SIEMENS

SIMATIC HMI

SIMATIC Panel PC 670 Computing Unit

Equipment Manual

This manual is part of the documentation package with the order number: 6AV7691-0AA00-1AB0

Edition 12/01

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:

Danger

indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning

indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Notice

indicates a potential situation which, if not avoided, may result in an undesirable result or state.

Note

is an important piece of information about the product, the handling of the product or the respective part of the documentation which should be noted in particular.

Qualified Personnel

Equipment may be commissioned and operated only by **qualified personnel**. Qualified personnel within the meaning of the safety notices in this manual are persons who are authorized to commission, ground and identify equipment, systems and circuits in accordance with safety engineering standards.

Correct Usage

Note the following:

Warning

The equipment may be used only for the applications stipulated in the catalog and in the technical description and only in conjunction with other equipment and components recommended or approved by Siemens.

Startup must not take place until it is established that the machine, which is to accommodate this component, is in conformity with the guideline 98/37/EEC.

Faultless and safe operation of the product presupposes proper transportation, proper storage, erection and installation as well as careful operation and maintenance.

Trademarks

You will find the registered trademarks of Siemens AG in the preface. Some of the other designations used in these documents are also registered trademarks; the owner's rights may be violated if they are used be third parties for their own purposes.

Impressum

Editor: A&D PT1D1
Publisher: A&D SE ES4

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Automation & Drives
SIMATIC Human Machine Interface
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Postfach 4848, D-90327 Nuernberg

Siemens Aktiengesellschaft

Order No. 6AV7691–0AA00–0AB0

SIMATIC Panel PC 670 Computing Unit Equipment Manual
Edition 12/01

Preface

About this manual

The SIMATIC Panel PC 670 equipment manual is part of the SIMATIC HMI documentation and consists of two parts: control unit and computing unit. It provides information for operators, mechanics, project engineers and maintenance personnel about the computing unit's installation, functionality, operation and technical structure.

Where to find what

The Operating Unit equipment manual contains the following chapters:

Chapter	Content
1	Overview of the computing unit's performance features
2 - 3	Commissioning, setting up and operating the computing unit
4 - 5	Upgrading and configuring the computing unit
6	Hardware information relating to the computing unit
7	Remote mount form factor
Appendix	• Fault diagnosis • Technical Data • ESD Guidelines
	Glossary
	Index

Notation

The following conventions are used in this manual:

`Motor off`	Text that is displayed on the operating unit is printed in Courier type face.
`Variable`	Symbolic names that stand for variable quantities that appear on the screen are printed in Courier italic type face.
Screens	Selectable functions are printed in standard italic type face.
ESC	Names of keys and buttons are shown in a different type face.

History

Release	Comments
03/00	Initial release of the SIMATIC Panel PC 670 – Computing Unit equipment manual.
12/01	Extension to include ”Remote mount form factor” option of the SIMATIC Panel PC 670 – Computing Unit equipment manual.

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- HMI®
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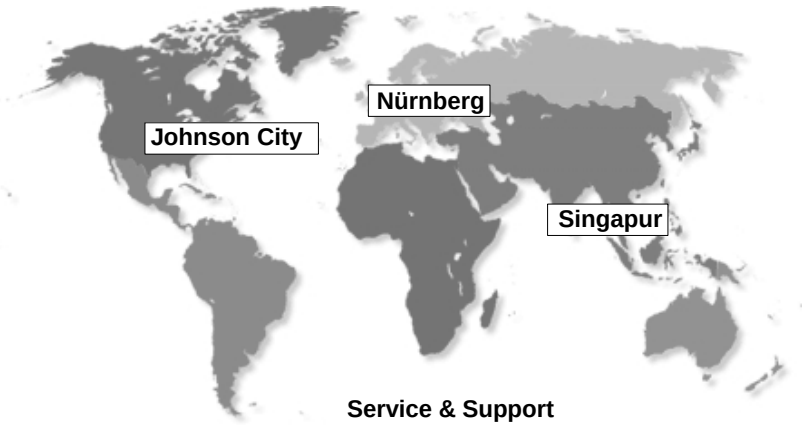
The languages of the SIMATIC Hotlines are generally German and English, in addition, French, Italian and Spanish are spoken on the authorization hotline.



Service & Support

Technical Support	**Authorization–Hotline**
Europe and Africa (Nurernberg) Mon.– Fri. 7:00 to 17:00 (Local time, GMT +1) Phone: +49 – (0) 180 – 5050 – 222 Fax: +49 – (0) 180 – 5050 – 223 E–Mail: techsupport@ad.siemens.de	**Europe and Africa** (Nuremberg) Mon. – Fri. 7:00 to 17:00 (Local time, GMT +1) Phone: +49 – (0) 911 – 895 – 7200 Fax: +49 – (0) 911 – 895 – 7201 E–Mail: authorization@nbgm.siemens.de
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Worldwide (Nuremberg) on weekdays 0:00 to 24:00 (Local time, GMT +1) Phone: +49 – (0) 911 – 895 – 7777 Fax: +49 – (0) 911 – 895 – 7001 E–Mail: techsupport@ad.siemens.de	quick call–back guaranteed within max. 2 hours (fee based, only with SIMATIC Card)

Training Center

To help you become familiar with SIMATIC S7 programmable controllers, we offer training courses. Please contact your regional training center or the central training center in D 90327 Nuremberg.

Phone: +49 (0) 911–895–3154

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Fax. +49 (0) 1805 23 56 12

Internet: `http://www.sitrain.com`

E–Mail: AD–Training@nbgm.siemens.de

For information on high–availability SIMATIC S7 automation systems, the H/F Competence Center in Nuremberg offers a special workshop. The H/F Competence Center will also support you during configuring, start–up and in case of any problems occurring at site.

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CoC–SI@nbgm.siemens.de

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  - on the Internet: address `http://www.siemens.de/simatic-net`
  - at fax polling no. +49 (0) 8765-93 02 77 95 00
- For current product information, FAQs, tips and hints and downloads which may be helpful for your application, see:
  - On the Internet: address `http://www.siemens.de/automation/service&support`
  - From the bulletin board system (BBS) in Nuremberg (*SIMATIC Customer Support Mailbox)* at the number +49 (0) 911 895-7100.

    To dial the mailbox, use a modem with up to V.34 (28.8 Kbaud), with the following parameters: 8, N, 1, ANSI, or dial on ISDN (x.75, 64 Kbits).

Further Support

If you have further questions about SIMATIC NET products, contact your local Siemens representative.

You will find the addresses:

- in our catalog IK PI
- on the Internet http://www.siemens.de/automation/partner
- in our interactive catalog CA01
  http://www.siemens.de/automation/ca01
- on our quick–start CD

SIMATIC Panel PC 670 Computing Unit Equipment Manual
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Product Overview

1

Overview

The computing unit is used as an entry-level system to PC-based automation, as a basic component for the PC-based HMI devices (Panel PC), as a basic component for PC-based machine operating panels (OP031, OP032S, OP032L, Trumpf OEM BT) and in special configurations as a basis for custom-configured devices.

The computing unit is intended for use in industry as well as in the residential, business and commercial areas and can also be used in building system automation or in public facilities, in addition to industrial applications.

The computing unit is a compact box computer with Pentium II mobile technology. It is a particularly powerful industrial PC for installation as a box system.

Quality

The computing unit is characterized by its high quality, which is attributable, for example, by:

- extensive climate, vibration and shock tests to ensure industrial compatibility;
- electromagnetic compatibility conforming to CE and FCC;
- UL/CSA approvals;
- hotline, service, spare parts;
- quality assurance conforming to ISO 9001;
- compliance with the requirements for a fire enclosure to EN60950/UL1950 – in other words, it may be used without an additional fire enclosure;
- compact dimensions;
- suitability for use in a wide ambient temperature range;
- a design that is easy to service and maintain.

Installation

The computing unit can be installed in virtually all the usual locations (refer to Chapter 2.2).

There are anchorage points on both of the longs sides for securing the computing unit. Mounting brackets are screwed onto these anchorage points.

Functions

The computing unit is equipped with software which allows it to be used universally. It includes the Windows NT or Windows 98 operating system. (Windows 2000 is in preparation.)

The computing unit additionally allows the use of:

- SIMATIC supplementary software
- software from the entire world of automation
- software from the PC world

Additional applications:

The computing unit can also be used in other areas of automation engineering (SIMATIC HMI; TELEPERM; SINUMERIK; SIROTEC, etc.).

Remote mount form factor

As an alternative to the integrated standard configuration, Remote mount form factor is possible. The advantages are that

- The control unit can be installed closer to the machine and inclined at an angle of up to 70 ° – for example, in a swivel arm (”boom”),
- The more sensitive computing unit (hard disk!) can be installed vertically some distance away from the machine where vibration is low – for example, in a cabinet.

With this configuration, additional components are required for communication between the control unit and the computing unit:

- The transmitter, which is mounted on the computing unit.
- The receiver, which is mounted on the control unit; and
- The cable, which links the two of them.

The present equipment manual describes

- Chapters 2 to 7 basically describe the specific characteristics of the computing unit, but also make reference to the complete unit where necessary – for example, with regard to the dimensions for mounting, maintenance and technical specifications.
- Chapter 7 describes the Remote Mount form factor of the Panel PC.

Advantages of the computing unit

- The computing unit is rugged in design and its functions make it particularly suitable for use on site under harsh industrial conditions. It meets the specific requirements of an industrial environment, such as noise immunity, compliance with standards, ruggedness and continuous operation.
- Owing to the variable operating location and the many options for installation, the computing unit can be used virtually anywhere.
- Integrated on the computing unit are all the ports required for SIMATIC automation. Specifically, these are:
  - parallel port (LPT 1)
  - serial ports (1x V.24, 1x V.24/TTY)
  - PS/2 keyboard port (supports PG720/740 keyboard with trackball)
  - PS/2 mouse port
  - USB port (1x internal, 1x external)
  - MPI/L2-DP (max. 12 MBaud)
  - Cardbus interface, 1 slot (type III)
  - VGA interface for external monitor
  - LVDS interface for flat-screen display

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Commissioning

2

Chapter Overview

In Section	You Will Find	on Page
2.1	Unpacking and Checking the Item Delivered	2-2
2.2	Installing the Item Supplied	2-3
2.3	Ensuring Readiness for Service	2-8
2.4	transport	2-10

2.1 Unpacking and Checking the Item Delivered

Unpacking the item

Unpack the item delivered to you as follows:

1. Remove the packaging.
2. Do not throw the original packaging away. Keep it in case you have to transport your PC at some time in the future.
3. Please keep the enclosed documentation in a safe place. You will require it when you first start up the item delivered to you and it is part of the device.
4. Check the packaging and the package contents for any visible damage.

Recording the serial number (F-No.)

1. Record the serial number of your computing unit in the table; you will find it on the nameplate above the floppy disk drive on the side of the device.

   The repair center will be able to identify the device by the F-No. and MLFB-No. if it is submitted for repair.

F-No.	
MLFB-No.	

2.2 Installing the Item Supplied

The item delivered to you is particularly suitable for installation in consoles, cabinets and panels.

The device complies with the requirements for a fire enclosure to EN60950. It can therefore be installed without an additional fire enclosure;

Please observe the following points when installing your device:

- Avoid extreme environmental conditions whenever possible. Protect your device from dust, moisture and heat.
- Do not expose your device to direct sunlight.
- The device must be installed in such a way that it presents no danger of any kind (for example, by tipping over).
- The clearance around the device must be at least 100 mm to make sure it is sufficiently ventilated.
- Never cover the ventilation slots.
- Observe the installation locations allowed when you install your device.

Warning

If systems are installed at a non-approved installation location, the approvals to UL 1950 and EN60950 are no longer valid!

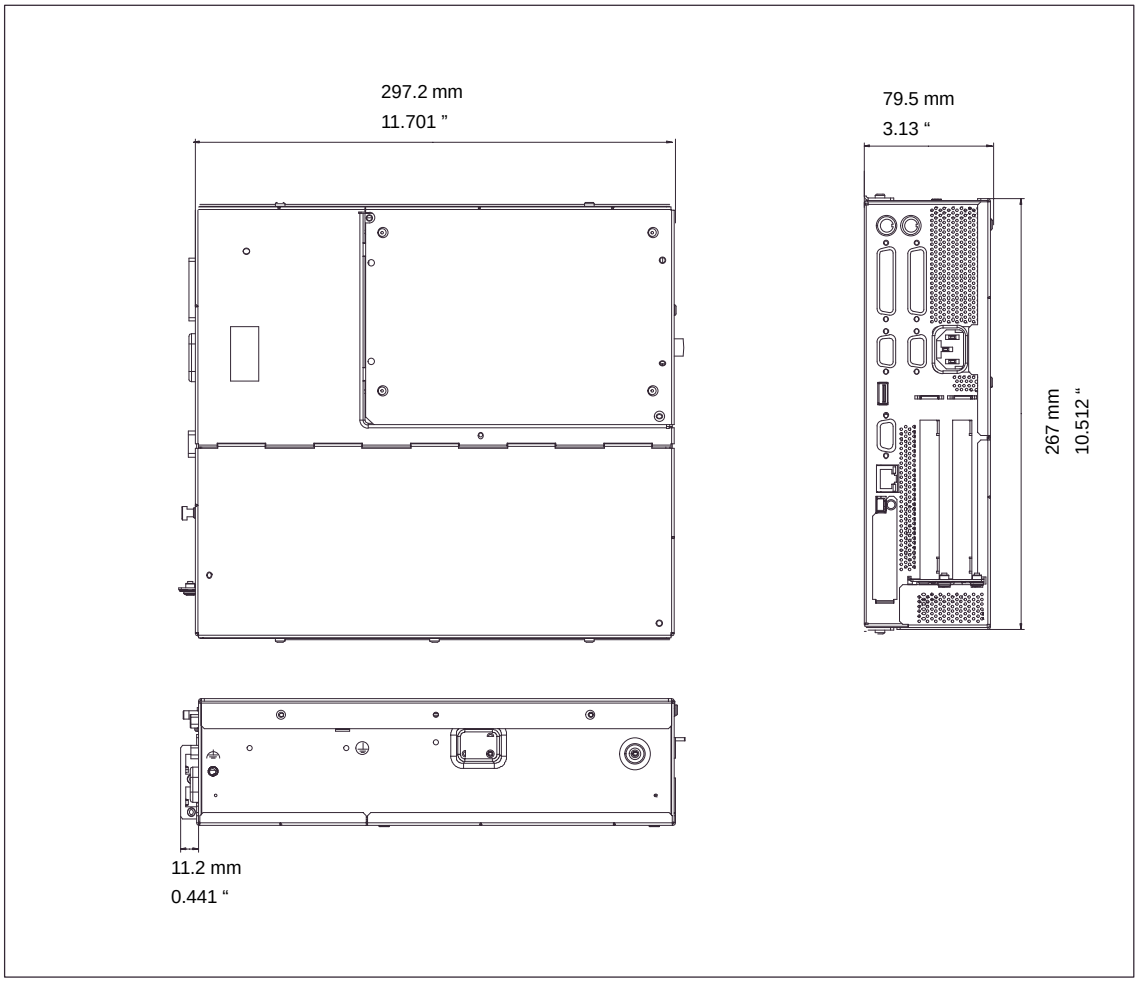


Figure 2-1 Dimension Drawings for Installing in Panel with Installation Bracket (Device without CD-ROM Drive)

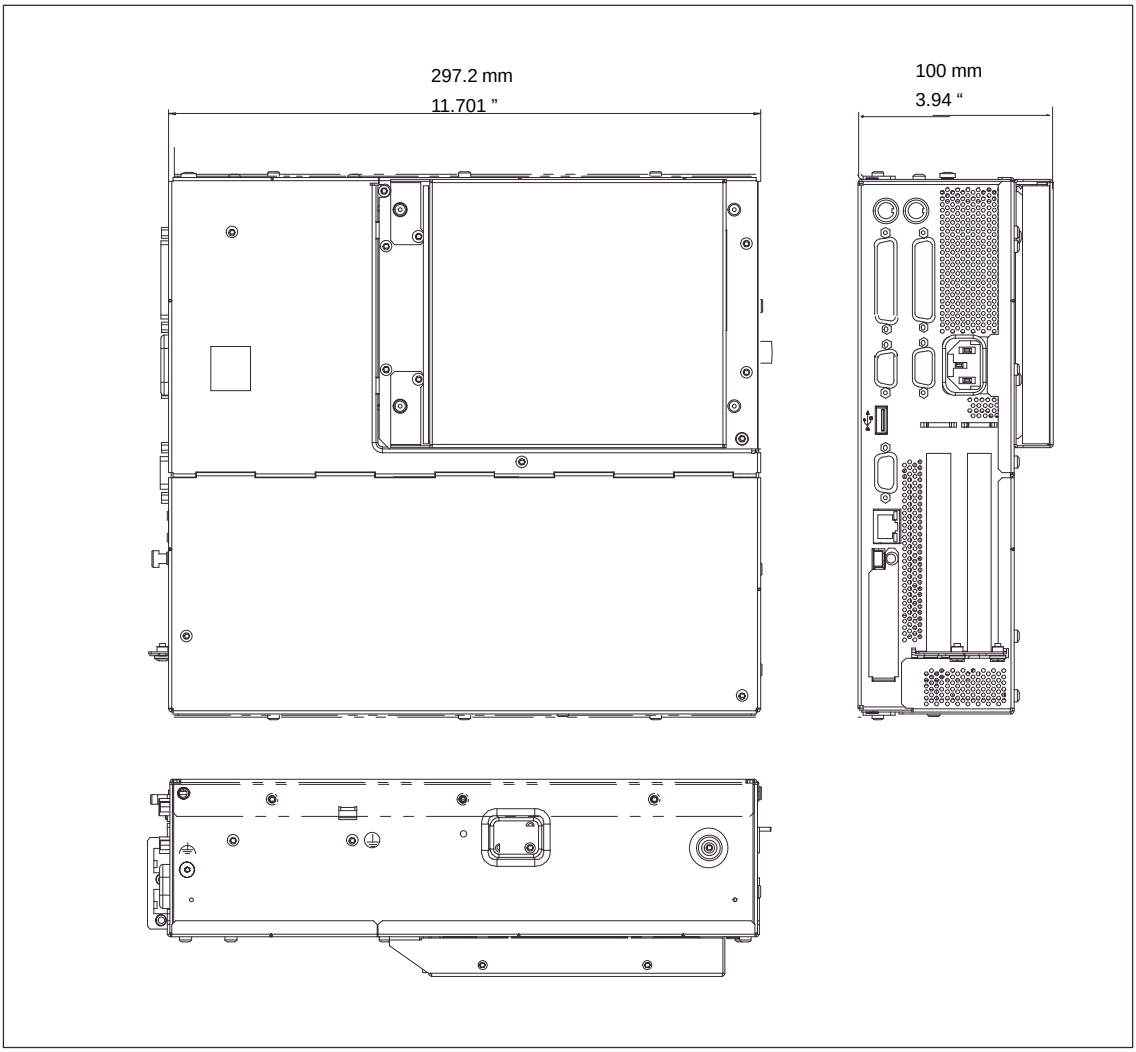


Figure 2-2 Dimension Drawings for Installing in Panel (Device with CD-ROM Drive)

Permissible installation locations for the computing unit with floppy disk drive

An inclined position of ± 20° is allowed at each of the permissible storage locations.

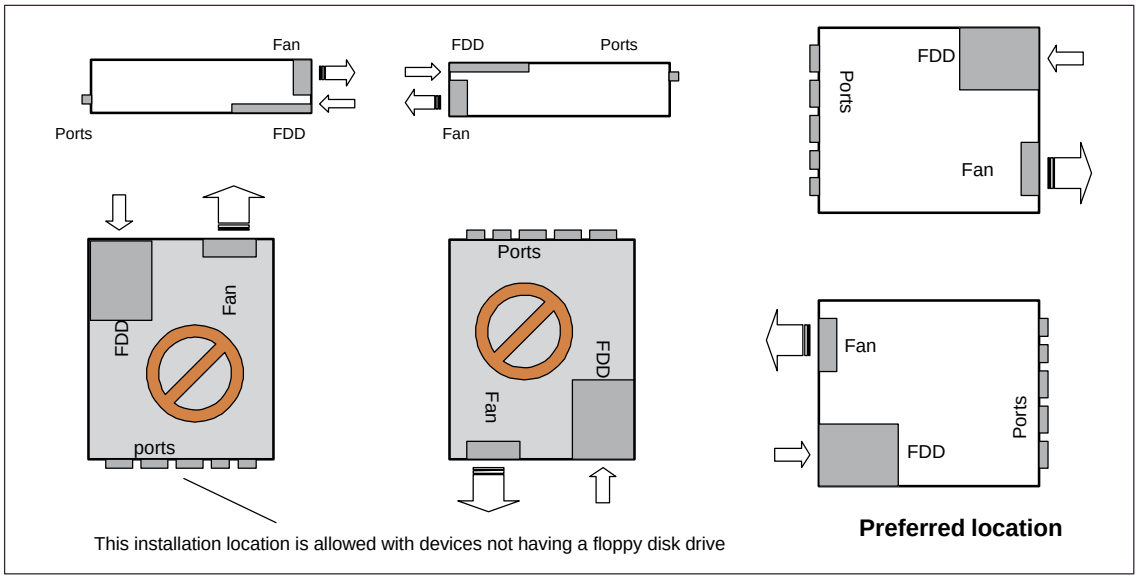


Figure 2-3 Permissible installation locations for the computing unit with floppy disk drive

Permissible installation locations for the computing unit having an LS 120 drive (option for custom solutions)

An inclined position of ± 15° is allowed at each of the permissible storage locations.

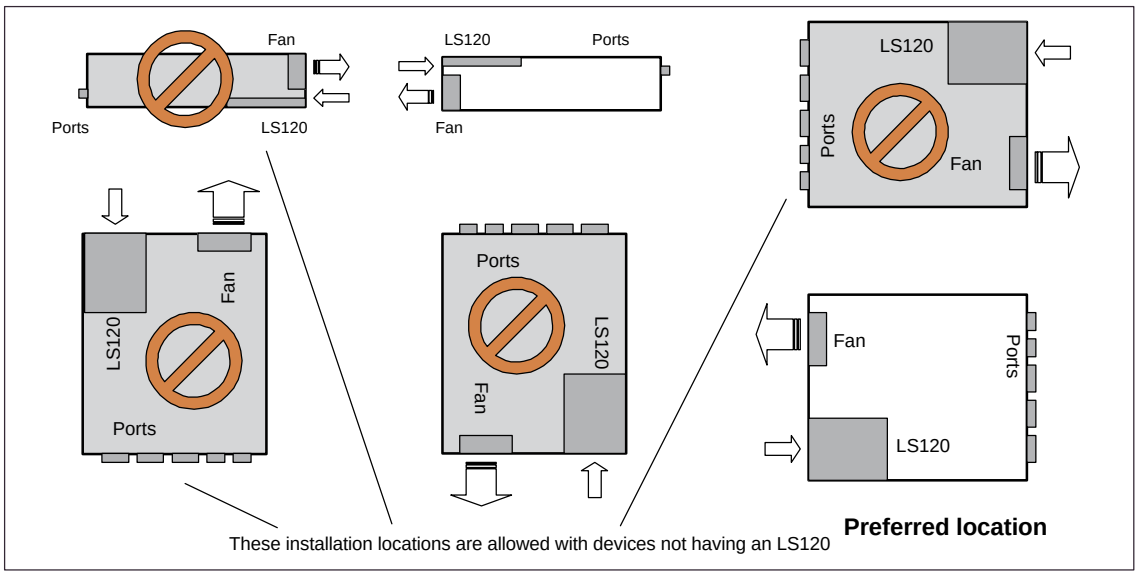


Figure 2-4 Permissible installation locations for the computing unit having an LS120

Note

The possible installation locations for the computing unit do not agree with the permissible installation location of Panel PC 670 (refer to the commissioning instructions).

2.3 Ensuring Readiness for Service

Grounding Measures

Low-resistance grounding connections ensure that the user of the installation is protected against electric shock (for example, if a short-circuit occurs or if there are defects in the system). Moreover, they discharge interference transmitted by external power supply cables, signal cables or cables to I/O devices.

You should therefore create a low-resistance connection (a large surface acting as the contact) between the grounding point on the system housing and the central grounding point of the cabinet or the installation in which the computer is to be installed. The minimum cross-section should not be less than 5 mm^2.

The grounding terminal is located on the side of the device and is identified by a  symbol.

Connecting to the power supply

Note

The computing unit is equipped with a safety-tested power supply cable and may be connected only to a socket outlet with grounding contact.

Make sure that the socket outlet on the device or the socket outlet with grounding contact of the building wiring system is freely accessible and located as near to the device as possible.

The computing unit does not have a mains switch. To completely disconnect the PC from the mains power supply, you must pull the plug. This connection must be easily accessible.

If the PC is to be installed in a cabinet, a central disconnector must be provided.

The standard power supply of the computing unit is designed for 120/230 V systems.

The power supply has automatic mains voltage changeover. There is no need to adjust the voltage range.

Connecting and turning on the computing unit

Before you connect the computing unit to the mains, connect the front panels ready for operation.

1. Insert the connecting cables into the appropriate sockets on the port side of the computing unit (refer to section 3.4.)
2. Once the peripheral devices have been connected, the device is ready for mains operation. Connect your device to the mains supply. The computing unit is now operating.

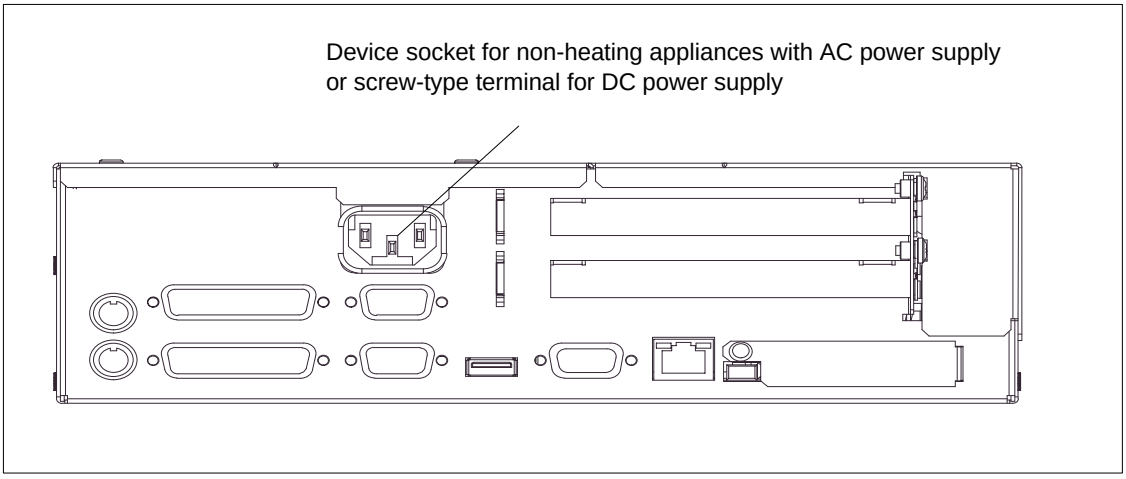


Figure 2-5 Connecting and Turning on the Computing Unit

Turning off the computing unit

The computing unit does not have a mains switch and is isolated from the mains supply only by detaching the mains supply plug.

2.4 Transportation

Shipping

Despite the rugged design of the computing unit, its built-in components are sensitive to severe vibrations and shock. You must therefore protect your computing unit from severe mechanical stress when it is in transit.

Caution

Risk of computing unit suffering damage

When in transit in cold weather and the device is subjected to extreme differences in temperature, care must be taken to ensure that moisture is not deposited on or in the device (moisture condensation).

Allow the device slowly to rise to room temperature before taking it into operation. If condensation has formed, wait for approximately 4 hours before turning the device on.

Setting Up and Operating the Computing Unit

3

Chapter Overview

3.1 Right Side of the Device (Port Side)

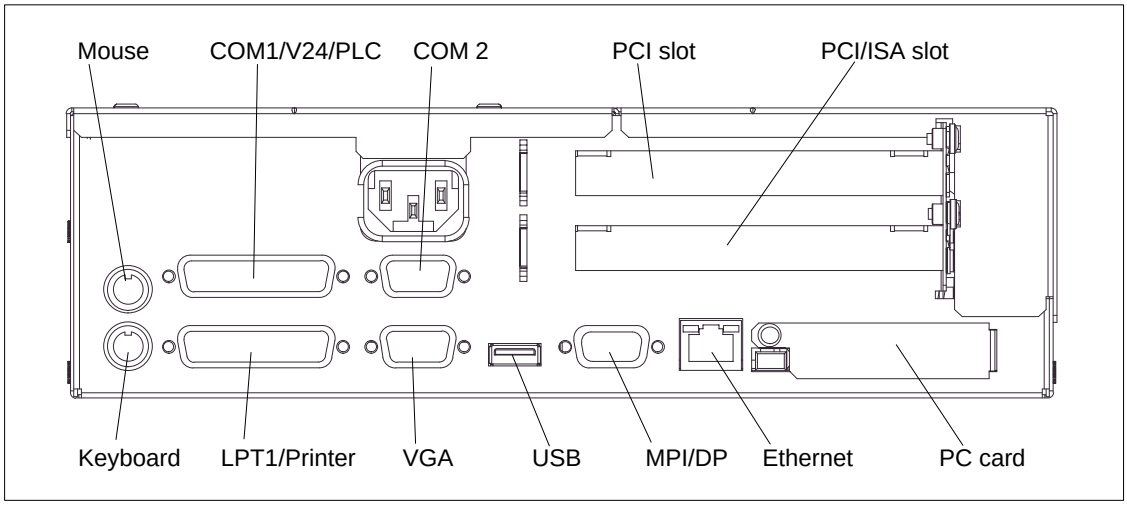


Figure 3-1 Right Side of Device with Ports

Note

When connecting I/O devices, always be sure to use shielded cables and metal connectors to avoid invalidating your operating permit. Use a screwdriver to fasten the interface cable connectors on the housing of the computing unit to improve electrical shielding.

Connection	Function
COM1/V24/PLC	You change the port to a plug connector by inserting the gender changer contained in the accessories.
MPI/DP (RS 485)	Isolated within the safety extra-low voltage circuit (SELV)

If expansion boards are installed on the computing unit, there are additional interfaces. Please refer to the description of the relevant module for the significance of these additional interfaces.

3.2 Left Side of Device (Drive Side)

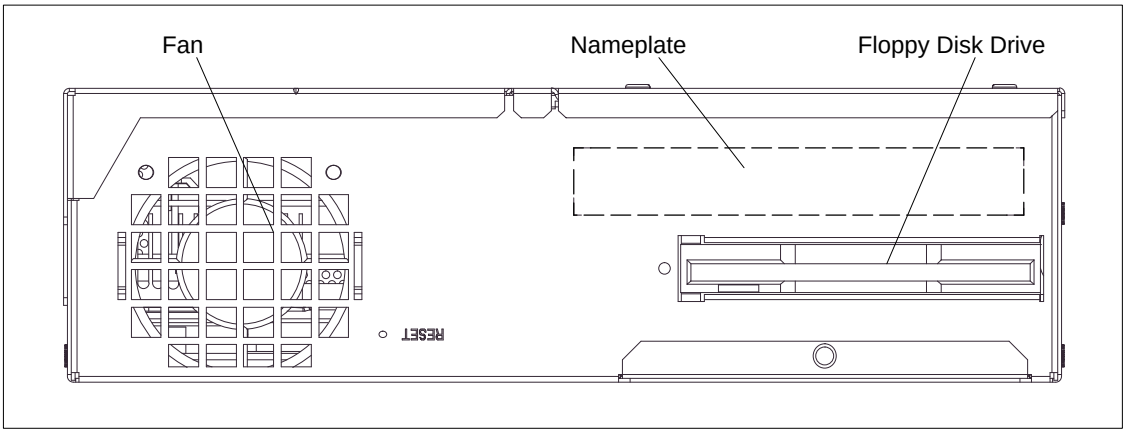


Figure 3-2 Left Side of Device

Reset Key

The Reset key can only be pressed with the aid of a pointed object (for example, elongated paper clip).

Pressing the Reset key triggers a hardware reset. The computing unit restarts.

Caution

There may be a loss of data with a hardware reset.

Front ports

The following front ports are located beneath the floppy disk drive:

- I/O port for connecting front components
- LVDS display port

VGA port

Please observe the following note on operating a flat display and an external monitor:

Note

The default setting of the display is simultaneous operation of a flat display and an external monitor. If no front display element is connected, the external monitor is used for the display, at a resolution of 640 x 480 pixels. Modes with a lower resolution and text modes are expanded to this format.

To optimize the display on the external monitor, set ”CRT/LCD selection: CRT enabled” in Setup on the main menu using the ”Hardware Options” dialog box. A resolution of 1024 x 768 pixels with a higher image refresh rate is then possible.

3.3 Connecting the Computing Unit to the Power Supply

Connecting to the power supply

The computing unit can be operated using the device socket for non-heating appliances on 120 V and 230 V power systems. Voltage changeover is automatic.

1. Insert the power supply cable supplied with the device into the device socket for non-heating appliances.
2. Connect the mains lead to a socket having a grounded protective ground conductor.
3. The device is then prepared for mains operation and operating.

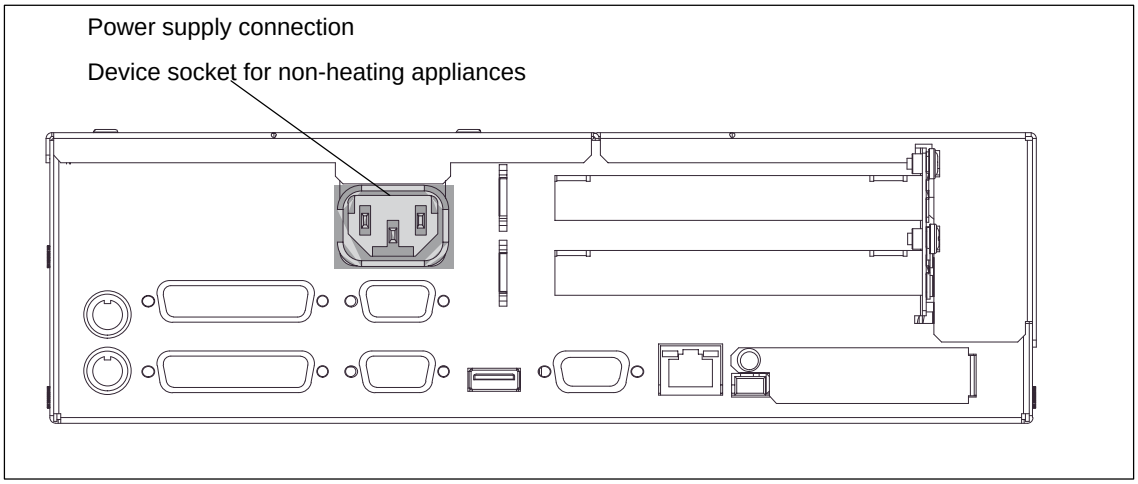


Figure 3-3 Power Supply Connection (Device Socket for Non-Heating Appliances)

Mains supply

The device is intended for connection to grounded power supply systems (TN networks to VDE 0100, Part 300, or IEC 364-3).

No provision is made for connection to non-grounded or impedance-grounded power supply systems (IT networks).

The power cable should comply with the safety guidelines of the country concerned.

Check to make sure that the rated voltage for the device is the same as the local mains voltage.

This device is equipped with a safety-tested power supply cable and may be connected only to a socket outlet with grounding contact.

Make sure that the socket outlet on the device or the socket outlet with grounding contact of the building wiring system is freely accessible and located as near to the device as possible.

To completely disconnect the PC from the mains power supply, you must pull the plug. This connection must be easily accessible. If the PC is to be installed in a cabinet, a central disconnector must be provided.

Lay the cables so that no one can step on or trip over them. When connecting the device, carefully study the pertinent information given in Chapter 2.

Never connect or disconnect power cables or data transmission lines during a thunderstorm.

In an emergency situation (for instance, damage to the housing, controls or power cable, penetration by liquids or foreign bodies), pull the power plug and contact the authorized service department.

The computing unit must be switched off before connecting/disconnecting I/O devices (keyboard, mouse, printer, etc.). Failure to do so can result in damage to the computing unit.

A connector safety interlock is supplied with a 120 V/230 V power supply.

As an option, the computing unit can alternatively be equipped with a 24 V power supply unit.

Country-Specific Notes

For the USA and Canada:

For operation in Canada and the United States, use CSA or UL-listed power cables.

The connector must comply with the NEMA 5-15 specification.

120 V power supply

A flexible cable with UL approval and CSA marking and the following features must be used: SJT design with three conductors, at least 18 AWG cross-section, a maximum length of 4.5 meters and parallel grounding-type plug (15 A, at least 125 V).

230 V power supply

A flexible cable with UL approval and CSA marking and the following features must be used: SJT design with three conductors, at least 18 AWG cross-section, a maximum length of 4.5 meters and Tandem grounding-type plug (15 A, at least 250 V).

230 V supply voltage outside the USA and Canada

A flexible cable with the following features must be used: at least 18 AWG cross-section and grounding-type plug (15 A, 250 V). The cables must conform to the relevant safety guidelines of the country in which they are installed and bear the specified markings.

3.4 Connecting Peripheral Devices

Note

Make sure the components you insert exhibit industrial compatibility when connecting peripheral devices

Printer connection via parallel port

To connect your printer, perform the following steps:

1. Turn off the computing unit and the printer.
2. Plug the printer cable onto the parallel port, LPT 1.
3. Connect the printer cable to the printer.
4. Tighten (screw) the connector on the port.

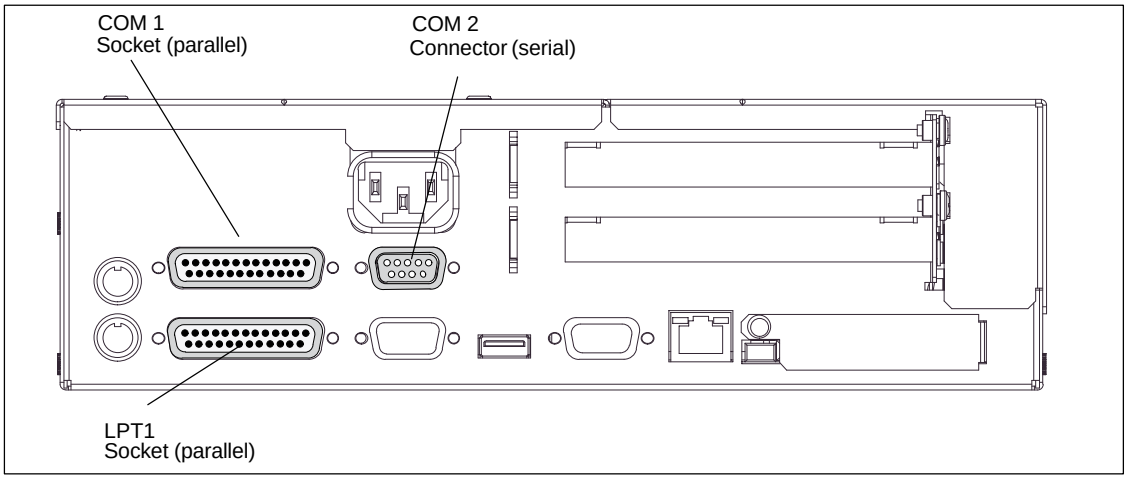


Figure 3-4 Printer Connection

Caution

Danger of damage being caused to the device

Connect printers to the parallel port only when the device on the LPT 1 port is turned off (printer likewise turned off).

