds to the relevant safety measures according to IEC, EN, VDE, UL, and CSA. If you have questions about the permissibility of the installation in the designated environment, please contact our service representative.

Installation

Condensation can occur if the device is transported from a cold environment into the operating area. The device must be dry prior to startup. You must allow for an acclimatization time of at least twelve hours.

Please observe the notes on ambient conditions in Appendix B *Technical Specifications* and the installation notes in Section 3.2 of this manual when installing and operating the device. The device is to be installed so that there is no danger of it falling or of causing damage to itself or others.

Be sure the fan ventilation slots are open so that a sufficient amount of air can be drawn in to cool the housing interior.

Power Connection

Install the cables so that no one can step on them or trip over them. When you connect the device, adhere to the relevant instructions in Chapter 2 of this manual.

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

In emergency situations (for example, damaged housing, damaged operator elements, a damaged power supply cable, ingress of liquids or foreign particles), switch off the device. Disconnect the power plug and inform the responsible service personnel.

The Rack PC must be switched off when you connect or disconnect peripheral devices (keyboard, mouse, printer, etc.). You can damage the PC if you do not adhere to these instructions.

Notes for Devices with AC Power Supply

The device is intended for service in grounded electricity supply systems (TN systems to VDE 0100, part 300, or IEC 364-3).

Service in non-grounded or impedance-grounded supply systems (IT systems) is not intended.

The power cord should meet the respective local safety requirements.

Check whether the device's set supply voltage is the same as the local supply voltage.

This device is equipped with a safety-tested power supply cable. You may connect this device only to a grounding outlet with a grounding contact.

Make certain that the socket outlet on the device or the grounding contact for the building wiring system is freely accessible and as near to the device as possible.

The mains switch does not separate the device from the power system. To establish a complete power separation, you must disconnect the power plug (inlet connector on the back of the device). This location must be accessible. A central isolating switch must be present for cabinet mounting.

Notes for Devices with DC Power Supply

The device does not fulfil the power supply connection requirements for a fire enclosure to EN60950; therefore the mounting must meet the requirements of fire protection enclosures in this area.



Warning

Only connect the device to 24V DC power supply systems which meet the requirements of a safe extra-low voltage (SELV); in addition, a protective conductor must be connected.

The cable cross section has to be adapted to the short circuit current of the 24V DC power supply unit so that the cable does not cause damages in the event of a short circuit. Cables with a cross section of a maximum of up to 5 mm^2 can be connected.

Country-Specific Information

For the United States and Canada:

In the United States and Canada USA, a CSA or UL-listed power supply cable must be used.

The male plug is a 5-15 style.

For operation with 120 V:

Use a UL Listed, CSA Labelles Cord Set, consisting of a min. 18 AWG. Type SVT or STJ three conductor flexible cord, max. 4.5 m (15 feet) in length and a parallel blade grounding type attachment plug rated 15 A, min 125 V.

For operation with 240 V:

Use a UL Listed, CSA Labelled Cord Set, consisting od a min. 18 AWG. Type SVT or SJT three conductor flexible cord, max. 4.5 m (15 feet) in length and a tandem blade grounding type attachment plug, rated 15 A, 250 V.

For operation with 230 V (outside of USA and Canada)

Use a Cord Set consisting of a min 18 AWG cord and grounding type attachment plug rated 15 A, 250 V. The cord set should have the approviate safety approvals for the country in which the equipment will be installed and marked.

Repairs

Only authorized personnel are permitted to repair the Rack PC.



Warning

Unauthorized opening and improper repairs on the device can result in significant danger to the user.

Before you open the device, first switch it off and then disconnect the power plug.

Install only system expansion devices provided for this computer. If you install other expansion devices, you can damage the system or violate the safety requirements and regulations for radio interference 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 Rack PC, the warranty becomes void.

The power supply may only be dismantled or exchanged by authorized technical personnel.

Battery

There is a battery in this device on the motherboard. Batteries may only be exchanged by technical personnel.

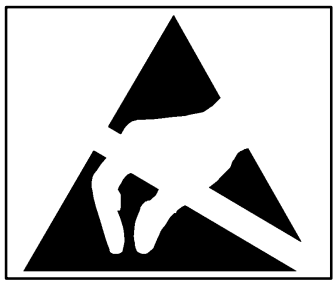
Observe the local regulations on disposal of special waste when disposing of dead batteries.

Caution

There is the danger of an explosion, if the battery is not exchanged as directed. Replace only with the same type or an equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the legal instructions of your area.

Notes on Inserting and Removing Modules (ESG Guidelines)

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



Please observe and carefully follow the guidelines mentioned below when handling modules equipped with electrostatically sensitive devices:

- Always discharge your body before handling modules equipped with ESDs (for example, by touching a grounded object).
- Devices and tools must be free of static electricity.
- Always pull the power plug and disconnect the battery before connecting or disconnecting modules (containing ESDs).
- Touch modules fitted with ESDs by their edges only.
- Never touch wiring posts or printed conductors on modules containg ESDs.

1.2 Certificates, Directives and Declarations

Notes on the CE Symbol



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

EMC Directive

This product fulfils the requirements for the EC directive 89/336/EEC on “electromagnetic compatibility” and the following fields of application apply according to this CE symbol:

Field of Application	Requirement For	
	Emitted Interference	Noise Immunity
Industry	EN 50081-2: 1993	EN 50082-2: 1995

The devices with AC power supply meet the norms of the the EN 61000-3-2:1995 (harmonic currents) and EN 61000-3-3:1995 (voltage fluctuation and flicker).

Caution

This is a class A electronic device. This device may cause interference in residential areas. In this case the user may be asked to take the necessary precautions.

Low Voltage Directive

The devices with AC power supply complies with the requirements of the EU Directive 73/23/EEC “Low-Voltage Directive.” Conformance with this standard has been verified according to EN 60950.

Declaration of Conformity

The EC declarations of conformity and the documentation relating to this are available to the authorities concerned, according to the above EC directive, from:

Siemens AG
Bereich Automation & Drives
A&D AS RD 4
Postfach 1963
D-92209 Amberg
Tel.: +49 (9621) 80-3283
Fax: +49 (9621) 80-3278

Observing the Setup Guidelines

The setup guidelines and safety instructions given in this electronic manual must be observed on startup and during operation.

Connecting Peripherals

The requirements regarding noise immunity (EN50082-2:1995) are met when you connect a peripheral suitable for an industrial environment. Peripheral devices are only be connected via shielded cables.

ISO 9001 Certificate

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

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

EQ-Net certificate no.: 1323-01

Software License Agreement

The Rack PC is shipped with the software already installed. Please observe the relevant license agreements.

1.3 Certification for the USA, Canada and Autralia

Security

One of the following markings on a device is indicative of the corresponding approval:

	Underwriters Laboratories (UL) to the UL 1950 Standard (I.T.E) or to the UL508 (IND.CONT.EQ)
	Underwriters Laboratories (UL) to the Canadian Standard C22.2 No. 950 (I.T.E) or to the C22.2 No. 142 (IND.CONT.EQ)
	Underwriters Laboratories (UL) to Standard UL 1950, Report E11 5352 and to the Canadian Standard C 22.2 No.950 (I.T.E) or to the UL508 and C22.2 No. 142 (IND.CONT.EQ)
	UL-Recognition-Mark
	Canadian Standard Association (CSA) to standard C22.2. No. 950 (LR 81690) or to C22.2 No. 142 (LR 63533)
	Canadian Standard Association (CSA) to the American Standard UL 1950 (LR 81690) or to the UL 508 (LR 63533)

EMV

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

(for devices with **DC power supply**)

Canadian Notice

This Class A digital apparatus complies with Canadian ICES-003.

Avis Canadien

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

(for devices with **AC power supply**)

Canadian Notice

This Class B digital apparatus complies with Canadian ICES-003.

Avis Canadien

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Australia

(for devices with **AC power supply**)

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

1.4 Transport

Transporting

Despite the fact that the Rack PC is of rugged design, its internal components are sensitive to severe vibrations or shock. You must therefore protect the PC from severe mechanical stress when transporting it.

Use the **original packing material** if you have to ship the Rack PC from one location to another.

Caution

Risk of damage!

When transporting the PC in cold weather, when it may be submitted to extreme variations in temperature, make sure that there is no moisture (condensation) on or in the PC.

The PC must be allowed to reach room temperature slowly before you switch it on. If condensation has formed, you should wait approximately 12 hours before switching on the PC.

Welcome to the SIMATIC Rack PC 840

2

Chapter Overview

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2.1 Front View with Closed Front Door

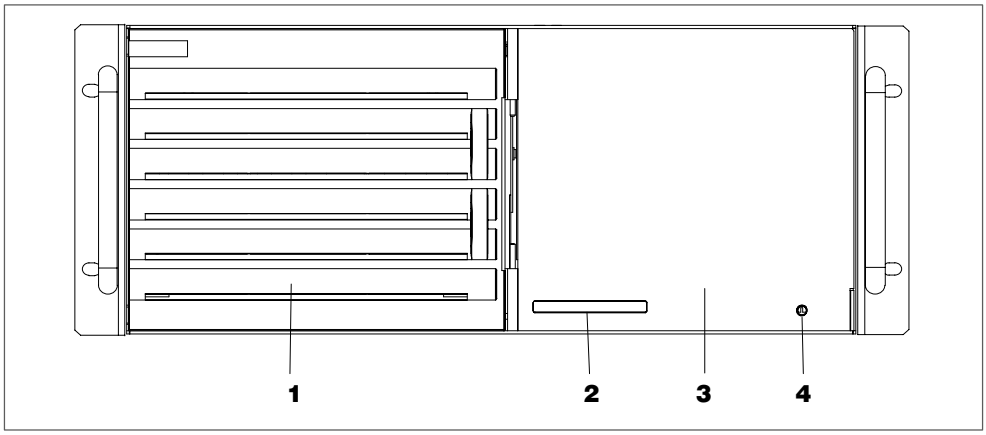


Figure 2-1 Front View with Closed Front Door

1 Front Panel

The front panel has openings for device ventilation. A filter mat and the fans are located behind this front panel. It can only be removed when the front door is open. Please check the filter mat regularly for dirt and replace it if necessary.

2 LEDs

The LEDs show the operating mode of the device:

FAN	red	CPU does not start or fan speed is too low. The fan status is only displayed when SOM or SOL is enabled.
TEMP	red	Inner temperature is critical. Check the filter mat or contact the Customer Support.
WATCHDOG	green red off	Watchdog monitoring is switched on. Monitoring time has run out. Watchdog is not activated.
ETHERNET	green off	Data traffic No data traffic or no connection
PROFIBUS/MPI	green off	Data traffic at Profibus DP No data traffic at Profibus DP or no connection to Profibus DP
HARDDISK	green	Lights up when hard disk is being accessed
POWER	yelllow green off	Standby, PC is in hibernate mode. Power, PC is in operating mode. Mains plug is removed.

3 Front Door

The Front ports and the screw to unlock the housing cover are protected against dirt and unauthorized access by means of a door. Please keep the front door closed during normal operation. The Microsoft Windows Product Key is located on the inside of the front door.

Caution

Only qualified personnel is authorized to open the Rack PC or carry out repairs or maintenance work.

4 Lock

To prevent unauthorized access you can lock the front door.

2.2 Front View with Opened Front Door

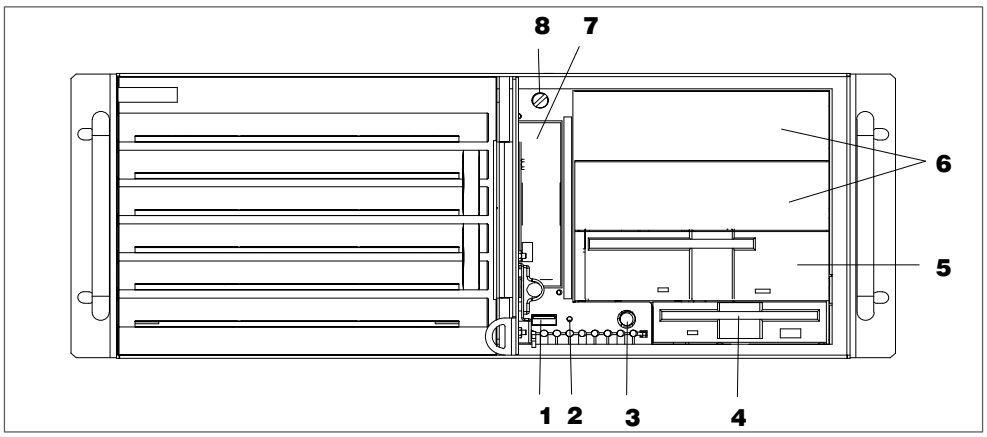


Figure 2-2 Front View with Opened Front Door

1 USB

Universal Serial Bus connector. You can use the USB port to connect external devices, for example, CD drives, printers, modems as well as mouse and keyboard. Older operating systems do not support this port. This connection is provided for maintenance purposes.

2 Reset Button

The reset button can be actuated with a thin pen (e.g. an opened up paper clip). If you actuate, the button, a hardware reset is triggered. The PC restarts. Data loss is possible with a hardware reset.

3 On/Off-Button

Use the On/Off pushbutton to power up the Rack PC. Please do not start your Rack PC until you have followed all of the instructions for commissioning.

4 Floppy Disk Drive (optional)

You can store programs and data on diskettes with the disk drive and load them from diskettes into the Rack PC.

5 CD ROM Drive (optional)

You can read data from CD ROM, CD RW and Audio/Video in the CD ROM drive.

5 CD RW Drive (optional, not represented)

In this drive you can use rewriteable CDs.

6 Dummy Panels (optional)

Depending on the device configuration, the components labelled ‘optional’ are either built in or the openings are closed with dummy panels.

6 Removeable Rack (optional, not represented)

There is a removable rack for the EIDE interface.

7 3.5” Dummy Panel

8 Housing Screw

Screw for fastening the housing cover.

Caution

Only qualified personnel is authorized to open the Rack PC or carry out repairs or maintenance work.

2.3 Side View

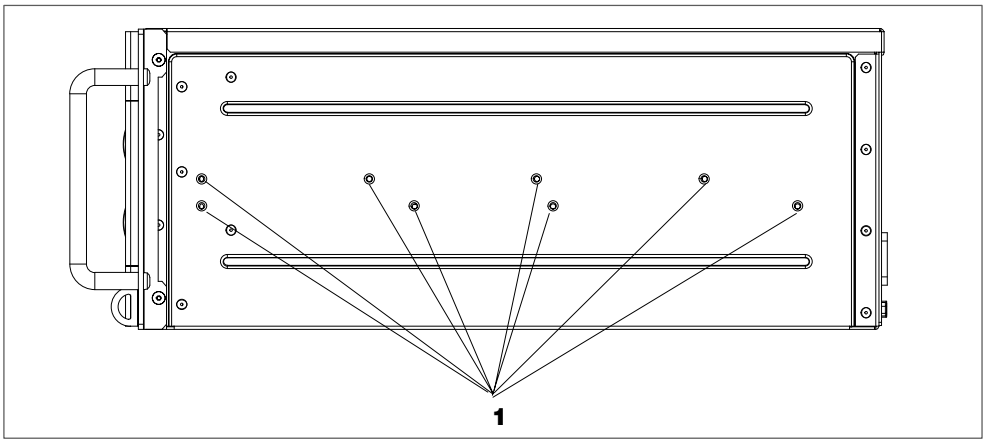


Figure 2-3 Side View

1 Fastening Points for Telescopic Rails

The Rack PC can be mounted on telescopic rails or on cabinet brackets. It is not permitted to mount it at the 19” front supports only. When using telescopic rails restricted technical specifications apply for the drives in the front drive holder. For more details refer to the Technical Specifications in Appendix C or to the Retrofit Notes in Appendix C.

The use of the telescopic rails makes it possible to completely pull the Rack PC out of the cabinet or rack.

2.4 Rear View

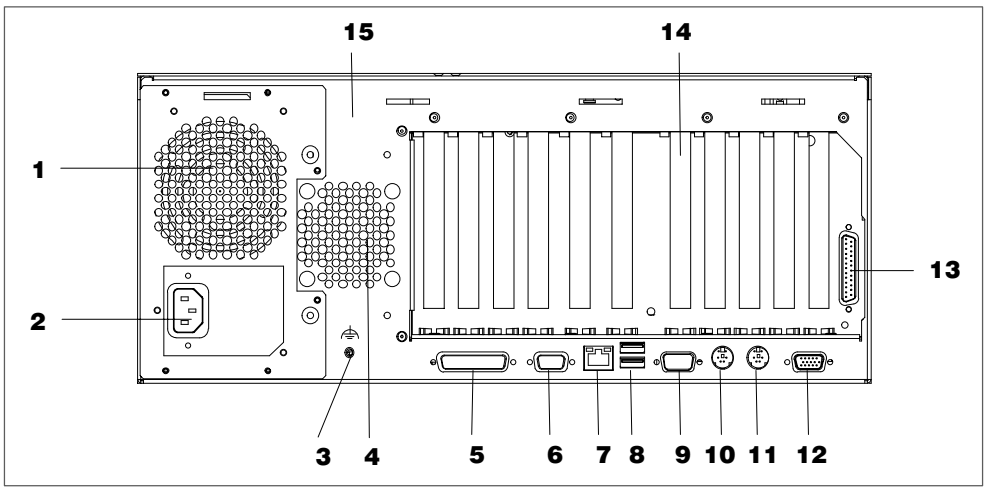


Figure 2-4 Rear View

1 Power Supply Fan

Here are openings for power supply ventilation.

Caution

The air venting slots for outgoing air must not be obstructed. Otherwise, there is a risk of overheating.

2 Power Supply

Appliance socket for AC power supply or screw terminal for DC power supply.

3 Equipotential Grounding

The connection with the equipotential grounding on the system housing to the central earth terminal of the cabinet or the unit into which the computer is fitted, ensures that faults arising from external power supply cables, signalling cables or cables to peripheral units are diverted.

4 Rear Drive Fan (opcional)

Here are openings for device ventilation.

5 COM1

The COM 1 (TTY) port is used to connect, for example, S5 automation units (AG). The supplied adapter can be used to convert the port into a 25-pole standard V.24 port for connecting serial port devices such as modem, mouse or printer. *Refer to Section 4.3 of the electronic manual.* The line current (TTY) is an optional product feature.

6 PROFIBUS/MPI (opcional)

You can connect the Rack PC to an S7 automation system or to a PROFIBUS network via the PROFIBUS/MPI port with galvanic isolation . *See Section 3.6 in the electronic manual.* This port is an optional product feature.

7 Ethernet 

RJ 45-Ethernet connector. Ethernet is a local network with a bus structure for data communication with a data transfer rate of 10 or 100 megabit per second (Mbps).

8 USB 

Universal Serial Bus connector. You can use the USB port to connect external devices, for example, CD drives, printers, modems as well as mouse and keyboard. Older operating systems do not support this port.

9 COM2

You can use the serial port 2 (V.24) to connect devices with a serial port such as modem, mouse or printer.

10 Keyboard

Connection for a PS/2 keyboard.

11 Mouse

PS/2 socket for connecting a PS/2 mouse.

12 VGA

You can connect an external VGA monitor to this connector.

13 LPT1

The parallel port connection for devices with parallel port (for example, printer)

14 Expansion Slots

Internal slots for expansion modules. Seven PCI and five ISA slots are available. A maximum of ten modules can be inserted simultaneously.

15 Type Label

You can find the order number and the serial number (F-No.) of your device on the type label.

2.5 Drives

As the Rack PC can be configured freely, the following drives are available - depending on your order.

2.5.1 Disk Drive

You can store programs and data on diskettes with the disk drive and load them from diskettes into the Rack PC.

Diskette Types

You can use following diskettes:

Double Sided Double Density Diskette	Double Sided High Density Diskette
3.5 in.	3.5 in.
720 Kbytes	1.44 Mbytes (135 TPI)

Caution

Risk of data loss!

When the green access LED of the disk drive is lit, the ejector may not be actuated.

2.5.2 Hard Disk Drive

The hard disk drive is used for the storage of large quantities of data. A maximum of four drives can be installed.

Optionally, the following drive holders are available for installation:

For Front Installation

- 5 1/4” Adapter
  A drive can be firmly installed in this adapter.
- Removeable rack
  A drive can be firmly installed in this rack.

For Installation in the Rear Drive Holder

- Drive holder Industry
  Two drives can be installed in this holder with damped vibration.

A special fan which enables operation of high-speed drives or drives which are exposed to high ambient temperatures (> 40°) can be installed in the rear drive holder .

Caution

Drives are sensitive to vibrations and shock. Any vibrations occurring during operation can lead to loss of data or damage to the drive.

If you intend transporting the unit, switch it off, and wait until the drive has come to rest (about 20 seconds) before you move it.

2.5.3 CD ROM Drive

Optionally, the CD ROM drive is installed in the front drive holder. The CD ROM drive enables you to read CD-ROM, CD-RW and video.

Operation

When pressing the open/close button the CD drawer is ejected with a short delay. Insert the CD in the drawer, writing up. The CD drawer is automatically drawn in when slightly pushing it or pressing the open/close button.

Quickly press the eject button for the drawer to come out. Now you can remove the CD.

Emergency Eject

When the device is switched off, the disk can be forced out by using a pin (for example, an opened up paper clip).

Notice

After the drawer has been closed, the CD is tested and the access LED on the drive starts to flash:

- If the access LED flashes continually, the CD is faulty but can still be read,
- If the access LED flashes several times and then remains lit, the CD you have inserted is defective and cannot be read.
- normally the access LED is lit when reading the CD.

Caution

CD ROM drives are sensitive to vibrations and shock. Any vibrations occuring during operation can lead to damage to the drive or CD.

2.5.4 CD RW Drive

The CD RW drive is optionally installed in the front drive bay. This drive supports the following recording processes: Disc at once, Track at once, Session at once, Packet writing. CD-ROMs, CD-Rs as well as Video CDs can be read.

Additional Software

To be attain the full functionality of the CD-RW drive, additional software (burner software) is necessary. You can find it on the CD included in the delivery of the device. To install the software place the CD in the drive and follow the instructions on the screen.

Caution

Burning operation with CD-RW is permissible only in undisturbed enviromment, shock and vibrations are to be avoided.

2.6 Backup Battery

A backup battery (3.6 V lithium battery), located on the motherboard, powers the hardware clock even after the device is switched off.

Batteries may only be exchanged by technical personnel. Observe the local regulations on the disposal of special waste when disposing of dead batteries. Refer to Section 4.3 for exchanging the backup battery.



Caution

There is the danger of an explosion if the battery is not exchanged as directed. Replace only with the same type or an equivalent type recommended by the manufacturer. Dispose of used batteries in accordance with the legal instructions of your area.



Warning

Risk of severe personal injury or property damage, danger of release of harmful substances.

There may be a danger of explosion if the battery is not handled properly. Incorrect disposal of used batteries can cause the release of harmful substances.

Do not throw a new or discharged lithium battery into an open fire, do not solder onto the cell container. Do not recharge the battery, do not open the battery by force.

The correct lithium battery is available from Siemens (order no.: A5E00047601).

Return used batteries to the manufacturer/recycler or dispose of them according to local regulations.

Setting Up and Operating the SIMATIC Rack PC 840

3

Chapter Overview

Section	Description	Page
3.1	Unpacking and Checking the Scope of Delivery	3-2
3.2	Installing the SIMATIC Rack PC 840	3-3
3.3	Preparing for Operation	3-6
3.4	Connecting Peripheral Units	3-8
3.5	Connecting the SIMATIC Rack PC 840 to Other SIMATIC S5 Devices	3-13
3.6	Connecting the SIMATIC Rack PC 840 to a SIMATIC S7 Network (MPI/DP)	3-16
3.7	Networking the SIMATIC Rack PC 840 with Other Stations on PROFIBUS	3-18
3.8	Ethernet (RJ45 Ethernet Port)	3-18
3.9	Connection under Windows	3-18

3.1 Unpacking and Checking the Scope of Delivery

Unpacking the Rack PC

Unpack your Rack PC programming device as follows:

1. Remove the packing.
2. Do not throw the original packing away. Keep it in case you have to transport the unit again sometime in the future.
3. Please keep the documentation in a safe place. It is required during the initial start up and is part of the device.
4. Check the packing and its contents for any shipping or transport damage.
5. Check with the packing list to make sure no components are missing. Also check the accessory parts, which you can order separately.
6. Please inform your local dealer of any shipping or transport damages and of outstanding items indicated on the packing list.

Recording the Serial Number and the Ethernet address

7. Enter the **serial number** and the **Ethernet address** of your PC in the table of the Getting Started. You can find the serial number on the type label attached to the rear of the device. The Ethernet address can be found in the BIOS setup settings in the main menu under the 'Hardware Options' function.

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

Enter the Microsoft Windows "Product Key" from the "Certificate of Authenticity"

8. Enter the Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA) in the table of the Getting Started. You will find the "Product Key" on the inside of the front door. You need the Windows "Product Key" if you want to re-install the operating system.

3.2 Installing the SIMATIC Rack PC 840

The Rack PC is particularly suitable for horizontal fitting in consoles, switch boards and 19” rack systems.

The Rack PC **with AC power supply** meets the requirements for a fire enclosure to EN60950. it can therefore be fitted without an additional fire enclosure.

The Rack PC **with DC power supply** does not fulfil the power supply connection requirements for a fire enclosure to EN60950; therefore the mounting must meet the requirements of fire protection enclosures in this area.

Please note the following points when installing the PC:

- Avoid extreme ambient conditions as far as possible. Protect your PC from dust, moisture, and heat.
- Keep the PC out of direct sunlight.
- Mount the PC as safely as possible to prevent any danger (for example, by falling over).
- The clearance near the ventilation slots must be at least 50 mm, so that the PC is sufficiently ventilated.
- Make certain that the ventilation slots for the housing are not covered.
- The device is meets the protection class IP41 requirements on the front side. Ensure that opening for the Rack PC is protected against water in an environment where there is a risk of splashing water.
- Make certain that the sliding door in front of the drives is closed during operation.
- The Rack PC can be mounted on telescopic rails or on cabinet brackets. It is not permitted to mount it at the 19” front supports only.
- Remove the glued on stands when fitting the Rack PC on telescopic rails. For this use, restricted technical specifications for the drives in the front drive holder apply. For more details refer to the Technical Specifications in Appendix B or to the Retrofit Notes in Appendix C.
- Use the respective manufacturer’s cabinet or rack slide rails or L-sections. Contact your cabinet supplier directly regarding cabinet or rack installation.
- The use of the telescopic rails makes it possible to completely pull the Rack PC out of the cabinet or rack.



Warning

If the systems are installed without keeping to the conditions mentioned above, the approvals pursuant to UL 1950, UL 508 and EN60950 are no longer valid!

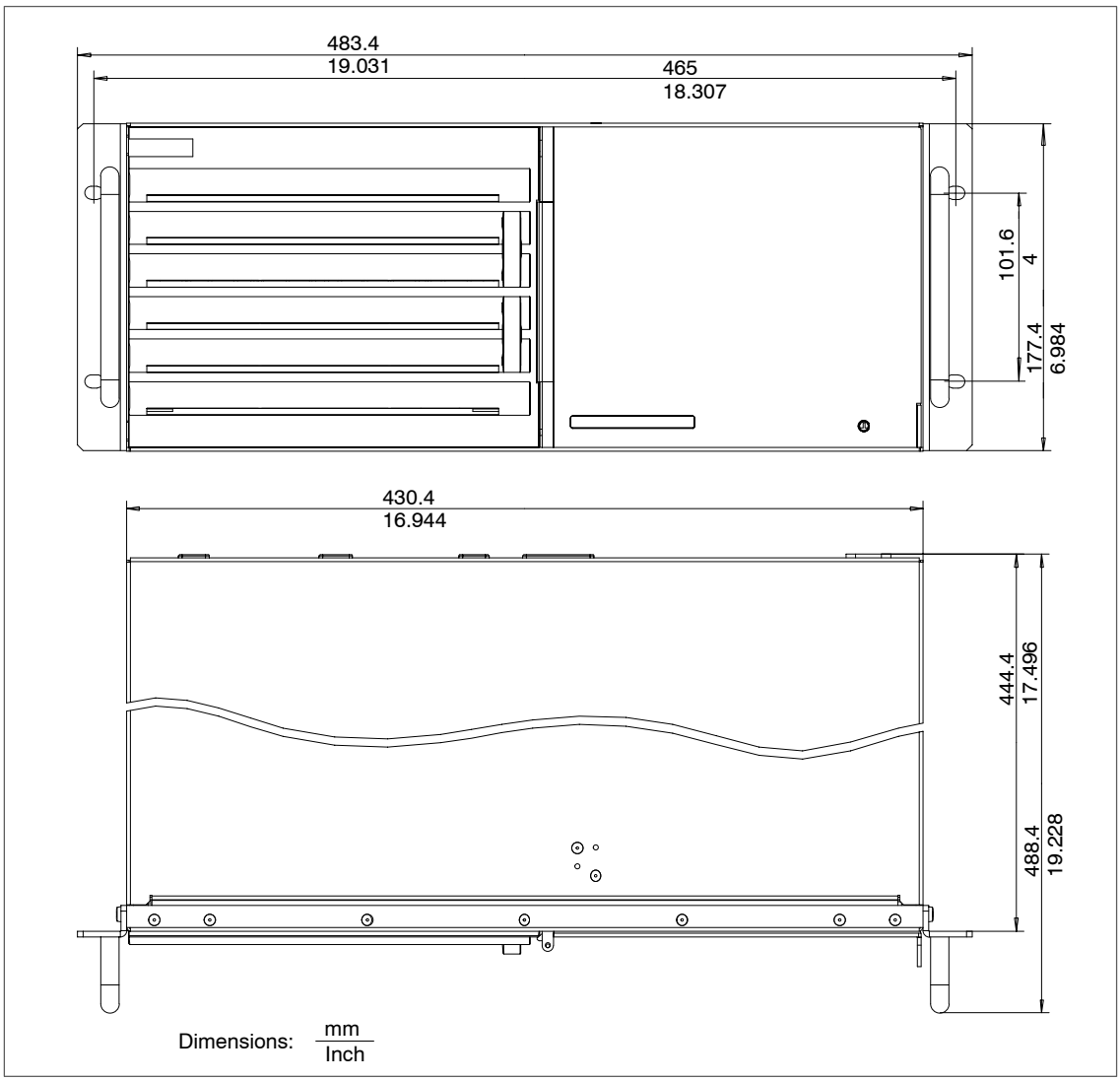


Figure 3-1 Dimension Drawings for Installation

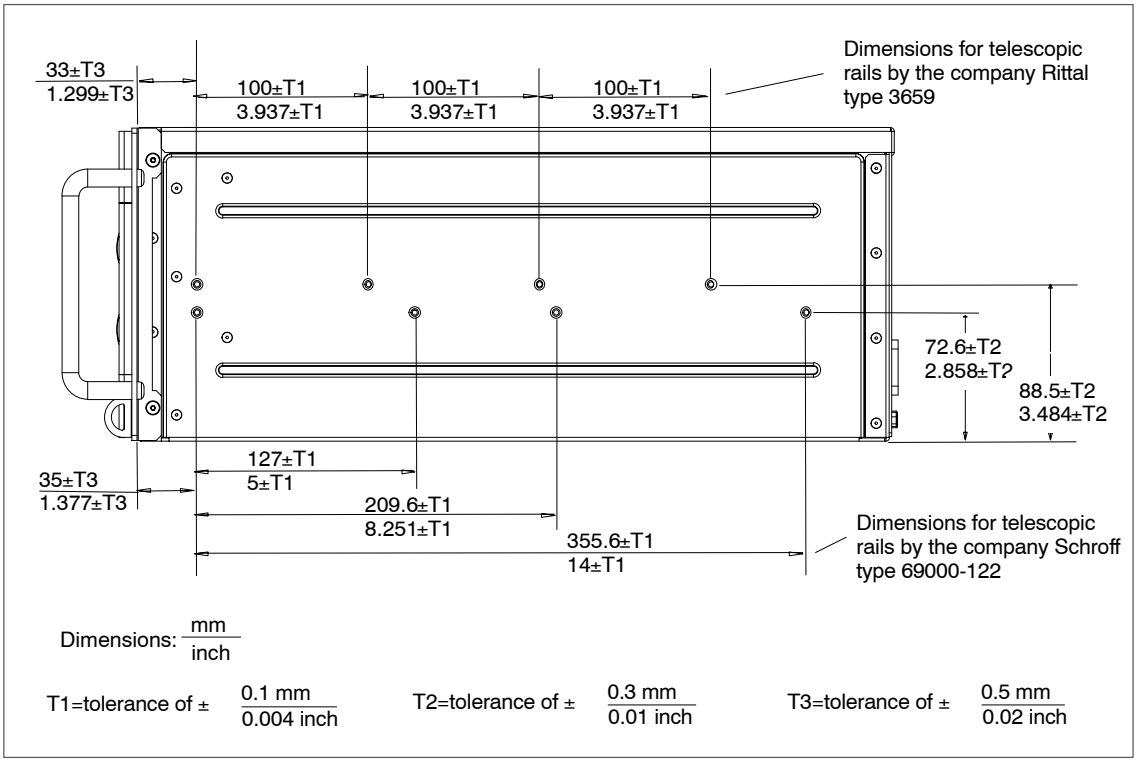


Figure 3-2 Dimensions for using telescopic rails

Technical Specifications of the Telescopic Rails

Load per pair	minimum 30 kg
Pull-out length for complete pull–out	minimum 470 mm
Rail thickness	maximum 9,7 mm
Fixing screws	M5 x 6mm

The fiixing screw of the telescopic rail should not go beyond a maximum of 5 mm into the housing.

3.3 Preparing for Operation

Connection to the Power Supply Unit

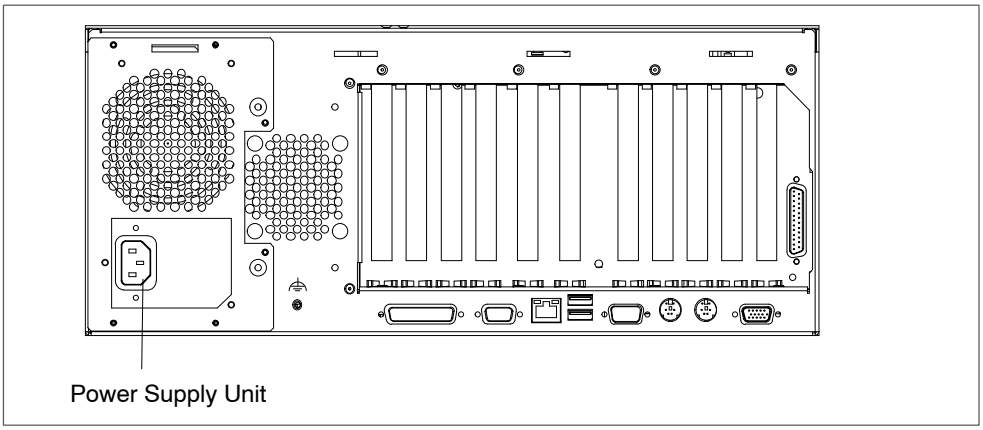


Figure 3-3 Connection to the Power Supply Unit

Warning

The Rack PC with AC power supply is equipped with a safety-tested mains cable and may only be connected to a grounded grounding outlet.

Make sure that the socket on the device or the grounding outlet of the building installation is easily accessible and as near as possible to the device.

The Rack PC has no mains switch. The mains plug must be pulled out for complete mains separation. This point must be easily accessible.

If the PC is installed in a cabinet, there must be a central mains disconnector.

The **AC power supply unit** is designed for 120/230/240 V systems. The power supply unit has a long-range input. It is not necessary to adjust the voltage span.

The **DC power supply unit** is designed for 24V systems.

Warning

Only connect the device to 24V DC power supply systems which meet the requirements of a safe extra-low voltage (SELV); in addition, a protective conductor must be connected.

The cable cross section has to be adapted to the short circuit current of the 24V DC power supply unit so that the cable does not cause damages in the event of a short circuit. Cables with a cross section of a maximum of up to 5 mm^2 can be connected.

Optionally, one of these power supplies is installed.

Equipotential Measures

Low-impedance ground connections ensure that faults arising from external power supply cables, signalling cables or cables to peripheral units are diverted.

Therefore connect the equipotential grounding connection on the system housing to the central earth terminal of the cabinet or the unit, into which the computer is fitted, in such a way that it has low impedance (large surface area, large contacts). The minimum cross section should not be less than 5 mm^2.

The connection is on the rear of the device and is identified by the symbol:



Connecting and Switching on the Rack PC

Before you connect the Rack PC to the mains, the peripheral units must be connected.

1. Insert the connector cable of the peripheral units into the corresponding sockets on the port side of the Rack PC (see Section 3.4.)
2. Once the peripheral units have been connected, the device is ready for operation from the power supply. Connect the device to the mains; the yellow Power LED at the front lights up. The Rack PC is now in standby mode.
3. Press the On/Off button behind the front door. The yellow and the green Power LEDs light up. The Rack PC is in operation.

Switching off the Rack PC

Press the On/Off button behind the front door. The green Power LED goes out. To completely separate the Rack PC from the mains, you have to remove the mains plug.

Note

If you are working with Windows, always use **Start > Shut down** in the task bar for switching off your Rack PC.

3.4 Connecting Peripheral Units

Notice

When connecting peripheral units, ensure that the components have industrial capability according to EN 50082-2.

Connecting the Printer to the Parallel Port

Proceed as follows to connect your printer:

1. Separate the Rack PC from the mains and switch off the printer.
2. Plug the printer cable into the LPT1 parallel port.
3. Connect the printer cable to the printer.
4. Screw the connector tight at the interface port.

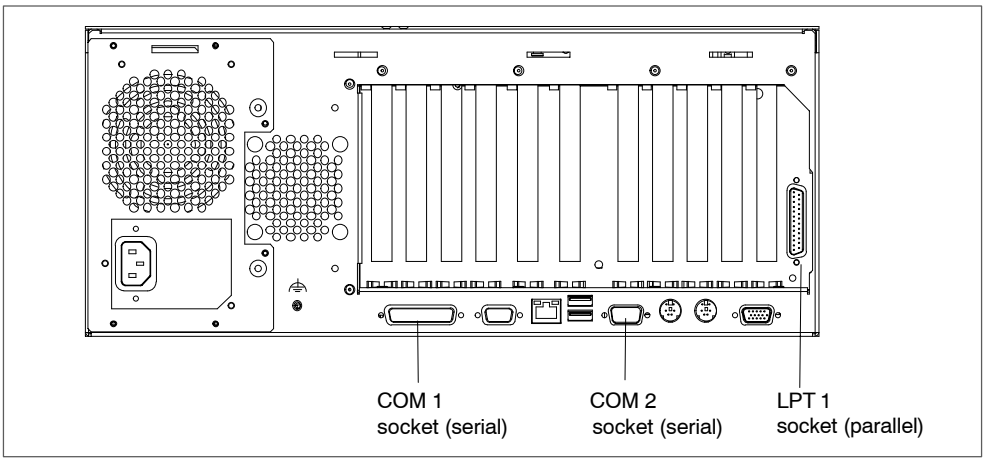


Figure 3-4 Position of the Printer Ports

Caution

Switch the unit off before connecting the parallel printer to the LPT 1 port (the printer should also be switched off).

Make sure that you use the correct port. If you use the wrong port or wrong connecting cables, the port may be damaged.

Before plugging in the cables, the electrostatic charge of your body, the unit, and the cables must be equalized. To do this, touch the mounting plate for the ports on the left-hand side of the unit. Only use original connecting cables.

Connecting the Printer to a Serial COM Port

You can also connect your printer to the Rack PC using a serial COM port. You will find information on how to adapt and set your port and which connecting cable you require in the description of your printer.

Connecting the Printer to a USB Port

You can find out how to connect a USB printer in **Connecting USB devices**.

Connecting Monitors

You connect external multisynchronous monitors using the standard VGA connector on the right-hand panel side of the unit. We recommend that you use a Siemens monitor.

You must switch the Rack PC off before connecting the monitor cable. You will find further information about the connector pinout in Chapter 7.

