SIEMENS

SIMATIC

Box PC 620

Manual

Valid for devices with the order number 6ES7647-5...

Edition 03/2002

A5E00131465-01

Safety Guidelines

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

Danger

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

Warning

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

Caution

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

Caution

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

Notice

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

Qualified Personnel

Repair, maintenance and servicing of device only to be carried out by qualified personnel. Qualified persons are defined as persons who are authorized to commission, to ground and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct Usage

Note the following:

Warning

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

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

Trademarks

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Third parties using for their own purposes any other names in this document which refer to trademarks might infringe upon the rights of the trademark owners.

Siemens AG
Organization Group Automation and Drives
Division Systems Engineering
Postfach 2355, D-90766 Fürth

Disclaim of Liability

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

Preface

Purpose of the Manual

This manual contains all the information you need for commissioning and using the SIMATIC Box PC 620.

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

Where is this Manual Valid?

This manual is valid for all supplied variations of the SIMATIC Box PC 620 and describes the state of delivery as of April 2002.

Certifications, Standards and Approvals

Certifications

The device fulfils the following guidelines and certifications:

- EU guideline 73/23/EEC on low voltages
- EU guideline 89/336/EEC on electromagnetic compatibility
- Underwriters Laboratories (UL) to Standard UL 1950 or UL 508
- Canadian Standard Association (CSA) to Standard C22.2 No. 950 or No. 142

Standards and Approvals

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

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

Incorporation into the Communications Environment

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

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

Structure of the Manual

In Chapters 1 to 4 the manual contains the most important instructions for starting up and using the Box PC 620. Chapters 5 to 9 are reference sections you will only require in special cases.

Important Information

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

Introduction

Before using your device for the first time you should read Chapter 2 to obtain more information about the Box PC 620 components and their function.

Setting Up and Operation

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

Expansion

Chapter 4 describes how to expand your Box PC 620 (for example, installation of memory expansions). Please observe the safety instructions.

Configuration

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

Error/Fault Dignostics

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

Hardware-Informationen

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

Reinstallation of the Software

Chapter 8 shows how to proceed in case you have to reinstall software.

ESD Guidelines

The guidelines for handling electrostatic sensitive devices in Chapter A are of particular importance for service and maintenance engineers who install expansions or carry out error analysis with the Box PC 620.

Technical Specifications

Appendix B lists the valid technical specifications for your device. Detailed information on how your Box PC 620 is equipped can also be found in the BIOS message (Summary Screen) when your PC is booting up.

Glossary

The glossary explains important terms.

Alphabetical Index

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

Conventions

The abbreviation Box PC oder device is also used within this manual for the product designation SIMATIC Box PC 620.

Further Support

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

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

Training Center

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

Telephone: +49 (911) 895-3200

http://www.sitrain.com/

SIMATIC Documentation on the Internet

You will find the documentation on the internet at:

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

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

Automation an Drives, Service & Support

Available worldwide, around the clock:

SIMATIC Basic Hotline

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

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

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

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

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

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

Service & Support on the Internet

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

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

where you will find the following:

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

Table of contents

Important Information

1

1.1 Safety Instructions

Caution

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

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

Installation

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

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

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

Warning

Adhere to the permissible mounting positions when mounting the systems (see chapter 3.2).

If the systems are installed in a non-permissible fitting position, the approvals pursuant to UL 1950, UL 508 and EN60950 are no longer valid!

Power Connection

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

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

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

When plugging in/unplugging peripheral connections (keyboard, mouse, printer etc.) the Box PC must be switched off (not for PC-Card and USB-devices). In the case of non-observance, this can lead to damage to the PC.

Notes for Devices with AC Power Supply

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

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

The power cord should meet the respective local safety requirements.

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

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

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

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

Notes for Devices with DC Power Supply

The device with DC power supply (24V DC) is an open device (right side of the device), therefore the mounting must meet the requirements of fire protection enclosures.

Warnung

Only connect the device to 24V DC power supply systems which meet the requirements of a safe extra-low voltage (SELV).

The cable cross section has to be large enough that the Box PC will not be damaged by the cables when there is a short circuit.

Country-Specific Information

For the United States and Canada:

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

The male plug is a 5-15 style.

For operation with 120 V:

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

For operation with 240 V:

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

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

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

Repairs

Only authorized personnel are permitted to repair the Box PC.

Warning

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

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

Install only system expansion devices provided for this computer. If you install other expansion devices, you can damage the system or violate the safety requirements and regulations for radio interference suppression. Contact your technical support team or where you purchased your PC to find out which system expansion devices may safely be installed.

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

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

Battery

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

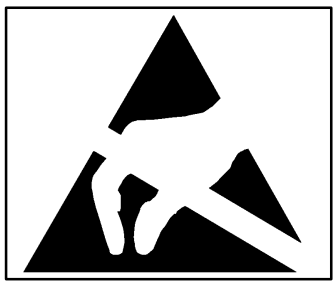
Observe the local regulations on disposal of special waste when disposing of dead batteries.

Caution

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

Notes on Inserting and Removing Modules (ESG Guidelines)

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



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

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

1.2 Certificates, Directives and Declarations

Notes on the CE Symbol

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

EMC Directive

Devices with a **power supply performance of 85W** are in accordance with the EU Directive 89/336/EEC “Electromagnetic Compatibility.” In accordance with the CE label for this product, the following areas of application are relevant:

Field of Application	Requirement For	
	Emitted Interference	Noise Immunity
Domestic, business and commercial areas, as well as small businesses	EN 50081-1: 1992	EN 50082-1: 1992
Industry	EN 50081-2: 1993	EN 50082-2: 1995

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

The devices with **power supply performance of 105W** are in accordance with the EU Directive 89/336/EEC “Electromagnetic Compatibility.” In accordance with the CE label for this product, the following area of application is relevant:

Application	Requirements	
	Emitted Interference	**Immunity**
Industrial area	EN 50081-2: 1993	EN 50082-2: 1995

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

Caution

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

Low Voltage Directive

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

Declaration of Conformity

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

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

Observing the Setup Guidelines

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

Connecting Peripherals

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

ISO 9001 Certificate

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

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

EQ-Net certificate no.: 1323-01

Software License Agreement

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

1.3 Certification for the USA, Canada and Autralia

Security

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

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

EMC

USA

Federal Communications Commission
Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded Cables

Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

Modifications

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Conditions of Operations

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canada

(for devices with **power supply 105W**)

Canadian Notice

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

Avis Canadien

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

(for devices with **power supply 85W**)

Canadian Notice

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

Avis Canadien

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

Australia

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

1.4 Transport

Transporting

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

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

Caution

Risk of damage!

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

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

Welcome to the SIMATIC Box PC 620

2

Overview of Chapter

2.1 Port Side View

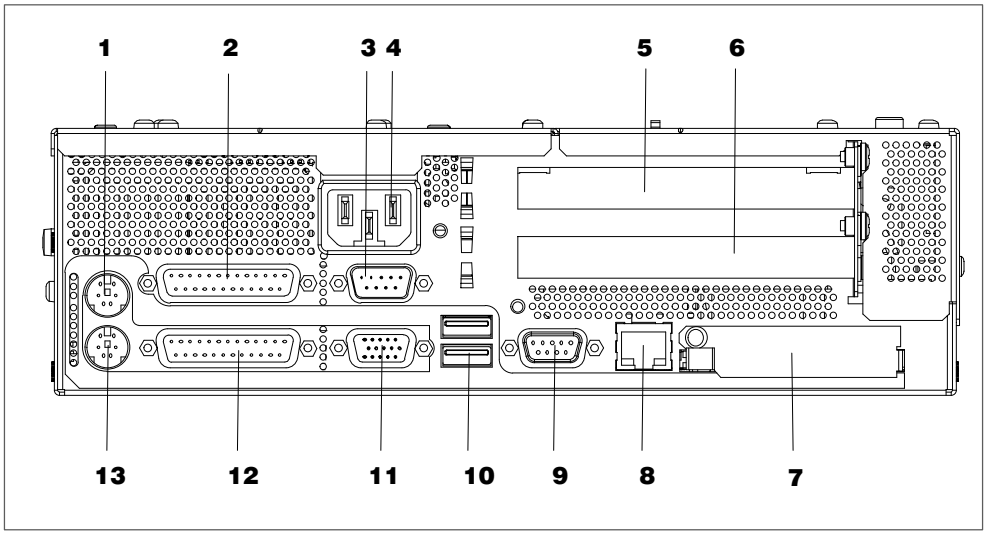


Figure 2-1 Ports

1 Mouse

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

2 COM1 V.24 /MODEM /AG

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

3 COM2

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

4 AC/DC Power Supply Connector

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

5 PCI Slots

Internal slots for expansion modules.

6 PCI/ISA Slots

Internal slots for expansion modules.

7 PC Card

Connection for PC Cards type I/II/III

8 Ethernet

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

9 PROFIBUS/MPI (optional)

You can connect the Box PC to an S7 automation system or to a PROFIBUS network via the PROFIBUS/MPI port with galvanic isolation. This interface is an optional product feature.

10 USB

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

11 VGA

You can connect an external VGA monitor to this connector.

12 LPT1

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

13 Keyboard

Connection for a PS/2 keyboard.

Caution

Ensure that you use shielded cables and metal plugs to connect the peripheral units; if this is not done, the approval for operation will be invalid! Screw down the plugs of the interface cables to the PC housing by means of a screwdriver. You thereby improve the electrical shielding.

If expansion modules have been inserted in the PC, there are additional ports. Please refer to the description of the respective module for their purpose.

2.2 Drive Side View

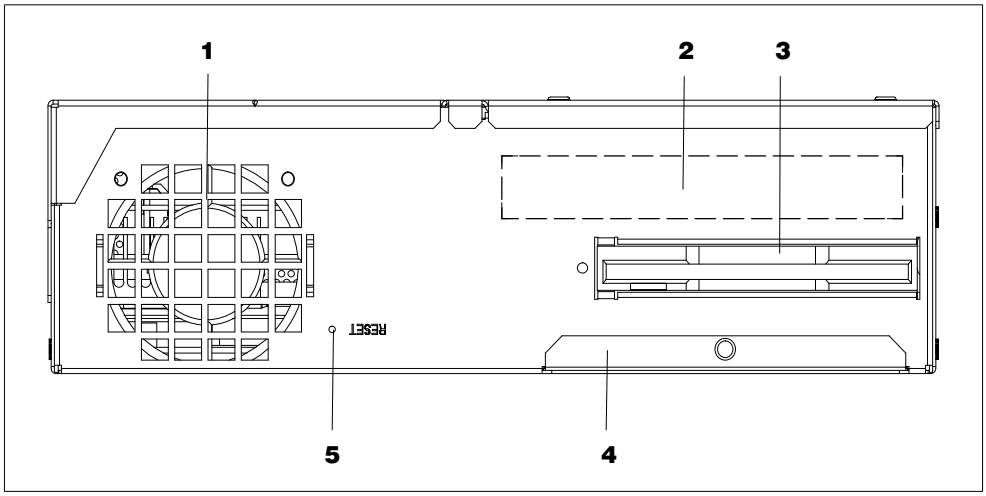


Figure 2-2 Drive Side View

1 Device Fan

Here are openings for device ventilation.

Caution

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

2 Type Label

You can find the order number and the serial number of your device on the type label.

3 Floppy disk drive (LS240 as an alternative)

Depending on the device configuration a standard floppy disk drive (1.44 Mbytes) or an LS240 Super disk drive is installed. Floppy disks up to 1.44 Mbytes as well as Super disks up to 240 Mbytes can be used in LS240 drives.

4 Front Ports

The front ports are located behind the cover below the floppy disk drive. They are used for connection of the following front elements:

- I/O port for the connection of front components
- LVDS display port

5 Reset Button

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

2.3 Bottom View

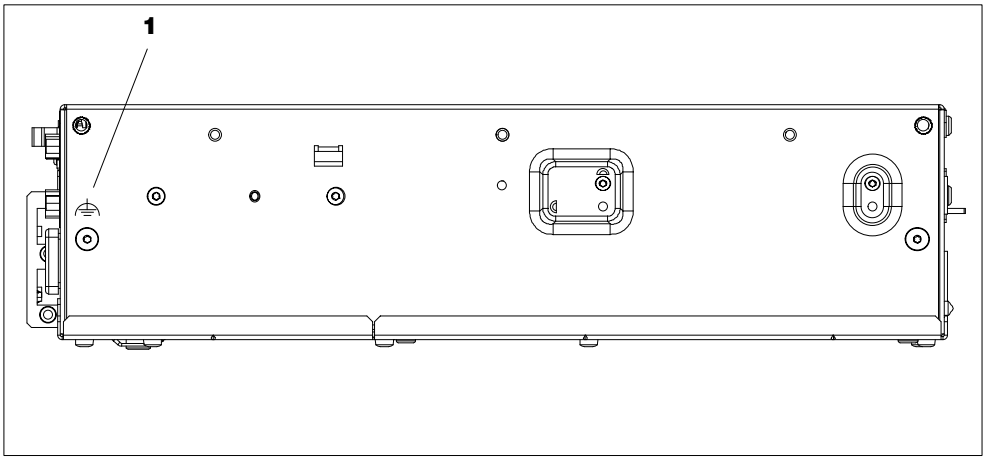


Figure 2-3 Bottom View

1 Equipotential Grounding

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

2.4 Side View

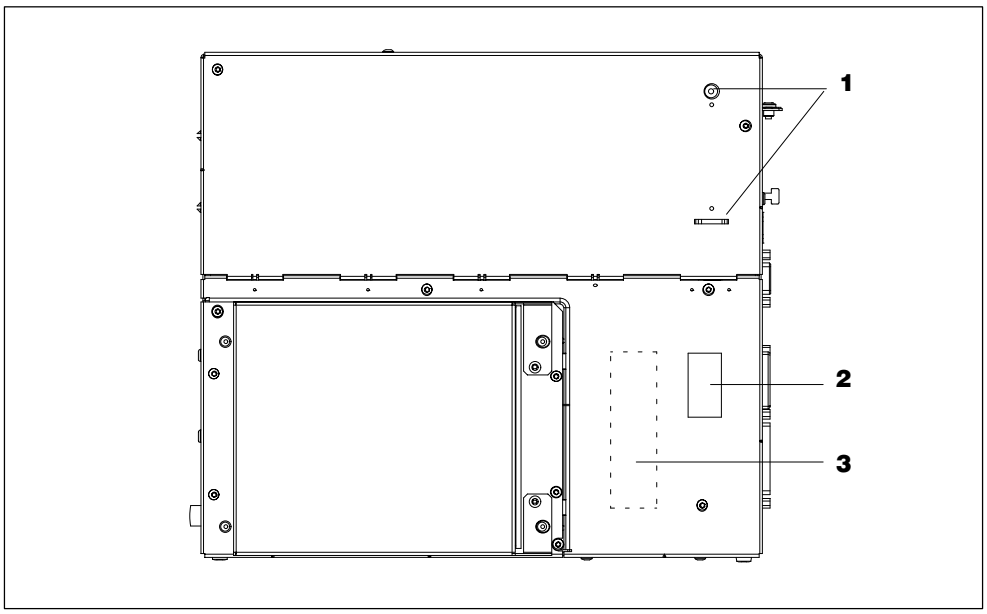


Figure 2-4 Side View

1 Mounting possibilities for the WinAC Backup Battery

You can mount the SIMATIC WinAC CPU41x-2PCI backup battery here. Use the battery holder without a slot plate supplied with the WinAC module to do this.

2 Input Data of Power Supply Unit

To distinguish between both performances of the power supply unit, the power supply unit with a 105W performance been marked with $P_{max=}$105W.

3 Certificate of Authenticity with Product Key

You need the Microsoft Windows “Product Key” on the “Certificate of Authenticity” if you reinstall software.

2.5 Ports

Front Ports

The front ports are located behind the cover below the floppy disk drive. They are used for connection of the following front elements:

- I/O port for the connection of front components
- LVDS display port
- CMOS display port

The front ports can be accessed as follows:

1. Undo the plastic rivet on the cover below the floppy disk drive with a flat screwdriver.
2. Pull the cover out of the guide. The front ports are now accessible.

The CMOS display port is only accessible after removal of the floppy disk drive.

Notice

Keep the cover and the plastic rivet for reuse.

VGA Port

Please read the following note referring to the operation of a flat display and an external monitor:

Notice

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

To optimize the screen display for an external monitor, select ”Hardware Options” under Setup in the main menu and set ”CRT/LCD selection: CRT enabled”. A resolution of 1024 x 768 pixels with a higher refresh rate is then possible.

2.6 Drives

The Box PC is equipped as standard with a 3.5” disk drive or an LS240 drive and a 3.5” hard disk drive.

2.6.1 Disk Drive (Depending on the Device Configuration)

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

Types of Diskette

You can use following diskettes:

double sided double density diskette	double sided high density diskette	LS240-Superdisks
3,5 inch	3,5 inch	3,5 inch
720 Kbytes	1,44 Mbytes (135 TPI)	120 Mbytes

Caution

Risk of loss of data!

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

2.6.2 LS 240 Drive (Depending on Device Configuration)

The Box PC can be equipped with an LS 240 drive as an alternative to a floppy disk drive.

Larger volumes of data can be stored on LS 240 data carriers than on a 1.44 MB floppy disk drive. The LS 240 has the following features:

- it is compatible with a 1.44 MB floppy disk drive, i.e. 1.44 MB or 120 MB disks can also be processed.
- an LS 240 data carrier has a maximum data volume of 240 Mbytes.
- the LS 240 drive is connected via an ATAPI (IDE) port.

Handling Disks with the LS 240 Drive

Depending on the fitting position, the disks are inserted into the disk drive as illustrated below:

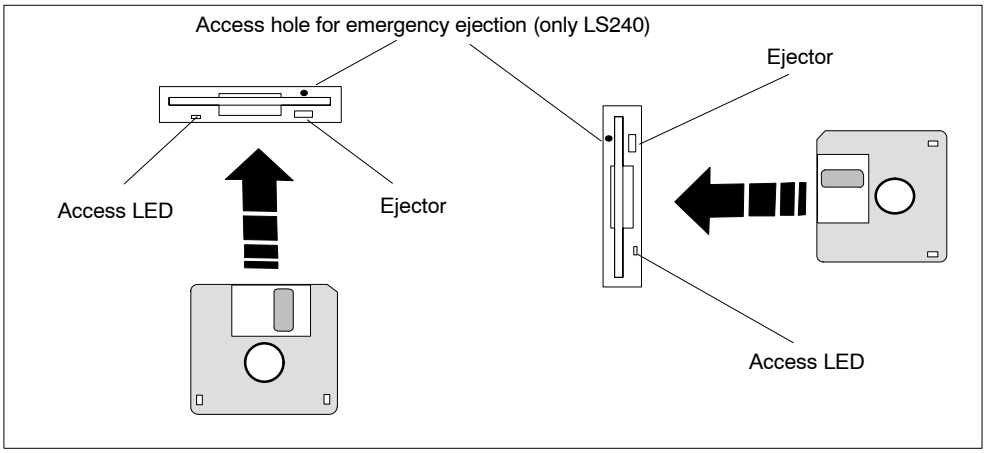


Figure 2-5 Handling Disks

Caution

Risk of loss of data!

When the green access LED of the LS 240 drive is lit, the ejector may not be actuated.

LS 240 drives are very sensitive to shocks of a non-permissible level. Shocks during operation can lead to damage to the drive or the data carrier. You can find the permissible values in the technical data in Section B.

Information on the LS240 Disk Drive

Restrictions

P-Tools under STEP 5

Data cannot be edited in PCP/M format on the LS240 drive using P Tools under STEP 5.

Notice

When you use the P Tools (for editing PCP/M files) supplied with STEP 5, remember that these are not fully supported by the Windows 98 and Windows 2000 operating systems nor by LS240 diskette drives. If you use the P Tools, we recommend that you use MS-DOS, Windows 3.x or Windows 95 and standard 1.44 Mbyte floppies.

Authorization with Authors W V2.x

To authorize STEP 7 and other SIMATIC components you must use AuthorsW. Start this program on the PG via the taskbar under **Start > Simatic > AuthorsW.**

Usage Notes for LS240 Superdisks

LS240 drives are suitable for floppy disks up to 1.44 Mbytes as well as Superdisks up to 120 Mbytes.

Track density for Superdisks is10 µm compared with the 120 µm of conventional disks.

The LS240 recognizes when a Superdisk is in the drive and switches to the higher capacity. With conventional disks, a capacity of 1.44 Mbytes or 720 Kbytes can be reached.

Due to their higher storage capacity, Superdisks are more sensitive to dirt, temperature and shock than conventional disks.

Notice

In order to achieve a reliable operation and high data security, please note the following during use:

- Store and transport the Superdisk in the protective cassette included to keep dust and dirt from the disk.
- Remove Superdisk from the drive when it is not being read or written to keep dirt particles away from the disk. Do not expose the disk unnecessarily to high operating temperatures.

Notice

If possible avoid vibration of the unit, when using Superdisks. Superdisks are more sensitive to vibration as a result of their high track density.

Emergency Removal:
When the unit is switched off, the disk can be forced out by using a pin (for example, a bent paper clip).

2.6.3 Hard Disk Drive

The hard disk drive is used for the storage of large quantities of data. it is fitted in a mounting which is easily exchangeable and damped against vibration.

Caution

Risk of loss of data and damage to the drive!

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

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

2.6.4 CD ROM or CD RW/DVD(Combo) Drive

Depending on the device equipment, a CD-ROM or a CD-RW/DVD drive is fitted in the SIMATIC Box PC 620. The fitting depth of the PC is increased by 20mm as a result.

Operation

When the open/close button is pressed, the CD/DVD tray is travelled out with a slight delay. Insert the CD/DVD with the labelling facing forwards into the tray. The CD/DVD tray is retracted automatically, when the tray is pressed briefly or the the Open/Close button is pressed.

By briefly pressing the eject button, the drawer springs out slightly. You can remove the CD/DVD.

Emergency removal

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

Notice

After the drawer has been closed, the CD/DVD is tested and the access display light on the drive starts to flash:

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

Caution

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

Additional Software

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

2.7 Backup Battery

A backup battery (3.6 V lithium battery) powers the hardware clock even after the programming device is switched off.

There is a battery on the motherboard in this device. Batteries may only be exchanged by technical personnel. Note the information in the documentation of the CPU module! Observe the local regulations on the disposal of special waste when disposing of dead batteries.

Caution

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

Warning

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

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

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

The correct lithium battery is available from Siemens (order no.: W79084-E1003-B1).

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

Setting Up and Operating the SIMATIC Box PC 620

3

Chapter Overview

3.1 Unpacking and Checking the Scope of Delivery

Unpacking the SIMATIC Box PC 620

Unpack your Box PC as follows:

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

Recording the Serial Number and the Ethernet address

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

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

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

8. Enter the Microsoft Windows "Product Key" from the "Certificate of Authenticity" (COA) in the table. You will find the "Product Key" on the device on the power supply unit covering. You need the Windows "Product Key" if you want to reinstall the operating system.

Serial number	SVP..
Order-No.	6ES...
Microsoft Windows Product Key	
Ethernet Address	

3.2 Installing the SIMATIC Box PC 620

The Box PC 620 can be operated in several fitting positions. It is particularly suitable for fitting in consoles, switch boards and control panels.

The Box PC 620 **with AC power supply** meets the requirements for a fire enclosure to EN60950. it can therefore be fitted without an additional fire enclosure.

The Box PC 620 **with DC power supply** is an open device (right device side); therefore the mounting must meet the requirements of a fire enclosure.

Please note the following points when installing the PC:

- Avoid extreme ambient conditions as far as possible. Protect your PC from dust, moisture, and heat.
- Keep the PC out of direct sunlight.
- Mount the PC as safely as possible to prevent any danger (for example, by falling over).
- The clearance around the housing must be at least 100 mm at the front and rear, so that the PC is sufficiently ventilated.
- Make certain that the ventilation slots for the housing are not covered.
- Observe the permissible fitting positions without fail when installing the systems.

Warnung

If the systems are installed in a non-permissible fitting position, the approvals pursuant to UL 1950, UL 508 and EN 60950 are no longer valid!

Depending on the configuration of the device, two mounting brackets are included in the scope of delivery. You can attach these to the housing with 6 screws (M3x6).

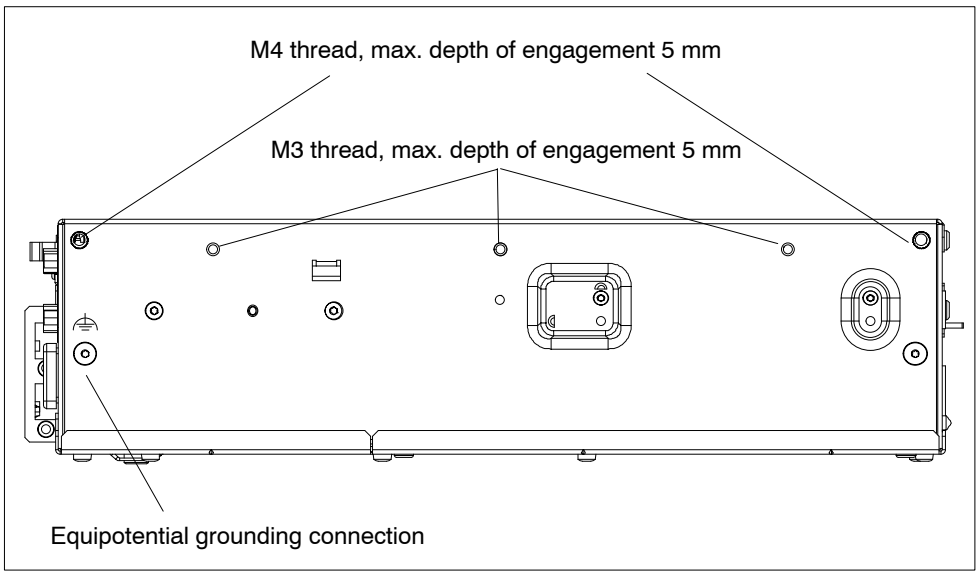


Figure 3-1 Screw Connection Points for Mounting Brackets (Cover Side Downwards)

Instructions for wall and ceiling mounting

To install the Box PC in a concrete wall or ceiling proceed as follows:

1. Fix the mounting brackets at the housing of the PC.
2. Drill four holes of 8 mm diameter and 60 mm depth into the wall or ceiling. You will find the required dimension drawings on the following pages.
3. Insert the concrete plugs (8 mm diameter and 50 mm long) into the drill holes.
4. Fix the PC with four screws (4 mm diameter and 50 mm long).

In a plasterboard wall or ceiling (min. 13 mm thick), drill holes of 14 mm diameter and fasten the PC with four anchors (4 mm diameter and 50 mm long).

In a metal sheet wall or eiling (min. 2 mm thick), drill holes of 5 mm diameter and fasten the PC with four screws (4 mm diameter and min. 15 mm long).

Warnung

The installer must verify that the wall or ceiling can support four times the full load of the Box PC (with mounting brackets and Add-On-Cards).