Make sure you are using the correct port. If you interchange the connectors, or use wrong connecting cables, the port might be damaged.

Before inserting the connecting cables, the static charge of your body, the device and the connecting cables must be brought to the same level. You can do this by briefly touching the metal housing.

Use the original cable to establish the connection.

Printer connection via serial port

Alternatively, you can connect your printer via a serial COM interface to the computing unit. You will find information on how to adapt and set your port and on the connecting cable you should use in the user manual for your printer.

Using a mouse

A PS/2, USB or a serial mouse can be used in conjunction with the computing unit.

Connecting a PS/2 mouse

You can connect an external PS/2 mouse or another external input device (pointing device) to the PS/2 mouse port.

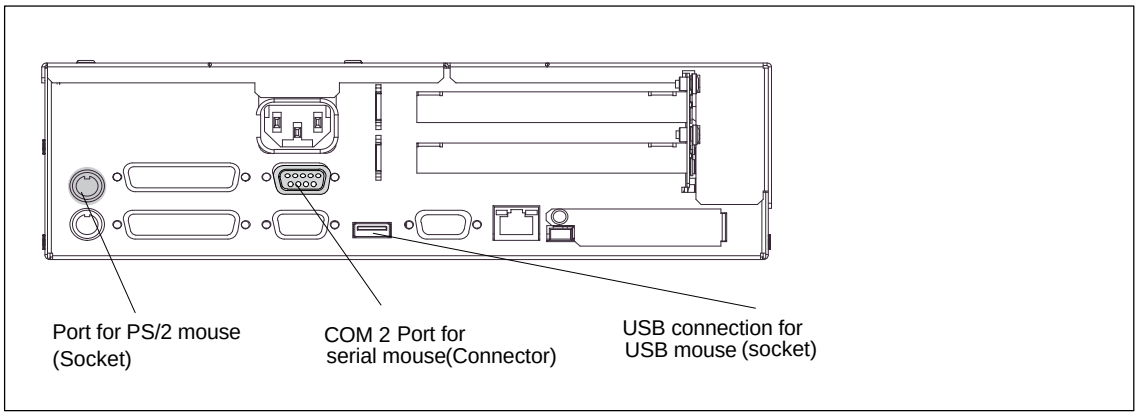


Figure 3-5 Connecting the Mouse

Proceed as follows:

1. Turn your device off.
2. Insert the cable of the PS/2 mouse or of another external input device (pointing device) into the mouse socket.
3. Restart your device.

Connecting a serial mouse

You can connect a serial mouse to the serial port COM 2. To operate a serial mouse, you have to install and assign parameters to the suitable mouse driver. To do this, please refer to the description of your mouse or the description of your operating system for the necessary information.

1. Turn your device off.
2. Plug your serial mouse onto the mouse connector labeled COM 2.
3. Screw the connector tight.
4. Restart your device.

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

Connecting a PS/2 keyboard

You can connect a PS/2 keyboard to your liking to the computing unit.

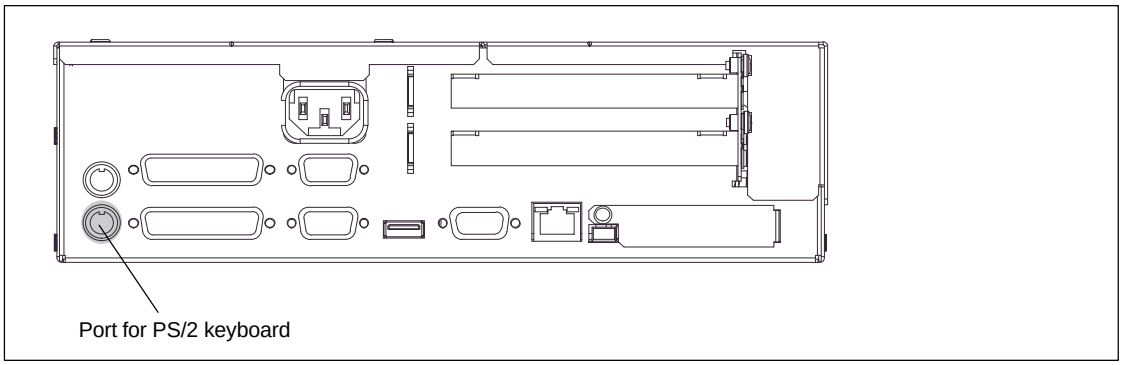


Figure 3-6 Connecting a PS/2 Keyboard

Proceed as follows:

1. Plug in the PS/2 keyboard connector.
2. Restart your device.

Note

We recommend you to use a keyboard with a straight keyboard connector so that the connector does not conceal adjacent ports.

Connecting USB devices

You can connect devices having a USB interface to the USB interface.

- Plug in the USB cable.

The device is detected automatically by a “plug and play” operating system such as Windows 98 and is then available.

A USB keyboard can be operated to run BIOS setup.

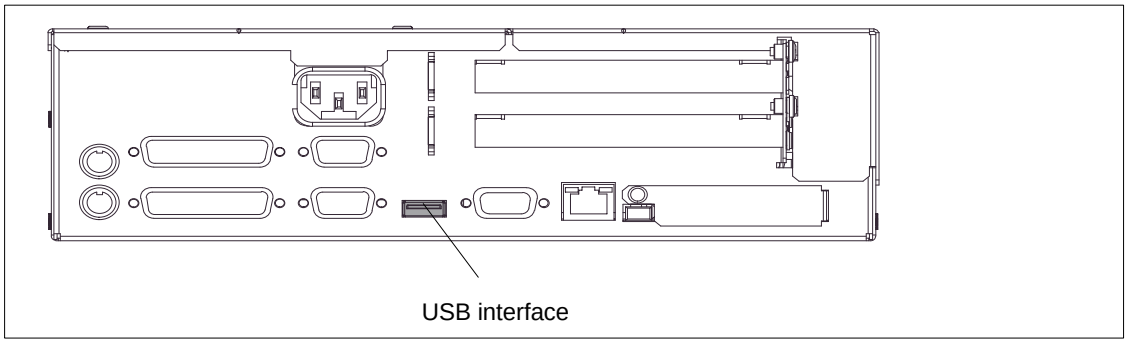


Figure 3-7 USB Connection

Note

Operating systems which do not support “plug and play” (Windows NT 4.0, for example) generally do not allow operation of USB devices.

3.5 Working with PC Cards

PC cards

Card bus cards (32 bit) and PCMCIA cards (16 bit) can be operated in the PC card interface. The computing unit features a PC card interface. Communication modules for MODEM, FAX/MODEM, ISDN, Token Ring, ETHERNET, memory expansions and check-card sized SCSI interface modules can be plugged into this interface.

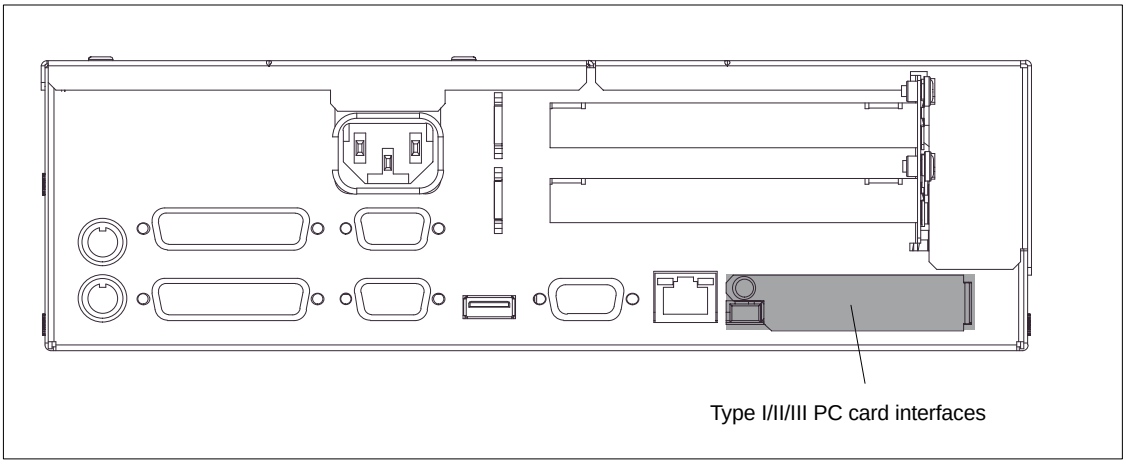


Figure 3-8 PC Card Interface

Take note of the following when working with Cardbus/PC cards:

1. Open the port cover on the left side of the device by loosening the plastic rivet with a flat screwdriver.
2. Remove the metal cover from the guide rail.
3. Insert the PCMCIA card or Cardbus card you require.

Caution

Make sure that the eject button for Cardbus/PC cards is fully depressed before inserting the PC card. If this is not the case, a card may jam in the slot when inserting thin PC cards (flash memory cards, for example). The PC card can then not be inserted properly.

The nameplate of the PC card must be visible to the rear of the device on being inserted.

Do not remove the cared until data transfer has stopped (danger of loss of data and system crash).

Caution

Always discharge your body's charge before inserting or removing Cardbus/PC cards by briefly touching a grounded object (refer also the ESD Guideline, section C).

Damage could occur if you do not.

Note

Peak currents of 650 mA at 5 V referred to 3 s are allowed.

Examples of PCMCIA cards on the PC card interface for

hard disk drive	330 mA *read/write*
(Maxtor MXL-131-III)	640 mA *spin up 2 s*
. . . . .	110 mA *idle*
fax/modem	60 mA *idle*
(Dr. Neuhaus)	140 mA *transfer*
Ethernet	
(XIRCOM)	150 mA

Installing PC cards

Observe the following points when you install these cards:

Note

Depending on the configuration of the computing unit, it could be that there are no free interrupts for the operation of PC cards. In this case, reserve interrupts in setup.

To reserve interrupts, proceed as follows:

On the "Advanced" BIOS setup menu, set the interrupt which will be required for the PC cards to "reserved" (default: available) on the "PCI Configuration" line at "PCI/PNP ISA IRQ Resource Exclusion".

Caution

Danger of PC cards and the computing unit being damaged.

The PC card must be plugged into the interface with its front facing the rear side of the computing unit. This side is normally marked with a company or product name and the wording ”This side up” or something similar.

If you attempt to insert the cared wrongly, the computing unit and the PC card might become damaged.

Before inserting the connecting cables, the static charge your body, the device and the connecting cables must be brought to the same level. You can do this by briefly touching the metal housing.

Note

To operate the PC card, “Card bus/PCMCIA Slot” has to be set to “Enabled” in BIOS SETUP: *Main* menu, *Hardware Option* submenu.

3.6 Drives

3.6.1 CD-ROM drive (depending on hardware configuration)

Note

The EJECT function offered by various applications for opening the CD-ROM tray does not work with this drive.

Once you have closed the tray, the CD is tested and the access LED on the drive starts to flash:

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

CD-ROM front

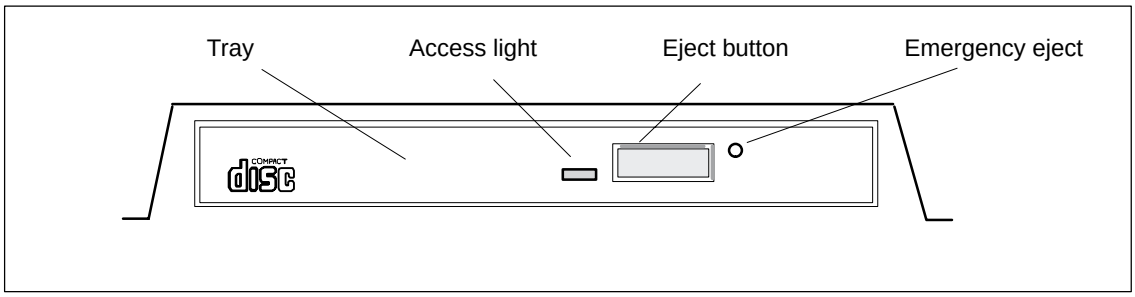


Figure 3-9 CD-ROM Front

Caution

Danger of data being lost and the drive damaged

CD-ROM drives are very sensitive to unacceptable vibrations. During operation, vibrations might damage the drive and/or the data medium. You can read the permissible values in the technical specifications in Chapter 7 of the instruction manual.

Emergency eject

The following procedure is used to remove the data medium when the eject button is locked by software or no power is being supplied to the drive. Motor-driven opening is not possible in this case.

1. Make sure that there is no power supply to the drive (switch off the PC).
2. Insert a max.1.3 mm thick and at least 55 mm long object (for example an elongated paper clip) into the emergency removal hole at the front of the drive. Careful pressure opens the drive tray and pushes the data medium out of the drive. Pull the CD tray manually further out of the housing and remove the CD.

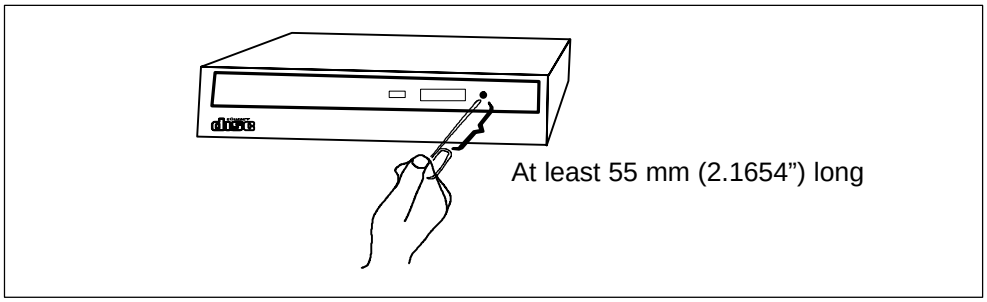


Figure 3-10 Emergency Eject

3.6.2 Floppy Disk or LS120 Drive (Depending on Hardware Configuration)

With the floppy disk drive, you can save programs and data to floppy disk and load them from disks onto the computing unit.

As an alternative to a floppy disk drive, the computing unit can be equipped with an LS 120 drive for custom solutions.

Floppy disk types

You can use the following floppy disks with the floppy disk drive:
Double Sided High Density, 3.5 in, 1,44 MB (135TPI).

With an LS 120, you can save larger amounts of data on data media than with a 1.44 MB floppy disk drive. The LS 120 has the following properties:

- LS 120 is compatible with the 1.44 MB floppy disk drive – in other words, it also supports 1.44 MB floppy disks.
- The maximum aggregate is 120 MB with an LS 120 data medium.
- LS 120 is connected via an ATAPI (IDE) interface.

Floppy disk handling with floppy disk drive

Insert the floppy disks into the drive as illustrated, depending on the installation location:

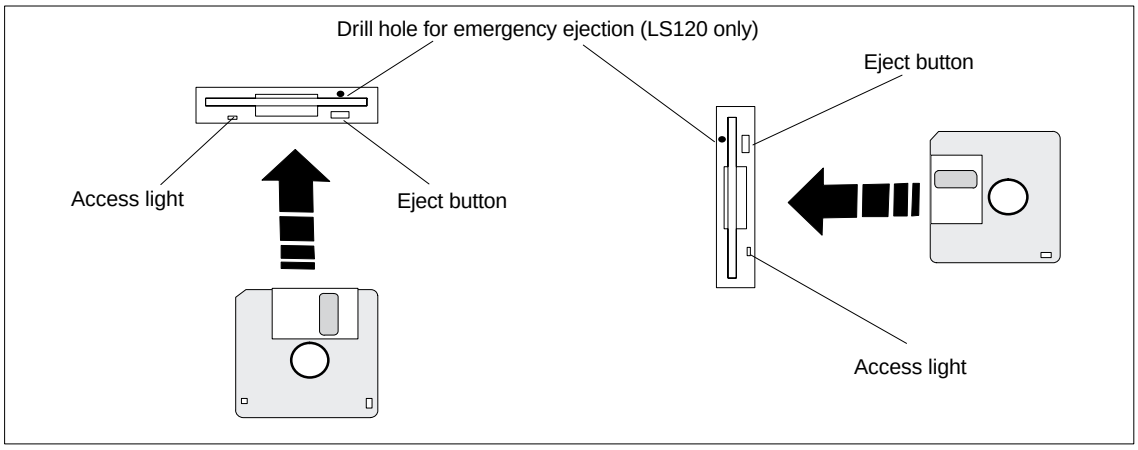


Figure 3-11 Handling Floppy Disks

The access light is on when the drive is being accessed.

Emergency removal with the LS120 works in the same manner as with the CD-ROM drive. Refer to section 3.6.1 for details.

Caution

Caution: This could result in loss of data!

The eject button must never be pressed while the green LED on the drive is on.

LS 120 drives are very sensitive when it comes to unacceptable vibrations. During operation, vibrations might damage the drive and/or the data medium. (Refer to section B for permissible values.)

3.7 Using the Computing Unit in a SIMATIC S5 Network

Point-to-point connection,

This section describes the options for connecting your computing unit to a programming unit or an S5 programmable controller in a point-to-point connection.

A point-to-point connection is possible by connecting the computing unit to another programming unit or a programmable controller by means of:

- a V.24 connection
- a TTY connection

Configuring notes for interfaces with current loop (TTY, 20 mA)

Different criteria have to be taken into account for reliable operation of a connection. The maximum data transfer rate (baud rate) depends on the required distance, the type of cable, the pin assignment of the interface and external interference.

Rules

To reduce interference by a favorable choice and correct connection of the cable, you should comply with the following rules:

- The shielded cable used must have a low line resistance (< 130 Ω / km) and a low capacitance (< 90 pF/ m). Twisted-pair cables are less susceptible to inductive interference. A low line resistance result in reduced voltage excursions and shorter charge reversal times; the line resistance decreases with increasing conductor cross-section for the same length of cable.
- The shorter the data transmission link, the higher the maximum possible transfer rate.
- If there is an active transmitter and an active receiver at the same end of the transmission link, the sequence of access priority to the transmission circuit must be taken into account in order to achieve the longest possible transmission link.
- Signal lines and power lines must not be run together. Signal lines must be installed as far away as possible from sources of strong interference (for example, 400 V 3-phase power cables).
- The active TTY interface with a 12 V open-circuit voltage has been tested on a 100 m long cable at a transmission rate of 9600 bps in an environment with normal levels of noise (field strength < 3 V/ m). If a LiYCY 5 x 1x 0.14 shielded cable is used, reliable transmission is possible over a distance of up to 100 m. The AS511 driver was used for testing (only one transmitter at a time).

Note

The interference field of the source of interference is reduced by the square of the distance.

Connecting the computing unit to an S5 programmable controller

You can connect the computing unit to a SIMATIC S5 programmable controller using the COM 1/TTY interface.

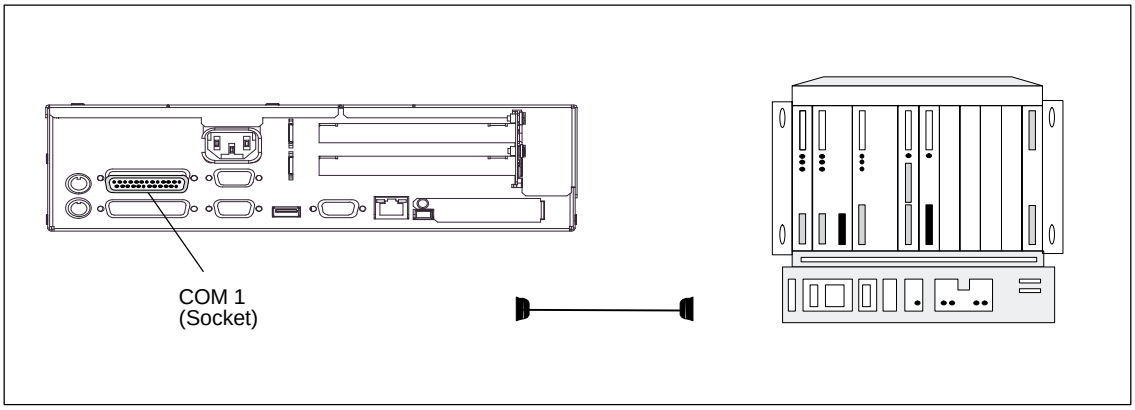


Figure 3-12 Connection to an S5 Programmable Controller

To connect the computing unit to a SIMATIC S5 programmable controller, perform the following steps:

1. Turn your device off.
2. Plug the connecting cable onto the COM 1 port.
3. Screw the connector tight.
4. Plug the connecting cable into the corresponding port on the CPU of the programmable controller.
5. In order to enable TTY operation, you must set TTY to “enabled” in the BIOS setup.

Caution

Danger of damage being caused to the device

If you interchange the connectors, or use wrong connecting cables, the port might be damaged.

Be careful not to plug the TTY cable in the LPT 1 port of the computing unit instead of the COM 1/TTY port.

Before inserting the connecting cables, the static charge of your body, the device and the connecting cables must be brought to the same level. You can do this by briefly touching the metal housing.

Use only the original connecting cable for the connection to the programmable controller.

Connecting the computing unit via an adapter

An adapter is available for connecting the computing unit to the PLC with earlier standard connecting cables.

Table 3-1 Adapter for Computing Unit Connection

Interface	Connection	Connecting cable Order No.	Adapter
COM 1 as TTY port	Computing unit to a SIMATIC S5 programmable controller	6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

In order to maintain a data transmission rate of 9600 bps up to a distance of 100 m, the receive diode is connected to ground (reference) via the connecting cable.

Connecting the computing unit to programming units (V.24, TTY)

If you want to connect your computing unit to a different programming unit, you can order the corresponding connecting cable (refer to Table 3-2).

Table 3-2 Connecting the Computing Unit to Other Programming Units

Interface	Connection	Connecting cable	Adapter
COM 1 as V.24 port	PG 7xx with PG 7xx		
COM 1 as TTY port	PG 7xx with PG 6xx	Series connection of 6ES5 733 -2xxx0[2)] and 6ES5 731-6AG00[1)]	6ES5 731-6AG00

1) When connecting the programming units is series, make sure you connect the cable the right way round (refer to Figure 3-13).

2) The connecting cable is available for order only as a spare part. A description of the connecting cable is given in Chapter 6.

Figure 3-13 Direction of Connection: Adapter - Connecting Cable

Note

When connecting the computing unit to another programming unit, you must switch the TTY ports (COM1) in one of the programming units by changing the jumper setting. When the computing unit is delivered to you, this port is always set to active.

Switching the computing unit active/passive

The COM 1 (TTY) serial port is set to active (20 mA current loop) when the computing unit is delivered to you. When you connect to a programming unit using the COM 1 (TTY) serial port, you must set one of the ports to passive. The switch for this on the computing unit is located on the motherboard.

These jumpers are accessible by opening the module cover.

Jumper settings

Change the jumper setting as shown in Figure 3-14:

S1-1	S1-2	Function
On	**On**	Active TTY port (default setting)
On	Off	TTY loop transmit isolated from power source (passive setting)
Off	On	TTY loop receive isolated from power source (passive setting)

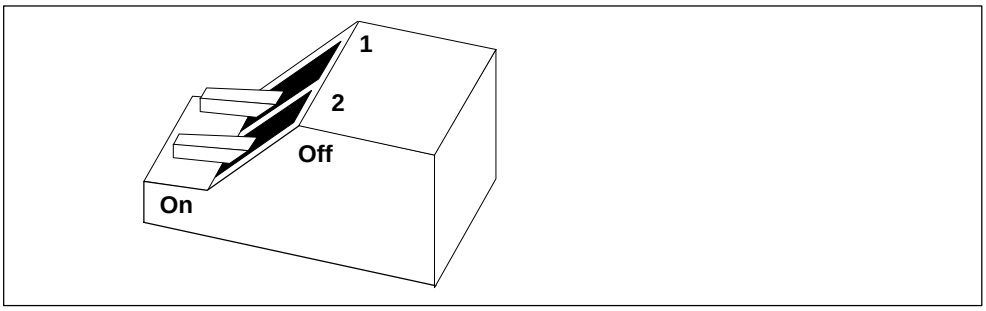


Figure 3-14 Jumper Setting, TTY Port Active

Changing the jumper setting

Proceed as follows to set the computing unit to passive:

1. Turn your device off.
2. Open the cover of the module .
3. Place the two jumpers in the “open” position (refer to Figure 3-14).
4. Close the cover of the module .

3.8 Using the Computing Unit in a SIMATIC S7 Network (MPI/DP)

Connecting to an S7 programmable controller via the MPI/DP interface

You can connect the computing unit to a SIMATIC S7 programmable controller or to a PROFIBUS network using an isolated*) MPI/DP interface. The MPI connecting cable (5m) for the connection to SIMATIC S7 CPUs (Order No. 6ES7901-0BF00-0AA0) is supplied with the computing unit. Only transfer rates up to 187.5 kbps are possible with this connecting cable. For baud rates from 1.5 Mbps, you require the 12 Mbps PROFIBUS connecting cable (Order No. 6ES7901-4BD00-0XA0).

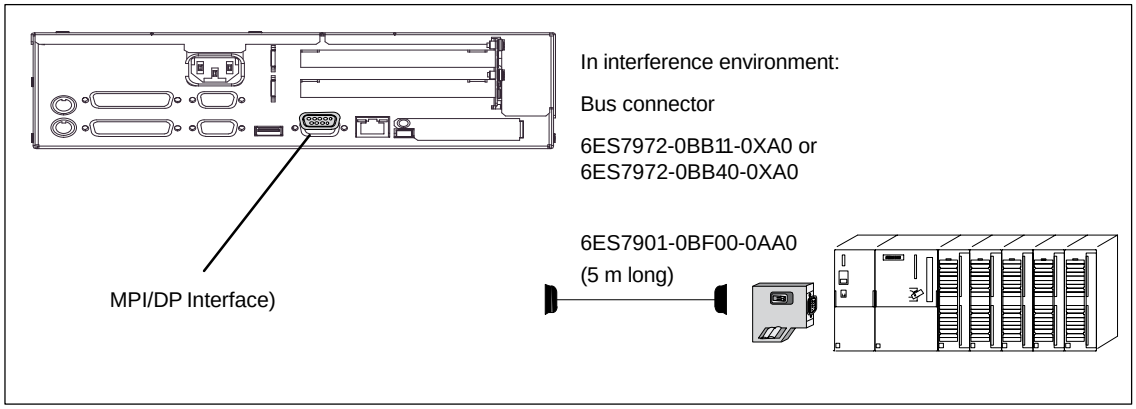


Figure 3-15 Connection Using the MPI/DP Interface

To connect the computing unit to a SIMATIC S7 programmable controller, perform the following steps:

1. Turn your device off.
2. Plug the connecting cable onto the MPI/DP interface

Caution

Danger of damage being caused to the device

Before inserting the connecting cables, the static charge your body, the device and the connecting cables must be brought to the same level. You can do this by briefly touching the metal housing.

* Optically isolated within the SELV circuit

Connection

Using the MPI/DP interface, it is possible to connect programming units with:

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

MPI/PROFIBUS-DP network

Up to 32 devices (PCs, programming units or PLCs) can be connected to the MPI/DP interface to form a network segment. The physical connection to the MPI/PROFIBUS-DP network is via an isolated RS485 interface, which is an integral part of the programming unit basic board.

Several MPI/PROFIBUS-DP network segments can be connected via repeaters. The complete MPI/PROFIBUS-DP network can consist of up to 127 nodes. Data transfer rates from 9.6 kbps to 12 Mbps are possible on the MPI network PROFIBUS-DP.

Note

You will find information on configuring an MPI/DP network in the manual *Profibus Networks* or *SIMATIC NET*.

3.9 Networking the Computing Unit and Other Nodes via PROFIBUS

Networking the computing unit via PROFIBUS

PROFIBUS is an open and rugged bus system for industrial use. It can be used to configure networks with up to 32 nodes per segment. PROFIBUS-DP supports data rates of 9.6 KBaud to 12 MBaud.

How the network functions

The network operates on the ”token passing with subordinate master/slave” principle (complying with DIN 19245, PROFIBUS). It distinguishes between active and passive nodes. An active node receives the token and passes it on to the next node within a specified time.

Hardware requirements

Using the following components, for example, you can connect or network the computing unit to/with PROFIBUS:

- interface RS 485, MPI/DP interface, integrated
- shielded, twisted pair (bus cable or spur line)

Note

Please refer to the SIMATIC NET Catalog IK 10 for further information on the SIMATIC Net PC cards.

3.10 Networking the Computing Unit and other Computers via Industrial Ethernet

Networking the computing unit via Industrial Ethernet

Industrial Ethernet is an industry standard bus system based on ETHERNET (ISO 8802/3). The main features of Industrial Ethernet are:

speed (10 Mbps), simple expansion, open communications and widespread application.

How the network functions

Industrial Ethernet is the generic name of networks and network components operating according to the CSMA/CD (ETHERNET) principle. Industrial Ethernet is a network having a bus structure, data transmission being performed with a triaxial cable (H1).

Note

Please refer to the SIMATIC NET Catalog IK 10 for further information on the SIMATIC Net PC cards.

3.11 Connection under Windows

Windows supports point-to-point connection via the LPT or COM. The connecting cables are standard, commercially available connecting cables. Refer to the section on networks in your Windows description or online Help “Connection to Another Computer”.

Computing Unit Expansions

4

What does this chapter contain?

You can enhance the functionality of your computing unit by installing additional main memory. This chapter describes how to expand your computing unit. Please observe the safety notes it contains.

Chapter Overview

4.1 Opening the Device

4.1.1 Requirements

The device is designed for easy maintenance so that any work that may be necessary can be done quickly and economically.

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 electrostatic sensitive devices at the end of this manual (ESD Guidelines).

Limitation of liability

All technical specifications and approvals apply only to expansion modules approved by SIEMENS.

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

All the modules and components are electrostatically sensitive. Please study the notes on electrostatic sensitive devices. The following symbol indicates that electrostatically sensitive modules are present.

Before opening the device

Note the following rules before opening the device:

- Before you disconnect the power supply cable, discharge the electrostatic charge on your body. You can do this by briefly touching the mounting plate for the interfaces on the left side of the device.
- Discharge the electrostatic charge from tools you are using.
- Wear a grounding strap when handling components.
- Leave components and component parts in their packaging until you are ready to install them.
- Disconnect the device from its power supply before plugging in or removing any components or component parts.
- Touch components and module only on their edges. Do not touch contact pins or printed conductors.
- Never operate the device with the cover open.

Tools

You can perform all necessary installation work on the computing unit with screwdrivers of the type TORX T10 and TORX T8.

4.1.2 Opening the Computing Unit

To open the computing unit, perform the following steps:

1. Turn off the computing unit, pull out the mains connector and remove all interconnecting cables and connecting cables from the device, including the keyboard cable.
2. Remove the computing unit from its mounting/cabinet (only necessary if mounting screws are inaccessible as a result of installation).
3. Undo the two screws (refer to Figure 4-1) on the housing cover.
4. Raise the cover slightly.
5. You can then remove the housing cover.

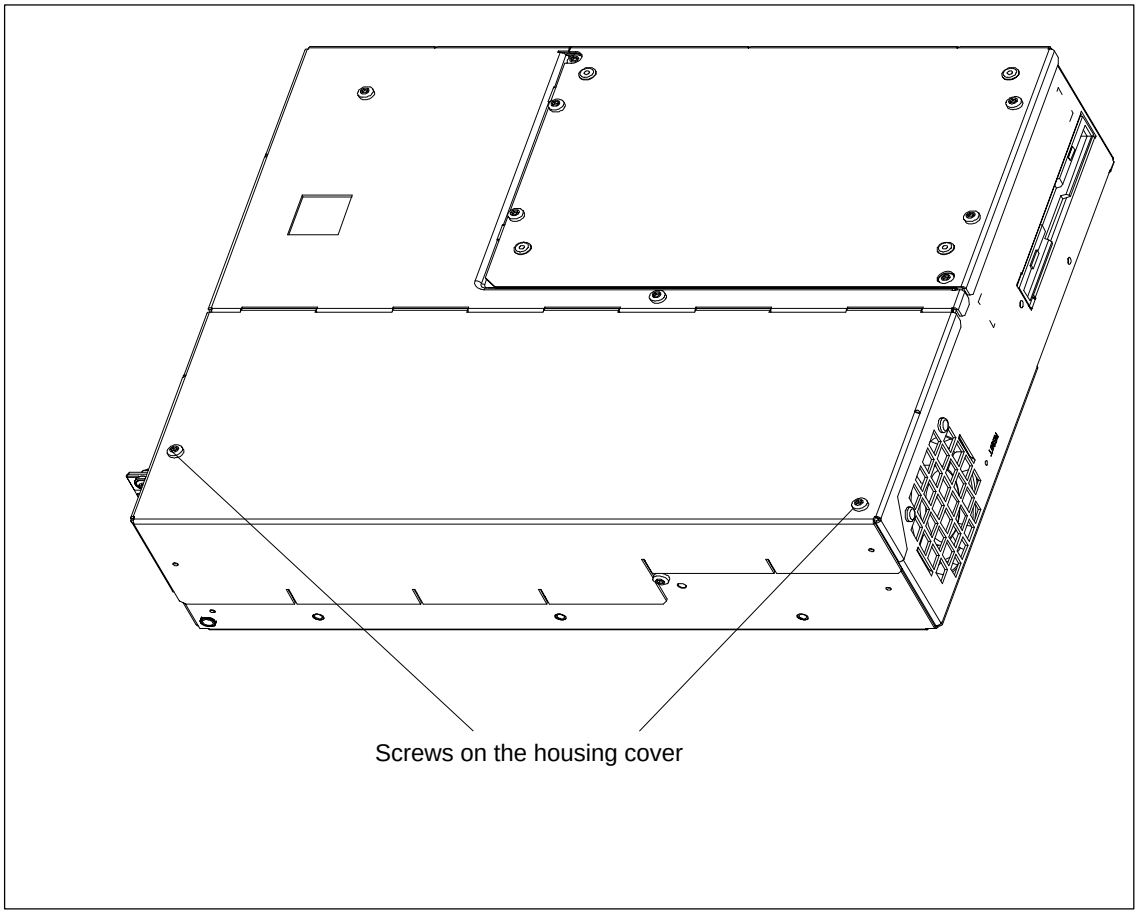


Figure 4-1 Computing Unit Prepared for Opening

4.1.3 Functional Units Visible After opening the Device

View

Once you have removed the top cover of your unit, the functional units are visible.