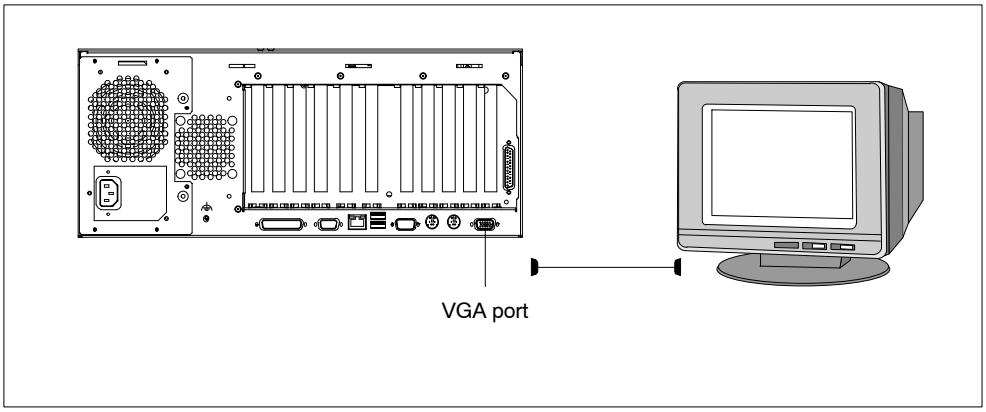


Figure 3-5 Connecting the Monitor

Proceed as follows to connect your monitor:

1. Separate the Rack PC from the mains and switch the monitor off.
2. Insert the monitor lead in the VGA socket.
3. Screw down the plug.
4. Connect the monitor cable to the monitor.
5. Reconnect the Rack PC to the mains and switch the monitor on.

Caution

If you want to set higher clock frequencies and resolutions, first make sure that the monitor you are using is suitable for a higher clock frequency and resolution.

If the clock frequency is too high, this can cause damage to the monitor.

Using a Mouse

You can connect a PS/2 mouse as well as a USB mouse to the Rack PC. The USB port is supported by Windows 2000 and Windows Me.

Connecting a PS/2 Mouse

You can connect an external PS/2 mouse or another external pointing device to an additional PS/2-compatible mouse connector.

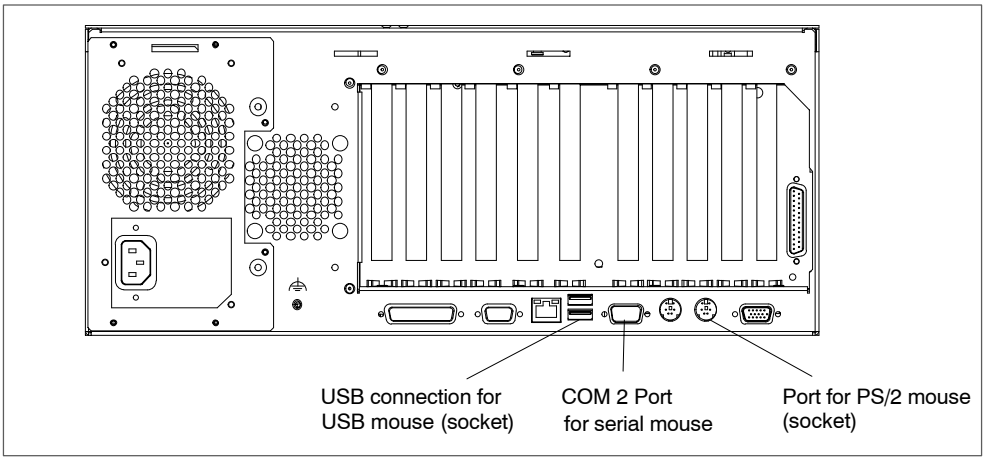


Figure 3-6 Connecting the Mouse

To connect the mouse, proceed as follows:

1. Separate the Rack PC from the mains.
2. Plug the cable of the PS/2 mouse or another external pointing device into the mouse connector.
3. Reconnect the Rack PC to the mains.

Connecting a Serial Mouse

You can connect a serial mouse to the COM 2 serial port. To operate a serial mouse, the appropriate mouse driver must be initialized and assigned parameters. You will find the information you need to do this in the description for your mouse or in the description for the operating system.

1. Separate the Rack PC from the mains.
2. Plug the serial mouse into the mouse connector labeled COM 2.
3. Secure the connector with the screws.
4. Reconnect the Rack PC to the mains.

You can find out how to connect a USB mouse in “Connecting USB devices”.

Connecting a USB Mouse

You can find out how to connect a USB mouse in **Connecting USB devices**.

Connecting a PS/2 Keyboard

A PS/2 keyboard of your choice can be connected to the Rack PC.

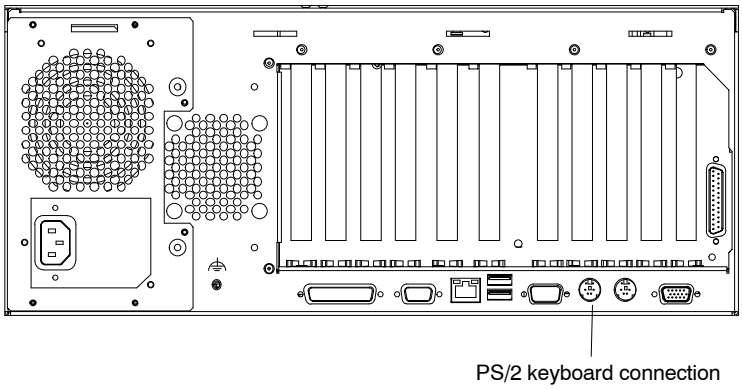


Figure 3-7 Connecting a PS/2 Keyboard

To connect the keyboard, proceed as follows:

1. Separate the Rack PC from the mains.
2. Insert the plug of the PS/2 keyboard.
3. Reconnect the Rack PC to the mains.

Notice

It is recommended that a keyboard with straight keyboard connector is used, so that the connector does not obscure adjacent ports.

Connecting a USB Keyboard

You can find out how to connect a USB keyboard in **Connecting USB devices.**

Connecting USB Devices

Single as well as several USB devices (mouse, keyboard or printer) can be connected to a USB port.

- Insert the USB device connector into the USB port.

The device is recognized by the Plug and Play operating system and is then available.

A USB keyboard can be used to manipulate the BIOS setup.

Note

For repair and maintenance purposes a further USB port is available at the front.

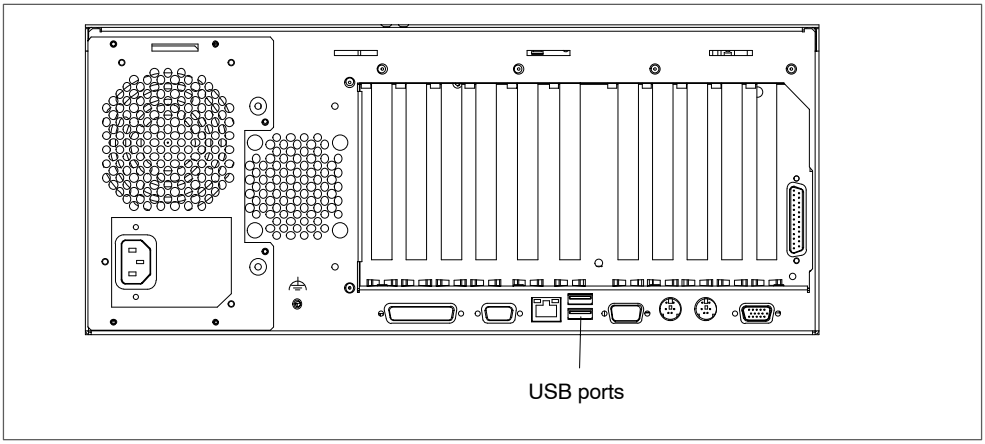


Figure 3-8 USB connections

Notice

Operating systems which do not support Plug and Play (for example, Windows NT 4.0), generally do not allow the operation of USB devices.

3.5 Connecting the SIMATIC Rack PC 840 to Other SIMATIC S5 Devices

Point-to-Point Connection

In this section, you will learn how to connect your Rack PC to a programming device or S5 programmable logic controller using a point-to-point connection.

You can establish a point-to-point connection by connecting the Rack PC to another programming device or a programmable logic controller using

- A V.24 connection
- A TTY connection (not possible for the basic variant of the Rack PC)

Connecting the Rack PC to an S5 Programmable Logic Controller

You can connect the Rack PC to a SIMATIC S5 programmable logic controller using the COM1/TTY interface port.

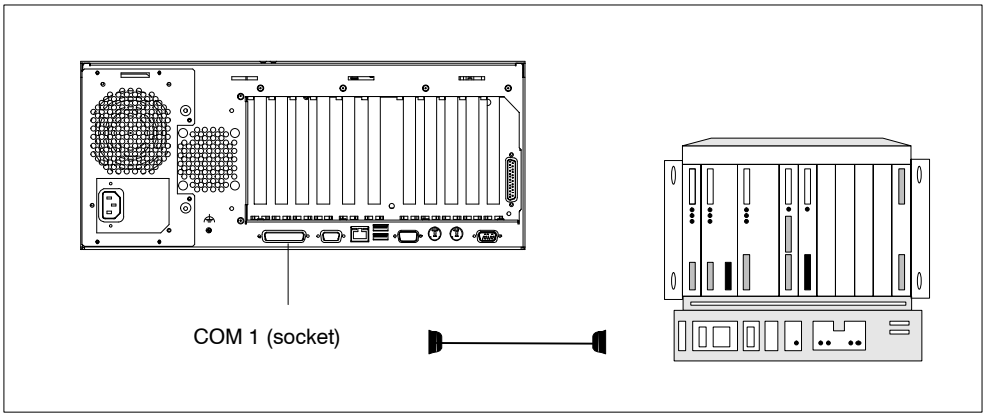


Figure 3-9 Connecting the Rack PC to an S5 Programmable Logic Controller

You connect your Rack PC to a SIMATIC S5 programmable logic controller as follows:

1. Separate the Rack PC from the mains
2. Insert the connecting cable into the port COM 1 / AG.
3. Screw down the plug.
4. Plug the cable into the corresponding port on the CPU of the programmable logic controller.
5. Reconnect the Rack PC to the mains.

Caution

Risk of damage to the Rack PC!

The interface port may be damaged if you confuse the connections or use the wrong connecting cables.

Make sure the TTY cable of the Rack PC is plugged into the COM 1 / TTY port and not into the LPT 1 port.

Before inserting the connecting cables, the electrostatic charge in your body, the device and the connecting cables must be brought to the same potential. Briefly touch the sheet metal case to do this.

Use only original cables to establish the connection to the programmable controller.

Connecting the Rack PC via an Adapter

The 6ES5 734-2BD20 standatd connecting cable is required for connection to a programmable controller. An adapter is available for connecting the programmable controller using old standard cables.

Tabelle 3-1 Adapter for Rack PC Connection

Port	Link	Connecting Cable Order No:	Adapter
TTY port (COM 1)	Rack PC to SIMATIC-S5 programmable controller	6ES5 734-2BD20	
		6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

In order to maintain a data transfer rate of 9600 bps up to a distance of 1000 m (3300 ft), the receiving diode is connected to ground (reference) via the connecting cable.

Notice

You can obtain lengths differing from the standard connecting cable (6ES5 734-2BD20) under the order number 6ES5 734-2xxx0, whereby xxx stands for the length code.

Rack PC to PG Connection (V.24, TTY)

If you want to connect your Rack PC to a programming device, you can plug the appropriate connecting cable into the V.24 or TTY interface port

Tabelle 3-2 Connection of the Rack PC to other PUs

Port	Link	Connecting Cable Order No.:	Adapter
COM 1 as a V.24 port	with PG 7xx	6ES5 733-5BD20[2)]	
COM 1 as a TTY port	with PG 6xx	Series connection of 6ES5 733 -2xxx0[2)] and 6ES5 731-6AG00[1)]	6ES5 731-6AG00

Notice

1. When connecting the programming devices in series, make sure you connect the cable the right way around (see Figure 3-10).
2. The connecting cable can only be ordered as a spare part. The connecting cable is described in Chapter 7.
3. The line current (TTY) is an optional product feature.

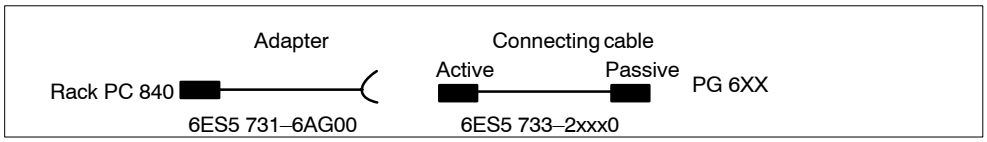


Figure 3-10 Direction of Connection: Adapter – Connecting Cable

Notice

For the PC/PG connection, you must switch the TTY ports (COM 1) in the programmable logic controller to passive by changing the jumper setting. The Rack PC interface is always active!

3.6 Connecting the SIMATIC Rack PC 840 to a SIMATIC S7 Network (PROFIBUS/MPI)

Connecting an S7 Programmable Controller via PROFIBUS/MPI Port

You can connect the Rack PC to a SIMATIC S7 automation system or to a PROFIBUS network via the potentially isolated*) PROFIBUS/MPI port**). The MPI cable for connection to SIMATIC S7 CPUs (Order No.: 6ES7901-0BF00-0AA0) is not supplied with the Rack PC.

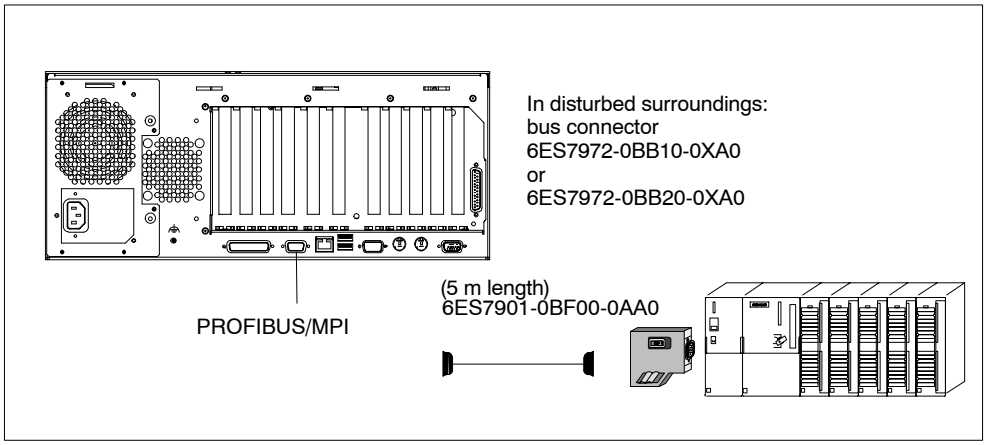


Figure 3-11 Connection Using the PROFIBUS/MPI Port

Proceed as follows when connecting to a SIMATIC S7 programmable logic controller:

1. Separate the Rack PC from the mains.
2. Connect the cable to the PROFIBUS/MPI port.

Caution

Risk of damage to the Rack PC!

Before plugging in the connecting cables, the static charge on your body, the unit, and the cables must be equalized. You can do this by briefly touching the metal housing.

* Electrical isolation in the saftey extra-low voltage circuit (SELV circuit).
** Optional product feature.

Connecting

Via the MPI/DP port, you can connect your PC to

- MPI networks (S7-200, S7-300, and S7-400) or
- PROFIBUS DP networks (DP components).

PROFIBUS/MPI Network

Up to 32 devices (PC, programming device, or programmable controller) can be connected to the PROFIBUS/MPI port to form a network segment. The physical connection to the network is via a floating RS485 port which is a component of the PC motherboard.

Several network segments can be connected via repeaters. The complete network can comprise up to 127 stations. Data transmission rates from 9.6 Kbps to 12 Mbps are possible.

3.7 Networking the SIMATIC Rack PC 840 with Other Stations on PROFIBUS

Networking the Rack PC on PROFIBUS

PROFIBUS is an open and robust bus system for industrial use. It can be used to configure networks with up to 32 stations per segment. PROFIBUS DP supports data transfer rates from 9.6 Kbps to 12 Mbps.

How the Network Functions

The network operates on the master-slave principle with token passing (complying with DIN19245, PROFIBUS). It distinguishes between active and passive stations. An active station receives the token and passes it on to the next station within a specified time.

Hardware Requirements

Using the following components, for example, you can connect or network the Rack PC with PROFIBUS:

- RS 485 MPI/DP port adapter (optional product feature)
- Shielded, twisted pair (bus cable or connecting cable to network).

3.8 Ethernet (RJ45 Ethernet Port)

Networking the Rack PC via the RJ45 Ethernet Port

The RJ45 Ethernet port is a Twisted Pair (TP) port with a data transfer rate of 10/100 Mbps. The onboard port is compatible with the Intel pro/100+ PCI adapter.

The port is Plug and Play capable and is automatically recognized in Windows. The log settings are carried out in the Windows control panel.

Notice

A class 5 Ethernet cable is required to operate ther 100 Mbps.

3.9 Connection under Windows

Windows supports point-to-point connections via the LPT or COM port. The required connecting cables are standard, commercially available products. More information is available in the online Help system under “Connection to Another Computer”.

SIMATIC Rack PC 840 Expansions

4

What Does This Chapter Contain?

You can enhance the performance of your Rack PC by adding an additional main memory, drives and expansion modules. This chapter describes how to expand your Rack PC. Please observe the relevant safety guidelines.

Chapter Overview

Section	Description	Page
4.1	Opening the Unit	4-2
4.2	Installing Memory Expansion Submodules	4-4
4.3	Replacing the Backup Battery	4-9
4.4	Installation of Expansion Cards	4-11
4.5	Removal and Installation of Drives	4-14
4.6	Removal and Installation of the Power Supply Unit	4-17
4.7	Removal and Installation of the Bus Board	4-18
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4.9	Removal and Installation of the Device Fan	4-20
4.10	Processor Upgrade	4-21
4.11	Reset Button	4-22

4.1 Opening the Unit

4.1.1 Prerequisites

The device is designed for easy maintenance so that any work that is necessary can be done quickly and at low cost.

Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically sensitive devices (ESD) in Appendix A.

Limitation of Liability

All technical specifications and licences apply only to expansion functions approved by SIEMENS.

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

All the modules and components in the Rack PC are electrostatically sensitive. Please read the ESD guidelines at the end of this book carefully. The following symbol warns that electrostatically-sensitive modules are present.



Before Opening the Unit

Note the following rules before opening the unit:

- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by quickly touching the power supply unit.
- Discharge any electrostatic charge from tools that you are using.
- Wear a grounding wrist-strap if you are handling components.
- Leave components and modules in their packing until you are ready to install them.
- Disconnect the Rack PC from its power supply by pulling out the mains plug before plugging in or removing any modules.This is only necessary for devices with AC power supply.
- Touch components and modules only on their edges. Above all, do not touch the connecting pins and printed conductors.
- Never operate the Rack PC with the cover open.

Tools

You can carry out all necessary installation work on the Rack PC with screwdrivers of the TORX T10 and TORX T8 types.

4.1.2 Opening the SIMATIC Rack PC 840

To open the Rack PC, proceed as follows:

1. Pull out the power supply connector.This is only necessary for devices with AC power supply.
2. If necessary, remove all cable connectors and connecting cables from the device.
3. If necessary, take the PC out of its support/cabinet.
4. Open the front door and loosen the middle screw **(1)**.
5. Push the housing cover **(2)** back completely.
6. Then you can remove the housing cover.

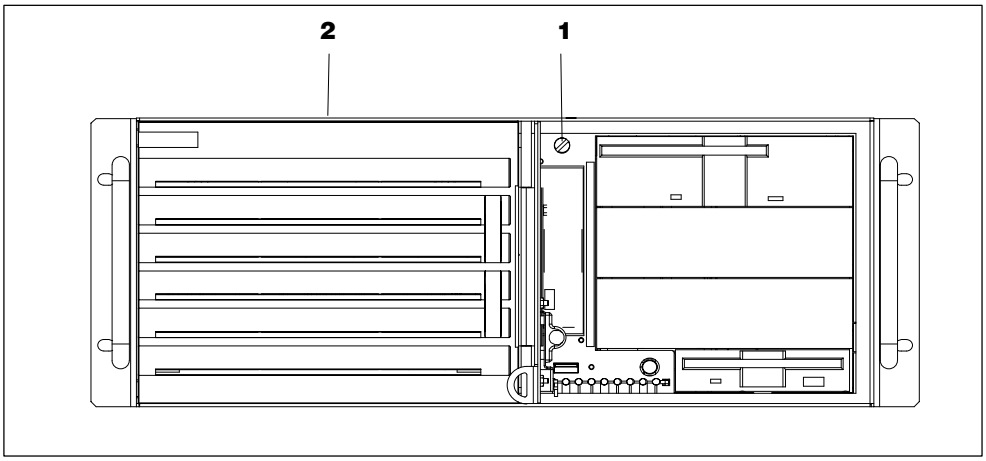


Figure 4-1 Rack PC Prepared for Opening

4.1.3 Components Visible after Opening the Unit

Components

Once you have removed the housing cover of your unit, the components are visible:

1 Motherboard

2 Memory expansion

3 Processor

4 Front drive holder

5 Backup battery

6 Power supply

7 Rear drive holder

8 Bus board

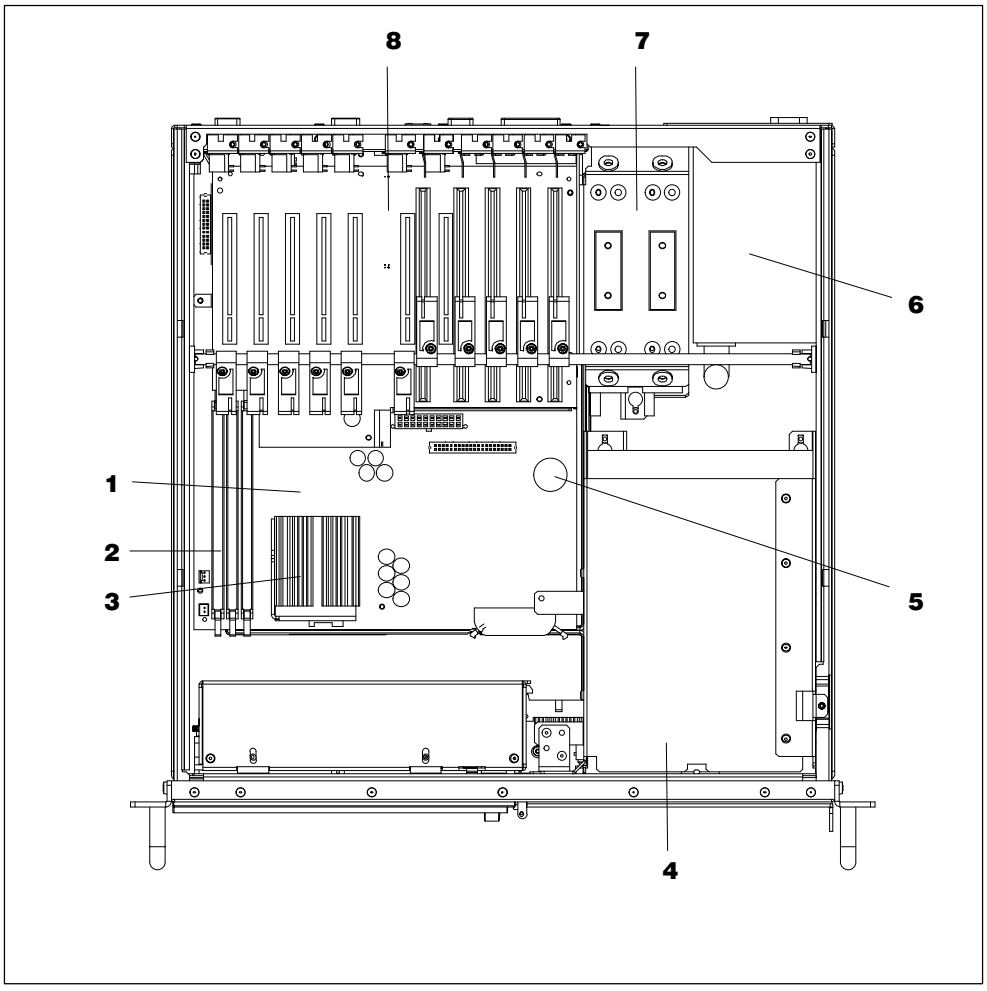


Figure 4-2 Rack PC Open

4.1.4 The Motherboard

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

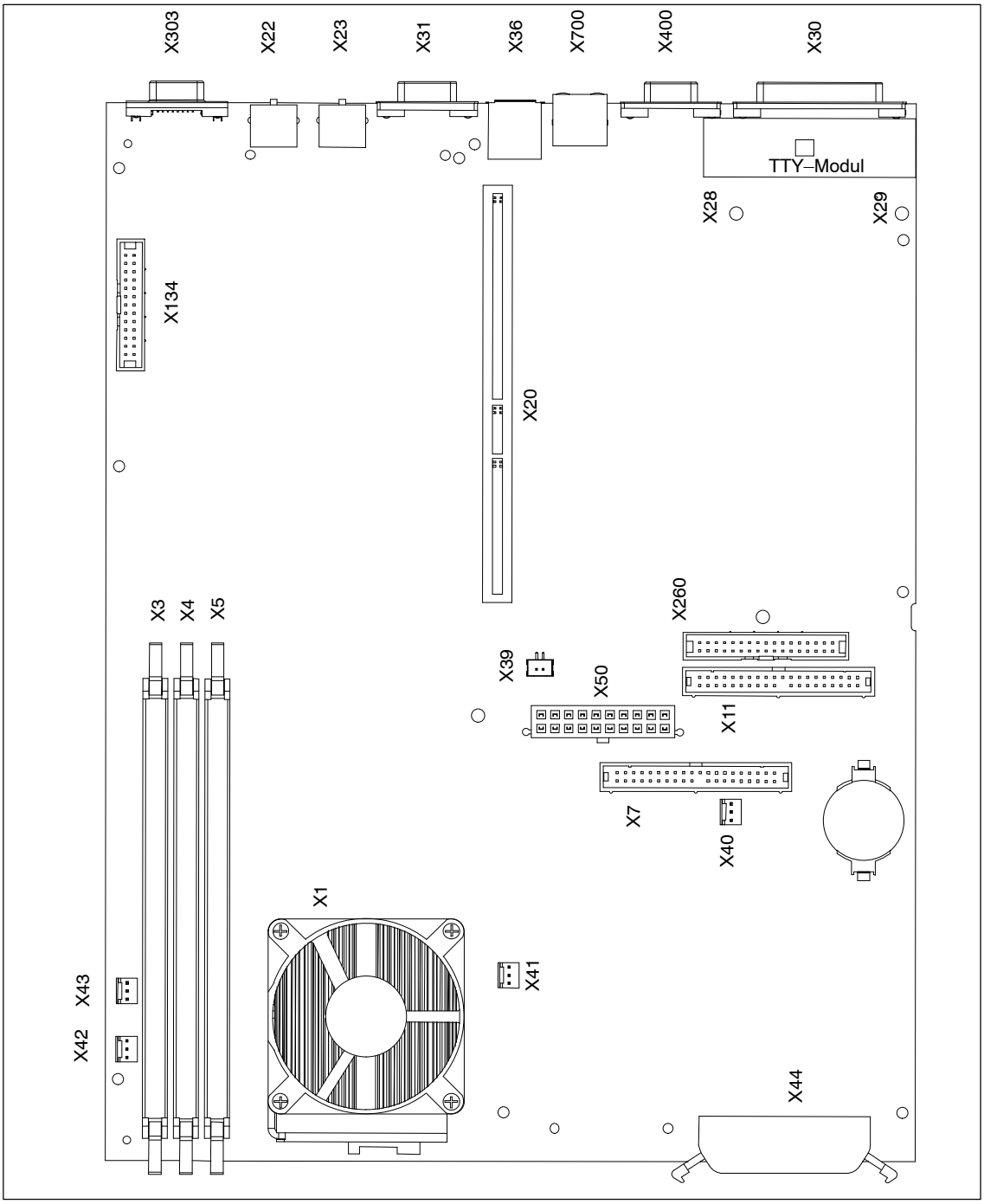


Figure 4-3 Motherboard

Components on the Motherboard

The following components are located on the motherboard of the Rack PC:

Slot	Interface/Port
X1	Processor socket with heat sink
X3, X4, X5	DIMM slots for memory expansion
X7	2.54 mm primary IDE
X10	2.54 mm secondary EIDE
X20	Socket connector for bus board
X22	PS/2 mouse connection
X23	PS/2 keyboard connection
X26	Connection for standard floppy
X28	Internal socket connector for COM1 (V.24/TTY) module
X29	Internal male connector for COM1 (V.24/TTY) module
X30	Serial port COM 1/TTY
X31	Serial port COM 2
X34	Internal Parallel port LPT 1
X36	USB port (2x high current USB)
X39	SCSI LED active
X41	Processor fan
X42, X43	Device fan connector
X44	I/O interface for front port connection
X50	Connection to power supply (power supply unit)
X303	VGA monitor connector
X400	PROFIBUS/MP *
X700	Ethernet

* Optional product feature

4.2 Installing Memory Expansion Submodules

The motherboard has 3 slots for 144 pin SDRAM memory submodules. This allows you to expand the memory capacity of your Rack PC to a maximum of 512 Mbytes.

Either one, two or three modules can be installed.

Memory	Modules		
	64 Mbytes	128 Mbytes	256 Mbytes
64 Mbytes	1	–	–
128 Mbytes	2	–	–
128 Mbytes	–	1	–
192 Mbytes	1	1	–
192 Mbytes	3	–	–
256 Mbytes	2	1	–
256 Mbytes	–	2	–
256 Mbytes	–	–	1
384 Mbytes	–	1	1
384 Mbytes	2	–	1
512 Mbytes	–	–	2
512 Mbytes	–	2	1

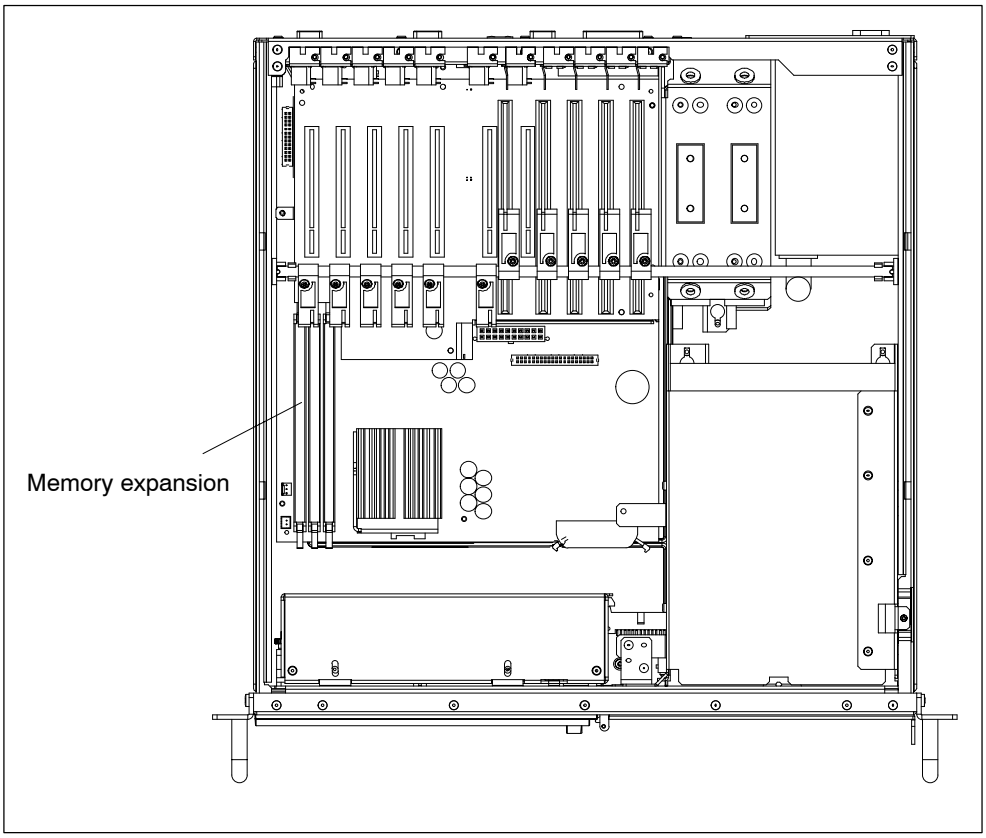


Figure 4-4 Position of the SDRAM Memory Modules

Caution

The electronic components of the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically sensitive devices (ESD) in Appendix A.

Installing the SDRAM Cards

To plug in expansion submodules, proceed as follows:

1. Open the unit as described in Section 4.1.
2. Plug the cards into the slots. Note the safety recess on the connector side of the SDRAM card.
3. Push the card down applying light pressure until it locks into place.
4. Close the unit.

Caution

Make sure that the cards sit securely in the slots, otherwise they can fall out and be damaged.

Installation

The memory configuration is detected automatically. When you switch on the unit, the distribution of base and extended memory is displayed on the screen.

4.3 Replacing the Backup Battery

Battery Power Supply for Real-Time Clock and Configuration

A backup battery (3.6 V-lithium battery) powers the the real-time clock even after the Rack PC is switched off. In addition to the time of day, all the information about the Rack PC (device configuration) is stored in RAM. If the backup battery fails or is removed, all these data are lost.

The clock uses very little power and the lithium battery has a high capacity so that the battery can provide backup power for the real-time clock for many years and seldom needs to be replaced.

Battery Voltage too Low

If the battery voltage is too low, the time is lost, and a correct device configuration can no longer be guaranteed.

In this case, you must replace the backup battery. The battery is in a battery holder on the motherboard.

Replacing the Battery

To change the battery, proceed as follows:

1. Note down your own BIOS setup settings.
2. Separate the device from the mains and remove all cable connectors.
3. Open the unit as described in Section 4.1.
4. Pull the battery out of its holder.
5. Insert the new battery by slightly pushing it into its holder.
6. Close the unit.
7. Reenter your own BIOS settings.

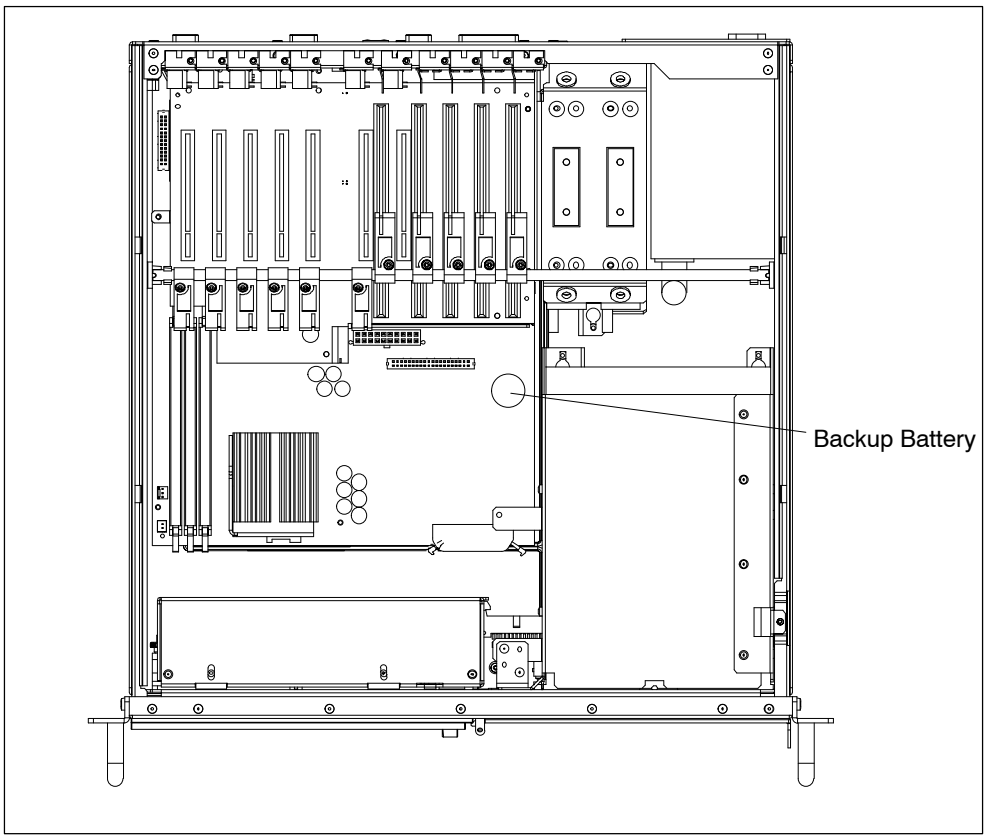


Figure 4-5 Position of the Backup Battery

Caution

Risk of damage!

Only replace the lithium battery with an identical battery or with a type recommended by the manufacturer (Order No.: A5E00047601).

Dispose of used batteries in keeping with local regulations.

Changing SETUP

If you change the battery or unplug the battery connector you must run the BIOS-SETUP to reset your programming device configuration data (see Chapter 5).

4.4 Installation of Expansion Cards

Notes about the Cards

The Rack PC is designed for the use with cards as per the AT/PCI specification. The dimensions of the cards may not exceed the stated dimensions. If the height is exceeded, contact problems, malfunctions and difficulties with the assembly cannot be excluded. The illustrations show cards with a full AT/PCI overall length. Depending on the slot, there may be restrictions on the overall length.

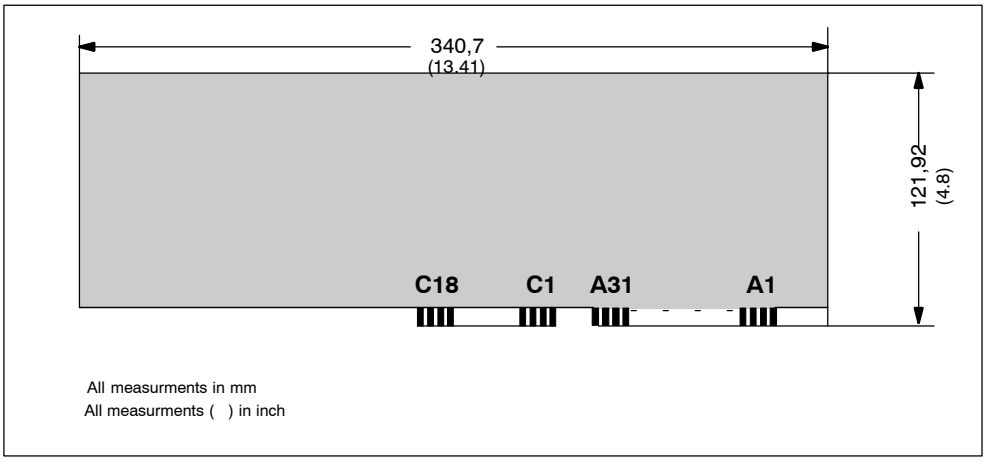


Figure 4-6 AT Card

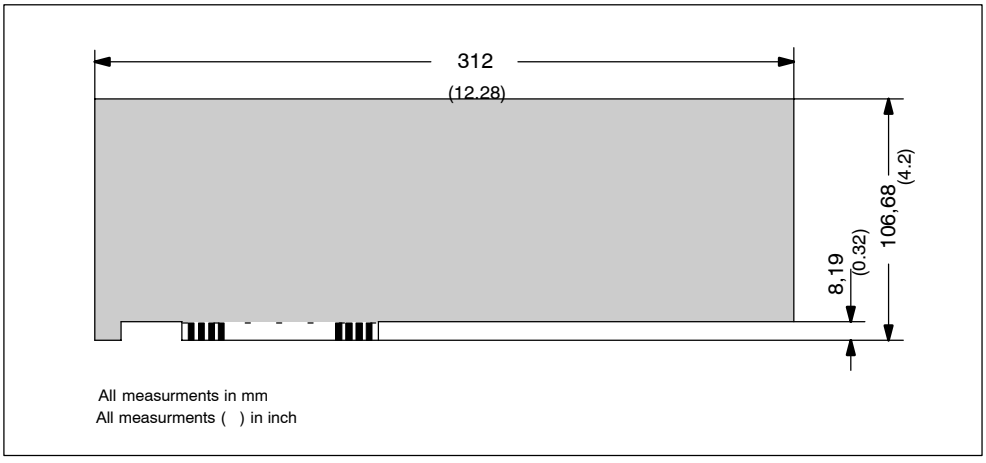


Figure 4-7 Long PCI Cards (5 V)

Note about Long PCI Cards

Before long PCI cards can be inserted into the guides of the fan trough, they must be fitted with a so-called extender (this should form part of the scope of supply of long PCI boards). Long PCI cards can be inserted into the guides of ISA modules by means of this extender.