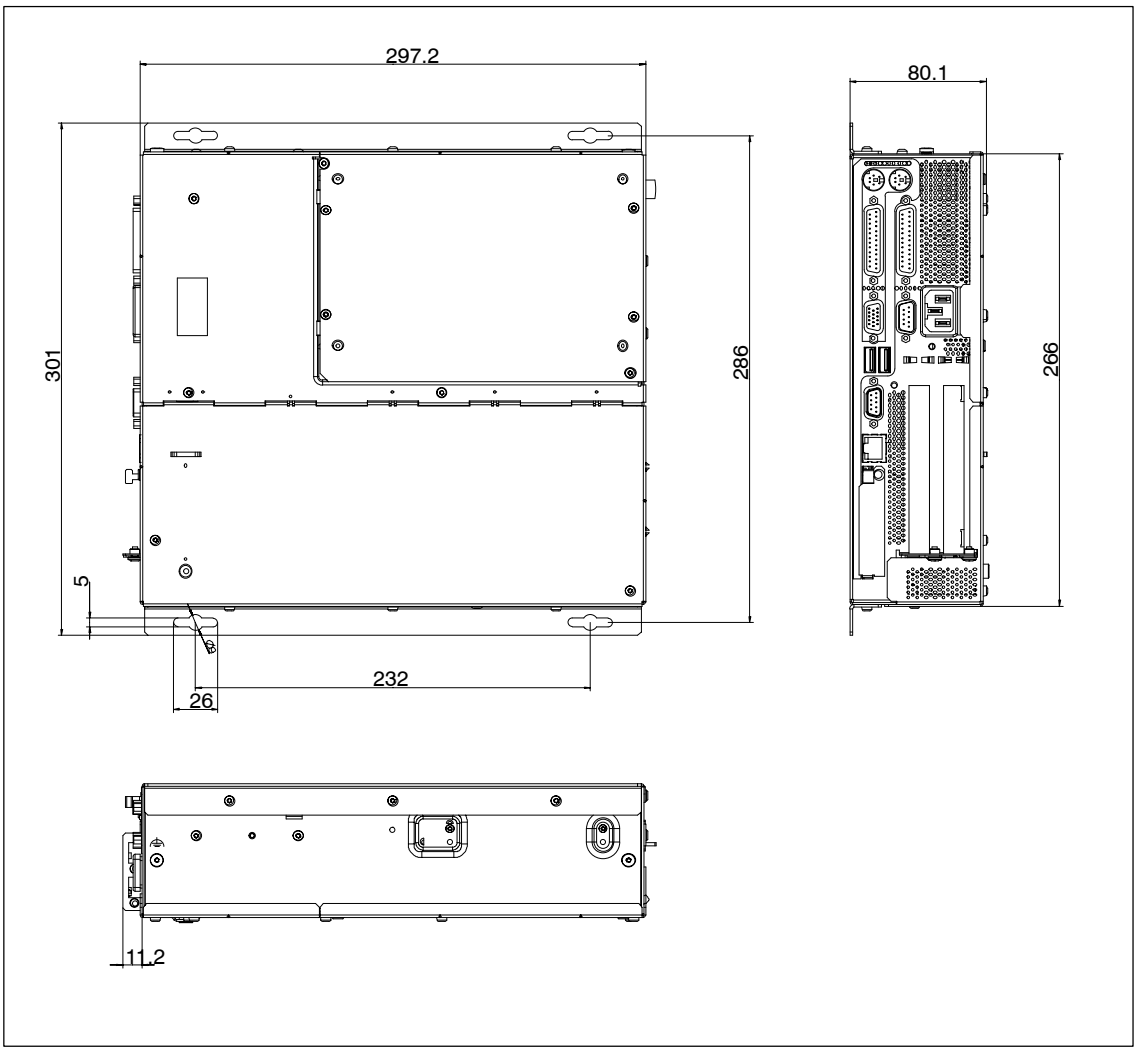


Figure 3-2 Dimension Drawings for Fitting in Control Panel with Installation Angle (Device without CD ROM Drive)

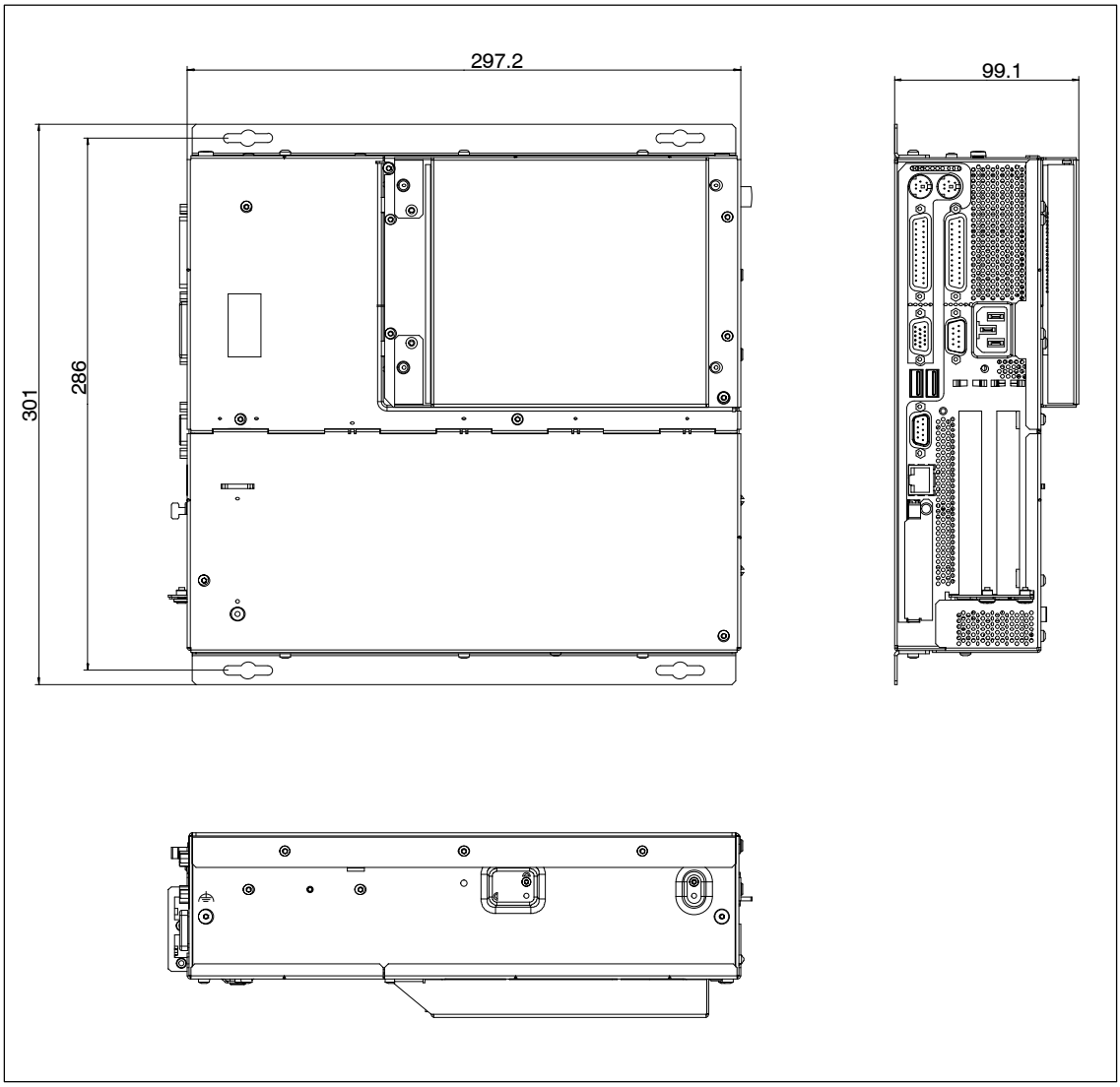


Figure 3-3 Dimension Drawings for Fitting in Control Panel with Installation Angle (Device with CD ROM Drive)

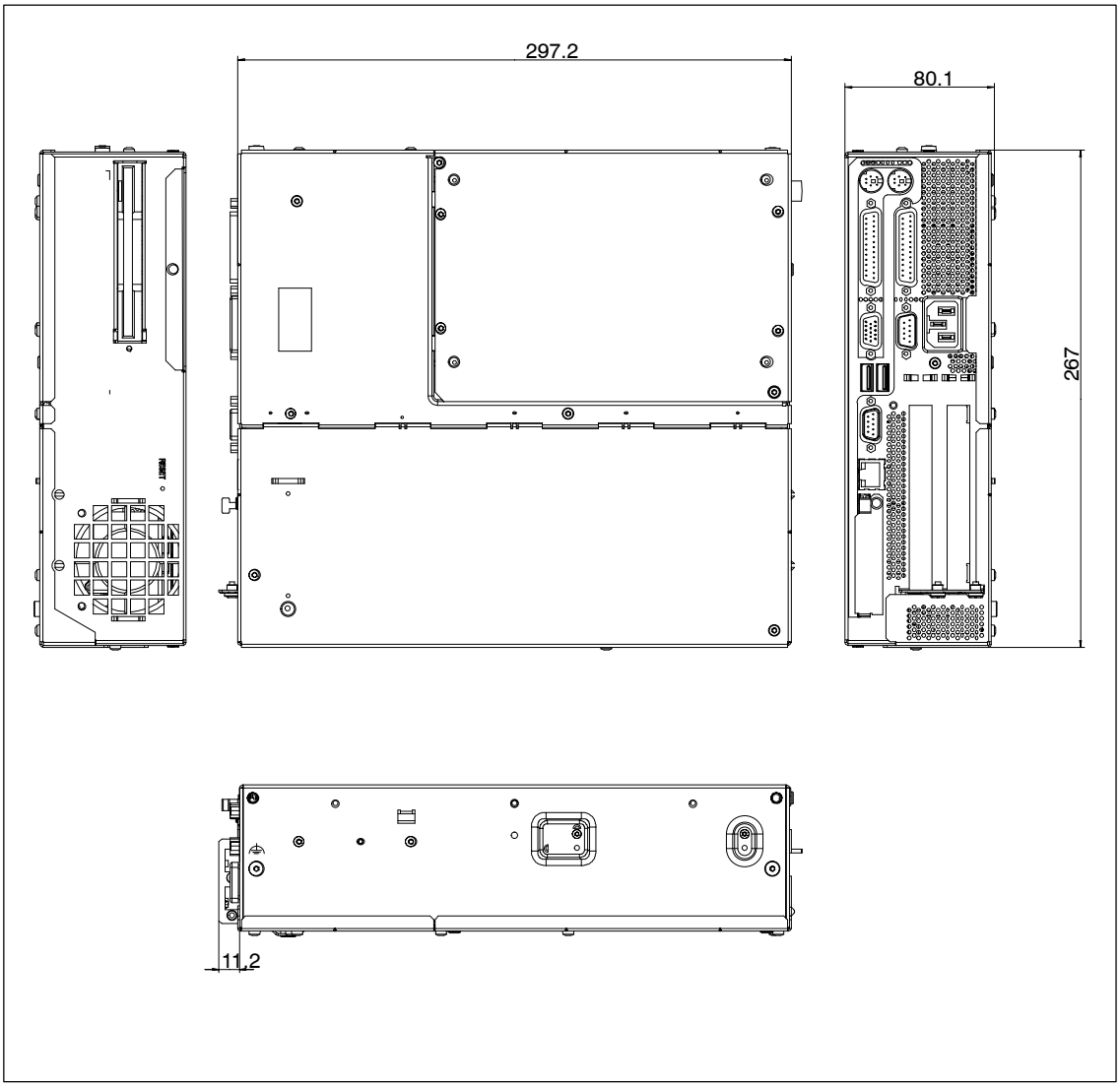
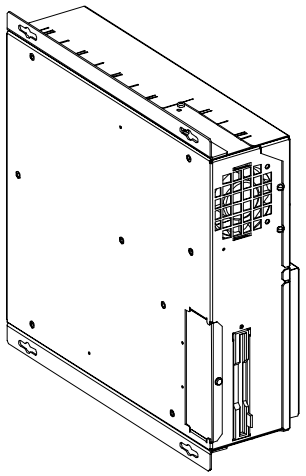


Figure 3-4 Dimension Drawings for Fitting in Control Panel without Installation Angle

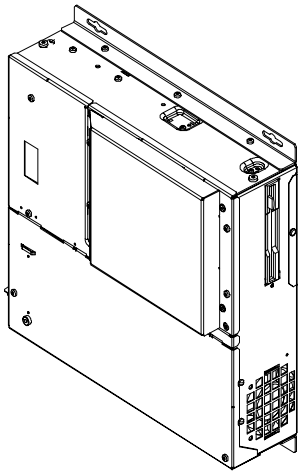
Permissible Fitting Positions of the PC to UL1950/EN60950/CSA22.2 No. 950

An inclined position of ± 20° is allowed in each of the permissible fitting positions.

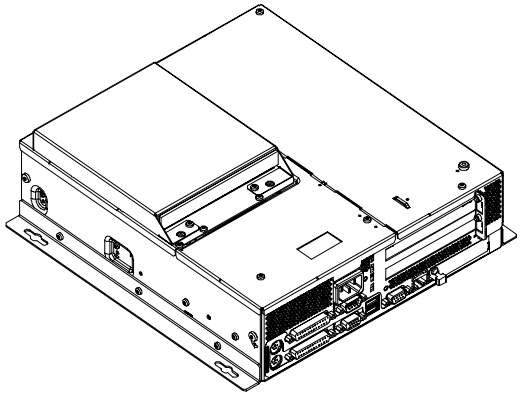
Position 1 (Preferred Position)



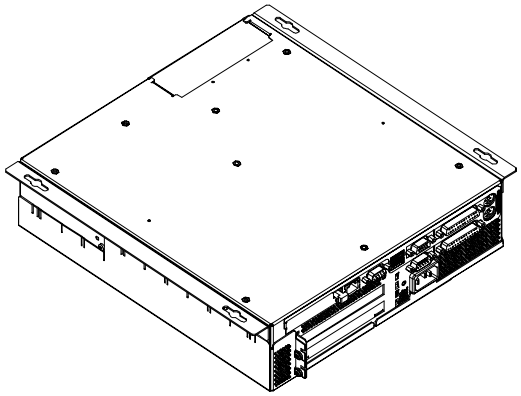
Position 2 *)



Position 3 (Desktop) *)



Position 4 (Ceiling) **)



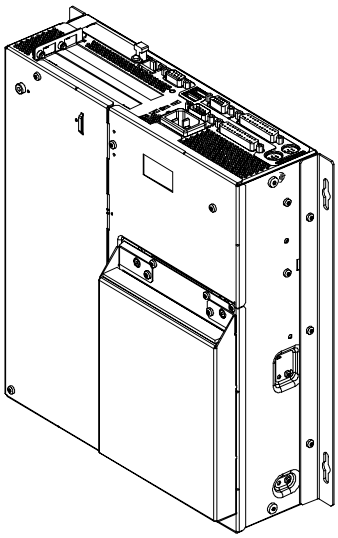
*) . not permissible for installed LS240 Drive

**) not permissible for installed CD ROM, CD RW/DVD Drive

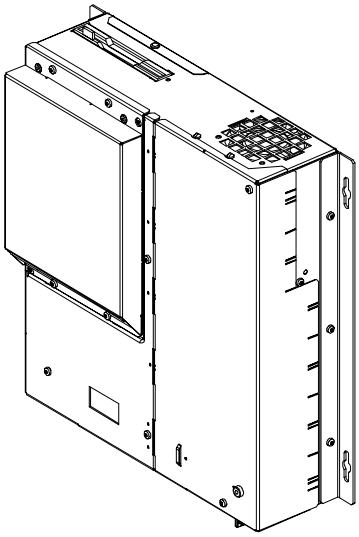
Additional Permissible Fitting Positions of the PC to UL508/CSA 22.2 No. 142

An inclined position of ± 15° is allowed in each of the permissible fitting positions. An external fire protection housing is not necessary.

Position 5
(Fan Side Down) *)**



Position 6
(Port Side Down) *)**



***) not permissible for installed Floppy Disk, CD ROM, CD RW/DVD or LS240 Drive

Caution

The fitting position with the fan side down is only permitted with additional precautions because warmed air is drawn down against the convection current, possibly causing a build-up of heat.

3.3 Preparing for Operation

Connection to the Power Supply Unit

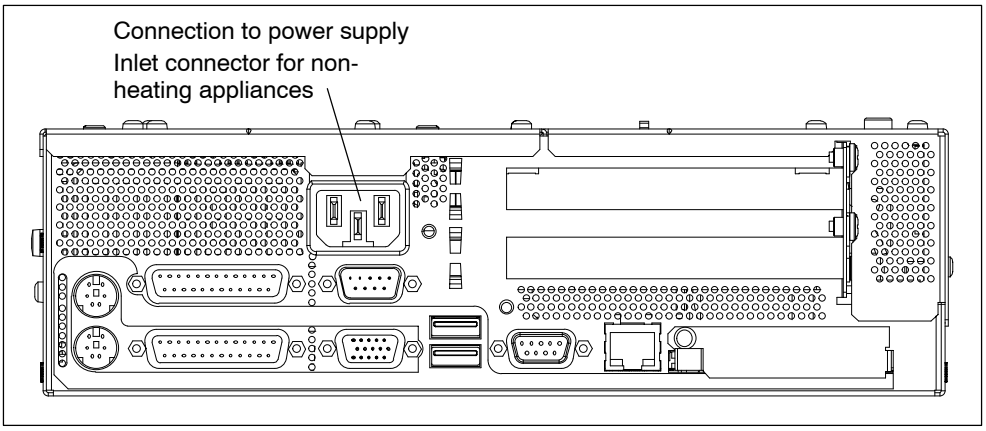


Figure 3-5 Connection to Power Supply (Inlet Connector for Non-Heating Appliances)

Caution

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

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

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

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

The **AC** power supply unit of the Box PC 620 is designed for 120/230/240V systems. The power supply unit has a long-range input. It is not necessary to adjust the voltage span.

The **DC**-power supply unit of the Box PC 620 is designed for 24V systems.

Optionally, one of these power supplies is installed.

Equipotential Measures

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

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

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

Connecting and Switching on the SIMATIC Box PC 620

Before you connect the Box PC to the mains, the keyboard, mouse and display or monitor must be connected.

1. Insert the connector cable of these peripheral units into the corresponding sockets on the port side of the Box PC (see Section 3.4.).
2. Connect the device to the mains.
3. The device is now ready for power supply operation and is now in service.

Switching off the SIMATIC Box PC 620

Before switching off the Box PC 620, you have to shut down the operating system to avoid loss of data. The Box PC has no mains switch and is switched off after only disconnection from the mains.

Notice

If you are working with Windows, you always have to use **Start > Shut Down** for switching off.

3.4 Connecting Peripheral Devices

Notice

When connecting peripheral units, ensure that the components have industrial capability.

Connecting the Printer to the Parallel Port

Proceed as follows to connect your printer:

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

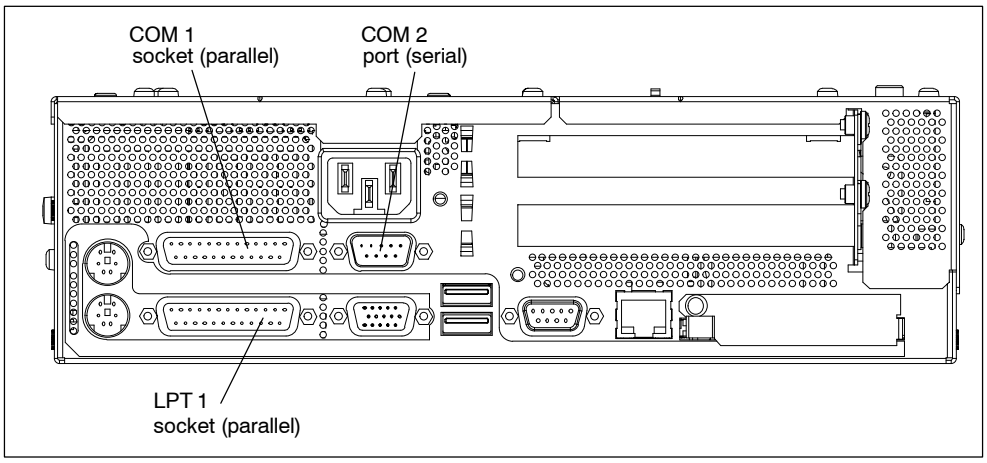


Figure 3-6 Position of the Printer Ports

Caution

Risk of damage to the unit!

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

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

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

Only use original connecting cables.

Connecting the Printer to the Serial Port

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

Connecting Monitors

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

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

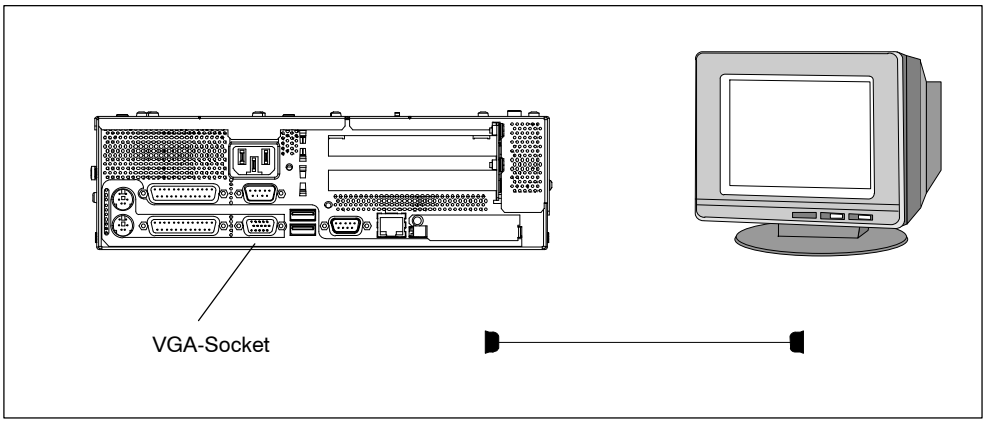


Figure 3-7 Connecting the Monitor

Proceed as follows to connect your monitor:

1. Disconnect the Box PC and switch off the monitor.
2. Insert the monitor lead in the VGA socket.
3. Screw down the plug.
4. Connect the monitor cable to the monitor.
5. Connect the PC to the power supply and switch on the monitor.
6. Make the necessary changes in the SETUP program (**Menu > Main > Hardware Options** “CRT enabled”, “LCD enabled” “SIMULTAN”)”.

Caution

Danger of damaging the monitor!

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

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

Using a Mouse

You can connect both a PS/2-USB and a serial mouse to the Box PC.

Connecting a PS/2 Mouse

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

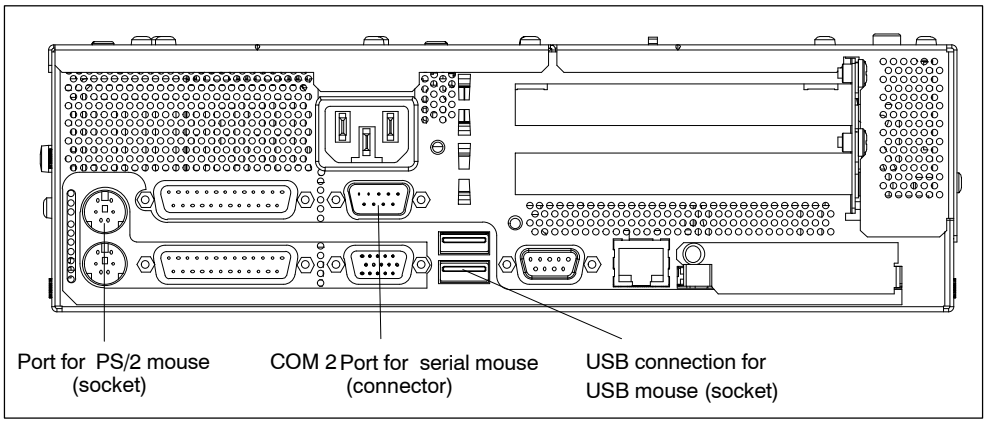


Figure 3-8 Connecting the Mouse

To connect the mouse, proceed as follows:

1. Disconnect the PC from the power supply.
2. Plug the cable of the PS/2 mouse or another external pointing device into the mouse connector.
3. Connect the PC to the power supply.

Connecting a Serial Mouse

You can connect a serial mouse to the COM2 serial port. To operate a serial mouse, the appropriate mouse driver must be initialized and assigned parameters. You will find the information you need to do this in the description of your mouse or in the description of the operating system.

1. Disconnect the PC from the power supply.
2. Plug the serial mouse into the mouse connector labeled COM2.
3. Secure the connector with the screws.
4. Connect the PC to the power supply.

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

Connecting a PS/2 Keyboard

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

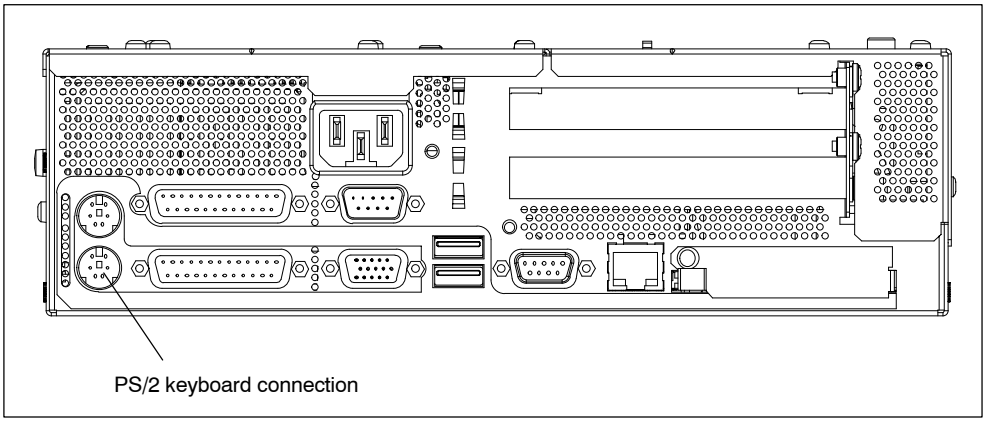


Figure 3-9 Connecting a PS/2 Keyboard

To connect the keyboard, proceed as follows:

1. Disconnect the Box PC from the power supply.
2. Insert the plug of the PS/2 keyboard.
3. Connect the Box PC to the power supply.

Note

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

Connecting Devices to an USB Interface

You can connect single or multiple USB devices (mouse, keyboard or printer) to the USB interfaces.

1. Plug the USB device cable into one of the USB interfaces.

The Plug and Play operating system recognizes the device. Any drivers are requested by the operating system, if necessary.

If you wish to connect more than two USB devices you must use a HUB. Both interfaces can be used as high-current source.

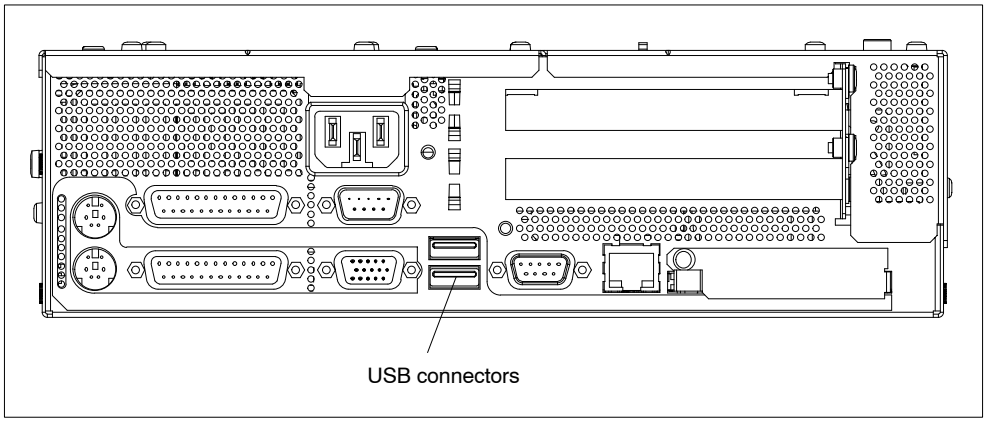


Figure 3-10 USB connection

Notice

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

Devices that do not have a USB plug (for example, printers) can be connected to the USB interface via adapter.

3.5 Working with PC Cards

PC Cards

The PC card interface supports Cardbus-Cards (32 Bit) and PCMCIA-Cards (16 Bit). The Box PC has one PC card port. You can plug communication modules for MODEM, FAX-MODEM, ISDN, Token Ring, ETHERNET, memory expansion and SCSI interface modules in credit-card format into these ports.