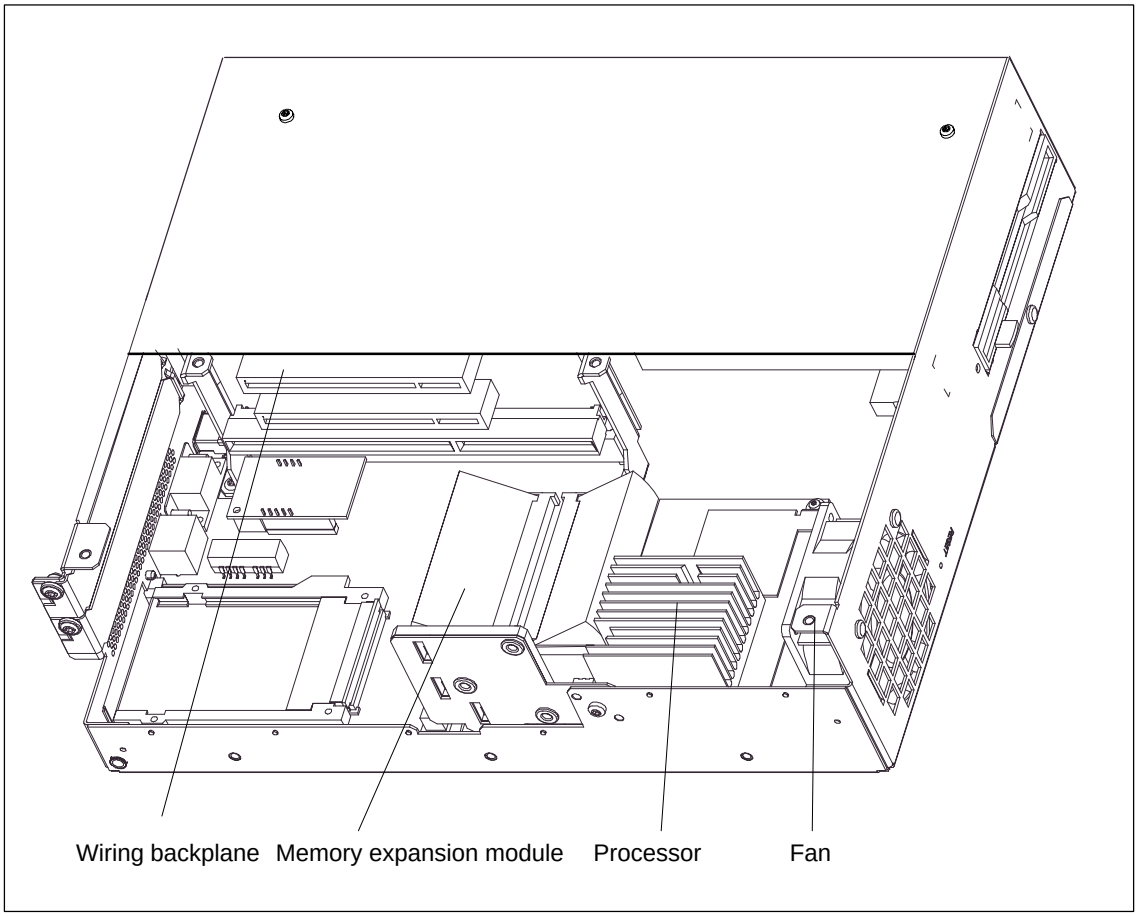


Figure 4-2 Computing Unit Open

4.1.4 Block Diagram of the Motherboard

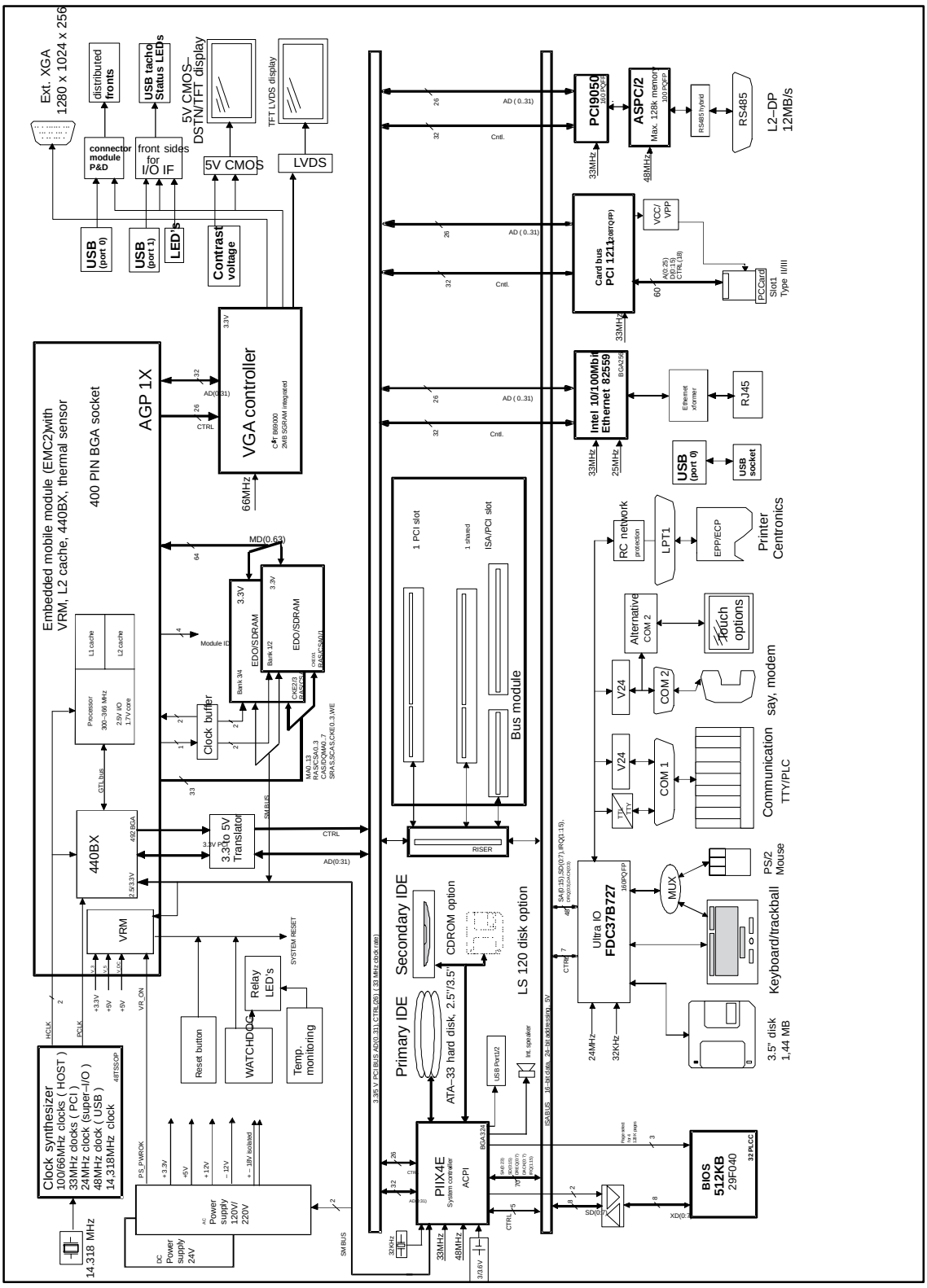


Figure 4-3 Block Diagram, Computing Unit

4.1.5 The Motherboard

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

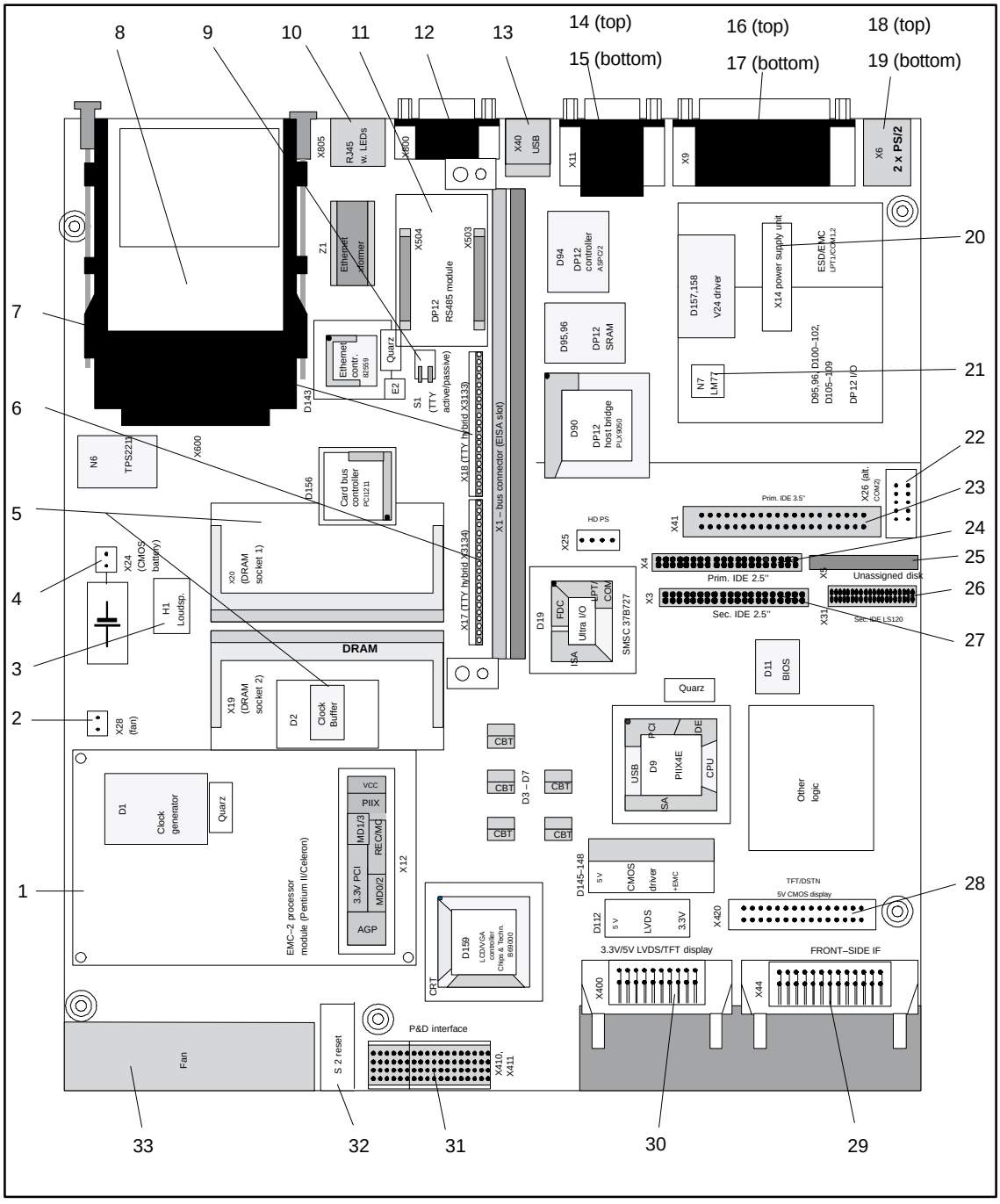


Figure 4-4 Motherboard

Components on the motherboard

The following components are located on the computing unit:

Serial Number	Functions
1	Processor module with heat sink
2	Connector for fan
3	Loudspeaker
4	Connector for clock battery
5	System memory, 2 slots
6	TTY sender
7	TTY receiver
8	PC card slot
9	DIP switch TTY active/passive
10	RJ45 socket for Ethernet LAN
11	DP12 RS485 module
12	MPI/DP port
13	USB bus connector
14	Serial interface COM 2
15	Socket for VGA monitor
16	Serial port COM 1/TTY
17	Parallel port LPT 1
18	PS/2 mouse connector
19	PS/2 keyboard connector
20	Power supply connection (power supply unit)
21	Temperature sensor
22	Connector, alternative COM2
23	IDE connector for 3.5” hard disk
24	IDE connector for 2.5” hard disk
25	Floppy disk cable connector
26	IDE connector for LS 120
27	IDE connector for CD-ROM
28	Connector for 5 V CMOS display
29	Connector for front-side IF
30	Connector for LVDS display (3.3 V/5 V)
31	Expansion slot for P&D interface module
32	Momentary-contact switch for hardware reset
33	Fan

4.2 Installing Additional Memory

Standard memory

The motherboard has 2 slots for 144 pin SO DIMM memory submodules. This allows you to expand the memory capacity of your computing unit to 256 Mbytes.

The basic configuration – depending on the device configuration you ordered – consists of a SDAM module of up to 256 Mbytes. Only one module has to be installed.

Memory	Modules		
	32 MB	64 MB	128 MB
64 MB	–	1	–
128 MB	–	2	–
128 MB	–	–	1
192 MB	–	1	1
256 MB	–	–	2

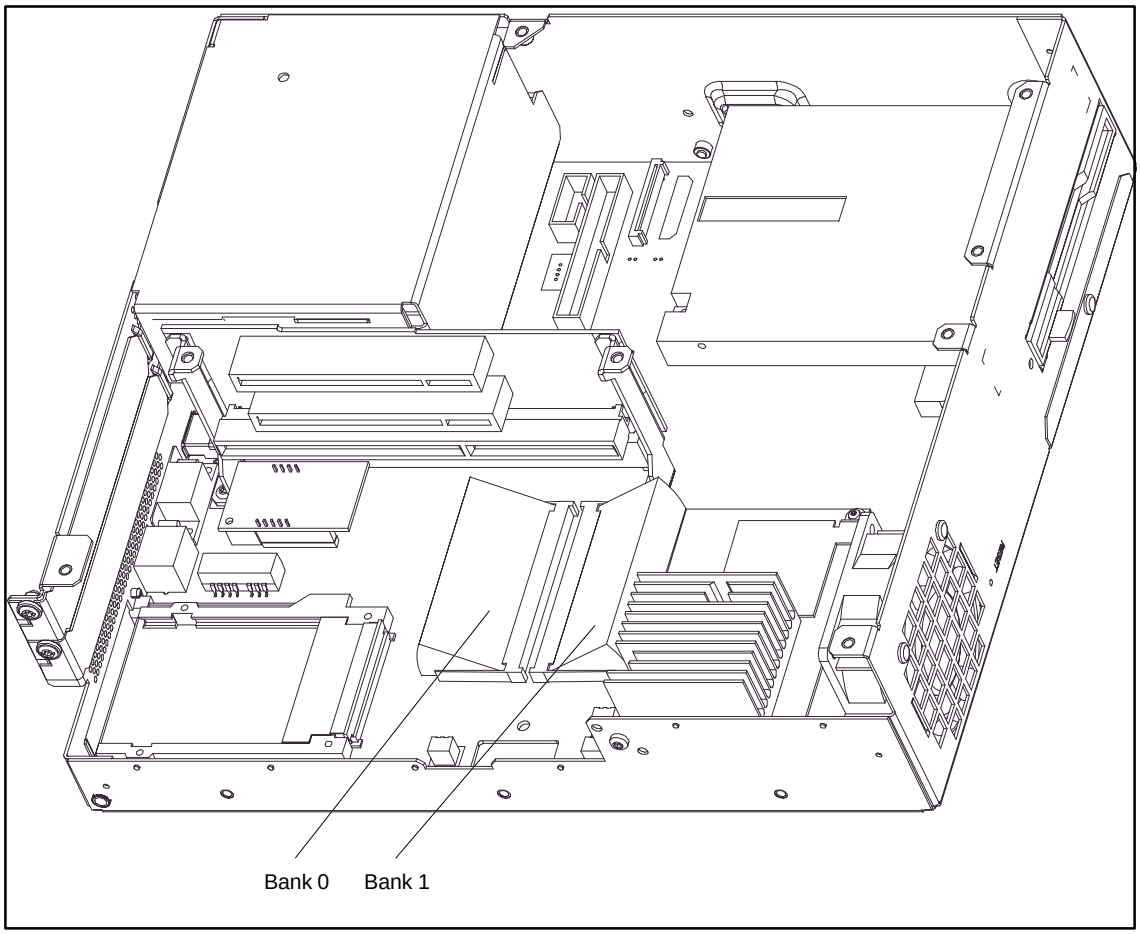


Figure 4-5 Position of SO DIMM Memory Submodules

Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures, therefore, have to be taken when handling them. These measures are explained in the guidelines for electrostatic sensitive devices (ESD Guidelines at the end of this manual).

Installing the SO DIMM Submodules

To insert the submodules, perform the following steps:

1. Open the unit first as described in section 4.1.
2. Insert the submodules into the sockets. Note the cutout (locking element) on the connector side of the SO DIMM module.
3. Press the submodule down applying light pressure until it locks into place.
4. Close the device.

Caution

Danger of damage!

The submodules must be sit securely in the slots, otherwise they might fall out and be damaged.

Installation

The memory capacity is detected automatically. When you switch on the device, 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 real-time clock even after the device is turned off. In addition to the time of day, all the information about the device (device configuration) is stored. If the backup battery fails or is removed from its plug, these data are lost.

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

Battery voltage too low

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

Replacing the battery

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

To change the battery, perform the following steps:

1. Turn off you device, and remove the mains cable and all interconnecting cables.
2. Open the device as described in section 4.1.
3. Change the backup battery inserted in the motherboard by pulling out the cable and undoing the cable tie.
4. Secure the new battery in its mounting with a cable tie.
5. Insert the battery connector in the motherboard.
6. Close the device.

Caution

Danger of damage!

Only replace the lithium battery with an identical battery or with a type recommended by the manufacturer (Order No: W79084-E1003-B1).

Dispose of used batteries in keeping with local regulations.

Improper replacement of the battery poses danger of explosion.

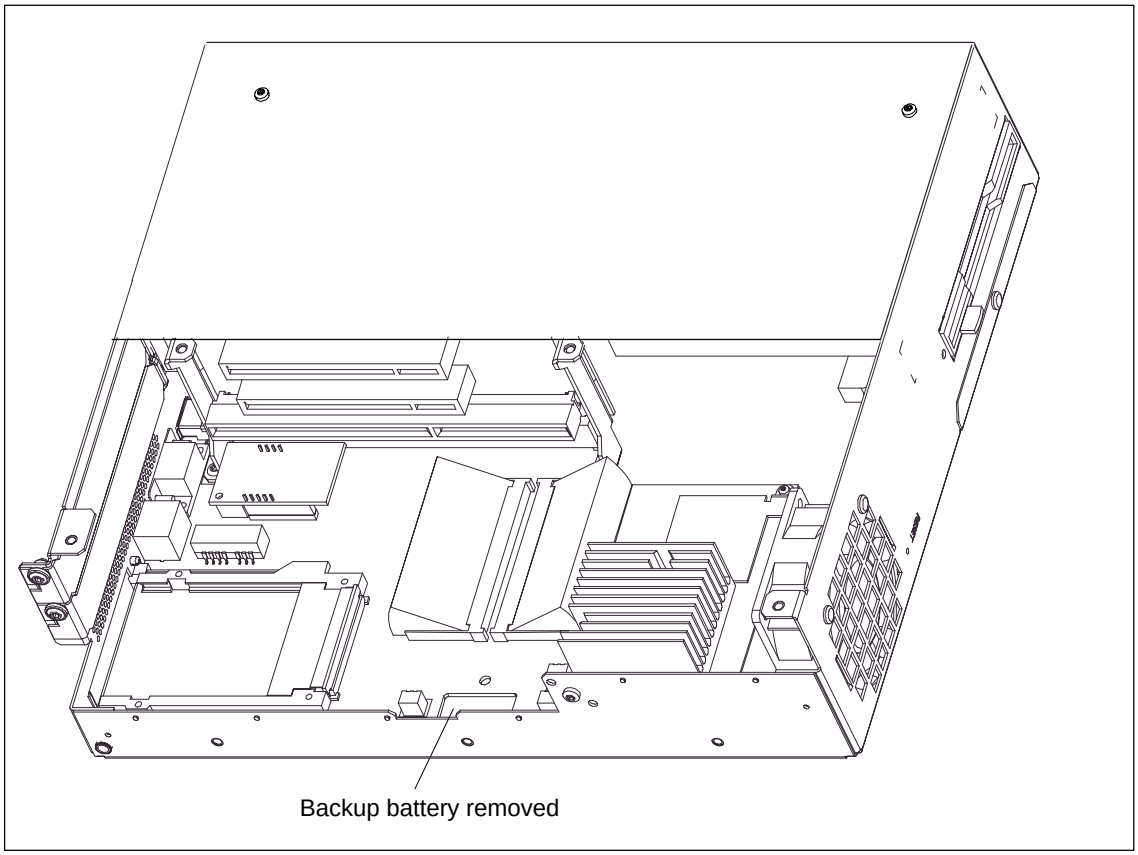


Figure 4-6 Position of the Backup Battery

Warning

Danger of bodily injury and damage to property, danger of release of noxious matter.

A lithium battery can explode if mistreated and noxious matter might be released if old batteries are disposed of wrongly.

Do not throw new or empty lithium batteries into the fire, and do not solder on the cell housing; do not recharge lithium batteries or force them open.

Obtain lithium batteries only from Siemens (Order No: W79084-E1003-B1).

If possible, return old lithium batteries to the manufacturer or recycling facility or dispose of them as special garbage.

Changing SETUP

If you change a battery or unplug the battery connector, you must run SETUP to reset your device's configuration data (refer to Chapter 5).

4.4 Installing ISA/PCI Cards

Notes about the cards

The computing unit is designed for the use of cards as per the AT/PCI specification. The dimensions of the cards must not exceed the stated dimensions. If the height is exceeded, contact problems, malfunctions and difficulties with installation cannot be ruled out. The illustrations show full length AT/PCI cards. Depending on the slot, there might be constraints concerning the overall length.

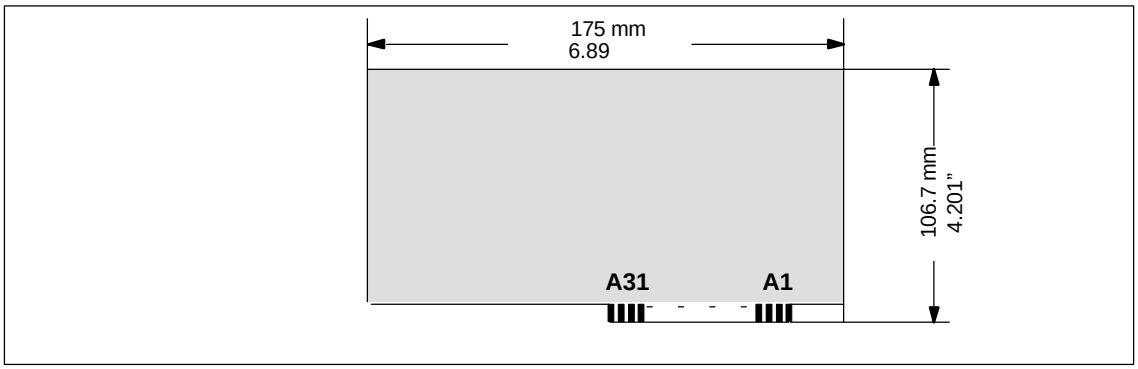


Figure 4-7 XT Card

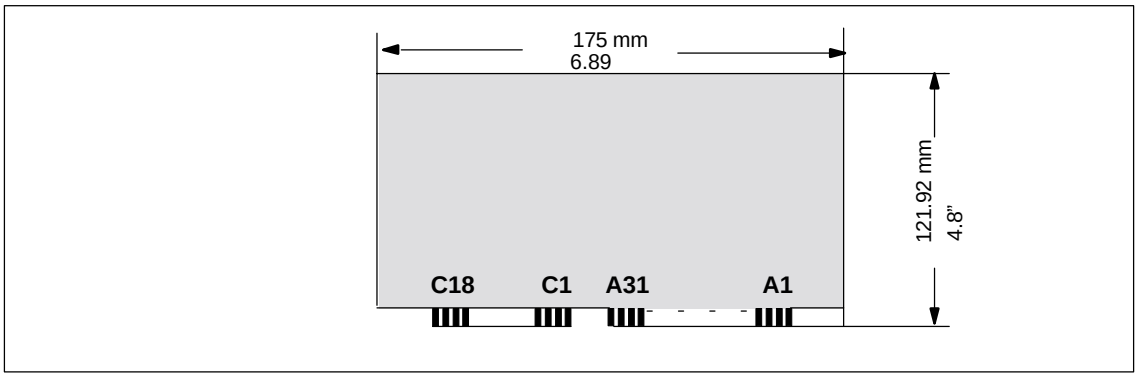


Figure 4-8 AT Card

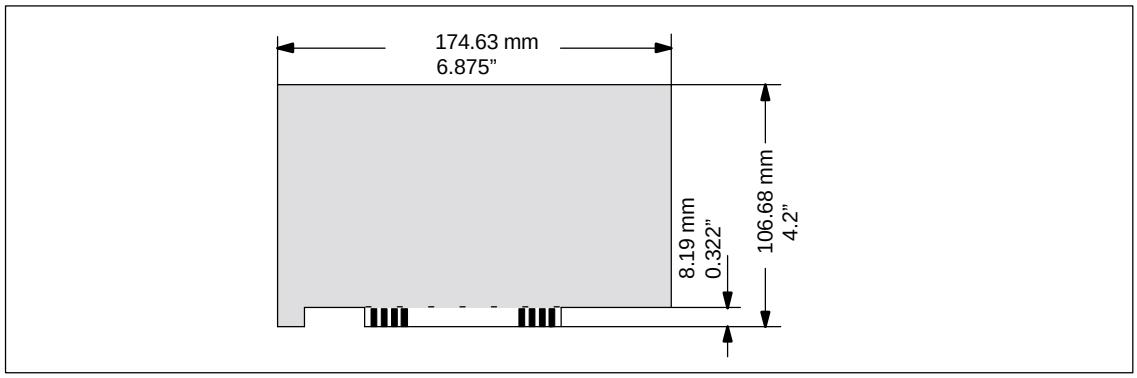


Figure 4-9 Short PCI Card (5 V)

Figure 4-10 Long PCI Card (5 V)

Note about long PCI cards

Before long PCI cards can be inserted in the guides of the fan trough, they must be fitted with an extender (this should be included with the long PCI board). Long PCI cards can be inserted in the guides of ISA modules by means of this extender.

4.4.1 Removing and Installing the Device for Holding Down the Modules

Use of devices for holding down the modules increases the resistance of the modules to vibration. The device for holding down the modules is attached to the system housing with a screw. It has three slits, through which the slide elements are inserted.

Proceed as follows:

1. Open the housing as described in section 4.1.
2. Undo the fixing screw of the device for holding down the modules.
3. During assembly, ensure that the device for holding down the modules is resting on the guide on the system housing.

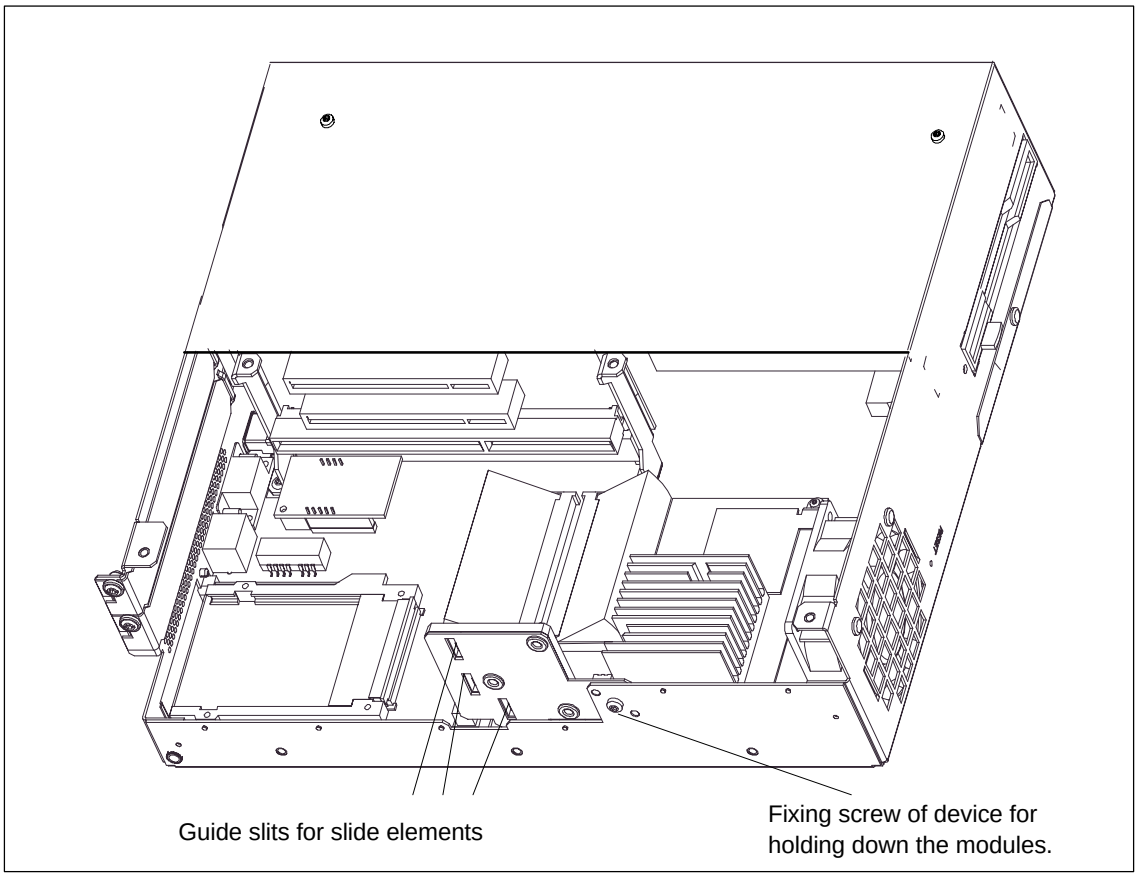


Figure 4-11 Removing and Installing an Expansion Board

Note

The slide elements are in the enclosed bag.

Aligning the device for holding down the modules:

To install the device for holding down the modules, perform the following steps.

1. Insert the slide element through the guide slit until it is resting firmly on the module. The module must now be introduced into the notch.

Caution

Do not exert pressure on the module! Therefore, do not use force to press the slide module onto the module.

2. Remove the surplus slide element:
   - Score the slide element at the top edge of the support with a knife and snap it off.
   - Nip off the surplus with a sharp side cutter.

4.4.2 Removing and Installing an ISA/PCI Card

Proceed as follows:

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

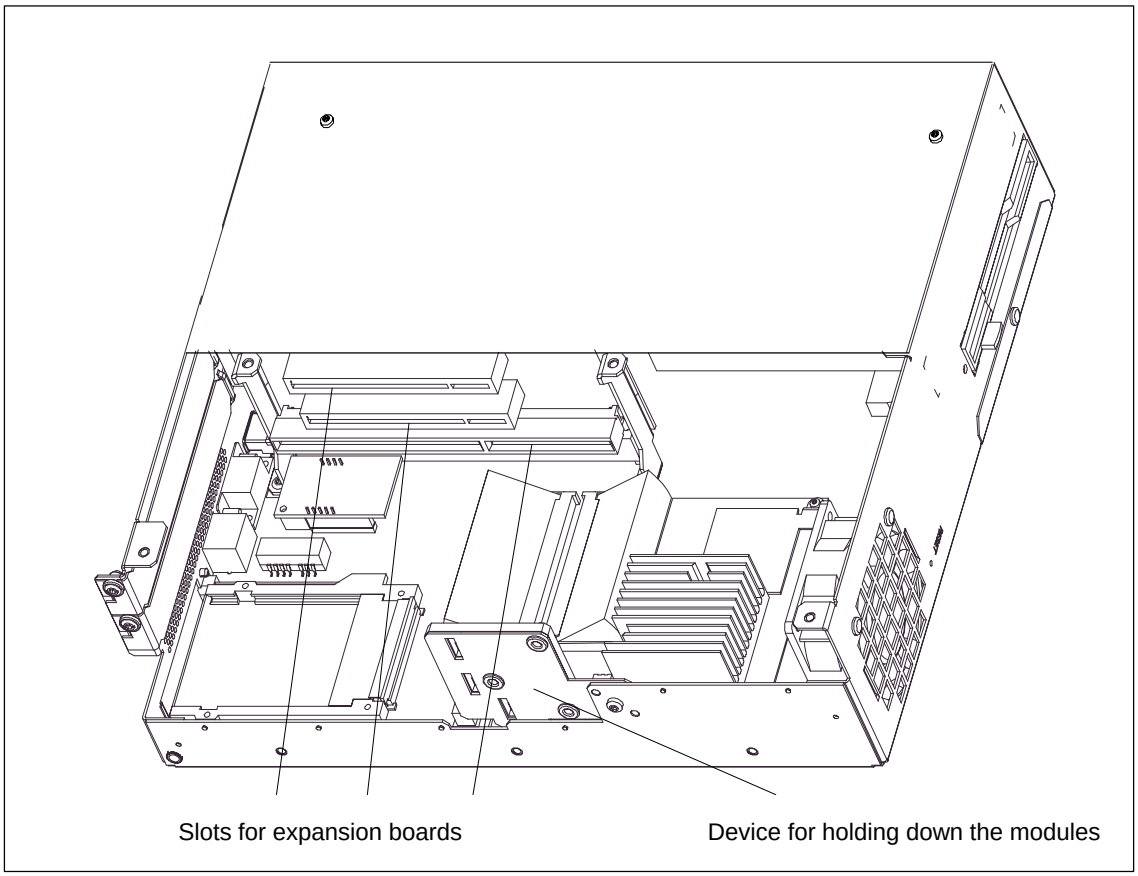


Figure 4-12 Removing and Installing an Expansion Board

4.5 Removing and Installing Drives

The basic configuration of the computing unit includes a 3.5” floppy disk drive and a 3.5” hard disk. An LS 120 drive is possible for custom solutions.

4.5.1 Removing and Installing the Hard Disk

The hard disk is used to store large quantities of data. It is installed on a vibration-damped mounting that is easy to replace.

Caution

Danger of data being lost and the drive damaged

Drives are very sensitive to unacceptable vibrations. During operation, vibrations can result in a loss of data or damage to the drive or a data medium.

If you wish to ship the device, wait until the drive has come to rest after you turn off the device. (Approximately 20 s.)

---

1. Undo the 4 screws on the back of the system housing.
2. Swing open the drive cage.
3. Detach the drive cage from its mounting and place the drive cage face down on the system housing.
4. Make a note of the cable assignment and detach the cables.
5. Proceed in the reverse order to install the new drive. The new drive must be of the same type as the one removed.

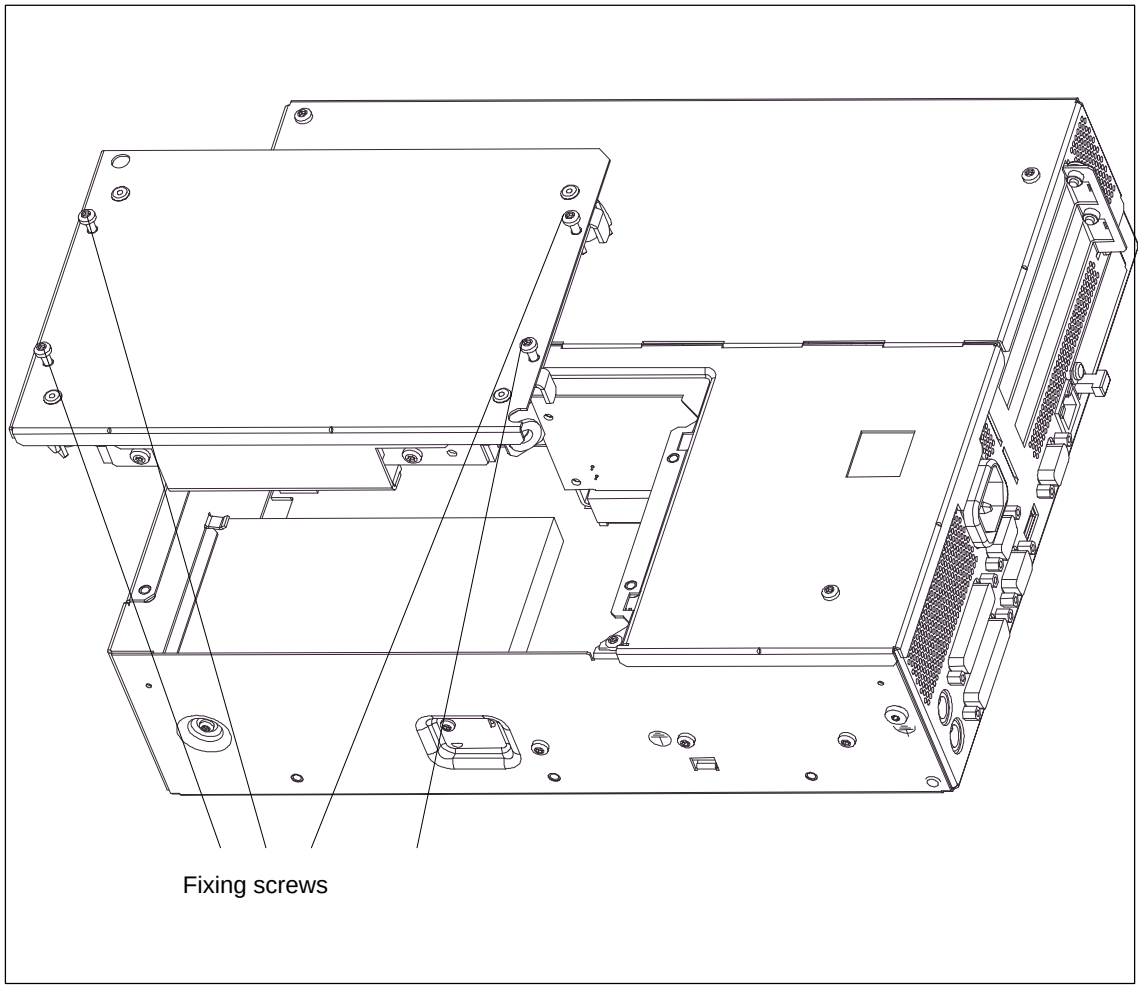


Figure 4-13 Removing and Installing the Drive Cage

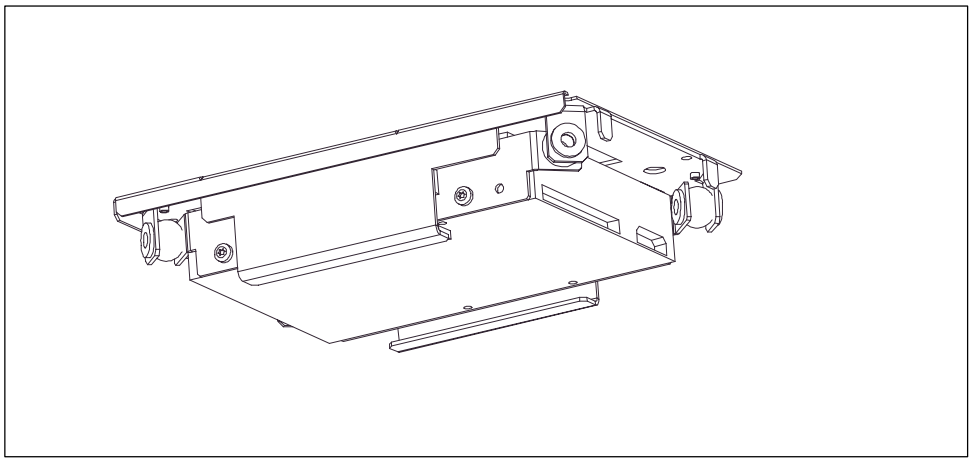


Figure 4-14 Hard Disk with Cage Removed

4.5.2 Removing and Installing a CD-ROM Drive

Depending on the hardware configuration of the device, a CD-ROM drive is installed on the computing unit. The mounting depth of the SIMATIC PC is increased by 20 mm as a result of its installation.

1. Undo the 2 screws on the back of the system housing.
2. Remove the cover of the CD-ROM drive.
3. Undo the three screws which secure the CD-ROM on the mounting.
4. Remove the CD-ROM drive from the mounting and carefully pull off the data cable.
5. Proceed in the reverse order to install the new drive.

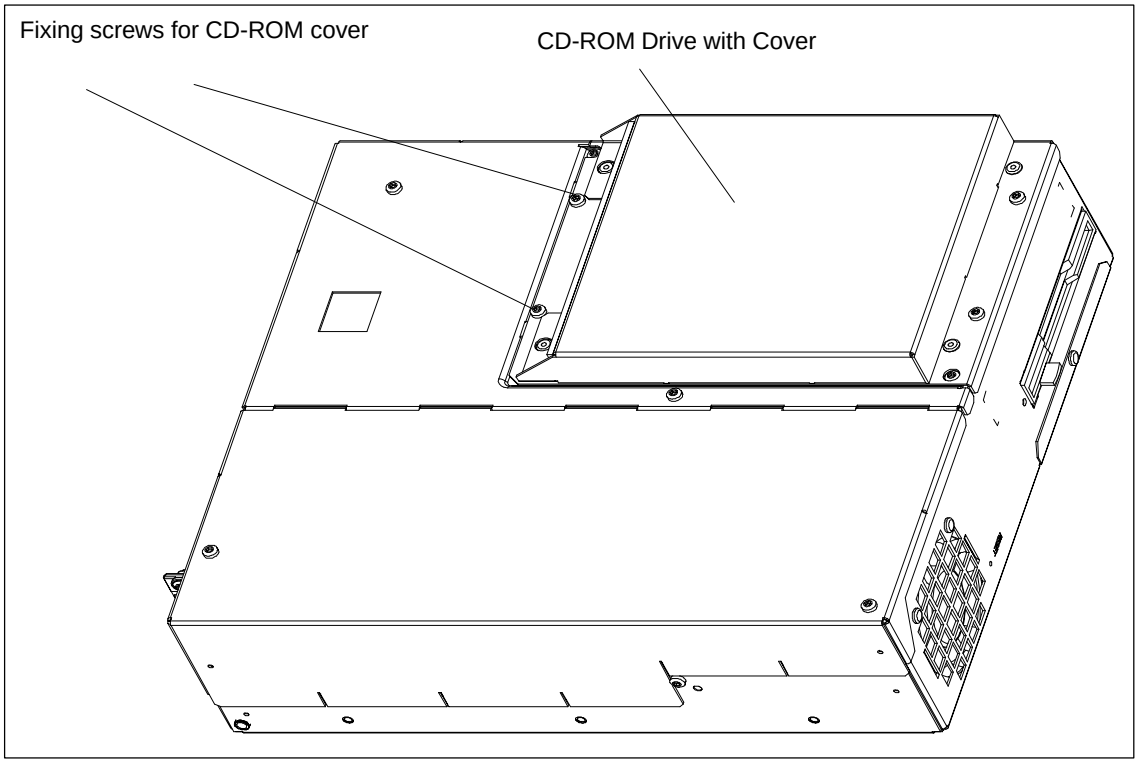


Figure 4-15 Computing unit with CD-ROM drive

4.5.3 Removing and Installing the Floppy Disk Drive

1. Remove the hard disk mounting as described in section 4.5.1.
2. Undo the interlocking of the controller flexible cable on the motherboard and pull the flexible cable out of the plug connection.
3. Undo the two fixing screws (TORX T8) on the system housing.
4. Lift the floppy disk drive upwards out of the housing.
5. Proceed in the reverse order to install the new drive. The new drive must be of the same type as the one removed.