4.4.1 Removal and Installation of the Device for Holding Down the Modules

The device for holding down the modules is inserted in two holders. Eleven down holders are fitted on the device for holding down the modules. These down holders are fully adjustable to the modules.

Proceed as follows:

1. Open the housing as described in Section 4.1.
2. Pull the device for holding down the modules out of the holders.
3. Fit the expansion modules.
4. Reinsert the device for holding down the modules into the holders.
5. Align the down holders.

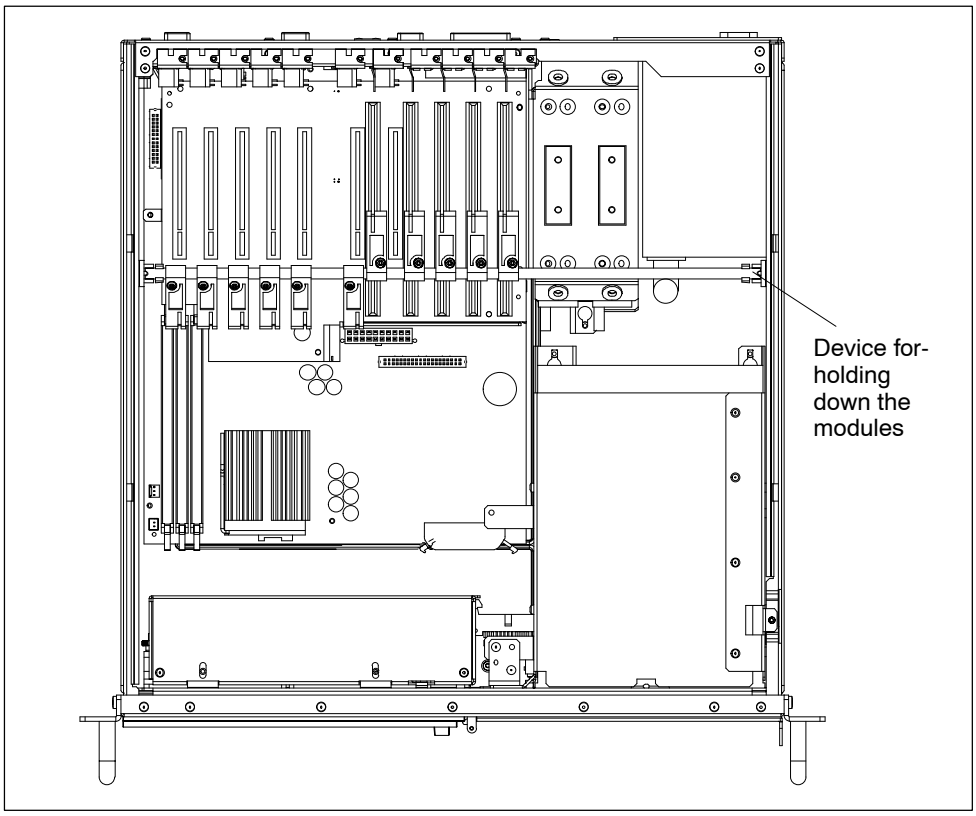


Figure 4-8 Removal/Installation of the Device for Holding Down the Modules

Aligning the Holding-Down Device

Proceed as follows to install the holding-down device.

1. Remove the binding screw and push the down holder until it is resting firmly on the module. The module must now be introduced into the notch.

Caution

No pressure may be exerted on the module!

4.4.2 Removal and Installation of an Expansion Module

Proceed as follows:

1. Open the housing as described in Section 4.1.
2. Remove all connectors from the expansion module and note the assignment.
3. Remove the device for holding down the modules as described in Section 4.4.1.
4. Undo the screws on the slot plate of the module.
5. Pull the module out of the slot.
6. Proceed in the reverse order to install the new expansion module.

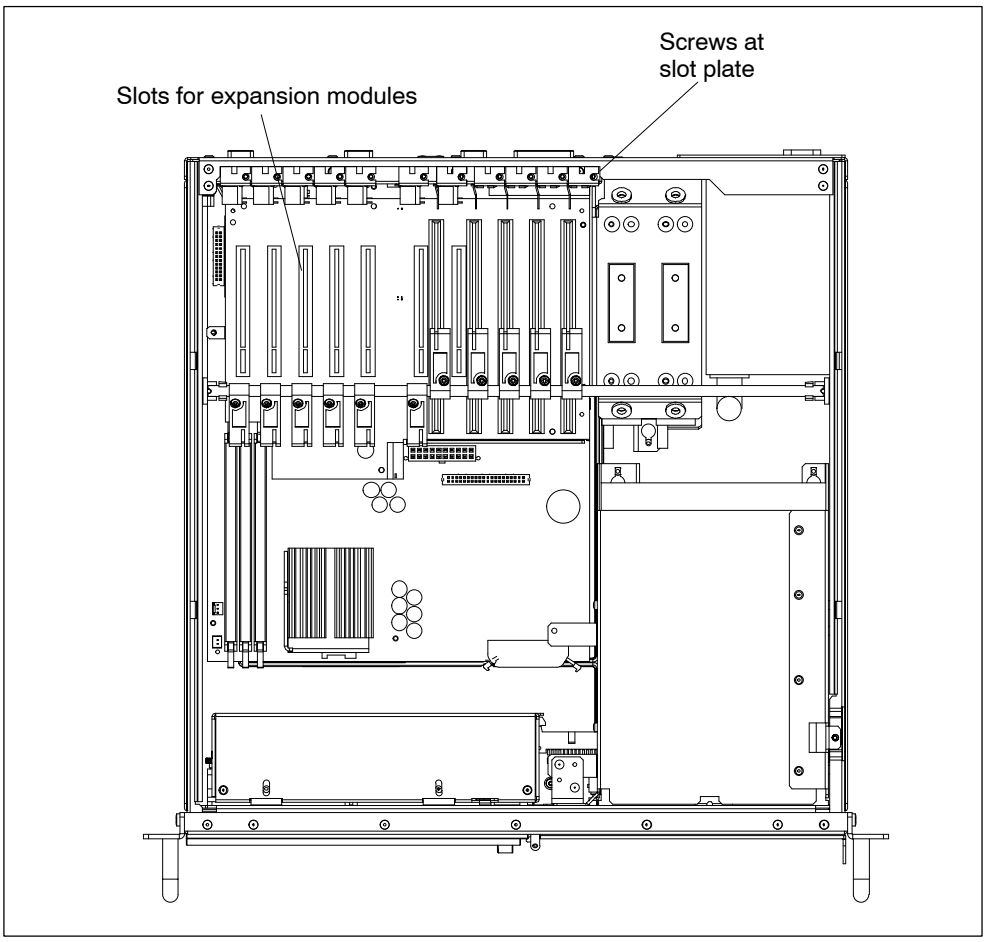


Figure 4-9 Removal/Installation of an Expansion Module

4.5 Removal and Installation of Drives

4.5.1 Removal and Installation of the Front Drive Holder

Depending on your order, a CD-ROM, a CD-RW, a hard disk and a disk drive can be installed in the front drive holder.

1. Open the device as described in Section 4.1.
2. Undo both screws of the drive holder.
3. Take the drive out of the housing.
4. Note down the cable assignment and remove the cables.
5. Proceed in reverse order when installing the drive holder.

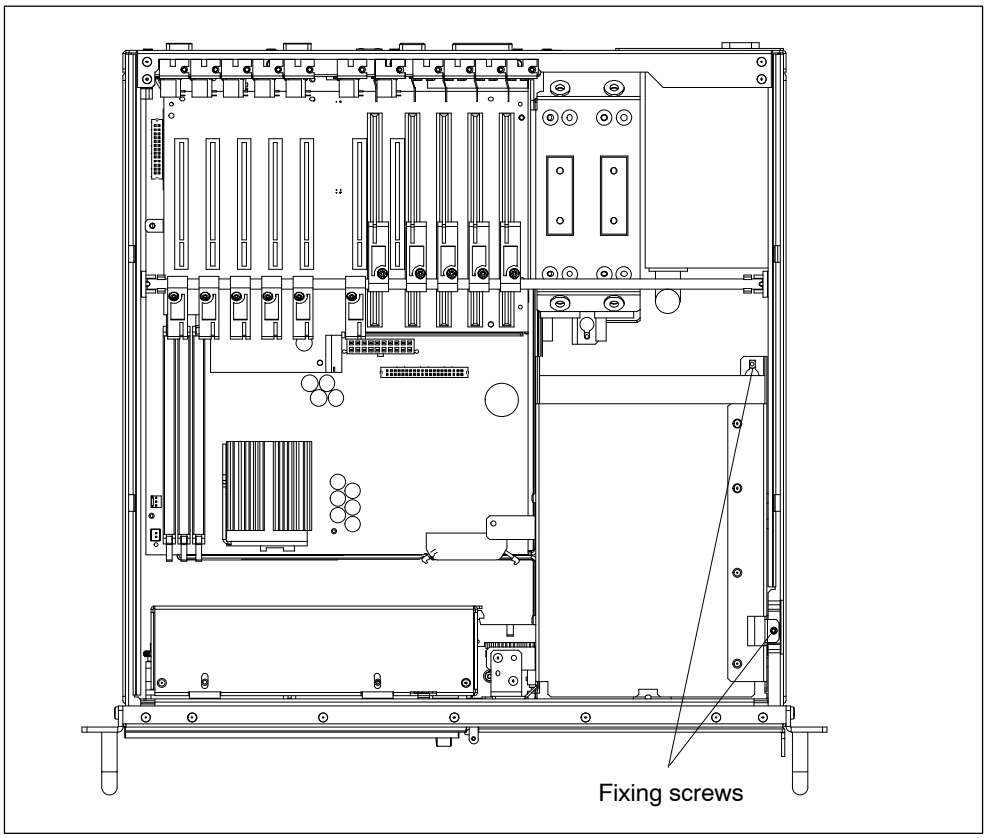


Figure 4-10 Installation and Removal of the Drive Holder

Hard disk drives can be installed in a 5 1/4” Adapter Industry Lite or in a removeable rack.

4.5.2 Removal and Installation of the Rear Drive Holder

The rear drive holder is fixed with four screws on the outside and one screw in the device.

1. Open the device as described in Section 4.1.
2. Note down the cable assignment and remove the cables.
3. Undo the screws and take the holder out of the housing.
4. Remove the power supply cables and note down their assignment.
5. Proceed in reverse order when installing.

4.5.3 Removal and Installation of the Hard Disk Drive

1. Open the device as described in Section 4.1.
2. Remove the drive holder as described in Sections 4.5.1 and 4.5.2.
3. If necessary, undo the four screws of the adapter or the removeable rack.
4. Undo the four drive screws.
5. Proceed in reverse order when installing.

4.5.4 Removal and Installation of the Floppy/CD ROM Drive

1. Open the housing as described in Section 4.1.
2. Remove the drive holder as described in Section 4.5.1.
3. Remove the data and power supply cables on the drive.
4. Undo the four screws on the drive and push the drive forward out of the holder.
5. Proceed in reverse order when installing the new drive.

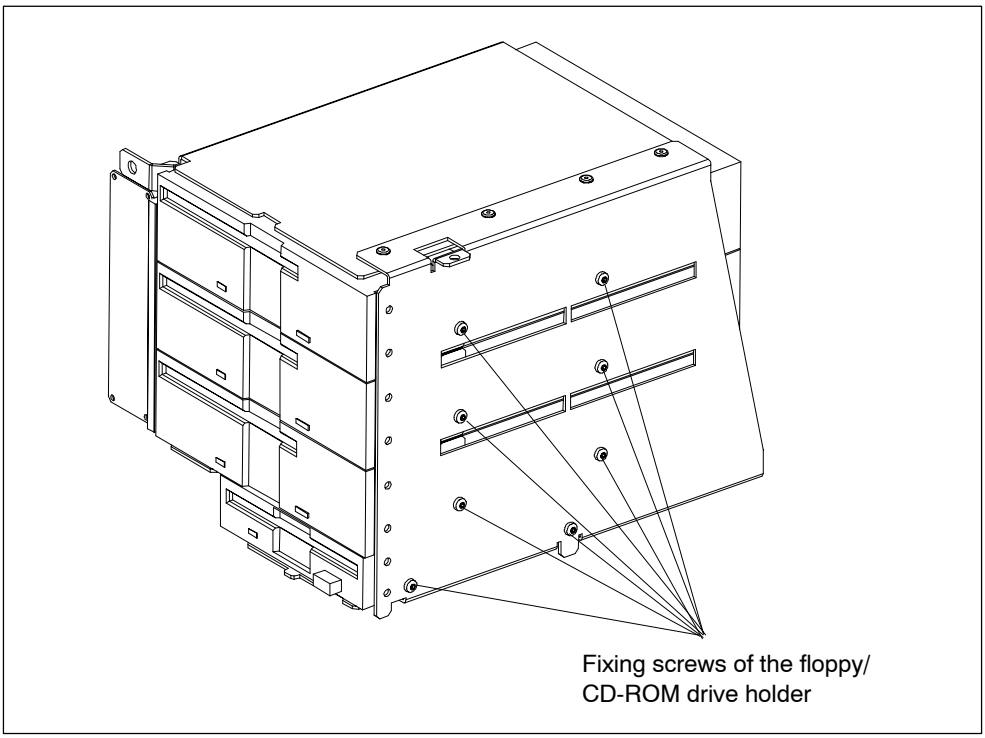


Figure 4-11 Installation of the Floppy Disk/CD ROM Drive Holder

4.6 Removal and Installation of the Power Supply Unit

Warning

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

1. Open the system housing as described in Section 4.1.
2. Remove the data and power supply cables of the drives, the motherboard and the bus board and note down their assignment.
3. Remove the cable tie which fixes the power supply cables in the housing.
4. Undo the six fixing screws (TORX T10) of the power supply mounting plate.
5. Pull the power supply unit out of the housing to the rear until you can access the power supply cable of the disk drive.
6. Remove the power supply cable of the disk drive.
7. Undo the four screws on the mounting plate.
8. Proceed in reverse order to fit the new power supply unit.

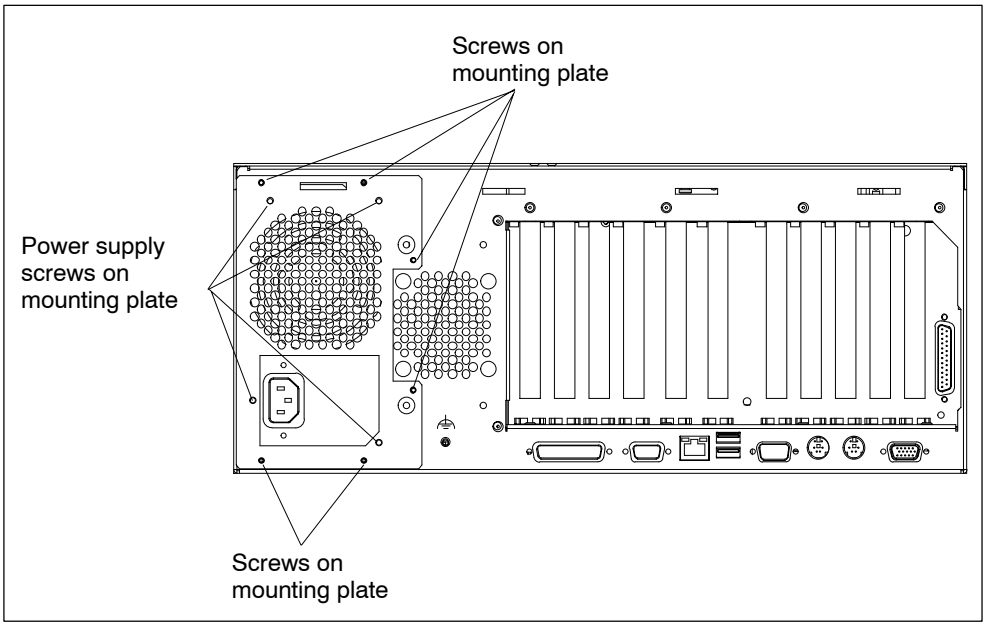


Figure 4-12 Removal and Installation of the Power Supply Unit

4.7 Removal and Installation of the Bus Board

1. Open the housing as described in Section 4.1.
2. Remove all the modules from the slots (proceed as described in Section 4.4.2.).
3. Remove all the connectors from the bus board.
4. Undo the four screws on the bus board and one screw on the outside of the rear housing wall.
5. Pull the bus board off the motherboard.
6. Proceed in reverse order to refit the bus board.

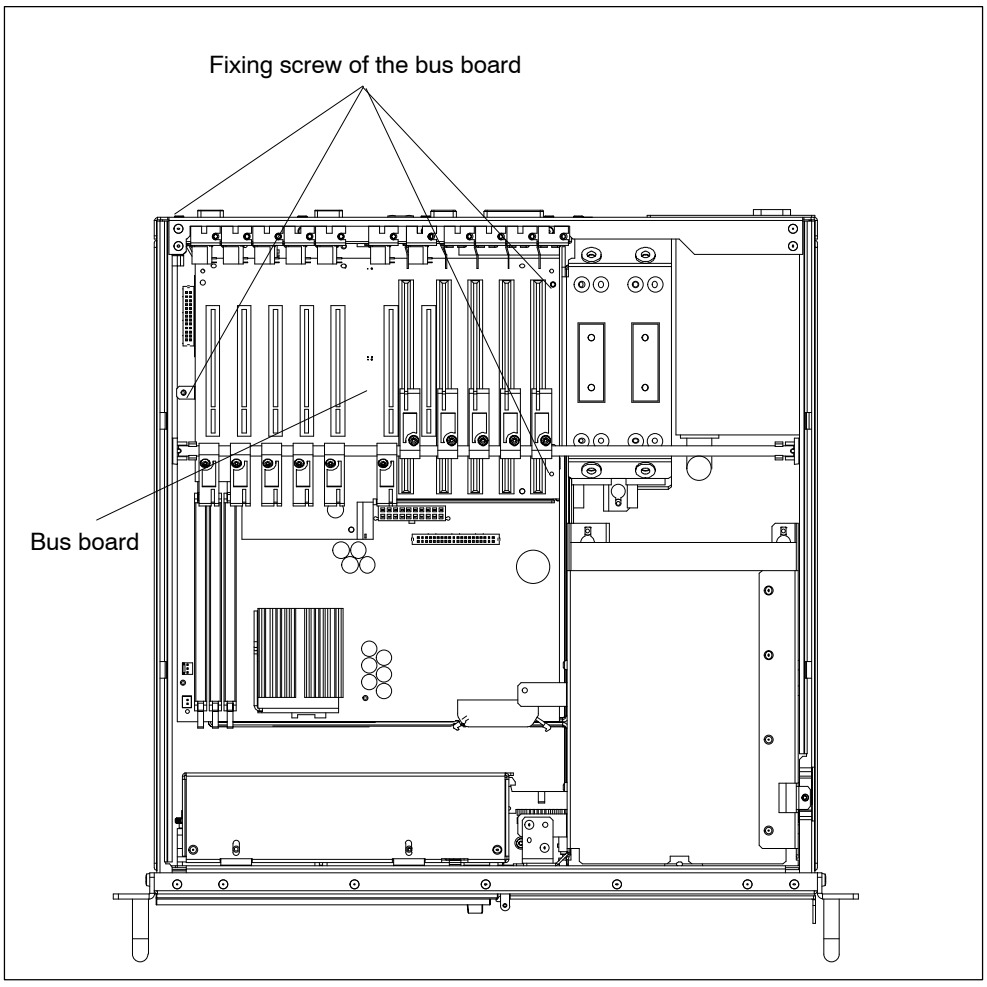


Figure 4-13 Removal and Installation of the Bus Board

4.8 Removal and Installation of the Motherboard

1. Open the housing as described in Section 4.1.
2. Remove all the modules from the slots (proceed as described in Section 4.4.2).
3. Remove the bus board as described in Section 4.7.
4. Remove all cables from the motherboard and note down their assignment.
5. Undo the screws and the three hex bolts on the motherboard. Undo the ten hex screws at the ports on the outside of the housing.
6. Proceed in reverse order to refit the motherboard.

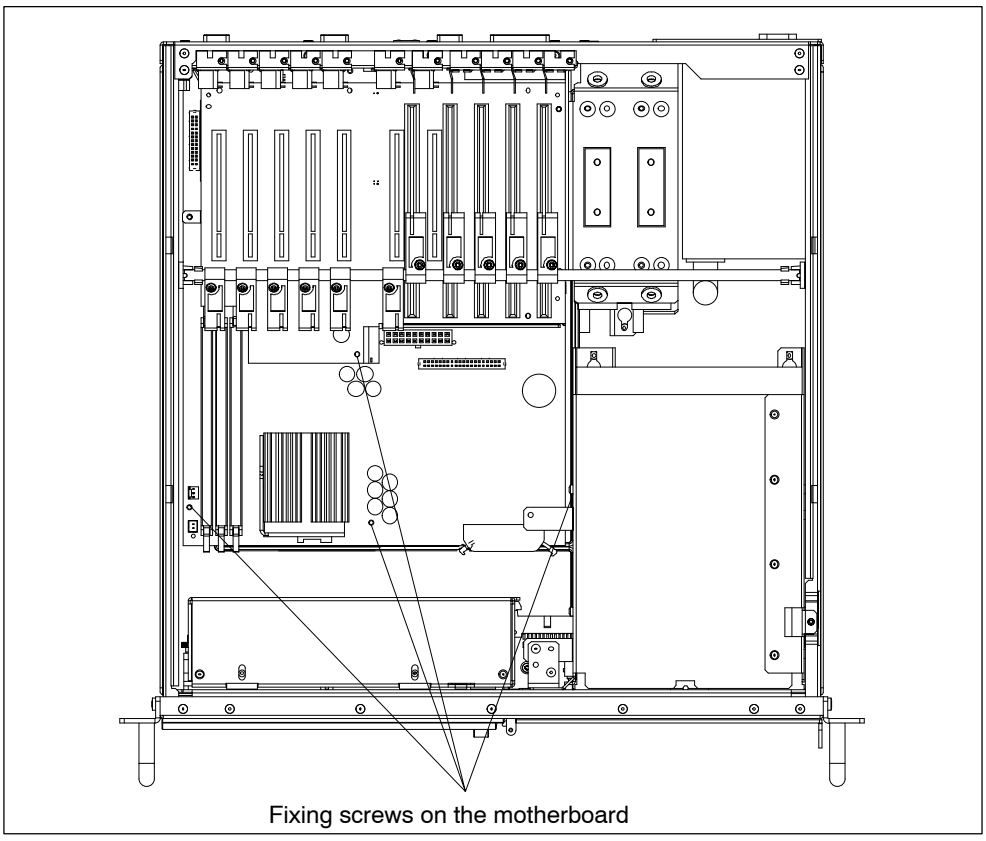


Figure 4-14 Fixing Screws on the Motherboard

The motherboard is available as a spare part without processor, memory modules and bus board.

4.9 Removal and Installation of the Device Fan

The Rack PC is ventilated by fans which blow fresh air into the housing (pressurization).

1. Switch off the device.
2. Open the front door at a right angle (90°). This enables you to access the front panel and pull it off towards the front.
3. Undo the two plastic rivets.
4. Lift the fan holder out of the housing.
5. Undo the plastic rivets which fasten the fan.
6. Pull the fan connector.
7. Proceed in reverse order for assembly.

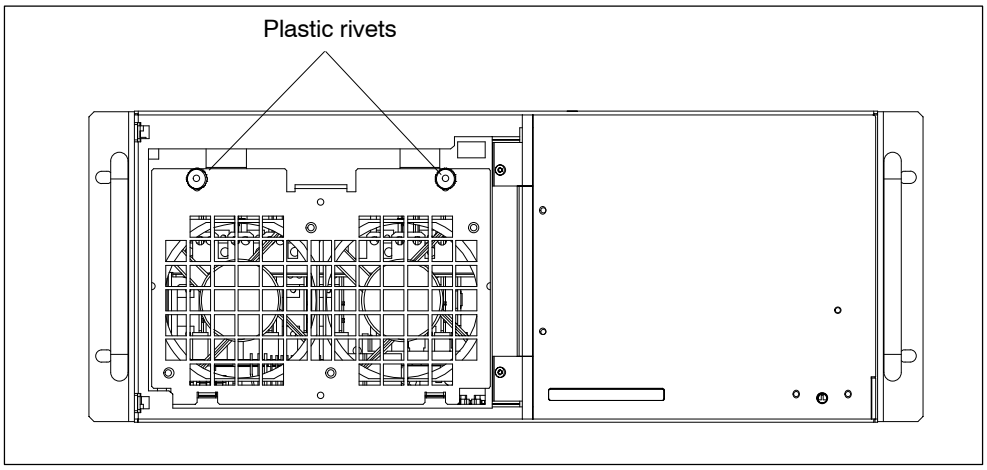


Figure 4-15 Removal and Installation of the Fan

Notice

Only a fan of the same type may be fitted!

Caution

To ensure that the device is adequately cooled, take care that the running direction of the fan is correct when installing.

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

Only qualified personnel is authorized to change the fan.

4.10 Processor Change

Proceed as follows to exchange the processor:

1. Open the housing as described in Section 4.1.
2. Pull out the fan cable plug.
3. Remove the cooling unit which is fixed using a lifting lever.
4. Then push the lever in the direction of the arrows (1) and swing it upwards as far as it will go (2).
5. Lift the old processor out of the slot (3).
6. Put the new processor in its socket and make sure that the marks on top of the processor have the exact position (4) as indicated on the slot (A).

Caution

The marks on top of the processor may be covered by the cooling unit. In this case, use the marks between the pin rows on the outside of the processor.

7. Swing the lever downwards until it clicks into position (5).
8. Fix the cooling unit using the lifting lever.
9. Reattach the fan cable plug to the motherboard.

Caution

Operating a processor at a higher frequency than the maximum permissible frequency may result in destruction of the processor, data loss, or data corruption.

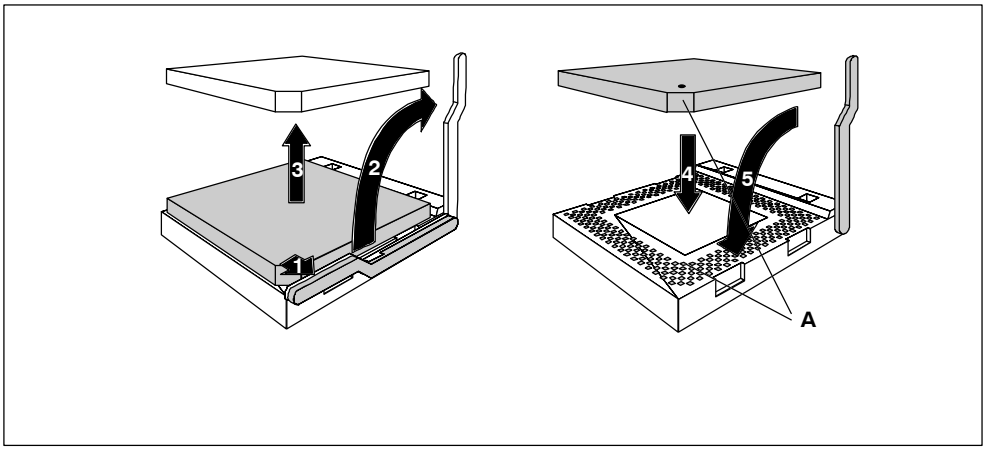


Figure 4-16 Changing the Processor

4.11 Reset Button

A hardware reset is initiated by means of the reset button on your device. The PC is restarted.

The Rack PC reset button is located behind the front door. The reset button can be only actuated with a thin pen (for example, an opened-up paper clip).

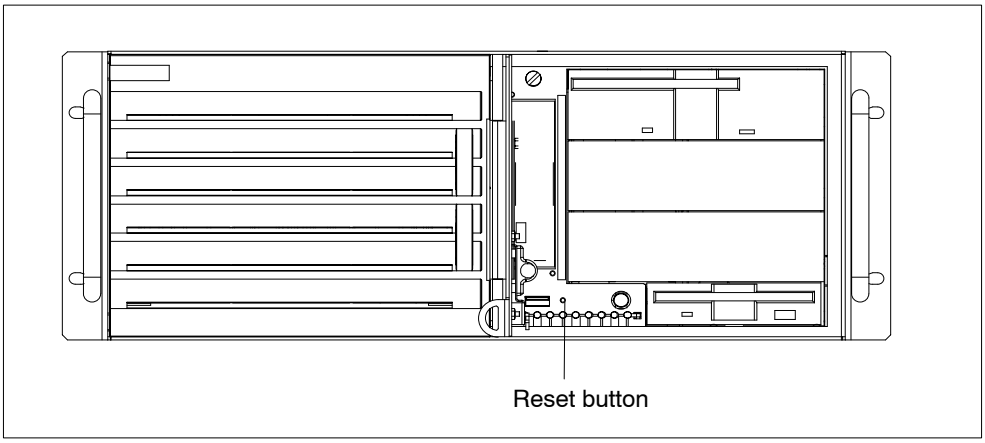


Figure 4-17 Reset Button on the Rack PC

Configuring the SIMATIC Rack PC 840

5

What Does This Chapter Contain?

In this chapter, you will learn how to configure your programming device. You need to do this if you change your system by adding, removing, or exchanging expansion modules and memory expansions, or by replacing a system module.

Chapter Overview

Section	Description	Page
5.1	Changing the Device Configuration with BIOS SETUP	5-2
5.2	The Main Menu	5-5
5.3	The Advanced Menu	5-12
5.4	The Security Menu	5-18
5.5	The Power Menu	5-20
5.6	The Boot Sequence Menu	5-22
5.7	The Version Menu	5-24
5.8	The Exit Menu	5-25
5.9	Default Setup Settings	5-26

5.1 Changing the Device Configuration with BIOS SETUP

Changing the Device Configuration

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

BIOS SETUP Program

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

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

Incorrect BIOS Data

If incorrect BIOS data are detected when you boot the system, the BIOS prompts you to

- Start BIOS SETUP by pressing **F2** or
- Continue booting by pressing **F1**.

Starting BIOS SETUP

On completion of the startup test, the BIOS gives you the opportunity of starting the SETUP program by displaying the following screen prompt:

```
PRESS < F2 > to enter SETUP
```

To start SETUP, proceed as follows:

1. Reset your Rack PC (warm or cold restart).
2. Press the **F2** key as long as the BIOS prompt appears on the screen.

BIOS SETUP Menus

The various menus and submenus are listed on the following pages. You can get all the information you need for the SETUP entry selected from the **“Item Specific Help”** part of the relevant menu.

Screen Display Following Power On

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

```
Phoenix BIOS 4.0 A5E000xxxxx–ES0x
Copyright 1985-2000 Phoenix Technologies Ltd.
All Rights Reserved.

SIMATIC Rack PC 840 V10.01.02
CPU = Intel® Pentium®III  866MHz
640K System RAM Passed
127MB Extended RAM Passed
0256K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
Mouse initialized
Fixed Disk 0: xxxx
ATAPI CD-ROM: Txxx
Press <F2> to enter SETUP
```

If you press the F2 key while the above display is shown, you select the ROM-based BIOS setup program. In this program, you can set a number of system functions and hardware configurations of your programming device.

The default settings are effective on delivery. You can change these settings using the BIOS setup. The modified settings become effective when you have saved them and terminated the BIOS setup.

The following screen shots may differ from what is shown here, depending on the device configuration. The following screen form appears when you start the BIOS setup:

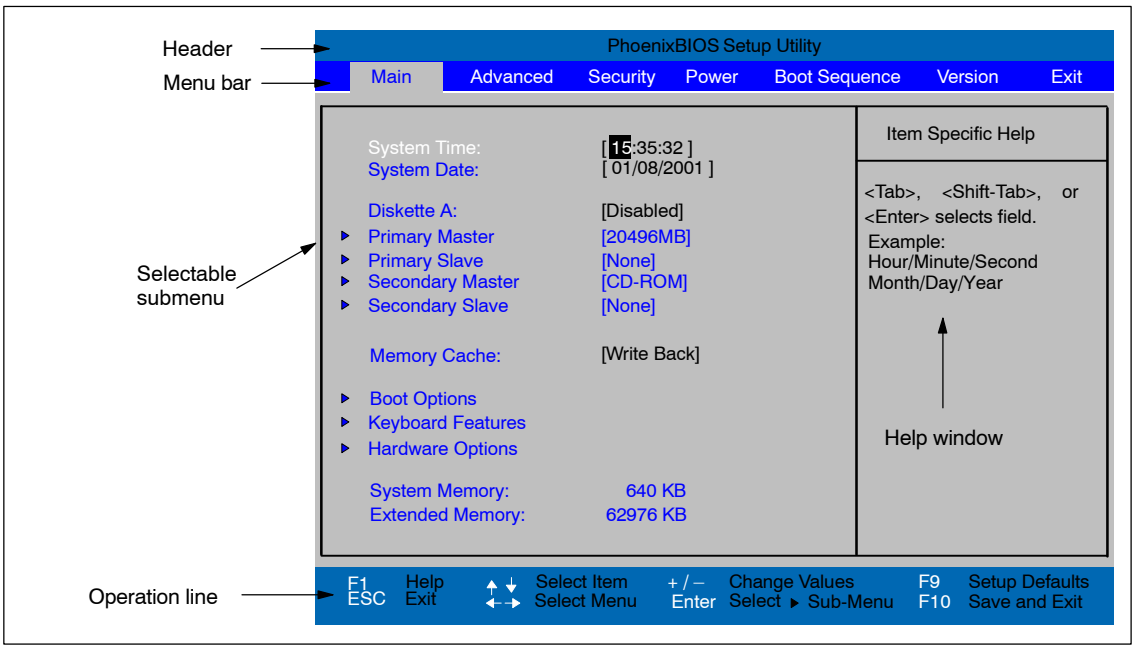


Figure 5-1 SETUP Main Menu (Example)

Menu Structure

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

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

You can move between the menu screens using the cursor keys [←] and [→].

Menu	Meaning
Main	System functions are set here
Advanced	An extended sytem configuration can be set here
Security	Security functions are set here, for example, a password
Power	Power-saving functions can be selected here
Boot Sequence	The boot priorities are defined here
Version	Information about the programming device (for example, release status) can be found here
Exit	Used for terminating and saving

5.2 The Main Menu

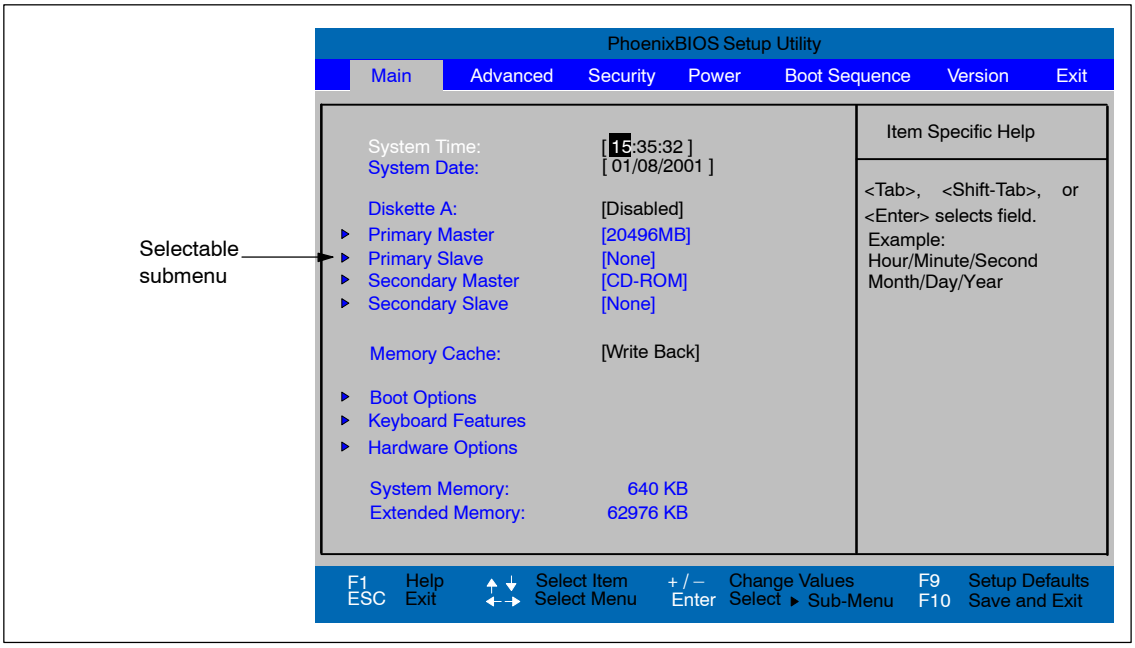


Figure 5-2 SETUP Main Menu (Example)

Setting in the Main Menu

In the **Main** menu, you can move upwards and downwards using the cursor keys [↑] and [↓] to select the following system parameters:

Field	Meaning
System Time	For viewing and setting the current time
System Date	For viewing and setting the current date
Diskette A	Type of built in floppy disk drive With LS 120 drive [Disabled]
Memory Cache	For setting cache options
by submenus	
Primary Master	Type of build in drives
Primary Slave	Type of build in drives
Secondary Master	Type of build in drives
Secondary Slave	Type of build in drives
Boot Options	For setting boot options
Keyboard Features	For setting keyboard interface options (for example, NUM Lock, Typematic Rate)
Hardware Options	For setting hardware options

System Time und System Date *Time and Date*

System Time and System Date indicate the current values. Once you have selected the appropriate option, you can use the [+] and [–] keys to modify the time setting

`Hour:Minute:Second`

and the date

`Month/Day/Year.`

You can move between the entries in the date and time options (for example, from hour to minute) using the tabulator key.

Diskette A *Disk Drive*

The type of floppy drive installed in the PC is set here. The following entries are possible:

[Disabled]	if no disk drive is available.
[1.44 MB, 3 1/2”]	Default setting for an installed disk drive A

Primary Master *Primary Slave Secondary Master/ Secondary Slave*

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

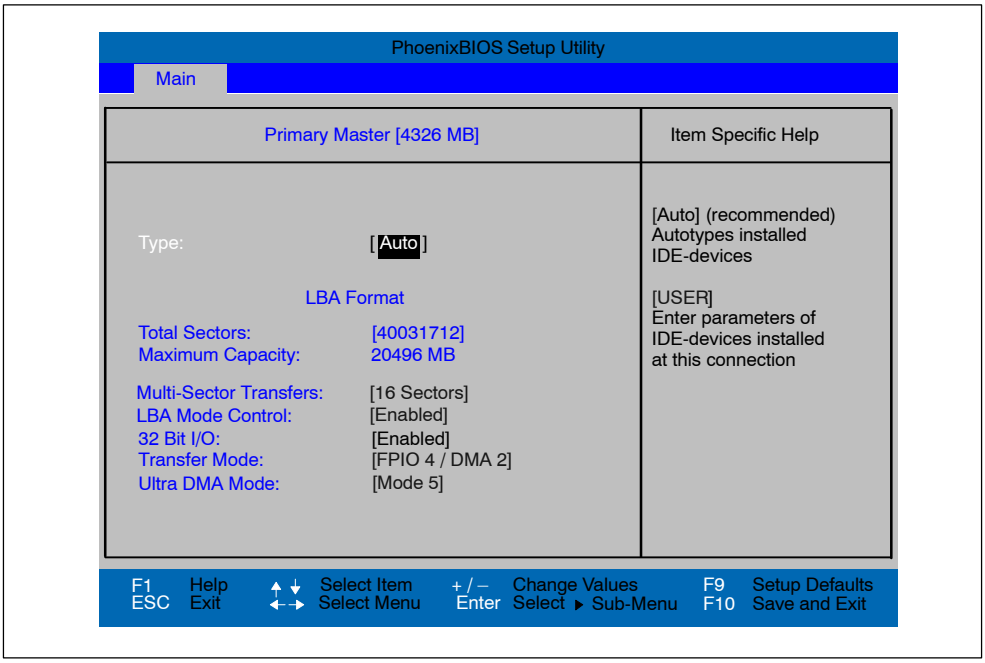


Figure 5-3 Primary Master

"Type" Field

The parameters you can select here are usually stored on the IDE drive. The 'Auto' setting in the 'Type' field means that these values are automatically read from the drive and written into memory (**Autodetect**).