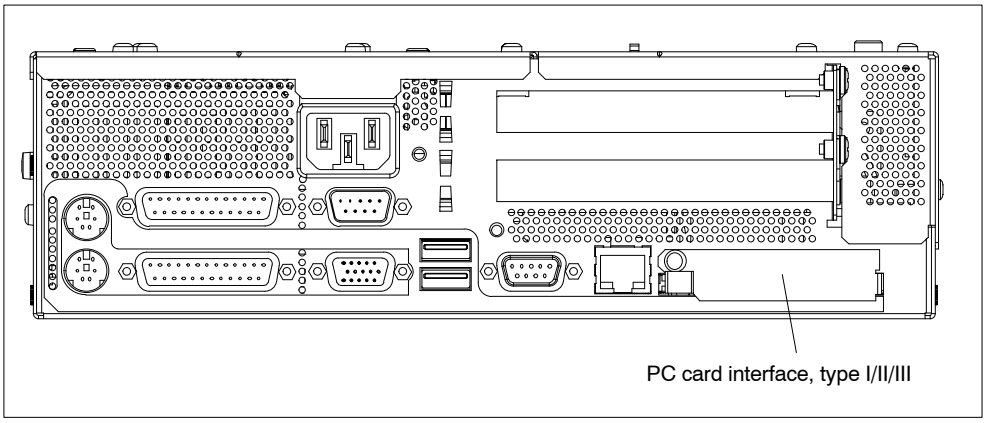


Figure 3-11 PC Card Interface

The following is to be observed when working with cardbus/PC cards:

1. Open the port cover on the left-hand side of the device by undoing the plastic rivet with a flat screwdriver.
2. Pull the cover out of the guide.
3. Insert the desired PCMCIA card or cardbus card.

Caution

Before inserting PC-Cards please make sure that the PC-Card Ejector is completely pressed otherwise the cards e.g. Flash Memory Cards could get stuck in the slot. The PC-Cards cannot be inserted correctly.

Always insert the PC card with the **label** toward the rear of the programming device.

Do not remove the PC card while data transfer is in progress (risk of data loss and system crash).

Caution

Before plugging in or taking out Cardbus/PC cards, you must discharge the electrostatic of your body by briefly touching grounded object (ESD guidelines, Section A.1).

Otherwise faults can occur.

Note

Peak currents of 650 mA at 5 V based on 3 s are permitted!

Examples of PCMCIA cards connected to PC card interface for

Hard Disk	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

Note the following when installing these cards:

Note

Depending on the configuration of the Box PC, there may not be any free interrupts available for operating PC Cards. You have to reserve the necessary PC card interrupts in the BIOPS setup menu as follows:

Set the necessary interrupt via **Advanced > PCI-Configuration > PCI/PNP ISA IRQ Resource Exclusion** to “reserved” (default: available).

Caution

Risk of damage to PC cards and the Box PC!

Always insert PC cards with the front face turned toward the rear of the Box PC. The front face generally bears the company and product designation and is labeled ”This side up”, or words to that effect.

You might damage the Box PC and the PC card if you attempt to insert the PC card the wrong way round.

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

Notice

In order to use a PC card the BIOS-SETUP **Main > Hardware Option** “Cardbus/PCMCIA Slot” has to be set to “Enabled”.

3.6 Connecting the SIMATIC Box PC 620 to other SIMATIC S5

Point-To-Point Connection

In this section, you will learn how to connect your SIMATIC Box PC 620 to a programming device or S5 programmable logic controller using a point-to-point connection.

You can stablish a point-to-point connection by connecting the SIMATIC Box PC 620 to another programming device or a programmable logic controller using

- A V.24 connection
- A TTY connection (optional product feature)

Configuring Interfaces with Line Current (TTY, 20 mA)

To ensure reliable data transfer, several factors must be taken into account. The maximum data transfer rate (baud rate) depends on the distance, the type of cable, the pin assignment of the interface and external interference.

You can reduce interference by choosing the right transmission cable and connecting it properly, and by observing the following guidelines:

- Use a shielded cable with a low line resistance (130 Ω / km) (about 40 Ω kft) and low capacitance (< 90 pF/m) (about 27 pF/ft). Twisted-pair cables are less susceptible to noise and interference. A low line resistance results 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 transmission link, the higher the maximum possible data transfer rate.
- If there is an active sender 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 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 no-load voltage has been tested on a 100 m (1100 ft) long cable at a transmission rate of 9600 bps in an environment with normal levels of noise fieldstrengthV/mor1V/ft).If a shielded 5 x 1 x 0.14shielded cable is used, reliable transmission is possible over a distance of up to 100 m (1100 ft). The AS511 protocol (only one transmitter at a time) was used for testing.

Note

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

Connecting the SIMATIC Box PC 620 to an S5 Programmable Logic Controller

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

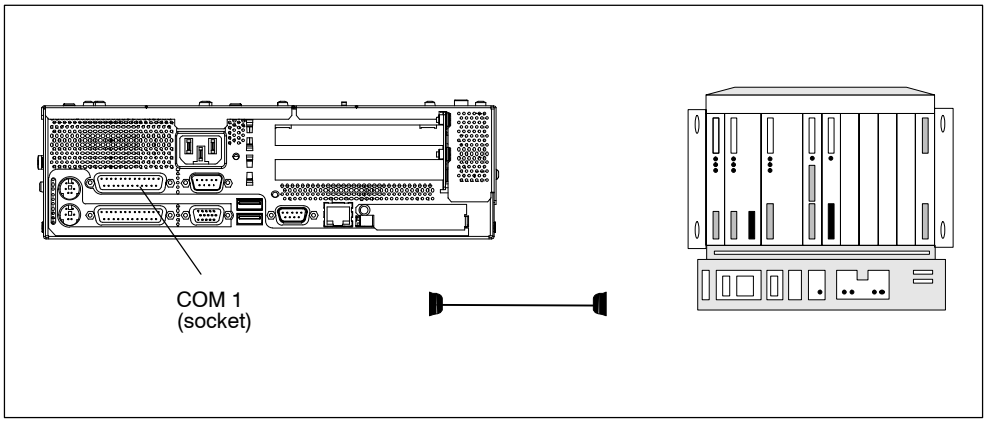


Figure 3-12 Connecting the Box PC to an S5 Programmable Logic Controller

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

1. Disconnect the Box PC from the power supply.
2. Insert the connecting cable into the port COM 1 / AG.
3. Screw down the plug.
4. Plug the cable into the corresponding port on the CPU of the programmable logic controller.
5. In order to enable TTY operation, you must set TTY to “enabled” in the BIOS setup.

Caution

Risk of damage !

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

Make sure the TTY cable of the SIMATIC Box PC 620is plugged into the COM 1 / TTY port and not into the LPT 1 port.

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

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

Connecting the SIMATIC Box PC 620 via an Adapter

The connecting cable 6ES5 734-2BD20 is supplied with the Box PC. An adapter is available for connecting the programmable controller using old standard cables.

Tabelle 3-1 Adapter for SIMATIC Box PC 620 Connection

Interface	Link	Connecting Cable Order no:	Adapter
TTY interface (COM 1)	Box PC to SIMATIC-S5 program-mable controller	6ES5 734-2BD20	
		6ES5 731-1xxx0 15–pin	6ES5 731-6AG00
		6ES5 731-0xxx0 25– pin	6ES5 731-6AG00

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

Note

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

SIMATIC Box PC 620 to PG Connection (V.24, TTY)

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

Tabelle 3-2 Connection of the SIMATIC Box PC 620 to other PUs

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

Notice

1. When connecting the programming devices in series, make sure you connect the cable the right way around (see Figure 3-13).
2. The connecting cable is available for order only as a spare part. The connecting cable is described in Chapter 7.
3. The line current (TTY) is an optional product feature.

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

Notice

For the PC/PU connection, you must switch the TTY ports (COM 1) in one of the programmable logic controllers to passive by changing the jumper setting. When the Box PC leaves the factory, this interface is always set to active!

3.7 Connecting the SIMATIC Box PC 620 to a SIMATIC S7 Network (PROFIBUS/MPI)

Connecting an S7 Programmable Controller via PROFIBUS/MPI Interface

You can connect the SIMATIC Box PC 620 to a SIMATIC S7 automation system or to a PROFIBUS network via the potentially isolated*) PROFIBUS/MPI port**). The MPI cable (5m) for connection to SIMATIC S7 CPUs (order no.: 6ES7901-0BF00-0AA0) is supplied with the SIMATIC Box PC 620. Only transfer rates of up to 187.5 kBit/s are possible with this cable connection. The 12 Mbit/s PROFIBUS connecting cable is required for baud rates from 1.5 Mbit/s (order no. 6ES7901-4BD00-0XA0).

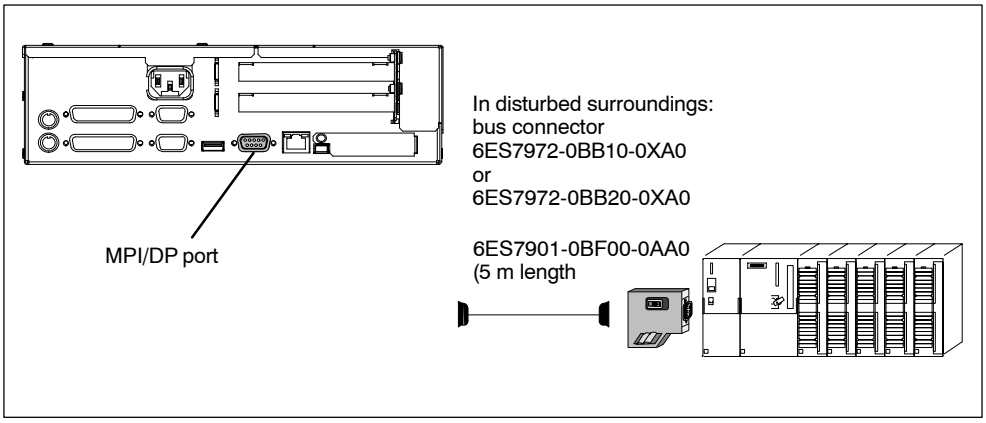


Figure 3-14 Connection Using the PROFIBUS/MPI Interface

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

1. Disconnect the PC from the power supply.
2. Connect the cable to the PROFIBUS/MPI interface.

Caution

Risk of damage to the SIMATIC Box PC 620!

Before plugging in the cables, the static charge on your body, the unit, and the cables must be equalized. You can do this by briefly touching the metal mounting plate for the interfaces on the left-hand side panel.

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

Connecting

Via the PROFIBUS/MPI interface, you can connect your PC to

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

PROFIBUS/MPI Network

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

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

3.8 Networking the SIMATIC Box PC 620 with Other Stations on PROFIBUS

Networking the Box PC on PROFIBUS

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

How the Network Functions

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

Hardware Requirements

Using the following components, for example, you can connect or network the SIMATIC Box PC 620 with PROFIBUS:

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

3.9 Ethernet (RJ45 Ethernet Interface)

Networking Box PC via RJ45 Ethernet Interface

The RJ45 Ethernet interface is a Twisted-Pair (TP) Interface for data transfer rates of 10/100 Mbaud. This on-board interface is compatible with Intel pro/100+ PCI Adapters.

The Plug & Play interface is automatically recognized in Windows. Protocols are configured in the Windows system control.

Notice

A Class 5 Ethernet cable is required for operation with 100 Mbaud.

3.10 Connection under Windows

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

SIMATIC Box PC 620 Expansions

4

What Does This Chapter Contain?

You can enhance the performance of your Box PC by adding additional memory. This chapter describes how to expand your PC. Please observe the relevant safety guidelines.

Chapter Overview

4.1 Opening the Unit

4.1.1 Prerequisites

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

Caution

The electronic components on the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically sensitive devices at the end of this manual.

Limitation of Liability

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

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

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

Before Opening the Unit

Note the following rules before opening the unit:

- Before you disconnect the power supply cable, discharge any electrostatic charge on your body. You can do this by touching the metal mounting plate for the interfaces on the left-hand side panel of the unit.
- Discharge any electrostatic charge from tools that you are using.
- Wear a grounding wrist-strap if you are handling components.
- Leave components and modules in their packing until you are ready to install them.
- Disconnect the Box PC from its power supply and remove the battery before plugging in or removing any modules or components.
- Touch components and modules only on their edges. Above all, do not touch the connecting pins and printed conductors.
- Never operate the Box PC with the cover open.

Tools

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

4.1.2 Opening the SIMATIC Box PC 620

To open the Box PC, proceed as follows:

1. Pull out the power supply connector, and remove all connecting cables from the unit, including the keyboard cable.
2. Remove the PC from its mounting/cabinet (only necessary if screws which have to be removed are inaccessible in the fitted position).
3. Undo the two screws (see fig. 5-1) on the housing cover.
4. Raise the cover slightly.
5. Then you can remove the housing cover.

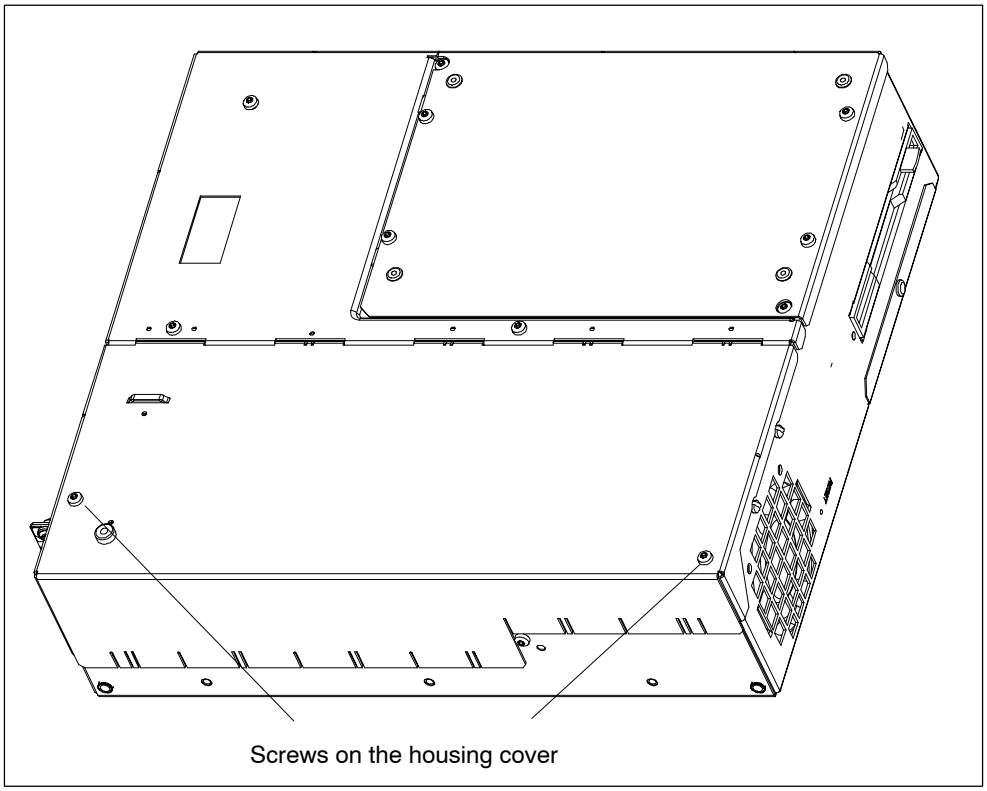


Figure 4-1 Box PC 620 Prepared for Opening

4.1.3 Components Visible After Opening the Unit

Components

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

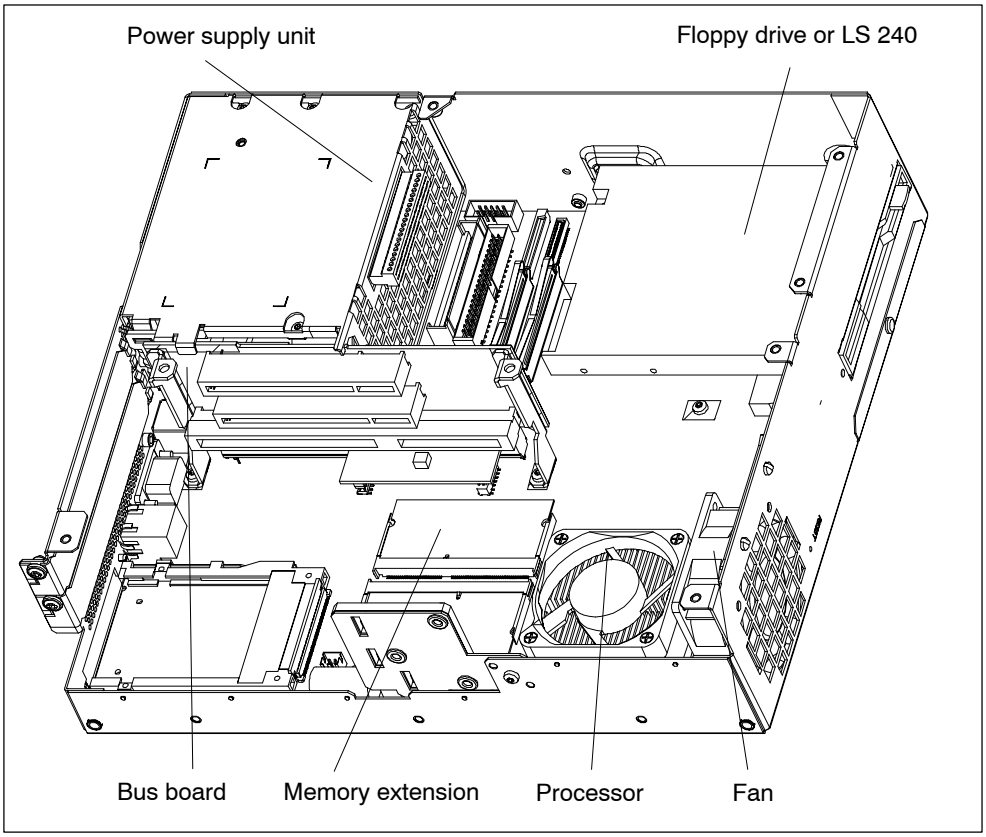


Figure 4-2 Box PC 620 Open

4.1.4 The Motherboard

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

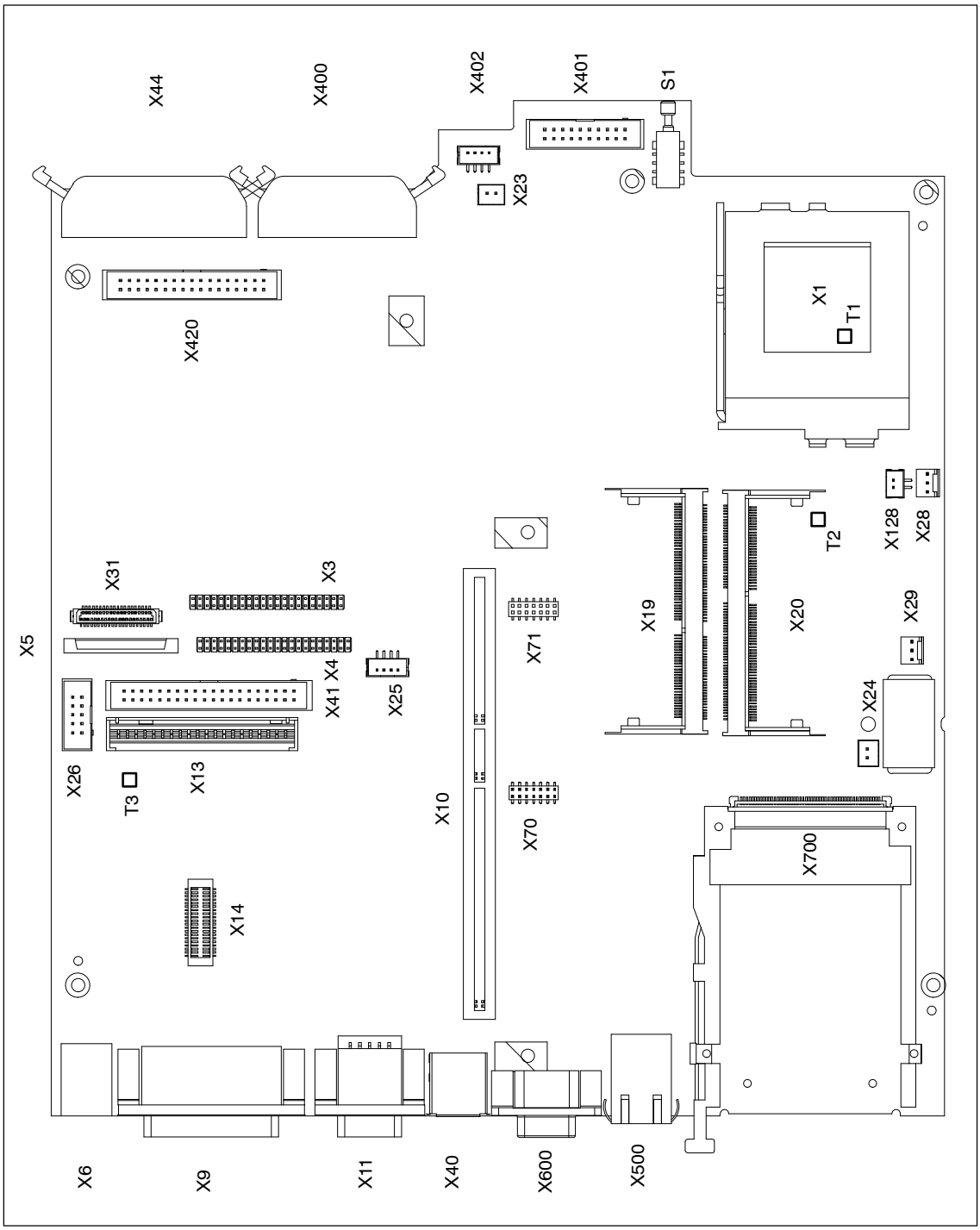


Figure 4-3 Motherboard

Components on the Motherboard

The following components are located on the motherboard of the Box PC 620 V2:

Number	Functions
X1	Processor module with heat sink
X3	IDE connector for CD-ROM
X4	IDE connector for 2.5 “ hard disk
X5	Floppy drive connector
X6	PS/2 mouse connection
X6	PS/2 keyboard connection
X9	Serial port COM 1/TTY
X9	Parallel port LPT 1
X11	Serial port COM 2
X11	Socket for VGA monitor
X13	Connection to power supply 105W
X14	Connection to power supply 85W
X19, X20	System memory, 2 slots
X23	No connected
X24	Connector for clock battery
X26	Connector alternative COM2
X28	No connected
X29	Connector for CPU fan
X31	IDE connector for LS 120
X40	USB bus connector
X41	IDE connector for 3.5 “ hard disk
X44	Connector for front interface
X70, X71	TTY tranmitter/receiver *1
X128	Connector for device fan
X400	Connector for LVDS display (3.3 V/5 V)
X401	No connected
X402	No connected
X420	Connector for 5 V CMOS display
X500	RJ45 socket for ethernet LAN
X600	MPI/DP port
X700	PC card slot
S1	Button for hardware reset
T1	Temperature sensor (in the processor)
T2	Temperature sensor
T3	Temperature sensor

*1 Optional product feature

4.2 Installing Memory Expansion Submodules

Standard Memory

The motherboard has 2 slots for 144 pin SO DIMM memory submodules. This allows you to expand the memory capacity of your Box PC 620 to a maximum of 512 Mbytes.

Either one or two modules can be installed.

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

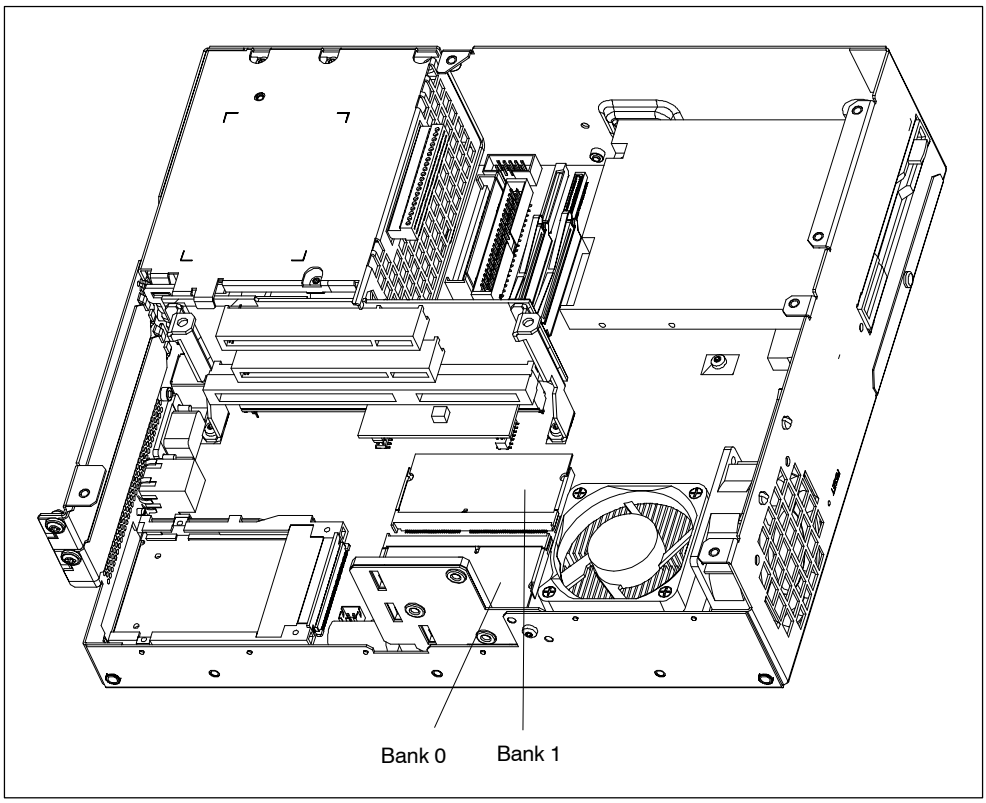


Figure 4-4 Position of the SO DIMM Memory modules

Caution

The electronic components of the printed circuit boards are extremely sensitive to electrostatic discharge. Certain precautionary measures are therefore necessary when handling such components. These measures are explained in the guidelines for handling electrostatically sensitive devices at the end of this manual.

Installing the SO DIMM Cards

To plug in expansion submodules, proceed as follows:

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

Caution

Risk of damage!

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

Installation

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

4.3 Replacing the Backup Battery

Battery Power Supply for Real-Time Clock and Configuration

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

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

Battery Voltage too Low

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

Replacing tthe Battery

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

To change the battery, proceed as follows:

1. Disconnect the PC from the power supply and remove all the connecting cables.
2. Open the unit as described in Section 4.1.
3. Change the backup battery inserted in the motherboard by pulling out the connector 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 unit.

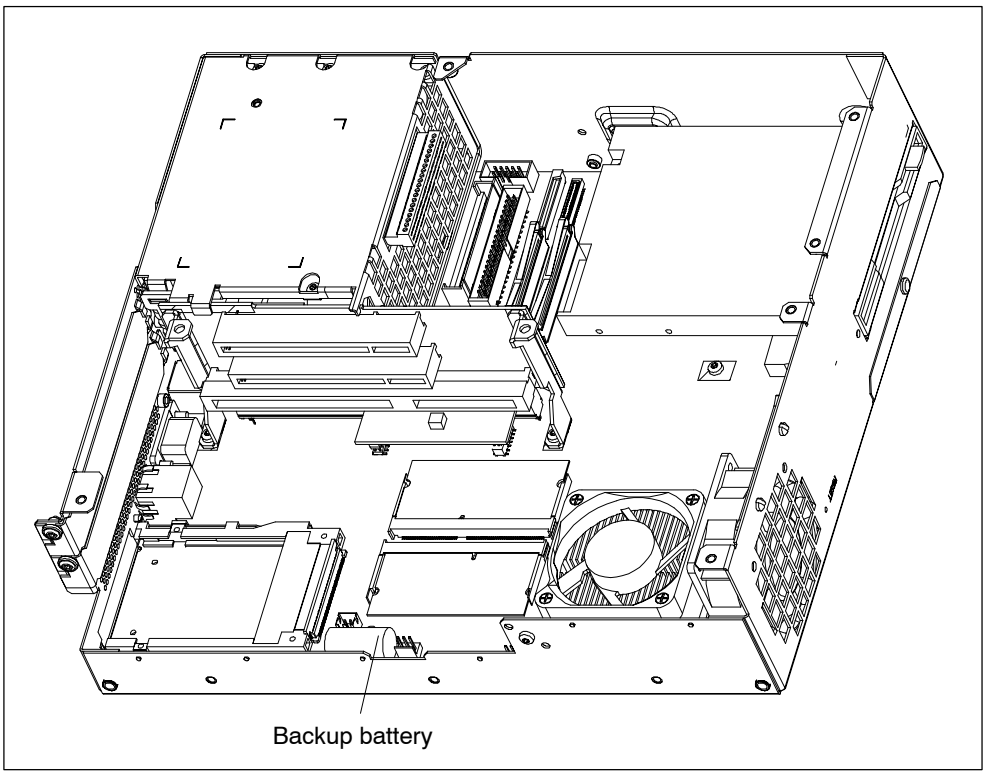


Figure 4-5 Position of the Backup Battery

Caution

Risk of damage!