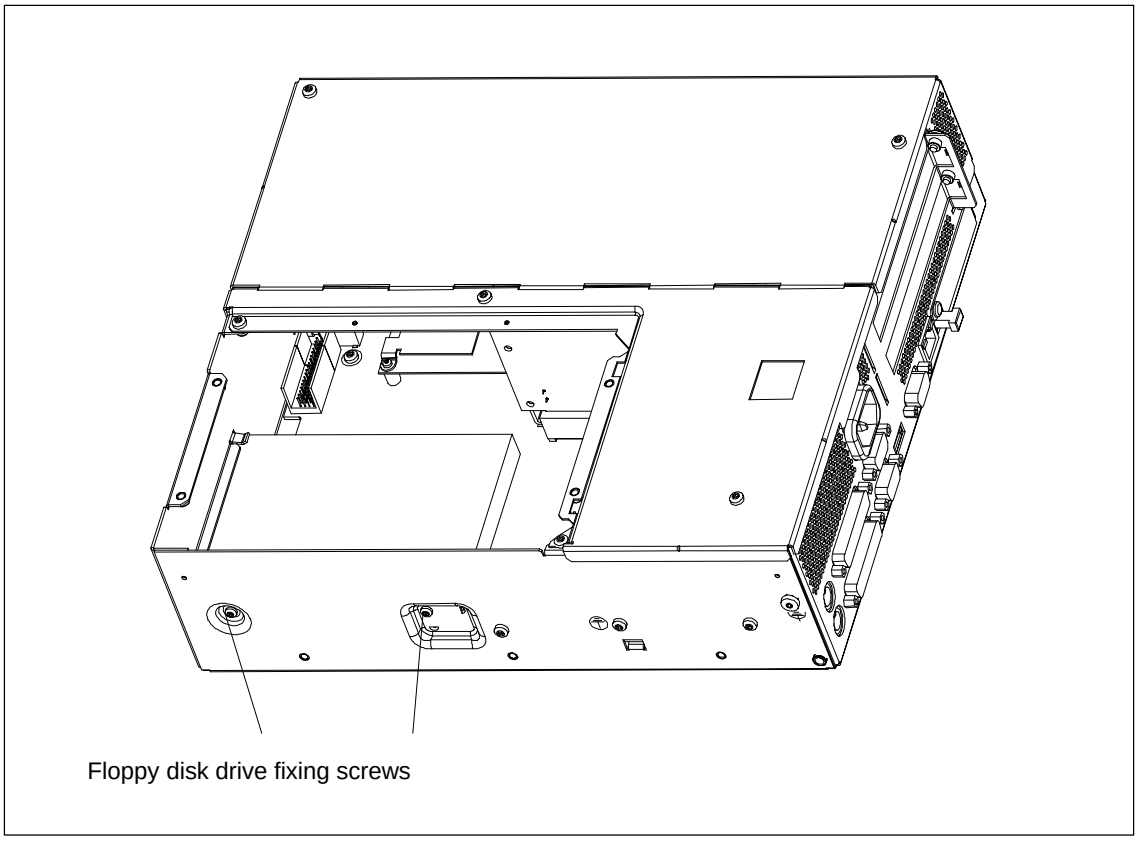


Figure 4-16 Installing the floppy disk drive

4.5.4 Removing and Installing the LS 120 Drive

To remove and install the LS120 drive, perform the same steps as for installing the floppy disk drive.

1. Remove the hard disk mounting as described in section 4.5.1.
2. Release the cable clamp assembly of the controller flexible cable on and pull the flexible cable out of the plug connection.
3. Undo the two fixing screws (TORX T8) on the system housing.
4. Lift the LS120 drive upwards out of the housing.
5. Proceed in the reverse order to install the new drive.

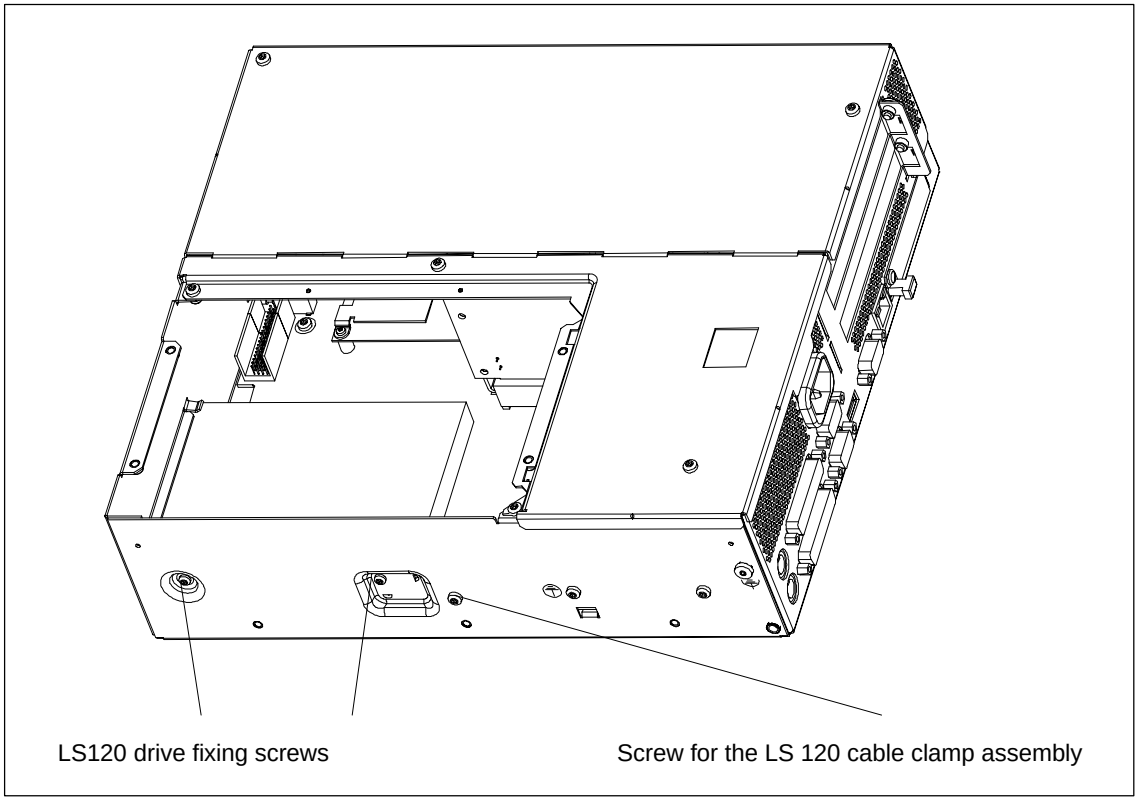


Figure 4-17 Installing the LS120 Drive

4.6 Removing and Installing the Power Supply

1. Open the system housing as described in section 4.1.
2. Remove the drive mounting as described in section 4.5.1.
3. Undo and remove the 3 screws of the cover of the power supply unit from the system housing.
4. Undo the two fixing screws (TORX T10) on the system housing.
5. Pull the power supply unit upwards out of the system housing.
6. Proceed in the reverse order to install the new power supply unit.

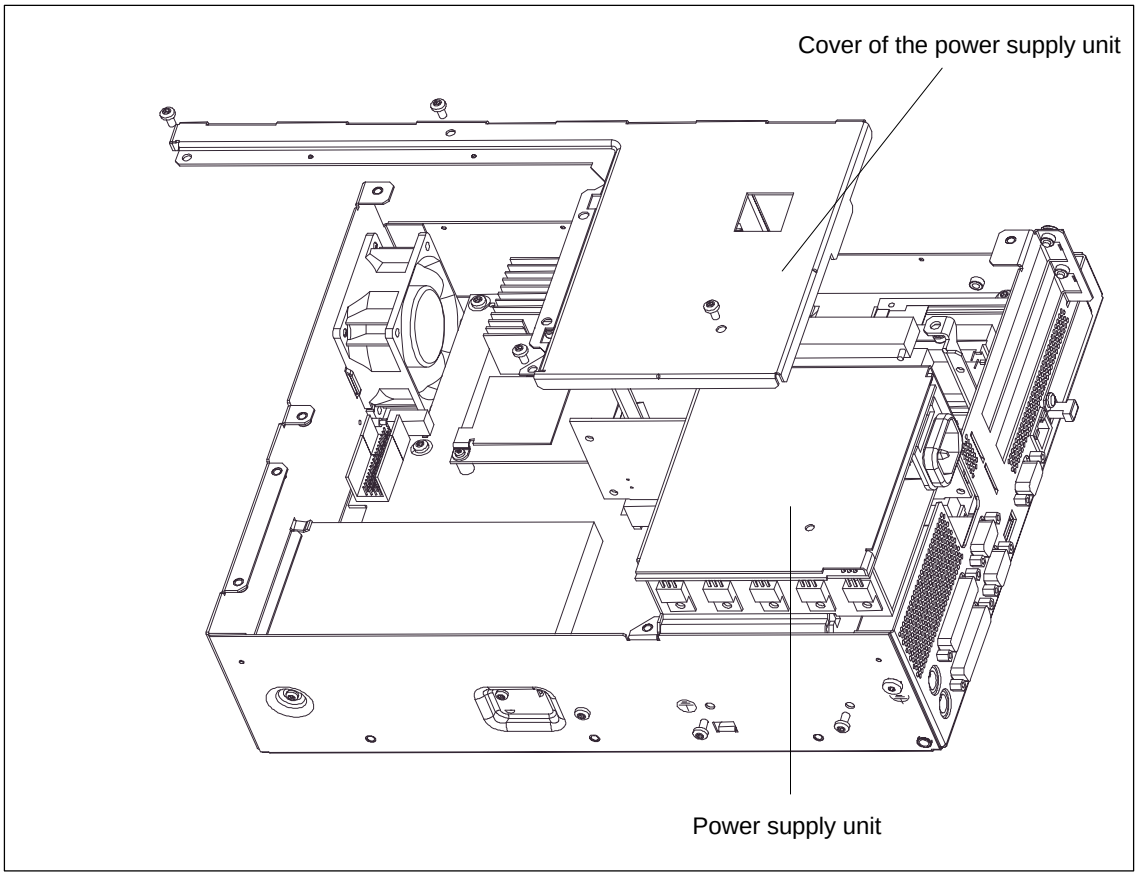


Figure 4-18 Removing and Installing the Power Supply

4.7 Removing and Installing the Wiring Backplane

1. Open the system housing as described in section 4.1.
2. Remove all the modules from their slots (perform the steps described in section 4.4.2).
3. Remove the drive mounting as described in section 4.5.1.
4. Remove the power supply unit as described in section 4.6.
5. Undo the screw on the motherboard.
6. Pull the wiring backplane from the motherboard.
7. Proceed in the reverse order to install the new wiring backplane.

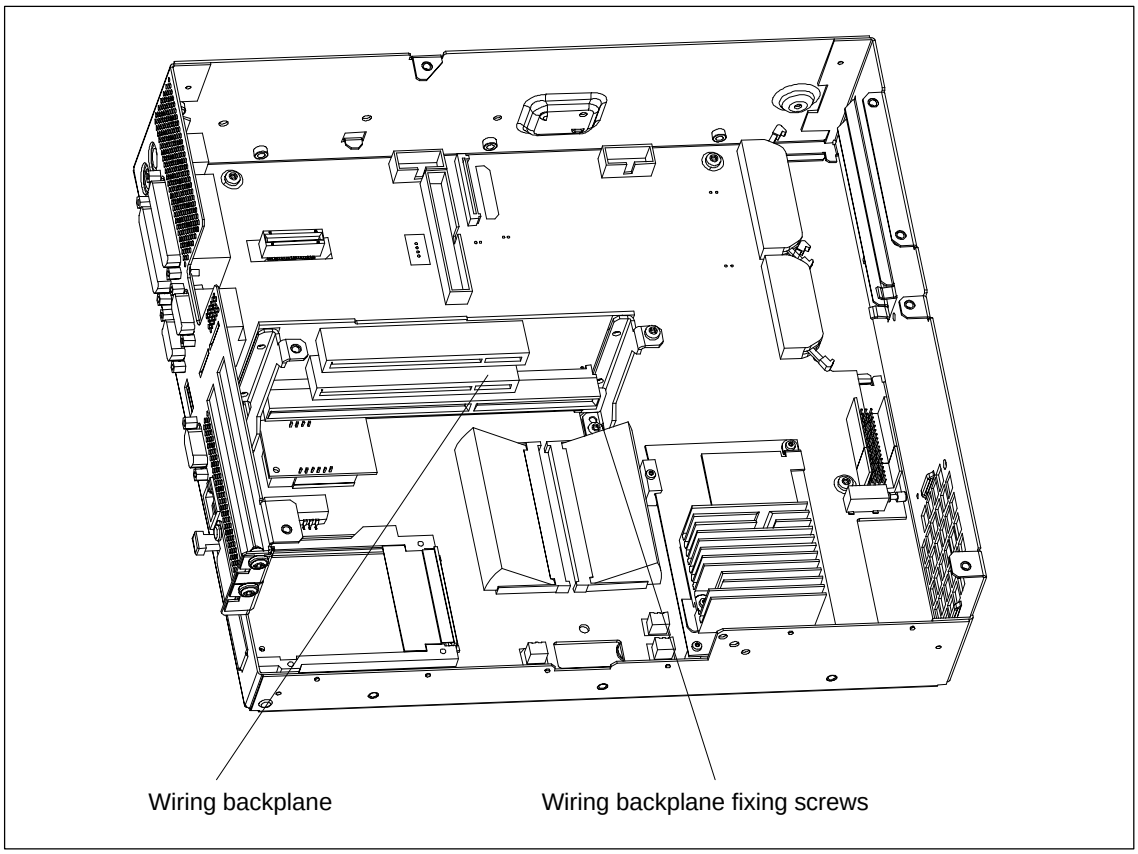


Figure 4-19 Removing and Installing the Wiring Backplane

4.7.1 Removing and Installing the Motherboard

1. Open the system housing as described in section 4.1.
2. Remove all the modules from their slots (perform the steps described in section 4.4.2).
3. Remove the drive mounting as described in section 4.5.1.
4. Remove the power supply unit as described in section 4.6.
5. Undo 7 screws on the motherboard and undo 10 hexagon head cap screws at the interfaces.
6. Remove the wiring backplane and the motherboard.
7. Proceed in the reverse order to install the motherboard.

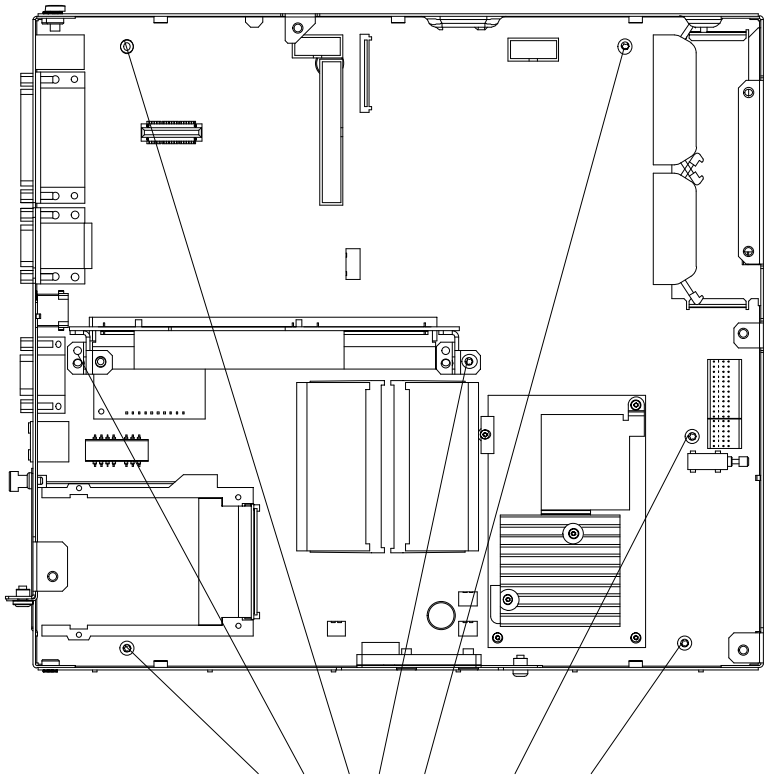


Figure 4-20 Fixing Screws on the Motherboard

The motherboard is supplied as a spare part without a processor, memory submodules or wiring backplane.

4.8 Removing and Installing the Fan

The computing unit is cooled by means of a fan, which extracts hot air out of the housing.

1. Open the system housing as described in section 4.1.
2. Pull off the fan cable connector on the basic board.
3. The fan is secured to the system housing by two plastic rivets. Undo the rivets by pressing out the gudgeon from the rear of the rivet shank.
4. Remove the fan.
5. Proceed in the reverse order for assembly.

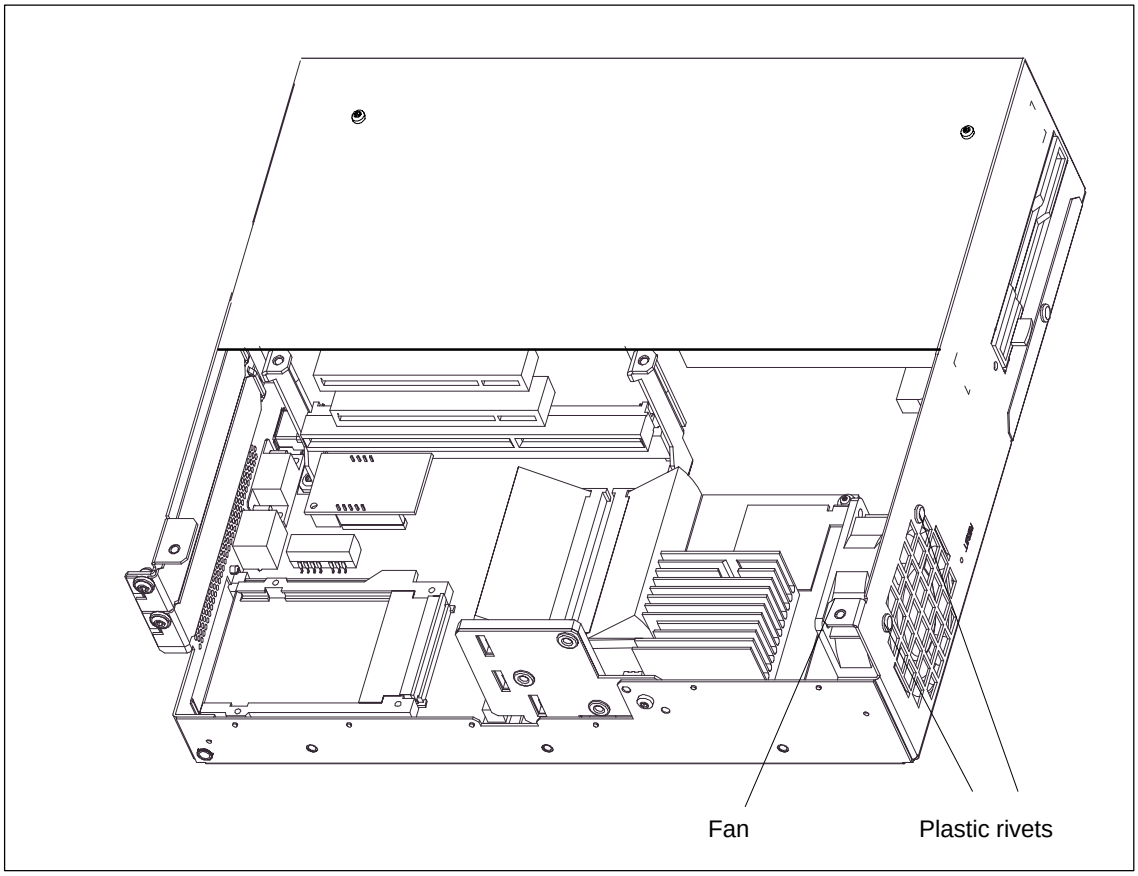


Figure 4-21 Removing and Installing the Fan

Note

Fit only a fan of the same type!

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 is pointing towards the housing wall.

4.9 Processor Upgrade

You can boost the performance capability of your computing unit by installing other processors. Consult your local service partner or distributor.

Note

Processor upgrade

If the processor is upgraded, for example to a processor with a different frequency, it might be necessary to upgrade the BIOS.

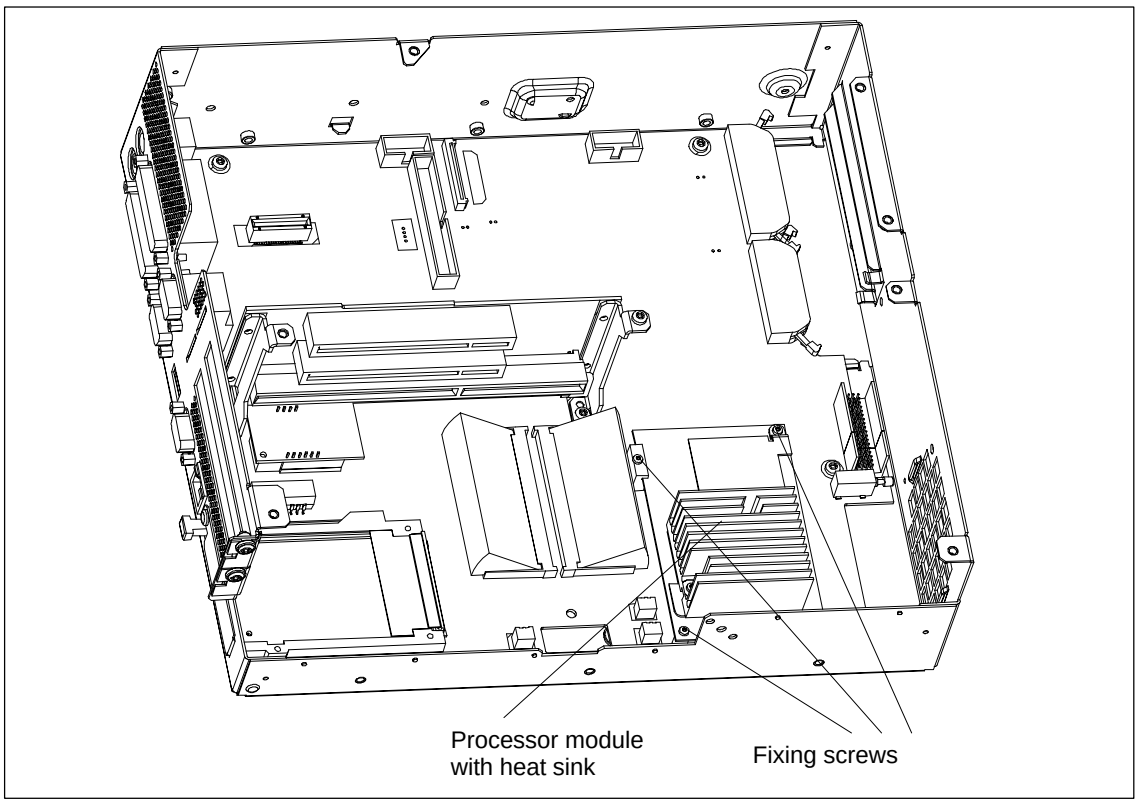


Figure 4-22 Position of the Processor

Proceed as follows:

1. Open the system housing as described in section 4.1 and remove all expansion boards (refer to section 4.4.2).
2. Undo the 3 fixing screws (TORX T6) of the module on the motherboard.
3. Then you can remove the CPU from the computer housing.
4. Proceed in the reverse order for assembly.

Note

The processor is supplied as a spare part without a heat sink.

4.10 Switch Adjustment/Jumpers

TTY jumpers (S1)

S1-1	S1-2	Function
On	**On**	Active TTY port (default setting)
On	Off	TTY loop transmit isolated from power source (passive setting)
Off	On	TTY loop receive isolated from power source (passive setting)

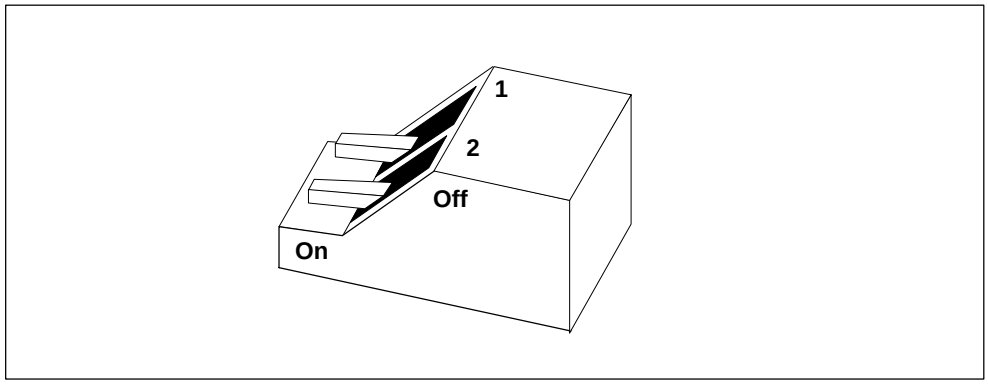


Figure 4-23 Jumper Setting, TTY Port Active

4.11 Network Connections and Interconnections

4.11.1 Connecting the MPI/DP Port

Connecting a PROFIBUS-DP network via the MPI/DP port

You can connect the computing unit to PROFIBUS-DP networks via the isolated *) MPI/DP port. The physical connection is established with SINEC-L2 components for stationary connections or using the 5 m long MPI connecting cable for non-stationary connections. SINEC-L2 components and MPI connecting cables are not included in the scope of supply of the computing unit and have to be ordered separately. The MPI connecting cable (5 m) can only be used for transfer rates up to 187.5 Kbaud.

To connect the computing unit to a PROFIBUS-DP network, perform the following steps:

1. Turn your device off.
2. Plug the power lead (of SINEC-L2 components or MPI connecting cable) onto the MPI/DP socket of your computing unit and secure the connector by tightening the screw-type lock.
3. Turn your computing unit on.

Caution

Danger of damage being caused to the device

Always discharge your body's charge before inserting power leads and connecting cables by briefly touching a grounded object (ESD Guidelines).

MPI/PROFIBUS-DP network

Up to 32 devices (computing units, programming devices, PLCs or DP components) can be interconnected to form a network segment. The physical connection to the PROFIBUS-DP network is via an isolated *) RS458 interface, which is an integral part of the interface.

Several PROFIBUS-DP network segments can be connected via repeaters.

The complete PROFIBUS-DP network can consist of up to 127 nodes. The data transfer rate on the MPI network is 187.5 kbaud, whereas on the PROFIBUS-DP network data transfer rates of 9.6 kbaud to 1.5 Mbaud are supported by the MPI/DP interface.

Note

You will find information on how to configure a PROFIBUS-DP network in the manual "Programmable Controller S7-300, Configuration, CPU Data" Order No. 6ES7 398-8AA03-8AA0.

*) Isolated within the safety extra-low voltage circuit SELV

4.11.2 Point-to-Point Connection

Point-to-point connection

This section describes the options for connecting your computing unit to a programming unit or a programmable controller in a point-to-point connection.

A point-to-point connection is possible by connecting the computing unit to a programming unit or a programmable controller by means of:

- a V.24 connection
- a TTY connection

You will find detailed notes in section 6.12.

Configuring notes for interfaces with current loop (TTY, 20 mA)

Different criteria have to be taken into account for reliable operation of a connection. The maximum data transfer rate (baud rate) depends on the required distance, the type of cable, the pin assignment of the interface and external interference.

Rules

Observe the following generally applicable rules to reduce interference:

- The shielded cable used must have a low line resistance (< 130 Ω/km) and a low capacitance (< 90 pF/m). Twisted-pair cables are less susceptible to inductive interference. A low line resistance result in reduced voltage excursions and shorter charge reversal times; the line resistance decreases with increasing conductor cross-section for the same length of cable.
- The shorter the data transmission link, the higher the maximum possible transfer rate.
- If there is an active transmitter and an active receiver at the same end of the transmission link, the sequence of access priority to the transmission circuit must be taken into account in order to achieve the longest possible transmission link.
- Signal lines and power lines must not be run together. Signal lines must be installed as far away as possible from sources of strong interference (for example, 400 V 3-phase power cables).
- The active TTY interface with a 12 V open-circuit voltage has been tested on a 1000 m long cable at a transmission rate of 9600 bps in an environment with normal levels of noise (field strength < 3 V/m). If a LiYCY 5 x 1x 0.14 shielded cable is used, reliable transmission is possible over a distance of up to 1000 m. The AS511 driver was used for testing (only one transmitter at a time).

Note

The interference field of the source of interference is reduced by the square of the distance.

Connecting the computing unit to an S5 programmable controller

You can connect the computing unit to a SIMATIC S5 programmable controller using the COM1/TTY interface.

To connect the computing unit to a SIMATIC S5 programmable controller, perform the following steps:

1. Turn your computing unit off.
2. Plug the connecting cable onto the COM1 /V.24/PLC port.

Caution

Danger of damage being caused to the device

If you interchange the connectors, or use wrong connecting cables, the port might be damaged. Be careful not to plug the TTY cable in the LPT 1 port of the computing unit instead of the COM1/TTY port.

Always discharge your body's charge and the charge of connecting cables before plugging in connecting cables by briefly touching a grounded object (ESD Guidelines).

Use only the original connecting cable for the connection to the programmable controller.

The computing unit and the programmable controller must be operated at the same protective conductor voltage.

Connecting the computing unit via an adapter

An adapter is available for connecting the computing unit to the PLC with earlier standard connecting cables.

Interface	Connection	Connecting cable	Adapter
TTY interface (COM1)	Computing unit with SIMATIC S5 programmable controller	6ES5 734-2BD20	
		6ES5 731-1xxx0 15-pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25-pin	6ES5 731-6AG00

High data transfer rate at distances up to 1000 m

In order to maintain a data transmission rate of 9600 bps up to a distance of 1000 m, the receive diode is connected to ground (reference) via the connecting cable. Cables of various lengths are available under the order number 6ES5 734-2xxx0 (xxx stands for the length code).

4.12 Reset Button

A hardware reset is initiated by means of the reset button on your device. The computing unit is restarted (cold restart).

On the computing unit, the reset button is located on the drive side beside the floppy disk drive. The reset button can only be operated with the aid of a pointed object (for example, tip of a ball-point pen or elongated paper clip). The position of the reset button is marked in the illustration of the computing unit below.

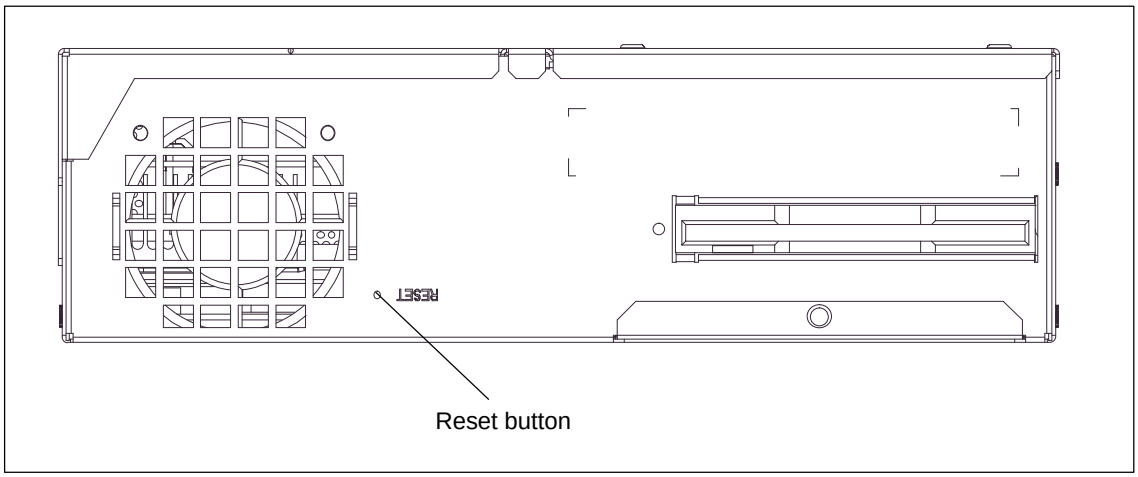


Figure 4-24 Reset Button on the Computing Unit

Configuring the Computing Unit

5

What does this chapter contain?

In this chapter, you will learn how to configure your computing unit. You need to do this if you want to change your system by adding, removing, or exchanging an extension board, memory expansion module, or by replacing a system module.

Chapter Overview

5.1 Modifying the Device Configuration with SETUP

Modifying the device configuration

The device configuration of your computing unit is preset for working with the software supplied to you. You should only modify the preset values if you have performed technical modifications to your device or if a fault occurs when the unit is powered up.

SETUP program

The Setup program is in the ROM BIOS. The system configuration settings are stored in the battery-protected memory of the computing unit.

You can use Setup to define the hardware configuration (for example, hard disk type) and system properties. Setup is also used to set the system date and time on the clock module.

Incorrect SETUP data

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

- start the SETUP program by pressing F2 or
- continue booting by pressing F1.

Starting SETUP

On completion of the startup test (warm or cold restart), the BIOS gives you the opportunity of starting the SETUP program. The following message appears on the display:

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

Press F2 for as long as the BIOS prompt appears.

When the computing unit is delivered to you, the default settings apply, but you can change and save them. The changes take effect upon completion of the BIOS Setup.

After BIOS Setup has started, the following dialog box appears on the screen:

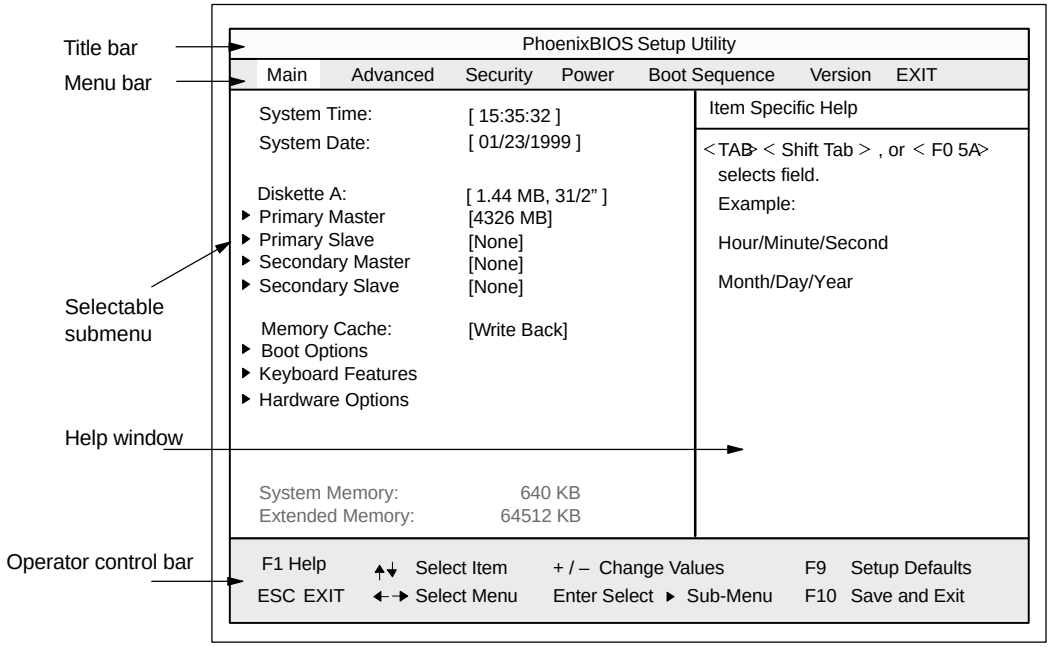


Figure 5-1 *Menu* SETUP Main

Menu structure

The screen is split into four sections. In the top section, you can select the different menu screens. In the left of center section, you can choose the different settings or submenus. In the right of center section, you are given small pieces of help information on the menu option you have currently chosen. The bottom section contains notes on the functions of keys.

You can move between the menu screens using the arrow keys ← LEFT and → RIGHT.

Menu	Meaning
Main	System functions are set here
Advanced	An extensive system configuration can be performed here
Security	Security functions are set here, for example a password
Power Savings	Power conservation functions can be chosen here
Boot Sequence	The boot priorities are set here
Version	Here you will find information about the version of the computing unit
EXIT	Used for exiting and saving

5.1.1 The *Main Menu*

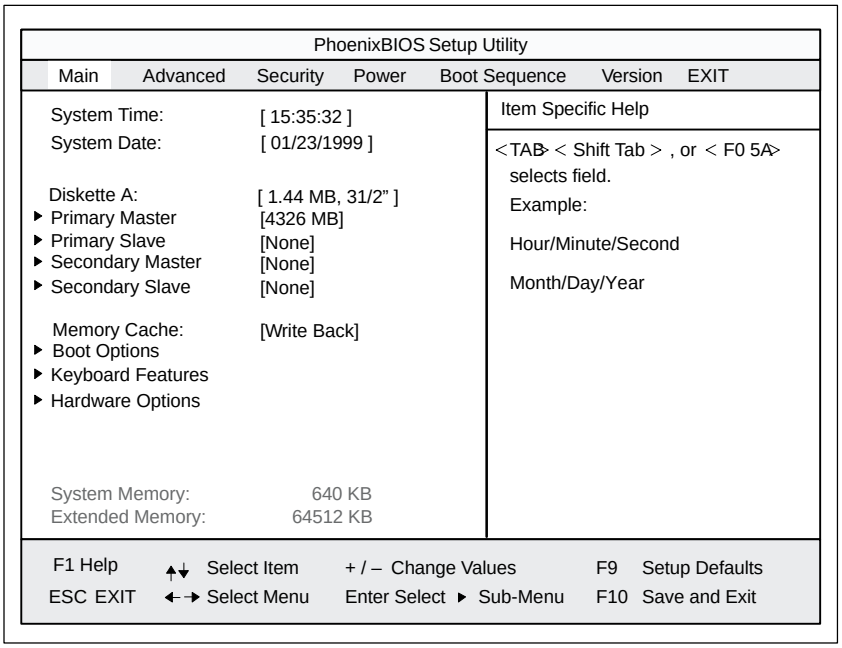


Figure 5-2 *Main* SETUP Menu

Settings in the *Main* Menu

On the *Main* menu, you can choose between the following system settings boxes using the arrow keys ↑ and ↓:

Field	Meaning
System Time	Current time
System Date	Current calendar date
Disk A:	Type of installed floppy disk drive. With LS 120 drive [Disabled]
Primary Master	Type of installed drives.
Boot Options	For setting boot options
Memory Cache	Cache options
Secondary Master	Type of installed drives.
Keyboard Features	Keyboard interface (for example, NUM Lock, Typematic Rate)
Hardware Options	For setting PG 720 hardware options

System Time and System Date *Time and date*

System Time and *System Date* display the current values. Once you have selected the appropriate box, you can use the + and – keys to modify the `Hour:Minute:Second` and `Month/Day/Year` settings.

You can move between the entries in the *System Time* and *System Date* boxes (for example, from Hour to Minute) using the tabulator key.