If Type is selected for a drive that cannot be detected, a timer times out in approximately 1 minute and the entries remain unchanged. You should always check that the interfaces for which you select 'Auto' are in fact connected to drives.

Select "User" if you want to define the hard-disk type yourself, in which case remember that you also have to set the other fields, including Cylinder, Heads, Sectors/Track or other settings according to the type of hard disk.

"Multi Sector-Transfer" Field

The entry in the Multi-Sector Transfer field defines the number of sectors transferred per interrupt. The value depends on the drive and should be set only by setting the *Type* field to *Auto*.

```
Disabled

 2,4,8,16   sectors
```

"LBA Mode Control" Field

If the LBA Mode Control field (enabled,disabled) is set to 'Enabled', the system supports hard disks with capacities greater than 528 Mbytes. The value depends on the drive and should be set only by setting the *Type* field to *Auto*.

"32 Bit-IO" Field

The setting in the 32 Bit I/O field defines the mode of access for the drive

```
Disabled    16-Bit access
Enabled     32-Bit access    (default)
```

"Transfer Mode" and "Ultra DMA Mode" Fields

The settings in these fields define the interface data-transfer rate. The value depends on the drive and should be set only by setting the *Type* field to *Auto*.

Hit ESC to exit the submenu.

”Boot Options” Field

The following submenu appears when you select the “Boot Options” field in the main menu:

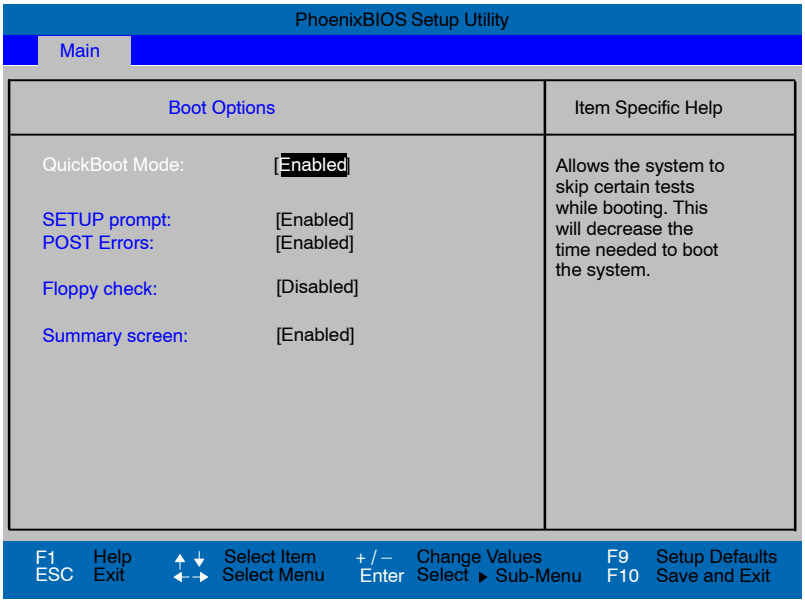


Figure 5-4 ”Boot Options” Submenu

Quick Boot Mode	Some hardware tests are skipped to speed up the boot procedure.
SETUP prompt	The message *PRESS <F2> to enter Setup* appears at the bottom of the screen during the system run-up phase.
POST Errors	The boot process is stopped if an error is detected; you must press F1 to acknowledge. Enter “Disabled” to avoid the necessity of acknowledging errors, for example, if no keyboard is connected.
Floppy check	The floppy head is stepped inward and then back to its original position during the system run-up phase. This test is useful because it reinitializes the drive.
Summary screen	The most important system parameters are displayed when the system run-up phase completes.

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

Example of a summary screen:

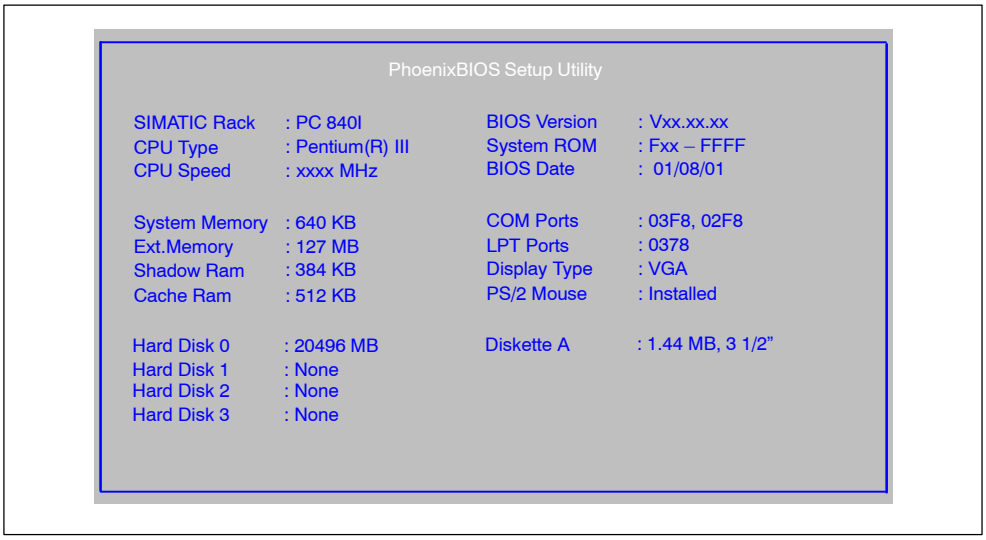


Figure 5-5 Summary Screen

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

“Keyboard Features” Field

The following submenu appears if you select the “Keyboard Features” field in the main menu:

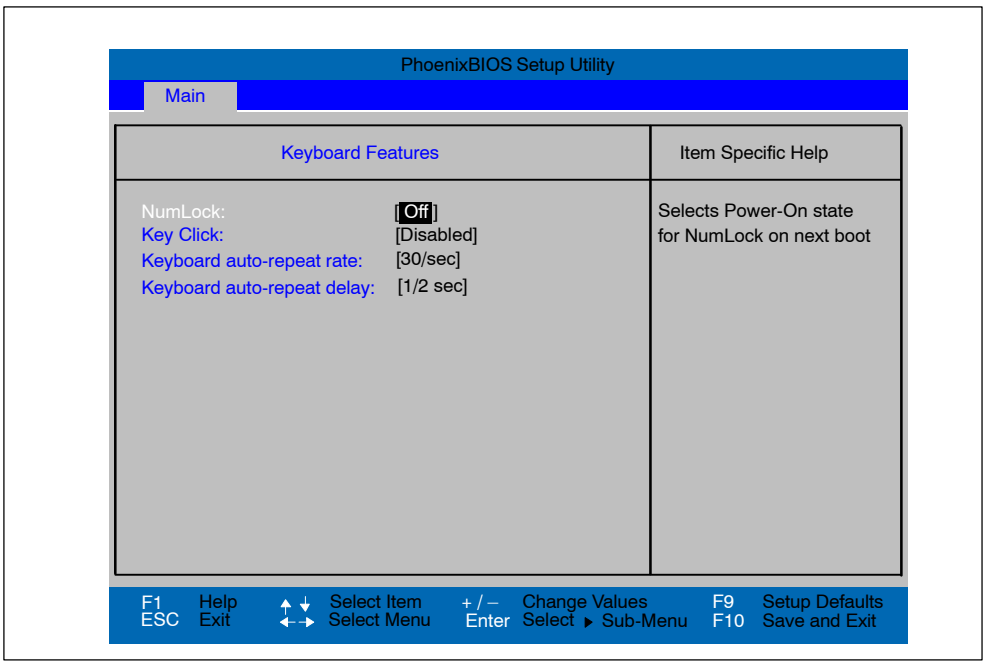


Figure 5-6 ”Keyboard Features” Submenu

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

”Hardware Options” Field

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

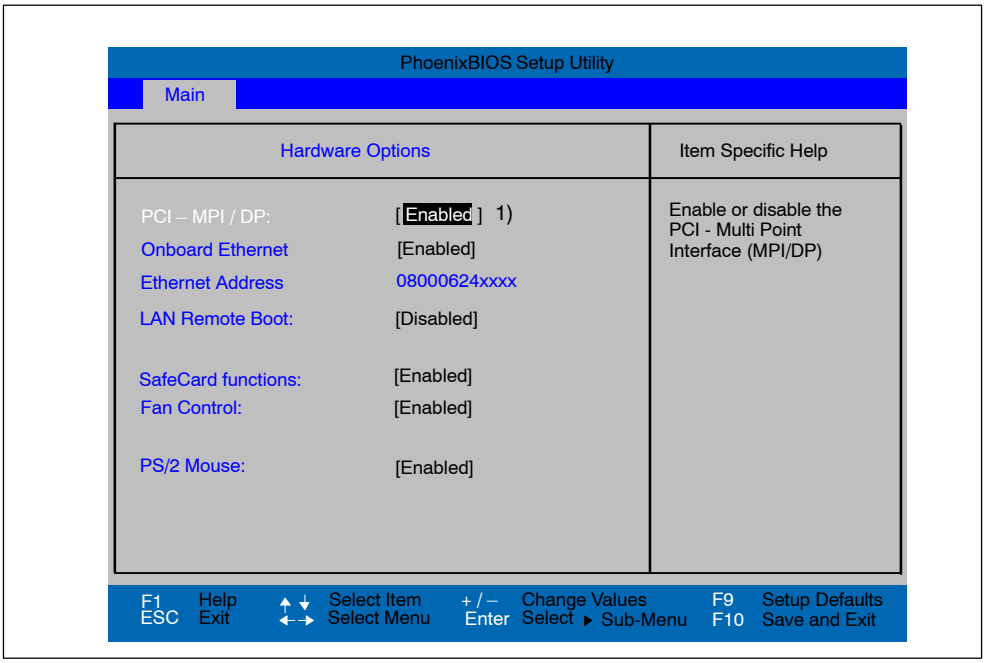


Figure 5-7 ”Hardware Options” Submenu

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

Entry	Meaning
PCI-MPI/DP *1	Enables the CP5611-compatible MPI/DP interface. The resourses are managed by the BIOS PCI Plug and Play mechanism.
On Board Ethernet	[Enabled] The Ethernet port on the motherboard is enabled. [Disabled] The Ethernet port on the motherboard is disabled.
Ethernet Address	The individual Ethernet address is entered here.

*1 Optional product feature

Entry	Meaning	
LAN Remote Boot	[Enabled]	Booting using a connected LAN is possible. The respective boot source is displayed as Intel® Boot-Agent in the boot sequence menu.
	[Disabled]	Booting using LAN is not possible.
SafeCard functions	[Enabled]	On board monitoring functions are enabled.
	[Disabled]	No monitoring functions.
	The relevant driver and the application must be started for operation of the monitoring functions.	
Fan Control	[Enabled]	Fan speed depends on temperature.
	[Disabled]	Fan always runs at full speed.
PS/2 Mouse	[Enabled]	The PS/2 port is activated. This is the default for the Rack PC, the PS/2 mouse is activated in this setting. IRQ 12 is assigned.
	[Disabled]	The PS/2 port is deactivated, IRQ12 is available.
	Note:	Invariably, changes to this interface do not come into effect until the PC is switched off and on again.

5.3 The Advanced Menu

Menu Structure

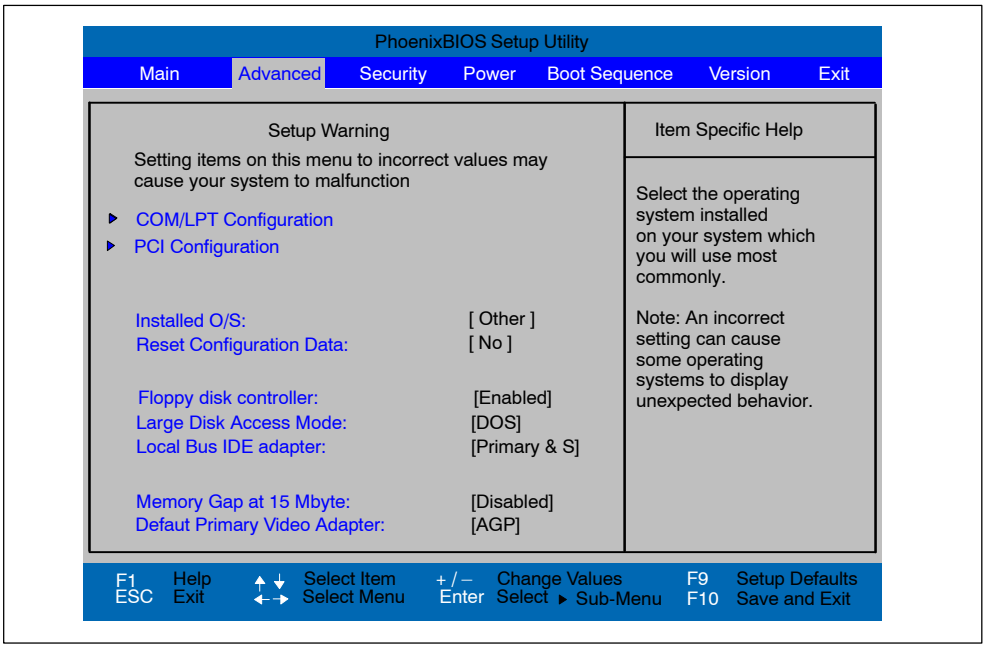


Figure 5-8 ”Advanced” Menu

Setting in the Advanced Menu

Installed O/S	Plug and Play means that all modules are automatically detected and installed, providing they support the Plug and Play functionality. [other] BIOS handles the entire Plug and Play capability, default configuration [Win95] BIOS handles the entire Plug and Play capability, default configuration [Win98] The operating system handles some of the Plug and Play functions [WinMe/2k The operating system handles the Plug and Play functions
Reset Configuration Data	[Yes] All installations under Plug and Play are deleted and reconfiguration is triggered the next time the system boots. The entry is then reset to [No]. System components that do not support Plug and Play have to be entered manually.
Floppy disk controller	[Enabled] The floppy disk controller is switched on. [Disabled] The floppy disk controller is switched off.

Local Bus IDE adapter	[Primary] [Secondary] [Primary & Secondary] [Disabled]	One IDE interface for max. two drives. Two IDE interfaces for max. four drives. No local IDE interface.
Large Disk Access Mode	[DOS] [OTHER]	The drive tables are adapted for DOS access operations in accordance with Enhanced IDE. The tables are not adapted.
Memory Gap at 15 MByte	[Disabled] [Enabled]	The complete onboard RAM memory is available. A 1MB area of the RAM above 15MB (Addresses F0 0000 – FF FFFF) can be used by ISA expansion cards.

"COM/LPT Configuration" Submenu

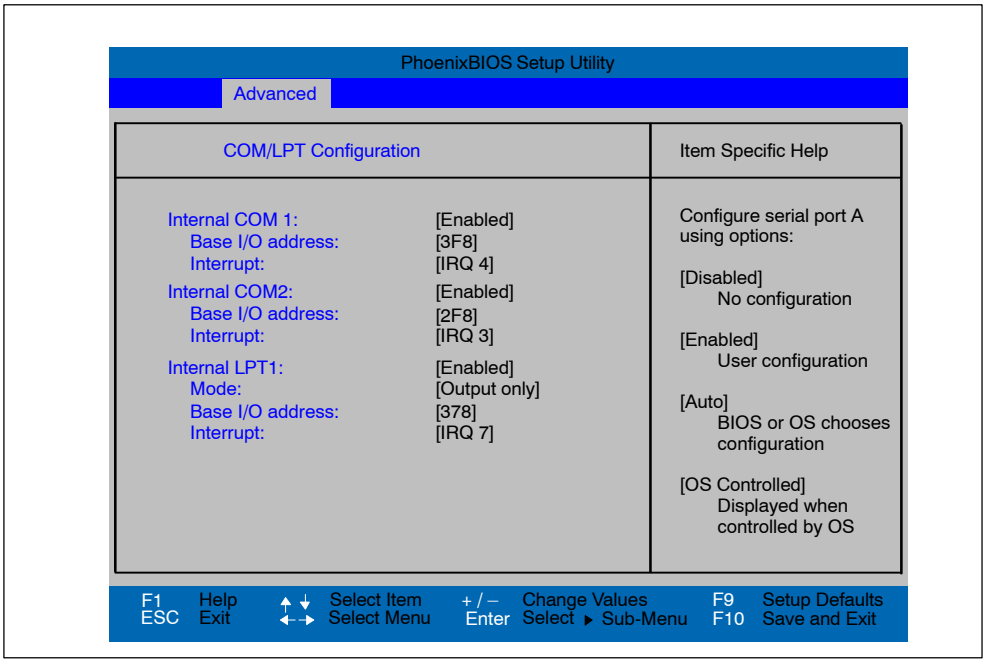


Figure 5-9 "COM/LPT Configuration" Submenu

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

The I/O addresses and interrupts are preassigned: it is advisable not to change these default assignments.

Printer Port Internal LPT1

Mode:	Use this setting to set the operating mode of the printer interface. Refer to the table below to ensure that the setting matches the printer connected to the printer port.

Settable Mode	Features
Output Only Standard parallel port – unidirectional (SPP)	• Standard setting for the 8 bit parallel transfer according to IEEE1284 specifications • Feedback of the output device is only possible via the control cables
Bidirectional Standard parallel port – bidirectional	as for SPP – unidirectional, however: • Feedback of the output device is also possible via the 8 bit data cables
EPP Enhanced parallel port	• Enhanced parallel port (data transfer rate from 500kbps up to 2Mbps) • Hardware handshake • different devices can be addressed
ECP Extended capability port	as for EPP, however: • own DMA channel • FIFO backup • Data compression

"PCI Configuration" Submenu

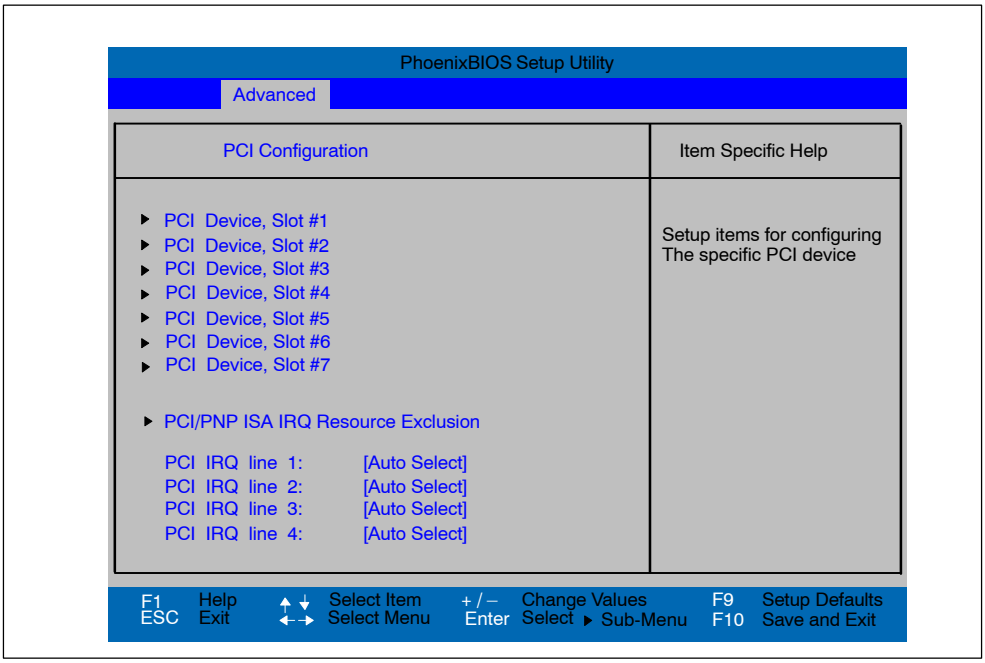


Figure 5-10 "PCI Configuration" Submenu

”PCI Devices” Field

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

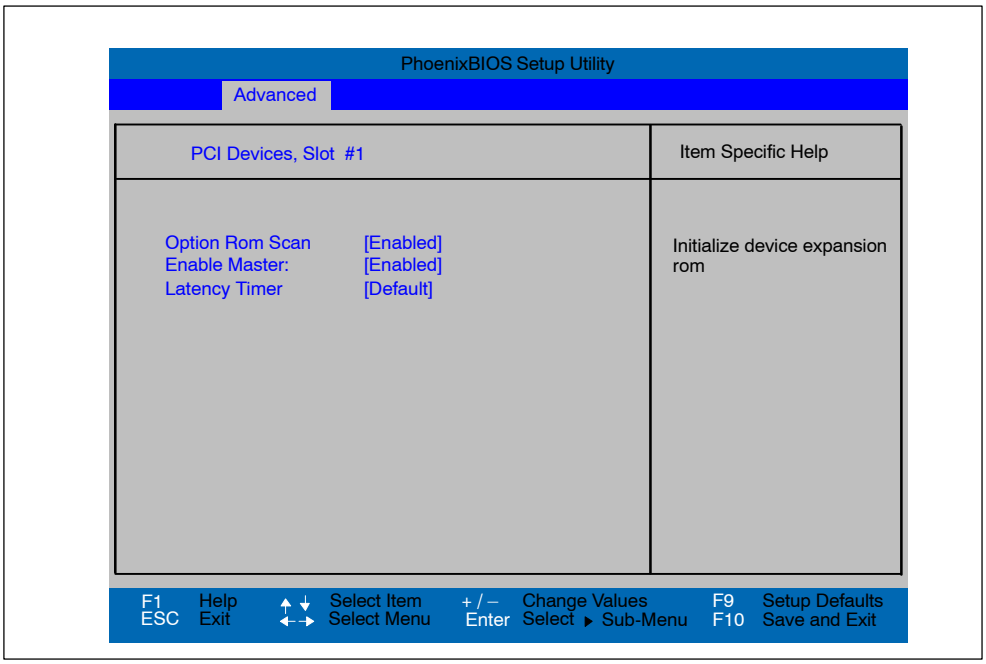


Figure 5-11 Submenu ”PCI Devices, Slot #1”

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

“PCI/PNP ISA IRQ Resource Exclusion” Submenu

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

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

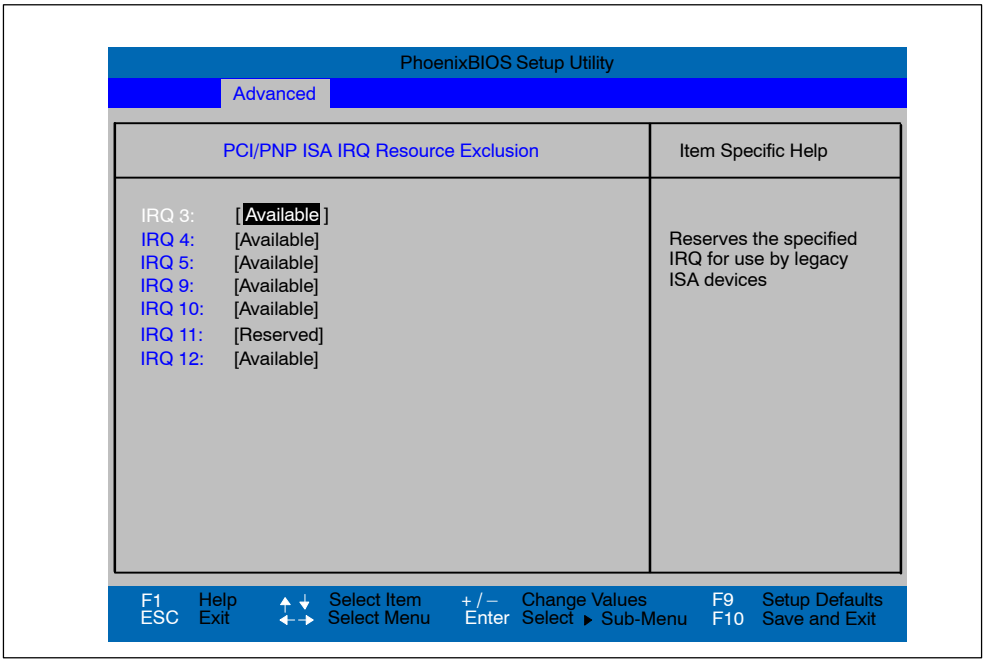


Figure 5-12 ”PCI / PNP ISA IRQ Resource Exclusion” Submenu

"PCI IRQ line" Field

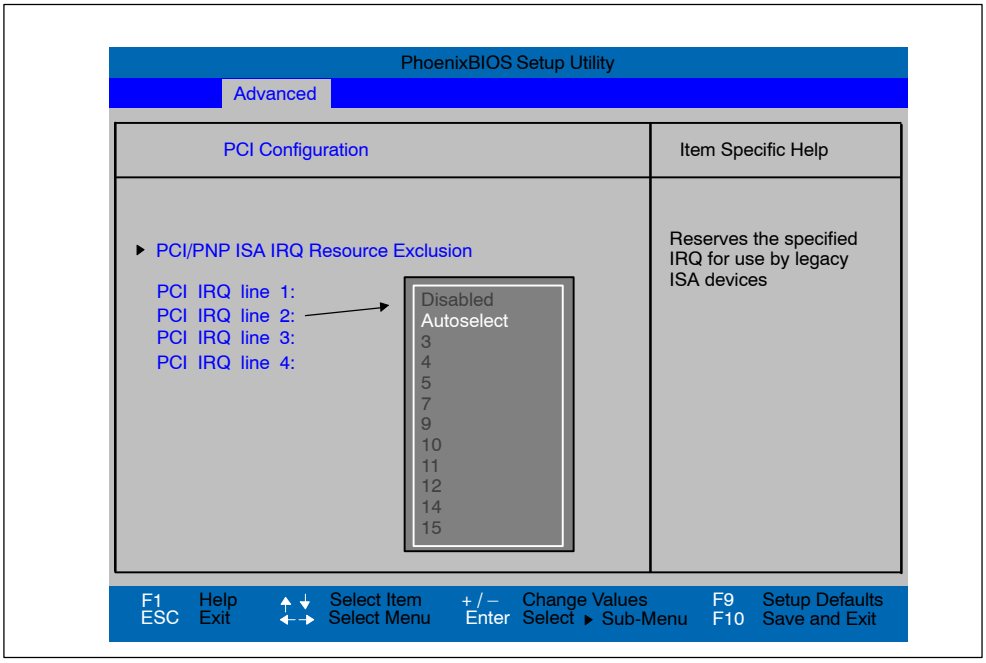


Figure 5-13 "PCI Configuration" Submenu

Disabled	No interrupt possible for this PCI-IRQ line
AutoSelect	Plug and Play mechanism in BIOS selects unassigned interrupts and allocates them to the on-board PCI devices.
3 to 15	The PCI-IRQ line is assigned to the selected interrupt. Do not use this setting unless it is specifically required in your application documentation.

Assignment of the PCI IRQ lines to the PCI slots.

Rack PC 840	PCI Module Interrupt Assignment (PCI-IRQ) in:						
Module Interrupt (Pin No.)	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
INT – A (A6)	line 1	line 2	line 3	line 4	line 1	line 2	line 3
INT – B (B7)	line 2	line 3	line 4	line 1	line 2	line 3	line 4
INT – C (A7)	line 3	line 4	line 1	line 2	line 3	line 4	line 1
INT – D (B8)	line 4	line 1	line 2	line 3	line 4	line 1	line 2

gray highlighting indicates slot module main interrupt

5.4 The Security Menu

You can only edit the fields enclosed in square brackets. Two passwords are assigned to protect your PC from unauthorized use. You can use the supervisor password to prevent use of diskettes for the normal user and to limit use of the hard disk.

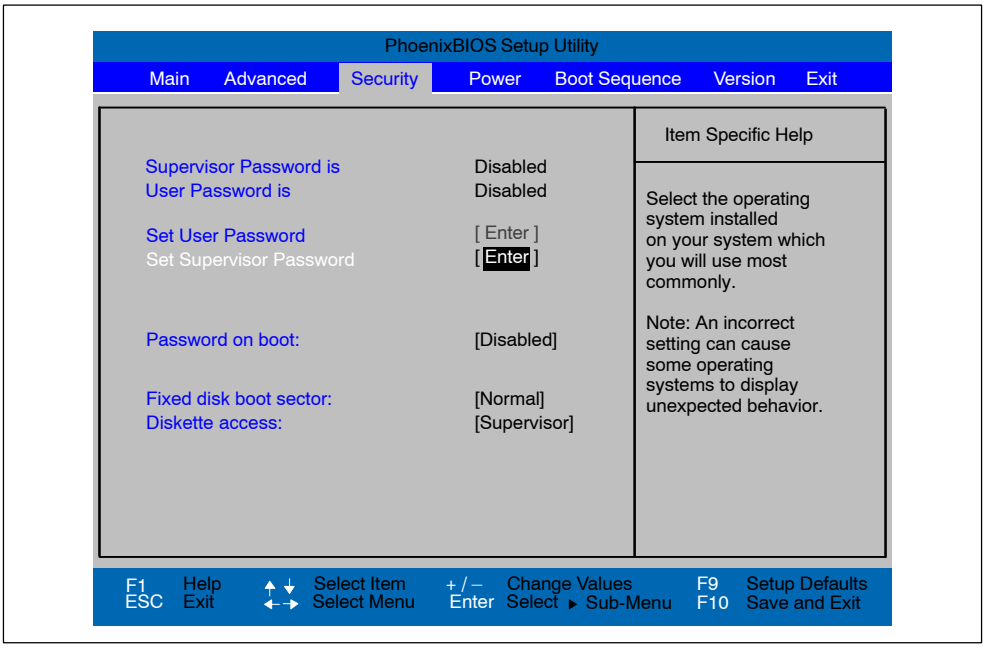


Figure 5-14 ”Security” Menu

User Password is	Disabled	Password is active. BIOS Setup cannot be opened until the password has been entered.
	Enabled	Certain Setup fields are thus configurable by the user, including the user password.
	The field resets automatically from [Disabled] to [Enabled] when the password is entered.	
Set Supervisor Password	This field opens the dialog box for entering a password. Once it has been entered, the supervisor password can be changed or deleted by pressing ”Return” and thus deactivated.	
Set User Password	This field opens the dialog box for entering a password. Once it has been entered correctly, the user password can be changed or deleted by pressing ”Return” and thus deactivated.	
Password on boot	[Disabled]	No password required for system boot.
	[Enabled]	Supervisor or user password must be entered for system boot.
Fixed disk boot Sector	[Normal]	All types of hard-disk access are permitted.
	[Write protect]	No operating system can be installed. This is a way of protecting against boot viruses.

Diskette access	This mode of protection is not active unless ”Password on boot ” is set to [enabled].	
	[Supervisor]	Diskette access is not possible unless the supervisor password was entered during system boot.
	[User]	Diskette access is not possible unless the user password was entered during system boot. **Note:** This function cannot be used under WIndows NT/2000, since this operating system does not access the diskette via BIOS routines. Please use the Windows NT/2000 system programs for this purpose.

5.5 The Power Menu

This menu has the following structure.

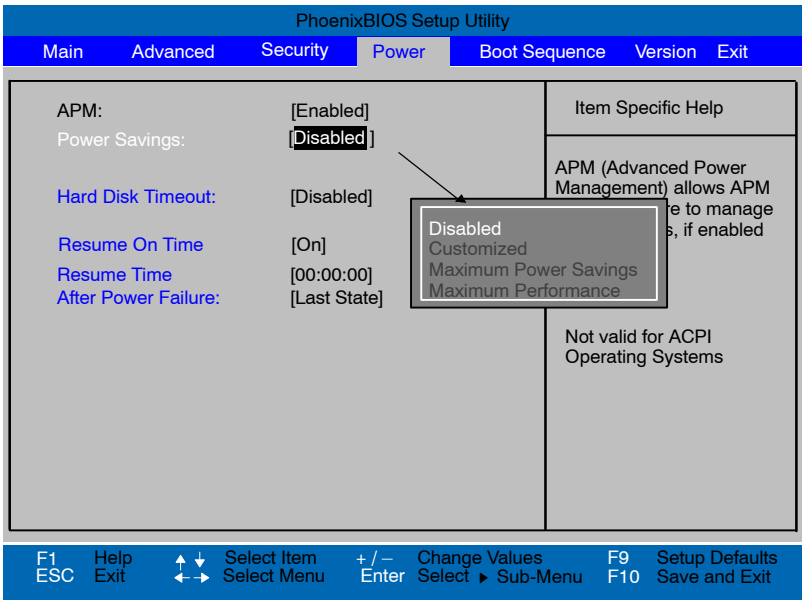


Figure 5-15 ”Power” Menu

The Power menu offers a number of power saver modes for environmentally friendly computing:

APM (Advanced Power Management)	[Enabled] [Disabled]	The operating system can shut down system resources when they are not needed. The operating system is denied APM access.
Power Savings	[Disabled]	No power-saving functions
	[Customize, Maximum Power Savings, Maximum Performance]	User-selectable and preset power saving functions for maximum and minimum power saving. You can set the parameters for Standby Timeout and Fixed Disk Timeout or they are set automatically to their defaults.
Hard Disk Timeout	[Disabled]	The hard disk does not shut down.
	[6, 8, 10, 15]	minutes since the last hard-disk access, the hard disk is shut down. The next time it is accessed, the hard disk starts spinning again after a brief delay.
Resume On Time	[On]	If this function is enabled the programming device is automatically switched on at the preset time.
	[Off]	’Off’ means this function is disabled.
Resume Time		Time for automatic restart

After Power Failure	[Stay Off]	After power failure the device is not switched on automatically.
	[Last State]	Provided it was switched on prior to a power failure, the device is switched on again
	[Power On]	Restores the previous power state before loss occured.

5.6 The Boot Sequence Menu

This menu allows you to prioritize the boot devices.

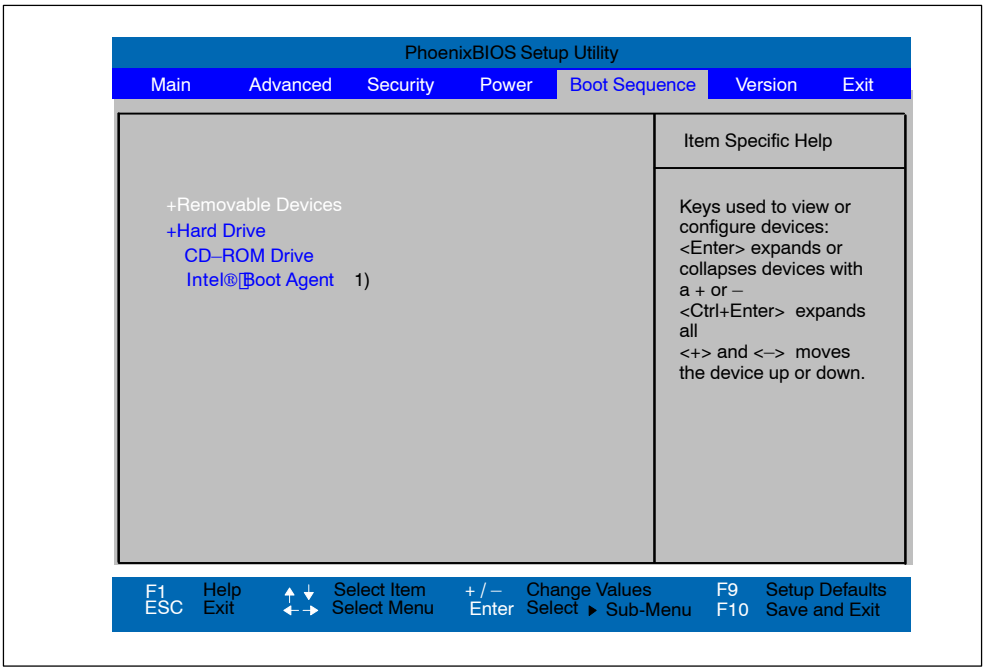


Figure 5-16 The ”Boot Sequence” Menu

1) Intel® Boot Agent is only displayed if, beforehand, the LAN Remote Boot function has been set to “Enabled” in the hardware options menu.

This menu lists the boot devices in groups. The group with the highest priority is at the top. The procedure for changing the sequence is as follows:

Use the ↑↓ keys to select a group and the + or – keys to move the group to its new position in the sequence.

Note

During booting the boot drive can be selected with the ESC key.

Groups marked + can contain more than one device. When you select a group marked in this way, hit Enter to view the list of devices in the group. See the figure below for an illustration:

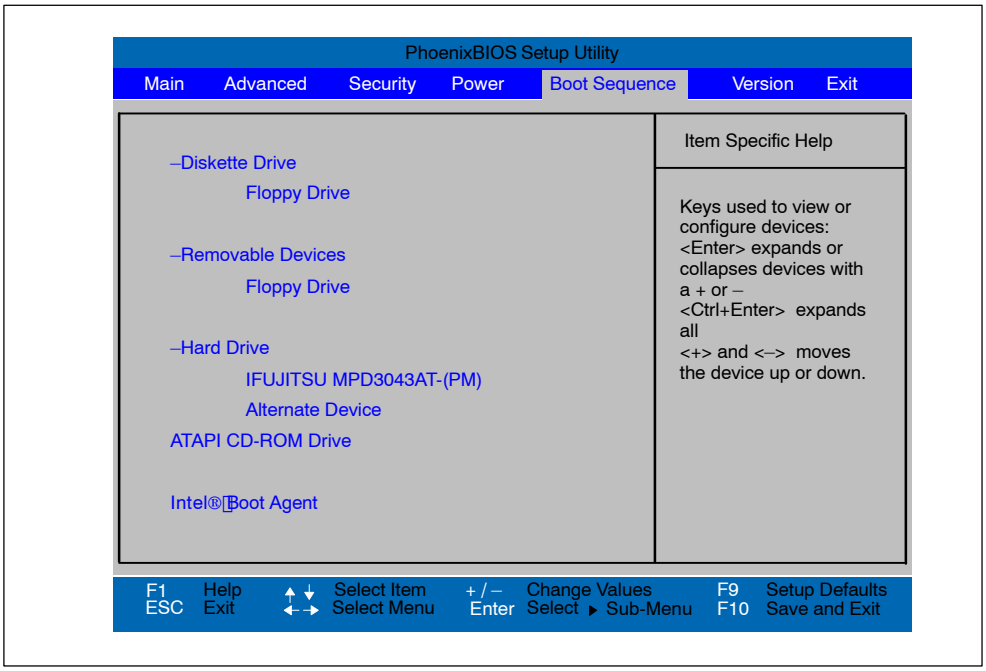


Figure 5-17 The ”Boot Sequence” Menu (Example)

This screen shows all possible boot devices; within a given group the highest priority device is always listed first. Here again, you can change the sequence as described above.