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

Dispose of used batteries in keeping with local regulations.

Changing SETUP

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

4.4 Installation of Expansion Cards

Notes about the Cards

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

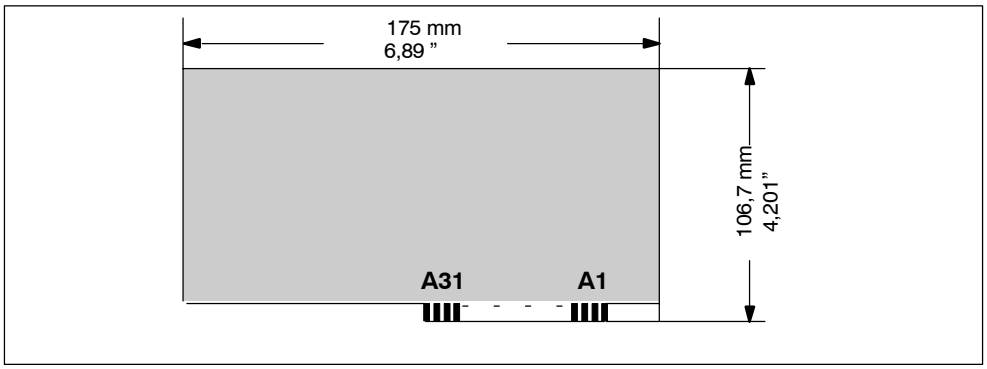


Figure 4-6 XT Card

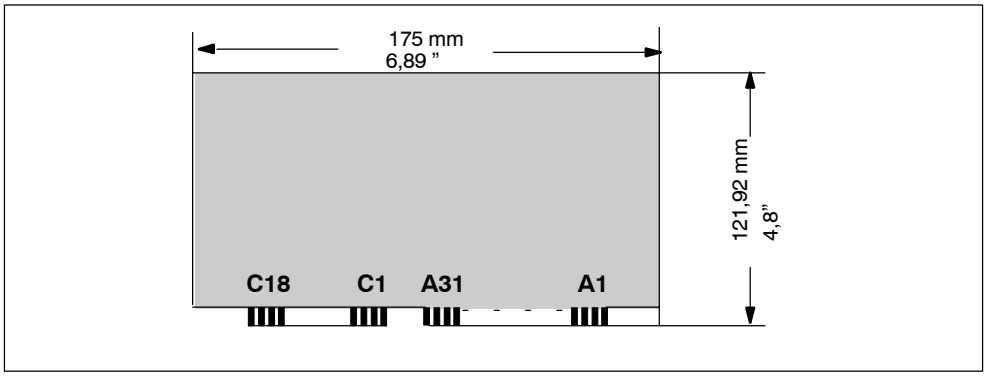


Figure 4-7 AT Card

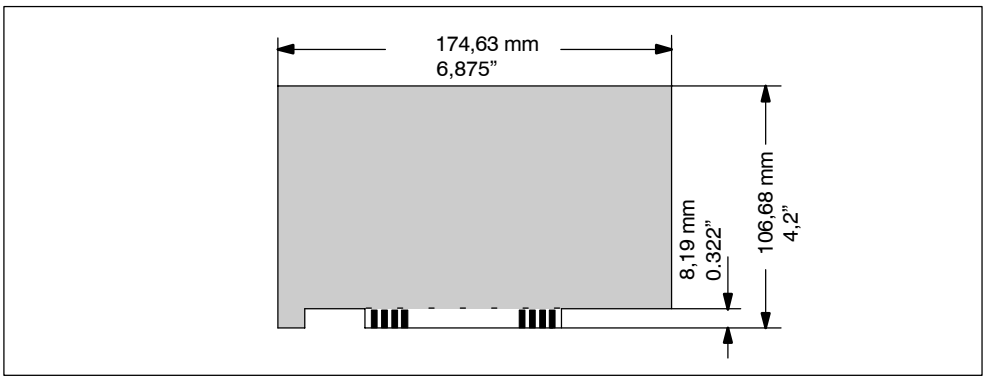


Figure 4-8 Short PCI Cards (5 V)

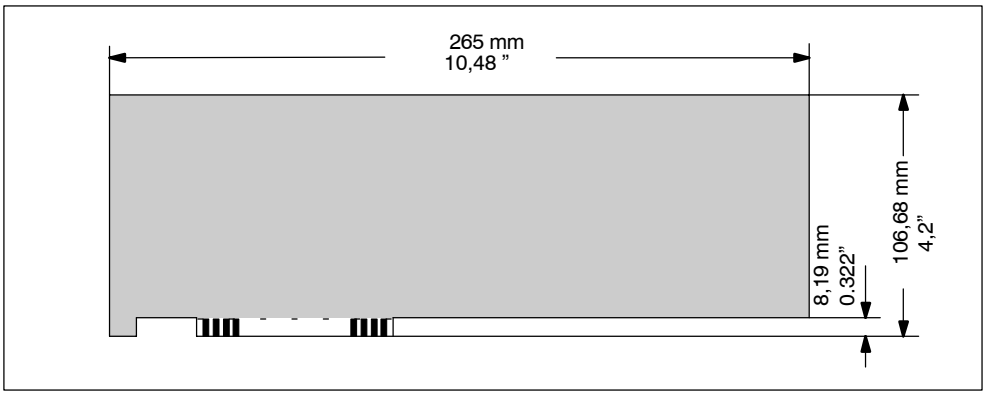


Figure 4-9 Long PCI Cards (5 V)

Note about Long PCI Cards

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

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

The device for holding down the modules is attached to the 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 housing.

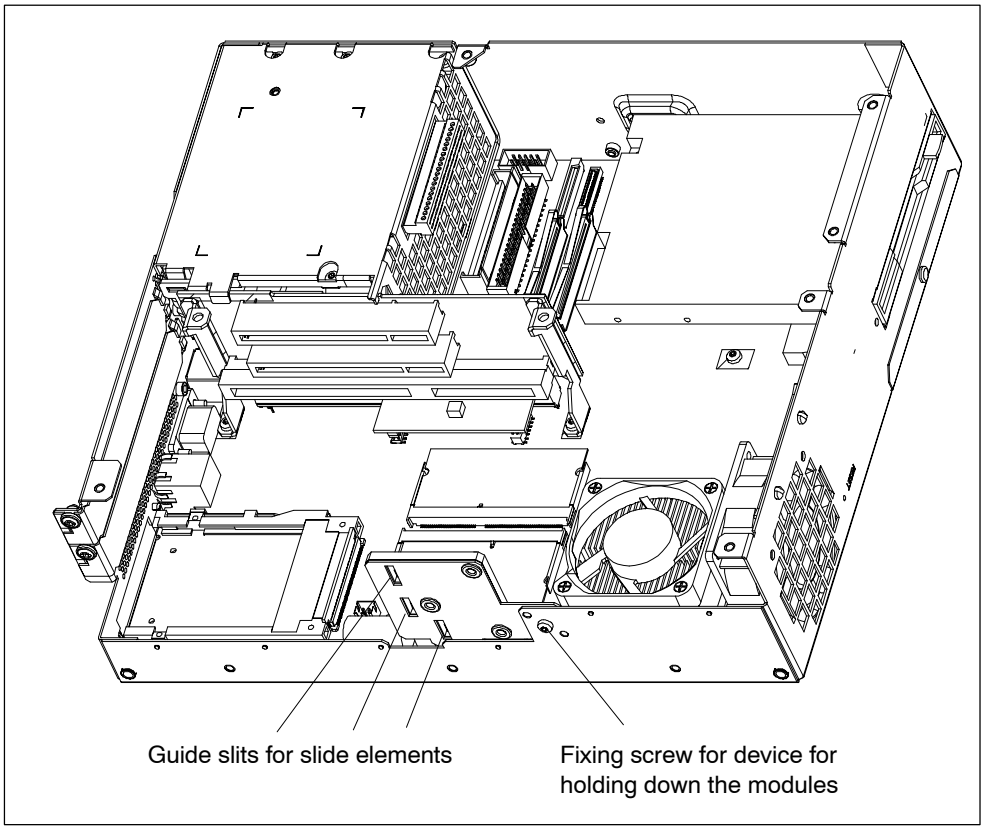


Figure 4-10 Removal/Installation of an Expansion Card

Note

The slide elements are in the enclosed plastic bag.

Aligning the Holding-Down Device

Proceed as follows to install the holding-down device.

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

No pressure may be exerted on the module! Therefore, do not use force to press the slide element onto the module.

2. Cut off the projecting part of the slide element:
   - Score the slide element at the top edge of the holding-down device with a knife and break it off.
   - Nip off the surplus with a sharp side cutter.

4.4.2 Removal and Installation of an Expansion Card

Proceed as follows:

1. Open the housing as described in Section 4.1.
2. Remove all connectors from the expansion card and note the 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 the slot.
6. Proceed in the reverse order to install the new expansion card.

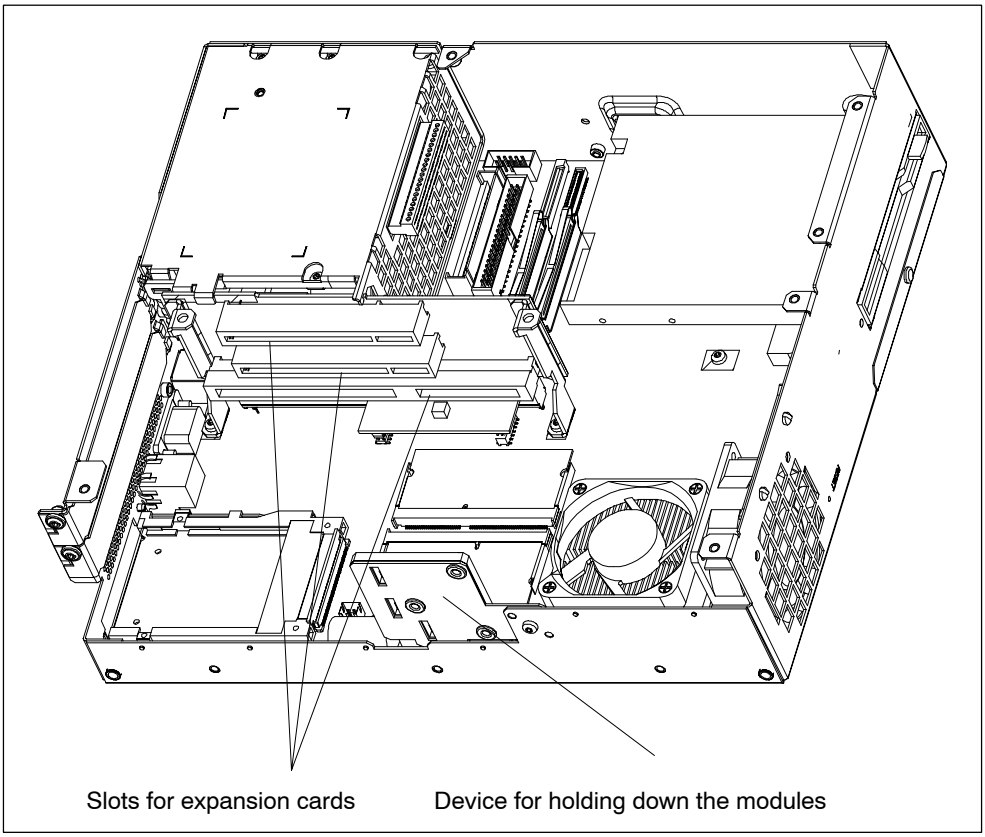


Figure 4-11 Removal/Installation of an Expansion Card

4.5 Removal and Installation of Drives

4.5.1 Removal and Installation of the Hard Disk Drive

1. Undo the 4 screws on the back of the housing.
2. Open the drive holder.
3. Detach the drive holder from the mounting and lay the drive holder with its top on the housing.
4. Note the cable assignment and pull off the cables.
5. Undo the four screws which secure the hard disk drive to the vibration-damped part of the mounting. Remove the hard disk drive from the mounting.
6. Proceed in the reverse order to fit the new drive. The new drive must be of the same type as the one removed.

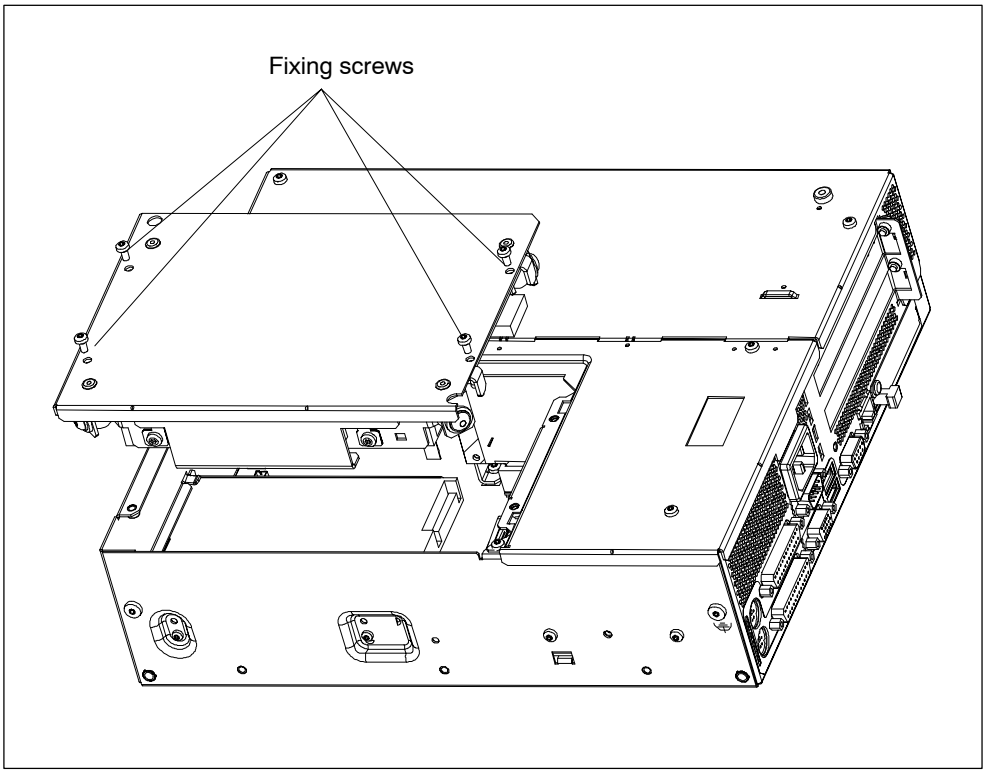


Figure 4-12 Installation and Removal of the Drive Holder

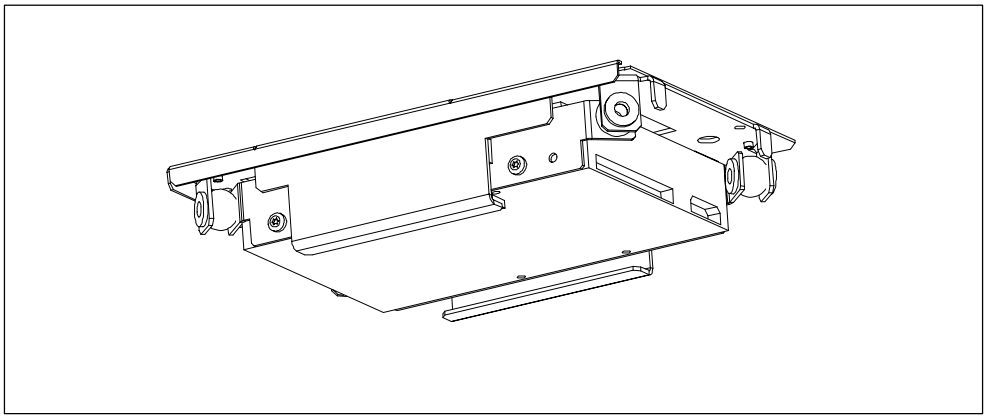


Figure 4-13 Hard Disk Drive with Holder Removed

4.5.2 Removal and Installation of a CD ROM Drive

Depending on the device equipment, a CD ROM drive is installed in the Box PC.

1. Undo the 2 screws on the back of the housing.
2. Remove the cover of the CD ROM drive.
3. Undo the three screws which secure the CD ROM drive to 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 fit the new drive.

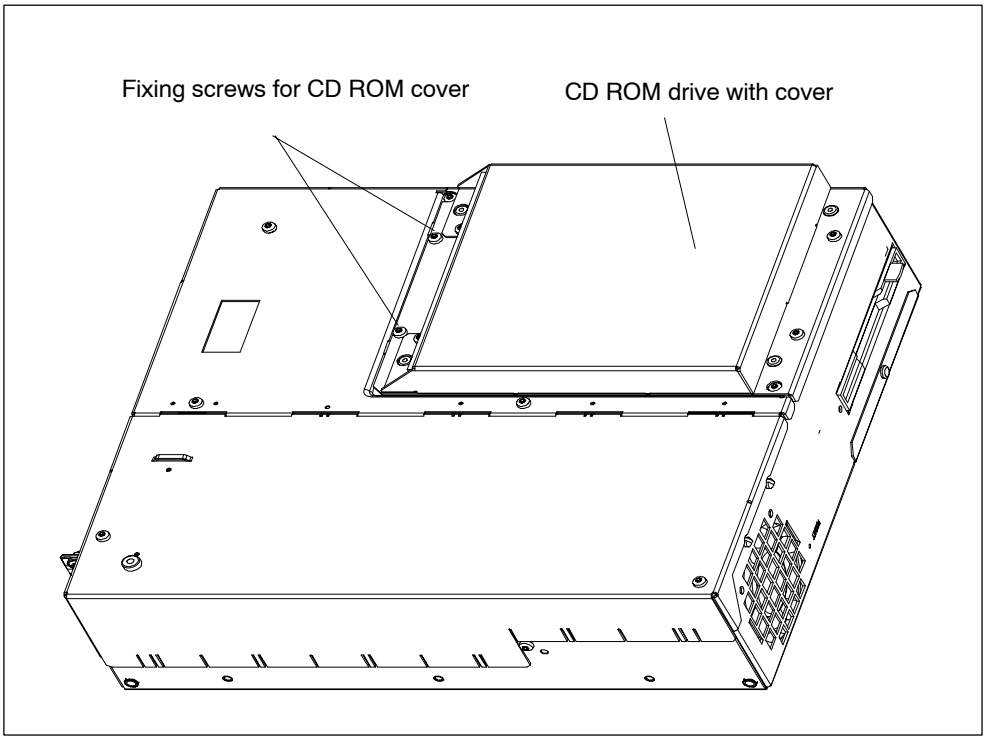


Figure 4-14 Box PC 620 with CD ROM Drive

4.5.3 Removal and Installation of the Floppy Drive

1. Open the housing as described in Section 4.1.
2. Remove the drive holder as described in Section 4.5.1.
3. Release the interlock of the controller flex-lead on the motherboard and pull the flex-lead out of the connector assembly.
4. Undo the two fixing screws (TORX T8) on the housing.
5. Lift the floppy drive upwards out of the housing.
6. Proceed in the reverse order to fit the new drive. The new drive must be of the same type as the one removed.

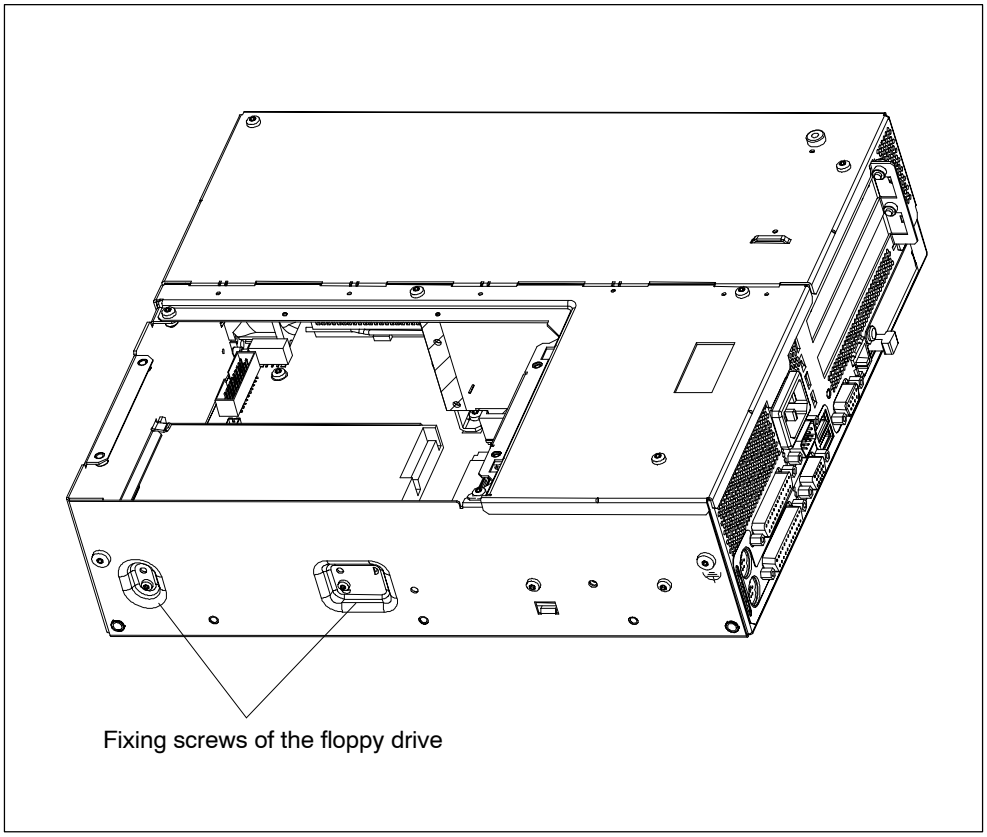


Figure 4-15 Installation of the Floppy Disk Drive in the Box PC 620

4.5.4 Removal and Installation of the LS 240 Drive

The removal and installation of the LS240 drive takes place with the same steps as for the floppy drive.

1. Open the housing as described in Section 4.1.
2. Remove the drive holder as described in Section 4.5.1.
3. Release the cable clamp assembly of the controller flex-lead on the motherboard and pull the flex-lead out of the connector assembly.
4. Undo the two fixing screws (TORX T8) on the housing.
5. Lift the LS 240 drive upwards out of the housing.
6. Proceed in the reverse order to fit the new drive.

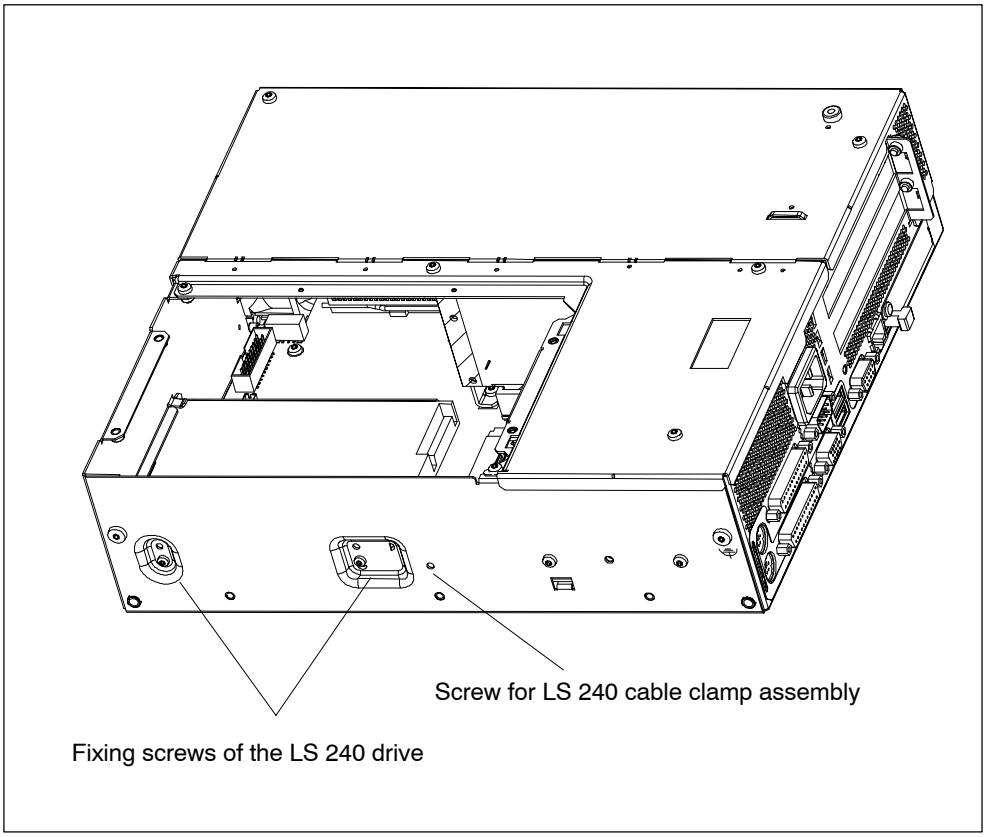


Figure 4-16 Installation of the LS 240 Drive

4.6 Removal and Installation of the Power Supply Unit

1. Open the system housing as described in Section 4.1.
2. Remove the drive holder as described in Section 4.5.1.
3. Undo and remove the 3 screws of the cover of the power supply unit from the housing
4. Remove the internal power supply cable from the power supply unit (only versions with the 105W power supply)
5. Undo the two fixing screws (TORX T10) on the housing.
6. Pull the power supply unit upwards out of the housing.
7. Proceed in the reverse order to fit the new power supply unit.

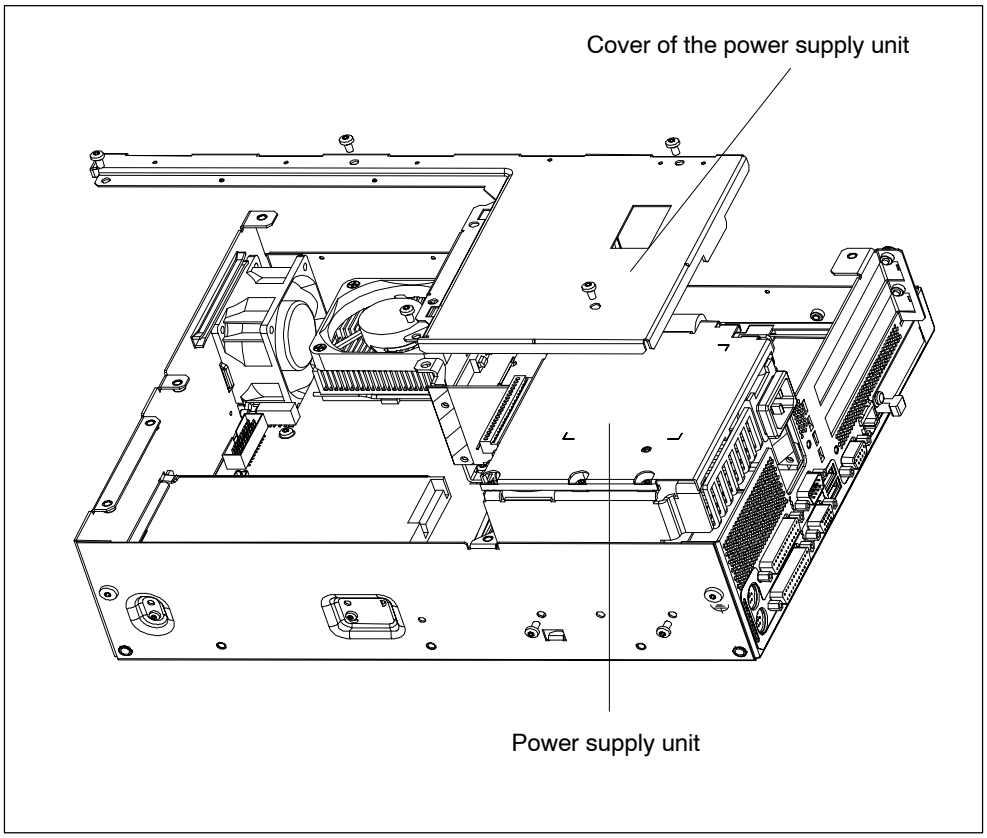


Figure 4-17 Removal and Installation of the Power Supply Unit

4.7 Removal and Installation of the Bus Board

1. Open the housing as described in Section 4.1.
2. Remove all the modules from the slots (proceed as described in Section 4.4.2).
3. Remove the drive holder 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 bus board off the motherboard.
7. Proceed in the reverse order to refit the bus board.