Diskette A *Disk drive*

Here you set the type of floppy disk drive installed on the computing unit. The following entries are possible:

[Disabled]	If there is no disk drive or LS 120 drive. Default setting for an installed LS 120 drive.
[360 KB,5 1/4”]	
[1.2 MB,5 1/4”]	
[720 KB,3 1/2”]	
[1.44 MB, 3 1/2”]	Default setting for an installed disk drive A
[2.88 MB, 3 1/2”]	

Primary Master*, Primary Slave, Secondary Master, Secondary Slave*

The system goes to the following submenu, for example, when you select one of these menu options:

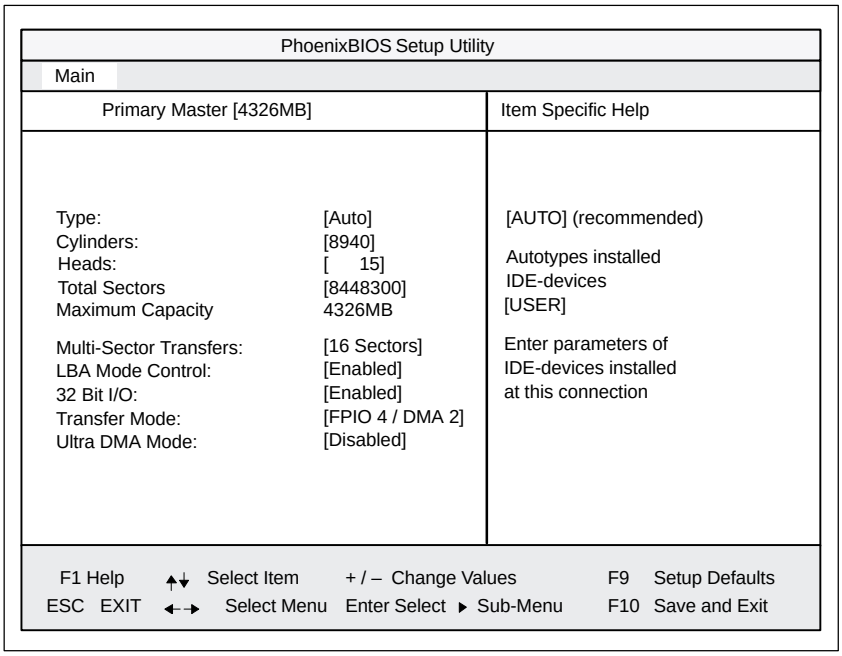


Figure 5-3 Example: Primary Master

Type

The parameters you can select here are normally stored on your IDE drive. The `Auto` setting in the *Type* field means that these values are automatically read from the drive and saved (**Autodetect**).

If the *Type* field is selected for a drive that does not exist, a timer times out in approximately 1 minute and the entries remain unchanged. It is sensible to set `Auto` only for those interfaces to which a drive is connected.

Select `User` if you want to define the hard-disk type yourself. In addition, you will also then have to set the other fields, such as *Cylinder*, *Heads*, to the correct values for the type of hard disk concerned.

Multi-Sector Transfer

The entry in the *Multi-Sector Transfer* box defines the number of blocks (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

If the *LBA Mode Control* field is set to `Enabled`, the system supports hard disk 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 I/O

The setting in the *32 Bit I/O* field defines the mode of access to the drive:

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

Transfer Mode, Ultra DMA Mode

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

Press ESC to exit the submenu.

Memory Cache

The following shortcut menu when you choose this menu option:

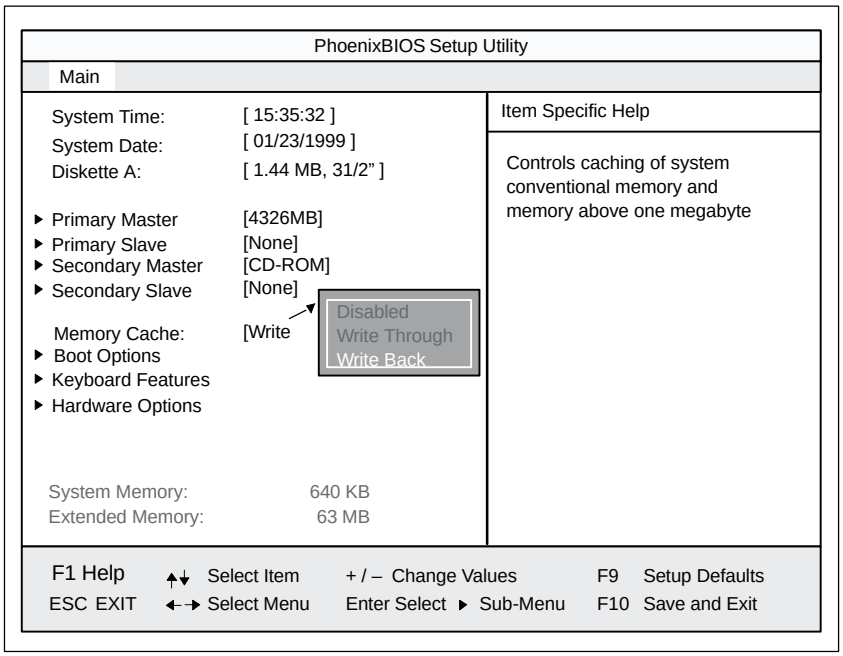


Figure 5-4 *Memory Cache* Menu

A cache is a fast memory buffer between the CPU and main memory (DRAM). Recurrent memory access operations are executed in the fast cache, instead of main memory, if the function is enabled. In rare instances involving some hardware and software combinations, it may be necessary to disable the cache because the program execution times or delays are too short on account of the fast cache.

[Disabled]	Cache is disabled
[Write Through]	Write access is not completed until the entry has been made in main memory.
[Write Back]	Write access is completed immediately. The entry in main memory takes place in the background (default)

Boot Options

The system goes to the following submenu when you select this menu option:

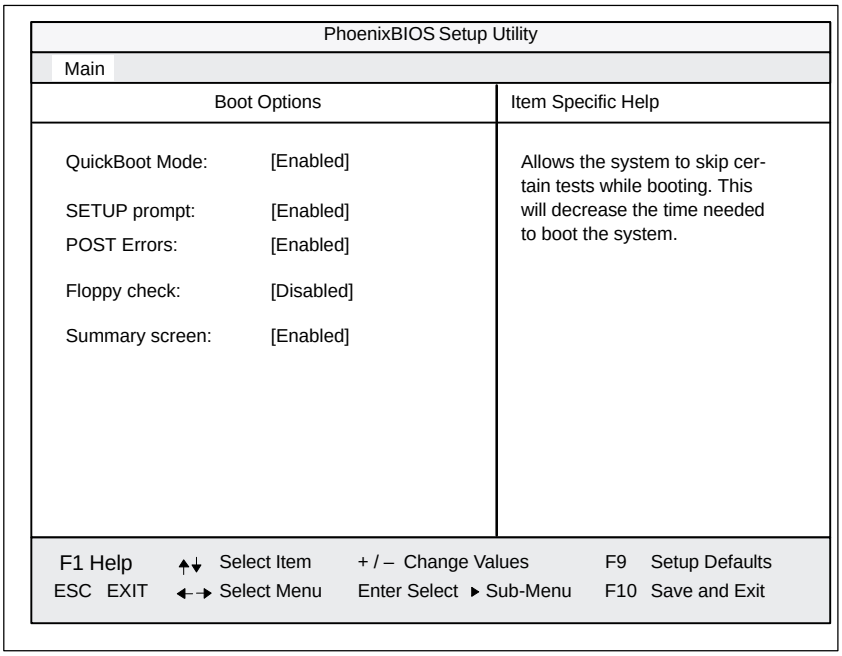


Figure 5-5 *Boot Options* Submenu

Quick Boot Mode	Some hardware tests are skipped when the system starts up, thus speeding up the boot procedure.
SETUP prompt	The message `PRESS` to enter Setup appears at the bottom of the screen during the system load phase.
POST Errors	The load operation is stopped if an error is detected during the system load phase, and you must press F1 to acknowledge. Enter `Disabled` to avoid the necessity of acknowledging this error, for example if no keyboard is connected.
Floppy check	The floppy head is stepped inward and then back to its original position in the system load phase. This test is useful because it reinitializes the drive.
Summary screen	The most important system parameters are displayed on the screen when the system load phase is completed.

The entry `Enabled` means that the function has been active; `Disabled` means it is inactive.

Example of a summary screen:

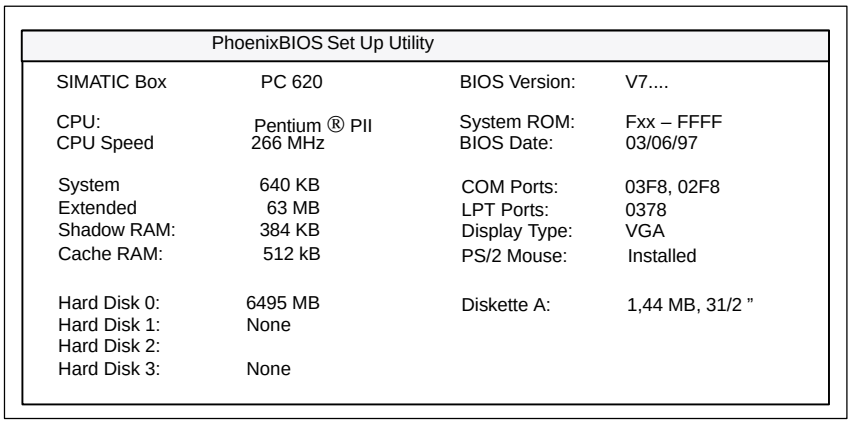


Figure 5-6 Summary Screen

The Summary screen appears when the system load phase finishes.

Keyboard Features

The system goes to the following submenu when you select this menu option:

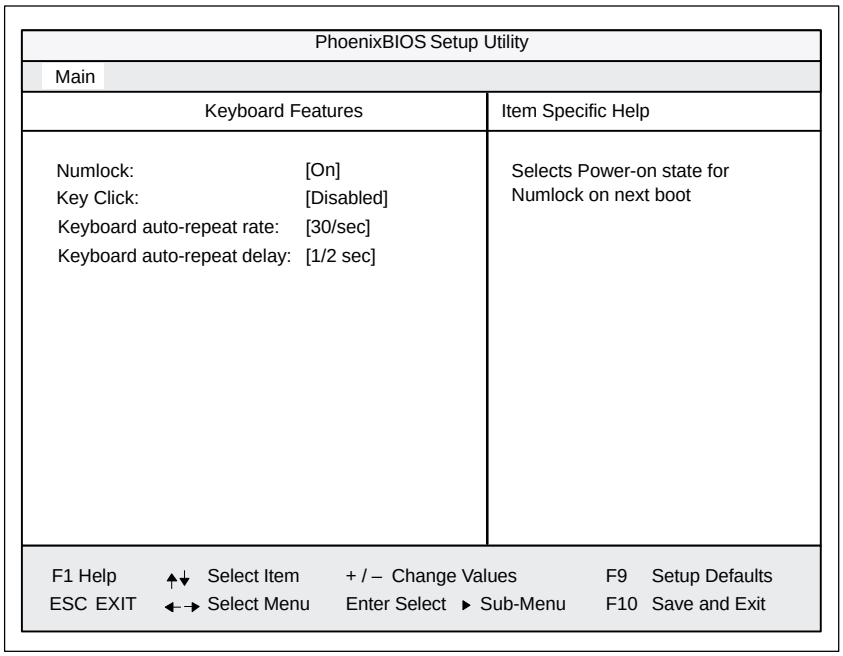


Figure 5-7 *Keyboard Features* Submenu

Numlock	Switches Numlock on or off following power on
Key Click	A keystroke can be heard.
Keyboard auto-repeat rate	Increase in automatic key repeat rate

Hardware Options

The system goes to the following submenu when you select this menu option:

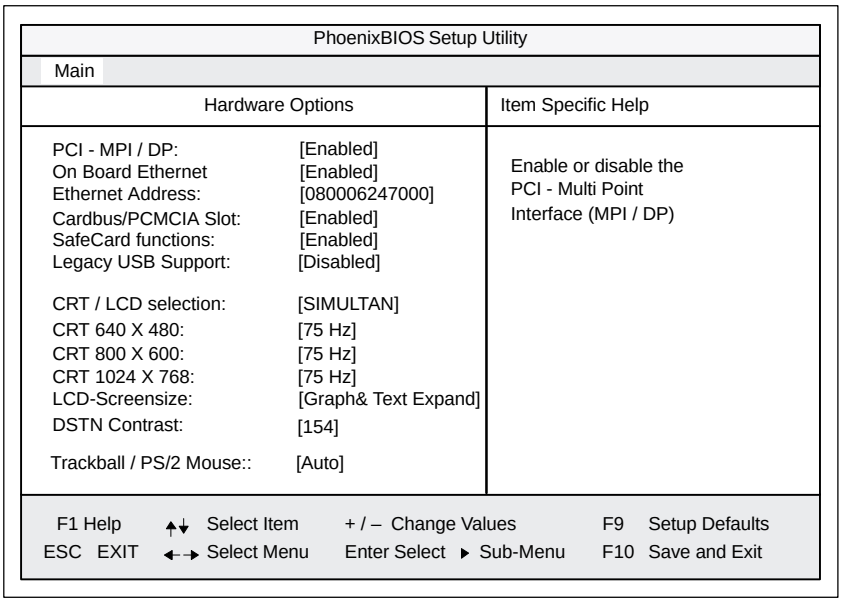


Figure 5-8 *Hardware Options* Submenu

The parameters of the interfaces present on the basic board are set here.

Entry	Meaning
PCI-MPI/DP	Enables the CP5611-compatible MPI/DP interface. The resources are managed by the BIOS PCI Plug&Play mechanism.
On Board Ethernet	`Enabled` The Ethernet port on the basic board is enabled. `Disabled` The Ethernet port on the basic board is disabled.
Ethernet Address	The individual Ethernet address is entered here.
Card bus / PCMCIA Slot	`Disabled` Disables the Cardbus/PCMCIA interfaces. `Enabled` The resources are managed by the BIOS PCI Plug&Play mechanism.
SafeCard functions	`Enabled` On-board monitoring functions are enabled. `Disabled` No monitoring functions. The relevant driver and application must be started for operation of the monitoring functions.

Entry	Meaning	
Legacy USB Support:	`Disabled`	A USB-capable operating system with the corresponding drivers is required to operate a USB keyboard or USB mouse. Setup adjustments can still be made with a USB keyboard.
	`Enabled`	USB keyboard and USB mouse are not supported by the operating systems without USB capability. Operating systems not having USB capability can be used.
CRT / LCD selection	`LCD Enabled`	All data are output only to the internal LCD, the 15-pin VGA port is disabled
	`CRT Enabled`	For maximum resolution, the display signals are output only to the 15-pin VGA port; the LCD interface of the VGA controller is disabled
	`SIMULTAN`	Both display interfaces are operated simultaneously. However, the LCD does not support all resolutions.
CRT 640 x 480	Image refresh rate with a resolution of 640x480 pixels	
CRT 800 x 600	Image refresh rate with a resolution of 800x600 pixels	
CRT 1024 x 768	Image refresh rate with a resolution of 1024x768 pixels	
LCD-Screen-size	`Normal`	The display window in Text and Graphic modes is not expanded to full screen size.
	`Text expand`	Only the Text modes are expanded to full screen size.
	`Graph&Text expand`	The Text and Graphic modes are expanded to full screen size.
DSTN Contrast	The contrast of DSTN displays is set here. Range: 0-255	
Trackball/ PS/2 mouse	`Internal`	The PS/2 port is activated (default setting). This means the trackball is activated. IRQ 12 is assigned.
	`External`	The PS/2 port is activated; IRQ 12 is assigned. The keyboard trackball is disabled; an external PS/2 mouse must be connected. If no external mouse is connected when the system boots, the BIOS deactivates the PS/2 port.
	`Auto`	Automatic detection of the type of mouse connected. A PS/2 mouse takes priority over the keyboard trackball.
	`Disabled`	The PS/2 port is deactivated; IRQ 12 is available.
	Note:	Any change to this interface will not come into effect until the computing unit is switched off and on again.

5.1.2 The *Advanced* Menu

Menu structure

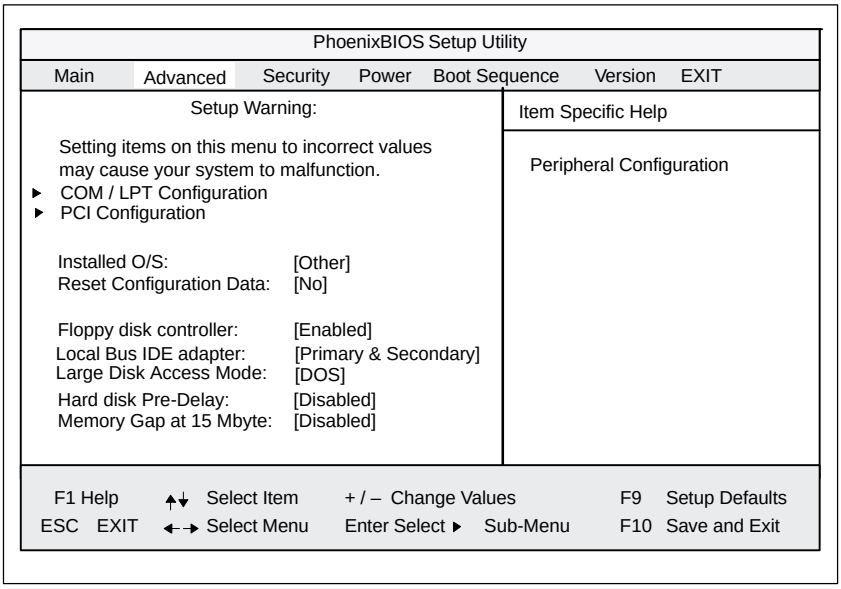


Figure 5-9 The *Advanced* Menu

Settings in the *Advanced* Menu

Field	Meaning
Installed O/S	Plug&Play means that fitted modules are automatically detected and installed, providing they support Plug&Play functions. `Other` The BIOS handles the entire Plug&Play capability, (default setting) `Win98` The operating system handles some of the Plug&Play functions
Reset Configuration Data	`Yes` All installations under Plug&Play are deleted and the configuration is triggered the next time the system boots. Then entry is then reset to `No`. System components that do not support Plug&Play have to be entered manually.
Floppy disk controller	Enables or disables the floppy controller of the basic board
Local Bus IDE adapter	`Primary` One IDE interface for max. two drives. `Secondary` One IDE interface for max. two drives. `Primary & Secondary` Two IDE interfaces for max. four drives. `Disabled` No local IDE interface.

Field	Meaning	
Large Disk Access Mode	DOS	The drive tables are adapted for DOS access operations in accordance with Enhanced IDE.
	Other	The tables are not adapted.
Harddisk Pre-Delay	Disabled	No additional startup delay for the hard disk.
	3 – 30	Additional startup delay for the secondary hard disk can be selected; needed only for older-generation hard disks.
Memory Gap at 15 MByte	Disabled	The area from 15 to 16 Mbytes is not available as PC-card memory.
	Enabled	The area from 15 to 16 Mbytes is enabled for PC cards which can use this address space.

COM/LPT Configuration

The system goes to the following submenu when you select this menu option:

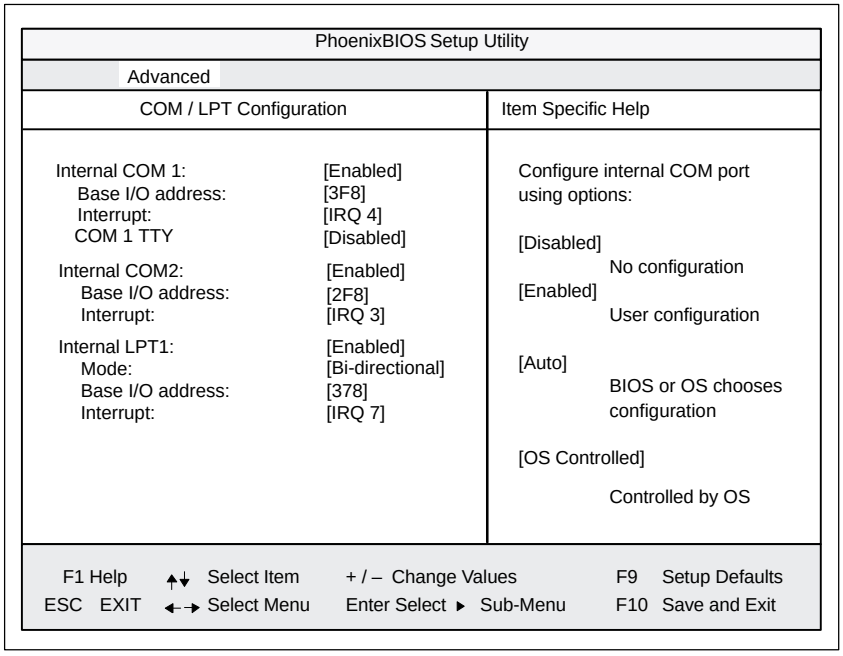


Figure 5-10 *COM/LPT Configuration* menu

Field	Meaning
Internal COM1	Disabled The resources assigned to an interface are freed.
Base I/O address	Sets the base input/output address. It is preassigned and recommended accordingly.
Interrupt	Sets the interrupt. It is preassigned and recommended accordingly.
COM1 TTY	Sets either V.24 (RS 232) (default setting) and TTY.

Field	Meaning
Internal COM2	`Disabled` The resources assigned to an interface are freed.
Base I/O address	Sets the base input/output address. It is preassigned and recommended accordingly.
Interrupt	Sets the interrupt. It is preassigned and recommended accordingly.
Internal LPT1	`Disabled` The resources assigned to an interface are freed.
Mode	Use this setting to set the operating mode of the printer interface. Make sure that the setting matches the data terminal you connected. Refer to the documentation for the device for the setting.
Base I/O address	Sets the base input/output address. It is preassigned and recommended accordingly.
Interrupt	Sets the interrupt. It is preassigned and recommended accordingly.

PCI Configuration

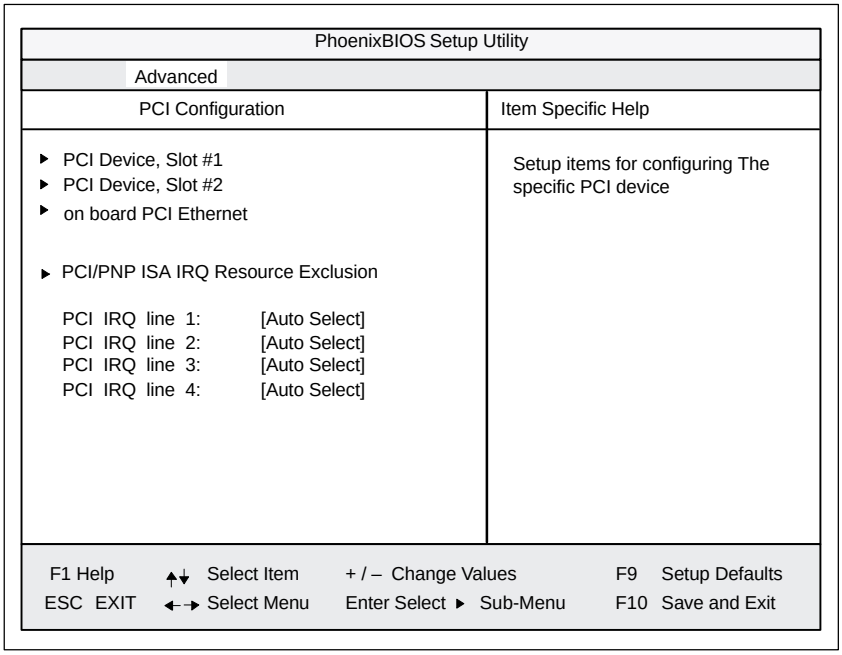


Figure 5-11 *PCI Configuration* Submenu

PCI Device Field

The system goes to the following submenu when you select this menu option:

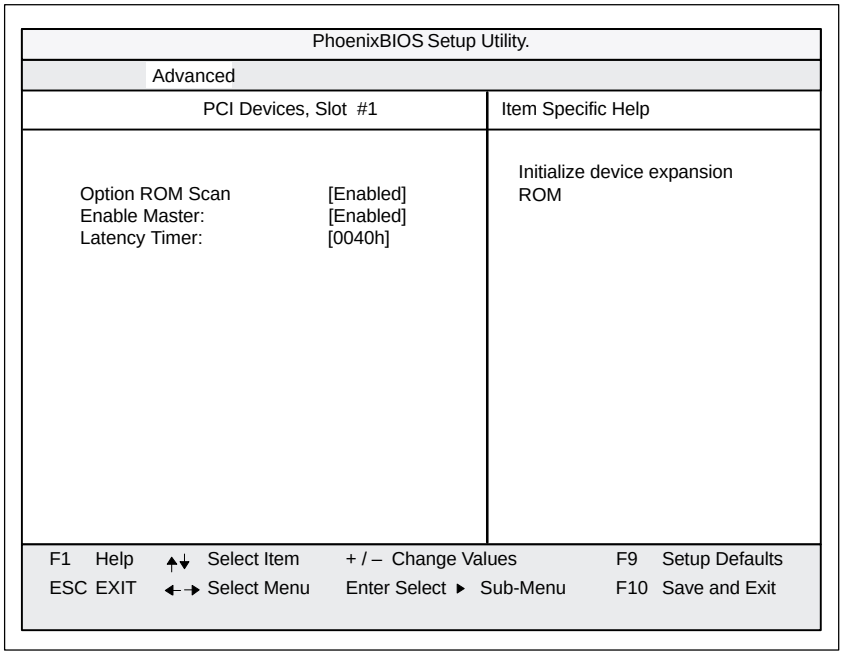


Figure 5-12 *PCI Devices, Slot #1* Submenu

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

On board PCI Ethernet field

The system goes to the following submenu when you select this menu option:

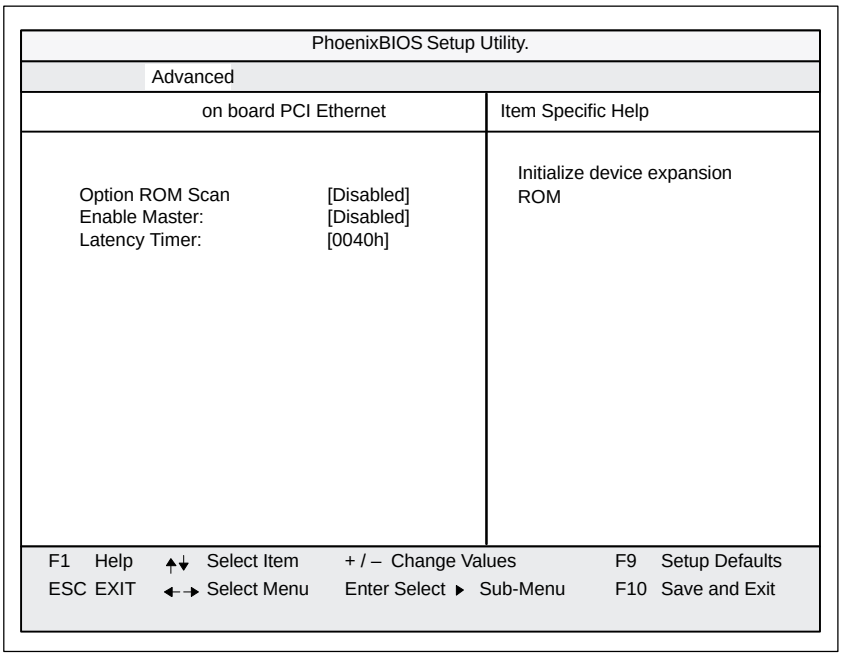


Figure 5-13 *On board PCI Ethernet* submenu

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

PCI/PNP ISA IRQ Resource Exclusion field

The system goes to the following submenu when you select this menu option:

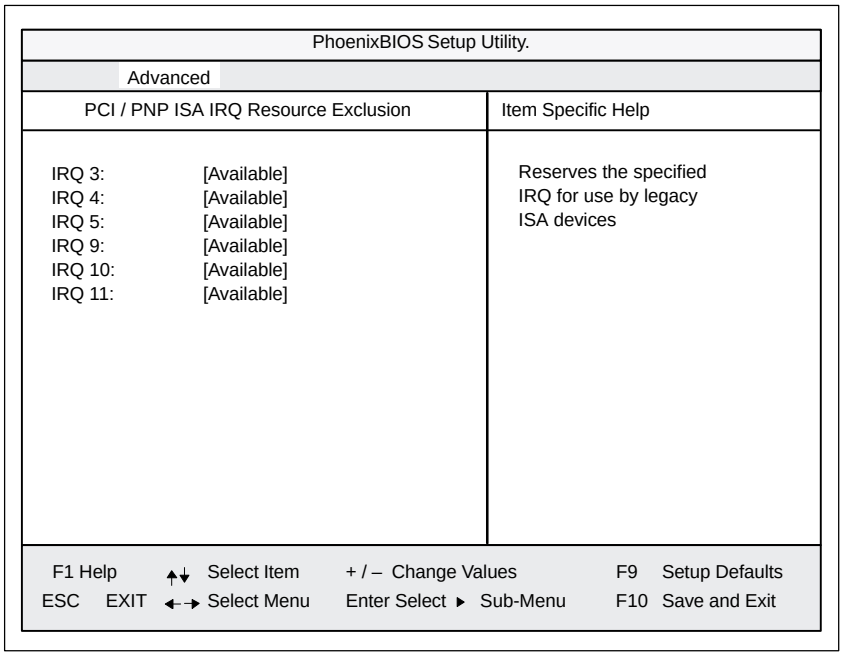


Figure 5-14 *PCI/PNP ISA IRQ Resource Exclusion* submenu

`Available` The Plug&Play mechanism in BIOS can allocate the IRQ to plug&play modules or motherboard functions.

`Reserved` Use only if the interrupt concerned has to be assigned specifically to PCMCIA modules without plug&play capability.

PCI IRQ line field

The system goes to the following submenu when you select this menu option:

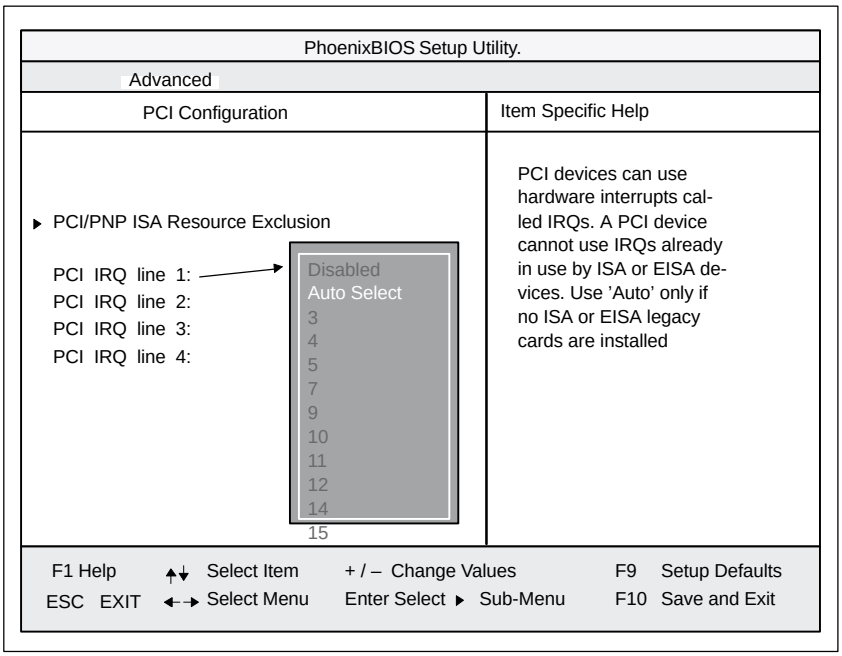


Figure 5-15 *PCI Configuration* Submenu

`Disabled` No interrupt possible for this PCI-IRQ line.

`Auto Select` The plug&play mechanism in BIOS selects unassigned interrupts and allocates them to the on-board PCI device.

`3` to `15` The PCI-IRQ line is permanently assigned to the selected interrupt. Do not use this setting unless it is specifically required in your application's documentation.

5.1.3 The *Security* Menu

Overview

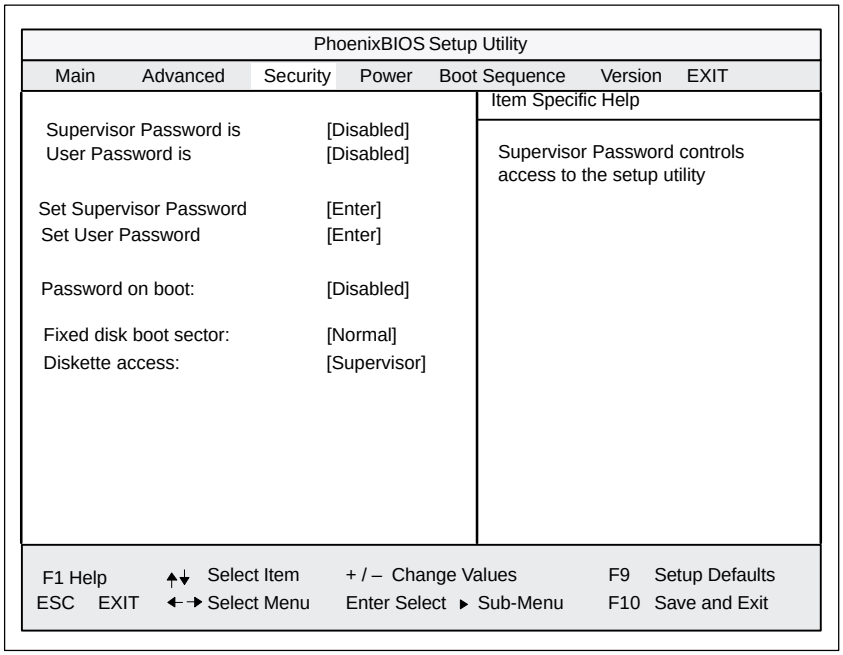


Figure 5-16 *Security* submenu

Field	Meaning
Supervisor Password is	`Disabled` Password is active. Used of floppy disks is prevented, and use of hard disk is restricted. `Enabled` Certain Setup fields can be configured by the user, including the supervisor password. The field resets automatically from `Disabled` to `Enabled` when the password is entered.
User Password is	`Disabled` Password is active. BIOS Setup cannot be opened until the password has been entered. `Enabled` Certain Setup fields can be configured 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 by entering a new password 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 by entering a new password or deleted by pressing Return and thus deactivated.

Field	Meaning	
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.
	`Protected`	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.

5.1.4 The *Power* Menu

Overview

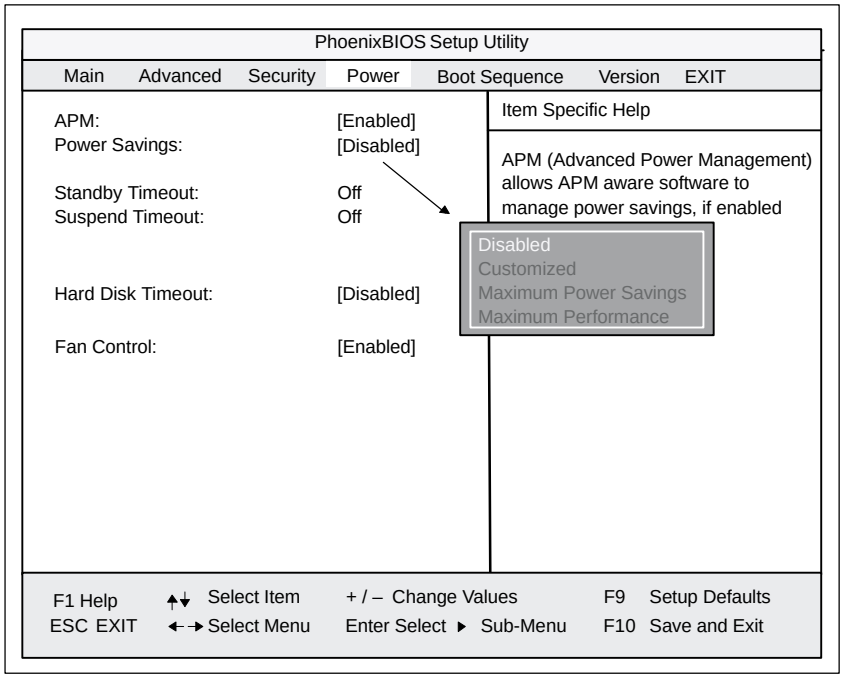


Figure 5-17 *Power* submenu

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

Field	Meaning
APM (Advanced Power Management)	`Enabled` The operating system can shut down system resources when they are not needed. `Disabled` The operating system is denied APM access.
Power Savings	`Disabled` No power-saving functions `Customized`, `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/Suspend Timeouts and Fixed Disk Timeout, or they are set automatically or set to their defaults.
Standby Timeout	`OFF` No Standby mode `30` seconds or `1, 2, 4, 8, 12, 16` minutes after your computing unit goes to Standby mode.
Suspend Timeout	`OFF` No Suspend mode `1, 2, 5, 10, 15, 20, 30` minutes after the computing unit goes to Suspend mode.

Field	Meaning
Hard Disk Timeout	`Disabled` The hard disk does not shut down. `10, 15, 30, 60` minutes after 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.
Fan Control	`Enabled` Fan speed depends on temperature. `Disabled` Fan always runs at full speed

5.1.5 The *Boot Sequence* Menu

Overview

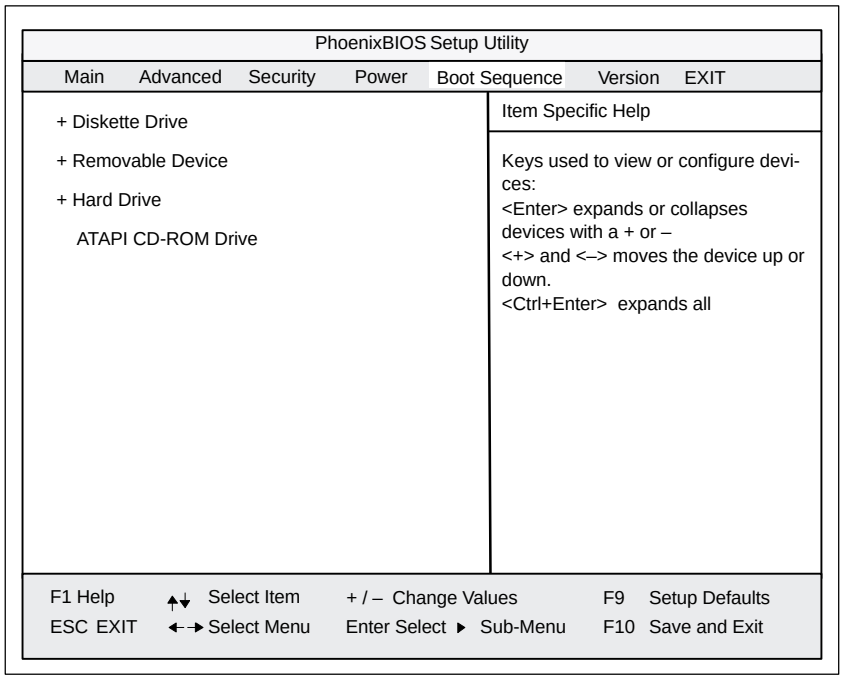


Figure 5-18 *BOOT-Sequence* Submenu

This menu lists the boot devices in prioritized groups.

The boot sources are displayed 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. Use the +, – keys to move the group to its new position in the sequence.

Note

During startup the boot drive can be selected with ESC.