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

5.7 The Version Menu

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

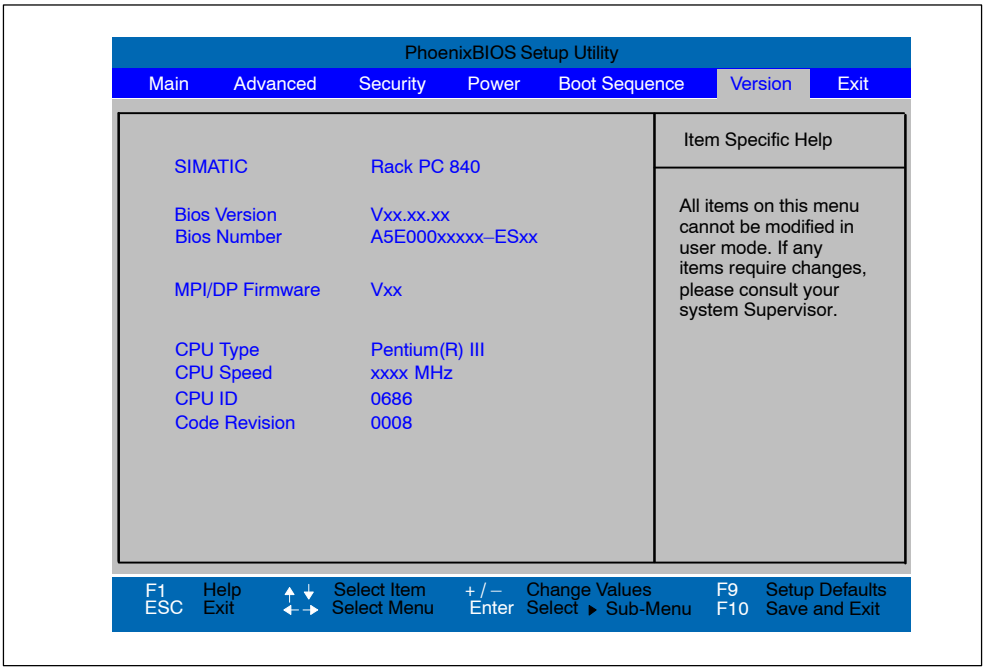


Figure 5-18 The ”Version” Menu

5.8 The Exit Menu

The setup program is always terminated using this menu.

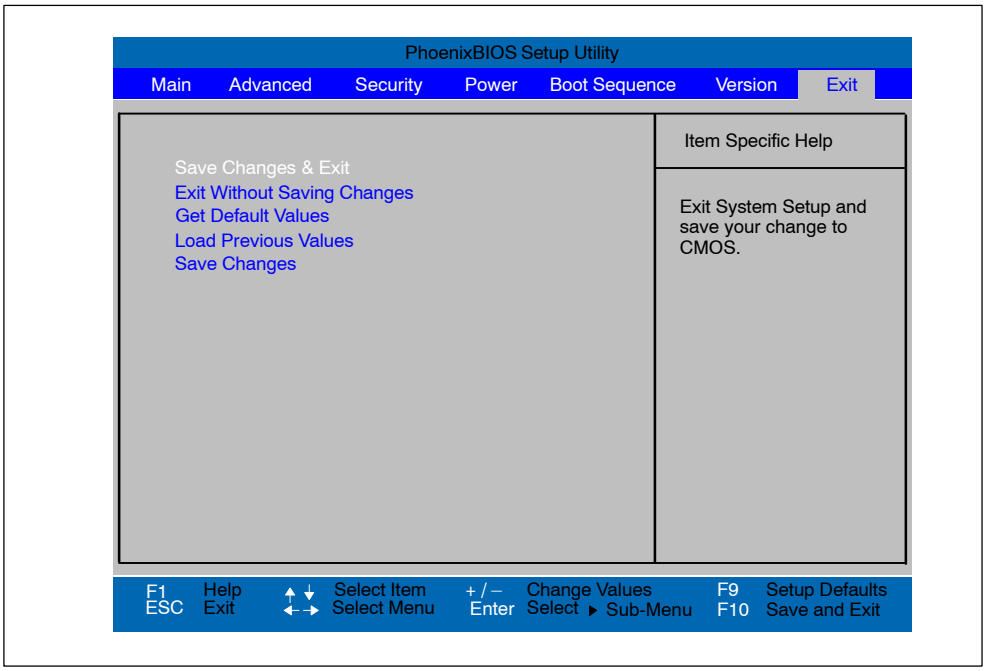


Figure 5-19 ”Exit” Menu

Save Changes & Exit	All changes are saved; a system restart is carried out with the new parameters.
Discard Changes & Exit	All changes are rejected; a system restart is carried out with the old parameters.
Get Default Values	All parameters are set to safe values.
Load Previous Values	The last saved values are reloaded.
Save Changes	Save all Setup settings.

5.9 Default Setup Settings

Documenting Your Device Configuration

If you have made any modifications to the default Setup settings, you can enter them in the following table. You can then refer to these entries if you need to make any hardware modifications later.

Note

Print the following table out and keep the pages in a safe place once you have filled in your entries.

System Parameter	Default Settings	Your Entries
Main		
System Time	hh:mm:ss	
System Date	MM/TT/JJJJ	
Diskette A	1.44 MB, 3 1/2”	
Primary Master		
Primary Slave	None	
Secondary Master	None	
Secondary Slave	None	
Boot Options		
Quick Boot Mode	Enabled	
SETUP prompt	Enabled	
POST Errors	Enabled	
Floppy check	Disabled	
Summary screen	Enabled	
Keyboard Features		
Num Lock	On	
Key Click	Disabled	
Keyboard auto-repeat rate:	30/s	
Keyboard auto-repeat delay	1/2s	
Hardware Options		
PCI-MPI/DP:	Enabled	
On Board Ethernet	Enabled	
Ethernet Adress	08000624xxxx	
LAN Remote Boot	Enabled	
Legacy USB Support	Disabled	
SafeCard Functions	Enabled	
Fan Control	Enabled	
PS2 Mouse	Auto	

System Parameter	Default Settings	Your Entries
Advanced		
Installed O/S	Other	
Reset Configuration Data	No	
COM/LPT Configuration		
Internal COM1	Auto	
Internal COM2	Auto	
Internal LPT1	Auto	
Mode	ECP	
PCI-Configuration		
PCI Device Slot 1		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 2		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 3		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 4		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 5		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 6		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 7		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
on board Ethernet		
on board Ethernet	Enabled	
Ethernet adress		
PCI/PnP ISA IRQ Exclusion		
IRQ3	Available	
IRQ4	Available	
IRQ5	Available	
IRQ9	Available	
IRQ10	Available	
IRQ11	Reserved	
IRQ12	Available	

System Parameter	Default Settings	Your Entries
PCI IRQ Line 1	Auto Select	
PCI IRQ Line 2	Auto Select	
PCI IRQ Line 3	Auto Select	
PCI IRQ Line 4	Auto Select	
Floppy disk controller	Enabled	
Large Disk Access Mode	DOS	
Local Bus IDE adapter	Primary& Secondary	
Memory Gap at 15 Mbyte	Disabled	
Default Primary Video Adapter	AGP	
Security		
Supervisor Password Is	Disabled	
User Password Is	Disabled	
Set Supervisor Password	Enter	
Set User Password	Enter	
Password on boot	Disabled	
Fixed disk boot sector	Normal	
Diskette Access	Supervisor	
Power		
APM	Enabled	
Power Savings	Disabled	
Hard Disk Timeout	Disabled	
Resume On Time	off	
Resume Time		
After Power Failure	Last State	
Boot Sequence		
Diskette Drive		
Removable Devices		
Hard Drive		
ATAPI CD-ROM Drive		
Intel® Boot Agent		
Version		
SIMATIC	Rack PC 840	
BIOS Version		
BIOS Number		
MPI/DP Firmware		
CPU Type	PIII	
CPU Speed	xxxx MHz	
CPU ID	0683	
Code Revision	0010	

Error Diagnosis

6

Chapter Overview

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

- Please look up the meaning of operating system error messages in your operating system documentation.
- You will find error messages which occur during the self-test (intermittent tones, screen messages) in Section 6.6 and 6.7 of this manual.

Section	Description	Page
6.1	Problems When Using Modules from Other Manufacturers	6-2
6.2	The Monitor Remains Dark	6-3
6.3	No Mouse Pointer Appears on the Screen	6-3
6.4	The Clock Time and/or the Date in your PC Is Incorrect	6-4
6.5	USB-Device does not Function	6-4
6.6	An Error Message Appears on the Screen	6-5
6.7	Self-Test of the SIMATIC Rack PC 840 before Booting	6-7

6.1 Problems When Using Modules from Other Manufacturers

Error Display

The PC crashes during power up.

Cause

The following causes are possible:

- Double assignment of I/O addresses
- Double assignment of hardware interrupts and/or DMA channels
- Signal frequencies or signal levels are not met
- Different connector assignments
- ”Reset Configuration” was not carried out.

Remedy

Check your computer configuration:

- If the computer configuration is the same as when your PC was delivered, please contact your technical support team.
- If the computer configuration has changed, reestablish the configuration you had when your PC was delivered. Remove any modules from other manufacturers. Perform a complete restart on your PC.
  - If the PC still crashes, you must contact your technical support team.
  - If the error no longer occurs, the module you used from another manufacturer was the cause of the fault. Replace this module with a Siemens module, or contact the module supplier.
- Force ”Reset Configuration” via BIOS Setup (see Chapter 5.3).

6.2 The Monitor Remains Dark

Cause and Remedy

The following causes are possible:

The monitor has been switched off.

- Switch on the monitor.

The monitor is in “powersave” mode.

- Press any key on the keyboard.

The brightness button has been set to dark.

- Set the screen brightness button to obtain more light. Refer to the operating instructions for the monitor for more detailed information.

The power supply cable or the screen cable is not connected.

- Switch off the monitor and the system unit.
- Check whether the power supply cable has been connected correctly to the monitor and to the system unit or to the grounding outlet.
- Check whether the monitor cable has been connected correctly to the system unit and to the monitor.
- Switch on the monitor and the system unit.

Note

If the monitor screen still remains dark after these checks and measures have been carried out, please contact your technical support team.

6.3 No Mouse Pointer Appears on the Screen

Cause and Remedy

The mouse pointer may not appear for the following reasons:

The mouse driver is not loaded

- Check whether the mouse driver is correctly installed. Check whether the mouse pointer is present when you start your user program. Refer to the manuals for the mouse and user program to obtain detailed information about the mouse driver.

The mouse is not connected

- Switch off your PC.
- Check whether the mouse cable is connected to the system unit correctly. If you use an adapter or an extension cord for the mouse cable, also check their plug-in connections.
- Switch on your PC.

Note

If the mouse pointer still does not appear on the screen after you have performed these checks and measures, please contact your technical support team.

6.4 The Clock Time and/or the Date in your PC Is Incorrect

Remedy

Set the clock time and the date in the setup menu.

Press <F2> to call setup when booting the computer.

Note

The battery is dead if the clock time and the date are still incorrect after you switch off your PC and switch it back on again. In this case, please contact your technical support team.

6.5 USB-Device does not Function

The USB port is not recognized by the operating system. It is only supported by Windows Me and Windows 2000 at the present time. In addition, the BIOS setup can be controlled by a USB keyboard.

6.6 An Error Message Appears on the Screen

Error Messages

The following table describes the error messages that the BIOS system outputs. Error messages the operating system or program outputs are described in the manuals for these programs.

Press <F2> to call Setup when booting the computer.

Error Message on the Screen	Meaning/Suggestion
Address conflict	Plug and Play Problem Contact your technical support team.
Combination not supported	Plug and Play Problem Contact your technical support team
IO device IRQ conflict	Plug and Play Problem Contact your technical support team
Invalid System Configuration Data	Plug and Play Problem Please set the option RESET CONFIGURATION.DATA in the Advanced Setup menu. Contact your technical support team
Allocation Error for ...	Plug and Play Problem Please undo the last hardware change. Contact your technical support team
System battery is dead Replace and run SETUP	The battery on the CPU module is defective or dead. Contact your technical support team
System CMOS checksum bad Run SETUP	Call up SETUP, adjust settings and save. If this message appears during each power up, contact your technical support team.
Incorrect Drive A type Run SETUP	Check the SETUP entries for drive A.
Incorrect Drive B type Run SETUP	Check the SETUP entries for drive B.
Diskette drive A error	Error accessing drive A. Contact your technical support team.
Diskette drive B error	Error accessing drive B. Contact your technical support team.
Failure Fixed Disk	Error accessing the hard drive. Check the SETUP settings Contact your technical support team.
Keyboard error	Check whether the keyboard is connected correctly.
Stuck Key	Check whether a key on the keyboard is stuck.
System RAM Failed at offset:	Memory error Contact your technical support team.
Shadow RAM Failed at offset:	Memory error Contact your technical support team
Extended RAM Failed at offset:	Memory error Contact your technical support team
Failing Bits:	Memory error Contact your technical support team

Error Message on the Screen	Meaning/Suggestion
Operating system not found	Possible causes: No operating system present Incorrect drive addressed (diskette in drive A/B) Incorrect active boot partition Incorrect entries in SETUP for the BOOT drive
Previous boot incomplete Default configuration used	Abort of the previous BOOT procedure, for example, due to a power failure. Check the hardware settings and the SETUP.
System cache error Cache disabled	Error in the CPU's cache module. Contact your technical support team.
Monitor type does not match CMOS Run SETUP	The monitor does not match the SETUP entries. Adapt the SETUP entries to the monitor.
System timer error	Hardware error Contact your technical support team.
Real time clock error	Clock chip error Contact your technical support team.
Keyboard controller error	Keyboard error Contact your technical support team.

6.7 Self-Test of the SIMATIC Rack PC 840 before Booting

When the PC is powered up, it runs a self-test (POST = Power On Self Test). If the POST detects a fault, it outputs the sequence of beeps (beep code) assigned for the fault or the FAN LED lights red. Each beep code consists of 2 x 2 sequences.

Conversion table for the beep codes to hexadecimal representation:

Beeps		Hex-Code
B	B	0
B	BB	1
B	BBB	2
B	BBBB	3
BB	B	4
BB	BB	5
BB	BBB	6
BB	BBBB	7
BBB	B	8
BBB	BB	9
BBB	BBB	A
BBB	BBBB	B
BBBB	B	C
BBBB	BB	D
BBBB	BBB	E
BBBB	BBBB	F

Example:

B	BBBB	BBB	BBB	Beeps
3		6		Hex-Code
Check shutdown code				Meaning

The POST Codes in order of occurrence:

Display (hex)	Meaning	Description
02	TP_VERIFY_REAL	Test whether the CPU is in real mode
1C	TP_RESET_PIC	Reset the interrupt controller
12	TP_RESTORE_CRO	Restore the controller register
13	TP_PCI_BM_RESET	Reset the PCI bus master
36	TP_CHK_SUTDOWN	Check the shutdown code
24	TP_SET_HUGE_ES	Switch the ES to special mode
03	TP_DISABLE_NMI	Switch off the NMI
0A	TP_CPU_INIT	Initialize the CPU
04	TP_GET_CPU_TYPE	Determine the CPU type
AE	TP_CLEAR_BOOT	Edit the boot flag
06	TP_HW_INIT	Initialize the main hardware
18	TP_TIMER_INIT	Initialize the timer
08	TP_CS_INIT	Initialize the chip set
C4	TP_PEM_SIZER_INIT	Reset system error
0E	TP_IO_INIT	Initialize IO
0C	TP_CACHE_INIT	Initialize the cache
16	TP_CHECKSUM	EPROM checksum test
28	TP_SIZE_RAM	Determine the RAM size
3A	TP_CACHE_AUTO	Determine the cache size
2A	TP_ZERO_BASE	Set 512k base RAM to 0
2C	TP_ADDR_TEST	Test the base RAM address cables
2E	TP_BASERAML	Check the 1.64k base RAM
38	TP_SYS_SHADOW	BIOS-Shadow
20	TP_REFRESH	Refresh block test
29	TP_PMM_INIT	Initialize the post memory manager
33	TP_PDM_INIT	Initialize the dispatch manager
C1	TP_7xx_INIT	Initialize the PG 7xx I/Os
09	TP_SET_IN_POST	Start power ON self-test
0A	TP_CPU_INIT	Initialize the CPU
0B	TP_CPU_CACHE_ON	Switch on the cache
0F	TP_FDISK_INIT	Initialize the hard disk
10	TP_PM_INIT	Initialize the power management
14	TP_8742_INIT	Initialize the 8742 block
1A	TP_DMA_INIT	Initialize the DMA blocks
1C	TP_RESET_PIC	Reset the interrupt controller
32	TP_COMPUTE_SPEED	Determine the clock pulse speed
C1	TP_740_INIT	Initialize the PG 740 I/Os
34	TP_CMOS_TEST	Test the CMOS RAM
3C	TP_ADV_CS_CONFIG	Configure the advanced chip set
42	TP_VECTOR_INIT	Initialize the interrupt vectors
46	TP_COPYRIGHT	Test the copyright

Display (hex)	Meaning	Description
49	TP_PCI_INIT	Initialize the PCI port
48	TP_CONFIG	Check the configuration
4A	TP_VIDEO	Initialize the video port
4C	TP_VID_SHADOW	Copy the video BIOS to RAM
24	TP_SET_HUGE_ES	Switch the ES to special mode
22	TP_8742_TEST	Test block 8742
52	TP_KB_TEST	Keyboard available?
54	TP_KEY_CLICK	Switch the keyboard click on/off
76	TP_KEYBOARD	Check the keyboard
58	TP_HOT_INT	Test for unexpected interrupts
4B	TP_QUIETBOOT_START	Switch off any boot messages
4E	TP_CR_DISPLAY	Display the copyright notice
50	TP_CPU_DISPLAY	Display the CPU type
5A	TP_DISPLAY_F2	Display the F2 message for “SETUP”
5B	TP_CPU_CACHE_OFF	Switch off the cache if applicable (SETUP setting)
5C	TP_MEMORY_TEST	Test the system memory
60	TP_EXT_MEMORY	Test the extended memory
62	TP_EXT_ADDR	Test the A20 address line
64	TP_USERPATCH1	Area for own initializations
66	TP_CACHE_ADVNCD	Determine and enable the cache size
68	TP_CACHE_CONFIG	Configure and test the cache
6A	TP_DISP_CACHE	Display the cache configuration
6C	TP_DISP_SHADOWS	Configuration and size of the shadow Display RAM
6E	TP_DISP_NONDISP	Display nondisposable segment
70	TP_ERROR_MSGS	Display post error
72	TP_TEST_CONFIG	Check SETUP irregularities
7C	TP_HW_INTS	Set the IRQ vectors
7E	TP_COPROC	Check whether the CO processor is present
96	TP_CLEAR_HUGE_ES	Switch the ES back
80	TP_IO_BEFORE	Disable IO circuits
88	TP_BIOS_INIT	Initialize the BIOS data area
8A	TP_INIT_EXT_BDA	Initialize the external BIOS data area
85	TP_PCI_PCC	Determine the PCI blocks
82	TP_RS232	Determine the serial ports
84	TP_LPT	Determine the parallel port
86	TP_IO_AFTER	Reenable the IO blocks
83	TP_FDISK_CFG_IDE_CTRLR	Configure the IDE controller
89	TP_ENABLE_NMI	Enable the NMI
8C	TP_FLOPPY	Initialize the floppy controller
90	TP_FDISK	Initialize the hard disk controller

Display (hex)	Meaning	Description
8B	TP_MOUSE	Test the internal mouse port
95	TP_CD	Test the CP
92	TP_USERPATCH2	Area for own initializations
98	TP_ROM_SCAN	Search for BIOS expansions
69	TP_PM_SETUP	Initialize the power management
9E	TP_IRQS	Enable the hardware IRQ
A0	TP_TIME_OF_DAY	Set the clock time and date
A2	TP_KEYLOCK_TEST	Preset the keylock
C2	TP_PEM_LOCK	Stop the error manager
C3	TP_PEM_DISPLAY	Display any possible errors
A8	TP_ERASE_F2	Delete the F2 message
AA	TP_SCAN_FOR_F2	Check whether to activate setup
AC	TP_SETUP_CHEK	Output any F1/F2 message
AE	TP_CLEAR_BOOT	Cancel the self-test flag
B0	TP_ERROR_CHECK	Check for any possible errors
B2	TP_POST_DONE	End of the self-test
BE	TP_CLEAR_SCREEN	Clear the screen
B6	TP_PASSWORD	Password query (option)
BC	TP_PARITY	Cancel the parity memory bit
BD	TP_BOOT_MENU	Display the boot menu (option)
B9	TP_PREPARE_BOOT	Prepare the boot
C0	TP_INT19	Boot via Interrupt 19
00		Message after startup is complete

If the INSERT key is pressed during the booting of the system, 3 short beeps are emitted. This signal means that the initialization of the special PC hardware has been skipped.

If your SIMATIC Rack PC 840 does not power up properly, you can advise the hotline of the hex code of the POST.

Hardware Information

7

Chapter Overview

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7.1 Current Requirement of the Components (Maximum Values)

Basic System

Component	Voltage					
	+5V	**+3,3V**	**+12V**	**–5V**	**–12V**	**5Vaux**
Pentium III motherboard	1.3 A	4.8 A	0.2 A		0.03 A	0.3 A
Prozessor Pentium III with fan	5 A	2.7 A	0.2 A			
Floppy disk drive *1	0.25 A					
Hard drive EIDE *1	0.5 A		0.4 A			
Hard drive SCSI *1	0.9 A		0.6 A			
CD ROM drive*1	0.9 A		0.8 A			
CD RW drive*1	0.9 A		0.8 A			
Fan 1 front			0.2 A			
Fan 2 front			0.2 A			
Fan 3 rear *1			0.1 A			
Single lines of current (max. permissible)	**30 A** *2	**20 A** *2	**7 A**	**0.5 A**	**0.5 A**	**1.5 A**
Total power consumption, permissible	180 W					
Power efficency of the AC and DC power supply	approximately 65%					

*1 Depending on the selected device configuration
*2 The total power comsumption of the +5V and +3.3V voltages may not exceed 160 W.

7.2 Overview of the Components and Ports

Component/Port	Description	Parameters
Chipset	Single chipset Intel 815E	• SDRAM
BIOS	Update via software	• 512K in 4 pages
CPU	Pentium III / Celeron (type FC PGA370)	• Upgradeable • Multimedia support • On Board L2-Cache with 128 k/256 k
Memory	DIMM modules up to max. 256MB/DIMM	• Data capacity of 64 bits • 3.3 V • SDRAM to PC133 specification • up to 128MBit chip size on the module • 66/100/133 MHz bus speed *3 • 3 DIMMs can be used • easy to exchange • variable from 64-512MB/DIMM
Graphics	UXGA LCD controller at AGP bus (C&T 69000)	• 16 Mbytes SDRAM graphics memory • CRT: up to 65535 colors
Hard disk *4	Master or slave on primary EIDE port ATA 33/66 mode	• Ultra DMA capable
CDROM *4	Master on secondary EIDE port	• 48 speed DMA capable
Floppy *4	Port for 34-pin ribbon cable	• 1.44 MB
Keyboard	Port for PS2 keyboard	• Standard
Mouse	PS2 mouse port	• Standard
Serial	COM1/25 pins COM2/9 pins.	• TTY *2 and V24 • Standard
TTY *2	Communication with SIMATIC S5-CPUs	• Range up to 1000 m
Parallel	Standard, bidirectional, EPP and ECP mode	• 25 pin subminiature Cannon connector
PROFIBUS/MPI *2	Communication port SIMATIC S7	• potentially isolated DP12 *1 (CP 5611 compatible) • 12MBaud
USB	Universal Serial Bus	• three high current (500mA) USB ports
Ethernet	10BaseT/100Base-TX (Intel 82559)	• 10/100 Mbps, potentially isolated *1

*1 Electrically isolated in a safety extra-low voltage circuit (SELV)
*2 Optional product feature
*3 Depending on the CPU type
*4 Depending on the selected device configuration

7.3 System Resources

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

Windows Me

Start > Programs > Accessories > System Tools > System Information

Windows 2000

Start > Settings > Control Panel > Administrative Tools > Computer Management > System Information

Windows NT 4.0

Start > Programs > Administrative Tools (Common) > Windows NT Diagnostics

7.4 Monitoring Functions

7.4.1 Overview

Function

The following individual functions are implemented:

- Temperature monitoring and excess/insufficient temperature indication
- Watchdog
- Fan monitoring

Messages from the monitoring modules can be transferred to applications.

The program SOM (Safecard On Motherboard) as well as drivers for Windows are available on the units for this. The status can be displayed or limits parameterized thereby.

You will find a description of the drivers and the SOM program on the *Documentation and Drivers* CD in the \Drivers.*\Safeonbo.ard directory.

7.4.2 Signals on the Front Interface

The meaning of the indicators is as follows:

LED	OFF	GREEN	RED
Watchdog	Watchdog not active	Watchdog active	Watchdog executed
Temp	Inside temperature normal		Inside temperature outside the permissible range.
FAN	CPU starts, fan speed is normal		CPU does not start or fan speed is too low.

The fan status is only displayed when SOM or SOL is enabled.

7.4.3 Temperature Monitoring/Indication

Temperature Monitoring

The temperature is measured by means of three temperature sensors. One sensor monitors the processor temperature, the second the temperature in the area near the processor module, and the third the temperature near the drives.

Flashing of the Temp LED indicates that the device is being operated in the limit range.

If the temperature exceeds one of the three temperature values of the set thresholds, a temperature error is registered with the following effects:

Reaction	Option
Temp LED turns to red	–
Device and CPU fans go to maximum rpms.	–
SOM application is displayed	–

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

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

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

- Acknowledge the error message via the SOM program
- Restarting the device.

7.4.4 Watchdog (WD)

Function

The watchdog monitors the execution of a program. The purpose of the WD is to notify the user of a program crash through various reactions.

The watchdog is idle when the PC is switched on or after a HW-RESET(cold restart), i.e., no reaction of the WD will be triggered and the Watchdog LED is switched off. If the watchdog is activated (by driver or SOM program) the Watchdog LED is green.

WD Reactions

If the WD is not triggered again within the set time (by driver or SOM program), the following reactions are initiated:

Reaction	Option
Watchdog LED switches from green to red	–
Initiate reset of the PC	adjustable
SOM application is displayed	–

The reactions which are to be triggered can be parameterized by driver or SOM program.

WD Monitoring Times TWD

The monitoring times are adjustable in increments of one second in a range from 3 to 255 seconds.

Note

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

7.4.5 Fan Monitoring

Front and processor fan operation are monitored. If a fan should fail, the following reactions are triggered:

Reaction	Option
Temp LED turns to red	–
Fan LED turns to red	–
SOM application is displayed	–

The temperature error remains stored until the cause of the fan failure has been corrected in one of the following ways:

- Acknowledgement of the error message via the SOM program.
- Device restart.

Flashing of the Temp LED indicates that the device is being operated in the limit range. Please check if the permissible ambient temperature has been exceeded or if the filter is soiled.

7.5 Ports

The following ports are available on the motherboard of the Rack PCC:

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

The connector assignments of the individual ports are described in the following chapters.

7.5.1 External Ports

Port	Position	Connector	Description
COM1	external	X30	25 pin, socket, V.24/V.28 and 20mA (TTY potentially isolated)
COM2	external	X31	9 pin, standard connector
LPT1	external	–	25 pin, standard socket
PS/2 mouse	external	X22	6 pin, mini DIN socket
PS/2 keyboard	external	X23	6 pin, mini DIN socket
USB	external	X36	First and second USB channel, additional internal third USB channel for front interface
PROFIBUS/MPI	external	X400	9 pin, standard socket, potentially isolated port
Ethernet	external	X700	RJ45
VGA	external	X303	15 pin, socket

COM 1 Serial Port, X30*

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

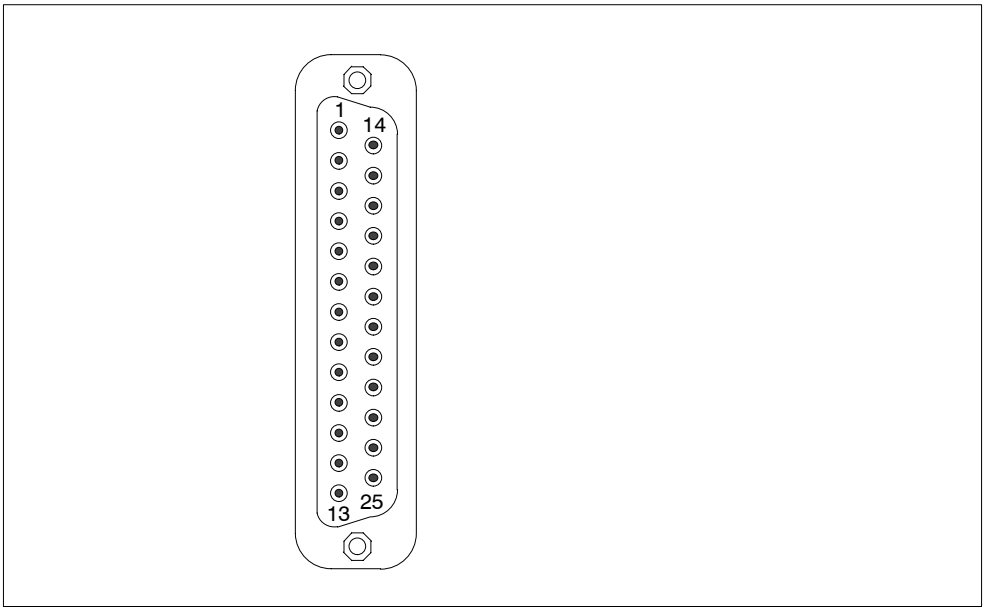


Figure 7-1 COM 1 Serial Port (Socket Connector)

Pin No.	Designation	Description	Input /Output
1	-	Shield	-
2	TxD (D1)	Serial transmit data	Output
3	RxD (D2)	Serial receive data	Input
4	RTS (S2)	Request to send	Output
5	CTS (M2)	Clear to send	Input
6	DSR (M1)	Data set ready	Input
7	GND (E2)	Functional ground (reference potential)	-
8	DCD (M5)	Data carrier detect	Input
9	+TTY RxD	TTY receive	Input
10 - 17	-	Unassigned	-
18	+TTY TxD	TTY send	Output
19	+20mA	Isolated current source	-
20	DTR (S1)	Data terminal ready	Output
21	-TTY TxD	TTY send	Output
22	RI (M3)	Incoming call	Input
23-25	-	Unassigned	-

* The line current (TTY) is an optional product feature.

Adapter for COM1

You can convert the COM1 port of the SIMATIC PC family into the usual 25 pin male connector by means of the enclosed adapter (25 pin / 25 pin). For this, you only have to plug the adapter onto the COM1 socket and secure it with the two hexagon head screws.

The V24 and TTY interfaces for COM1 can be alternately used.

COM 2 Serial Port (V24/Mouse), X31

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

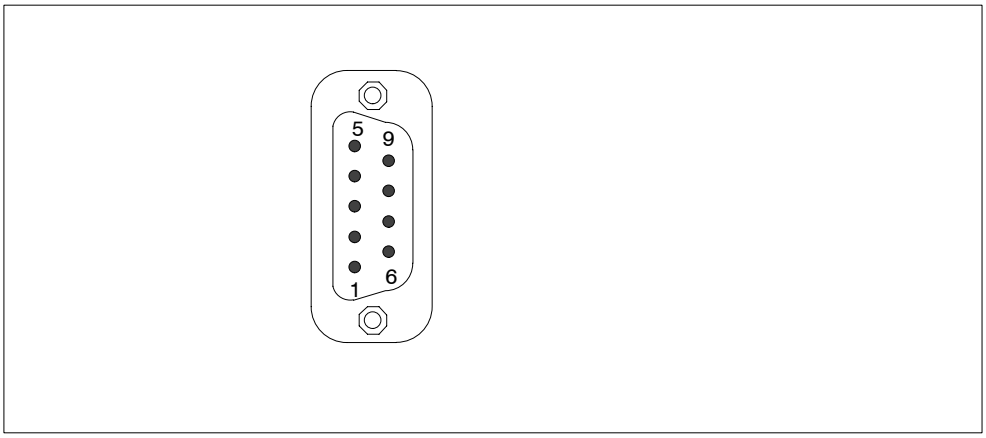


Figure 7-2 COM 2 Serial Port (Connector)

Pin No.	Designation	Description	Input / Output
1	DCD (M5)	Receiving signal level carrier	Input
2	RxD (D2)	Received data	Input
3	TxD (D1)	Transmitted data	Output
4	DTR (S1)	Terminal ready	Output
5	GND (E2)	Functional ground (reference potential)	-
6	DSR (M1)	Readiness for operation	Input
7	RTS (S2)	Switch on transmitter	Output
8	CTS (M2)	Ready to transmit status	Input
9	RI (M3)	Incoming call	Input

LPT1 Parallel Port

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

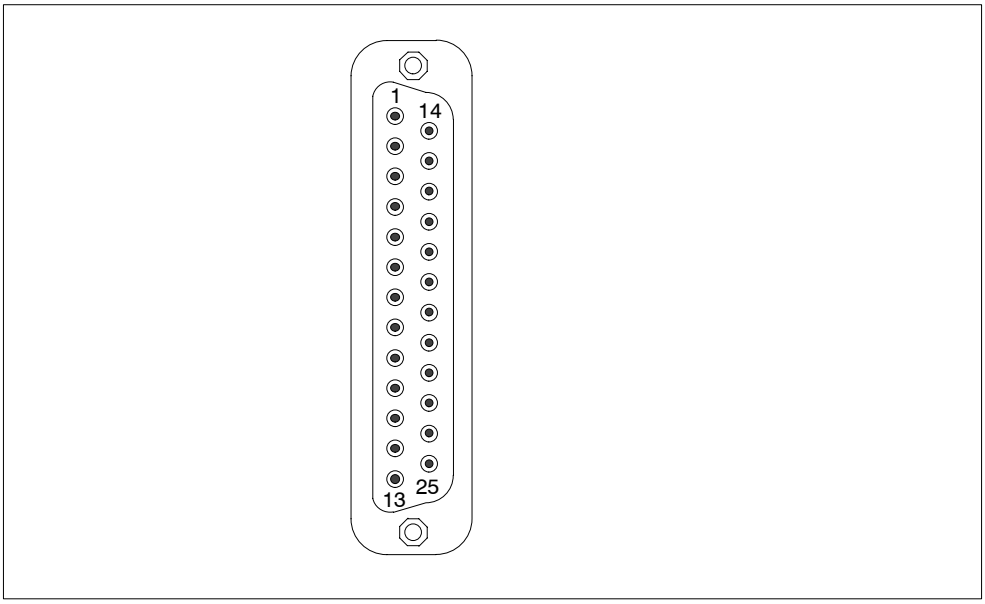
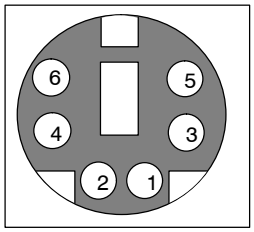


Figure 7-3 LPT 1 Parallel Port (Socket)

Pin No.	Designation	Description	Input / Output
1	/ Strobe (CLK)	Data message	Output (open collector)
2	Data - Bit 0	Data line 0	Output (TTL level)
3	Data - Bit 1	Data line 1	Output (TTL level)
4	Data - Bit 2	Data line 2	Output (TTL level)
5	Data - Bit 3	Data line 3	Output (TTL level)
6	Data - Bit 4	Data line 4	Output (TTL level)
7	Data - Bit 5	Data line 5	Output (TTL level)
8	Data - Bit 6	Data line 6	Output (TTL level)
9	Data - Bit 7	Data line 7	Output (TTL level)
10	/ACK	Acknowledge	Input (4.7 kΩ pull up)
11	BUSY	Not ready	Input (4.7 kΩ pull up)
12	PE	No paper	Input (4.7 kΩ pull up)
13	SELECT	Device selection	Input (4,7 kΩ pull up)
14	/ AUTO FEED	Automatic new line	Output (open collector)
15	/ ERROR	Device error	Input (4,7 kΩ pull up)
16	/ INIT	Reset / Initialization	Output (open collector)
17	/ SELECT IN	Printer selection	Output (open collector)
18 - 25	GND	Ground	-

PS/2 Mouse Port, X22

You can connect an external PS/2 mouse to your Rack PC.
The connector has the following pinout:



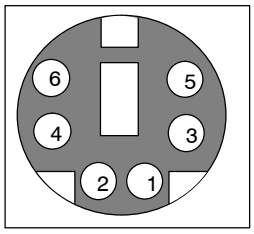
View of socket connector

Figure 7-4 Connector Pinout for a PS/2 Mouse

Pin No.	Designation	Description	Input / Output
1	DAT	Data line, mouse	Input / Output
2		Unassigned	-
3	GND	Ground	-
4		+5V (fused)	Output
5	CLK	Clock line, mouse	Input / Output
6	-	Unassigned	-

PS/2 Keyboard with Trackball Port, X23

You can connect an external keyboard to your Rack PC.
The connector has the following pinout:



View onto the socket

Figure 7-5 Connector Pinout for an External Keyboard Connecting Cable

Pin-No.	Designation	Description	Input / Output
1	DAT	Data line, keyboard	Input/output
2		Unassigned	-
3	GND	Ground	-
4	P5VFK	+5V (fused)	Output
5	CLK	Clock line, keyboard	Input/output
6	-	Unassigned	-

USB Ports, X36

The Universal Serial Bus ports have the following pinout:

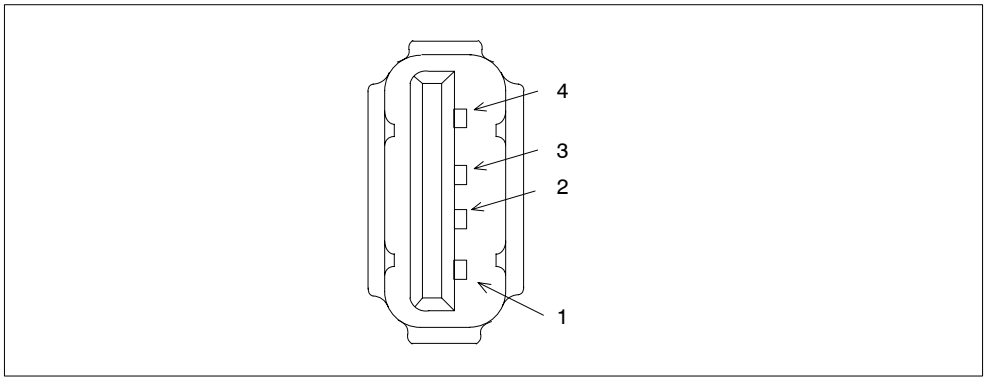


Figure 7-6 USB Port

Pin-No.	Designation	Description	Input / Output
1	VCC	+5V (fused)	Output
2	- Data	Data line	Input / Output
3	+ Data	Data line	Input / Output
4	GND	Ground	-

The connectors are of type A.

The ports are rated as high current USB (500mA).