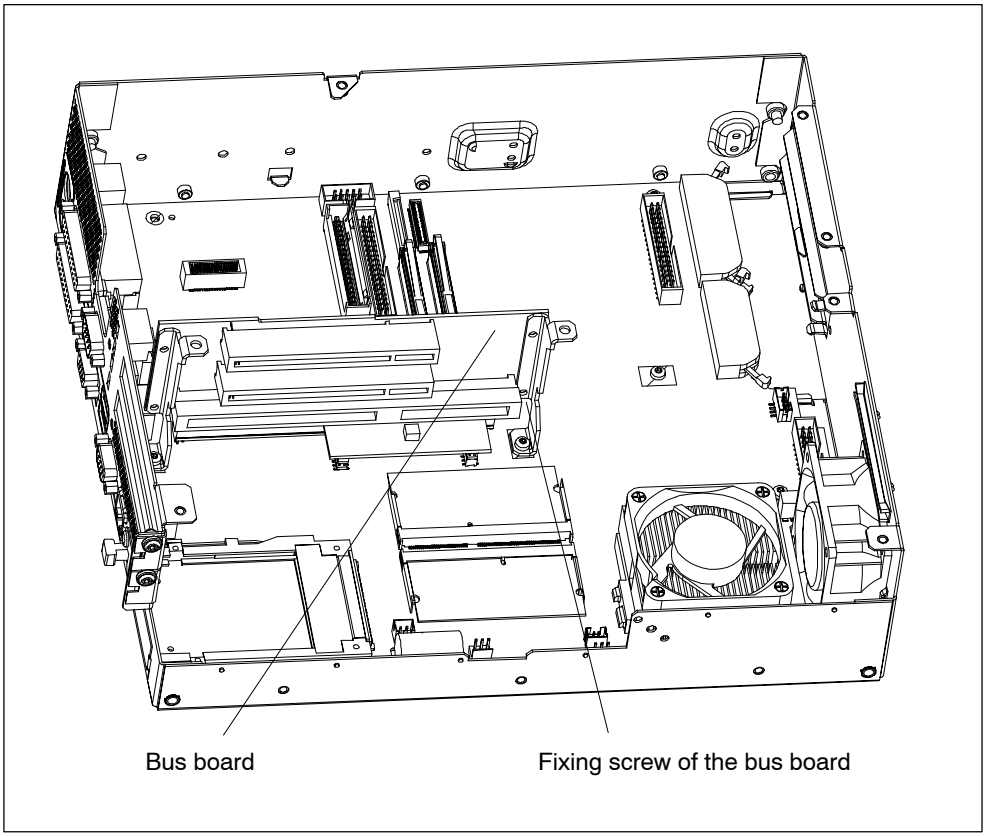


Figure 4-18 Removal and Installation of the Bus Board

4.8 Removal and Installation of the Motherboard

1. Open the housing as described in Section 4.1.
2. Remove all the modules from the slots (proceed as described in Section 4.4.2).
3. Remove the drive holder as described in Section 4.5.1.
4. Remove the power supply unit as described in Section 4.6.
5. Undo the 7 screws on the motherboard and the 10 hexagon head screws on the ports.
6. Remove the bus board and the motherboard.
7. Proceed in the reverse order to refit the motherboard.

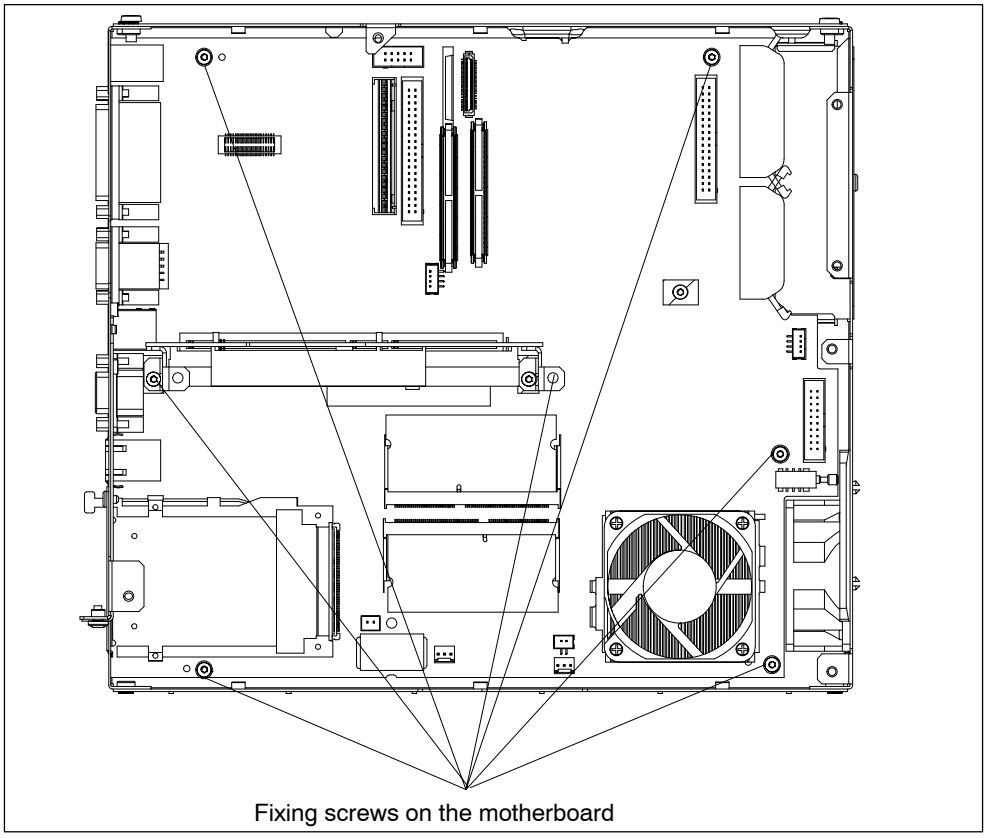


Figure 4-19 Fixing Screws on the Motherboard

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

4.9 Removal and Installation of the Device Fan

The Box PC is cooled by means of a fan which sucks hot air out of the housing.

1. Open the 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 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.

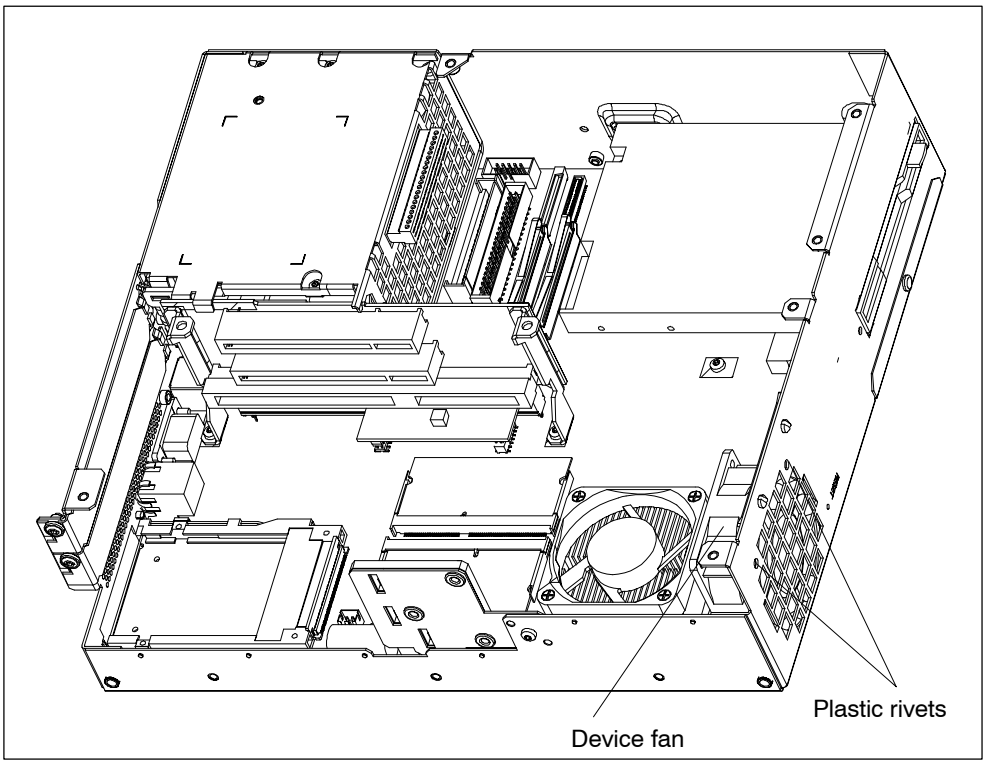


Figure 4-20 Removal and Installation of the Device Fan

Notice

Only a fan of the same type may be fitted!

Caution

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

Ensure that the arrow on the fan points to the housing wall.

4.10 Processor Change

Proceed as follows to exchange the processor:

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

Caution

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

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

Caution

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

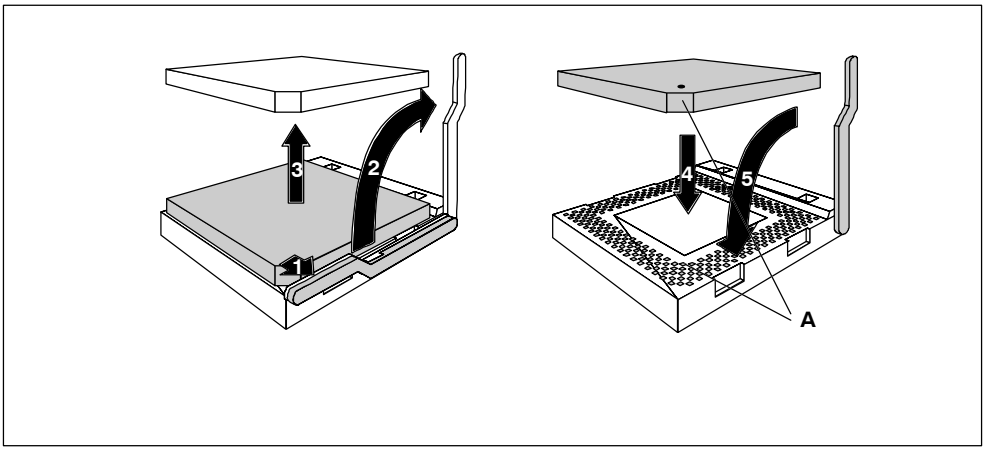


Figure 4-21 Changing the Processor

4.11 Reset Button

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

In the Box PC the reset button is on the drive side beside the floppy drive. The reset button can be only actuated with a thin pen (e.g. an opened-up paper clip). The position of the reset button is marked in the illustration of the Box PC below.

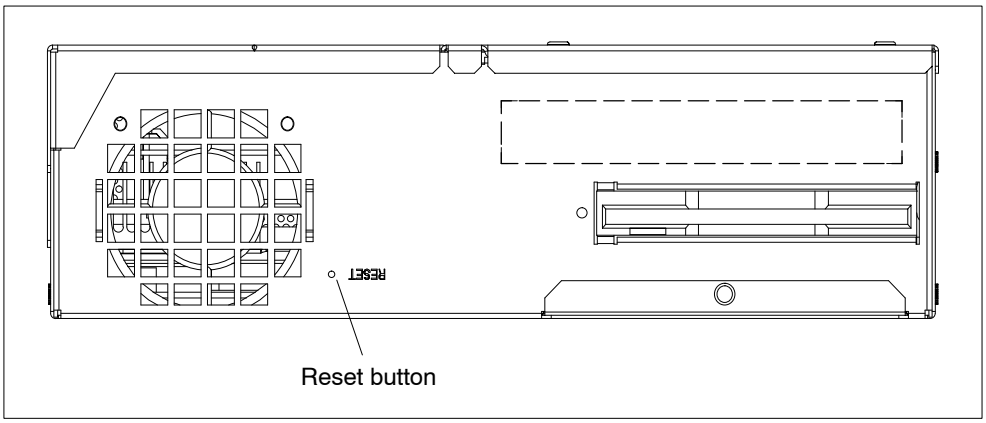


Figure 4-22 Reset Button

Configuring the SIMATIC Box PC 620

5

What Does This Chapter Contain?

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

Chapter Overview

5.1 Changing the Device Configuration with BIOS SETUP

Changing the Device Configuration

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

BIOS SETUP Program

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

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

Incorrect BIOS Data

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

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

Starting SETUP

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

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

To start SETUP, proceed as follows:

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

BIOS SETUP Menus

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

Screen Display Following Power On

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

```
Phoenix BIOS 4.0 A5E00123801—ES02
Copyright 1985-2001 Phoenix Technologies Ltd.
All Rights Reserved.

SIMATIC Box PC 620 V02.01.02
CPU = Pentium®III  866MHz
637K System RAM Passed
119MB Extended RAM Passed
0128K Cache SRAM Passed
System BIOS shadowed
Video BIOS shadowed
UMB upper limit segment address: ....
Fixed Disk 0: xxxx
ATAPI CD-ROM: Txxx
Mouse initialized
Press <F2> to enter SETUP
```

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

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

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

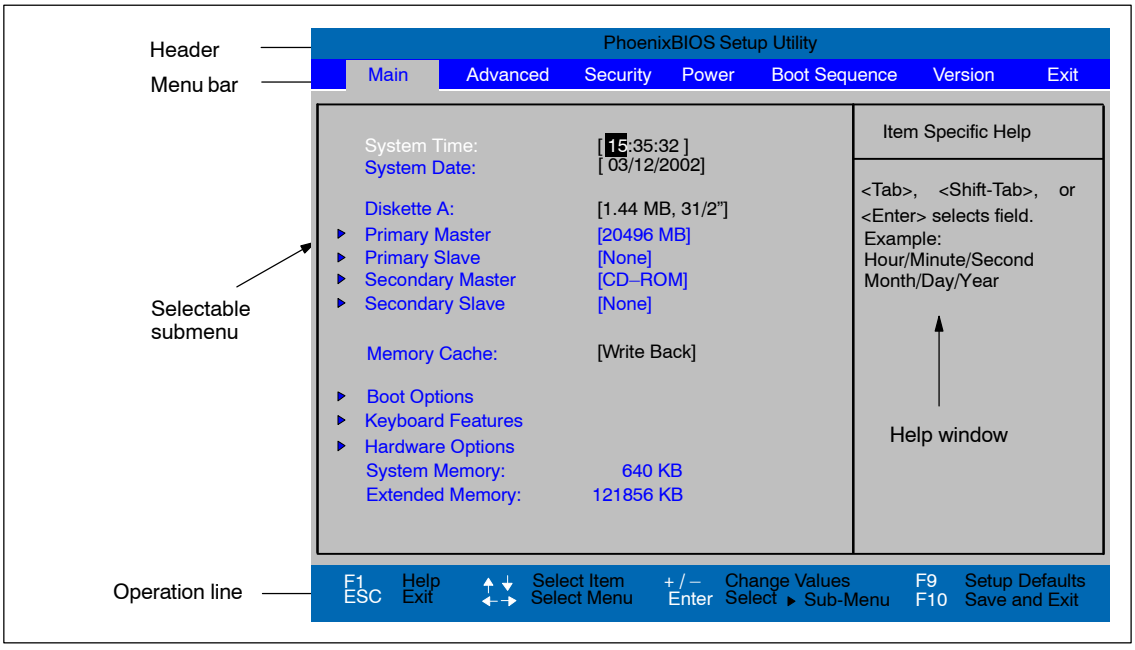


Figure 5-1 SETUP Main Menu (Example)

Menu Structure

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

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

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

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

5.1.1 The Main Menu

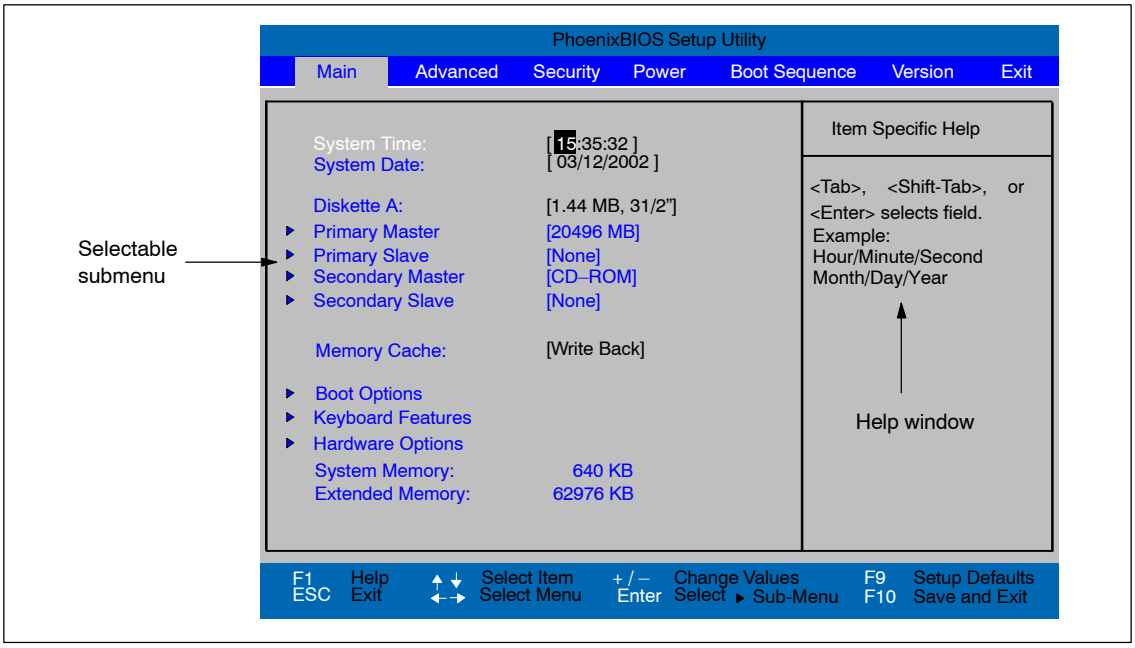


Figure 5-2 SETUP Main Menu (Example)

Setting in the Main Menu

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

Field	Meaning
System Time	For viewing and setting the current time
System Date	For viewing and setting the current date
Diskette A	Type of built in floppy disk drive With LS 240 drive [Disabled]
Memory Cache	For setting the cache options
by submenus	
Primary Master	Type of build in drives
Secondary Master	Type of build in drives
Boot Options	For setting boot options
Keyboard Features	For setting keyboard interface options (e.g. NUM Lock, Typematic Rate)
Hardware Options	For setting hardware options

System Time und System Date *Uhrzeit und Datum*

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

`Hour:Minute:Second`

and the date

`Month/Day/Year.`

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

Diskette A *Disk drive*

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

[Disabled]	If there is no disk drive or LS 240 drive. Default setting for an installed LS 240 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 jumps to the following submenu when you select this type of menu field:

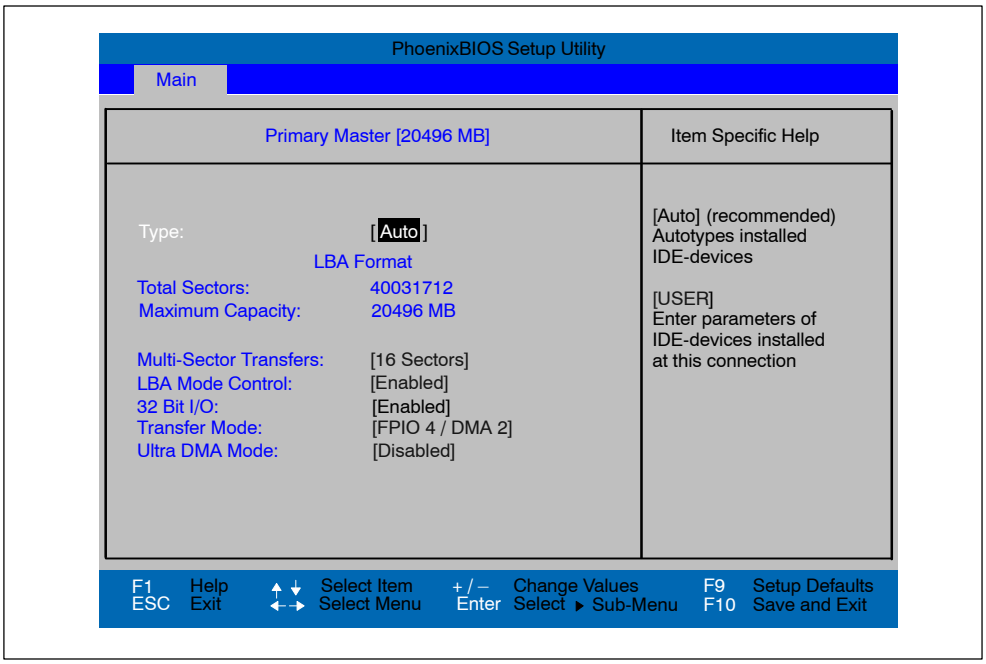


Figure 5-3 Primary Master

"Type" Field

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

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

Select "User" if you want to define the hard-disk type yourself, in which case remember that you also have to set the other fields, including Cylinder, Heads, Sectors/Track and WritePrecomp, to the correct values for the type of hard disk in question.

“Multi Sector-Transfer” Field

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

```
Disabled

 2,4,8,16   sectors
```

“LBA Mode Control” field

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

“32 Bit-IO” Field

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

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

“Transfer Mode” and “Ultra DMA Mode” Fields

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

Hit ESC to exit the submenu.

”Memory Cache” Submenu

The following pop-up menu appears when you select the submenu “Memory cache” in the main menu:

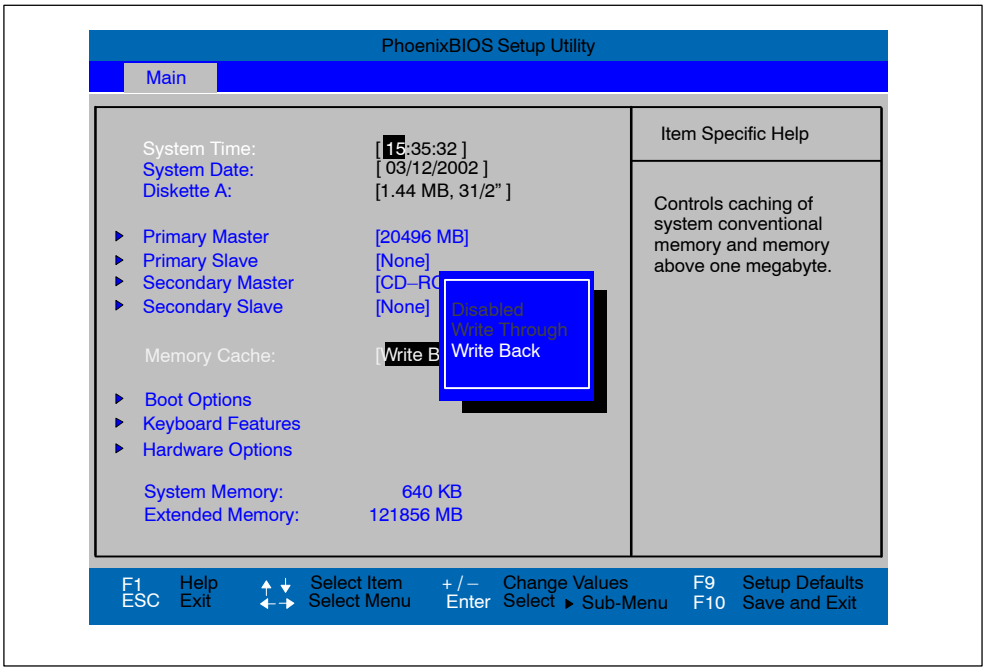


Figure 5-4 “Memory Cache” Field

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 the 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 runtimes or waits are too short on account of the fast cache.

[Disabled]	Cache is disabled
[Write Through]	Write access is not concluded until the entry has been made in main memory
[Write Back]	Write access is concluded immediately; the entry in main memory takes place in the backround (default)

”Boot Options” Submenu

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

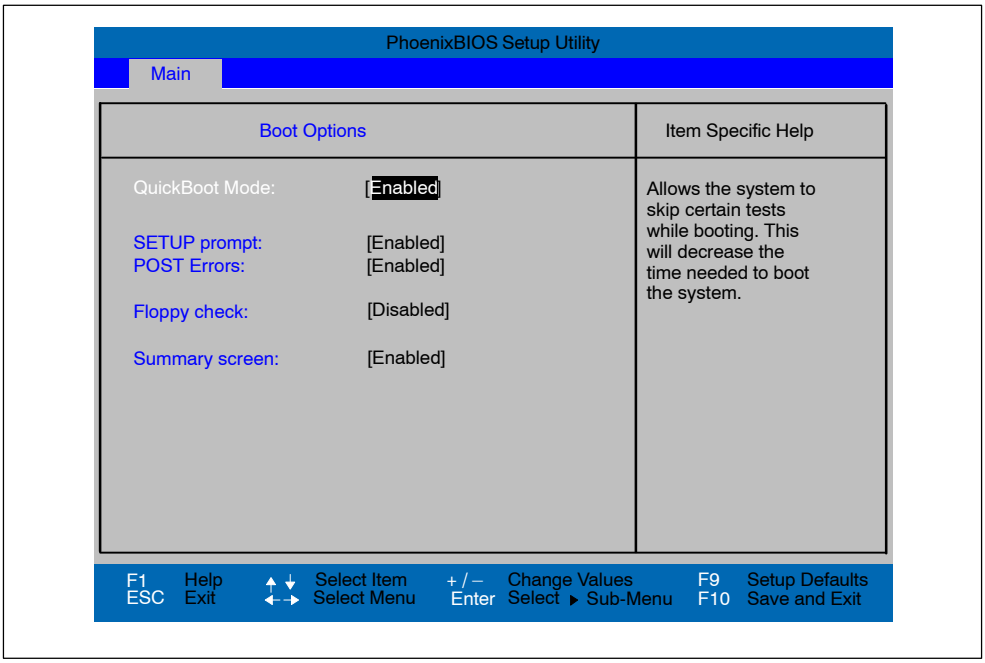


Figure 5-5 ”Boot Options” Submenu

Quick Boot Mode	Some hardware tests are skipped to speed up the boot procedure.
SETUP prompt	The message *PRESS <F2> to enter Setup* appears at the bottom of the screen during the system run-up phase.
POST Errors	The boot process is stopped if an error is detected; you must press F1 to acknowledge. Enter “Disabled”to avoid the necessity of acknowledging errors, for example if no keyboard is connected.

Floppy check	The floppy head is stepped inward and then back to its original position during the system run-up phase. This test is useful because it reinitializes the drive.
Summary screen	The most important system parameters are displayed when the system run-up phase completes.