Groups marked + 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:

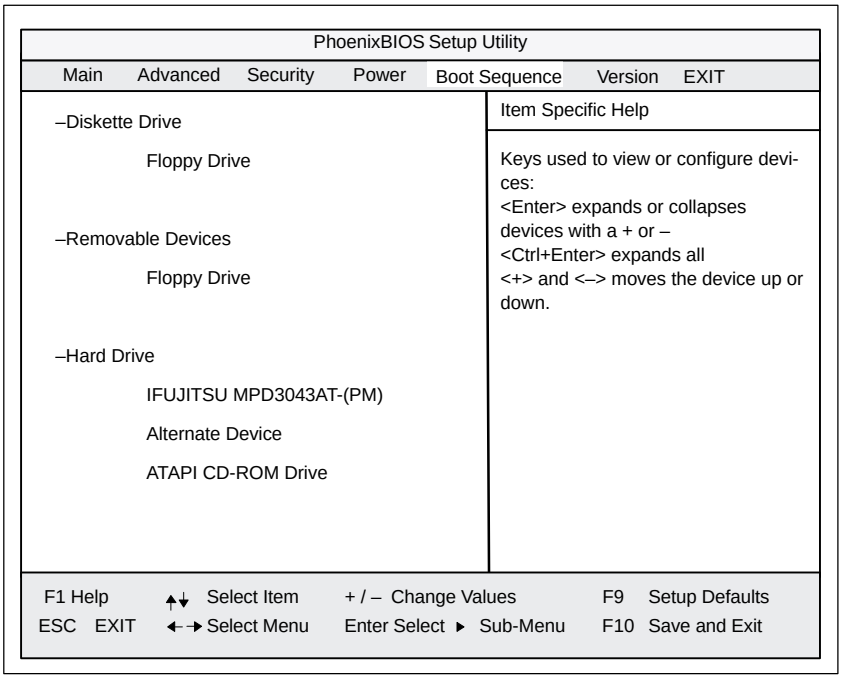


Figure 5-19 *BOOT-Sequence* Submenu

This screen shows all possible boot sources. 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 it is bootable.

5.1.6 The *Version* Menu

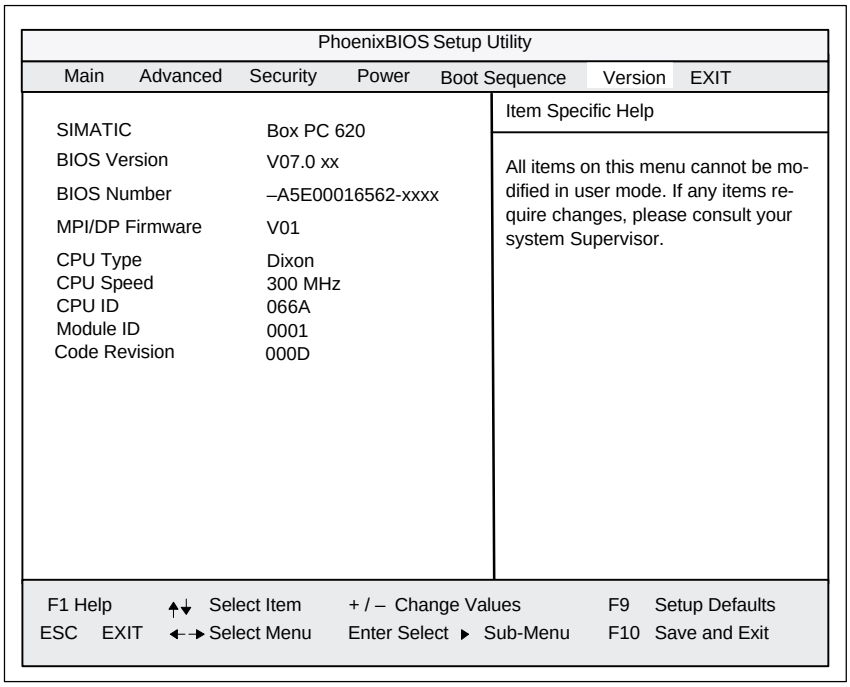


Figure 5-20 Example of *Version* Submenu

Note

You should keep this information at hand whenever you have technical queries about your system.

5.1.7 The *Exit* Menu

Overview

The setup program is always terminated using this menu.

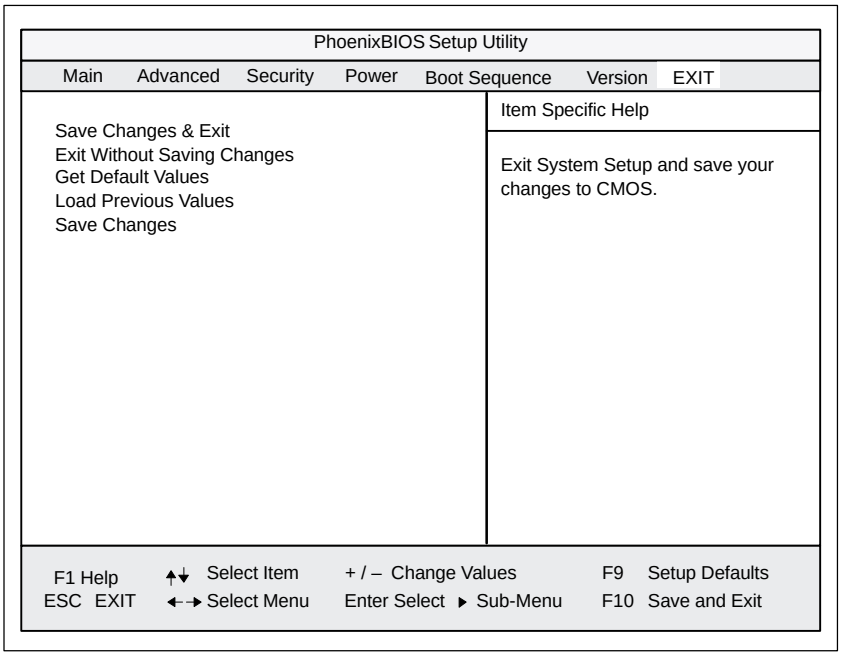


Figure 5-21 *Exit* Submenu

Field	Meaning
Save Changes & Exit	All changes are saved; a system restart is then carried out with the new parameters.
Exit Without Saving Changes	All changes are rejected; a system restart is then 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

Documenting your device configuration

If you have made any modifications to your 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.

System Parameters	Standard Settings	Your Entries
Main		
System Time	hh:mm:ss	
System Date	MM/DD/YYYY	
Disk A:	1.44 MB, 3 1/2" / for LS 120: Disabled	
Primary Master	C: 4326 MB	
Primary Slave	None	
Secondary Master	None	
Secondary Slave	None	
Memory Cache	Write back	
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 Address	08000624xxxx	
Cardbus/PCMCIA Slot	Enabled	
SafeCard Functions	Enabled	
Legacy USB Support	Disabled	
CRT/LCD selection	SIMULTAN	
CRT 640 x 480	75 Hz	
CRT 800 x 600	75 Hz	
CRT 1024 x 768	75 Hz	
LCD Screensize	Graph&Text Expanded	
DSTN Contrast	154	
Trackball / PS2 Mouse	Auto	
Advanced		
COM/LPT Configuration		
Internal COM1	Enabled	
Base I/O address	3F8	
Interrupt	IRQ4	

System Parameters	Standard Settings	Your Entries
Internal COM2	Enabled	
Base I/O address	2F8	
Interrupt	IRQ3	
Internal LPT1	Enabled	
Mode	Bi-directional	
Base I/O address	378	
Interrupt	IRQ7	
DMA Channel (for ECP only)	DMA 10	
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	
on board PCI Ethernet		
Option ROM Scan	Disabled	
Enable Master	Disabled	
Latency Timer	0040 h	
PCI/PnP ISA IRQ Exclusuion		
IRQ3	Available	
IRQ4	Available	
IRQ5	Available	
IRQ9	Available	
IRQ10	Available	
IRQ11	Reserved	
PCI IRQ Line 1	Auto Select	
PCI IRQ Line 2	Auto Select	
PCI IRQ Line 3	Auto Select	
PCI IRQ Line 4	Auto Select	
Installed O/S	Other	
Reset Configuration Data	No	
Floppy disk controller	Enabled	
Local Bus IDE adapter	Primary& Secondary	
Large Disk Access Mode	DOS	
Hard Disk Pre-Delay	Disabled	
Memory Gap at 15 MByte	Disabled	
Security		
Supervisor Password is	Disabled	
User Password is	Disabled	
Set Supervisor Password	F0 5A	
Set User Password	F0 5A	
Password on boot	Disabled	

System Parameters	Standard Settings	Your Entries
Fixed disk boot sector	Normal	
Diskette Access	Supervisor	
Power		
APM	Enabled	
Power Savings	Disabled	
Standby Timeout	Off	
Suspend Timeout	Off	
Hard Disk Timeout	Disabled	
Fan Control	Enabled	
Boot Sequence		
Diskette Drive		
Removable Devices		
Hard Drive		
ATAPI CD-ROM Drive		
Version		
SIMATIC	Box PC 620	
BIOS Version	V7.xx	
BIOS Number	A5E16562-ESxx	
MPI/DP Firmware	V01	
CPU Type	Pentium II	
CPU Speed	333 MHz	
CPU ID		
Code Revision	0015	

5.2 Configuring the PC Card Interface

The software required for using PC cards under MS such as:

- Socket Services
- Card Services
- Client Drivers
- Flash File System

can be obtained from the nearest Siemens sales office or representative.

Windows NT4 does not support socket services.

Your computing unit comes supplied with Windows 98 / NT4 already installed, this supports the PC Card interface.

The computer must be rebooted under Windows NT4.

Hardware Information

6

Chapter Overview

6.1 Current Requirement of the Components (Maximum Values)

Basic system

Component	Voltage				
	+5V	**+3.3V**	**+12V**	**–5V**	**–12V**
Pentium II basic board	2.3 A	2.4 A	0.1 A	0.01 A	0.02 A
Processor (Celeron 300/Dixon 333)	2.7 A	0.9 A			
Floppy disk drive/LS 120	1.2 A				
Hard disk	0.6 A		0.4 A		
CD ROM drive	0.8 A				
Fan			0.25 A		
Sum (max. for basic configuration)	**7.6 A**	**3.3 A**	**1.06 A**	**0.01 A**	**0.02 A**
Free for upgrades	2.9 A	0.9 A	0.95 A	0.04	0.18 A
Sum (maximum configuration) *)	**10.5 A**	**4.2 A**	**1.7 A**	**0.05 A**	**0.2 A**

*) Less the power requirement for the front panels

6.2 Overview of the Components and Ports

Component/Port	Description	Parameters
CPU	Mobile Intel processor (type MMC2)	• Upgradeable • Multimedia support • On-board L2 cache with 128 k/256 k
Memory	DIMM submodules up to max. 256 MB/DIMM	• Data capacity of 64 bits + ECC • Modules with ECC possible • 3.3 V • SDRAM to PC100 specification • Up to 128 Mbit chip size on the module • 100 MHz bus speed • 3 DIMMs can be used • Easy to replace • Variable from 64 to 256 MB/DIMM
Chipset	Single chipset 440BX	• SDRAM • ECC support
Hard disk	ATA-33 mode	• Ultra DMA capable
DP12	Communication port SIMATIC S7	• Isolated DP12 1) (CP 5611 compatible) • 12 Mbaud
TTY	Communication with SIMATIC S5 CPU	• Range up to 1000 m
USB	Universal Serial Bus	• One high current (500 mA) USB ports
Ethernet	10BaseT/100Base-TX	• 10/100 Mbaud, isolated 1)
Floppy	Notebook port for 34-pin ribbon cable	• 1.44 MB
Keyboard	Port for PS2 keyboard	• Standard • Trackball supported
Mouse	PS2 mouse port	• Standard
Serial	COM1, 25-pin COM2, 9-pin	• TTY and V24 • Standard
Parallel	Standard, bidirectional, EPP and ECP modes	• 25-pin SUB-D
BIOS	Update via software	• 512 K in 4 pages
CDROM	Master on secondary EIDE channel	• 24 speed
LS120	Slave on secondary EIDE channel	• 1.44 MB standard floppy disks • 120MB SuperDisk

1) Electrically isolated in a safety extra-low voltage circuit (SELV)

6.3 Hardware Address Table

In the distribution of the address areas a distinction is made between

- memory address space and
- I/O address space.

Different write/read signals (I / O WR, I / O RD, MEMR, MEMW) address these different areas. The following tables will give you an overview of the address areas used. Please refer to the descriptions of the individual function groups for more details.

How memory decoding works

The Pentium II CPU has a memory address area of 64 Gbytes, of which 4 Gbytes can be used. The CPU has 64 data lines, 33 address lines and 8 byte enable lines (BE0 to BE7), which encode the non-available address lines A0, A1 and A2.

The CPU address bus is mapped via the PAC (system controller) to the PCI address bus. The memory addresses of addresses 0000 0000h to 0009 FFFFh (640 kbytes) and from address 0010 0000h to 2FFF FFFFh (768 Mbytes) are excluded.

The ISA bridge PIIX (PCI ISA IDE Xcellerator) precisely maps the ISA address bus once on the PCI address bus. The ISA address bus for 8 bit modules includes the address area from A0 to A19, which corresponds to the CPU addresses 0000 0000h to 000F FFFFh (1 Mbyte).

For 16-bit ISA modules, the address bus is expanded by address lines A20 to A23 and therefore addresses from 0000 0000h to 00FF FFFFh (16 Mbytes). The distinction between the 1 Mbyte and the 16 Mbyte ISA address areas is achieved by special memory read/write signals which are activated only if address lines A20, A21, A22 and A23 have logic zero level.

If address areas assigned to main memory or the PCI bus are addressed by the CPU, no ISA bus control signals are generated. This means that an ISA bus module is not addressed in these memory areas. Conversely, an ISA bus master cannot reach addresses above 16 Mbytes. In order to obtain a larger address area for dual-port RAM expansions than the memory address between 640 kbytes and 1 Mbyte, various decoding holes are provided on the Pentium PU basic board:

- The CPU address area FFF0 0000h to FFFD FFFFh (1024 k-128 k BIOS = 896 Kbytes) is mapped to the ISA address area 00F0 0000h to 00FD FFFFh and is always addressed in the CPU address area. Decoding of the address lines A24 to A31 missing on the ISA bus is accomplished by special hardware on the basic board.
- The CPU address area 00F0 0000h to 00FF FFFFh is mapped in the ISA address area 00F0 0000h to 00FF FFFFh (16 MB memory window). This setting can be enabled and disabled by running Setup.

Memory address assignment

From Address	to Address	Size	Assignment	Comments
0000 0000	0007 FFFF	512 k	Conventional system memory	
0008 0000	0009 FBFF	127 k	Conventional system memory extended	
0009 FC00	0009 FFFF	1k	Conventional system memory extended BIOS DATA	
000A 0000	000A FFFF	64 k	Refresh memory	VGA
000B 0000	000B 7FFF	32 k	Software graphic/text refresh memory	unassigned
000B 8000	000B FFFF	32 k	Refresh memory	VGA/CGA
000C 0000	000C AFFF	44 k	VGA BIOS extension	VGA
000C B000h	000CB FFFh	4 k	Motherboard resources	
000E 0000h	000F FFFFh	128 k	System disk extension of plug&play BIOS	
0010 0000h	03FF FFFFh	63 M	System disk extension of plug&play BIOS	
0810 0000h	0810 0FFFh	4 k	Texas Instruments PCI-1225	Cardbus controller
0810 1000h	0810 1FFFh	4 k	Texas Instruments PCI-1225	Cardbus controller
0900 0000h	0A0F FFFFh	17 M	Intel 82443BX Pentium® II Processor / AGP controller	
0D00 0000h	0DFF FFFFh	16 M	Chips and Tech. 69000 PCI	VGA
0E00 0000h	0E03 FFFFh	256 k	Chips and Tech. 69000 PCI	VGA
F400 0000h	F407 FFFFh	512 k	CP5611 (PCI)	
F408 0000h	F408 007Fh	8 k	CP5611 (PCI)	
F800 0000h	FBFF FFFFh	64 M	Intel 82443BX Pentium® II Processor / PCI jumper	
FFFE 000h	FFFF FFFFh	128 k	Motherboard resources	Mirroring of the System BIOS (from 000E 0000h to 000F FFFFh)

This list is not absolute, since Windows allocates the resources. It is therefore quite possible that other addresses are assigned in some instances. The assignment used can be found in the Windows “resource report”.

I/O address assignment

Table 6-1 I/O address assignment

Address: From – To		Assignment	Comments
0000	000F	DMA controller 1	
0020	0021	Interrupt controller 1	
0024	003D	Motherboard resources	
0040	0043	Timer 1	
0060	0060	Keyboard controller, data	
0061	0061	NMI, system loudspeaker settings	
0064	0064	Keyboard controller, command, status	
0070	0070	Real time clock index	
0071	0071	Real time clock date	
0072	0077	CMOS RAM/keyboard	
0078	0079	Reserved, board configuration	
0080	008F	DMA page register	
00A0	00A1	Interrupt controller 2	
00A4	00B9	Motherboard resources	
00C0	00DF	DMA controller 2	
00F0	00FF	Numeric processor	
0170	0177	Secondary IDE channel	Can be deactivated
01F0	01F7	Primary IDE channel	
0200	0203	Reserved for game port, otherwise unassigned, joystick	Reserved/unassigned
0220	022F	ESS SOLO -1 DOS emulation	Sound
02F8	02FF	COM 2	Can be deactivated
0300	031F	Programming interface	Can be deactivated
0330	0331	ESS SOLO -1 DOS emulation	Sound
0370	0370	Super IO	
0371	0371	Index/data	
0376	0376	Secondary IDE channel command	Can be deactivated
0377	0377	Secondary IDE channel status	Can be deactivated
0378	037F	LPT1	Can be deactivated
0388	038B	ESS SOLO -1 DOS emulation	Sound
03B0	03BB	VGA	Chips and Tech. 69000
03C0	03DF	VGA	Chips and Tech. 69000
03F0	03F5	FD controller	
03F6	03F6	Primary IDE channel command	
03F7	03F7	First IDE channel, status	
03F8	03FF	COM 1	Can be deactivated
04D0	04D1	Motherboard resources	

Table 6-1 I/O address assignment, continued

Address: From – To		Assignment	Comments
0CF8	0CFF	PCI bus	PCI BUS
1000	103F	PIIX IO	
1040	104F	PIIX power management	
1050	1057	First IDE controller (dual FIFO)	
1058	105F	Second IDE controller (dual FIFO)	
1060	107F	PCI/USB universal host controller	
1080	10E7	ESS SOLO -1 audio device	Sound

DMA assignment

DMA Port	Data Transfer	Description
0	8/16 bits	Not available
1	8/16 bits	Not available
2	8/16 bits	Floppy
3	8/16 bits	Not available
4		Cascading of DMA controllers
5	16 bits	Not available
6	16 bits	Not available
7	16 bits	Not available

6.4 Interrupt Assignment

Interrupt assignment

Handling of the 16 hardware interrupts (IRQ 0 to IRQ 15) is taken care of by two type 82C59 integrated interrupt controllers on the computing unit.

The INT output of the slave controller is connected to the IRQ 2 input of the master controller. Interrupt 9 (IRQ 9) can be used on the bus for the assigned interrupt 2 (IRQ 2). IRQ 9 parameters are set to the software interrupt vector 0A H (IRQ 2) in the initialization phase by the ROM BIOS.

Priority

The interrupts are prioritized in the reverse order of their numbering. Interrupt IRQ 0 has the highest priority and interrupt IRQ 7 the lowest. For triggering IRQ 2, interrupt IRQ 8 has the highest priority and IRQ 15 the lowest. Interrupts IRQ 8 to IRQ 15 therefore have higher priorities than interrupts IRQ 3 to IRQ 7. The interrupt vectors are initialized and masked when the computing unit is powered up.

I/O addresses of interrupt controllers

Interrupt	Description	Parameterized Interrupt Vector, Memory Address
SMI	System management interrupt, cannot be masked	-
NMI	Expansion slots Signal IO Channel Check2	INT 2 H
IRQ 0	Internal timer (system clock)	INT 8 H
IRQ 1	Keyboard	INT 9 H
IRQ 2	Cascading of interrupt controller 2	INT A H
IRQ 3 *)	Serial port 2 (COM2/IRDA), can be cleared in setup	INT B H
IRQ 4 *)	Serial port 1 (COM1/TTY), can be cleared in setup	INT C H
IRQ 5 **)	Cardbus controller	INT D H
IRQ 6 *)	Floppy controller	INT E H
IRQ 7 *)	Parallel port 1 (printer interface LPT1/EPP/ECP), can be cleared in setup	INT F H
IRQ 8	Battery-backed real-time clock (RTC)	INT 70 H
IRQ 9	VGA controller	INT 71 H
IRQ 10	Cardbus controller	INT 72 H
IRQ 11 *)	USB	INT 73 H
IRQ 12 *)	PS/2 mouse or trackball on keyboard. Can be cleared in setup if the mouse or trackball functions are not required.	INT 74 H
IRQ 13	Math. coprocessor error	INT 75 H
IRQ 14	IDE interface (primary)	INT 76 H
IRQ 15 *)	IDE controller (secondary)	INT 77 H

Please watch out for interrupts that have already been assigned in the system.

*) These components can be disabled using BIOS SETUP. The functions are then no longer available, and the resources are freed for other components.

**) The on-board interface is compatible with plug&play; the assigned resources are managed by the BIOS.

6.5 Video Modes

Mode No. (Hex)	VESA Mode No.	Video Mode (Text/Graphics) (L) = Linear Mode	Colors	CRT (I) = Interlaced	LCD/Simultan
00+/01+	--	Text 40x25	16	70Hz	60Hz
02+/03+	--	Text 80x25	16	70Hz	60Hz
04/05	--	Gr.320x200	4	70Hz	60Hz
6	--	Gr.640x200	2	70Hz	60Hz
07+	--	Text 80x25	2 (b/w)	70Hz	60Hz
TAB	--	Gr.320x200	16	70Hz	60Hz
0E	--	Gr.640x200	16	70Hz	60Hz
0F	--	Gr.640x350	2 (b/w)	70Hz	60Hz
10	--	Gr.640x350	16	70Hz	60Hz
11	--	Gr.640x480	2 (b/w)	60Hz	60Hz
12	--	Gr.640x480	16	60Hz	60Hz
13	--	Gr.320x200	256	70Hz	60Hz
20	120h	Gr.640x480 (L)	16	60/75/85	60Hz
22	122h	Gr.800x600 (L)	16	56/60/75/85	60Hz
24	124h	Gr.1024x768 (L)	16	43(I)/60/75/85	60Hz
28	128h	Gr.1280x1024 (L)	16	43(I)/60	60Hz
30	101h	Gr.640x480 (L)	256	60/75/85	60Hz
31	100h	Gr.640x400 (L)	256	70	60Hz
32	103h	Gr.800x600 (L)	256	56/60/75/85	60Hz
34	105h	Gr.1024x768 (L)	256	43(I)/60/75/85	60Hz
38	107h	Gr.1280x1024 (L)	256	43(I)/60	60Hz
40	110h	Gr.640x480 (L)	32K	60/75/85	60Hz
41	111h	Gr.640x480 (L)	64K	60/75/85	60Hz
42	113h	Gr.800x600 (L)	32K	56/60/75/85	60Hz
43	114h	Gr.800x600 (L)	64K	56/60/75/85	60Hz
44	116h	Gr.1024x768 (L)	32K	43(I)/60/75/85	60Hz
45	117h	Gr.1024x768 (L)	64K	43(I)/60/75/85	60Hz
50	112h	Gr.640x480 (L)	16M	60/75/85	60Hz
52	115h	Gr.800x600 (L)	16M	56/60/75/85	60Hz
64	104h	Gr.1024x768	16	43(I)/60/75/85	60Hz
68	106h	Gr.1280x1024	16	43(I)/60	60Hz
6A	102h	Gr.800x600	16	56/60/75/85	60Hz
70	101h	Gr.640x480	256	60/75/85	60Hz
71	100h	Gr.640x480	256	70	60Hz
72	103h	Gr.800x600	256	56/60/75/85	60Hz
74	105h	Gr.1024x768	256	43(I)/60/75/85	60Hz
78	107h	Gr.1280x1024	256	43(I)/60	60Hz

6.6 Monitoring Functions

The LEDs described in the following sections are only available on specific versions of the device. The basic configuration of the computing unit does not have any LEDs. The hardware signals are described in section 6.7.2.

6.6.1 Overview

Function

The following individual functions are implemented:

- temperature monitoring and indication of overheating and underheating
- watchdog

Messages can be passed by the monitor modules to applications.

The program SOM (Safecard on Motherboard) and drivers for Win NT and Windows 98 are available on the devices for this purpose. These tools can be used to display the status and assign parameters to limit values.

You will find a description of the drivers and the SOM program in the SafeCard directory on the *Documentation and Drivers* CD supplied to you.

6.6.2 Signals at the Front-Side Port

The indications have the following meanings:

LED	OFF	YELLOW
Temp	System turned off	Inside temperature outside permissible range.

6.6.3 Temperature Monitoring and Display

Temperature monitoring

The temperature is acquired by three thermocouples. One thermocouple monitors the processor temperature, the second monitors the temperature in the processor module area and the expansion boards, while the third monitors the temperature in the power supply module area. The following conditions result in a temperature drift:

- temperature exceeds the threshold value for overheating
- temperature falls below the threshold value for underheating

The temperature thresholds can be set separately (by driver or SOM program).

One of the following reactions is triggered should the temperature drift:

Reaction	Options
Temp LED from OFF to YELLOW	Always
Trigger IRQ	Adjustable

6.6.4 Watchdog (WD)

Function

The watchdog monitors the execution of a program. The purpose of the WD is to report a program crashing to the user by means of different reactions.

The watchdog is idle when you turn on the computing unit or following a HW RESET(cold restart) – in other words, no reaction by the WD is initiated.

WD reactions

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

Reaction	Option
Acknowledge WD	Always
Initiate reset on the computing unit	Adjustable
Send IRQ on computing unit	Adjustable

The reactions you want to have triggered can be set by drivers or the SOM program.

WD monitoring times, TWD

The monitoring times can be adjusted in increments of one second over the range from 3 to 255 seconds.

Note

If the watchdog time is modified after the watchdog has been activated – in other words, while the watchdog is running – the watchdog will be retriggered as a result!

6.7 Ports

The basic board of the computing unit features the following ports:

- ports for connecting external devices
- ports for connecting displays
- ports for internal connections (drives, wiring backplane, etc.)

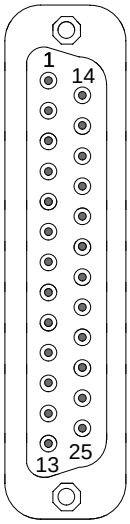
The connector pin-outs of the different ports are described in the sections below.

6.7.1 External Ports

Interface	Position	Connec-tor	Description
COM 1	external	X9	3F8h-3FFh, can be disabled IRQ4, edge-triggered 25-pin, socket, V.24/V.28 and 20mA (TTY isolated)
COM 2	external	X11	2F8h-2FFh, can be disabled IRQ3, edge-triggered 9-pin, standard connector
LPT1	external	X9	378h-37Fh, can be disabled IRQ7, edge-triggered 25-pin, standard socket
PS/2 mouse	external	X7	060h-064h IRQ12, edge-triggered 6-pin, mini DIN socket
PS/2 keyboard/ PS/2 trackball	external	X6	060h-064h IRQ1, edge-triggered 6-pin, mini DIN socket
USB	external	X40	First USB port, additionally second USB port for front-side port
MPI /DP12	external	X800	Can be disabled IRQ5, edge-triggered 9-pin, standard socket, isolated port
Ethernet	external	X805	RJ45
VGA	external	X11	3B0h-3BFh, 3C0h-3CFh, 3D0h-3DFh, can be disabled IRQ9, edge-triggered 15-pin, standard socket
PCCard/CardBus port	external	X600	3E0h-3E1h 100-pin SMD socket connector

Serial port COM1 (PLC/V24/Modem)

The serial port (COM 1) on the computing unit is assigned as follows:

Connector	Pin No.	Short Name	Meaning	Input Output
	2	TxD (D1)	Serial transmission data	Output
	3	RxD (D2)	Serial received 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)	Station ground (reference potential)	-
	8	DCD (M5)	Data carrier detect (carrier)	Input
	9	+TTY RxD	TTY receive	Input
	10	-TTY RxD	TTY receive	Input
	18	+TTY TxD	TTY send	Output
	19	+20mA	Floating current source	-
	20	DTR (S1)	Data terminal equipment ready	Output
	21	-TTY TxD	TTY send	Output
	22	RI (M3)	Incoming call	Input
	1	-	Shield	-
	11-17	-	Not assigned	-
	23-25	-	Not assigned	-

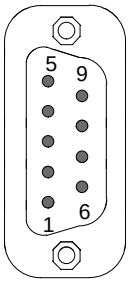
Gender changer for COM1

You can convert the COM1/V24/PLC port of the SIMATIC PC family into a 25-pin male connector by means of the enclosed gender changer (25-pin/25-pin). Plug the gender changer onto the COM1socket and secure it with the two hexagon head screws.

Pin No.	Meaning	Direction	Pin No.	Meaning	Direction
1	Shield	GND	14	NC	
2	Transmitted data (TxD/D1)	Output	15	NC	
3	Received data (RxD/D2)	Input	16	NC	
4	Power up sender (RTS/S2)	Output	17	NC	
5	Clear to send (CTS/M2)	Input	18	+TTY transmitted data (TxD)	Output
6	Data set ready (DSR/M1)	Input	19	Floating current source	Positive potential
7	Station ground (GND/E2)	Ground	20	Data terminal equipment ready (DTR/S1)	Output
8	Received signal carrier (DCD/M5)	Input	21	–TTY transmitted data (TxD)	Output
9	+TTY received data (RxD)	Input	22	Incoming call (RI/M3)	Input
10	–TTY received data (RxD)	Input	23	NC	
11	NC		24	NC	
12	NC		25	NC	
13	NC		Casing	GND	

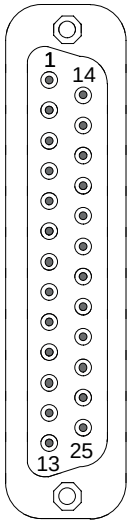
Serial port COM2 (V24/mouse)

The serial port on the computing unit is assigned as follows:

Connector	Pin No.	Short Name	Meaning	Input Output
	1	DCD (M5)	Data carrier detect	Input
	2	RxD (D2)	Received data	Input
	3	TxD (D1)	Transmission data	Output
	4	DTR (S1)	Data terminal equipment ready	Output
	5	GND (E2)	Station ground	-
	6	DSR (M1)	Data set ready	Input
	7	RTS (S2)	Request to send	Output
	8	CTS (M2)	Clear to send	Input
	9	RI (M3)	Incoming call	Input

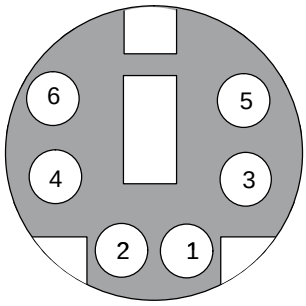
Parallel port LPT1

The parallel port on the computing unit is assigned as follows:

Connector	Pin No.	Signal Description	Input/Output
	1	Strobe (CLK)	Output (open collector)
	2	Data bit 0	Output (TTL level)
	3	Data bit 1	Output (TTL level)
	4	Data bit 2	Output (TTL level)
	5	Data bit 3	Output (TTL level)
	6	Data bit 4	Output (TTL level)
	7	Data bit 5	Output (TTL level)
	8	Data bit 6	Output (TTL level)
	9	Data bit 7	Output (TTL level)
	10	ACK (Acknowledge)	Input (4.7 kΩ pull up)
	11	BUSY	Input (4.7 kΩ pull up)
	12	PE (PAPER END)	Input (4.7 kΩ pull up)
	13	SELECT	Input (4.7 kΩ pull up)
	14	AUTO FEED	Output (open collector)
	15	ERROR	Input (4.7 kΩ pull up)
	16	INIT	Output (open collector)
	17	SELECT IN	Output (open collector)
	18	GND	-
	:	:	:

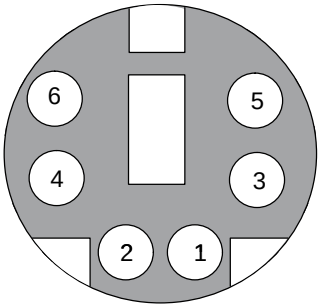
PS/2 mouse port

You can connect an external PS/2 mouse to your computing unit. The port is assigned as follows:

Connector – View of Socket	Pin No.	Name	Input Output
	1	Data	Input/Output
	2	Not assigned	-
	3	0 V	-
	4	Current limited 5 V power supply	Output
	5	Clock	Input/Output
	6	Not assigned	-

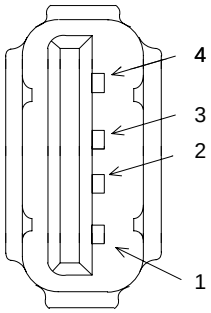
PS/2 trackball/keyboard port

You can connect an external keyboard to your computing unit. The port is assigned as follows:

Connector – View of Socket	Pin No.	Name	Input/ Output
	1	Keyboard data	Input/Output
	2	Trackball data lead	Input/Output
	3	0 V	-
	4	Current limited 5V power supply	Output
	5	Keyboard clock line	Input/Output
	6	Trackball clock lead	Input/Output

USB port

The Universal Serial Bus port is assigned as follows:

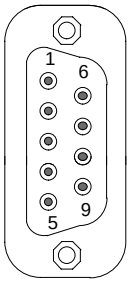
Connector	Contact Number	Signal Name
	1	VCC
	2	- Data
	3	+ Data
	4	Ground

The connector is a type A connector.

The port is rated as a high current USB (500 mA).

MPI/DP port

The MPI/DP port on the computing unit is assigned as follows:

Connector	Pin No.	Name	Meaning	Input/ Output
	1	NC	Pin 1 is not assigned	-
	2	NC	Pin 2 is not assigned	-
	3	LTG_B	Signal lead 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 AS is sending.	Input
	5	M5EXT	M5EXT return conductor (GND) of 5 V supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed 90 mA.	Output
	6	P5 EXT	P5EXT supply (+5 V) of 5 V supply. The current load caused by an external user connected between P5EXT and M5EXT must not exceed 90 mA.	Output
	7	NC	Pin 7 is not assigned	-
	8	LTG_A	Signal lead A of MPI module	Input/ Output
	9	RTS_PG	RTS output signal of the MPI module. The signal is ’1’ when the PU is sending.	Output
	Shield		On connector casing	

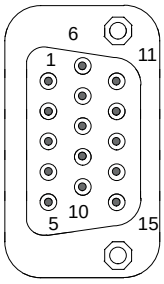
Ethernet RJ45 connection

Pin No.	Meaning
1	TD+
2	TD–
3	RD+
4, 5 *	Terminated internally
6	RD–
7, 8 *	Terminated internally
LED yellow	Link
LED green	Activity

* Not required for data transmission

VGA port

The VGA socket on the computing unit is assigned as follows:

Connector	Pin No.	Name	Meaning	Input/ Output
	1	R_EXT	red	Output
	2	G_EXT	green	Output
	3	B_EXT	Blue	Output
	4	-	NC	-
	5	M	GND	GND
	6	M	GND	GND
	7	M	GND	GND
	8	M	GND	GND
	9	-	NC	-
	10	M	GND	GND
	11	-	NC	-
	12	-	NC	-
	13	EXT_H	Horizontal sync	Output
	14	EXT_V	Vertical sync	Output
	15	-	NC	-

6.7.2 Assignment of Ports for Connection of a Front Panel to Basic Board

Interface	Position	Connec-tor	Description
Display IF (CMOS)	Internal	X420	Connection of LC display with CMOS port
Display IF (LVDS)	Internal	X400	Connection of LC display with single chip, LVDS port
Plug&display IF	Internal	X410/ X411	Reserved
I/O front-panel IF	Internal	X44	Port for front-panel I/O
COM 2	Internal	X26	Internal COM2 port

Display port (CMOS, X420)

D-STN and TFT displays with 5 V CMOS port and VGA resolution (640x480) can be connected to this port. The display is selected and the D-STN/TFT signals are allocated automatically according to the Display Select inputs. The maximum cable length is 50 cm at a display clock rate of 25 MHz.

Pin	Signal – DSTN	Meaning – DSTN	Pin	Signal – TFT	Meaning – TFT
1	P5V_D_fused	+5V (fused) Display VCC	1	P5V_D_fused	+5V (fused) Display VCC
2	P5V_D_fused	+5V (fused) Display VCC	2	P5V_D_fused	+5V (fused) Display VCC
3	GND		3	GND	
4	CLK	Shift clock	4	CLK	Shift clock
5	GND		5	GND	
6	LP	Horizontal sync	6	HSync	Horizontal sync
7	FP	Vertical sync	7	VSync	Vertical sync
8	-	-	8	R0	Signal red bit 0 (LSB)
9	-	-	9	R1	Signal red bit 1
10	UD6	Upper data bit 6	10	R2	Signal red bit 2
11	GND		11	GND	
12	UD7	Upper data bit 7	12	R3	Signal red bit 3
13	UD2	Upper data bit 2	13	R4	Signal red bit 4
14	UD3	Upper data bit 3	14	R5	Signal red bit 5 (MSB)
15	GND		15	GND	
16	UD1	Upper data bit 1	16	G0	Signal green bit 0 (LSB)
17	UD0	Upper data bit 0	17	G1	Signal green bit 1
18	LD3	Upper data bit 3	18	G2	Signal green bit 2
19	GND		19	GND	
20	LD2	Lower data bit 2	20	G3	Signal green bit 3
21	LD1	Lower data bit 1	21	G4	Signal green bit 4
22	LD0	Lower data bit 0	22	G5	Signal green bit 5 (MSB)
23	GND		23	GND	
24	UD5	Upper data bit 5	24	B0	Signal blue bit 0 (LSB)
25	UD4	Upper data bit 4	25	B1	Signal blue bit 1
26	LD7	Lower data bit 7	26	B2	Signal blue bit 2
27	GND		27	GND	
28	LD6	Lower data bit 6	28	B3	Signal blue bit 3
29	LD5	Lower data bit 5	29	B4	Signal blue bit 4
30	LD4	Lower data bit 4	30	B5	Signal blue bit 5 (MSB)
31	VCON	Contrast voltage	31	–	–
32	M	Data enable	32	ENAB	Data enable
33	DispOn	Display On	33	DispOn	Display On
34	Res.	Reserved	34	Res.	Reserved

Display port (LVDS), X400

TFT displays with an LVDS port can be connected to this port. 18-bit displays having a resolution up to 1024x768 pixels can be connected. The permissible display clock rate is 20 MHz to 66 MHz. The display is selected automatically according to the code of the Display Select inputs. The display supply voltages (3,3 V and 5 V) are connected as a function of the requirements for the connected displays via the graphics controller. The maximum cable length is 50 cm at a transfer rate of 455 MHz. Specific cable properties have to be taken into account for differential cable pairs in accordance with the LVDS specification.