PROFIBUS/MPI Socket Connector *, X400

The PROFIBUS/MPI socket connector on the Rack PC has the following pinout:

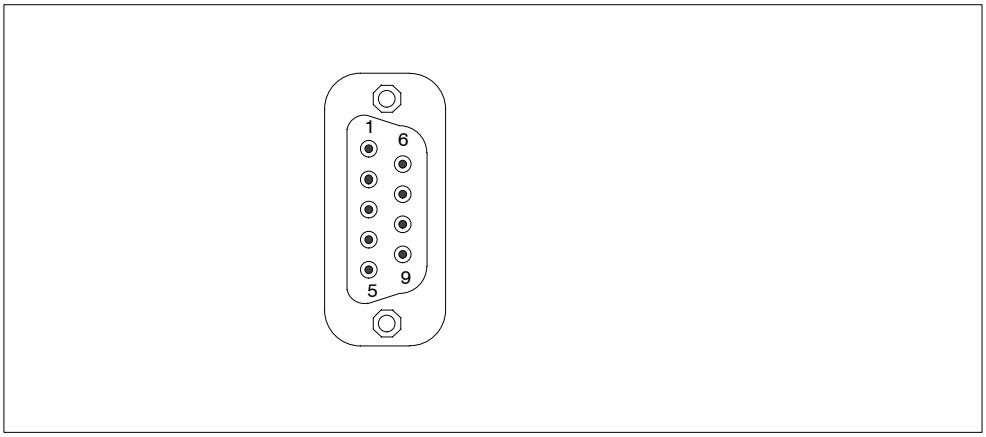


Figure 7-7 PROFIBUS/MPI Socket Connector

Pin No.	Designation	Description	Input/Output
1	-	Unassigned	-
2	-	Unassigned	-
3	LTG_B	Signal line B of MPI module	Input/output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is “1” active when the directly connected programmable controller is sending.	Input
5	M5EXT	M5EXT return line (GND) of the 5 V power supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed the maximum of 90 mA.	Output
6	P5 EXT	P5EXT power supply (+5 V) of the 5 V power supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed the maximum of 90 mA.	Output
7	-	Unassigned	-
8	LTG_A	Signal line A of the MPI module	Input/output
9	RTS_PG	RTS output signal of the MPI module. The control signal is “1” when the programming device is sending.	Output
Screen		on connector casing	

* Optional product feature

Ethernet RJ45 Connection, X700

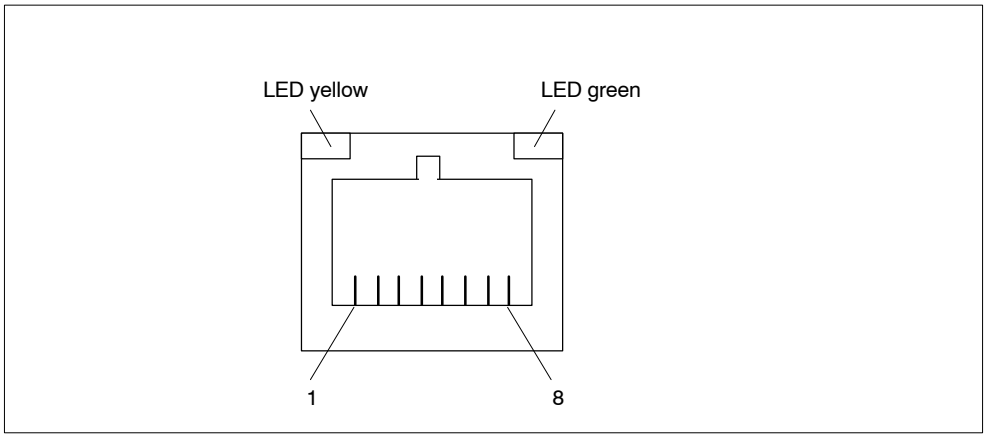


Figure 7-8 Ethernet port

Pin-No.	Designation	Description	Input / Output
1	TD+	Transmitted data	Output
2	TD–	Transmitted data	Output
3	RD+	Received data	Input
4, 5 *	SYMR	Internal 75 Ω output	-
6		Received data	Input
7, 8 *	SYMT	Internal 75 Ω output	-
S		Shield	-
	LED yellow	Connection	-
	LED green	Activity	-

* is not necessary for data transfer

VGA Socket Connector, X303

The VGA socket connector on the Rack PC has the following pinout:

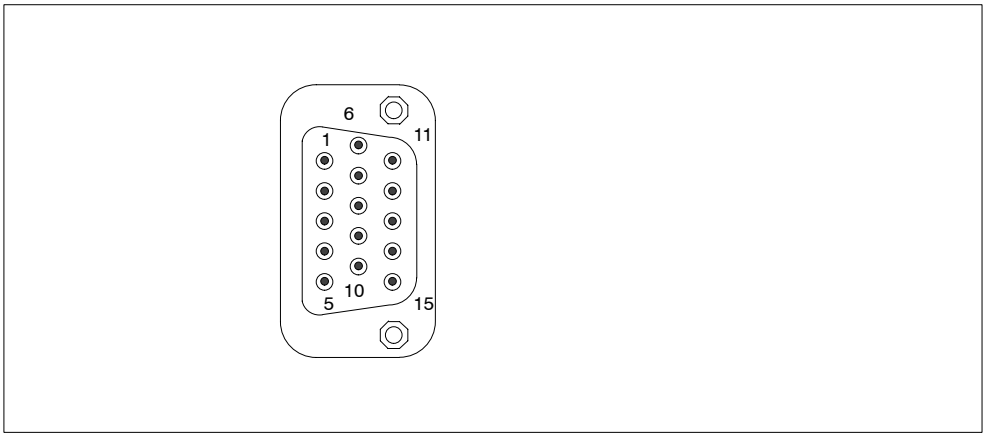


Figure 7-9 VGA Socket Connector

Pin No.	Designation	Description	Input/Output
1	R	Red	Output
2	G	Green	Output
3	B	Blue	Output
4	-	Unassigned	-
5	GND	Ground	-
6	GND	Ground	-
7	GND	Ground	-
8	GND	Ground	-
9	5 V	5 V (fused)	Output
10	GND	Ground	-
11	-	Unassigned	-
12	DDC_DAT	Display Data Channel Data	Input / Output
13	EXT_H	Horizontal synchronizing pulse	Output
14	EXT_V	Vertical synchronizing pulse	Output
15	DDC_CLK	Display Data Channel Clock	Input / Output

7.5.2 Assignment of the Front Port on the Motherboard

Front Port

The operation panel is connected to this port.

Pin No.	Designation	Description	Input / Output
1	GND	Ground	-
2	P12V		Output
3	Soft Off	Power LED (yellow), anode with 150Ω in series on motherboard	Output
4	P5V_fused	+5V (fused)	Output
5	GND	Ground	-
6	PWR button	Connection pin for On/Off button at the front	Input
7	K_CLK	Keyboard clock	Output
8	K_DATA	Keyboard data	Input / Output
9	M_CLK	Mouse clock	Output
10	M_DATA	Mouse DATA	Input / Output
11	P5V_fused	+5V (fused)	Output
12	USB_D1M	USB data	Input / Output
13	USB_D1P	USB data	Input / Output
14	GND	Ground	-
15	NC		-
16	NC		-
17	NC		-
18	NC		-
19	RESET_N	Reset signal (low active)	Input
20	SPEAKER	Connection for system speaker	Output
21	HD_LED	HD LED, anode with 150Ω in series on motherboard	Output
22	DP_LED	PROFIBUS/MPI LED, anode above 150Ω in series on motherboard	Output
23	Ethernet_LED	Ethernet LED, anode above 330Ω in series on motherboard	Output
24	TEMP_ERR	LED temperature error, anode with 330Ω in series on motherboard	Output
25	RUN_R	LED watchDog error, anode with 330Ω in series on motherboard	Output
26	RUN_G	LED watchdog o.k., anode with 330Ω in series on motherboard	Output

7.5.3 Assignment of the Internal Ports on the Motherboard

Port	Position	Connector	Description
Memory	internal	X3, X4, X5	3 DIMM slot, 64 bits
Processor	internal	X1	Socket for FCPGA mobile processor
Bus extender	internal	X20	Socket for bus extender, assigned with ISA and PCI bus signals
Power supply	internal	X50	20 pin connector for power supply
Floppy	internal	X26	two drives are possible (82078 compatible) 360kB, 720kB, 1.2MB, 1.44MB 3F0h-3F7h, 370h-377h, can be disabled IRQ 6, edge-triggered 34 pin, socket for standard floppy disk drive
primary EIDE (e.g. hard disk)	internal	X7	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 40 pin, 2.54 mm male connector (3.5” HD, primary), a maximum of two drives are operable
secondary EIDE (e.g. CD-ROM)	internal	X11	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 40 pin, 2.54 mm male connector , a maximum of two drives are operable
V.24/TTY module *	internal	X28, X29	Connection for V.24/TTY transmitter hybrid * (physical interface)
PS connection for CPU fan	internal	X41	Power supply for CPU fan, 3 pin, male connector
PS connection for device fan	internal	X42 X43	Power supply for device fan (controlled), 3 pin, male connector
PS connection for drive fan	internal	X40	Power supply for device fan (uncontrolled), 3pin, male connector
Connection for SCSI LED	internal	X39	Input fpr SCSI drive activity display

* Optional product feature

Port to the Bus Unit, X20

The Rack PC has a bus board with seven PCI slots, one ISA slot and two shared ISA /PCI slots. Ten expansion cards can simultaneously be installed to ISA specification (Rev. 3.1) and PCI specification (Rev. 2.0). All the PCI slots can be used as masters. Only 5V PCI modules are operable.

The power supply to the expansion cards is effected via the connection of the bus board with the motherboard and additionally directly from the power supply unit.

The connection to the motherboard is effected by a gold-plated direct connector of the type ‘PCI, 64 bit’. All the necessary bus signals (ISA and PCI) are applied to this connector. The following table shows the connector assignment.

Bus Board Pin Assignment

Pin No.	5V System Environment Side B	Side A
1	–12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	PRSNT1#	Reserved
10	Reserved	+5V
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	AUX3V
15	Ground	RST#
16	CLK	+5V
17	Ground	GNT#
18	REQ#	Ground
19	+5V	ME#
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SDONE
41	+3.3V	SBO#
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground

Pin No.	5V System Environment Side B	Side A
49	Ground	AD[09]
50	CONNECTOR KEY	
51	CONNECTOR KEY	
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V	+5V
60	Reserved	Reserved
61	+5V	+5V
62	+5V	+5V
	CONNECTOR KEY	
	CONNECTOR KEY	
63	Reserved	Reserved
64	Reserved	Reserved
65	Reserved	Reserved
66	Ground	Ground
67	Reserved	Reserved
68	Reserved	Reserved
69	Reserved	+3.3 V
70	Ground	PCI_GND_N1
71	PCI1_PCLK	Ground
72	Ground	PCI_GND_N2
73	PCI_REQ_N1	Ground
74	Ground	PCI6_PCLK
75	PCI2_PCLK	RISER_ID1
76	Ground	Reserved
77	PCI_REQ_N2	RISER_ID2
78	Ground	NO_GO
79	PCI_REQA_N	+12V
80	PCI_GNTA_N	SERIRQ_N
81	–3.3V	+3.3V
82	PCI3_PCLK	Ground
83	Ground	PCI_GNT.N3
84	PCI_REQ_N3	Ground
85	Ground	PCI4_PCLK
86	PCI_REQ_N4	Ground
87	Ground	PCI_GNT_N4
88	PCI5_PCLK	+3.3V
89	+3.3V	PCI_GNT_N5
90	PCI_REQ_N5	+3.3V
91	Ground	ISA_OSL
92	+12V	+12V
93	+12V	+12V
94	–12V	–5V

low active

Pin Assignment for ATX Power Supply Connector, X50

Pin No.	Designation	Description	Input / Output
1	3.3V	3.3V power supply	Input
2	3.3V	3.3V power supply	Input
3	GND	Ground	-
4	5V	5V power supply	Input
5	GND	Ground	-
6	5V	5V power supply	Input
7	GND	Ground	-
8	PowerGood		Input
9	AUX-5V	5V aux. power suppy	Input
10	12V	12V power supply	Input
11	3.3V	3.3V power supply	Input
12	–12V	–12V power supply	Input
13	GND	Ground	-
14	PSOFF		Output
15	GND	Ground	-
16	GND	Ground	-
17	GND	Ground	
18	–5V	–5V power supply	Input
19	5V	5V power supply	Input
20	5V	5V power supply	Input

Port for Floppy Disk Drive, X26

This port is intended for the connection of a standard floppy disk drive. The maximum connection length of the data cable may not exceed 40 cm.

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

Assignment of the EIDE Ports, X7, X1

Pin No.	Designation X7	Description	Input / Output
1	RESET	Reset	Output
2	GND	Ground	-
3	D7	Data signal D7	Input / Output
4	D8	Data signal D8	Input / Output
5	D6	Data signal D6	Input / Output
6	D9	Data signal D9	Input / Output
7	D5	Data signal D5	Input / Output
8	D10	Data signal D10	Input / Output
9	D4	Data signal D4	Input / Output
10	D11	Data signal D11	Input / Output
11	D3	Data signal D3	Input / Output
12	D12	Data signal D12	Input / Output
13	D2	Data signal D2	Input / Output
14	D13	Data signal D13	Input / Output
15	D1	Data signal D1	Input / Output
16	D14	Data signal D14	Input / Output
17	D0	Data signal D0	Input / Output
18	D15	Data signal D15	Input / Output
19	GND	Ground	-
20	–	Unassigned	-
21	DREQ	DMA Request	Input
22	GND	Ground	-
23	IOW_N	Write signal	Output
24	GND	Ground	-
25	IOR_N	Read signal	Output
26	GND	Ground	-
27	IORDY	Ready signal	Input
28	Reserved	Reserved	-
29	DACK_N	DMA Acknowledge	Output
30	GND	Ground	-
31	IRQ	Interrupt signal	Input
32	–	Unassigned	-
33	AD_1	Adress 1	Output
34	Reserved	Reserved	-
35	AD_0	Adress 0	Output
36	AD_2	Adress 2	Output
37	CS1_N	Chip Select 1	Output
38	CS3_N	Chip Select 3	Output
39	HDACT_N	HD active	Input
40	GND	Ground	-

Pin No.	Designation X11	Description	Input / Output
1	RESET	Reset	Output
2	GND	Ground	-
3	D7	Data signal D7	Input / Output
4	D8	Data signal D8	Input / Output
5	D6	Data signal D6	Input / Output
6	D9	Data signal D9	Input / Output
7	D5	Data signal D5	Input / Output
8	D10	Data signal D10	Input / Output
9	D4	Data signal D4	Input / Output
10	D11	Data signal D11	Input / Output
11	D3	Data signal D3	Input / Output
12	D12	Data signal D12	Input / Output
13	D2	Data signal D2	Input / Output
14	D13	Data signal D13	Input / Output
15	D1	Data signal D1	Input / Output
16	D14	Data signal D14	Input / Output
17	D0	Data signal D0	Input / Output
18	D15	Data signal D15	Input / Output
19	GND	Ground	-
20	–	Unassigned	-
21	DREQ	DMA Request	Input
22	GND	Ground	-
23	IOW_N	IO Write	Output
24	GND	Ground	-
25	IOR_N	IO Read	Output
26	GND	Ground	-
27	IORDY	IO Ready	Input
28	CSEL	Master/Slave	Input
29	DACK_N	DMA Acknowledge	Output
30	GND	Ground	-
31	IRQ14/15	Interrupt signal	Input
32	IOCS16	Chip Select 16 bits	Input
33	AD_1	Adress 1	Output
34	Reserved	Reserved	-
35	AD_0	Adress 0	Output
36	AD_2	Adress 2	Output
37	CS1_N	Chip Select 1	Output
38	CS3_N	Chip Select 3	Output
39	HDACT_N	Disk drive activity	Input
40	GND	Ground	-
41	P5V	+5V power supply	Output
42	P5V	+5V power supply	Output
43	GND	Ground	-
44	Reserved	Reserved	-

Assignment for Fan Supply, X41, X42, X43

Pin No.	Designation	Description	Input / Output
1	GND	Ground	–
2	+12V	Switched power supply	Output
3	CPU FAN_CLK	Speed signal for monitoring	Input

Assignment for Uncontrolled Fan Supply, X40

Pin No.	Designation	Description	Input / Output
1	GND	Ground	–
2	+12V	Power supply	Output
3	NC	–	–

Assignment for SCSI Activity Connector, X39 Type JST B2B-PH-SM3-TB

Pin No.	Designation	Description	Input / Output
1	NC	–	
2	SCSI HD_N	0V levell means that SCSI port is active	Input

7.6 Bus Board

7.6.1 Design and Mode of Operation

The bus board is designed as a passive link between the motherboard and the expansion modules. It is mounted by means of four screws.

The bus board has seven PCI slots and five long ISA slots. Ten expansion modules corresponding to ISA specifications (Rev. 3.1) and PCI specifications (Rev. 2.0) can simultaneously be inserted. All PCI slots are master capable. The expansion modules are powered via the link between the bus board and the motherboard and via the auxiliary ATX contect directly from the power supply unit.

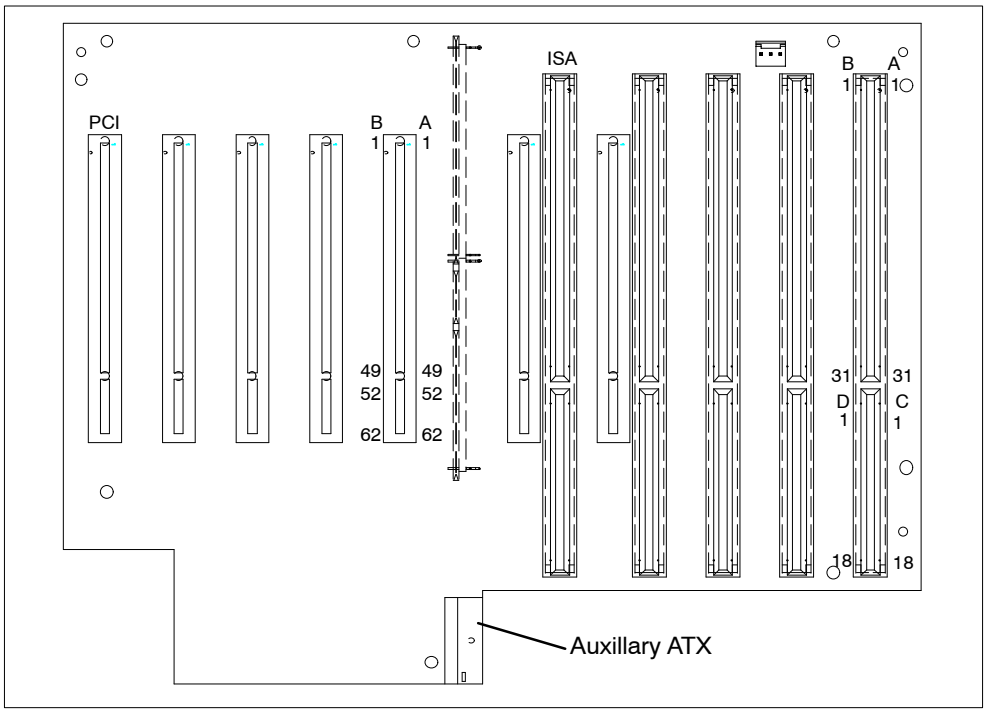


Figure 7-10 Connector Assignment on the Bus Board

Connector Assignment Auxillary ATX

Pin No.	Designation	Description	Input / Output
1, 2, 3	GND	Masse	
4, 5	+3.3 V	+3.3 V	
6	+5 V	+5 V	

Connector Assignment Fan

Pin No.	Designation	Description	Input / Output
1	GND	Ground	–
2	+12V	Power supply	Output
3	NC	–	–

7.6.2 Port for Motherboard

The connection to the motherboard is established by a gold-plated PCI 64 bit direct connector. All the required bus signals (ISA and PCI) are present on this connector. The following table shows the pin assignments.

Pin-Nr.	5V System Environment Side B	Side A
1	–12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	PRSNT1#	Reserved
10	Reserved	+5V
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V
17	Ground	GNT#
18	REQ#	Ground
19	+5V	Reserved
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SDONE
41	+3.3V	SBO#
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground

Pin-Nr.	5V System Environment Side B	Side A
49	Ground	AD[09]
50	CONNECTOR KEY	
51	CONNECTOR KEY	
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V	+5V
60	Reserved	Reserved
61	+5V	+5V
62	+5V	+5V
	CONNECTOR KEY	
	CONNECTOR KEY	
63	Reserved	Reserved
64	Reserved	Reserved
65	Reserved	Reserved
66	Ground	Ground
67	Reserved	Reserved
68	Reserved	Reserved
69	Reserved	+3.3 V
70	Ground	PCI_GND_N1
71	PCI1_PCLK	Ground
72	Ground	PCI_GND_N2
73	PCI_REQ_N1	Ground
74	Ground	PCI6_PCLK
75	PCI2_PCLK	RISER_ID1
76	Ground	Reserved
77	PCI_REQ_N2	RISER_ID2
78	Ground	NO_GO
79	PCI_REQA_N	+12V
80	PCI_GNTA_N	SERIRQ_N
81	–3.3V	+3.3V
82	PCI3_PCLK	Ground
83	Ground	PCI_GNT.N3
84	PCI_REQ_N3	Ground
85	Ground	PCI4_PCLK
86	PCI_REQ_N4	Ground
87	Ground	PCI_GNT_N4
88	PCI5_PCLK	+3.3V
89	+3.3V	PCI_GNT_N5
90	PCI_REQ_N5	+3.3V
91	Ground	ISA_OSL
92	+12V	+12V
93	+12V	+12V
94	–12V	–5V

low active

ISA Slot Pin Assignment

Pin No.	Designation	Type*	Pin No.	Designation	Type
A1	IOCHCK#	I	B1	0 V	GND
A2	SD 07	I/O	B2	RESET DRV	O
A3	SD 06	I/O	B3	+ 5V	V_{CC}
A4	SD 05	I/O	B4	IRQ 9	I
A5	SD 04	I/O	B5	– 5V	V_{CC}
A6	SD 03	I/O	B6	DRQ 2	I
A7	SD 02	I/O	B7	– 12V	V_{CC}
A8	SD 01	I/O	B8	OWS#	I
A9	SD 00	I/O	B9	+ 12V	V_{CC}
A10	IOCHRDY#	I	B10	0 V	GND
A11	AEN	O	B11	SMEMW#	O
A12	SA 19	I/O	B12	SMEMR#	O
A13	SA 18	I/O	B13	IOW#	I/O
A14	SA 17	I/O	B14	IOR#	I/O
A15	SA 16	I/O	B15	DACK3#	O
A16	SA 15	I/O	B16	DRQ 3	I
A17	SA 14	I/O	B17	DACK1#	O
A18	SA 13	I/O	B18	DRQ 1	I
A19	SA 12	I/O	B19	REFRESH	I/O
A20	SA 11	I/O	B20	CLK	O
A21	SA 10	I/O	B21	IRQ 7	O
A22	SA 09	I/O	B22	IRQ 6	O
A23	SA 08	I/O	B23	IRQ 5	O
A24	SA 07	I/O	B24	IRQ 4	O
A25	SA 06	I/O	B25	IRQ 3	O
A26	SA 05	I/O	B26	DACK2#	O
A27	SA 04	I/O	B27	TC	O
A28	SA 03	I/O	B28	BALE	O
A29	SA 02	I/O	B29	+ 5V	V_{CC}
A30	SA 01	I/O	B30	OSC	O
A31	SA 00	I/O	B31	0 V	GND

*) I/O determines the direction of the signals for the CPU board.
low active

Pin No.	Designation	Type *	Pin No.	Designation	Type
C1	SBHE#	O	D1	MEMCS16#	I
C2	LA 23	I/O	D2	IOCS16#	I
C3	LA 22	I/O	D3	IRQ 10	I
C4	LA 21	I/O	D4	IRQ 11	I
C5	LA 20	I/O	D5	IRQ 12	I
C6	LA 19	I/O	D6	IRQ 15	I
C7	LA 18	I/O	D7	IRQ 14	I
C8	LA 17	I/O	D8	DACK0#	O
C9	MEMR#	I/O	D9	DRQ 0	I
C10	MEMW#	I/O	D10	DACK5#	O
C11	SD 08	I/O	D11	DRQ 5	I
C12	SD 09	I/O	D12	DACK6#	O
C13	SD 10	I/O	D13	DRQ 6	I
C14	SD 11	I/O	D14	DACK7#	O
C15	SD 12	I/O	D15	DRQ 7	I
C16	SD 13	I/O	D16	+ 5V	V_{CC}
C17	SD 14	I/O	D17	MASTER#	I
C18	SD 15	I/O	D18	0 V	GND

low active

Under normal conditions, the signals -SBHE, LA17 - LA23, -MEMR and MEMW are operated as outputs (sending from the CPU). Only CPU boards which are suitable for use as a master CPU for system bus access send and receive these signals. A minus sign “-” in front of the signal name shows that the signal is LOW active.

PCI Slot Pin Assignment

Pin No.	5V System Environment Side B	Side A
1	-12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	PRSNT1#	Reserved
10	Reserved	+5V
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V
17	Ground	GNT#
18	REQ#	Ground
19	+5V	Reserved
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SDONE
41	+3.3V	SBO#
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground

	5V System Environment Side B	Side A
49	Ground	AD[09]
50	CONNECTOR KEY	
51	CONNECTOR KEY	
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V (I/O)	+5V (I/O)
60	Reserved	Reserved
61	+5V	+5V
62	+5V	+5V

low active

7.7 Operator Panel

A 26-pin connection cable connects the operator panel to the motherboard.

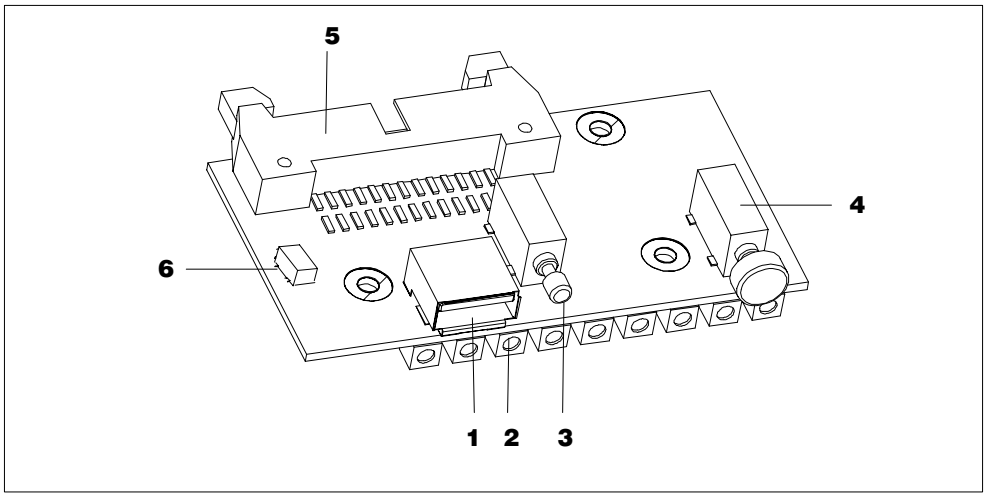


Figure 7-11 Operator Panel

1 USB Port

For pin assignment see page 7-14

2 LEDs

LEDs green, red, yellow

3 Reset Button

1-pin button

4 On/Off Button

1-pin button

5 26-pin Pin Connector

Connection to the motherboard

6 External Reset Connector

The device is reset.

Connector to the Motherboard (X44)

Pin No.	Designation	Description	Input / Output
1	RUN_G	LED watchdog o.k., anode with 330Ω in series on motherboard	Output
2	RUN_R	LED watchDog error, anode with 330Ω in series on motherboard	Output
3	TEMP_ERR	LED temperature error, anode with 330Ω in series on motherboard	Output
4	Ethernet_LED	Ethernet LED, anode above 330Ω in series on motherboard	Output
5	DP_LED	PROFIBUS/MPI LED, anode above 150Ω in series on motherboard	Output
6	HD_LED	HD LED, anode with 150Ω in series on motherboard	Output
7	SPEAKER	Connection for system speaker	Output
8	RESET_N	Reset signal (low active)	Input
9	NC		-
10	NC		-
11	NC		-
12	NC		-
13	GND	Ground	-
14	USB_D1P	USB data	Input / Output
15	USB_D1M	USB data	Input / Output
16	P5V_fused	+5V (fused)	Output
17	M_DATA	Mouse DATA	Input / Output
18	M_CLK	Mouse clock	Output
19	K_DATA	Keyboard data	Input / Output
20	K_CLK	Keyboard clock	Output
21	PWR button	Connection pin for On/Off button at the front	Input
22	GND	Ground	-
23	P5V_fused	+5V (fused)	Output
24	Soft Off	Power LED (yellow), anode above 150Ω in series on motherboard	Output
25	P12V		Output
26	GND	Ground	-

External Reset (X30) Type: JST B2B-PH-SM3-TB

Pin No.	Designation	Description	Input / Output
1	PWRGood	External reset, (IO low max. 30 mA)	
2	GND	Ground	

The device is reset when pins 1 and 2 (for example, via button) are short circuited. It remains in this state until the short circuit has been remedied.

7.8 AC Power Supply

Output Voltages

Voltage	Max. Current	Voltage Stability
+ 12 V	8 A	± 4 %
– 12 V	0.5 A	± 6 %
+ 5 V	30 A *	± 3 %
– 5 V	0.5 A	± 5 %
+ 3.3 V	20 A *	± 3 %
+ 5 V aux	1,5 A	± 5 %

* The total power consumption of the +5V and +3.3V voltages may not exceed 160 W.

Power-Good-Signal

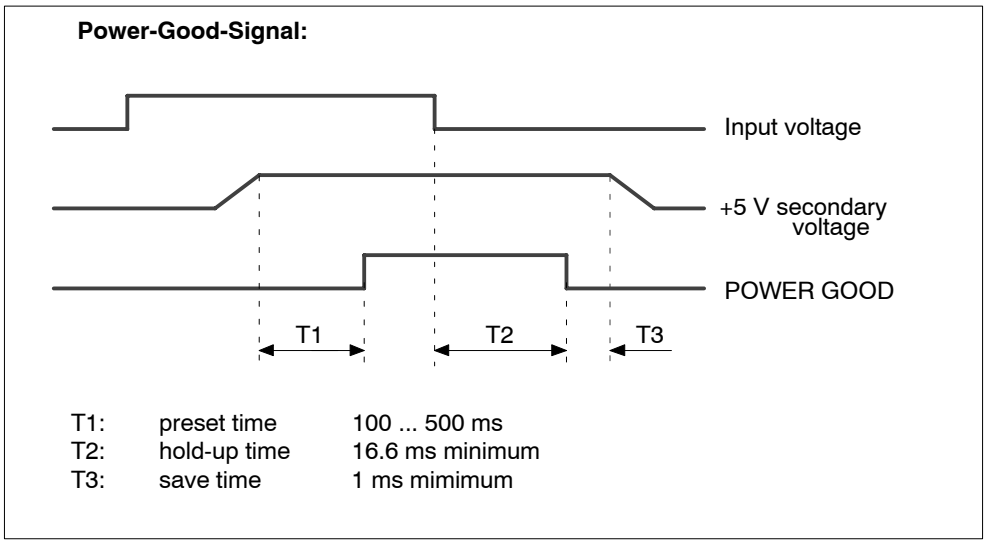


Figure 7-12 Time Characteristics of the Power Good Signal

7.9 DC Power Supply

Output Voltages

Voltage	Max. Current	Voltage Stability
+ 12 V	8 A	± 4 %
– 12 V	0.5 A	± 6 %
+ 5 V	30 A	± 3 %
– 5 V	0.5 A	± 5 %
+ 3.3 V	20 A	± 5 %
+ 18 V aux	0.08 A	± 5 %

* The total power comsumption of the +5V and +3.3V voltages may not exceed 160 W.

Power-Good-Signal

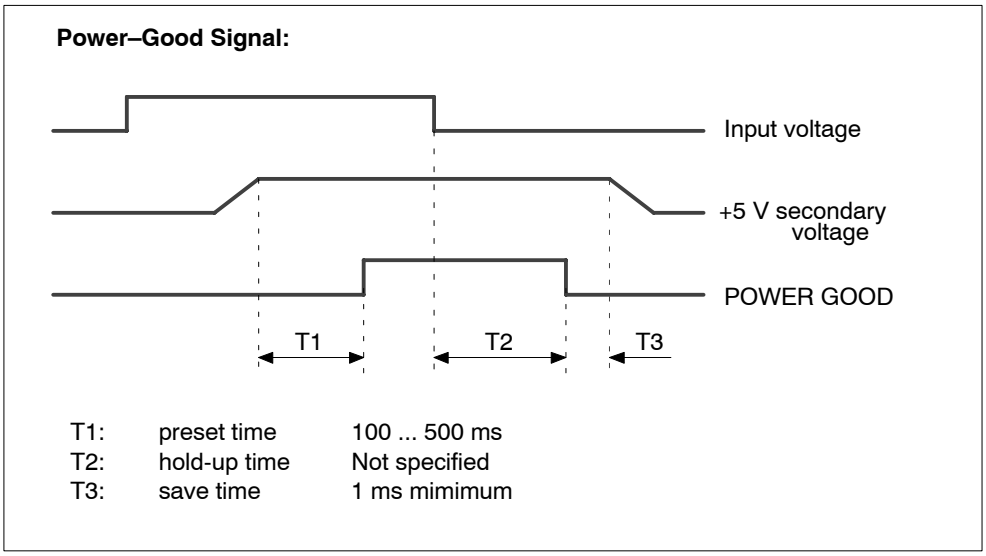


Figure 7-13 Time Characteristics of the Power Good Signal

7.10 Connecting Cables

SIMATIC S5 Connecting Cable

You can use the SIMATIC S5 connecting cable (not supplied with all variants) to connect your PC to a SIMATIC S5 programmable controller. Please read the notes in Chapter 3.

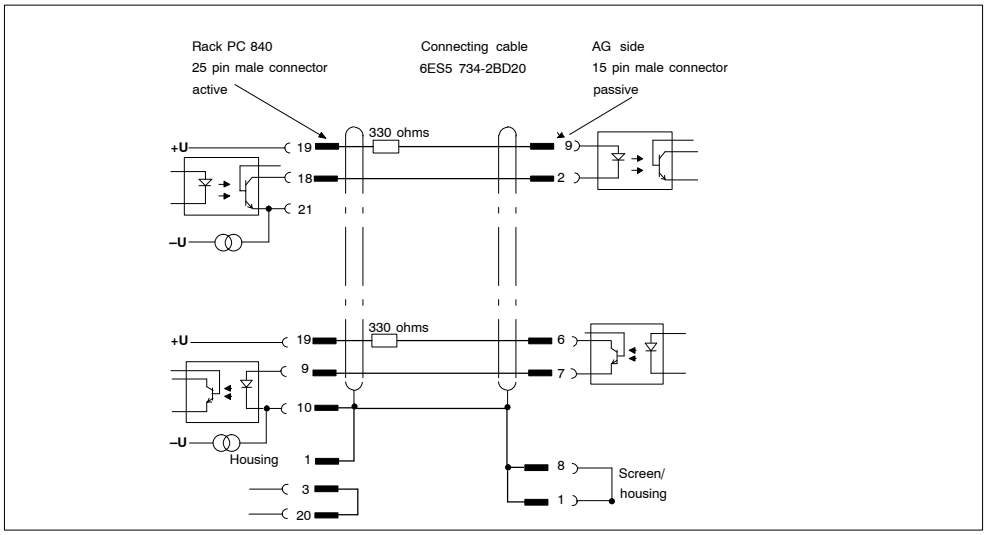


Figure 7-14 SIMATIC S5 Connecting Cable

SIMATIC S7 Connecting Cable for PROFIBUS/MPI

You can use the 6ES7901-0BF00-0AA0 connecting cable to connect your Rack PC to a SIMATIC S7 programmable controller. Please read the notes in Chapter 3.

Controller

8

Chapter Overview

Section	Description	Page
8.1	SCSI Controller	8-2
8.2	Raid Controller	8-18

8.1 SCSI Controller

Overview

SCSI stands for **S**mall **C**omputer **S**ystem **I**nterface.

The SCSI controller (host adapter) acts as an interface between the internal bus (PCI bus) and devices with an SCSI interface, called SCSI devices in the rest of this document.

Every SCSI device, including the SCSI controller, has an SCSI bus address which is its ID. Each ID is unique to that particular device. This description tells you how to set up and display IDs.

The SCSI controller is a PCI module which uses PCI bus master technology. This means that the controller can transfer data to and from the PC's working memory to the SCSI device quickly and without any help from the CPU (Central Processing Unit).

Your SCSI device documentation tells you how to install and operate your SCSI device.

Setting SCSI Addresses (IDs)

Each SCSI device that is connected to the SCSI controller must be given its own address (ID 0 to ID 15).

The SCSI controller supports standard SCSI and ultrawide SCSI. With standard SCSI, devices with ID 0 to ID 7 can be connected; with ultrawide SCSI, devices with ID 0 to 15 can be connected. ID 15 has the highest priority. The controller itself has ID 7, so it can support both types of SCSI.

- Make sure that each SCSI device has its own unique SCSI ID.

More details about setting the SCSI address are contained in your SCSI device documentation.

Connecting SCSI Devices

SCSI devices and the SCSI controller are connected via a common bus (SCSI bus).

Termination (terminal resistance) must be enabled (or installed) on the SCSI devices connected at the ends of the SCSI cable. Termination must be disabled (or removed) on all other SCSI devices.

Your SCSI device documentation tells you how to enable or disable termination on SCSI devices that have been added on later.

- Make sure that termination is properly installed.
- Connect the devices via the SCSI cable to the SCSI connector on the system module.
- The SCSI controller terminator must be disabled when you connect devices with the external SCSI bus.

Caution

Only SCSI devices with a single ended interface may be connected to the SCSI controller. Most SCSI devices meet this requirement. Contact your supplier or our customer service staff if in doubt.

Connectors and Cables

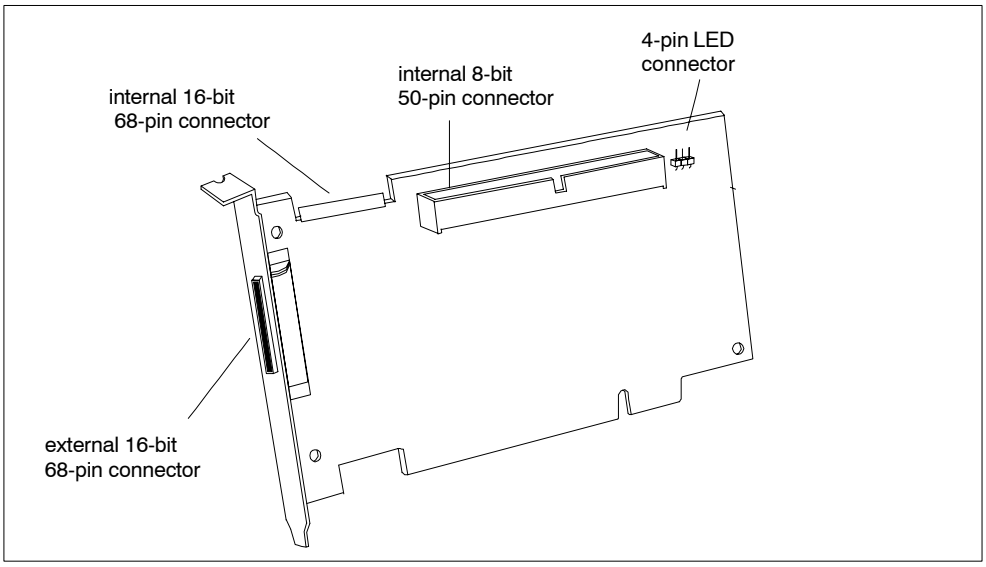
The integrated SCSI controller has the following connectors.

- Internal 16-bit 68-pin connector socket (UW SCSI bus)
- Internal 8-bit 50-pin connector plug (U SCSI bus)
- 4-pin LED connection plug
- External 16-bit 68-pin connector socket (UW SCSI bus)

Only two of the controller's SCSI connections may be assigned at the one time.

The integrated hard disk is connected at the internal 16-bit connector.

Read "Connecting Other SCSI Devices" for more information on expanding the system.



8-bit SCSI devices have a 50-pin connector, and 16-bit SCSI devices have a 68-pin connector.

You need an adapter (68-pin to 50-pin) if you want to connect 8-bit SCSI devices to the SCSI controller.

If you are operating an 8-bit SCSI device as the final device on the SCSI cable you need an adapter (68-pin to 50-pin) with high-byte termination.

Notice

Use top-quality SCSI cables only as otherwise you may have problems transferring data.

8.1.1 SCSI Setup

The BIOS of the SCSI controller contains an *SCSI Setup* program controlled by menu commands. This program allows you to select settings for the SCSI controller and SCSI devices connected to it.

When the system starts up, an SCSI BIOS message appears with a list of the SCSI devices connected.

Note

If an SCSI BIOS error message appears or problems with SCSI devices occur, read the ”Trouble with the SCSI Controller” and ”SCSI BIOS Messages” sections.

Starting SCSI Setup

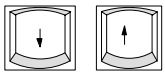
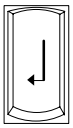
- Start the device and press the key combination Ctrl and A when the following message appears on your screen:

```
Press <Ctrl> <A> for SCSI Select (TM) Utility!
```

The first menu of *SCSI-Setup, Configure/View Host Adapter Settings* and *SCSI Disk Utilities* is displayed.