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

Example of a summary screen:

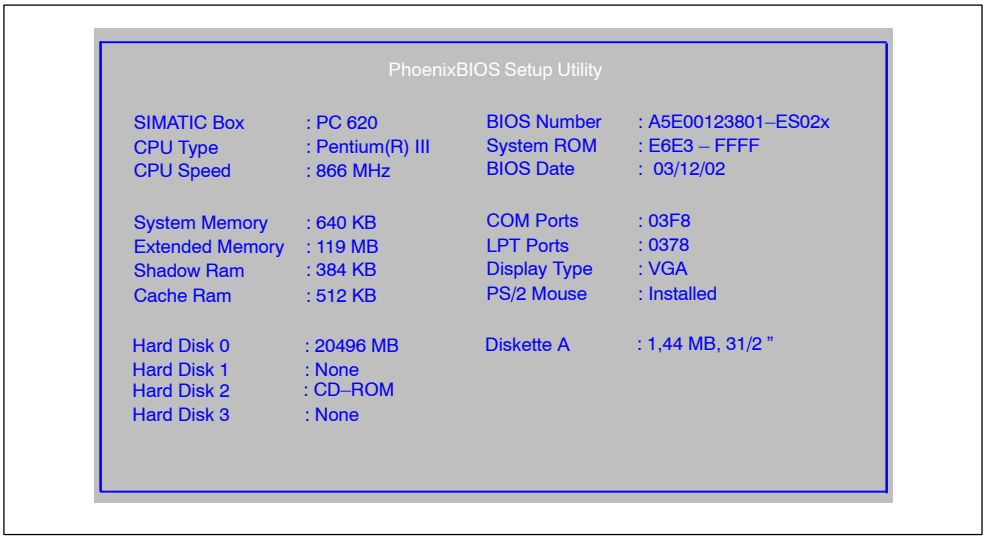


Figure 5-6 Summary Screen

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

“Keyboard Features” Submenu

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

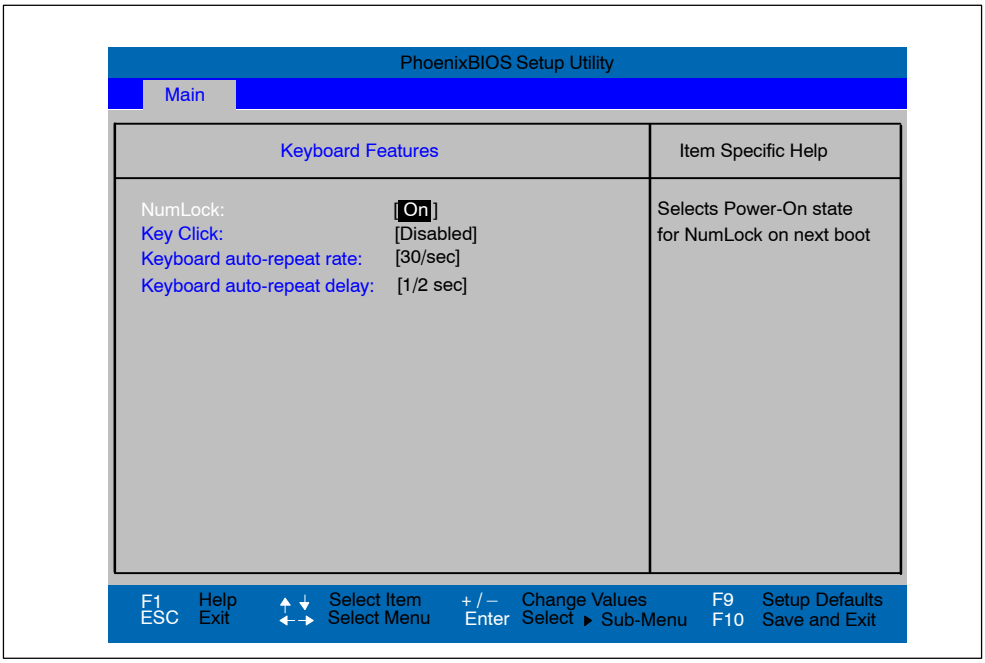


Figure 5-7 ”Keyboard Features”Submenu

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” Submenu

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

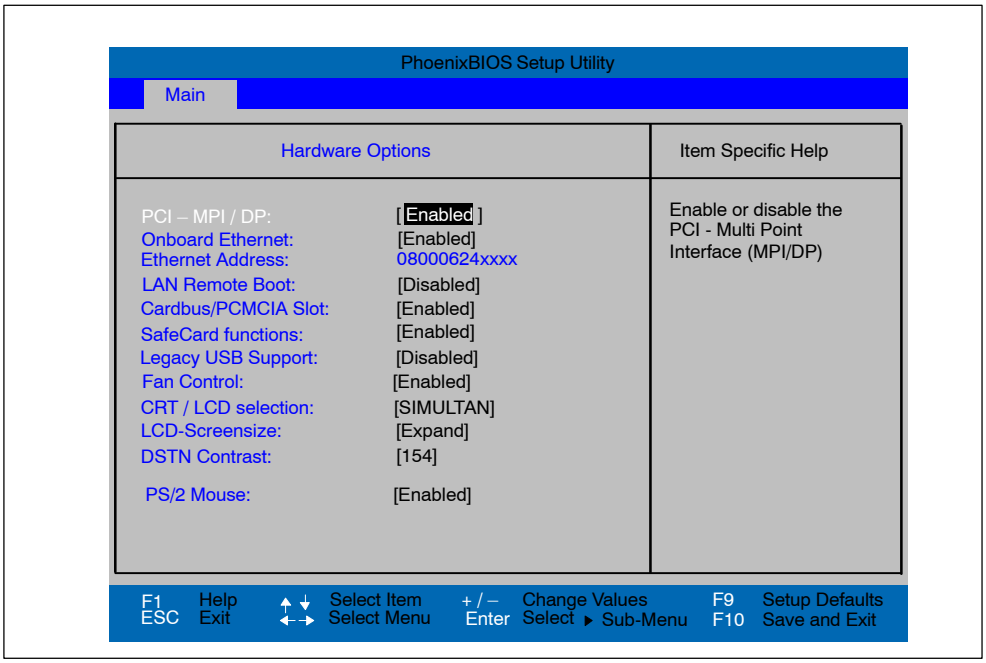


Figure 5-8 ”Hardware Options” Submenu

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

Entry	Meaning	
PCI-MPI/DP *1	Enables the CP5611-compatible MPI/DP interface. The recourses are managed by the BIOS PCI plug and play mechanism.	
On Board Ethernet	[Enabled]	The ethernet port on the motherboard is enabled.
	[Disabled]	The ethernet port on the motherboard is disabled.
Ethernet Address	The individual ethernet address is displayed here.	
LAN Remote Boot	[Enabled]	Booting using a connected LAN is possible. The respective boot source is displayed as Intel® Boot-Agent in the boot sequence menu.
	[Disabled]	Booting using LAN is not possible.

*1 Optional product feature

Entry	Meaning	
Cardbus / PCMCIA Slot	[Disabled]	Disables the Cardbus / PCMCIA interfaces.
	[Enabled]	The resources are managed by the BIOS PCI plug and play mechanism.
SafeCard functions	[Enabled]	On board monitoring functions are enabled.
	[Disabled]	No monitoring functions.
	The relevant driver and the application must be started for operation of the monitoring functions.	
Legacy USB Support	[Disabled]	A USB-capable operating system is required to operate a USB keyboard or a USB mouse. Setup adjustments can be made with a USB keyboard.
	[Enabled]	USB keyboard and USB mouse are supported by the BIOS. Non-USB capable operating systems can be used.
Fan Control	[Enabled]	Fan speed depends on temperature.
	[Disabled]	Fan always runs at full speed.
CRT / LCD selection	[LCD Enabled]	All data is output only to the internal LCD, the 15-way VGA port is disabled
	[CRT Enabled]	For maximum resolution the display signals are output only to the 15-way VGA port; the LCD interface of the VGA controller is disabled.
	[SIMULTAN]	Both display interfaces are enabled and operate simultaneously. Note, however, that the LCD does not support all resolutions.
LCD-Screen-size	[Normal]	The display window in Text and Graphic modes is not expanded to full screen size.
	[Expanded]	Die volle Bildschirmgröße wird genutzt, auch wenn die Auflösung nicht die Pixelgröße des Bildschirms hat.
DSTN Contrast	The contrast of the DSTN displays is set here. Range: 0-255	
PS/2 Mouse	[Internal]	The PS/2 port is activated. This is the default for the Box PC. IRQ 12 is assigned.
	[Disabled]	The PS/2 port is deactivated, IRQ12 is available.
	[Autodetect]	It is automatically detected if a mouse is connected.
	Note:	Invariably, changes to this interface do not come into effect until the PC is switched off and on again.

5.1.2 The Advanced Menu

Menu Structure

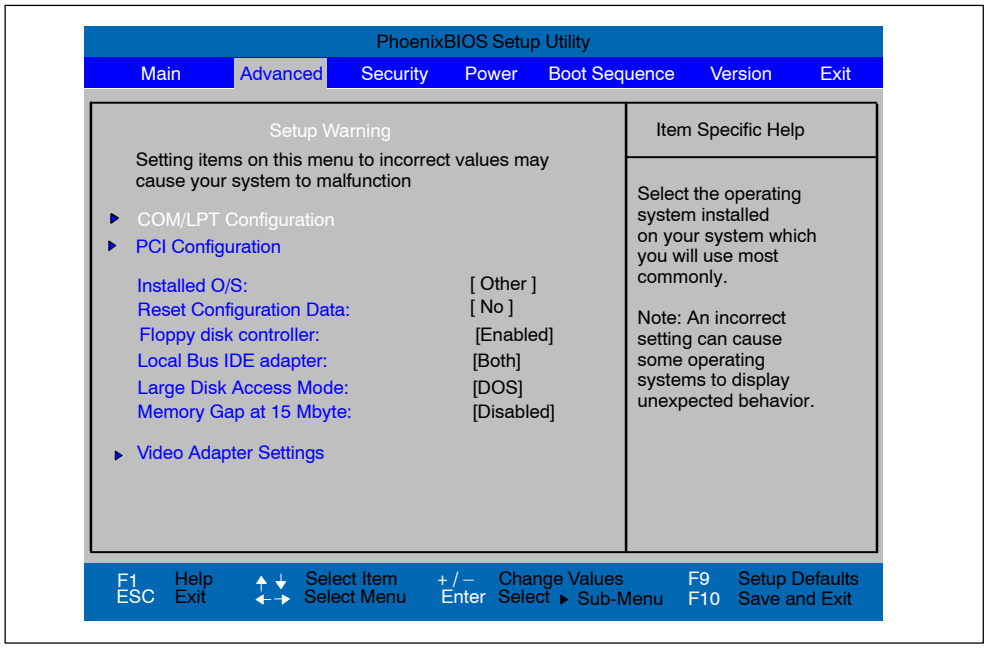


Figure 5-9 “Advanced” Menu

Setting in the Advanced Menu

Installed O/S	Plug and Play means that all modules are automatically detected and installed, providing they support the Plug and Play functionality.	
	[other]	BIOS handles the entire Plug and Play capability, default configuration
	[Win95], [Win98], [WinMe], [Win2000]	The operating system handles some of the Plug and Play functions
Reset Configuration Data	[Yes]	All installations under Plug and Play are deleted and reconfiguration is triggered the next time the system boots. The entry is then reset to [No]. System components that do not support Plug and Play have to be entered manually.
Floppy Disk Controller	[Enabled]	Floppy Disk Controller on the motherboard is activated.
	[Disabled]	Floppy Disk Controller on the motherboard is deactivated (with LS 240 drive).

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

Submenu COM/LPT Configuration

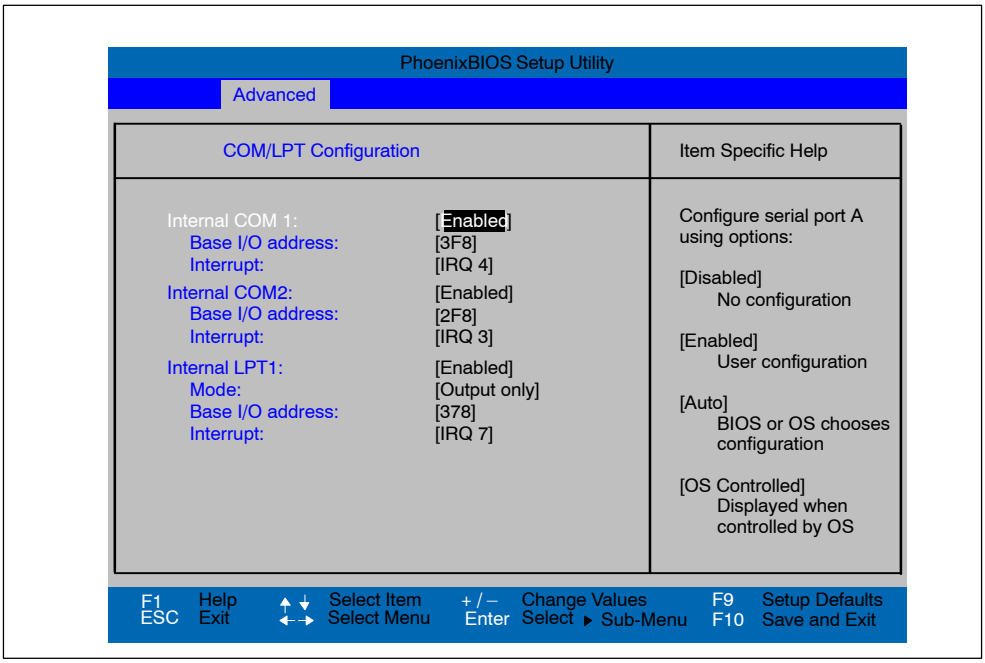


Figure 5-10 ”COM/LPT Configuration” Submenu

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

The I/O addresses and interrupts are preassigned to be operated as COM1, COM2 and LPT1 and we recommend you use them accordingly.

Printer Port Internal LPT1

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

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

PCI Configuration Submenu

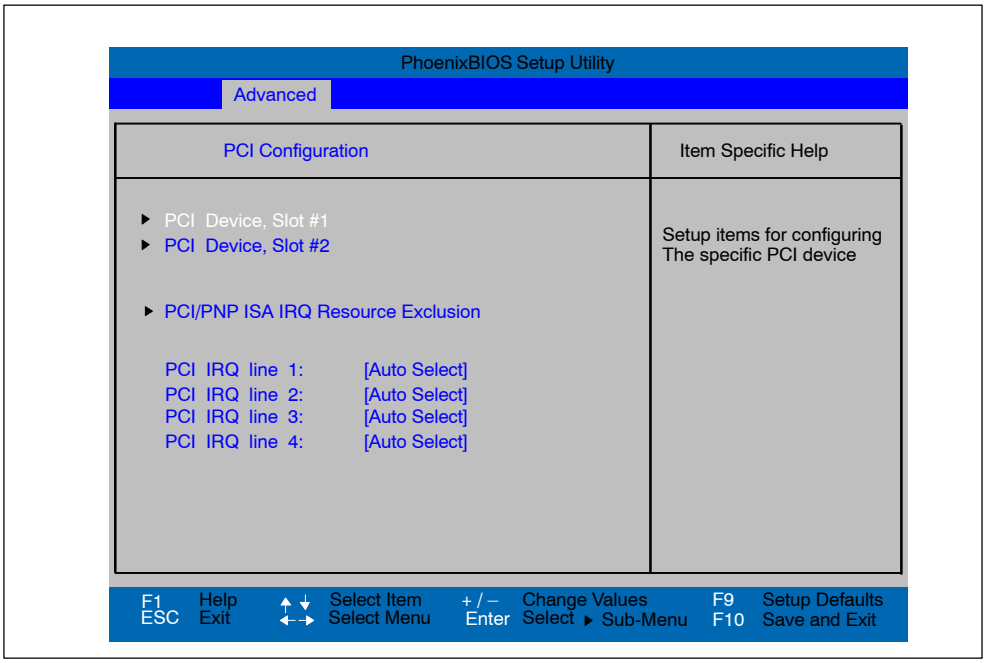


Figure 5-11 "PCI Configuration" Submenu

”PCI Devices” Submenu

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

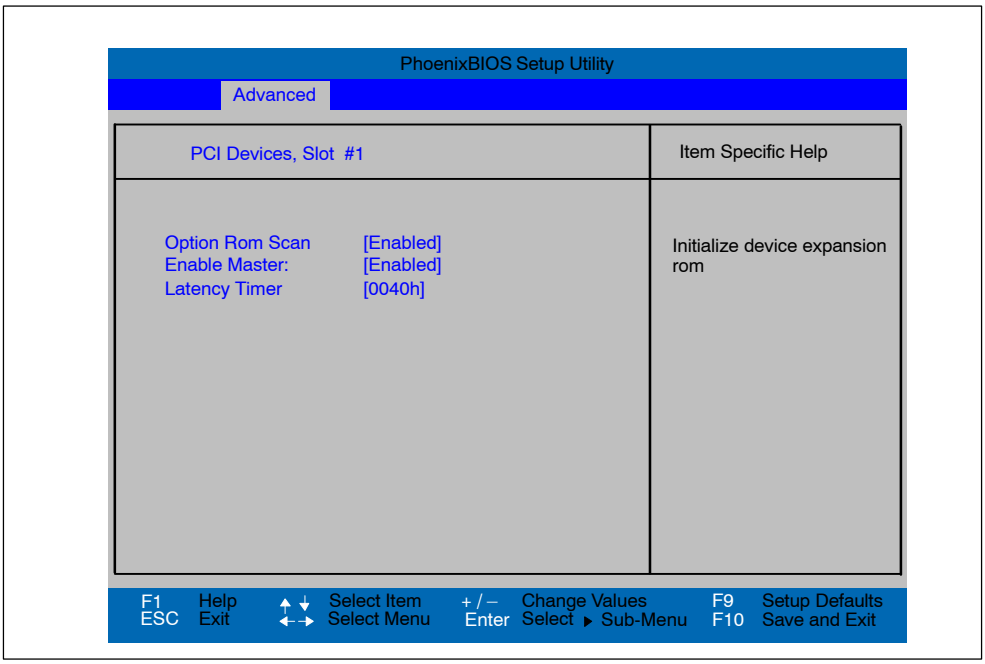


Figure 5-12 ”PCI Devices, Slot #1” Submenu

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

Submenu “PCI/PNP ISA IRQ Resource Exclusion”

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

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

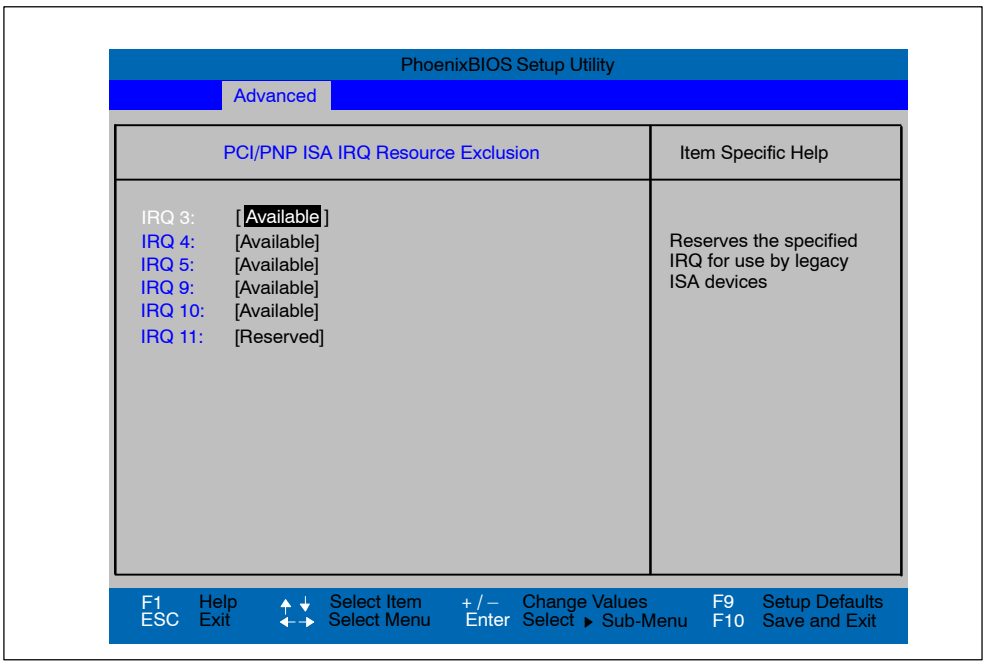


Figure 5-13 ”PCI / PNP ISA IRQ Resource Exclusion” Submenu

“PCI IRQ line” Field

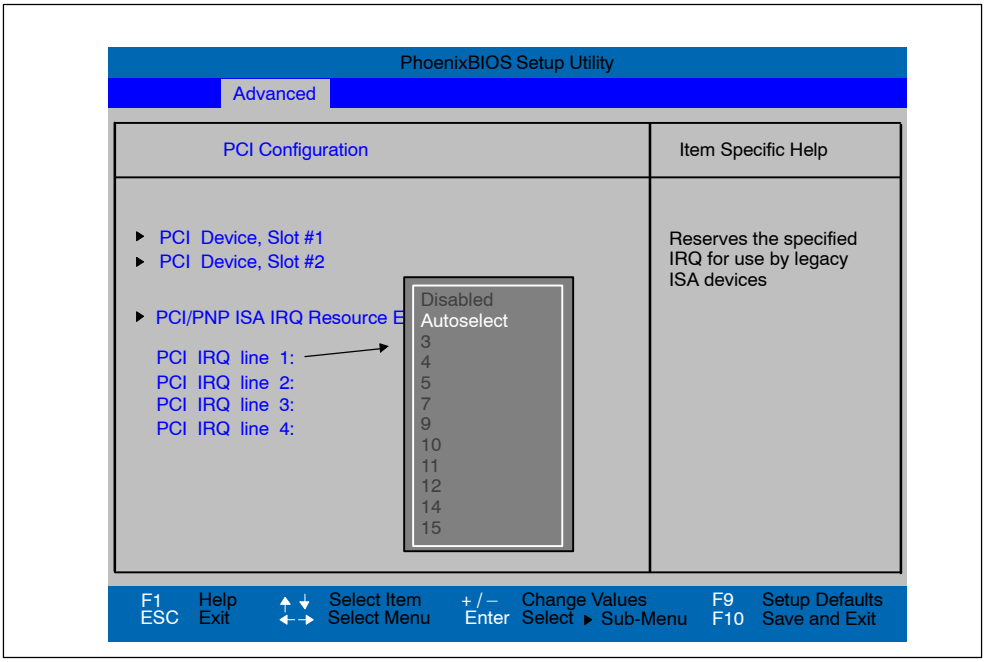


Figure 5-14 ”PCI Configuration” Submenu

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

Submenu “Video Adapter Settings”

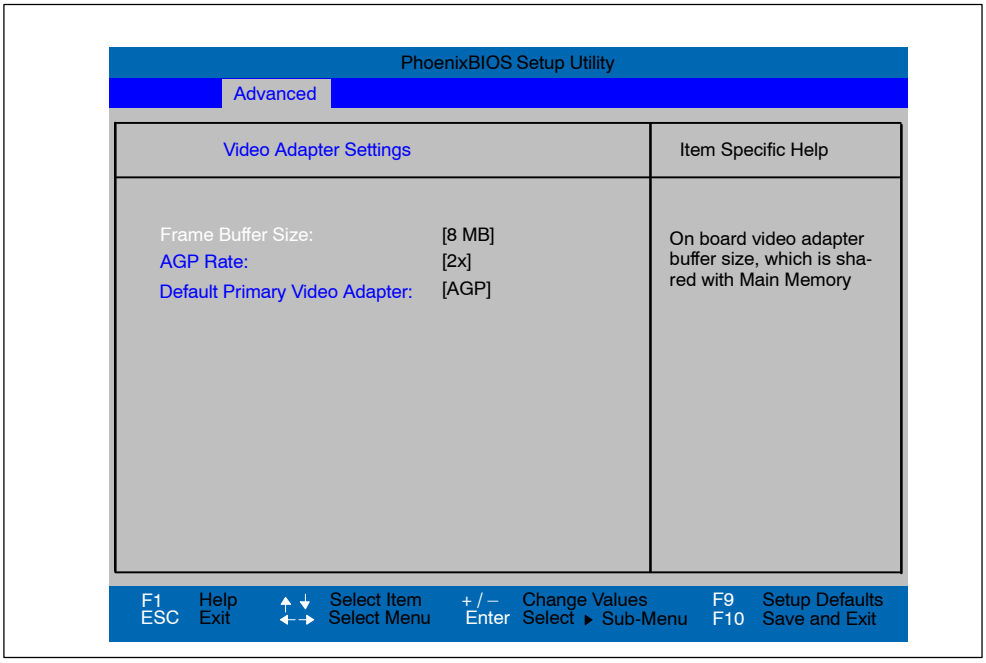


Figure 5-15 Submenu”Video Adapter Settings”

Frame Buffer Size	[8] [16] [32]	Specifies the size of the graphic memory used Onboard graphic card. This range is in the Main memory of the system.
AGP Rate	[1x] [2x] [4x]	Specifies the AGP transfer speed to the Onboard graphic card.
Default Primary Video Adapter	[AGP] [PCI]	The Onboard video graphic card is used as a primary display unit. A PCI graphic card may be used as a primary display device. This input is ignored if no additional graphic card is inserted.

5.1.3 The Security Menu

Summary

You can only edit the fields enclosed in square brackets. You can assign two passwords to protect your PC from unauthorized use. With the supervisor password, the setup access can be restricted or denied to normal users.

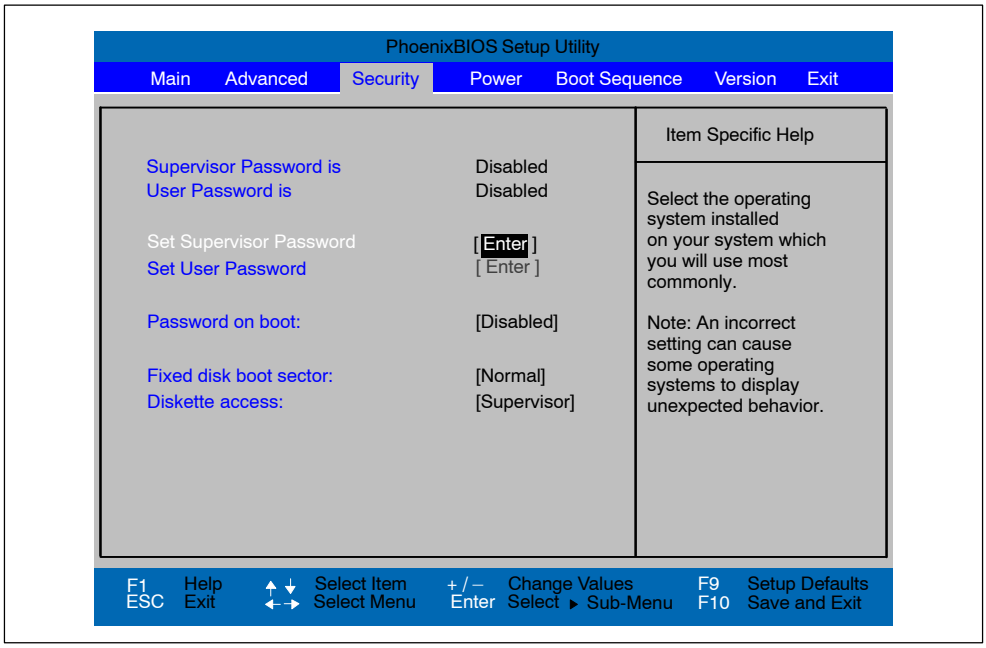


Figure 5-16 ”Security” Menu

Supervisor Password is	[Disabled]	Password not set. All setup entries can be processed without a password.
	[Enabled]	Passwort is enabled. The BIOS setup can only be processed after entering a password. This password has a higher priority than a User Password.
	The input field automatically changes from [Disabled] to [Enabled] when the password is entered.	
User Password is	[Disabled]	No User Password is assigned. If a Supervisor Password is assigned, only the Supervisor can operate the setup.
	[Enabled]	User Password is active. A user is thus given the right to process some setup fields.
	The input field automatically changes from [Disabled] to [Enabled] when the password is entered.	
Set User Password	This field opens the dialog box for entering a password. Once it has been entered correctly, the user password can be changed or deleted by pressing ”Return” and thus deactivated.	
Password on boot	[Disabled]	No password required for system boot.
	[Enabled]	Supervisor or user password must be entered for system boot.