Pin No.	Signal	Meaning
1	P5V_D_fused	+5V (fused) Display VCC
2	P5V_D_fused	+5V (fused) Display VCC
3	RXIN0–	LVDS input signal bit 0 (–)
4	RXIN0+	LVDS input signal bit 0 (+)
5	P3V3_D_fused	+3.3V (fused) display VCC
6	P3V3_D_fused	+3.3V (fused) display VCC
7	RXIN1–	LVDS input signal bit 1 (–)
8	RXIN1+	LVDS input signal bit 1 (+)
9	GND	
10	GND	
11	RXIN2–	LVDS input signal bit 2 (–)
12	RXIN2+	LVDS input signal bit 2 (+)
13	GND	
14	GND	
15	RXCLKIN–	LVDS clock signal (–)
16	RXCLKIN+	LVDS clock signal (+)
17	GND	
18	GND	
19	Reserved	
20	Reserved	

Assignment of a display to Display Select pins

Automatic configuration of one of 15 possible displays is performed by means of the Display Select inputs. The Display Select inputs have pull-up resistors – in other words, if these inputs are not connected, they go to High. The input has to be connected to GND for them to go Low.

No.	LCD_SEL3	LCD_SEL2	LCD_SEL1	LCD_SEL0	Display type
0	Low	Low	Low	Low	Reserved
1	Low	Low	Low	High	640 x 480 (VGA), D-STBN, 16 bit
2	Low	Low	High	Low	Reserved
3	Low	Low	High	High	640 x 480 (VGA), TFT, 18 bit
4	Low	High	Low	Low	Reserved
5	Low	High	Low	High	1024 x 768 (XGA), TFT, 18 bit
6	Low	High	High	Low	800 x 600 (SVGA), TFT, 18 bit
7	Low	High	High	High	Reserved
8	High	Low	Low	Low	Reserved
9	High	Low	Low	High	Reserved
10	High	Low	High	Low	Reserved
11	High	Low	High	High	Reserved
12	High	High	Low	Low	Reserved
13	High	High	Low	High	Reserved
14	High	High	High	Low	Reserved
15	High	High	High	High	No display/DDC selected display

I/O port for front control elements

All the signals necessary for the connection of front control elements, in addition to the display and USB ports, are applied to this port. The maximum cable length is 50 cm at a USB data rate of 12 Mbaud.

Pin No.	Signal Name	Remark
1	GND	Chassis ground
2	P12V	Power supply for inverter (max. 0.6 A)
3	BL_ON	Backlight on (5 V to 12 V = On)
4	P5V_fused	+5 V VCC (fused)
5	GND	Chassis ground
6	P3V3_fused	+3.3 V VCC (fused)
7	K_CLK	Keyboard clock
8	K_DATA	Keyboard data
9	M_CLK	Mouse clock
10	M_DATA	Mouse data
11	P5V_fused	+5 V VCC (fused)
12	USB_D1M	USB Data– port 1
13	USB_D1P	USB Data+ port 1
14	GND	Chassis ground
15	LCD_SEL0	Display type select signal 0
16	LCD_SEL1	Display type select signal 1
17	LCD_SEL2	Display type select signal 2
18	LCD_SEL3	Display type select signal 3
19	RESET_N	Reset signal (Low active)
20	SPEAKER	Connection for system loudspeaker
21	HD_LED	HD LED, anode with 1 kΩ in series on motherboard
22	DP_LED	MPI/DP LED, anode with 1 kΩ in series on motherboard
23	Ethernet_LED	Ethernet LED, anode with 1 kΩ in series on motherboard
24	TEMP_ERR	LED temperature drift, anode with 1 kΩ in series on motherboard
25	RUN_R	LED WatchDog error, anode with 1 kΩ in series on motherboard
26	RUN_G	LED WatchDog OK, anode with 1 kΩ in series on motherboard

Internal serail port COM2 (V.24), X26

This port is connected in parallel to the external COM2 port. Both ports can therefore only be used as alternately. They are assigned such that a 1:1 connection can be established to a 9-pin D-SUB socket when insulation displacement connectors are used. The maximum cable length is 100 cm at a data rate of 9.6 kbaud.

Pin No.	Signal	Meaning
1	DCD	Data carrier detect (I)
2	DSR	Data set ready (I)
3	RxD	Received data (I)
4	RTS	Request to send (O)
5	TxD	Transmission data (S)
6	CTS	Clear to send (I)
7	DTR	Data terminal equipment ready (S)
8	IP	Incoming call (I)
9	GND	GND
10	P5V	+5 V power supply

6.7.3 Assignment of the Internal Ports on the Motherboard

Interface	Position	Connector	Description
Memory	Internal	X19, X20	2 SO-DIMM socket, 64 bit
Processor	Internal	X12	Socket for MMC2 mobile processor
Bus expansion	Internal	X1	Socket for bus expansion, assigned with ISA and PCI bus signals)
Power supply	Internal	X14	40-pin cable connector for DC signals
Floppy	Internal	X5	Two drives are possible (82078 compatible) 360 kB, 720 kB, 1.2 MB, 1.44 MB 3F0h – 3F7h, 370h – 377h, can be disabled IRQ 6, edge-triggered 26-pin, socket for flex. cable (Notebook connection)
3.5” hard disk	Internal	X41	Up to two drives are possible 170h-177h, 1F0h-1F7h, can be disabled IRQ 14, IRQ 15, edge-triggered 40-pin, 2.54 mm plug connector (3.5” HD, primary)
2.5” hard disk	Internal	X4	Up to two drives are possible 170h-177h, 1F0h-1F7h, can be disabled IRQ 14, IRQ 15, edge-triggered 44-pin, 2 mm plug connector (2.5” HD, primary)
CD-ROM drive	Internal	X3	A maximum of one drive is possible 170h-177h, 1F0h-1F7h, can be disabled IRQ 14, IRQ 15, edge-triggered 44-pin, 2 mm plug connector (CDROM, secondary slave when LS 120 connected, otherwise secondary master)
LS120	Internal	X31	A maximum of one drive is possible 170h-177h, 1F0h-1F7h, can be disabled IRQ 14, IRQ 15, edge-triggered 1x41-pin (Hirose DF9-41), (LS120, secondary master when drive connected), for use of flex. cable of PG740)
RS485 hybrid	Internal	X503/ X504	Connection for RS485 hybrid (physical interface for MPI/DP port)
TTY sender	Internal	X17	Connection for TTY sender hybrid (physical interface)
TTY receiver	Internal	X18	Connection for TTY receiver hybrid (physical interface)
Power supply port for 3.5” hard disk	Internal	X25	Power supply connection for 3.5” hard disk, 4-pin, plug connector
Power supply connection for CPU fan	Internal	X28	Power supply for CPU fan 2-pin, plug connector
Power supply connection for device fan	Internal	X29	Power supply for device fan 2-pin, plug connector
Backup battery	Internal	X24	Connection for backup battery 2-pin, plug connector

Port to bus module (X1)

The computing unit has a bus module with a PCI expansion slot and a shared ISA/PCI slot. Expansion boards can be installed complying with ISA specification (Rev. 3.1) and PCI specification (Rev. 2.0) with a maximum length of 265 mm (175 mm for shared ISA/PCI modules). All PCI slots can be used as masters. Only 5 V PCI modules can be operated.

The bus module is designed as a truly passive module – in other words, there are only receptacles for the expansion boards and any backup capacitors that may be present. The power supply of the expansion boards runs via the connection of the bus module to the basic board. The -5 V voltage is not provided by the power supply and is generated from the -12 V on the bus module using in-phase control.

The connection to the basic board is established by a gold-plated 'EISA' type two-part connector. All the necessary bus signals (ISA and PCI) are applied to this connector. The following table shows the connector pin assignment.

ISA Bus Signals								PCI Bus Signals							
	Signal		Signal		Signal		Signal		Signal		Signal		Signal		Signal
A	Name	**B**	Name	**C**	Name	**D**	Name	**E**	Name	**F**	Name	**G**	Name	**H**	Name
1	iochk#	1	gnd	1	sbhe#	1	memcs 16#	1	gnd	1	clk (slot3)	1	sdone	1	serr#
2	sd7	2	rstdrv	2	la23	2	iocs16 #	2	gnd	2	gnd	2	sbo#	2	ad15
3	sd6	3	+5V	3	la22	3	irq10	3	inta#	3	intc#	3	c/be1#	3	ad14
4	sd5	4	irq9	4	la21	4	irq11	4	intb#	4	intd#	4	par	4	ad12
5	sd4	5	-5 V	5	la20	5	irq12	5	+5V	5	+5V	5	gnd	5	gnd
6	sd3	6	drq2	6	la19	6	irq15								
7	sd2	7	-12 V	7	la18	7	irq14	7	+5V	7	+5V	7	gnd	7	gnd
8	sd1	8	0ws#	8	la17	8	dack0#	8	rst#	8	clk (slot 1)	8	ad13	8	ad10
9	sd0	9	+12V	9	memr#	9	drq0	9	gnt# (slot 1)	9	gnd	9	ad11	9	ad8
10	iochrdy	10	gnd	10	memw #	10	dack5#	10	req# (slot1)	10	gnt# (slot 2)	10	ad9	10	ad7
11	aen	11	smem w#	11	sd8	11	drq5	11	gnd	11	gnd	11	c/be0#	11	ad5
12	sa19	12	smemr #	12	sd9	12	dack6#	12	clk (slot 2)	12	req# (slot2)	12	ad6	12	ad3
13	sa18	13	iow#	13	sd10	13	drq6	13	gnd	13	ad31	13	ad4	13	ad1
14	sa17	14	ior#	14	sd11	14	dack7#	14	ad30	14	ad29	14	ad2	14	ad0
15	sa16	15	dack3#	15	sd12	15	drq7	15	Req_N 3	15	GNT_ N3				
16	sa15	16	drq3	16	sd13	16	+5V					16	+5V	16	+5V
17	sa14	17	dack1#	17	sd14	17	ma-ster#	17	+3,3V	17	+3,3V	17	+5V	17	+5V
18	sa13	18	drq1	18	sd15	18	gnd	18	ad28	18	ad27	18	gnd	18	gnd
19	sa12	19	re-fresh#					19	ad26	19	ad25	19	gnd	19	gnd
20	sa11	20	sysclk					20	ad24	20	c/be3#				
21	sa10	21	irq7					21	ad22	21	ad23				
22	sa9	22	irq6					22	ad20	22	ad21				
23	sa8	23	irq5					23	ad18	23	ad19				
24	sa7	24	irq4					24	+3,3V	24	+3,3V				
25	sa6	25	irq3												
26	sa5	26	dack2#					26	+3,3V	26	+3,3V				
27	sa4	27	t/c					27	ad16	27	ad17				
28	sa3	28	bale					28	frame#	28	irdy#				
29	sa2	29	+5V					29	c/be2#	29	dev-sel#				
30	sa1	30	osc					30	trdy#	30	lock#				
31	sa0	31	gnd					31	stop#	31	perr#				

DC port of the power supplies

The power supply has a cable connector (X2), through which all the signals on the DC side are connected to the basic board. The port assignment shown is only a draft. It will be defined during the development of the power supply and basic board.

Pin No.	Series A Series B	Meaning
1	PwrGood	Power Good signal
2	TTY VCC	Floating VCC (15 V ± 3 V) for TTY port
3	TTY GND	TTY chassis ground
4	NAU N	Power failure, early warning signal
5	GND	Chassis ground
6	P12V	+12 V
7	V DC	For processor module
8	N12V	–12 V
9	GND	Chassis ground
10	GND	Chassis ground
11	P3V3	+3.3 V
12	P3V3	+3.3 V
13	GND	Chassis ground
14	GND	Chassis ground
15	GND	Chassis ground
16	GND	Chassis ground
17	P5V	+5V
18	P5V	+5V
19	P5V	+5V
20	P5V	+5V

Port to the floppy disk drive (X5)

This port is designed for connecting a Notebook floppy disk drive. The maximum connection length of the data cable must not be longer than 40 cm.

Pin No.	Signal Name	Pin No.	Signal Name
1	P5V	14	STEP_N
2	INDEX_N	15	GND
3	P5V	16	WR_DAT_N
4	DS_N0	17	GND
5	P5V	18	WR_GAT_N
6	DCHG_N	19	EDOUT
7	NC	20	TRACK N0
8	NC	21	EDIN
9	HDOUT	22	WR_PRT_N
10	HDIN	23	GND
11	DIR_SL_N	24	RD_DAT_N
12	GND	25	GND
13	NC	26	SIDE_1_N

Assignment of the IDE ports (X3, X4, X41)

The primary IDE port is designed for alternatively installing 2.5” and 3.5” hard disks. 3.5” drives are connected by means of a 40-pin 2.54 mm pitch connector and 2.5” drives by means of a 44-pin 2 mm pitch connector. The two connectors are connected in parallel. The secondary IDE port is provided for the optional connection of a CD-ROM and/or an LS 120 drive. It can be adapted using a 44-pin 2 mm pitch connector. The maximum connection length of the data cables must not be longer than 40 cm.

Pin	X41	X4/X3	Meaning	Pin	X41	X4/X3	Meaning
1	RESET		Reset	23	IOW_N		IO Write
2	GND			24	GND		
3	D7		Data signal D7	25	IOR_N		I/O read
4	D8		Data signal D8	26	GND		
5	D6		Data signal D6	27	IORDY		I/O ready
6	D9		Data signal D9	28	Reser-ved	CSEL	Master/slave
7	D5		Data signal D5	29	DACK_N		DMA Acknowledge
8	D10		Data signal D10	30	GND		
9	D4		Data signal D4	31	IOCS16		I/O Chip Select 16
10	D11		Data signal D11	32	9		
11	D3		Data signal D3	33	AD_1		Address 1
12	D12		Data signal D12	34	Reserved		Reserved
13	D2		Data signal D2	35	AD_0		Address 0
14	D13		Data signal D13	36	AD_2		Address 2
15	D1		Data signal D1	37	CS1_N		Chip Select 1
16	D14		Data signal D14	38	CS3_N		Chip Select 3
17	D0		Data signal D0	39	HDACT_N		Data signal D0
18	D15		Data signal D15	40	GND		Data signal D15
19	GND			41		P5V	+5V power supply
20	9		Code	42		P5V	+5V power supply
21	DREQ		DMA Request	43		GND	
22	GND			44		Reser-ved	Reserved

Connection for LS120 drive (X31)

The LS120 drive for customized solutions is connected via this port. This port is connected in parallel to the secondary IDE port. When connected, the LS120 drive automatically becomes a master – in other words, a bootable drive – on account of a special circuit). The maximum connection length of the data cable must not be longer than 40 cm.

Pin No.	X31	Meaning	Pin No.	X31	Meaning
1	RESET	RESET	21	RESET	RESET
2	GND	Chassis ground	22	IOW_N	IO Write
3	D8	Data signal D8	23	GND	Chassis ground
4	D7	Data signal D7	24	IOR_N	I/O read
5	D9	Data signal D9	25	GND	Chassis ground
6	D6	Data signal D6	26	IORDY	I/O ready
7	D10	Data signal D10	27	Reserved	
8	D5	Data signal D5	28	DACK_N	DMA Acknowledge
9	D11	Data signal D11	29	TBD	
10	D4	Data signal D4	30	GND	Chassis ground
11	D12	Data signal D12	31	Reserved	Reserved
12	D3	Data signal D3	32	IOCS16	I/O Chip Select 16
13	D13	Data signal D13	33	AD_2	Address 2
14	D2	Data signal D2	34	AD_1	Address 1
15	D14	Data signal D14	35	CS3_N	Chip Select 3
16	D1	Data signal D1	36	AD_0	Address 0
17	D15	Data signal D15	37	HDACT_N	HD active
18	D0	Data signal D0	38	CS1_N	Chip Select 1
19	GND	Chassis ground	39	TBD	
20	DREQ	DMA Request	40	P5V	+5 V power supply
			41	P5V	+5 V power supply

Power supply port for hard disk (X.25)

Power is supplied to the 3.5” hard disk via this port.

Pin No.	Signal	Meaning
1	P12V	+12 V
2	GND	Chassis ground
3	GND	Chassis ground
4	P5V	+5 V

Connections for CPU fans (X28)

The CPU fan and the device fan are connected using these two ports.

Pin No.	Signal
1	12V temperature-controlled
2	0 V fan, switched

Connection for backup battery (X42)

The battery for backing up the CMOS RAM is connected to this port. The battery used is a 3.6 V lithium battery with a capacity of 750 mAh.

Pin No.	Signal	Meaning
1	+	Positive
2	–	Negative

6.8 Bus Module

6.8.1 Design and Theory of Operation

The bus module is designed as a passive link between the basic board and the expansion boards. It is mounted with a screw.

The bus module has a PCI expansion slot and a shared ISA/PCI slot. The power supply of the expansion boards runs via the connection of the bus module to the basic board. An external power supply (+5 V and +12 V) is provided.

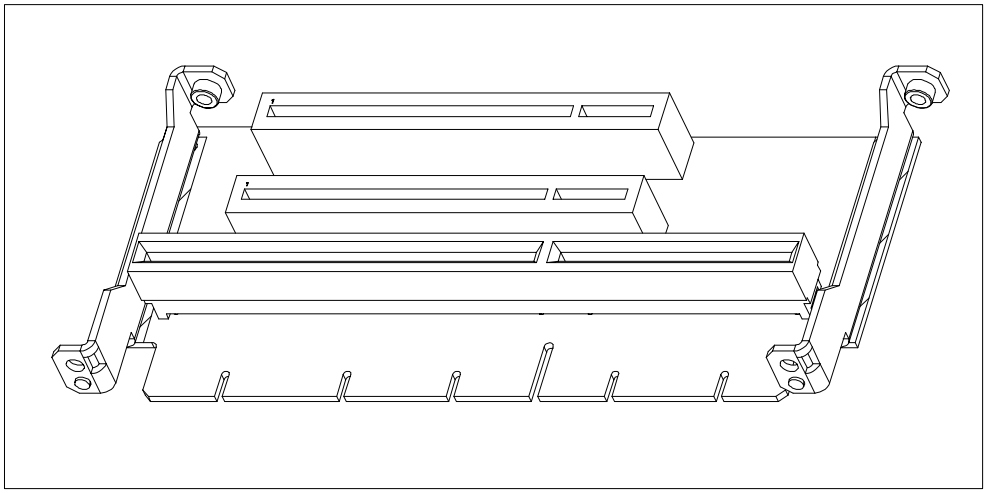


Figure 6-1 Wiring Backplane

6.8.2 Interface to the Basic Board

The connection to the basic board is established by a gold-plated EISA type two-part connector. All the necessary bus signals (ISA and PCI) are applied to this connector. The following table shows the connector pin assignment.

ISA Bus Signals								PCI Bus Signals							
	Signal		Signal		Signal		Signal		Signal		Signal		Signal		Signal
A	Name	**B**	Name	**C**	Name	**D**	Name	**E**	Name	**F**	Name	**G**	Name	**H**	Name
1	iochk#	1	gnd	1	sbhe#	1	memcs 16#	1	gnd	1	clk (slot3)	1	sdone	1	serr#
2	sd7	2	rstdrv	2	la23	2	iocs16#	2	gnd	2	gnd	2	sbo#	2	ad15
3	sd6	3	+5V	3	la22	3	irq10	3	inta#	3	intc#	3	c/be1#	3	ad14
4	sd5	4	irq9	4	la21	4	irq11	4	intb#	4	intd#	4	par	4	ad12
5	sd4	5	-5 V	5	la20	5	irq12	5	+5V	5	+5V	5	gnd	5	gnd
6	sd3	6	drq2	6	la19	6	irq15								
7	sd2	7	-12 V	7	la18	7	irq14	7	+5V	7	+5V	7	gnd	7	gnd
8	sd1	8	0ws#	8	la17	8	dack0#	8	rst#	8	clk (slot 1)	8	ad13	8	ad10
9	sd0	9	+12V	9	memr#	9	drq0	9	gnt# (slot 1)	9	gnd	9	ad11	9	ad8
10	iochrdy	10	gnd	10	memw #	10	dack5#	10	req# (slot1)	10	gnt# (slot 2)	10	ad9	10	ad7
11	aen	11	smemw#	11	sd8	11	drq5	11	gnd	11	gnd	11	c/be0#	11	ad5
12	sa19	12	smemr#	12	sd9	12	dack6#	12	clk (slot 2)	12	req# (slot2)	12	ad6	12	ad3
13	sa18	13	iow#	13	sd10	13	drq6	13	gnd	13	ad31	13	ad4	13	ad1
14	sa17	14	ior#	14	sd11	14	dack7#	14	ad30	14	ad29	14	ad2	14	ad0
15	sa16	15	dack3#	15	sd12	15	drq7	15	Req_N3	15	GNT_N 3				
16	sa15	16	drq3	16	sd13	16	+5V					16	+5V	16	+5V
17	sa14	17	dack1#	17	sd14	17	ma-ster#	17	+3,3V	17	+3,3V	17	+5V	17	+5V
18	sa13	18	drq1	18	sd15	18	gnd	18	ad28	18	ad27	18	gnd	18	gnd
19	sa12	19	refresh#					19	ad26	19	ad25	19	gnd	19	gnd
20	sa11	20	sysclk					20	ad24	20	c/be3#				
21	sa10	21	irq7					21	ad22	21	ad23				
22	sa9	22	irq6					22	ad20	22	ad21				
23	sa8	23	irq5					23	ad18	23	ad19				
24	sa7	24	irq4					24	+3,3V	24	+3,3V				
25	sa6	25	irq3												
26	sa5	26	dack2#					26	+3,3V	26	+3,3V				
27	sa4	27	t/c					27	ad16	27	ad17				
28	sa3	28	bale					28	frame#	28	irdy#				
29	sa2	29	+5V					29	c/be2#	29	devsel#				
30	sa1	30	osc					30	trdy#	30	lock#				
31	sa0	31	gnd					31	stop#	31	perr#				

ISA slot pin assignment

Pin	Signal Name	Type*	Pin	Signal Name	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	–OWA	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 defines the direction of the signals from the point of view of the CPU module.

Pin	Signal Name	Type *	Pin	Signal Name	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 13	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

Under nor,al conditions, the signals –SBHE, LA17 – LA23, –MEMR and MEMW are operated as outputs (sending from CPU). Only CPU modules that 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

	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 (I/O)
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V (I/O)
17	Ground	GNT#
18	REQ#	Ground
19	+5V (I/O)	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	ACK64#	REQ64#
61	+5V	+5V
62	+5V	+5V
	CONNECTOR KEY	
	CONNECTOR KEY	
63	Reserved	Ground
64	Ground	C/BE[7]#
65	C/BE[6]#	C/BE[5]#
66	C/BE[4]#	+5V (I/O)
67	Ground	PAR64
68	AD[63]	AD[62]
69	AD[61]	Ground
70	+5V (I/O)	AD[60]
71	AD[59]	AD[58]
72	AD[57]	Ground
73	Ground	AD[56]
74	AD[55]	AD[54]
8	AD[53]	+5V (I/O)
76	Ground	AD[52]
77	AD[51]	AD[50]
78	AD[49]	Ground
79	+5V (I/O)	AD[48]
80	AD[47]	AD[46]
81	AD[45]	Ground
82	Ground	AD[44]
83	AD[43]	AD[42]
84	AD[41]	+5V (I/O)
85	Ground	AD[40]
86	AD[39]	AD[38]
87	AD[37]	Ground
88	+5V (I/O)	AD[36]
89	AD[35]	AD[34]
90	AD[33]	Ground
91	Ground	AD[32]
92	Reserved	Reserved
93	Reserved	Ground
94	Ground	Reserved

Assignment of slot-specific PCI bus signals

PCI Socket Pin No.	PCI Slot 1	Shared ISA PCI Slot
B16	clk (slot 1)	clk (slot2)
A6	inta#	intb#
A7	intc#	intd#
B7	intb#	intc#
B8	intd#	inta#
B18	req# (slot 1)	req# (slot 2)
A17	gnt# (slot 1)	gnt# (slot 2)
A26	ad29	ad30

6.9 Hard Disk Drive

Capacity		See ordering data
Power requirements	typically (startup) 5V typically (startup) 12V	0.41 A (0.3 A) 0.21 A (1.3 A)
Parameters Heads	Cylinder / Sectors /	Depend on type of hard disk used
Jumpers	Single * Master Slave	J8-1 = 0 J8-3 = 0 J8-5 = 0 J8-1 = 0 J8-3 = 0 J8-5 = 1 J8-1 = 0 J8-3 = 1 J8-5 = 0
Fast IDE Highspeed		Yes

1 = Jumper inserted
0 = Jumper not inserted
* = Default setting
All other jumpers should remain as supplied

6.10 Floppy Disk Drive

Capacity		1.44 MB
Power requirements	typically (startup) 5V typically (startup) 12V	0.40 A (0.70 A)
Parameters	Cylinders Sectors Heads	80 18 2
Jumpers	Single	None

6.11 AC and DC Power Supplies

Technical Data

Voltage	Max. current	Voltage stability
+12 V	1.7 A	± 4%
–12 V	0.2 A	± 6%
+ 5 V	10.5 A	± 3%
–5 V	0.05 A	± 5%
+3.3 V	4.2 A	± 5%
+ 18 V (electrically isolated)	0.05 A	± 5%

Voltage

	AC	DC
Input voltage	120/230 V AC, ± 10 %	24 V DC
Frequency	47 – 63 Hz	–
Power consumption	≤ 120 Watt	
Stored energy time upon power failure	20 ms	20 ms at rated voltage
Output power	84 W	
Degree of protection	IP20 (when installed)	
Protection class	VDE 0106	
Approvals	EN 60950/IEC 950, UL 1950	

Power Good signal

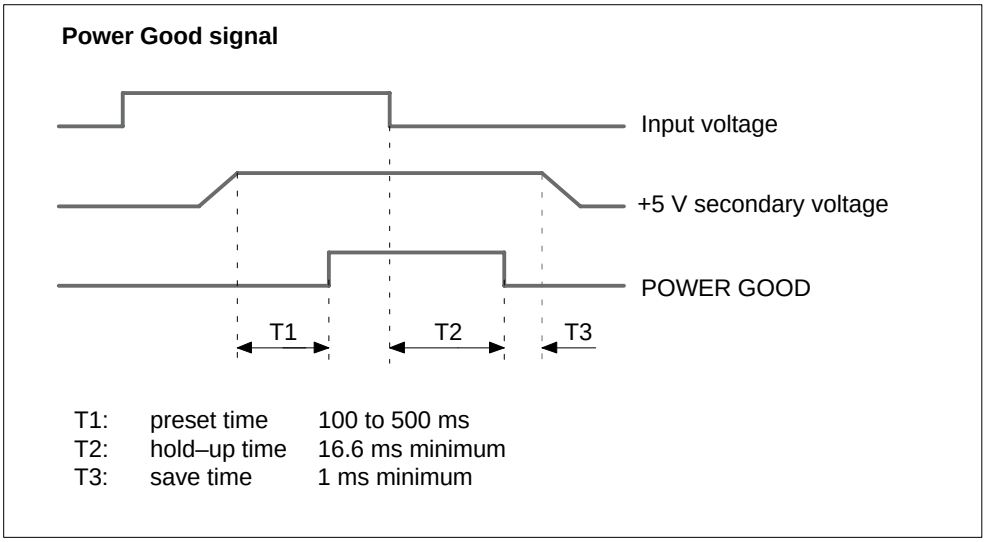


Figure 6-2 Time Characteristics of the Power Good Signal

6.12 Connecting Cables

Overview

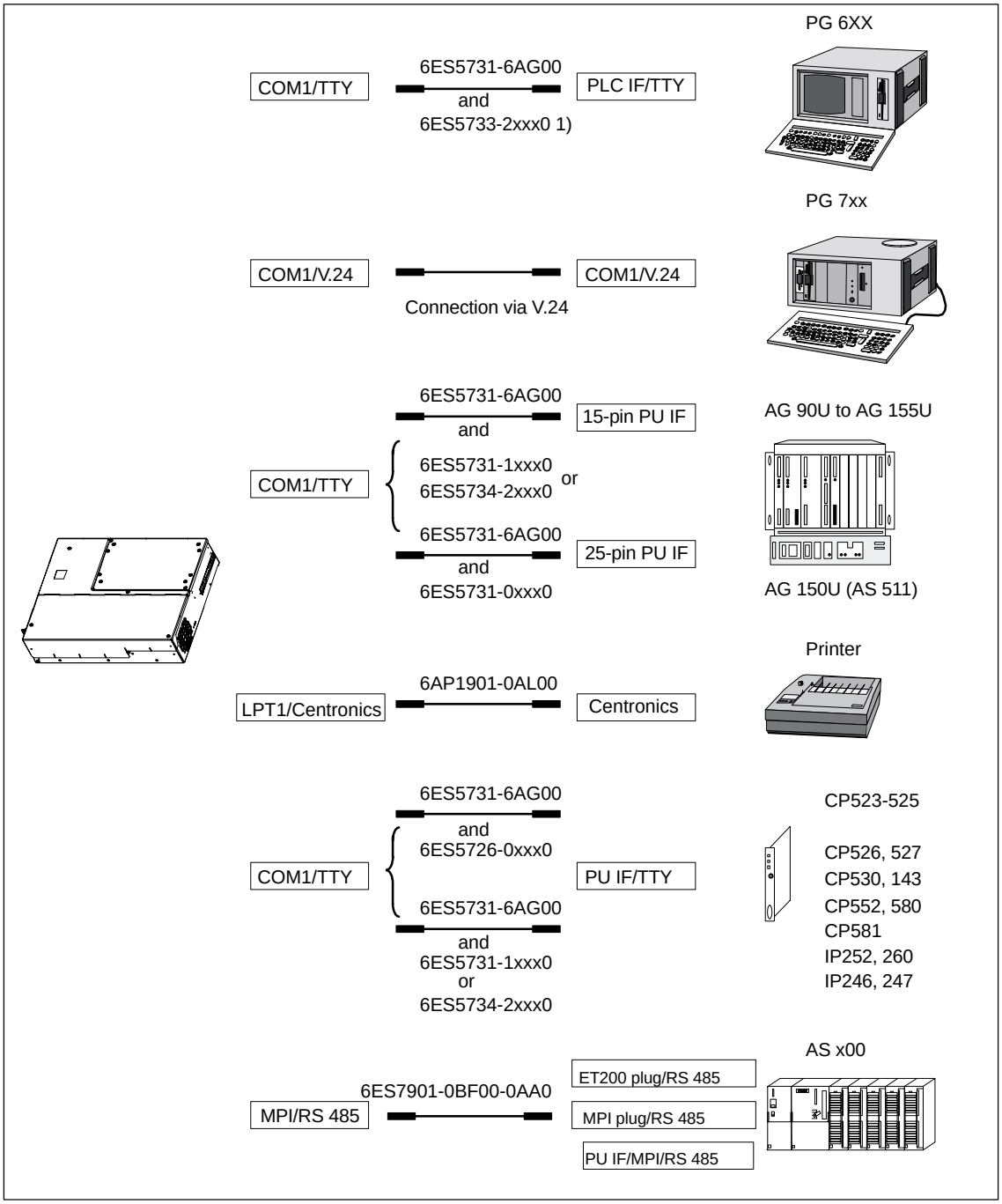


Figure 6-3 Connecting Cables

1) Connecting cables only as spare parts now

Standard connecting cable

You can use the standard connecting cable to connect your computing unit to a Siemens programmable controller. Please study the notes in Chapter 3.

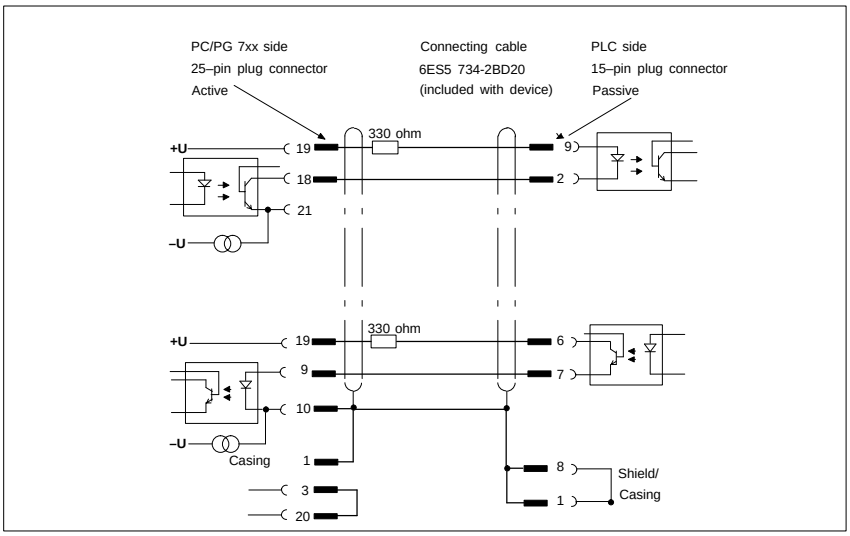


Figure 6-4 Standard Connecting Cable

Adapter PG 6xx cable

If you want to connect your computing unit to a PLC with the standard connecting cable of a PG 6xx, please use an adapter.

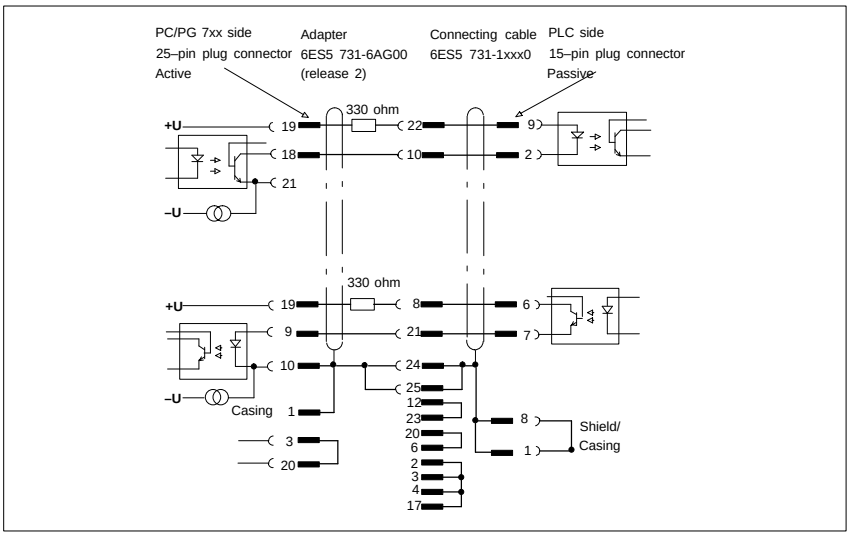


Figure 6-5 Adapter for Connection to PG 6xx

Connecting cable with 25-pin socket

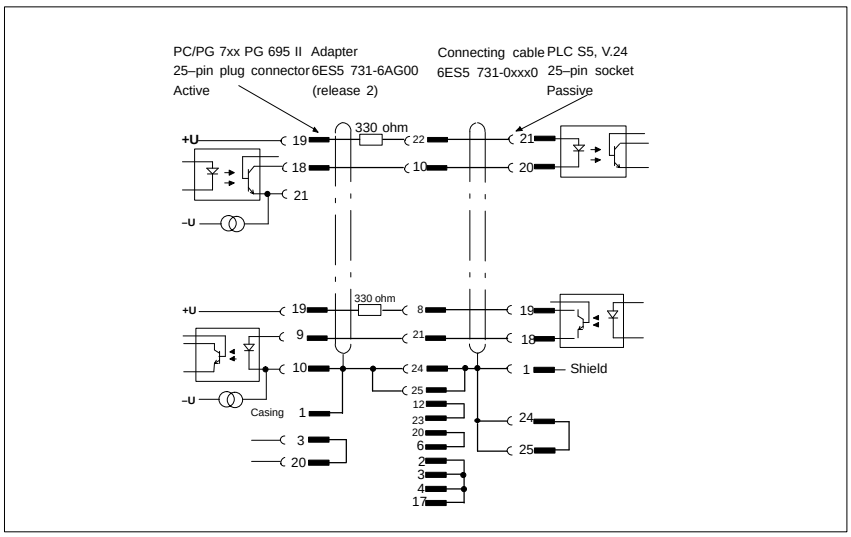


Figure 6-6 Connecting Cable with 25-Pin Socket

Connecting cables for the connection of a PC/PU interface

You can connect your computing unit to PUs via
TTY / COM 1 with this cable. This cable does not have an order number. Please study the notes in Chapter 3.

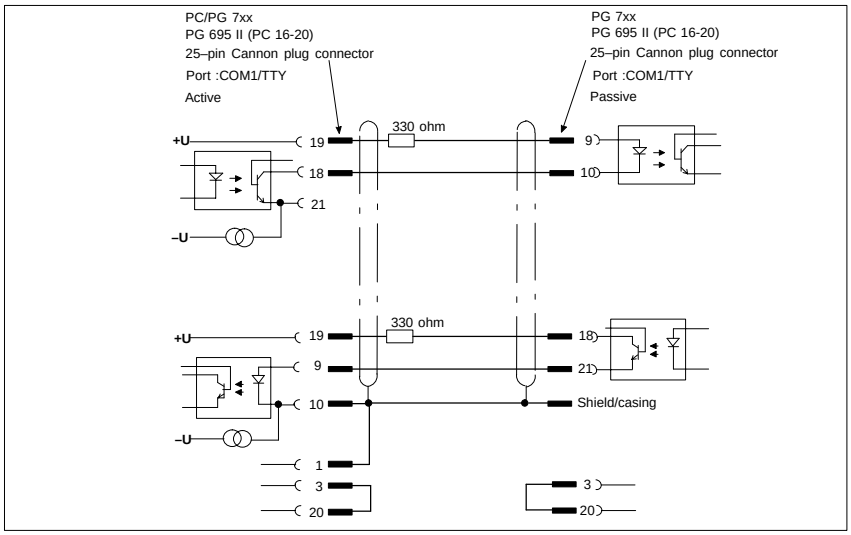


Figure 6-7 Connecting Cables for the Connection of a PC/PU Interface

Interface to PLC S5/V.24 and COM 1/TTY of a PG 6xx

If you want to connect your computing unit to the PLC S5 / V.24 port of a PG 6xx, you will need an adapter. In this case, the computing unit must be active. Please study the notes on changing the TTY/COM 1 port from passive to active in section 4.10.

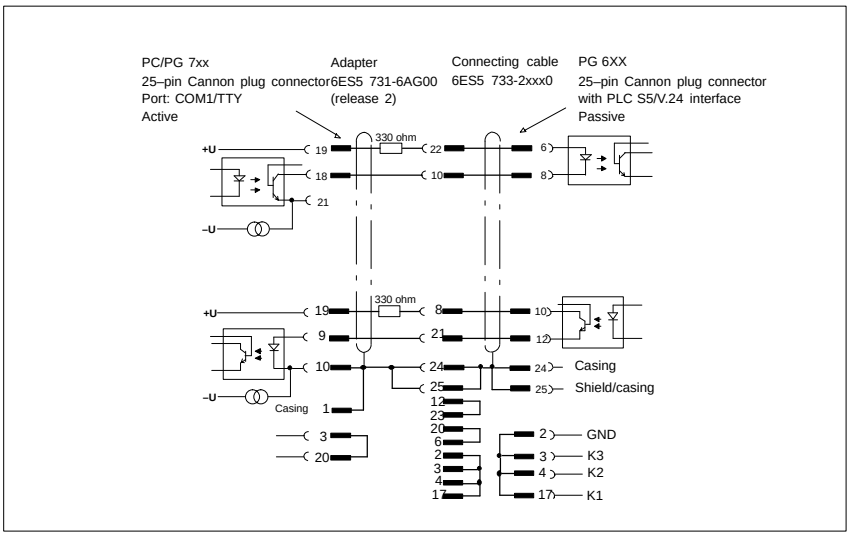


Figure 6-8 Interface to PLC S5/V.24 and COM 1/TTY of a PG 6xx

PC/PG 7xx connection in V.24 mode

You can interconnect all PG 7XX's with this connecting cable.