Using Keyboard Commands

Use the following keys to operate the program:

	to select an entry
	to confirm a selection
	to call the previous menu and exit *SCSI Setup*.
	to restore default settings
	to toggle between black+white and color display

Note also the status bar at the bottom margin of the screen.

Exiting SCSI Setup

When you press the ESC key, the previous menu from the current menu level is displayed. If you have made changes in the current menu, you will be asked if you want to save the changes you have made.

- Repeatedly press the ESC key until you have reached the first menu level (*Configure/View Host Adapter Settings*).
- Press the ESC key in the first menu and follow subsequent screen prompts to exit SCSI Setup.

SCSI Setup Default Settings

SCSI-Bus Interface Definitions	**Default Setting**
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	LowON/HighON
Additional Options	**Default Setting**
Boot device Options	
Boot Target ID	0
Boot LUN Number*	0
SCSI Device Configuration (for each SCSI device)	
SCSI Device ID	1 to 15
Initiate Sync Negotiation	Yes
Maximum Sync Transfer Rate	40 Mbyte/s
Enable Disconnection	Yes
Initiate Wide Negotiation	Yes
Send Start Unit Command**	No
Multiple LUN Support**	No
Include in BIOS Scan	Yes
Advanced Configuration Options	
Plug and Play SCAM Support	Disabled
Reset SCSI Bus at IC Initialization	Enabled
Extended BIOS Translation for DOS Drives > 1 Gbyte**	Enabled
Host Adapter BIOS	Enabled
Support Removable Disk Under BIOS as Fixed Disks**	Boot only
Display Ctrl mAssage During BIOS Initialization**	Enabled
BIOS Support for Bootable CD-ROM**	Enabled
BIOS Support for Int 13 Extensions**	Enabled

* The setting is only effective if *Multiple LUN Support* is active (*Enabled*).

** The setting is only effective if the BIOS of the SCSI controller is active (*Enabled*).

8.1.2 Meaning of the Setup Parameters

SCSI Bus Interface Definitions

Host Adapter SCSI ID

All SCSI devices connected to an SCSI bus, including the SCSI controller, must have different SCSI addresses.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15

The SCSI controller is set to the displayed SCSI address
(default entry: 7)

SCSI Parity Checking

The SCSI controller uses default parity checking on the SCSI bus for monitoring data transfer. Older SCSI devices may not support parity checking. If this is the case, you must disable this option.

Enabled	Parity checking is activated (default setting)
Disabled	Parity checking is deactivated.

Notice

If parity checking is disabled, this applies to all devices connected to the SCSI bu

Host Adapter SCSI Termination

If the Ultra Wide SCSI controller is the final device on the SCSI cable, termination must be enabled. If the Ultra Wide SCSI controller is not the final device on the SCSI cable, termination must be disabled.

Automatic	Host adapter is terminated automatically
LowON/HighON	Termination is enabled (default setting)
LowOFF/HighOFF	Termination is disabled.

Additional Options: Boot Device Options

Boot Target ID

The Ultra Wide SCSI controller can start the operating system from a drive with any SCSI address (ID). The selected SCSI ID must match the one configured on the drive.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15

The Ultra Wide SCSI controller boots from the drive with the SCSI ID that is displayed (default setting: 0).

Boot LUN Number

If your startup drive has several LUNs (Logical Unit Numbers) and the *Multiple LUN Support* function is enabled, you can select which LUN you want to use as the boot drive.

0, 1, 2, 3, 4, 5, 6, 7

The SCSI controller boots with the LUN that is displayed (default setting: 0)

SCSI Device Configuration

SCSI Device ID

This row contains the SCSI device IDs (0-15)

Initiate Sync Negotiation

SCSI devices, including the SCSI controller, communicate with each other via a common SCSI bus. Before data are sent via the SCSI bus, the SCSI controller and the connected SCSI devices negotiate and agree on the transmission rate and number of data packages to be sent in a specific space of time.

If you have operating problems with older SCSI devices, you should disable *Initiate Sync Negotiation*. You may have to change some settings on your SCSI devices (read your SCSI device documentation).

Even if the *Sync Negotiation* function is disabled, the SCSI controller switches automatically to fast synchronous mode if requested to do so by an SCSI device. However, it can also exchange data with slow SCSI devices.

Yes	The function is enabled (default setting).
No	The function is disabled.

Notice

Synchronous data transmission is required for fast and ultra SCSI operations.

Initiate Wide Negotiation

When *Initiate Wide Negotiation* is set, the SCSI controller uses fast 6-bit data transfer (wide SCSI) instead of the slower 8-bit data transfer.

Disable *Initiate Wide Negotiation* only if you are not using wide SCSI devices or if there are operating problems with 8-bit SCSI devices. You may have to change some settings on your SCSI devices (read your SCSI device documentation).

Fast SCSI devices, including the SCSI controller, can cope with data transmission rates to and from the SCSI bus of up to 40 Mbytes/s.

Yes The function is enabled (default setting).

No The function is disabled.

Maximum Sync Transfer Rate

Fast SCSI devices (Ultra Wide) including the SCSI controller, support a data transfer rate on the SCSI bus of up to 40 Mbytes/s with synchronous data transfer. If you select *Enabled* in the *Support for Ultra SCSI Speed* menu option, a transfer rate of 40 Mbytes/s is set automatically.

Enable Disconnection

This function allows SCSI devices to release the SCSI bus while a command is being carried out. A typical example for use of this function is a tape drive that does not need to access the SCSI bus while being rewound and can be disconnected from the SCSI bus during this process.

You can disable the function if you have only one SCSI device connected. In this case, disabling will improve performance.

Yes The function is enabled (default setting).

No The function is disabled.

Send Start Unit Command

If this function is enabled, SCSI devices supporting this function will not be started until you receive the Start Unit Command from the SCSI BIOS. In this way the SCSI devices can be switched on one after the other. This function is used if the power supply to your system is not sufficient to start a number of drives at the same time or in order to avoid peak turn-on currents.

You may have to change the settings on your SCSI devices so that this function is supported (read your SCSI device documentation).

Yes The function is enabled.

No The function is disabled.

Multiple LUN Support

You use this setting to decide whether an SCSI device with multiple LUNs (Logical Unit Numbers) can or cannot be used as a start drive.

Enabled The SCSI device is used as start drive.

Disabled The SCSI device is not used as start drive (default setting).

Include BIOS Scan

If this function is enabled, the SCSI device can be used as a boot drive. The SCSI device is contacted by the SCSI BIOS and receives a drive name. A message is displayed on the screen.

Yes The SCSI device can be a boot drive and is given a drive name (default setting).

No The SCSI device is not contacted by the SCSI BIOS.

Note

In the case of drives which you know will never be used as a boot drive (DAT drive, for example), you should set this function to No. This saves time when starting the system.

Advanced Configuration Options

Plug and Play SCAM Support

You can use this setting to specify whether or not the ID management at the SCSI bus is to be carried out automatically by the host controller. (SCSI Configured Automatically protocol (SCAM))

Disabled No automatic ID management (default setting).

Enabled The SCSI controller sends SCAM commands. Most devices without SCAM capabilities tolerate SCAM commands. If problems should arise, reset to Disabled.

Reset SCSI Bus at IC

If you have enabled this menu option, the SCSI bus is reset.

Enabled SCSI bus is reset (default setting).

Disabled SCSI bus is not reset.

Extended BIOS Translation for DOS Drives > 1Gbyte

When this function is enabled, you can operate drives of up to 8 Gbyte capacity (2 Gbytes per partition) under MS-DOS 5.0 or a later version. The SCSI BIOS must be enabled for this purpose.

Formerly, only drives with a capacity of up to 1 Gbyte could be operated under DOS 5.0.

Enabled	Drives of up to 8 Gbytes can be operated under MS-DOS 5.0 (default setting).
Disabled	Drives of up to 1 Gbyte can be operated under MS-DOS 5.0.

Caution

Save the data on your hard disk before you change the default setting. After switching on you must repartition and format the hard disk with the MS-DOS programs *FDISK* and *FORMAT*.

Host Adapter BIOS

If the SCSI devices can only be operated using additionally loaded drivers, you can disable the SCSI-BIOS. This saves 16 Kbytes of system memory and saves time starting the system.

Caution

If the SCSI BIOS is disabled, you cannot boot up from the SCSI devices connected to the SCSI bus.

If you disable the SCSI BIOS, you can still call *SCSI Setup* using the Ctrl + A keys when starting the system and make changes.

Enabled	The SCSI BIOS is activated (default setting).
Disabled	The SCSI-BIOS is deactivated.

Notice

Remember that you must install special SCSI drivers for your SCSI devices if you disable the SCSI BIOS.

Support Removable Disks under BIOS as Fixed Disks

If you enable this function, you can treat removable disk drives such as MO drives just like fixed disk drives without having to install additional software.

Boot Only Only the selected boot removable disk drive is treated like a fixed disk drive (default setting).

Alls Disks All removable disk drives supported by the BIOS are treated as fixed disk drives.

Disabled No removable disk drive is treated as a hard disk drive. You need special drivers for the removable disk drives as they are not supported by the BIOS.

Caution

When using this function you may not remove the disk from the removable disk drive while the server is on.

Display Ctrl + A Message During BIOS Initialization

This setting determines whether the message

```
Press <Ctrl> <A> for SCSISelect (TM) Utility!
```

appears when you power up the system.

Even if you disable display of this message, you can still call *SCSI Setup* using the Ctrl + A key combination when starting the system.

Enabled The message is displayed when powering up (default setting).

Disabled The message is not displayed when powering up.

BIOS Support for Bootable CD-ROM

This setting enables booting from a bootable CD-ROM

Enabled Booting from a CD-ROM is possible (default setting).

Disabled Booting from a CD-ROM is not possible.

BIOS Support for Int 13 Extensions

This setting determines whether the SCSI BIOS supports a hard disk drive with more than 1024 cylinders. *Enabled* is the default setting.

Enabled Hard disk drives with more than 1024 cylinders are supported (default setting).

Disabled Hard disk drives with more than 1024 cylinders are not supported.

SCSI Disk Utilities

If you call the menu item *SCSI Disk Utilities*, you obtain a list of all devices connected to the SCSI bus. You also get to select from two menus for hard disk drives: *Verify* and *Format Disk*.

Verify

You can use *Verify* to verify a selected hard disk drive. All defects thus identified are entered in the hard disk's existing error list.

Format Disk

You can use *Format Disk* to format a selected hard disk drive in low-level format. Hard disks are usually already formatted in low-level format. Use this menu item only if you want to delete the entire hard disk and create a new error list.

8.1.3 Connecting Other SCSI Devices

Notes

The cable supplied with the product has 3 UW SCSI connections.

The controller and the cable are terminated. If you want to connect up other devices, observe the general information in Section 8.1.

You can connect up another two SCSI devices internally. Possible expansions:

Number: Internal	Type	ID-Range 2)	Number: External	Type 1)	ID-Range 2)
1	UW	0-15	14	UW	0-15
2	UW	0-15	13	UW	0-15
3	UW	0-15	12	UW	0-15
1	UW	0-15	7	W	0-6
2	UW	0-15	7	W	0-6
3	UW	0-15	7	W	0-6

1) UW means 16-bit SCSI, W means 8-bit SCSI

2) ID 7 is intended for the SCSI controller

The customer is responsible for determining the extent to which the connection of external SCSI devices is compatible with the device. Devices with FCC, UL and CE labeling should be connected.

8.1.4 Terminating the AHA-2940 Ultra Wide

Termination on the AHA-2940Ultra Wide itself is controlled by software comands via the SCSISelect utility. The default setting is set to Automatic. When set to Automatic, if the AHA-2940Ultra Wide detects that SCSI cables are connected to any of its three SCSI connectors, it automatically sets the termination setting for the low and high bytes of the 16-bit Wide SCSI bus. The low byte controls 8-bit SCSI; the low and high bytes together control 16-bit Wide SCSI.

We recommended that you leave the AHA-2940Ultra Wide set to its default setting of Automatic. If you want to manually set the AHA-2940Ultra Wide termination setting, see the chapters and this description. The following table lists the termination configurations. Figures 8-1 and 8-2 show termination examples for the AHA-2940Ultra Wide.

Device Connected to AHA-2940Ultra Wide	Low	High
68-pin internal connector only	ON	ON
68-pin external connector only	ON	ON
68-pin internal and 68-pin external connectors	OFF	OFF
50-pin internal connector only	ON	ON
50-pin and 68-pin internal connectors	OFF	ON
50-pin internal and 68-pin external connectors	OFF	ON

Caution

Do not connect SCSI devices to all three connectors of an AHA-2940 Ultra Wide host adapter!

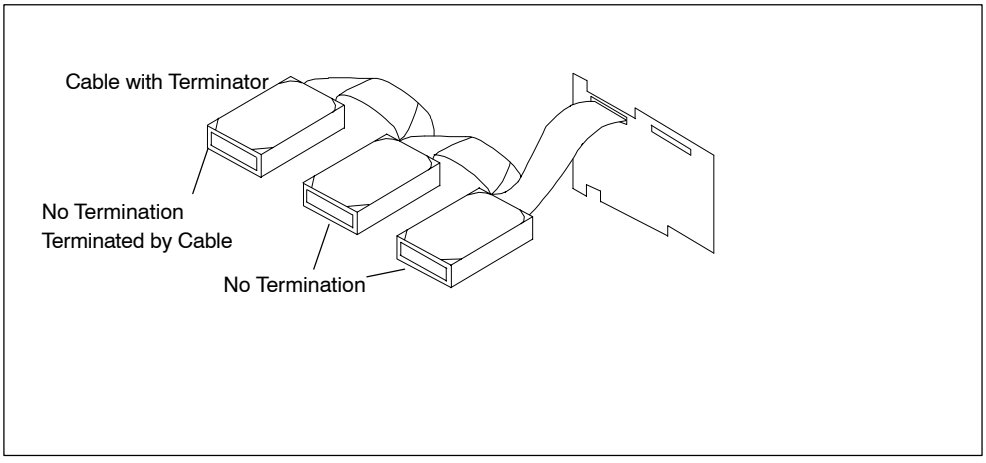


Figure 8-1 Internal Termination

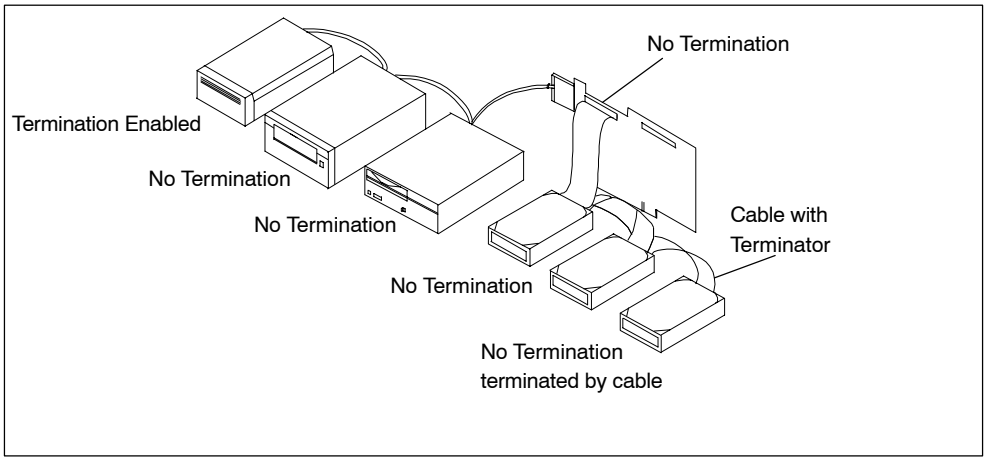


Figure 8-2 Internal and External Termination

8.1.5 Terminating SCSI Devices

Read the device's documentation to determine how to enable or disable termination on your particular SCSI device(s). On most internal SCSI devices the termination setting is controlled by a jumper or a switch. On other internal SCSI devices you must physically remove or install resistor module(s). On most external SCSI devices, a terminating plug (a resistor pack embedded in a small plug) is installed or removed to control termination (see Figure 8-3).

8.1.6 SCSI Cables

You should only use the integrated cable for internal extensions. Another two 16-bit SCSI devices may be connected up to this cable. The cable is terminated on the drive-side.

You should only use top quality 68-pin external SCSI cables for external extensions. The total external cable length may not exceed 2 meters.

8.1.7 Connecting External SCSI Devices

If you are connecting external SCSI devices to your host adapter, you must obtain an external SCSI cable for each external device you install.

1. Prepare each SCSI device for installation; configure the SCSI ID and attach a terminating plug into the last external device. For instructions, see the device's documentation.
2. Plug the connector at one end of the external SCSI cable into the host adapter's external SCSI connector.
3. Plug the connector at the other end of the cable to either one of the SCSI connectors on the external SCSI device.
4. To connect other external SCSI devices, daisy-chain each device to the previous device until all external SCSI devices have been connected (see Figure 8-3).

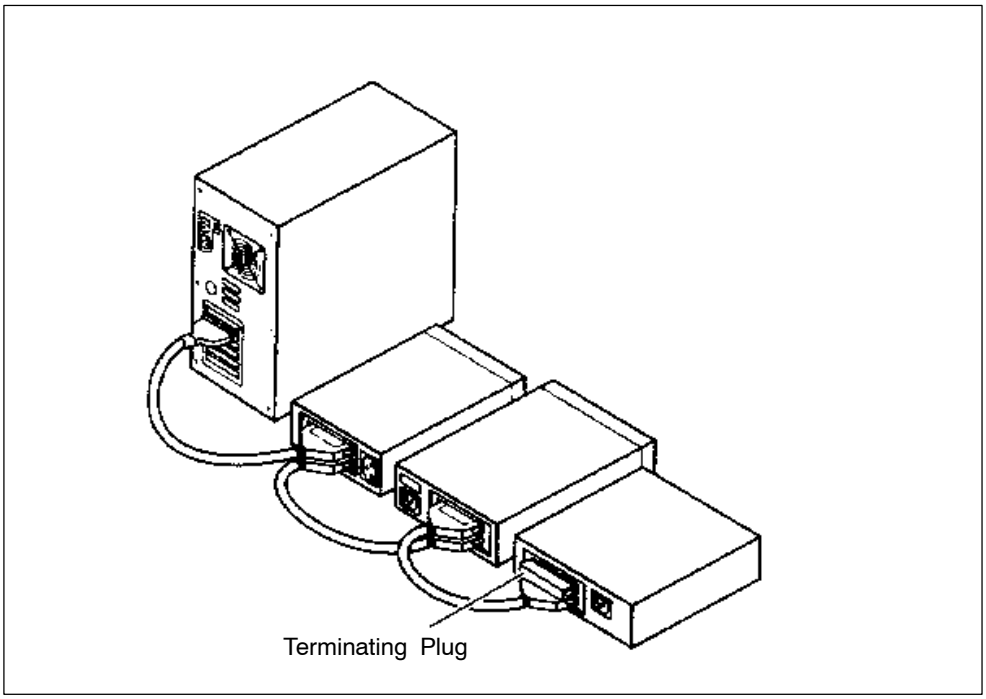


Figure 8-3 External Termination

8.1.8 Troubleshooting on the SCSI Controller

Most problems with the SCSI controller occur when new SCSI devices are connected up to the SCSI bus (termination problems, for example). If you are having problems with the SCSI controller or SCSI devices connected to it, check the following:

- Do all the SCSI devices have a power supply?
- Are the SCSI and power supply cables correctly plugged into the SCSI device?
- Is the SCSI cable correctly plugged into the SCSI connection of the controller?
- Does each SCSI device, including the SCSI controller, have its own SCSI ID?
- Are the SCSI devices and SCSI controller properly terminated?
- Is parity checking either enabled or disabled on all SCSI devices connected up to the SCSI bus?
- Was the device switched off and on again after any changes to the BIOS setup or SCSI setup or SCSI device settings?

SCSI BIOS Messages

When you switch on the SCSI-BIOS, the following messages may appear during system startup:

`Device connected, but not ready`

The SCSI device connected to the Ultra Wide SCSI controller is not reacting to commands from the SCSI controller. Switch *Send Start Unit Command* in *SCSI-Setup* for the relevant SCSI device to *Yes*. If the message continues to appear, read your SCSI device documentation to find out how to set the SCSI device.

`Start unit request failed`

The SCSI-BIOS was unable to pass on a power up command (Start Unit) to the SCSI device. Call SCSI Setup and send the *Send Start Unit* for the relevant SCSI device to *No*.

`Time-out failure during ...`

A time limit has been exceeded. Check the SCSI bus termination. Disconnect the SCSI cables from the Ultra Wide SCSI controller and restart the system. If the system starts successfully, check the SCSI cable. One of the SCSI devices may also be faulty. Check the SCSI devices.

Other Problems and Solutions

- If you are booting from a SCSI hard disk drive, make sure the Drives setting (in your computer's setup program) that corresponds to the drive is set to None or No Drives Installed, as is required for SCSI hard disk drives (for further information, refer to the documentation for your computer).

Notice

If both SCSI and non-SCSI (e.g. IDE) disk drives are installed, then the non-SCSI disk drive is always the boot device.

- If you changed any values on a host adapter, in a setup program, or on a SCSI device, did you turn the power OFF and ON to ensure that the new values are loaded?
- If you tried to use the format/verify utility on a disk device and got an Unexpected SCSI Command Failure pop-up bow with error information, the utility probably encountered a problem with the disk device or the media and therefore cannot run.

You can probably determine from the Sense Key information (e.g. 06h – Unit Attention) both the cause of the problem and its solution. Here are some of the more common Sense Key values and their meanings:

- 02h – Not ready – The media is not ready to format. Be sure that media is inserted in the drive and that the media is spun up.
- 03h – Medium error – The disk media may be defective. If it is a removable-media drive, try using a different disk media. If it is a fixed disk drive, the disk may be physically damaged. Verify and format the media with SCSI Select.
- 04h – Hardware error – The disk drive may be defective. Consult the hardware documentation and contact the manufacturer.
- 05h – Illegal request – The Adaptec formatting utility does not support a low-level format of this device; however, the device may already be low-level formated by the manufacturer. (This error rarely occurs).
- 06h – Unit attention – The removable media may be write-protected. Disable write protection and run the utility again.

8.2 Raid Controller

Type

A Promise FASTTRAK 100 TX2 RAID Controller built in for EIDE drives.

Structure

The system is configured as RAID 1 (data is distributed on two hard disks.). The hard disks are each operated on an EIDE bus as masters. This way the system can continue to operate in a bus in the event of cable problems and the rack attains a high degree of error tolerance.

The RAID Controller is built in slot number 5 of the module.

Operating Instructions

You will find instructions on how to operate the RAID system on the supplied manual on RAID Controller.

When using removable racks, faulty hard disks can be replaced during operation in the event of an error. The new disk is synchronized in the background. This can last a while (up to hours) depending on the size of the hard disks and the system performance.

The safe system state RAID 1 is reached again only after the successful completion of synchronization.

Reinstalling the Software

Please follow the instructions on the manual or the electronic manual supplied on the CD on RAID Controller.

Instructions on Windows NT

For Windows NT you have to select FASTTRAK 100 TX2/TX4 from the recommended lists.

When reinstalling Windows NT the ATAPI.SYS has to be activated, so that the CD-ROM / CDRW can be operated.

To do this, change the start type into restart via System setting > Devices > ATAPI. You have to restart your computer afterwards.

Instructions on Windows 2000

When reinstalling Windows 2000 you have to select FASTTRAK 100 TX2/TX4 from the recommended lists

Reinstallation of the Software

9

What Does This Chapter Contain?

This chapter describes how to reinstall software in case the preinstalled software should be faulty.

Chapter Overview

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9.1	Restoring the Hard Disk	9-2
9.2	Installation of the Windows Operating System	9-6
9.3	Installing Drivers and Software	9-11
9.4	Installing the Raid Controller Software	9-12
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9.1 Restoring the Hard Disk

9.1.1 Creating Partitions under Microsoft Windows Me

After installing a new hard disk it is necessary to create partitions with the program “FDisk” when the partitions have errors or need to be changed.

Caution

By deleting or creating partitions or logical DOS hard drives all saved data is lost on the hard disk. All drives on the hard disk will be erased.

The hard disk is delivered with the following installed (only for Windows Me variants):

- a partition of the PRI DOS type, FAT 32 system,
- a partition of the EXT DOS type, FAT 32 system.

To restore the partitions to their original condition, please proceed as follows:

Primary Partition

1. To boot from the Windows 98 CD proceed as follows: When the BIOS message
   `Press <F2> to enter Setup`
   appears on the screen press the ESC key. After initialization a boot menu to select the boot options is displayed.
2. Select “ATAPI CD ROM Drive”.
3. When “Microsoft Windows 98 Startup Menu” is displayed, select “2. Boot for FDISK, FORMAT or Windows Me Setup”.
4. Start the Microsoft Windows 98 hard disk configuration program using ”A:\>FDisk”.
   In the dialog box for large disk support select “[Y]” for Yes when prompted “Do you wish to enable large disk support (Y/N)...?” to create a FAT 32 partition.
5. Create a primary DOS partition with at least 4090 MB. When prompted “Do you want to use the maximum available memory for creating the primary DOS partition and do you want this partition to be activated?” select “[N]” for No for a FAT 32 partition and then enter the desired partition size, for example, 6100 MB.

Creating an Extended Partition

In order to create an extended partition, you have to first boot from the Windows Me Recovery CD as described in steps 1 to 4 above.

Using ”A:\>FDisk” start the Microsoft Windows Me hard disk configuration program.

In the dialog box for large disk support select “[Y]” for Yes when prompted “Do you wish to enable large disk support (Y/N)...?”.

Create an extended DOS partition for the rest of the disk space, assign a logical drive and format it.

9.1.2 Creating Partitions under Windows 2000

After installing a new hard disk it is necessary to create partitions when the partitions have errors or need to be changed.

Caution

By deleting or creating partitions or logical DOS hard drives all saved data is lost on the hard disk. All drives on the hard disk will be erased.

The hard disk is delivered with the following installed:

- a partition with the FAT32 file system ,
- a partition with NTFS file system.

To restore the partition to its delivery state, proceed as follows:

Primary Partition, FAT32 File System

1. Boot from the Recovery CD and press ESC when the BIOS message
   `Press <F2> to enter Setup`
   appears. After initialization, select the boot options in the boot menu.
2. Select ”ATAPI CD-ROM Drive”.
3. Select ”2. Boot for FDISK, FORMAT or Windows 98 Setup” in the ”Microsoft Windows Startup Menu” screen form.
4. Start the Microsoft Windows hard disk configuration program with ”A:\>FDisk”. In the screen form select “Do you wish to enable large disk support (Y/N)...? [Y]” for Yes to support data media with large memory capacity.
5. Create a primary DOS partition with 4090 MB. Enter [N] for “No” for the question ”Do you want to use the maximum memory size available for the primary DOS partition and do you want to activate this partition?” and set the partition size to 6100 MB.

6. To format the partition from the Recovery CD, as described above in steps 1 to 3, reboot and then format drive C: with the “Format” program. Enter:
”A:\>Format C:”
(A: is the CD-ROM drive).

Creating an Extended FAT 32 Partition

In order to create an extended partition you have to boot from the Recovery CD as described above in steps 1 to 4.

Create an extended DOS partition for the rest of the disk space.

In the Windows 2000 setup or under Windows 2000 the FAT 32 file system can be converted to an NTFS file system with the “Format” function.

9.1.3 Creating Partitions under Windows NT

After installing a new hard disk it is necessary to create partitions when they partitions have errors or need to be changed.

Caution

By deleting or creating partitions or logical DOS hard drives all saved data is lost on the hard disk. All drives on the hard disk will be erased.

The hard disk is delivered with the following installed (only for versions delivered with Windows NT):

- a partition of with the FAT16 file system with 2045 Mbytes,
- a partition of with the NTFS file system.

To restore the partitions to their original condition, please do the following:

Primary Partition

1. To boot from the Recovery CD proceed as follows: When the message
   `Press <F2> to enter Setup`
   appears on the screen press the ESC key. After initialization a boot menu to select the boot options is displayed.
2. Select “ATAPI CD-ROM Drive”.
3. When “Microsoft Windows 98 Startup Menu” is displayed, select “2. Boot for FDISK, FORMAT or Windows NT Setup”.
4. Start the Microsoft Windows 98 hard disk configuration program with ”A:\>FDisk” (A is the CD-ROM drive).
   Select the dialog box for enable large disk support for installing a FAT16 partition “activate support (Y/N)...? [N] ” for No.
5. Create a primary DOS-Partition of 2045 MB for a FAT 16 file system. Answer the question “Do you wish to use the maximum available size...” for a 2045 MB FAT16 partition with [Y] for Yes.
6. In order to continue with the next step “Create a Save to Disk Partition” the primary partition needs to be formatted.
   Use the Recovery CD to boot as described in steps 1 to 3 above and then format drive C: with the program “Format”.
   Type: ”A:\>Format C:”.

The creation of NTFS partitions is done under the Windows NT setup program. Starting the Windows NT setup is described in Section 9.2.1.

9.2 Installing the Windows Operating System

Dependent on the device model, different operating system CDs are shipped:

Microsoft Windows NT or Recovery Microsoft Windows NT,
Recovery Microsoft Windows Me,
Recovery Microsoft Windows 2000.

9.2.1 Installing the Recovery CD for Microsoft Windows NT

This CD contains encoded data which can only be transferred to a SIEMENS SIMATIC PC.

Data transfer is carried out with the OEMSETUP.EXE program on the CD ROM or, after booting, from the CD-ROM with the recovery function.

After transferring the required data to the hard disk, the operating system can be installed using the Windows NT setup program.

Windows NT Installation Sequence

If a Windows operating system is already installed or if the PC has been started with a user created bootdisk, data transfer takes place using the OEMSETUP.EXE program. To do this, start the OEMSETUP.EXE program in the root directory of the Recovery CD and continue the sequence as of point 5.

If there is no operating system installed, proceed as follows:

1. Insert the Recovery CD in the CD ROM drive and reboot the system.
2. To boot from the CD proceed as follows: When the message
   `Press <F2> to enter Setup`

   appears on the screen press the ESC key. After intialization a boot menu to select the boot options is displayed.
3. Select ”ATAPI CD ROM Drive”.
4. When “Microsoft Windows 98-Startup Menu” is displayed, select
   “1. Boot for CD-Recovery”.
   If the hard disk has not been installed, first select “2. Boot for FDISK, FORMAT or Windows Setup” (Section 9.1).
5. You have to acknowledge the “SIEMENS End User License Agreement” with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screen you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder “I386” is necessary for the Windows NT installation or setup.

7. Select the drive for data transfer. The selected drive is not the installation drive for Windows. For the Windows setup, you need an available disk space of approximately 300 MB on the installation drive for Windows.

Note

By default, drive C: is used for the data transfer (Recovery).

Ensure that there is an available disk space of approximately 300 MB left on drive C: after the selected recovery data have been copied.

8. Confirm the end massage box.
9. Start the Windows setup program
   LW:\I386\Winnt.exe /b
   LW is the drive where the recovery data have been copied.

You can find the information on installation of Windows NT on the Recovery CD in the folder SUPPORT\BOOKS\.

Note

If you want to become an expert user of Microsoft Windows NT Workstation, see the “Windows NT Workstation Resource Kit” Version 4.0 (is not included in the package). It contains specific information for administrators who are responsible for installing, managing, and integrating Windows NT Workstation in a network or multiuser environment.

9.2.2 Installing the Microsoft Windows Me Operating System

These steps should only be carried out when updating from Windows 2000 to Windows Me or when reinstalling Windows Me.

With the help of the Recovery CD you can reinstall or restore the operating system.

This CD contains encoded data which can only be transferred to a SIEMENS SIMATIC PC.

Data transfer is carried out using the OEMSETUP.EXE program on the CD ROM or using the recovery function after booting the CD ROM.

The operating system can be installed using the Windows Me setup program after the necessary data has been transferred to the hard disk. To start the Windows Me setup enter:
LW:\>WIN9x\SETUP.EXE
(LW: Drive to which the WIN9x folder has been transferred).

9.2.3 Installing the Recovery CD for Microsoft Windows Me

If a Windows operating system is already installed or if the Rack PC has been started from a boot diskette, data transfer is carried out using the OEMSETUP.EXE program. To do this, start the OEMSETUP.EXE program in the root directory of the Recovery CD and continue the sequence as of point 5.

If no operating system is installed, proceed as follows:

1. Insert the “Recovery Microsoft Windows Me” CD in the CD ROM drive and connect the Rack PC to the mains.
2. To boot from the Recovery CD proceed as follows: When the BIOS message `Press <F2> to enter Setup` appears on the screen press the ESC key. After initialization a boot menu to select the boot options is displayed.
3. Select “ATAPI CD ROM Drive” .
4. When “Microsoft Windows 98 Startup Menu” is displayed, select “1. Booten for CD-Recovery” .
   If the hard disk has not been installed, first select “2. Boot for FDISK, FORMAT or Windows-Setup (Section 9.1).
5. You have to acknowledge the “SIEMENS End User License Agreement” with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screen you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder “WIN9x” is necessary for the Windows Me installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for Windows, but the drive on which the required installation files and expansions are stored. For the Windows setup following transfer, you require an available disk space of approximately 250 MB. As a standard, Windows Me is installed in drive C:. Therefore, when selecting the drive make sure that there will be sufficient disk space available on drive C: after data transfer.

Note

By default, drive C is used for the data transfer (Recovery).

Ensure that there is an available disk space of approximately 250 MB left on drive C: after the selected recovery data have been transferred.

8. After data transfer and end message acknowledgement Windows Me setup can be started directly using the LW:\WIN9x\SETUP.EXE program. (LW: Drive to which the WIN9x folder has been transferred).
9. After having started setup.exe please follow the screen instructions.

9.2.4 Installing the Recovery CD for Microsoft Windows 2000

This CD contains encoded files which can only be transferred to a SIEMENS SIMATIC PC.

Data transfer is made with the OEMSETUP.EXE program on the CD ROM, or after booting from the CD ROM with the recovery function.

After transferring the required data to the hard disk, the operating system can be installed using the Windows 2000 setup program.

Windows 2000 Installation Sequence

If a Windows operating system is already installed or if the PC has been started with a user created bootdisk, data transfer takes place using the OEMSETUP.EXE program. To do this, start the OEMSETUP.EXE program on the Recovery CD and continue the sequence as of point 5.

If there is no operating system installed, then please do the following:

1. Insert the Recovery CD in the CD-ROM drive and reboot the system.
2. To boot from the CD proceed as follows: When the BIOS message
   `Press <F2> to enter Setup`
   appears on the screen press the ESC key. After intialization a boot menu to select the boot options is displayed.
3. Select ”ATAPI CD ROM Drive”.
4. When “Microsoft Windows 98-Startup Menu” is displayed, select “1. Boot for CD-Recovery”.
   If the hard disk has not been installed, first select “2. Boot for FDISK, FORMAT or Windows-Setup (Section 9.1).
5. You have to acknowledge the “SIEMENS End User License Agreement” with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screen you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder “I386” is necessary for the Windows 2000 installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for Windows. For the Windows setup, you need an available disk space of approximately 500 MB on the installation drive for Windows.

Note

By default, drive C: is used for the data transfer (Recovery).

Ensure that there is an available disk space of approximately 500 MB left on drive C: after the selected recovery data have been copied.

---

8. Confirm the end message box.

9. Start the Windows setup program
   LW:\I386\Winnt.exe
   LW is the drive where the recovery data have been copied.
10. Now follow the screen instructions.

Setting the Language Selection for Windows 2000

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

In order to install the MUI, run the program MUISETUP.EXE in the CD_DRIVE:\MUI folder on the Recovery CD and follow the screen dialog to install the desired languages.

The desired language for Windows 2000 menus and dialogs, as well as the keyboard layout can be set via the control panel with the dialog **Start > Settings > Control Panel > Regional Options >** tab **"General" >** box **"Menus and dialogs"** and in the tab **"Inputs"**, box **"Keyboard layout"** .

In addition to the language for menus and dialogs, you can also set via **Regional Options** the standard for the region with **Set Default**.

Your device is set to English menus and dialogs and a US keyboard when delivered. You can set another language and keyboard via the control panel with the dialog **Start >Settings > Control Panel > Regional Options >** tab **"General**", box **"Menus and dialogs">** tab **"Input locales",** box **"Input language"**.

9.3 Installing Drivers and Software

To install the drivers and software from the “Documentation and Drivers” CD supplied, proceed as follows:

- Place the “Documentation and Drivers” CD in the CD ROM drive.
- Start the Start programm on the CD.The Acrobat Reader will be installed if necessary.
- Navigate to the driver list (language, operating system and device dependent).
- Please install the corresponding driver according to driver list.

Note

When reinstalling Windows 2000, make sure to install the chip set driver prior to the other drivers.

When reinstalling Windows NT, the Windows NT ServicePack has to be installed prior to all the other drivers. The ServicePack has to be reinstalled after a driver installation.

9.4 Installing the Raid Controller Software

Reinstalling the Software

Please follow the instructions on the manual or the electronic manual supplied on the CD on RAID Controller.

Instructions on Windows NT

For Windows NT you have to select FASTTRAK 100 TX2/TX4 from the recommended lists.

When reinstalling Windows NT the ATAPI.SYS has to be activated, so that the CD-ROM / CDRW can be operated.

To do this, change the start type into restart via System setting > Devices > ATAPI. You have to restart your computer afterwards.

Instructions on Windows 2000
When reinstalling Windows 2000 you have to select FASTTRAK 100 TX2/TX4 from the recommended lists.

9.5 Installating the Burner Software

You will find instructions on installing and operating the burner software on the supplied CD ROM for the burner software.

Guidelines for Handling Electrostatic Sensitive Devices (ESD)

A

Chapter Overview

Section	Description	Page
A.1	What Does ESD Mean?	A-2
A.2	Electrostatic Charging	A-3
A.3	Basic Protective Measures against Discharge of Static Electricity	A-4

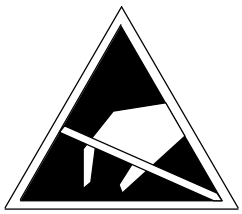
A.1 What Does ESD Mean?

Definition

All electronic components are equipped with high-integrated modules or components. Conditioned by their technology, these electronic components are extremely sensitive to overvoltages and therefore to discharges of static electricity.

The short term **ESD** has been adopted for these **E**lectrostatic **S**ensitive **D**evices/ modules.

Electrostatic sensitive modules are identified by the following symbol:





Caution

Electrostatic sensitive devices can be destroyed by voltages which are far below the limit of perception of human beings. These voltages occur when you touch a component or the electrical connections of a module without being electrostatically discharged. The damage which arises in a module as a result of overvoltage cannot usually be detected immediately, but only becomes apparent after a lengthy operating period.

A.2 Electrostatic Charging

Charging

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

The maximum electrostatic voltage values which an operator can be charged with when contacting the materials stated in the illustration are shown in Fig. A-1. These values correspond to the specifications of IEC 801-2.

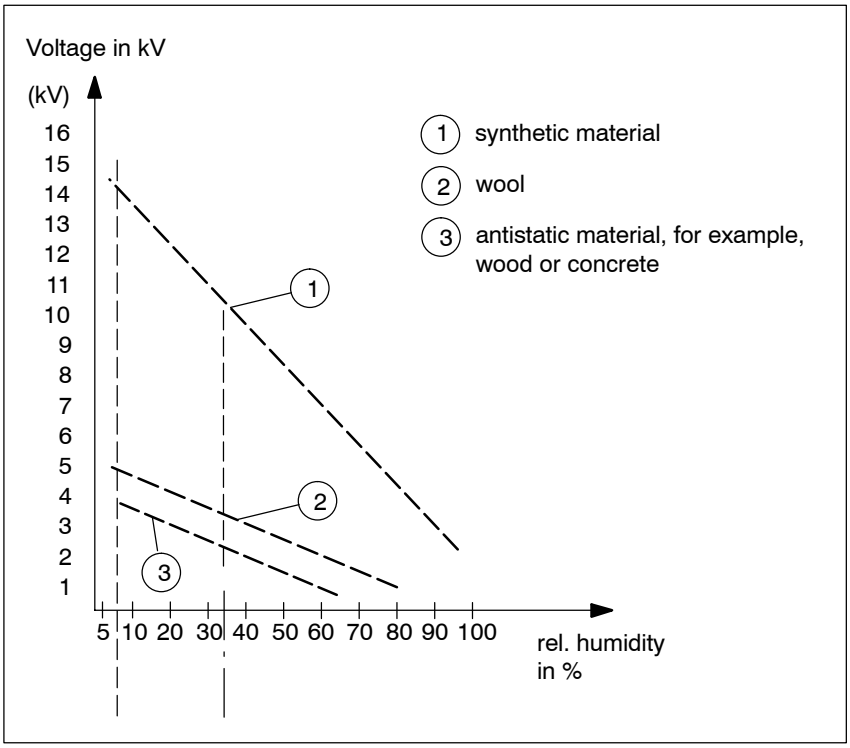


Figure A-1 Electrostatic Voltages which an Operator Can Be Charged with

A.3 Basic Protective Measures against Discharge of Static Electricity

Ensuring a Good Ground Connection

When handling electrostatic sensitive devices, ensure that your person, the workplace and packaging are grounded. In this manner you avoid static charge.