Fixed disk boot Sector	[Normal]	All types of hard-disk access are permitted.
	[Write protect]	No operating system can be installed. This is a way of protecting against boot viruses.
Diskette access	This mode of protection is not active unless ”Password on boot ” is set to [enabled].	
	[Supervisor]	Diskette access is not possible unless the supervisor password was entered during system boot.
	[User]	Diskette access is not possible unless the user password was entered during system boot. **Note:** This function can not be used under WIndows NT/2000, since this operating system does not access the diskette via BIOS routines. Please use the Windows NT/2000 system programs for this purpose.

5.1.4 The Power Menu

Summary

This menu has the following structure.

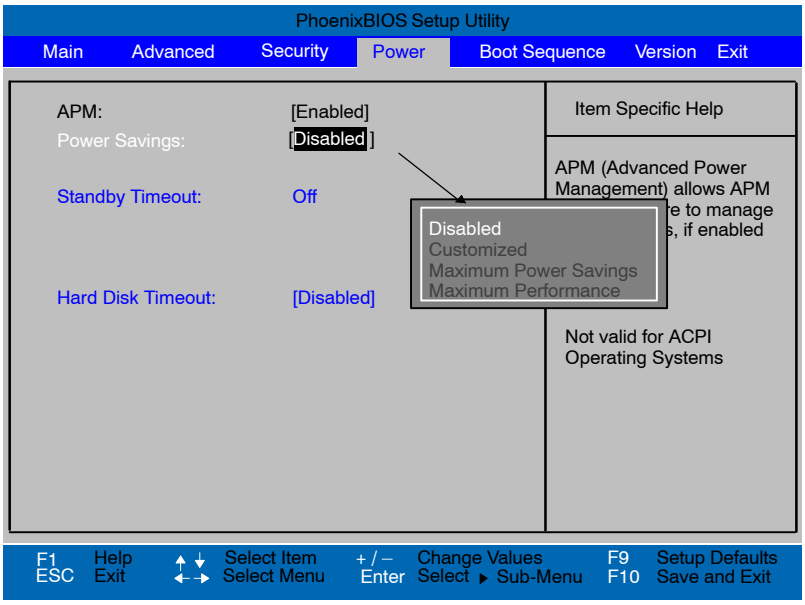


Figure 5-17 “Power” Menu

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

APM (Advanced Power Management)	[Enabled] [Disabled]	The operating system can shut down system resources when they are not needed. The operating system is denied APM access.
Power Savings	[Disabled]	No power-saving functions[Customize, Maximum Power Savings, Maximum Performance]
		User-selectable and preset power saving functions for maximum and minimum power saving. You can set the parameters for Standby/Suspend Timeouts and Fixed Disk Timeout or they set automatically to their defaults.
Standby Timeout	[Off] [30 seconds or 1, 2, 4, 8, 12, 16]	No standby mode ...minutes after your PC enters standby mode.
Hard Disk Timeout	[Disabled] [10, 15, 30, 60]	The hard disk does not shut down. Time since the last hard-disk access, the hard disk is shut down. The next time it is accessed, the hard disk starts spinning again after a brief delay.

5.1.5 The Boot Sequence Menu

Summary

This menu allows you to prioritize the boot devices.

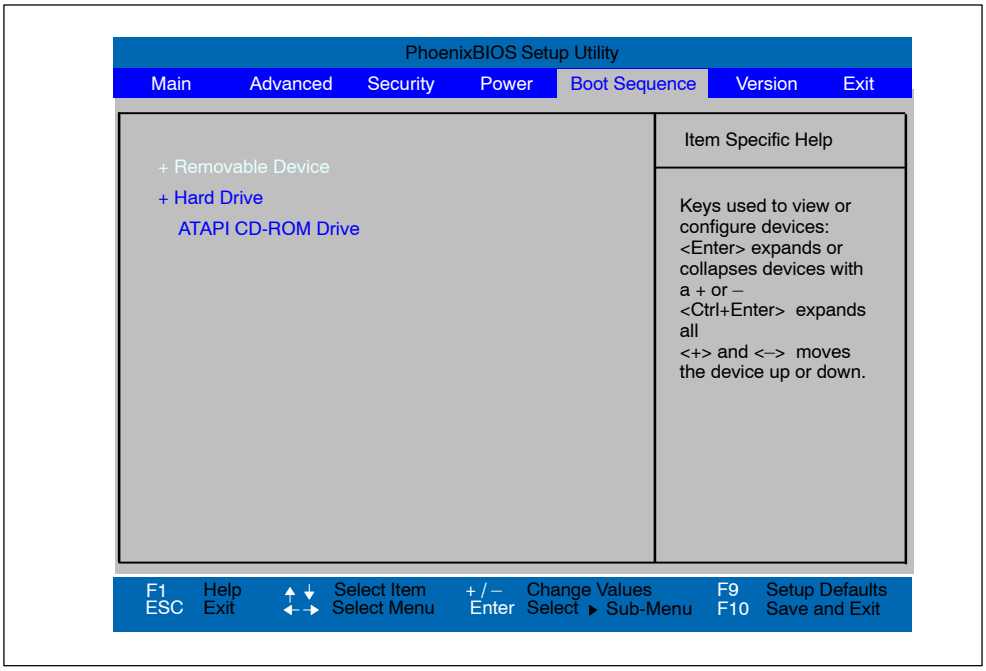


Figure 5-18 “Boot Sequence” Menu

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

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

Note

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

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

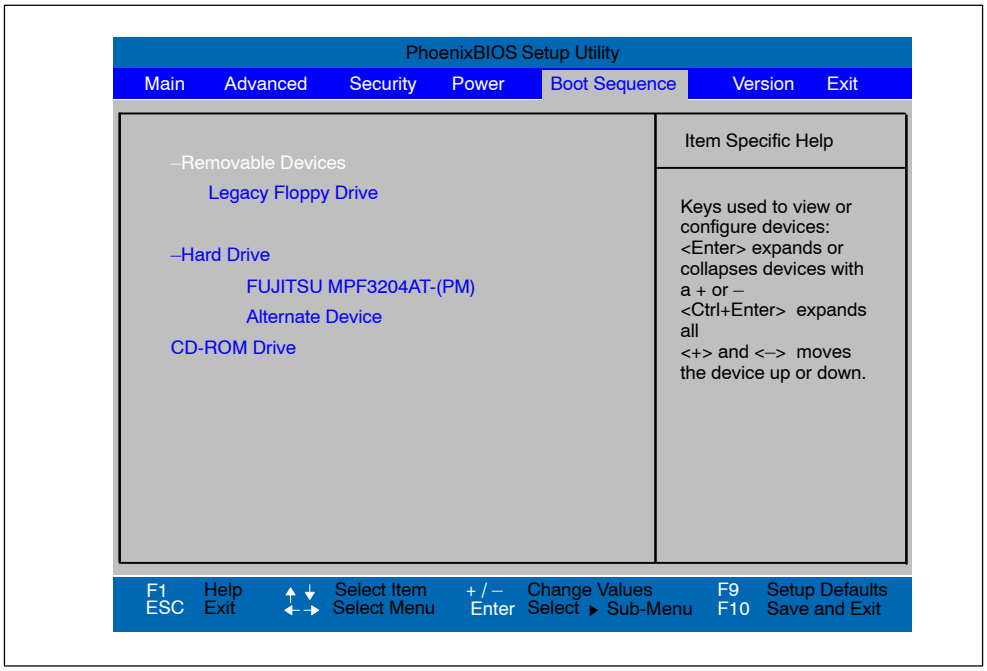


Figure 5-19 “Boot Sequence” Menu (Example)

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

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

5.1.6 The Version Menu

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

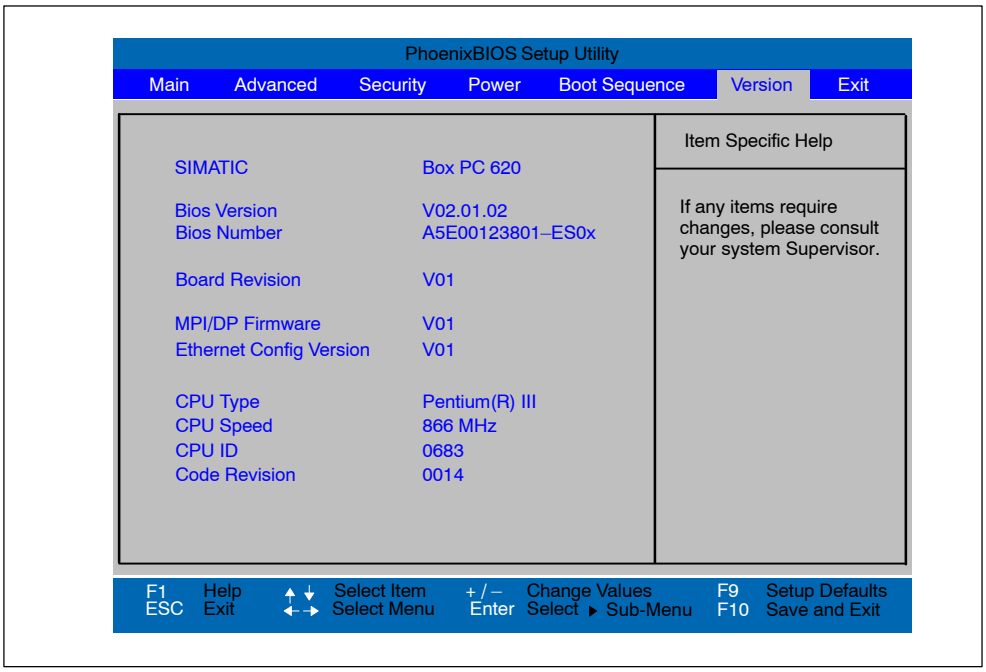


Figure 5-20 “Version” Menu

5.1.7 The Exit Menu

The Exit Menu

The setup program is always terminated using this menu.

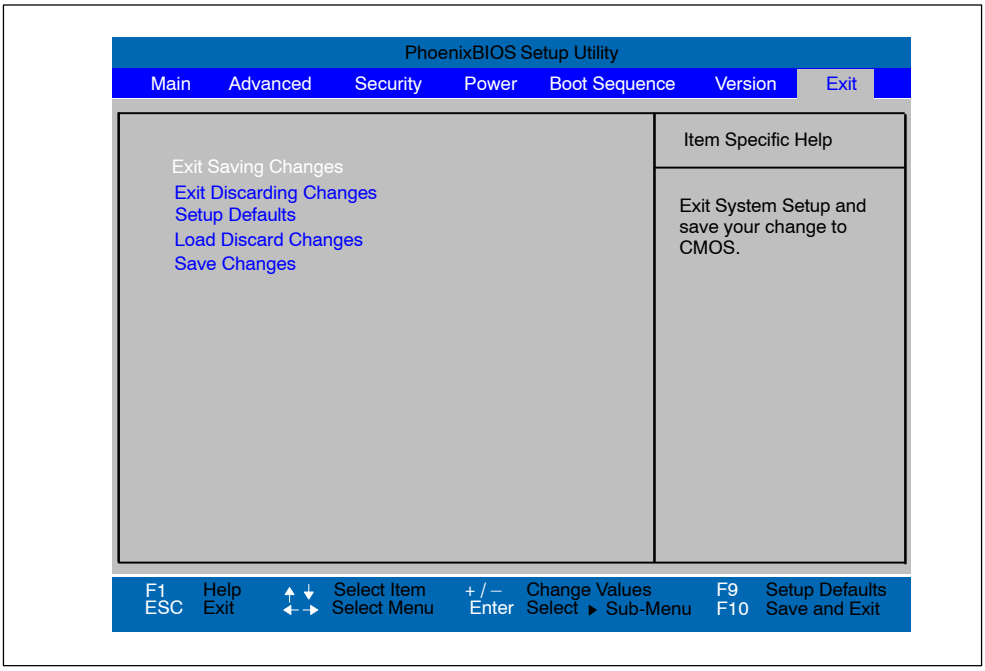


Figure 5-21 Menü “Exit”

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

5.1.8 Default Setup Settings

Documenting Your Device Configuration

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

Note

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

Systemparameter	Default Settings	YourEntries
Main		
System Time	hh:mm:ss	
System Date	MM/TT/JJJJ	
Diskette A	1,44 MB, 3 1/2” bei LS 240: Disabled	
Primary Master	C: 20496 MB	
Primary Slave	None	
Secondary Master	CD−ROM	
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 Adress	08000624xxxx	
LAN remote boot	Disabled	
Cardbus/PCMCIA Slot	Enabled	
SafeCard Functions	Enabled	
Legacy USB Support	Disabled	

Systemparameter	Default Settings	YourEntries
Fan Control	Enabled	
CRT/LCD selection	SIMULTAN	
LCD Screensize	Expanded	
DSTN Contrast	154	
PS2 Mouse	Enabled	
Advanced		
COM/LPT Configuration		
Internal COM1	Enabled	
Base I/O address	3F8	
Interupt	IRQ4	
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 (nur bei ECP)	DMA 3	
PCI-Configuration		
PCI Device Slot 1		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI Device Slot 2		
Option ROM Scan	Enabled	
Enable Master	Enabled	
Latency timer	0040 h	
PCI/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	Both	
Large Disk Access Mode	DOS	
Hard Disk Pre-Delay	Disabled	
Memory Gap at 15 Mbyte	Disabled	

Systemparameter	Default Settings	YourEntries
Video Adapter Settings		
Frame Buffer Size	8 MB	
AGP Rate	2x	
Default Primary Video Adapter	AGP	
Security		
Supervisor Password Is	Disabled	
User Password Is	Disabled	
Set Supervisor Password	Enter	
Set User Password	Enter	
Password on boot	Disabled	
Fixed disk boot sector	Normal	
Diskette Access	Supervisor	
Power		
APM	Enabled	
Power Savings	Disabled	
Standby 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	
Board Revision	V01	
BIOS Number	A5E16562-ESxx	
MPI/DP Firmware	V01	
Ethernet Config Version	V01	
CPU Type	Pentium III	
CPU Speed	866 MHz	
Code Revision	001A	

5.2 Configuring the PC Card

You can obtain the software you require for using PC cards under MS DOS, such as

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

from the nearest Siemens sales office or representative.

Your PC comes supplied with Windows 98 / NT4 / 2000 already installed; this supports the PC Card interface.

After configuration, the computer must be rebooted.

Error Diagnosis

6

Overview of Chapter

6.1 Problems When Using Modules from Other Manufacturers

Error Display

The PC crashes during power up.

Cause

The following causes are possible:

- Double assignment of I/O addresses
- Double assignment of hardware interrupts and/or DMA channels
- Signal frequencies or signal levels are not met
- Different connector assignments

Remedy

Check your computer configuration:

- If the computer configuration is the same as when your PC was delivered, please contact your technical support team (Chapter 8).
- If the computer configuration has changed, re-establish the configuration you had when your PC was delivered. Remove any modules from other manufacturers. Perform a complete restart on your PC.
  - If the PC still crashes, you must contact your technical support team.
  - If the error no longer occurs, the module you used from another manufacturer was the cause of the fault. Replace this module with a Siemens module, or contact the module supplier.

6.2 The Monitor Remains Dark

Cause and Remedy

The following causes are possible:

The monitor has been switched off.

- Switch on the monitor.

The monitor is in “powersave” mode.

- Press any key on the keyboard.

The brightness button has been set to dark.

- Set the screen’s brightness button to obtain more light. Refer to the operator’s guide for the monitor for more detailed information.

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

- Switch off the monitor and the system unit.
- Check whether the power supply cable has been connected correctly to the monitor and to the system unit or to the grounding outlet.
- Check whether the monitor cable has been connected correctly to the system unit and to the screen (if a connector is present).
- Switch on the monitor and the system unit.

Note

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

6.3 The Screen Display Does not Appear or Drifts

Cause and Remedy

Either the incorrect line frequency and/or the incorrect resolution is set for the screen or for the user program.

- Stop the user program. If the error still occurs after you have ended the program, switch off the monitor. After at least three seconds, switch on the monitor again.
- Adjust the relevant entries for the monitor in the *CONFIG.SYS* file (on the hard drive).
- Correct the settings for the monitor and graphics in your user program.
- Select the correct screen driver for your user program.

6.4 No Mouse Pointer Appears on the Screen

Cause and Remedy

The mouse pointer may not appear for the following reasons:

The mouse driver is not loaded

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

The mouse is not connected

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

Note

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

6.5 The Clock Time and/or the Date in Your PC Is Incorrect

Remedy

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

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

Note

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

6.6 USB-Device does not function

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

6.7 An Error Message Appears on the Screen

Error Messages

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

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

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

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

6.8 Diagnostic Messages (Port 80)

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

In addition, the individual self-test steps are output at I/O port 80h.

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	BBB	BBB	B	Beeps
2		8		Hexadecimal code
Check system memory				Meaning

Special codes

In addition to the subsequent beep codes listed, there are the following special codes:

3x short	If the INSERT button is pressed during system start: the Onboard Device Installation is skipped. The Onboard Graphics is used as standard output.
1x long 8x short	Error occurs when reading the MPI system information: please turn to your customer support.
4x short	MPI EPROM is programmed for the first time.
1x long 5 x short	Ethernet Error: please turn to your customer support.

The POST codes in order of occurrence:

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

Display (hex)	Meaning	Description
49	TP_PCI_INIT	Initialize the PCI 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 circuit 8742
52	TP_KB_TEST	Keyboard available?
54	TP_KEY_CLICK	Switch the keyboard click on/off
76	TP_KEYBOARD	Check the keyboard
58	TP_HOT_INT	Test for unexpected interrupts
4B	TP_QUIETBOOT_START	Switch off any boot messages
4E	TP_CR_DISPLAY	Display the copyright notice
50	TP_CPU_DISPLAY	Display the CPU type
5A	TP_DISPLAY_F2	Display the F2 message for “SETUP”
5B	TP_CPU_CACHE_OFF	Switch off the cache if applicable (SETUP setting)
5C	TP_MEMORY_TEST	Test the system memory
60	TP_EXT_MEMORY	Test the extended memory
62	TP_EXT_ADDR	Test the A20 address line
64	TP_USERPATCH1	Area for own initializations
66	TP_CACHE_ADVNCD	Determine and enable the cache size
68	TP_CACHE_CONFIG	Configure and test the cache
6A	TP_DISP_CACHE	Display the cache configuration
6C	TP_DISP_SHADOWS	Configuration and size of the shadow Display RAM
6E	TP_DISP_NONDISP	Display 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 circuits
88	TP_BIOS_INIT	Various initialisations
8A	TP_INIT_EXT_BDA	Initialize the external BIOS data area
85	TP_PCI_PCC	Determine the PCI circuits
82	TP_RS232	Determine the serial interfaces
84	TP_LPT	Determine the parallel interface

Display (hex)	Meaning	Description
86	TP_IO_AFTER	Re-enable the IO circuits
83	TP_FDISK_CFG_IDE_CTRLR	Configure the IDE controller
89	TP_ENABLE_NMI	Enable the NMI
8C	TP_FLOPPY	Initialize the floppy controller
90	TP_FDISK	Initialize the hard disk controller
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 printed?
AC	TP_SETUP_CHEK	Output any F1/F2 message
AE	TP_CLEAR_BOOT	Cancel the self-test flag
B0	TP_ERROR_CHECK	Check for any possible errors
B2	TP_POST_DONE	End of the self-test
BE	TP_CLEAR_SCREEN	Clear the screen
B6	TP_PASSWORD	Password query (option)
BC	TP_PARITY	Cancel the parity memory bit
BD	TP_BOOT_MENU	Display the boot menu (option)
B9	TP_PREPARE_BOOT	Prepare the boot
C0	TP_INT19	Boot via Interrupt 19
00		Message after startup is complete

Hardware Information

7

Overview of Chapter

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7.1 Current Requirement of the Components (Maximum Values)

Basic System with Power Supply Unit 85W

Component	Voltage				
	+5V	**+3.3V**	**+12V**	**–5V**	**–12V**
Pentium III Motherboard	0.5 A	2.5 A	0.1 A		0.02 A
Processor Pentium III 1260	5 A				
Floppy disk drive / LS 240	0.56 A				
Hard disk	0.4 A		0.5 A		
CD RW/DVD drive	0.92 A				
Fan			0.2 A		
Sum (basic configuration)	**7.38 A**	**2.5 A**	**0.8 A**	**0 A**	**0.02 A**
ISA/PCI slots (Sum)	3 A		0.6 A	0.1 A	0.1 A
PC-Card slot	0.5 [1]	0.6 A [1]	0.12 A		
Sum (max. for maximum configuration)	**10 A** [2]	**4.2 A**	**1.7 A** [3]	**0.1 A**	**0.2 A**
Total power consumption	**85W**				

Basic System with Power Supply Unit 105W

Component	Voltage				
	+5V	**+3.3V**	**+12V**	**–5V**	**–12V**
Pentium III Motherboard	0.5 A	2.5 A	0.1 A		0.02 A
Processor Pentium III 1260	5 A				
Floppy disk drive / LS 240	0.56 A				
Hard disk	0.4 A		0.5 A		
CD RW/DVD drive	0.92 A				
Fan			0.2 A		
Sum (basic configuration)	**7.38 A**	**2.5 A**	**0.8 A**	**0 A**	**0.02 A**
ISA/PCI slots (Sum)	3 A	4 A	0.6 A	0.1 A	0.1 A
PC-Card slot	0.5 [1]	0.6 A [1]	0.12 A		
Sum (max. for maximum configuration)	**13.5 A** [2]	**8.5 A**	**2.5 A** [3]	**0.1 A**	**0.3 A**
Total power consumption	**105W**				

1 Alternative 5V or 3.3V
2 11A, if the total power consumption is not exceeded
3 3A, if the total power consumption is not exceeded
4 15A for 5 sec.
5 4A for 5 sec
6 are generated on the Bus board from -12V

7.2 Overview of the Components and Ports

Component/Port	Description	Parameters
Chipset	VIA PN133T	• SDRAM
BIOS	Update via software	• 512K in 4 pages
CPU	Pentium III / Celeron (type FC-PGA370)	• Upgradeable • Multimedia support • On Board L2-Cache with 128 k/256 k /512 K
Memory	DIMM modules up to max. 256MB/DIMM	• Data capacity of 64 bits + ECC • Modules with ECC possible • 3.3 V • SDRAM to PC100 specification • up to 128MBit chip size on the module • 66/100MHz bus speed • 2 DIMMs can be used • easy to exchange • variable from 64-512MB/DIMM
Graphics	UXGA LCD Controller on the AG Bus is integrated Chip set (S3)	• up to 32 Mbytes of SDRAM are part of the main memory and can be configured (8/16/32MB) • CRT: up to1600x1200/85Hz 65536 colors with PC133 memory modules up to1280x1024/85Hz 65536 colors with PC100 memory modules
Hard Disk	ATA-33 mode	• Ultra DMA capable
CD ROM	Master on secondary EIDE port	• 24 speed
CD RW/DVD	Master on secondary EIDE port	Multi Spin Writer Drive • Read: CD ROM, CD R 14-32 times, CD RW 8-20 times Speed, 8 times • Write: CD R 12 times, CD RW 10 times Speed suppors recording: • Disc at once, Track at once, Session at once, Packet writing
Floppy	Notebook port for 34 pin flat cable	• 1.44 MB
LS240	Slave on secondary EIDE port	• 1.44MB standard floppy disks • 120MB/240MB SuperDisk
Keyboard	Port for PS2 keyboard	• Standard
Mouse	PS2 mouse port	• Standard
Serial	COM1/25 pins COM2/9 pins.	• TTY *2 and V24 • Standard
TTY *2	Communication with SIMATIC S5-CPUs	• Range up to 1000 m

Component/Port	Description	Parameters
Parallel	Standard, bidirectional, EPP and ECP mode	• 25 pin subminiature Cannon connector
DP12 *2	Communication port SIMATIC S7	• potentially isolated DP12 *1 (CP 5611 compatible) • 12MBaud
USB	Universal Serial Bus	• three high current (500mA) USB ports (2x external and 1x internal)
Ethernet	10BaseT/100Base-TX (Intel 82559)	• 10/100 Mbps, potentially isolated *1

*1 Electrically isolated in a safety extra-low voltage circuit (SELV)
*2 Optional product feature

7.3 System Resources

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

Windows 98

Start > Programs > Accessories > System Tools > System Information

Windows 2000

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

Windows NT 4.0

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

7.4 Monitoring functions

The LEDs described in the following passages exist only for specific device models. The basic model of the Box PC 620 has no LEDs. The hardware signals are described in Section 7.5.2.

7.4.1 Overview

Function

The following individual functions are implemented:

- Temperature monitoring and excess/insufficient temperature indication
- Watchdog
- Monitoring the processor fan

Messages from the monitoring modules can be transferred to applications.

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

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

7.4.2 Signals on the Front Interface

The meaning of the indicators is as follows:

LED	OFF	GREEN	RED
Watchdog	Watchdog not active	Watchdog active	Watchdog executed
Temp	Inside temperature normal		Inside temperature outside the permissible range.

7.4.3 Temperature Monitoring/Indication

Temperature Monitoring

The temperature is measured by means of three temperature sensors. One sensor monitors the processor temperature, the second the temperature in the area of the memory module and the expansion cards and the third the temperature in the area of the power supply unit.

- If the temperature near the power supply exceeds 45°C (fixed value), the fan is set to maximum rpms. To activate this feature, the setting “Fan Control” has to be turned on in the Setup menu (Sec. 6.1.4).
- If the temperature exceeds one of the three temperature values of the set thresholds, a temperature error is registered with the following effects:

Reaction	Option
Temp LED to red	always
Fan goes to maximum rpms.	always
SOM application is displayed	always

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

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

The temperature error remains saved until the temperature thresholds are again exceeded and are reset by one of the following measures:

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

7.4.4 Watchdog (WD)

Function

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

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

WD Reactions

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

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

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

WD Monitoring Times TWD

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

Note

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

7.4.5 Fan Monitoring

Processor fan operation is monitored. If the fan should fail, the following reactions are triggered:

Reaction	Option
SOM application is displayed	always

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

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

7.5 Ports

The following ports are available on the motherboard of the Box PC 620:

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

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

7.5.1 External Ports

Port	Position	Connector	Description
COM1	external	X9	3F8h-3FFh, can be disabled IRQ4, edge-triggered 25 pin, socket, V.24/V.28 and 20mA (TTY potentially isolated)
COM2	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	X6	060h-064h IRQ12, edge-triggered 6 pin, mini DIN socket
PS/2 keyboard	external	X6	060h-064h IRQ1, edge-triggered 6 pin, mini DIN socket
USB	external	X40	First USB channel, additional internal second USB channel for front interface
MPI /DP12	external	X600	can be disabled IRQ5, edge-triggered 9 pin, standard socket, potentially isolated port
Ethernet	external	X500	RJ45
VGA	external	X11	3B0h-3BFh, 3C0h-3CFh, 3D0h-3DFh, can be disabled IRQ9, edge-triggered 15 pin, standard socket
PCCard/CardBus port	external	X700	3E0h-3E1h 100 pin SMD plinth

Serial Port COM1 (PLC/V.24/Modem) *

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

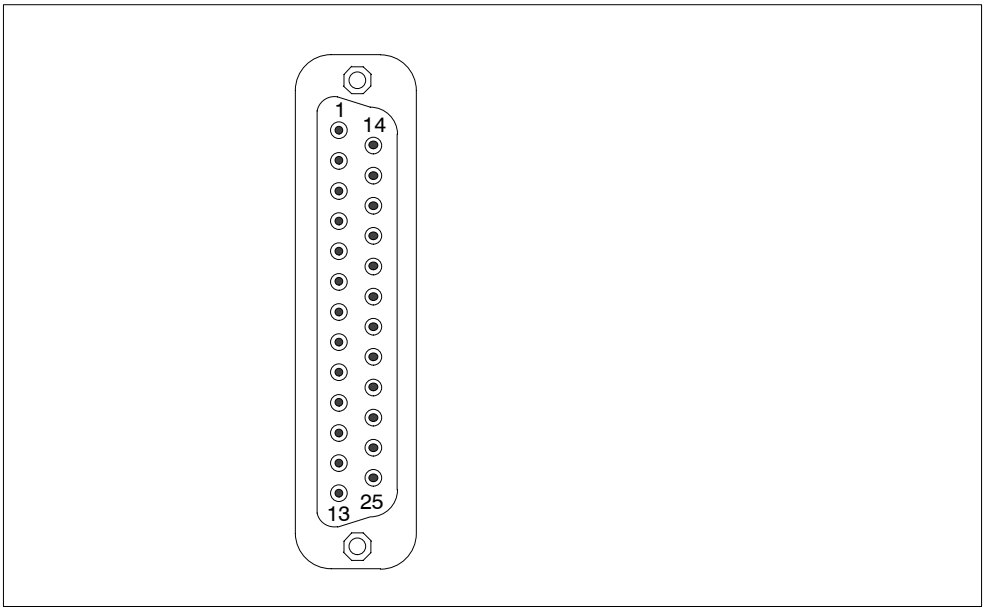


Figure 7-1 COM 1 Serial Port (Socket Connector)

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

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

Gender Changer for COM1

You can convert the COM1/V24 / AG port of the SIMATIC PC family into the usual 25 pin male connector by means of the enclosed gender changer (25 pin / 25 pin). For this, you only have to plug the gender changer onto the COM1 socket and secure it with the two hexagon head screws.