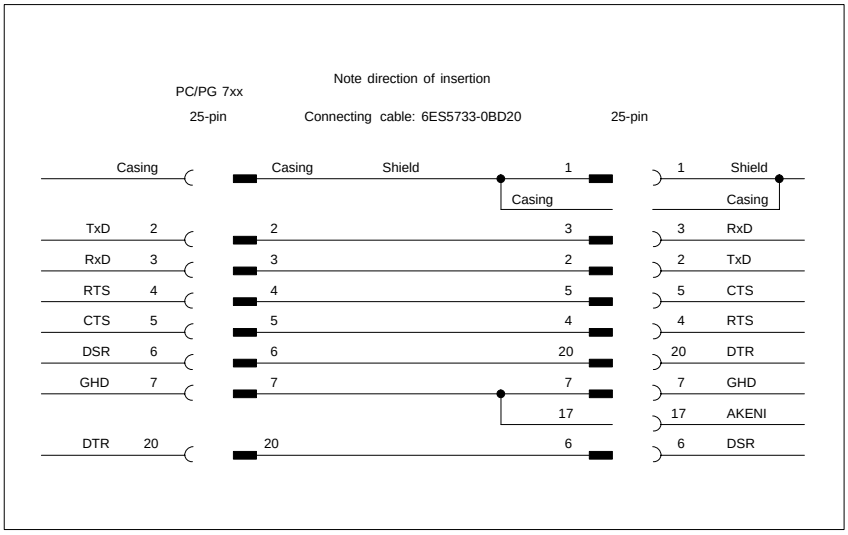


Figure 6-9 PC/PG 7xx Connection in V.24 Mode

Remote mount form factor

7

This chapter describes the specific features of distributed configuration to the extent that they vary from the integrated configuration (described in Chapters 2 to 6).

The present document concentrates on the computing unit.

The part of the description referring to the Remote mount of the control unit will be found in ”SIMATIC Panel PC 670/870 Control Unit” manual.

Overview You will find general information about the Remote mount concept in Section 5.1 of the ”SIMATIC Panel PC 670/870 Control Unit” manual.

7.1 Description

7.1.1 Overview

Figure 7-1 shows a PC 670 computing unit (distributed configuration) with the transmitter fitted between mounting brackets.

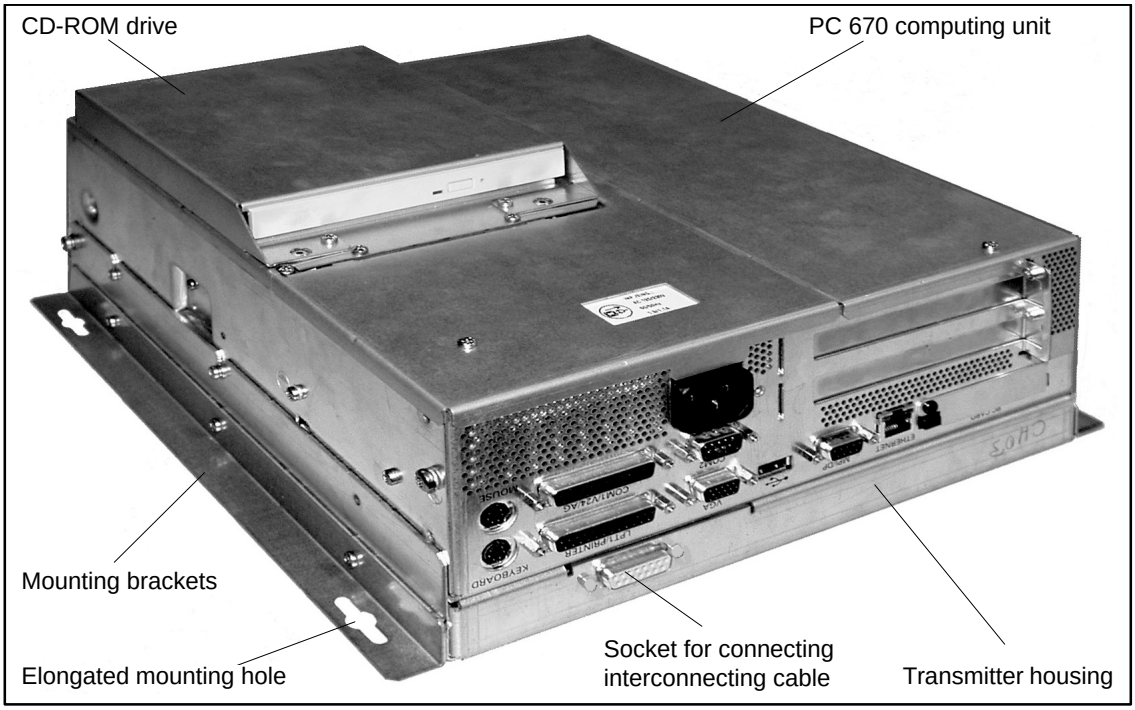


Figure 7-1 PC 670 computing unit in distributed configuration (230 V power supply) including transmitter

You can see the fitted transmitter pcb in Figure 7-4.

7.1.2 Dimensions

Figure 7-2 shows the dimensions of the PC 670 computing unit with transmitter.

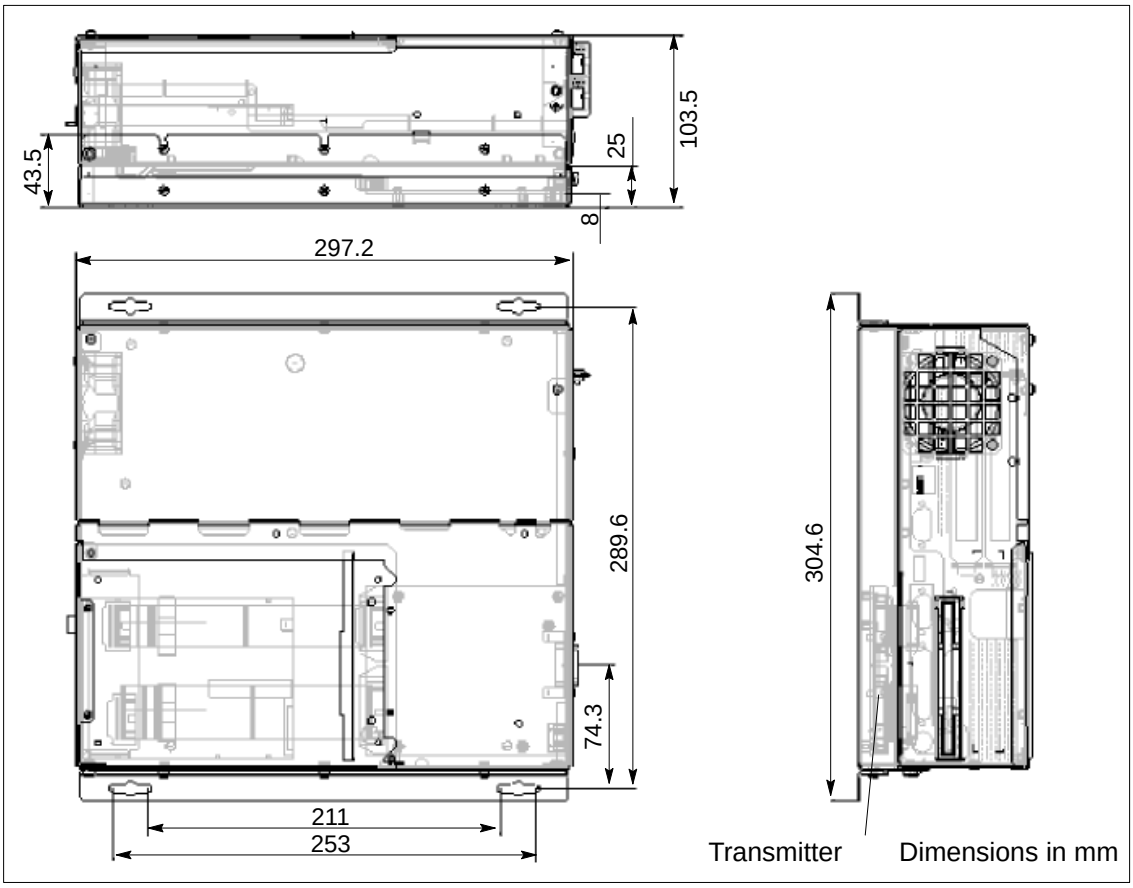


Figure 7-2 Dimensions of PC 670 computing unit in distributed configuration including transmitter

7.1.3 Mounting

The computing unit is supplied as a complete combination with the transmitter installed ex works.

The device is fitted with the help of four elongated holes in the mounting brackets (refer to Figures 7-1 and 7-2).

Installation The computing unit can be fitted horizontally or vertically. An inclined position of ±5 ° is allowed; vertical installation is recommended.

Downward direction of the airflow is not allowed (interfaces at top; refer to Figure 7-3).

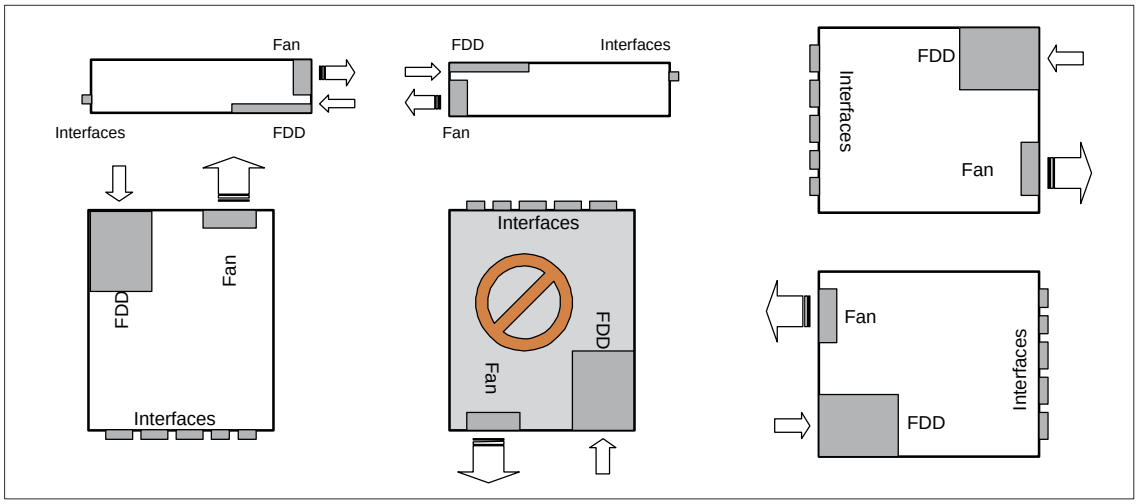


Figure 7-3 Installation locations for the computing unit

7.2 Cable connection

The transmitter and receiver are interconnected by a cable no longer than 20 m.

For operation, the angled cable connector is inserted in the socket of the transmitter and locked.

The interconnecting cable must also be fixed in position.

For further details refer to the ”SIMATIC Panel PC 670/870 Control Unit” manual, Chapter 5.

7.3 Spare parts

The interconnecting cable for the Panel PC with distributed configuration is a spare part (refer to the ”SIMATIC Panel PC 670/870 Control Unit” manual).

7.4 Technical Specifications

Of relevance to the user, in addition to the technical specifications listed in Appendix B, are only the:

- Dimensions: see Figure 7-2.
- S30 encoder setting of the transmitter:
  the transmitter setting to the display you are using is performed before it is supplied.

Display code

Should it be necessary to check or modify the setting, perform the following steps:

1. Unscrew the computing unit from the installation wall.
2. Unscrew the four fastening screws on the transmitter housing (Figure 7-1).
3. Remove the transmitter housing from the computing unit (there is no need to unplug the cables).

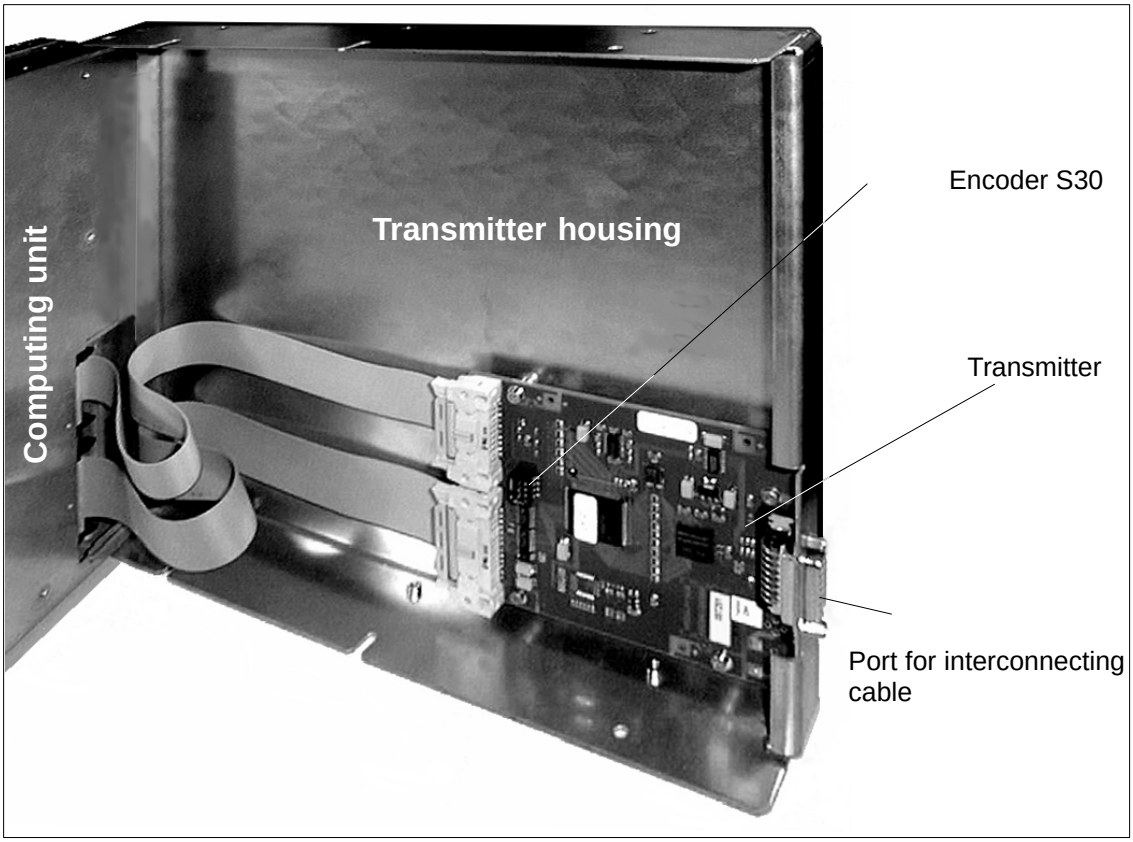


Figure 7-4 Transmitter in opened transmitter housing

4. Check (or set) the switch setting as shown in the table below:

Table 7-1 Display type setting using encoder S30

Type	Resolution	S30/4	S30/3	S30/2	S30/1
12” (SVGA)	800 x 600	OFF	ON	ON	ON
15” (XGA)	1024 x 768	OFF	ON	ON	OFF

5. Install in reverse order.

SIMATIC Panel PC 670 Computing Unit Equipment Manual
Edition 12/01

Error Diagnostics

A

In this chapter

In this chapter you will find a selection of important errors and messages on the computing unit, together with their causes and remedies.
The built-in self-test of the computing unit is likewise explained.

A.1 Diagnosing Errors

The table shows when the messages and errors occur and how you perform troubleshooting.

Error	Cause	Remedy
Power ON LED does not light	Power supply connection is not correct	Check the power supply connection, mains cable, and mains plug
The display/monitor shows the following message: `Invalid configuration information... Press the F1 key for continue, F2 to run Setup utility`	Erroneous configuration data Backup battery defective or empty	Press F2, check the configuration data in SETUP, enter default values if required, check error messages in the first SETUP dialog box
The display/monitor shows the following message: `No boot device available`	No bootable disk in drive Wrong hard disk type entered in SETUP	Use *Fixed Disk function* in SETUP
The display/monitor shows the following message: `Keyboard stuck key failure`	A key stuck during the system self-test of the keyboard.	Check the keyboard Reboot the system
Startup of the computing unit is aborted following several whistling noises	An error occurred during the system self-test	Check the hardware (refer to section 2.1).
Whistling is heard every time a key is pressed but characters are not displayed	The keyboard buffer has overflowed	<CTRL> <PAUSE>
Not Ready error when attempting to read from floppy disk	No disk inserted Disk is not formatted.	Insert disk Format disk
Write Protection error when attempting to write to disk	The disk is write-protected The guide slot is open with the 3.5” format	Disable write protection
Ports COM1, COM2, LPT1 or MPI/DP cannot be addressed	Ports are set to `Disabled` in SETUP.	Set ports COM1,COM2, LPT1 or MPI/DP in SETUP to *Enabled* in the `Hardware Options` dialog box.
<\> Key is not displayed	Wrong keyboard driver being used	Load the proper keyboard driver <ALT> <9> <2>
Mouse does not work	The ball in the mouse does not move freely No or wrong mouse driver	Clean the ball and the housing of the mouse Load the proper mouse driver
The mouse pointer cannot be moved	The PS/2 port is set to `Disabled` in Setup	Check the entry in Setup
The mouse pointer does not move smoothly	The ball in the mouse is dirty	Clean the ball and the housing of the mouse
The drive cover cannot be opened	The bezel does not fit properly	Press the bezel in properly

A.2 Built-In Self Test of the Computing Unit

When the computing unit is powered up, it runs a self-test (POST = Power On Self Test). If errors are detected, the corresponding sequence of beeps (beep code) is output. 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	BB	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 early
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 module 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 module 8742
1A	TP_DMA_INIT	Initialize the DMA modules
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

Display (hex)	Meaning	Description
46	TP_COPYRIGHT	Test the copyright
49	TP_PCI_INIT	Initialize the PCI interface
48	TP_CONFIG	Check the configuration
4A	TP_VIDEO	Initialize the video interface
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 module 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	Display the configuration and size of the shadow RAM
6E	TP_DISP_NONDISP	Display non-disposable 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 modules
88	TP_BIOS_INIT	Various initializations
8 A	TP_INIT_EXT_BDA	Initialize the external BIOS data area
85	TP_PCI_PCC	Determine the PCI modules
82	TP_RS232	Determine the serial interfaces
84	TP_LPT	Determine the parallel interface
86	TP_IO_AFTER	Reenable the IO modules
83	TP_FDISK_CFG_IDE_CTRLR	Configure the IDE controller
89	TP_ENABLE_NMI	Enable the NMI
8C	TP_FLOPPY	Initialize the floppy controller

Display (hex)	Meaning	Description
90	TP_FDISK	Initialize the hard disk controller
8B	TP_MOUSE	Test the internal mouse interface
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	Was F2 pressed?
AC	TP_SETUP_CHEK	Switch 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 flag
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 while the system is booting, three short beeps are output. This indicates that the initialization of the PC-specific is being skipped.

If your computing unit not start up properly, you can report the Hex code of the self-test to the hotline.

Technical Specifications

B

In this Appendix

This appendix contains the following technical specifications for the Panel PC 670 computing unit:

- General Information
- Safety
- Electromagnetic Compatibility (EMC)
- Ambient Conditions
- Mechanical environmental conditions
- Special features
- Motherboard
- Drives
- Graphics card
- Interfaces
- Function displays (light-emitting diodes) on device

General	
External dimensions B x H	295 mm x 265 mm x 80 mm, without CD-ROM drive 295 mm x 265 mm x 100 mm, with CD-ROM drive
Weight	Central configuration: approx. 6 kg Remote mount: approx. 7,5
Line voltage (U_N)	120 V (85 V to 132 V (AC), or 230 V (170 V to 264 V) AC (autorange); alternatively: 24 V (DC) (18.5 V to 28.5 V)
Line voltage frequency	50/60 Hz (47 to 63 Hz)
Brief voltage interruption acc. to NAMUR	max. 20 ms at o.85 U_N (max. 10 events per hour; recovery time at least 1 second)
Max. power consumption	Central configuration: 130 W, Remote mount: 133 W
Max. current output (DC)	+5 V / 10.5 A 3.3 V / 4.2 A +12 V / 1.7 A –12 V / 0.2 A –5 V / 0.05 A (total max. 84 W)
Noise emission	< 55 dB (A) to DIN 45635
Degree of protection	IP20

Safety	
Protection class	Protection class I to VDE 0106 T1: 1982 (IEC 536)
Safety requirements	IEC 950/09.91 corr. to DIN VDE 0805/11.93

Electromagnetic compatibility (EMC)		
Emitted interference	EN 55011 Class A (requirement in industrial environment)	
Noise immunity: Line-fed interference on supply lines	± 2 kV ± 1 kV ± 2 kV	(to IEC 1000-4-4; burst) (to IEC 1000-4-5; surge symm) (to IEC 1000-4-5; surge asymm)
Noise immunity on signal lines	± 1 kV ± 2 kV ± 1 kV ± 2 kV	(to IEC 1000-4-4; burst; length < 3 m) (to IEC 1000-4-4; burst; length > 3 m) (to IEC 1000-4-5; surge symm; Length > 20 m) (to IEC 1000-4-5:1995; surge asymm) Length > 20 m)
Noise immunity to discharges of static electricity	± 6 kV contact discharge ± 8 kV discharge in air	(to IEC 1000-4-2) (to IEC 1000-4-2)

Electromagnetic compatibility (EMC)	
Noise immunity to high-frequency radiation	10 V/m 80-1000 MHz, 80% AM (to IEC 1000-4-3) 10 V/m 900 MHz, 50% ED (to ENV 50204:1995 10 V 9KHz- 80MHz (to IEC 1000-4-6)
Magnetic field	30 A/m 50 Hz (to IEC 1000-4-8)

Climatic conditions	
Temperature	Tested to DIN EN 60068-2-2:1994, DIN IEC 68-2-1, DIN IEC 68-2-14,
– operation	+ 5°C to +45°C (with full configuration)
– storage/transport	- 20°C to +60°C
– gradient	max 10°C/h (no condensation)
Relative humidity	Tested to DIN IEC 68-2-3, DIN IEC 68-2-30, DIN IEC 68-2-56
– operation	5% to 80% at 25°C (no condensation)
– storage/transport	5% to 95% at 25°C (no condensation)
– gradient	max 10°C/h (no condensation)

Mechanical environmental conditions	
Vibration *)	Tested to DIN IEC 68-2-6
– operation	10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s^2
– storage/transport	5 to 9 Hz: 3,5 mm, 9 to 500 Hz: 9.8 m/s^2
Shock	Tested to DIN IEC 68-2-29
– operation	50 m/s^2, 30 ms,
– storage/transport	250 m/s^2, 6 ms,

*) Constraints for LS 120 and CD-ROM

LS 120 with 120 MB disk	10 to 58 Hz: 0.015 mm, 58 to 500 Hz: 2 m/s^2
CD-ROM	10 to s 58 Hz: 0.019 mm, 58 to 500 Hz: 2.5 m/s^2

Special features	
Quality assurance	to ISO 9001

Motherboard	
Processor	Intel Mobile Pentium II / Celeron (type: MMC2), (see ordering data)
Cache	2x 16 KB first level, 128/256 KB second level, depending on processor used)
Main memory (RAM)	Maximal 256 MB SDRAM memory configuration (see ordering data)
Free expansion slots	1 shared ISA/PCI (max 170 mm long), 1 PCI (max 265 mm long)
– Max. permissible power consumption per ISA slot – Max. permissible power consumption per PCI slot – Values not to be exceeded as total (all slots)	5V 2A, 12V 0.3A, -12V 0.1A 5V 2A, 12V 0.3A, -12V 0.1A 5V 3A, 12V 0.6A, -12V 0.15A

Drives	
Floppy disk drive/LS 120	3.5”, (1.44 MB) / 3.5” (120 MB or 1.44 MB)
Hard disk drive	3.5”, EIDE, UDMA33, hard disk capacity (see ordering data)

Graphics	
Graphics controller	XGA LCD controller on AGP bus; Type: Chips & Technology 69000 PCI
Graphics memory	2 MB SDRAM, integrated in graphics controller
Resolutions/frequencies/colors	CRT: up to 1024x768/75 Hz/65535 colors

Ports	
COM 1	Serial port 1 (V.24 / TTY), 25-pin sub D socket connector
COM 2	Serial port 2 (V.24), 9-pin sub D connector
LPT1	Parallel port (standard, EPP and ECP modes) Interface for printer with parallel port
VGA	VGA port for external monitor
Keyboard	PS/2 keyboard connector (combo interface with trackball signals)
Mouse	PS/2 mouse port
USB	2 ports (1x internal, 1x external)
Cardbus	1 interface (max. Type III)
DP12 interface, isolated • Transmission speed • Mode • Physical interface • Memory address area • Interrupts	9-pin sub D socket connector, screw-type locking • 9.6 Kbaud to 12 Mbaud, software-selectable • isolated 1): data lines A, B control lines RTS AS, RTS_PG - 5V voltage supply (max. 90 mA) • ground connection: - screen of DP12 connection cable • RS485, isolated 1) • 0CC000h ...0CC7FFh or 0DC000h ...0DC7FFh • IRQ5, 10, 11 or 15, software-selectable

1) Electrically isolated in a safety extra-low voltage circuit (SELV)

Function displays (LEDs) on device	
Computing unit	FD/LS120 access (on FD/LS120 drive) CD-ROM access (on CD drive)

SIMATIC Panel PC 670 Computing Unit Equipment Manual
Edition 12/01

ESD Guidelines

C

What does ESD mean?

Virtually all present-day modules incorporate highly integrated MOS devices or components. For technological reasons, these electronic components are very sensitive to overvoltages and consequently therefore to electrostatic discharge:

These devices are referred to in German as Elektrostatisch Gefährdeten Bauelemente/ Baugruppen: “EGB”

The more frequent international name is:

“ESD” (Electrostatic Sensitive Device)

The following symbol on plates on cabinets, mounting racks or packages draws attention to the use of electrostatic sensitive devices and thus to the contact sensitivity of the assemblies concerned:

ESDs may be destroyed by voltages and energies well below the perception threshold of persons. Voltages of this kind occur as soon as a device or an assembly is touched by a person who is not electrostatically discharged . Devices exposed to such overvoltages cannot immediately be detected as defective in the majority of cases since faulty behavior may occur only after a long period of operation.

Precautions against electrostatic discharge

Most plastics are capable of carrying high charges and it is therefore imperative that they be kept away from sensitive components.

When handling electrostatic sensitive devices, make sure that persons, workplaces and packages are properly grounded.

Handling ESD assemblies

A general rule is that assemblies should be touched only when this cannot be avoided owing to the work that has to performed on them. Under no circumstances should you handle printed-circuit boards by touching device pins or circuitry.

You should touch devices only if

- you are grounded by permanently wearing an ESD wrist strap or
- you are wearing ESD shoes or ESD shoe-grounding protection straps in conjunction with an ESD floor.

Before you touch an electronic assembly, your body must be discharged. The simplest way of doing this is to touch a conductive, grounded object immediately beforehand – for example, bare metal parts of a cabinet, water pipe etc.

Assemblies should not be brought into contact with charge-susceptible and highly insulating materials such as plastic films, insulating table tops and items of clothing etc. containing synthetic fibers.

Assemblies should be deposited only on conductive surfaces (tables with an ESD coating, conductive ESD cellular material, ESD bags, ESD shipping containers).

Do not place assemblies near visual display units, monitors or television sets (minimum distance to screen > 10 cm).

Measuring and modifying ESD assemblies

Perform measurements on ESD assemblies only when

- the measuring instrument is grounded – for example, by means of a protective conductor – or
- the measuring head has been briefly discharged before measurements are made with a potential-free measuring instrument – for example, by touching a bare metal control cabinet.

When soldering, use only grounded soldering irons.

Shipping ESD assemblies

Always store and ship assemblies and devices in conductive packing – for example, metallized plastic boxes and tin cans.

If packing is not conductive, assemblies must be conductively wrapped before they are packed. You can use, for example, conductive foam rubber, ESD bags, domestic aluminum foil or paper (never use plastic bags or foils).

With assemblies containing fitted batteries, make sure that the conductive packing does not come into contact with or short-circuit battery connectors. If necessary, cover the connectors beforehand with insulating tape or insulating material.

SIMATIC HMI Documentation

D

Target groups

This manual is part of the SIMATIC HMI documentation. The documentation is aimed at the following target groups:

- Newcomers
- Users
- Configurers
- Programmers
- Commissioning engineers

How the documentation is organized

The SIMATIC HMI documentation consists of the following components:

- User's Guides for:
  - Configuration software
  - Runtime software
  - Communication between PLCs and operating units
- Equipment Manuals for the following operating units:
  - SIMATIC PC
  - MP (Multi Panel)
  - OP (Operator Panel)
  - TP (Touch Panel)
  - TD (Text Display)
  - PP (Push Button Panel)
- Online Help on the configuration software
- Start-up Guides
- First Steps

Overview of complete documentation

The following table provides an overview of the SIMATIC HMI documentation and shows you when you require the different documents.

Documentation	Target Group	Content
First Steps with ProTool Product Brief	Newcomers	This documentation guides you step by step through the configuration of • a screen with various objects • changing from one screen to another • a message. This documentation is available for: • OP 3, OP 5, OP 7, OP 15, OP 17 • OP 25, OP 27, OP 35, OP 37, TP 27, TP 37 • Windows-based systems
ProTool Configuring Windows-based Systems User's Guide	Configurers	Provides information on working with the ProTool/Pro configuration software. It contains • information on installation • basic principles of configuration • a detailed description of configurable objects and functions. This documentation is valid for Windows-based systems.
ProTool Configuring Graphics Displays User's Guide	Configurers	Provides information on working with the ProTool configuration software. It contains • information on installation • basic principles of configuration • a detailed description of configurable objects and functions. This documentation is valid for graphic display operating units.
ProTool Configuring Text-based Displays User's Guide	Configurers	Provides information on working with the ProTool/Lite configuration software. It contains • information on installation • basic principles of configuration • a detailed description of configurable objects and functions. This documentation is valid for text-based display operating units.
ProTool Online Help	Configurers	Provides information on the configuration computer while working with ProTool. Online Help contains • context-sensitive help • detailed instructions and examples • detailed information • all the information from the user guide.
ProTool/Pro Runtime User's Guide	Commissioning engineers, Users	Provides information on working with ProTool/Pro Runtime software. It contains • installation of the ProTool/Pro Runtime visualization software • commissioning and running the software on Windows-based systems.

Documentation	Target Group	Content
Copy Protection Start-up Guide	Commissioning engineers, Users	The ProTool/Pro Runtime visualization software is a copyright product. This manual contains information on the installation, repair and uninstallation of authorizations.
Application Example Start-up Guide	Newcomers	ProTool is supplied with example configurations and the corresponding PLC programs. This documentation describes how you • load the examples onto the operating unit and PLC • run the examples and • upgrade the connection to the PLC to suit your own specific application.
SIMATIC Panel PC 670 Equipment Manual	Commissioning engineers, Users	Describes the computer unit and operating unit of the SIMATIC Panel PC 670.
MP 270 Equipment Manual TP 170A Equipment Manual TP 070 Equipment Manual	Commissioning engineers, Users	Describes the hardware and the general operation of Windows-based Panels: • installation and commissioning instructions • a description of the equipment • operating instructions • instructions for connecting the PLC, printer and programming computer, • maintenance instructions.
OP 37/Pro Equipment Manual	Commissioning engineers, Users	Describes the hardware, installation and inclusion of upgrades and options for the OP 37/Pro.
TP 27, TP 37 Equipment Manual OP 27, OP 37 Equipment Manual OP 25, OP 35, OP 45 Equipment Manual OP 7, OP 17 Equipment Manual OP 5, OP 15 Equipment Manual TD 17 Equipment Manual	Commissioning engineers, Users	Describes the hardware and general operation. It contains • installation and commissioning instructions • a description of the equipment • instructions for connecting the PLC, printer and programming computer, • operating modes • operating instructions • description of the standard screens supplied with the operating unit and how to use them • fitting options • maintenance and fitting of spare parts.
OP 3 Equipment Manual	Commissioning engineers, Users, Programmers	Describes the hardware of the OP3, its general operation and the connection to the SIMATIC S7.
PP 7, PP 17 Equipment Manual	Commissioning engineers, Users	Describes the hardware, installation and commissioning of push-button panels PP 7 and PP 17.

Documentation	Target Group	Content
Communication User's Guide	Programmers	Provides information on connecting text-based and graphics displays to the following PLCs: • SIMATIC S5 • SIMATIC S7 • SIMATIC 500/505 • drivers for other PLCs This documentation describes the • configuration and parameters required for connecting the devices to the PLC and the network • user data areas used for exchanging data between operating unit and PLC.
Communication for Windows-based Systems User's Guide	Programmers	Provides information on connecting Windows-based systems to the following PLCs: • SIMATIC S5 • SIMATIC S7 • SIMATIC 505 • OPC • Allen Bradley PLC-5/SLC 500 • Mitsubishi FX • Telemecanique TSX This documentation describes the • configuration and parameters required for connecting the devices to the PLC and the network • user data areas used for exchanging data between operating unit and PLC.
Other PLCs Online Help	Programmers	Provides information on connecting devices to PLCs, such as: • OPC • Mitsubishi • Allen Bradley • Telemecanique • Modicon • Omron • SIMATIC WinAC When the drives are installed, the relevant Online Help is installed at the same time.
ProAgent for OP User's Guide	Configurers	Provides the following information about the ProAgent optional package (process diagnosis) for OPs • configuring system-specific process diagnosis • detecting, locating the cause of and eliminating process errors, • customizing standard diagnostic screens supplied with the software.

Glossary

A

Application

An application is a program directly linked to the MS-DOS or Windows operating system. Applications on SIMATIC PCs are, for example, the visualization packages SIMATIC ProTool/Pro, SIMATIC WinCC and others.

Automation system (AS)

A controller in the SIMATIC S7 series (for example, SIMATIC S7-200/300/400).

B

Base memory

Base memory is a part of main memory. It is 640 KB on all SIMATIC PCs. This size is set on the SETUP menu at the *Base Memory* option and is not modified even if memory is upgraded.

C

Cache

Buffer between working memory and central processing unit.

COM1 port

Serial V.24/modem port, 25-pin, sub-D connectors, sockets. The port is suitable for asynchronous data transmission. It can also be used to connect printers having a serial interface.

COM2 port

Serial V.24 port, 9-pin, sub-D connectors, pins. Preferred for connecting a mouse of other external devices (for example, a printer).

Configuration file

Contains data which define the appearance of a configuration following a complete restart. These files are CONFIG.SYS, AUTOEXEC.BAT and register files.

Configuration software

Configuration software updates the device configuration when modules are fitted. This is done either by copying the configuration files supplied with the device of by manual configuration.

D

Device configuration

The device configuration of a SIMATIC PC contains details about its features and options such as memory capacity, drive types, monitor, network address, etc. The data are stored in a configuration file and are used by the operating system to select the correct drivers and device parameters.

When the basic configuration changes, the user can modify the settings using a program that configures the system (SETUP).

Drivers

Program parts of the operating system. They convert the data of applications into specific formats required by the peripheral devices (for example, hard disks, monitors, printers).

E

Ethernet port

For connecting a local area network (bus structure) for text and data communications at a data transfer rate of 100 Mbaud.

Expanded memory

Expansion memory modules can be installed to expand the default working memory of a SIMATIC PC.

I

Interface module

Module for connecting hardware I/O.

Interface, multipoint

The multipoint interface (MPI) is the SIMATIC PC interface to the SIMATIC S7/M7. This enables programmable modules, (module, programmable), text displays and operator panels to be reached from a central point. The nodes on the MPI can communicate with each other.

Interrupt

Discontinuation in the processor of a programmable controller by an interrupt event.

IRQ

Interrupt request.

ISA

Industrial Standard Architecture (bus for expansion board)

K

Keyboard port

PS/2 keyboard connector Keyboards with an integrated trackball can be connected.

L

LPT 1 port

The LPT 1 port (Centronics interface) is a parallel interface which can be used for attaching a printer.

LS 120 drive

The LS 120 drive is compatible with the familiar 3.5” floppy disk drive. The LS 120 drive supports both standard floppy disks (1.44 MB) and superdisks with a capacity of up to 120 MB.

M

Main memory

Main memory is the whole RAM on a SIMATIC PC.

Motherboard

The motherboard is the heart of SIMATIC PCs. Data are processed and saved from here, and interfaces and device peripherals are controlled and managed.

Mouse port

PS/2 mouse connector.

MPI/DP port

(Multi-Point-Interface/Profibus-DP) for connecting an S7 programmable controller.

P

Parallel port

Information is transferred on a byte by byte basis through a parallel port. High data transfer rates are achieved as a result. SIMATIC PCs have one parallel port (LPT) for attaching a printer.

PC card interface

For connecting PC cards (types I/II/III).

PCI or PCI/ISA slot

(Peripheral Component Interconnect) for expansion boards.

PCMCIA

(Personal Computer Memory Card International Association). Association of computer manufacturers formed with the aim of defining an international standard for memory modules and PC expansion cards. Cooperates with JEIDA.

Port, parallel

Information is transferred on a byte by byte basis through a parallel port. High data transfer rates are achieved as a result. SIMATIC PCs have one parallel LPT1 port.

Port, serial

Data are transferred bit by bit through serial ports. They are used in instances where large distances have to be traversed with minimum cabling.

Printer interface

Parallel port, 25-pin, sub-D connectors, sockets. For attaching printers.

Programmable logic controller (PLC)

A controller in the SIMATIC S5 series (for example, AG S5-115U/135U).

R

RTC

Real time clock

S

SCSI interface

Small Computer System Interface. Interface for connecting SCSI devices (for example, hard disks, CD-ROM drives)

SETUP (BIOS Setup)

A program which defines information about the device configuration. The device configuration of the SIMATIC PC is preset. Changes have to be made when a memory expansion module, new modules or drives have to be activated.

SINEC L2

Bus system on the basis of the Profibus standard. SINEC L2 supports direct interconnection of components in the SIMATIC S5/S7 series (for example, programming units, PLCs, automation systems, etc.).

SINEC H1 (Ethernet)

Bus system on the basis of the Ethernet standard. SINEC H1 interface modules support direct interconnection of components in the SIMATIC S5/S7 series (for example, programming units, PLCs, automation systems).

T

TFT display

Thin-film transistor color display

U

USB port

(Universal Serial Bus) for connecting devices to the USB port.

V

V.24 interface

The V.24 interface is a standard interface for data transmission, and printers, modems, etc. can be connected to it.

VGA port

(Video Graphics Array) for connecting an external monitor, 15-pin, sub-D connectors, sockets.

W

Warm restart

By warm restart we mean a restart after a program abort. The operating system is reloaded and started. A warm restart is performed by pressing the keys CTRL+ ALT+ DEL.

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W

X