Avoid Direct Contact

As a general principle, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). To prevent discharge energy from reaching and damaging sensitive components, hold the components in such a way that you do not touch the pins or the printed conductors.

If you have to perform measurements on an assembly, discharge your body by touching a grounded metallic object before carrying out the work. Use only grounded measuring instruments.

Technical Specifications

B

General	
Order nos.	See order documentation
Dimensions (w x h x d)	430.4x177.4x44.4 (w x h x d in mm) For more details refer to chapter 3.2
Weight	min. 16 kg, max. 23 kg
Supply voltage (U_N)	120 V AC to 240 V AC (85 ... 264 V AC) alternative: 24 V DC 20,4 ... 28,8 V DC)
Line voltage frequency	50 - 60 Hz
Brief voltage interruption acc. to Namur (AC)	min. 20 ms at 0.85 U_N (max. 10 times per hour; min. recovery time 1 s)
max. power consumption	265 W
max. current output (AC)	+5V/30A ***** +3,3V/20A ***** ***** in total 160W +12V/7A –12V/0.5A –5V/0.5A +5Vaux/1.5A in total max. 180W
max. current output (DC)	+5V/ 30A ***** +3,3V/20A ***** ***** in total 160W +12V/8A –12V/0.5A –5V/0.5A +5Vaux /1A in total max. 180W
Noise emission	< 55 dB(A) to DIN 45635
Enclosure	IP 41 front, IP 20 at the rear
Safety	
Protection class	Protection class I acc. to IEC 60536
Safety specifications	IEC 60950 acc. to DIN VDE 0805
Electromagnetic Compatibility (EMC)	
Emitted interference (AC)	EN 55022 Class A, EN 61000-3-2 class D and EN 61000-3-3
Emitted interference (DC)	EN 55022 Class A
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV (to IEC 61000-4-4; Burst) ± 1 kV (to IEC 61000-4-5; Surge symm) ± 2 kV (to IEC 61000-4-5; Surge unsymm)
Noise immunity on signal lines	± 1 kV (IEC 61000-4-4; Burst; length < 3m) ± 2 kV (IEC 61000-4-4; Burst; length > 3m) ± 2 kV (to IEC 61000-4-5:1995; Surge unsymm; length > 20 m)
Noise immunity to discharges of static electricity	± 6 kV contact discharge (to IEC 61000-4-2) ± 8 kV air discharge (to IEC 61000-4-2)
Immunity to RF interference	10 V/m 80-1000 MHz, 80% AM (to IEC 61000-4-3) 10 V/m 900 MHz and 1.89 GHz, 50% ED (to IEC 61000-4-3) 10 V 9KHz- 80MHz (to IEC 61000-4-6)
Magnetic field	30 A/m 50Hz (to IEC 61000-4-8)

Ambient Conditions	
Temperature	tested to DIN EN 60068-2-2:1994, DIN IEC 60068-2-1,DIN IEC 60068-2-14,
– operation	+ 5°C to +50°C (see chapter C Retrofit Notes)
– storage/transport	- 20°C to +60°C
– gradient	(Max. speed of temperature change 10° C/h (50° F/h) condensation not permitted)
Relative humidity	tested to DIN IEC 60068-2-3, DIN IEC 60068-2-30,DIN IEC 60068-2-56
– operation	5% to 80% at 25°C (no condensation)
– storage/transport	5% to 95% at 25°C (no condensation)
– gradient	(Max. speed of temperature change 10° C/h (50° F/h) condensation not permitted)
Mechanical Specifications	
Vibration	tested to DIN IEC 60068-2-6
– operation *1 , *3	10 to 58 Hz: 0.0375 mm, 58 to 500 Hz: 5 m/s^2
– storage/transport	5 to 9 Hz: 3.5 mm, 9 to 500 Hz: 9.8 m/s^2
Shock	tested to DIN IEC 60068-2-29
– operation *2, *3	50 m/s^2, 30 ms,
– storage/transport	250 m/s^2, 6 ms
Special Features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Intel Pentium III / Celeron (type: FCPGA 370), (see order documentation)
Internal processor cache	2x 16KB first level, 128/256 KB second level, dependent on the processor used
Main memory	3 slots maximum 512 MB SDRAM, memory configuration (see order documentation)
2nd Level Cache	Processor internal
Free expansion slots	7 PCI (max 265 mm long) 5 ISA a maximum of 10 modules simultaneously
– max. permissible current input per ISA slot	5 V 2 A, 12 V 0.3 A, -12 V 0.05 A
– max. permissible current input per PCI slot	5 V 2 A or 3.3 V 2 A, 12 V 0.3 A, -12 V 0.05 A
– in total (all slots)	90 W total power consumption may not be exceeded
Drives	
Floppy disk drive	3.5” (1.44 MB)
Hard disk drive	3.5” EIDE, UDMA33/66/100, SCSI, UW (see order documentation for equipment)
CD-ROM, CR-RW	5,25” EIDE, UDMA33 (see order documentation for equipment)
Graphics	
Graphics controller	SXGA LCD controller on the AGP bus ATI Rage Mobility 128
Graphics memory	8 MB SDRAM
Resolutions/frequencies/colors	CRT: up to 1280x1024/16.7 mill. colors/85 Hz LCD: up to 1024x768x18 bits
Internal connection for LCD	LVDS single chip; single channel

Ports	
COM1 *4	Serial port 1 (V.24 / TTY), 25 pin subminiature Cannon connector
COM2	Serial port 2 (V.24), 9 pin subminiature Cannon connector
LPT1	Parallel port (standard, EPP and ECP mode) Connection for printer with parallel port
VGA	Connection for external monitor
Keyboard	PS/2 keyboard connection
Mouse	PS/2 mouse connection
USB	3 channels (2x internal, 1x external)
MPI/DP12 port, potentially isolated *5	9 pin subminiature Cannon socket
• Transfer rate	• 9.6 Kbps to 12 Mbps, configurable by SW
• Operating mode	• potentially isolated*: - data lines A,B - control lines RTS AS, RTS_PG - 5V supply voltage (max. 90 mA) • connected to ground: - shield of the DP12 connecting line
• Physical port	• RS485, potentially isolated*
• Memory address area	• to be configured automatically
• Interrupts	• to be configured automatically
Ethernet	Ethernet port (RJ45), Controller Intel 82562
Function Indicators (LEDs)	
SIMATIC Rack PC 840	FAN TEMP WATCHDOG ETHERNET PROFIBUS/MPI HARDDISK POWER FD access CD ROM access

***** Optically isolated within the safety extra-low voltage circuit (SELV)

***1** Restrictions for drives in the front drive holder:
When operating with stands the following values must not be exceeded: 0,019 mm from 10 to 58Hz and 3 m/s2 from 58 to 500 Hz.
When fitting the device using telescopic rails, make sure that the device is free from mechanical disturbances.

***2** Restrictions for drives in the front drive holder:
When operating with stands 30m/s2 must not be exceeded.
When fitting the device using telescopic rails, make sure that the device is free from mechanical disturbances. When using a CD-RW drive, the device should generally be free of mechanical disturbances while burning.

***3** When using a CD-RW drive, the device should generally be free of mechanical disturbances while burning.

***4** The line current (TTY) is an optional product feature

***5** Optional product feature

Retrofit Notes

C

What Does This Chapter Contain?

This chapter describes the permissible variants of equipment for Rack PC 840 including drives and processors and the resulting permissible operating conditions.

Permissible Variants of Equipment for the Temperature Range of 5 to 35°C

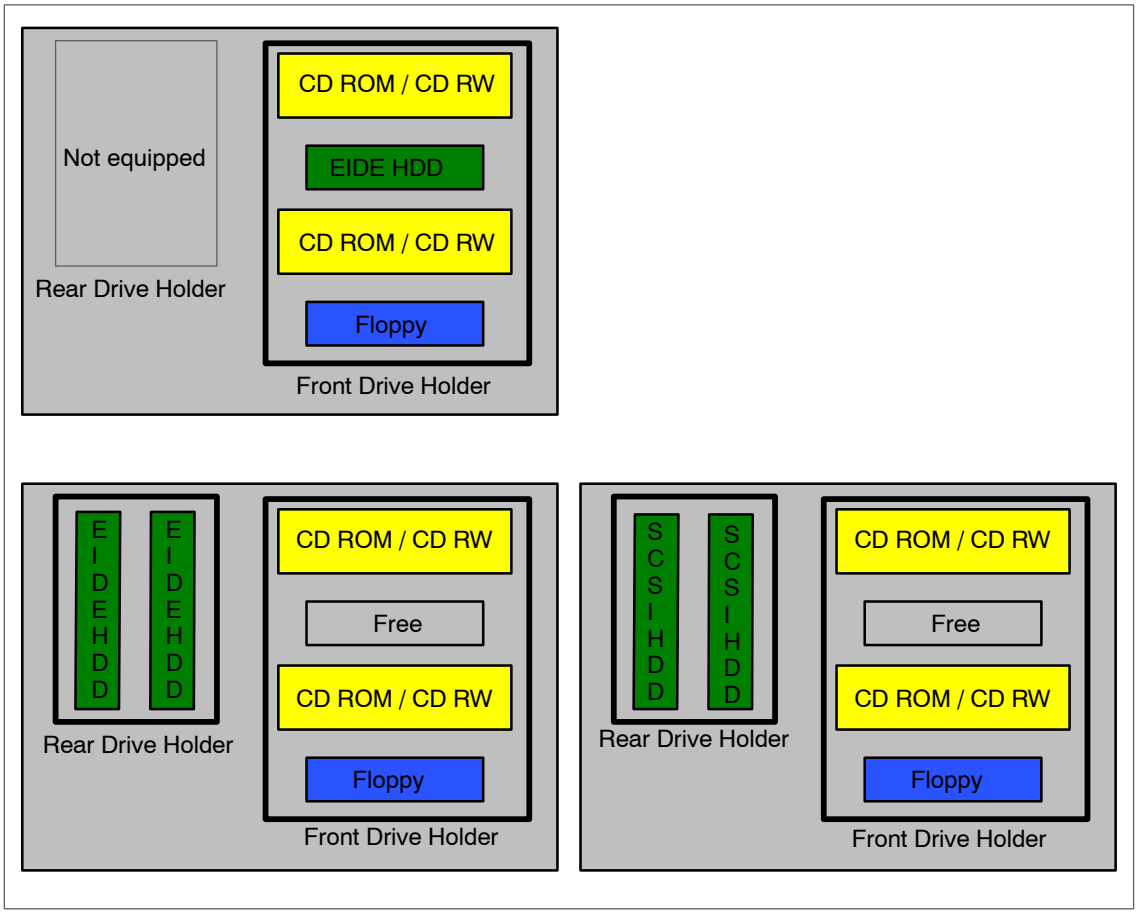


Figure C-1 Permissible Variants of Equipment for the Temperature Range of 5 to 35°C

Celeron and PIII processors up to 1.26 Ghz can be used. The maximum permissible power loss of expansion modules is 80W.

The EIDE drives in front of the drive holder can either be mounted permanently or in a removeable rack.

Devices equipped with removable racks are not to be exposed to shock in accordance with DIN IEC 600068-2-29.

Permissible Variants of Equipment for the Temperature Range of 5 to 40°C

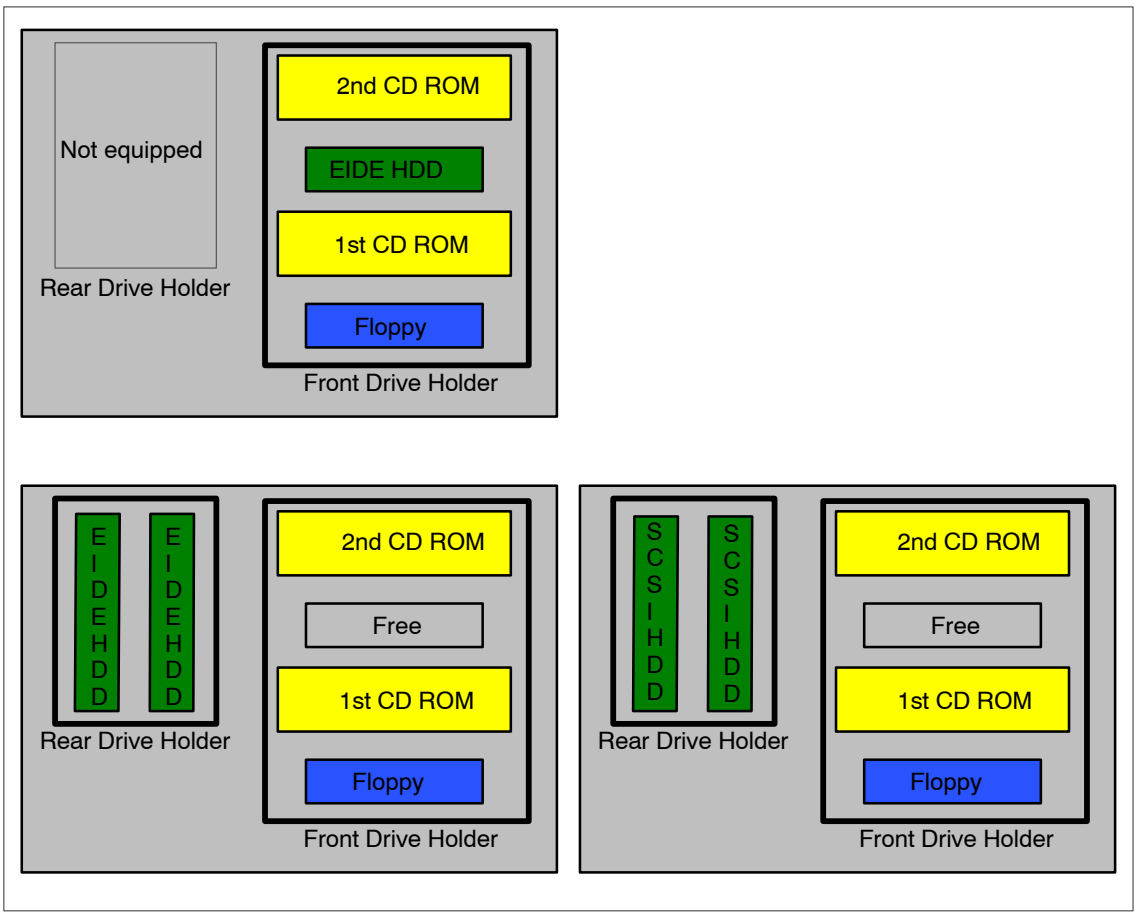


Figure C-2 Permissible Variants of Equipment for the Temperature Range of 5 to 40°C

Celeron and PIII processors up to 1.26 Ghz can be used. The maximum permissible power loss of expansion modules is 80W.

The EIDE drives in front of the drive holder can either be mounted permanently or in a removeable rack.

Devices equipped with removable racks are not to be exposed to shock in accordance with DIN IEC 600068-2-29.

Permissible Variants of Equipment for the Temperature Range of 5 to 45°C

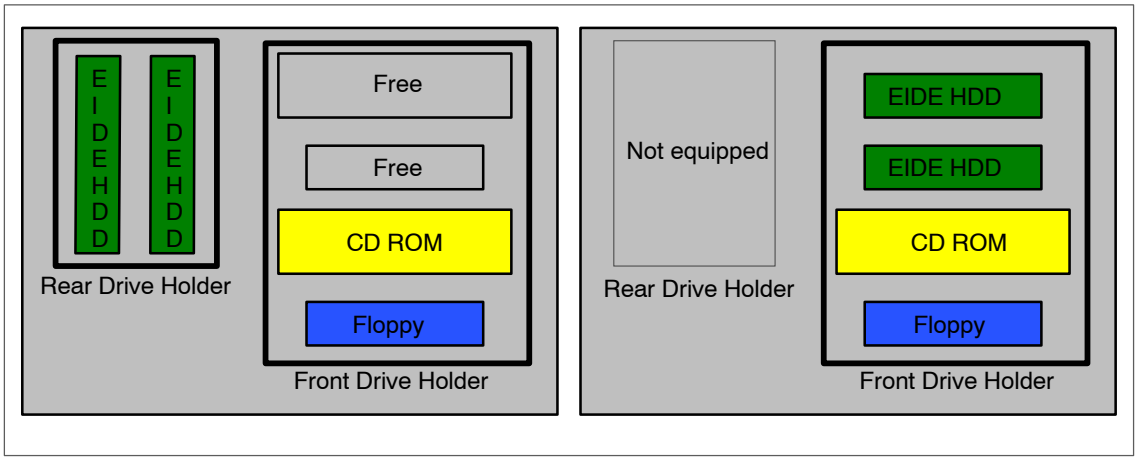


Figure C-3 Permissible Variants of Equipment for the Temperature Range of 5 to 45°C

Celeron and PIII processors up to 1.26 Ghz can be used. When using PIII processors with 1.13 Ghz 4 instead of 7 long PCI slots are available. The maximum permissible power loss of expansion modules is 80W.

The EIDE drives in front of the drive holder can either be mounted permanently or in a removeable rack.

Devices equipped with removable racks are not to be exposed to shock in accordance with DIN IEC 600068-2-29.

Permissible Variants of Equipment for the Temperature Range of 5 to 50°C

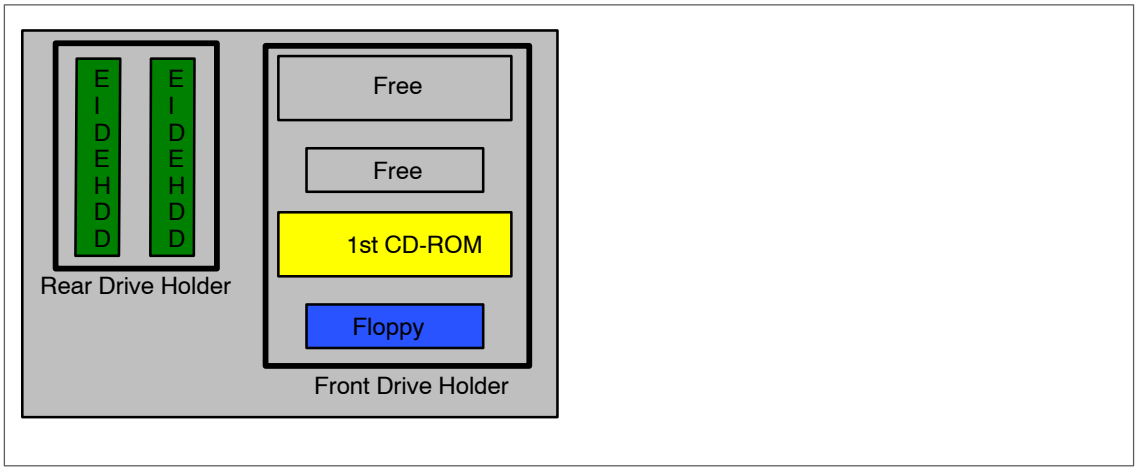


Figure C-4 Permissible Variants of Equipment for the Temperature Range of 5 to 50°C

Celeron processors with 566 Mhz can be used. The maximum permissible power loss of expansion modules is 30W. CD RW and CD ROM can be installed and can be operated within the temperature limits as described previously.

Glossary

What Does this Chapter Contain?

This chapter contains a glossary in which you will find a list of the terminology used in conjunction with the SIMATIC range of personal computers and programming devices and a brief explanation of each of the terms.

A

AC

Alternating **C**urrent. Current that changes its direction at regular intervals.

Access Protection

Access to the programs and data of a programming device can be protected by passwords. The user password or Superuser password can be assigned in the BIOS Setup.

ACPI

Advanced **C**onfiguration and **P**ower **I**nterface enables the operating system to supervise the power supply of each device connected to the computer. See also: Power Management.

APM

Advanced **P**ower **M**anagement monitors and conserves power on a PC-based system, particularly a battery-powered laptop computer, by enabling programs to communicate their power requirements so that the system can route power away from unused hardware components.

Application

An application is a program which builds directly on, for example, the MS-DOS/Windows operating system. Applications on your programming device are, for example, the STEP 5 Basic package, STEP 7, etc.

ASCII-Editor

With an ASCII editor you can edit text files which are stored in ASCII code.

ATA

Advanced **T**echnology **A**ttachment is the official name for the disk drive interface standard commonly known as Integrated Drive Electronics (IDE). See also: IDE.

AuthorsW

The authorization can be saved on the aithorization diskette again by the menu command **Start > Simatic > AuthorsW**.

Authorization Diskette

The authorization disk contains the authorization required by the re-installation of a software.

B

Backup

Duplicate of a program, storage medium or database. Created to backup or to protect irreplaceable data of working copies as a precaution against corruption or destruction. Some applications automatically create backup copies, while managing both the current version as well as the previous version that is stored on the hard disk drive.

Base Memory

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

Battery

In personal computers, batteries are used as an auxiliary source of power when the main power is shut off, as a power source for laptop and notebook computers (rechargeable batteries, such as nickel cadmium, nickel metal hydride, and lithium ion, are used), and as a method to keep the internal clock and the circuitry responsible for the part of RAM that stores important system information always powered up. Strictly speaking, only batteries that are not rechargeable are classified as batteries.

BIOS

Acronym for **B**asic **I**nput/**O**utput **S**ystem. On PC-compatible computers, the set of essential software routines that tests hardware at startup, starts the operating system, and supports the transfer of data among hardware devices.

Boot Diskette

Boot disk that contains a boot sector and an initial loader for the operating system.

Boot

Start or restart of the PG. During the boot sequence the operating system is transferred from the system drive into the main memory.

Booting

Loading operation which transfers the operating system to the main memory.

Bps

The speed (in bits per second) with which information is transmitted over a data link.

C

Cache

The cache memory buffers often used data to increase the speed of access. The computer has two cache levels.

Cardbus interface

This interface is compatible with 32-bit Cardbus Cards with PCI performance compliant with the PC Card standard.

CD ROM

Compact **D**isc **R**ead **O**nly **M**emory. Removable memory for large amounts of data.

Click

Pressing and immediately releasing the left mouse button; selects objects or triggers commands.

Cold Boot

A startup process that begins with turning on the computer's power. Typically, a cold boot involves some basic hardware checking by the system, after which the operating system is loaded from disk into memory.

COM1 Port

Serial V.24/modem-PLC interface. This interface is suitable for asynchronous data transmission. It can also be used to connect printers with a serial interface.

COM2 Port

Serial RS-232 interface which can be used to connect a mouse or a printer.

Configuration Files

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

Configuration Software

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

Controller

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

Cursor

Collective term for mouse pointer and text cursor.

Cursor Control

Keypad on the keyboard for controlling the cursor.

D

DC

Direct **C**urrent. Unidirectional electrical current.

DIMM

Dual **I**nline **M**emory **M**odule. Memory RAM chips that are installed on the PCB, similar to the more common SIMM (Single Inline Memory Module) chips. The DIMM with its 64-bit data bus architecture has connections on both sides which are connected to different circuits for processing different instructions. SIMMs, however, have a 32-bit data bus architecture where all lines are connected to the same circuit for processing the same instructions. DIMMs can be installed in the computer as single chip, SIMMs, on the contrary, only in pairs.

Device Configuration

The configuration of a programming device contains information on hardware and device options, such as memory configuration, drive types, monitor, network address, etc. The data are stored in a configuration file and enable the operating system to load the correct device drivers and configure the correct device parameters.

If changes are made to the hardware configuration, the user can change entries in the configuration file using the SETUP program.

Disk Drive

The disk drive (floppy disk drive) is used to store programs and data on diskette (write access) or to load from diskette to the computer (read access).

Diskette

The diskette (floppy disk) is an external data access memory on which all types of files and programs can be stored. The storage medium is a round magnetic disk in a plastic cover to protect it from getting scratched.

Display

Flat screen monitor of the PG.

Dormancy

An energy saving power management mode that shuts down the monitor and hard disk after all data found in the work memory have been saved to the hard disk (Save to Disk). The PG will then be shut down.

Double-Click

Pressing and releasing the left mouse button very quickly twice in succession without moving the mouse. This action is normally to open an object or program.

Drives

Devices for operating rotary disk media (diskettes, hard disk, CDs).

Drivers

These are programs which are part of the operating system. They adapt user program data to the specific formats required by I/O devices such as hard disk, printers, and monitors.

Drop-Down Menu

In graphics-supported programs, a menu line is positioned on the top edge of the screen. The menu titles contained in this line can be set either as drop-down or pull-down menus. Drop-down menus “roll” down as soon as the mouse pointer passes over a menu title. Pull-down menus only “roll” down when the menu title is clicked on. Different functions can then be called from these menus by moving the mouse and clicking on an item in a menu.

DVD

Digital **V**ideo **D**isc. A digital video disc can store greater amounts of data than a traditional CD. A standard single-layer, single-sided digital video disc can store 4.7 GB of data; a two-layer standard increases the single-sided disc capacity to 8.5 GB. Digital video discs can be double-sided with a maximum storage of 17 GB per disc. A digital video disc player is needed to read digital video discs; this player is equipped to read older optical storage technologies.

E

EIDE

Enhanced **I**ntegrated **D**rive **E**lectronics. An extension of the IDE standard, EIDE is a hardware interface standard for disk drive designs that house control circuits in the drives themselves. It allows for standardized interfaces to the system bus while providing for advanced features, such as burst data transfer and direct data access. EIDE accommodates drives as large as 8.4 gigabytes (IDE supports up to 528 megabytes).

Energy Options

With Energy Options, you can reduce energy consumption of your computer while it always remains to be ready to use. This function can be configured in Windows via **Settings > Control Panel > Energy Options**.

EPROM/EEPROM Submodules

These are plug-in submodules with EPROM/EEPROM chips. S5 user programs can be stored on them. These programmed submodules are then plugged into specially designed slots in the programmable logic controller.

Ethernet

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

Extended Memory

Memory extensions can be installed in the programming device to increase the width of the memory.

F

File

A complete, named collection of information, such as a program, a set of data used by a program, or a user-created document. A file is the basic unit of storage that enables a computer to distinguish one set of information from another.

Formatting

Formatting divides the memory area on a magnetic data medium into tracks and sectors. Formatting deletes all the data on a data medium. Every data medium must be formatted before it is used for the first time.

Function Keys

Function keys can be divided into two different types; the normal function keys which are assigned a particular function of the computer (for example, delete key), and programmable function keys (softkeys).

G

Gender Changer

The Gender Changer is used to convert the COM1/V24/PLC interface of the SIMATIC PC family to a common socket.

H

Hard Copy

The output of the complete contents of the screen on a printer is called a hard copy.

Hard Disk Drive

Hard disk drives (Winchester drives) are a form of magnetic disk memory where the magnetic disks are permanently built into the drive.

Hibernate

See **Dormancy**.

HMI

Human **M**achine **I**nterface

HTML

Hyper**t**ext **M**arkup **L**anguage is the markup language used for documents on the World Wide Web. HTML is an application of SGML (Standard Generalized Markup Language) that uses tags to mark elements, such as text and graphics, in a document to indicate how Web browsers should display these elements to the user and should respond to user actions such as activation of a link by means of a key press or mouse click.

HTTP

Hyper**t**ext **T**ransfer **P**rotocol is the protocol used to carry requests from a browser to a Web server and to transport pages from Web servers back to the requesting browser.

Hub

In a network, a device joining communication lines at a central location, providing a common connection to all devices on the network. The term is an analogy to the hub of a wheel.

Hyperlink

A connection between an element in a hypertext document, such as a word, phrase, symbol, or image, and a different element in the document, another document, a file, or a script. The user activates the link by clicking on the linked element, which is usually underlined or in a color different from the rest of the document to indicate that the element is linked.

I

IDE

Integrated **D**evice **E**lectronics is a type of disk–drive interface in which the controller electronics reside on the drive itself, eliminating the need for a separate adapter card.

Infrarot

Acronym: IR. Having a frequency in the electromagnetic spectrum in the range just below that of red light. Objects radiate infrared in proportion to their temperature.

Industrial Ethernet

Bus system based on the Ethernet standard. Components of the SIMATIC S5 and S7 series (programming devices, programmable logic controllers, programmable control systems) can be networked using Industrial Ethernet NICs.

Interface module

Module for the connection of peripheral hardware.

Interrupt

When the processor receives an interrupt, it suspends its current operations, saves the status of its work, and transfers control to a special routine known as an interrupt handler. This routine processes an instruction set to deal with the particular situation that caused the interrupt. Interrupts can be generated by various hardware devices to request service or report problems.

Interface

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

Interface Module

Module which controls and extends the hardware periphery.

IRQ

Acronym for interrupt request. One of a set of possible hardware interrupts, identified by a number. The number of the IRQ determines which interrupt handler will be used. In the AT bus, ISA, and EISA, 15 IRQs are available. Each device's IRQ is hardwired or set by a jumper or DIP switch.

ISA

Industrial **S**tandard **A**rchitecture (bus for expansion modules)

J

JEIDA

Japanese **E**lectronics **I**ndustry **D**evelopment **A**ssociation. Association of Japanese electronics manufacturers whose aim is to set up standards worldwide for the miniaturization and flexible application of PC expansion cards. Cooperates with PCMCIA.

K

Keyboard

A keyboard is the collection of keys which are used to input data, text, characters, letters, numbers, special characters, and control commands in a computer. The keyboard forms the input interface between the user and the computer.

L

LCD

Liquid **C**rystal **D**isplay. Display type on the base of liquid crystals with a thin film polarized molecular structure, enclosed between two transparent electrodes.

LED

Light **E**mitting **D**iode (for example, status display). Semiconductor diode that transforms electrical energy into light.

Lid Switch

The device is switched off by closing the display lid.

LPT1 Port

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

LS240-Drive

Floppy disk drive that is capable of storing 240 MB of data on a single 3.5-inch floppy disk. LS-240 drives are also compatible with other floppy disk formats.

M

Main Memory

Main memory is a RAM memory in the CPU that is accessed by the CPU during user program processing.

Memory Card

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

Micro Memory Card

New and very compact card for SIMATIC.

Memory Expansion

See Extended Memory

Modem

Communications device that enables a computer to send and receive data over a telephone line. **Mo**dulator and **dem**odulator of a signal transmission facility. It converts the digital pulses from a computer into analog signals (and vice versa).

Module

Modules are boards (printed circuit boards) which can be plugged into a programmable logic controller or programming device. They are available, for instance, as central controller modules, interface modules, or as bulk memory modules.

Monitor

The device on which images generated by the computer's video adapter are displayed.

Mother Board

The mother board is the core of the programming device. From here data are processed and stored, interfaces and device I/Os are controlled and managed.

Mouse

The mouse is a pointing device with which the user inputs coordinates (x,y). By moving the mouse, the mouse pointer can be moved at will around the screen. By pressing the left mouse button, the position is marked. The other mouse keys may have different assignments according to the application. With the mouse, objects can be selected, menus processed, and functions started.

Mouse Pointer

The mouse pointer is moved across the worktop (screen) by means of the mouse. The mouse pointer selects, for example, objects which are to be processed.

MS-DOS

The single **M**icro**s**oft-**D**isk-**O**perating-**S**ystem is one of the standard OS for PCs.

Multimedia

The combination of sound, graphics, animation, and video. In the world of computers, multimedia is a subset of hypermedia, which combines the aforementioned elements with hypertext.

N

Network

Link between programming devices and programmable controllers by means of interface modules, physical cables, and the corresponding software to allow data exchange between the devices.

O

Operating System

Collective term for all functions which, in conjunction with the hardware, control and monitor execution of the user programs, the distribution of resources among the individual user programs, and the maintenance of the operating mode (for example, Windows 98, MS-DOS).

P

Parallel Interface

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

Password

Unique sequence of characters that is entered for user identification. See Access Protection.

PC

Personal computer

PC Card

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

PCI

Peripheral **C**omponent **I**nterconnect (high-speed I/O expansion bus)

PCMCIA

(Personal Computer Memory Card International Association). Association of about 450 computer companies with the aim of setting worldwide standards for miniaturizing PC expansion cards and making their use more flexible, offering the market a basis for development. Cooperates with JEIDA. See Cardbus interface.

PG

Compact programming device especially for industrial applications. The PG is fully equipped for programming SIMATIC PLCs.

PG LINK

Serial interface on a CPU, CP/IP module and coordination module (PG-MUX). Used to connect a programming device. Some CPUs are optionally equipped with two PG links.

Pixel

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

PIC

SIMATIC S5 programmable logic controller

Plug and Play

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

Power Button

The device can be switched on or off with the power button.

Power Management

The Power Management of a modern PC can regulate the consumption of energy of the most important components of the computer (e.g. monitor, hard disk and CPU) individually, while the current active operations will not be affected. This function is particularly important for portable computers.

PROFIBUS

Bus system based on the PROFIBUS standard. Components of the SIMATIC S5 and S7 series (programming devices, programmable logic controllers, programmable control systems, distributed I/Os) can be networked using PROFIBUS.

Programmable Logic Controller System

The programmable logic controllers (PLC) of the SIMATIC S5 system consist of one or more CPUs and various I/O modules. The PLCs of the SIMATIC S7 system (for example, S7-200, S7-300, S7-400) consist of one or more CPUs and various I/O modules.

Programmable Controller (AS)

This programmable controller (PLC) consists of the central unit, a CPU and of diverse I/O modules.

Pull-Down Menu

See Drop-Down Menu

R

RAM

RAM (**R**andom **A**ccess **M**emory) is a volatile read/write memory in which every memory location can be addressed individually and its contents changed. RAM is used to store data and programs.

Rechargeable Battery

Reachargeable battery is used as a power source for laptop and notebook computers independent of external power supply. It also prevents the loss of data as a result of power failure.

Restart

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

ROM

ROM (**R**ead **O**nly **M**emory) is a non-volatile memory in which every memory location can be addressed individually. They contain factory set programs and data that are not lost in the event of a power failure.

RS-232 Interface

The RS-232 interface is a standardized interface for data transmission. Printers, modems and other hardware modules can be connected to a RS-232 interface.

RTC

Real Time Clock

S

SCSI Interface

Small **C**omputer **S**ystem **I**nterface. Interface for connecting SCSI devices (hard disk drives, CD-ROM drives).

Serial Interface

Data is transmitted one bit at a time via a serial interface (port); serial interfaces are therefore slower than parallel interfaces.

SETUP

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

SIMATIC S5 Memory Submodules

Memory submodules for SIMATIC S5 which are programmed with the PG and can be plugged into an S5 programmable logic controller.

SIMATIC Memory Cards

Memory submodules in credit-card format for SIMATIC S5 and SIMATIC S7 which are programmed with the PG and can be plugged into an S5 or S7 programmable logic controller.

Software

The collective term for all programs which are used on a computer. The operating system and the user programs are part of the concept “software”.

SOM

Safecard **O**n **M**otherboard. Consists of a monitoring module on the motherboard, the driver and the SOM program. Provides functions for monitoring various temperatures and the program cycle (Watchdog).

Standby

Power saving status: for example, hard disk drive or display turned off.

Startup Disk

The bootstrap instructions coded into a computer’s ROM (read-only memory) and executed at startup. The startup ROM routines enable a computer to check itself and its devices (such as the keyboard and disk drives), prepare itself for operation, and run a short program to load an operating-system loader program.

STEP 5

This is a software package which represents the basis for all other STEP 5 software packages. With the programming device (PG), this package is used to program programmable logic controllers of the SIMATIC S5 family. The language used is known as STEP 5.

STEP 7

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

STN Display

Super Twist Nematic passive display

Suspend to Disk

Transition to power-off status, with prior saving of the system contents to the hard disk drive.

Suspend to RAM

Transition to power-saving status, with prior saving of the system contents to the RAM.

SVGA

Super **V**ideo **G**raphics **A**rray is a video standard established by the Video Electronics Standards Association (VESA) in 1989 to provide high-resolution color display on IBM-compatible computers.

T

Text Cursor

The cursor shows where text may be entered, for example, in text editors and in dialog windows. In many applications the position of the cursor can be changed by moving and clicking with the mouse pointer.

TFT

Thin-**F**ilm-**T**ransistor. Technology for liquid crystal displays (LCD). The display consists of a large grid of LCD cells. Each one of the pixels represents a single cell. The electrical field in the cells is supported by thin film transistors.

Touchpad

The Touchpad is used in many programs (with mouse control) as an input device for cursor control and menu operation. The Touchpad works with touch-sensitive sensors. The cursor can be moved over the screen with the touch of a finger.

Touchscreen

The Touchscreen is a computer monitor developed and modified to recognize a touch on the screen surface. The user can move the cursor or select an option by touching the screen.

U

URL

Uniform **R**esource **L**ocator is an address for a resource on the Internet. URLs are used by Web browsers to locate Internet resources. A URL specifies the protocol to be used in accessing the resource (such as http: for a World Wide Web page or ftp: for an FTP site), the name of the server on which the resource resides (such as //www.whitehouse.gov), and, optionally, the path to a resource (such as an HTML document or a file on that server).

USB

Acronym for universal serial bus. A serial bus with a data transfer rate of 12 megabits per second (Mbps) for connecting peripherals to a microcomputer. USB can connect up to 127 peripherals, such as external CD-ROM drives, printers, modems, mice, and keyboards, to the system through a single, general-purpose port. This is accomplished by daisy chaining peripherals together. USB is designed to support the ability to automatically add and configure new devices and the ability to add such devices without having to shut down and restart the system (hot plugging).

User Interface

The software-controlled menus and screens on the monitor through which the user communicates with the program.

User program

Contains all instructions, declarations and signal processing data that can be used for system or a process control. It is assigned to a programmable module (for example, CPU, FM) and can be split into smaller blocks (modules).

V

VGA

Video **G**raphics **A**rray. Industrial standard graphics adapter for use with any commonly used software.

Video Adapter

Also known as Video Controller, this electronic component generates the video signal sent through a cable to a video display. The video adapter is usually located on the computer's main system board or on an expansion board, but it is sometimes built into the terminal.

W

Warm Start

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

WAV

A file format in which Windows stores sounds as waveforms. Such files have the extension .wav.

Windows

Windows is a multitasking graphical user interface environment that runs on MS-DOS-based computers (Windows 3x and Windows for Workgroups), and as a self-contained operating system for desktop computers (Windows 9x), workstations, (Windows NT Workstation, Windows 2000 Professional), and network servers (Windows NT Server, Windows NT Enterprise Edition, Windows 2000 Server, and Windows 2000 Advanced Server). Windows provides a standard graphical interface based on drop-down menus, windowed regions on the screen, and a pointing device such as a mouse.

WWW

World **W**ide **W**eb is the total set of interlinked hypertext documents residing on HTTP servers all around the world. Documents on the World Wide Web, called pages or Web pages, are written in HTML (Hypertext Markup Language), identified by URLs (Uniform Resource Locators) that specify the particular machine and pathname by which a file can be accessed, and transmitted from server to end user under HTTP (Hypertext Transfer Protocol).

Working Memory

The memory in which a program is stored which can be processed. Also known as main memory.

Write Protection

Write protection for files or diskettes

- Write protection for files; this type of write protection is stored in the computer and is allocated by the system manager.
- Floppy disk write protection; for 3 1/2 in. diskettes by opening the write protection hole.

W2k

Another name for Windows 2000.

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