The V24 and TTY interfaces for COM1 can be alternately used. The factory set default value is V24 operation. Switching from V24 to TTY operation is described in Section 5.1.2.

Serial Port COM2 (V24/Mouse)

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

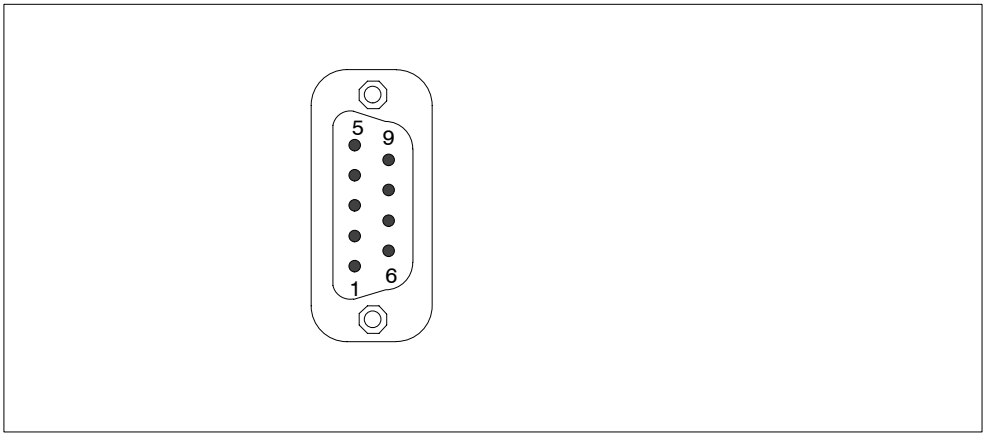


Figure 7-2 Serial Port COM 2 (Connector)

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

Parallel Port LPT1

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

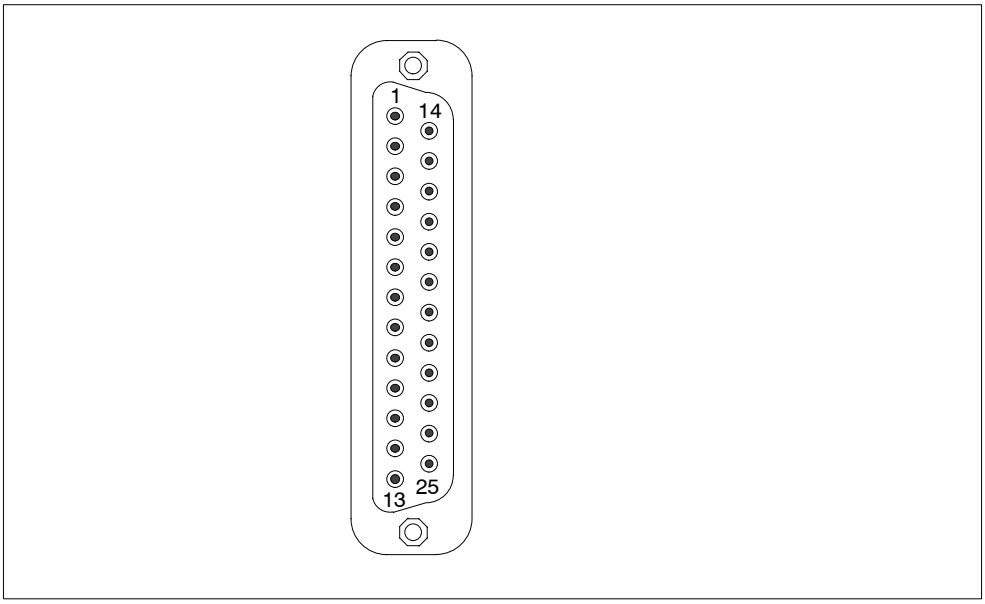
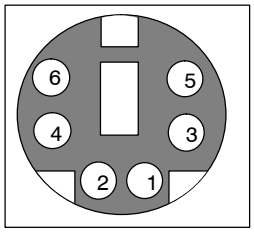


Figure 7-3 Parallel Port LPT 1 (Socket)

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

PS/2 Mouse Port

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



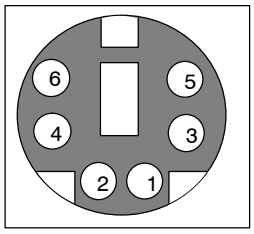
View of socket connector

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

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

PS/2 Keyboard

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



View onto the socket

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

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

USB Port

The Universal Serial Bus ports have the following pinout:

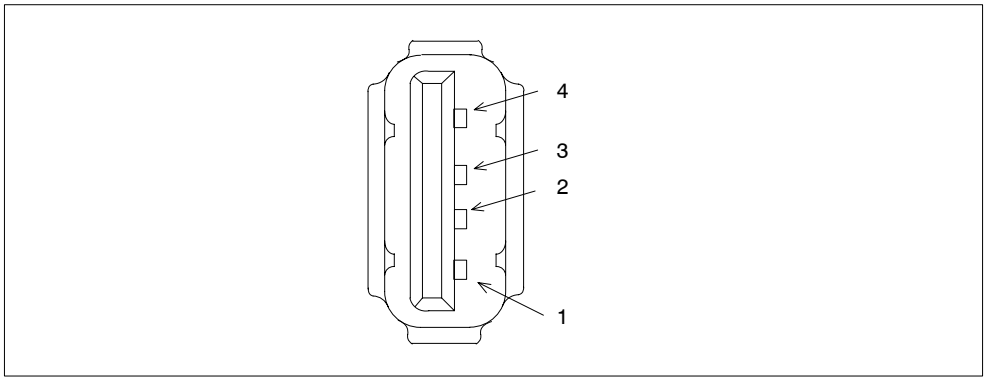


Figure 7-6 USB port

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

The connector is of type A.

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

PROFIBUS/MPI Socket Connector *

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

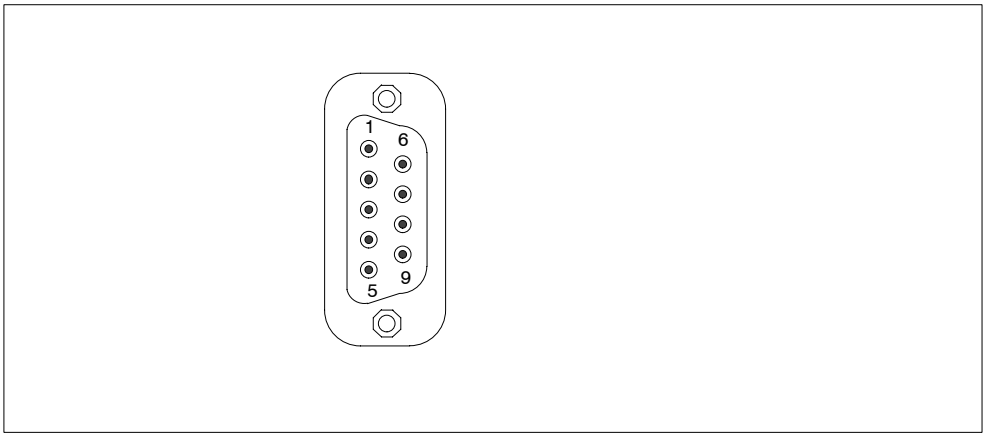


Figure 7-7 PROFIBUS/MPI Socket Connector

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

* Optional product feature

Ethernet RJ45 Connection

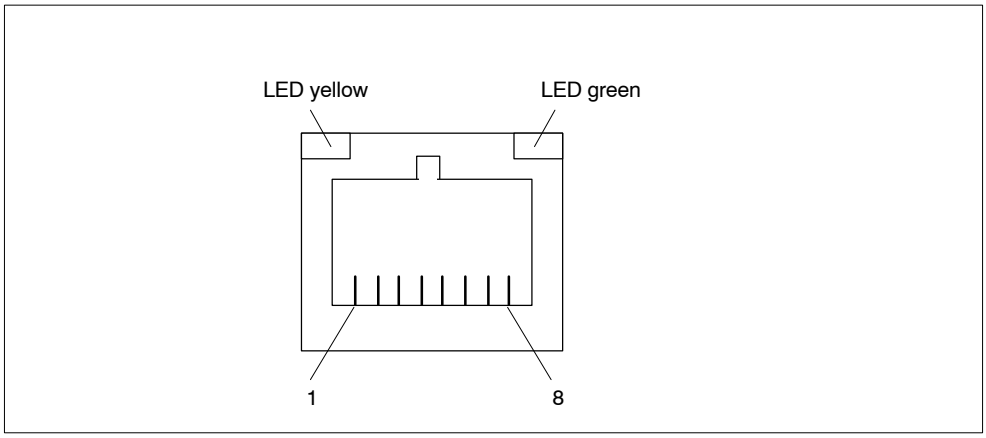


Figure 7-8 Ethernet port

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

* is not necessary for data transfer

VGA Socket Connector

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

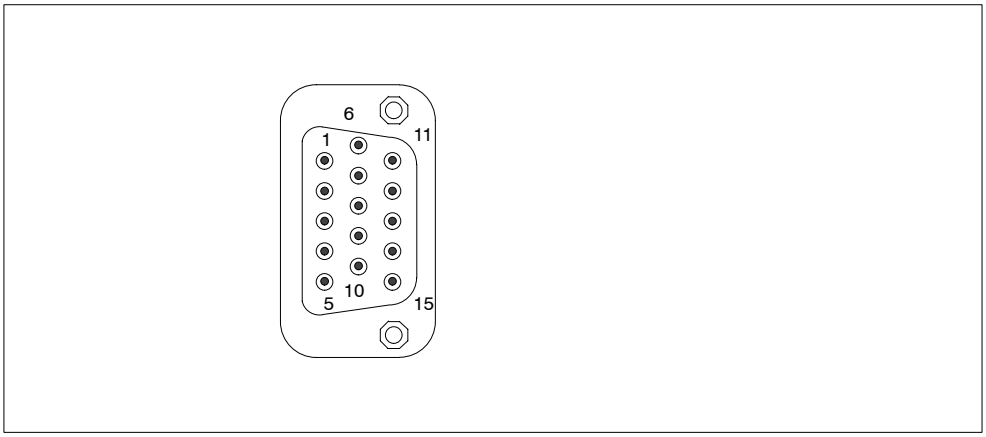


Figure 7-9 VGA Socket Connector

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

7.5.2 Assignment of the Front Ports on the Motherboard

Port	Position	Connector	Description
Display (CMOS)	Internal	X420	Connection of LC displays with CMOS port
Display (LVDS)	Internal	X400	Connection of LC displays with single chip LVDS port
I/O Front	Internal	X44	Port for front Front I/O
COM2	Internal	X26	Internal COM2 port

Display Port (CMOS, X420)

D-STN and TFT displays with 5V CMOS port and VGA resolution (640x480) can be connected to this port. The display is selected and the D-STN/TFT signals allocated automatically in accordance with the coding of the Display Select inputs. The maximum cable length is 50 cm with 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	Lower 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)

TFT displays with an LVDS port can be connected to this port. The connection of 18 bit displays up to a resolution of 1024x768 pixels is possible. The permissible display clock rate is 20MHz to 66Mhz. The display is selected automatically in accordance with the coding of the Select Inputs display. The display supply voltages (3.3V and 5V) are connected via the graphic controller, dependent on the-requirements of the connected displays. The maximum cable length is 50cm with a transmission rate of 455MHz. Special cable properties are to be considered for the pair of differential cables in accordance with the LVDS specification.

Pin No.	Designation	Description	Input / Output
1	P5V_D_fused	+5V (fused) VCC display	Output
2	P5V_D_fused	+5V (fused) VCC display	Output
3	RXIN0–	LVDS output signal bit 0 (-)	Output
4	RXIN0+	LVDS output signal bit 0 (+)	Output
5	P3V3_D_fused	+3.3V (fused) VCC display	Output
6	P3V3_D_fused	+3.3V (fused) VCC display	Output
7	RXIN1–	LVDS output signal bit 1 (-)	Output
8	RXIN1+	LVDS output signal bit 1 (+)	Output
9	GND	Ground	-
10	GND	Ground	-
11	RXIN2-	LVDS output signal bit 2 (-)	Output
12	RXIN2+	LVDS output signal bit 2 (+)	Output
13	GND	Ground	-
14	GND	Ground	-
15	RXCLKIN-	LVDS clock pulse (-)	Output
16	RXCLKIN+	LVDS clock pulse (+)	Output
17	GND	Ground	-
18	GND	Ground	-
19	Reserved		
20	Reserved		

Allocation of the Display to Display Select Pins

The automatic configuration of one of 15 possible displays is effected via the Display Select Inputs. The Display Select inputs are fitted with Pull-Up resistors, i.e. if these inputs are not connected, they have a high level. In order to generate a low level, the input must be connected to GND.

Pin No.	LCD_SEL3	LCD_SEL2	LCD_SEL1	LCD_SEL0	Display type
0	low	low	low	low	reserved
1	low	low	low	high	reserved
2	low	low	high	low	reserved
3	low	low	high	high	reserved
4	low	high	low	low	640 x 480 (VGA), TFT, 18 bits
5	low	high	low	high	reserved
6	low	high	high	low	1024 x 768 (XGA), TFT, 18 bits
7	low	high	high	high	800 x 600 (SVGA), TFT, 18 bits
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 in addition to the Display and COM2 port which are necessary for the connection of front control elements are applied to this port. The maximum cable length is 50cm with a USB data transfer rate of 12MBaud.

Pin No.	Designation	Description	Input / Output
1	GND	Ground	-
2	P12V	Power supply for inverter	Output
3	BL_ON	Backlight on (5V = On)	Output
4	P5V_fused	+5V (fused)	Output
5	GND	Ground	-
6	P3V3_fused	+3.3V (fused)	Output
7	K_CLK	Keyboard clock	Output
8	K_DATA	Keyboard data	Input / Output
9	M_CLK	Mouse clock	Output
10	M_DATA	Mouse DATA	Input / Output
11	P5V_fused	+5V (fused)	Output
12	USB_D1M	USB data- channel 1	Input / Output
13	USB_D1P	USB data+ channel 1	Input / Output
14	GND	Ground	-
15	LCD_SEL0	Display type-select signal 0	Input
16	LCD_SEL1	Display type-select signal 1	Input
17	LCD_SEL2	Display type-select signal 2	Input
18	LCD_SEL3	Display type-select signal 3	Input
19	RESET_N	Reset signal (low active)	Input
20	SPEAKER	Connection for system speaker	Output
21	HD_LED	HD LED, anode with 1kΩ in series on motherboard	Output
22	DP_LED	MPI/DP LED, anode above 1kΩ in series on motherboard	Output
23	Ethernet_LED	Ethernet LED, anode above 1kΩ in series on motherboard	Output
24	TEMP_ERR	LED temperature error, anode with 1kΩ in series on motherboard	Output
25	RUN_R	LED watchDog error, anode with 1kΩ in series on motherboard	Output
26	RUN_G	LED watchdog o.k., anode with 1kΩ in series on motherboard	Output

Internal Serial Port COM2 (V.24)

This port is connected in parallel to the external COM2 port. Both ports can therefore only be used alternatively. The assignment is executed in such a way that a 1:1 connection to a 9 pin subminiature Cannon socket can be made when using insulation piercing connecting devices. The maximum cable length is 100cm with a data transfer rate of 9.6 Kbps.

Pin No.	Designation	Description	Input / Output
1	DCD	Receiving signal level	Imput
2	DSR	Readiness for operation	Input
3	RxD	Received data	Input
4	RTS	Switch on transmitter	Output
5	TxD	Transmitted data	Output
6	CTS	Ready to transmit status	Input
7	DTR	Terminal ready	Input
8	RI	Incoming call	Input
9	GND	Functional ground (reference potential)	-
10	P5V	+5V power supply	Output

7.5.3 Assignment of the Internal Ports on the Motherboard

Port	Position	Connector	Description
Memory	internal	X19, X20	2 SO-DIMM slot, 64Bit
Processor	internal	X1	Socket for MMC2 mobile processor
Bus extender	internal	X10	Socket for bus extender, assigned with ISA and PCI bus signals
Power supply 105W	internal	X13	20 pin connector for DC signals of the power supply unit with 85W
Power supply 85W	internal	X14	40 pin connector for DC signals of the power supply unit with 85W
Floppy	internal	X5	two drives are possible (82078 compatible) 360kB, 720kB, 1.2MB, 1.44MB 3F0h-3F7h, 370h-377h, can be disabled IRQ 6, edge-triggered 26 pin, socket for flex-lead (notebook connection)
3.5” hard disk	internal	X41	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 40 pin, 2.54mm male connector (3.5” HD, primary), a maximum of two drives are operable

2.5” hard disks	internal	X4	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 44 pin, 2mm male connector (2.5” HD, primary), a maximum of two drives are operable
CD ROM	internal	X3	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 44 pin, 2mm male connector (CD ROM, secondary slave with connected LS120, otherwise secondary master), a maximum of one drive is operable
LS240	internal	X31	170h-177h, 1F0h-1F7h, can be disabled IRQ14, IRQ15, edge-triggered 1x41 pin (Hirose DF9-41, LS240, secondary master with connected drive), a maximum of one drive is operable
TTY transmitter/ receiver*	internal	X70/71	Connection for TTY transmitter/receiver hybrid (physical interface)
PS connection for 3.5” hard disk	internal	X25	Power supply for 3.5” hard disk, 4 pin, male connector
PS connection for CPU fan	internal	X29	Power supply for CPU fan, 3 pin, male connector
PS connection for device fan	internal	X28	Power supply for device fan, 2 pin, male connector
Backup battery	internal	X24	Power supply for device fan, 2 pin, male connector

* Optional product feature

Port to the Bus Unit

The Box PC has a bus unit with a PCI slot and a shared ISA /PCI slot. Expansion cards can be installed to ISA specification (Rev. 3.1) and PCI specification (Rev. 2.0) with a maximum length of 265mm (175 mm for shared ISA/PCI modules). All the PCI slots can be used as masters. Only 5V PCI modules are operable.

The bus unit is executed as a purely passive module, i.e. there are only socket contacts for the expansion cards and any necessary backup capacitors. The power supply to the expansion cards is effected via the connection of the bus unit with the basic board. The -5V voltage is not provided for in the power supply and is produced from the -12V on the bus unit via in-phase voltage control.

DC Port of the Power Supply Unit 85W

The power supply unit has a connector (X2) through which all the signals on the DC side are connected with the motherboard.

Pin No.	Row A	Description	Pin No.	Row B	Description
1	PS_PWROK	Power Good Signal	1	PS_PWROK	Power Good Signal
2	TTY_VCC	Potential–free VCC (15V ± 3V) for TTY port	2	TTY_VCC	Potential–free VCC (15V ± 3V) for TTY port
3	TTY_GND	TTY_GND	3	TTY_GND	TTY_GND
4	PS_NAU_N	Power failure early warning alarm	4	PS_NAU_N	Power failure early warning alarm
5	GND	GND	5	GND	GND
6	P12V	+12V	6	P12V	+12V
7	V_DC	for processor module	7	V_DC	for processor module
8	N12V	-12V	8	N12V	-12V
9	GND	GND	9	GND	GND
10	GND	GND	10	GND	GND
11	P3V3	+3.3V	11	P3V3	+3.3V
12	P3V3	+3.3V	12	P3V3	+3.3V
13	GND	GND	13	GND	GND
14	GND	GND	14	GND	GND
15	GND	GND	15	GND	GND
16	GND	GND	16	GND	GND
17	P5V	+5V	17	P5V	+5V
18	P5V	+5V	18	P5V	+5V
19	P5V	+5V	19	P5V	+5V
20	P5V	+5V	20	P5V	+5V

DC Port of the Power Supply Unit 105W

The power supply unit has a connector (X2) through which all the signals on the DC side are connected with the motherboard.

Pin no.	Designation	Description
1	P5V	+5V
2	P5V	+5V
3	P5V	+5V
4	P5V	+5V
5	P5V	+5V
6	PS_NAU_N	Power failure early warning alarm
7	PS_PWROK	Power Good Signal
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	N12V	–12V
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	P12V	+12V
16	P12V	+12V
17	P3V	+3.3V
18	P3V	+3.3V
19	P3V	+3.3V
20	P3V	+3.3V

Port to the Floppy Disk Drive

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

Pin no.	Designation	Description	Input/Output
1	P5V	+5V	Output
2	INDEX_N	Index hole recognition	Input
3	P5V	+5V	Output
4	DS_N0	Drive 0 selection	Output
5	P5V	+5V	Output
6	DCHG_N	Disk change display	Input
7	n.c.	not connected	-
8	n.c.	not connected	-
9	Reserved	reserved	-
10	MOT_N0	Activate motor 0	Output
11	Reserved	reserved	-
12	DIR_SL_N	Step motor direction	Output
13	n.c.	not connected	-
14	STEP_N	Step motor pulse	
15	GND	Ground	-
16	WR_DAT_N	Write data signal	Output
17	GND	Ground	-
18	WR_GAT_N	Enable data signal	Output
19	Reserved	reserved	-
20	TRACK_N0	Track 0 signal	Input
21	Reserved	reserved	-
22	WR_PRT_N	Write protection signal	Input
23	GND	Ground	-
24	RD_DAT_N	Read Data signal	Input
25	GND	Ground	-
26	SIDE_1_N	Page selection	Output

Assignment of the IDE Ports

The primary IDE port is intended for the alternative installation of 2.5” and 3.5” hard disks. 3.5” drives are connected via a 40 pin 2.54mm latching connector, 2.5” drives via a 44 pin 2mm latching connector. The two connectors are connected in parallel. The secondary IDE port is intended for the optional connection of a CD ROM and / or an LS 240 drive. It is adaptable via a 44 pin 2mm latching connector. The maximum connection length of the data cables may not exceed 40cm.

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

Connection for LS240 Drive

The optional LS240 drive is connected via this port. This port is connected in parallel with the secondary IDE port. The connected LS240 drive is automatically master (i.e. bootable drive) as the result of a special RC circuit. The maximum connection length of the data cable may not exceed 40cm.

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

PS Connection for Hard Disk

The power supply of the 3.5” hard disk is effected via this connection.

Pin No.	Designation	Description	Input / Output
1	P12V	+12 V	Output
2	GND	Ground	–
3	GND	Ground	–
4	P5V	+ 5V	Output

Connection for CPU Fan

The CPU fan is connected via this connection.

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

Connection for Device Fan

The device fan is connected via this connection.

Pin No.	Designation	Description	Input / Output
1	+12V	Switched power supply	Output
2	GND	Ground	–

Connection for Backup Battery

The battery for the standby supply to the CMOS RAM is connected to this connection. A 3.6 V lithium battery with a capacity of 750 mAh is used.

Pin No.	Designation	Description	Input / Output
1	+	Positive pole	Input
2	–	Negative pole	–

7.6 Bus Board

7.6.1 Design and Mode of Operation

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

The bus board has two ISA slots and two PCI slots, as well as a shared ISA /PCI slot. The expansion modules are powered via the link between the bus board and the motherboard. An external power supply (+5V and +12V) is provided.

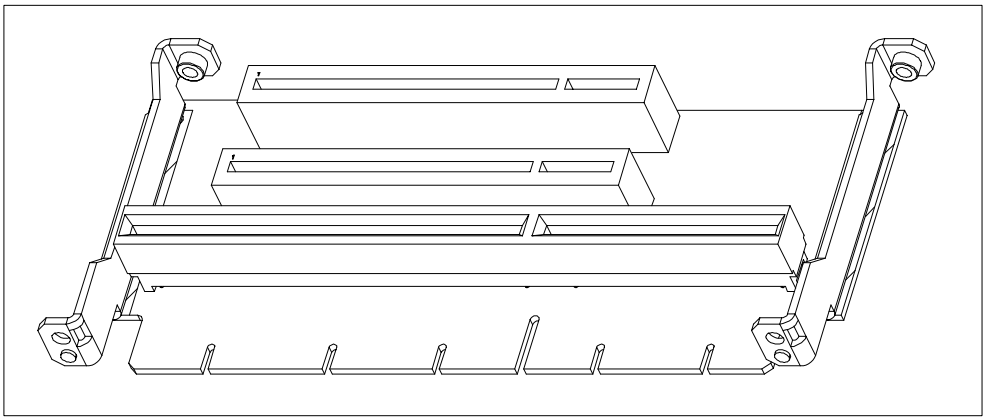


Figure 7-10 Bus Board

7.6.2 ISA Slot Pin Assignment

Pin	Designation	Type*	Pin	Designation	Type
A1	–IOCHCK	I	B1	0 V	GND
A2	SD 07	I/O	B2	RESET DRV	O
A3	SD 06	I/O	B3	+ 5V	V_{CC}
A4	SD 05	I/O	B4	IRQ 9	I
A5	SD 04	I/O	B5	– 5V	V_{CC}
A6	SD 03	I/O	B6	reserved	I
A7	SD 02	I/O	B7	– 12V	V_{CC}
A8	SD 01	I/O	B8	reserved	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	I
A22	SA 09	I/O	B22	reserved	I
A23	SA 08	I/O	B23	IRQ 5	I
A24	SA 07	I/O	B24	IRQ 4	I
A25	SA 06	I/O	B25	IRQ 3	I
A26	SA 05	I/O	B26	reserved	O
A27	SA 04	I/O	B27	TC	O
A28	SA 03	I/O	B28	BALE	O
A29	SA 02	I/O	B29	+ 5V	V_{CC}
A30	SA 01	I/O	B30	OSC	O
A31	SA 00	I/O	B31	0 V	GND

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

low active

Pin	Designation	Type *	Pin	Designation	Type
C1	–SBHE#	O	D1	–MEMCS16#	I
C2	LA 23	I/O	D2	–IOCS16#	I
C3	LA 22	I/O	D3	IRQ 10	I
C4	LA 21	I/O	D4	IRQ 11	I
C5	LA 20	I/O	D5	reserved	I
C6	LA 19	I/O	D6	reserved	I
C7	LA 18	I/O	D7	reserved	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	reserved	I
C18	SD 15	I/O	D18	0 V	GND

low active

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

7.6.3 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]
75	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 the 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	req1	req0
A17	gnt1	gnt0
A26	ad29	ad30

7.7 Power Supply with 85W power output (AC and DC)

Technical Specifications

Voltage	Max. Current	Voltage Stability
+ 12 V	1.7 A	± 4 %
– 12 V	0.2 A	± 6 %
+ 5 V	10 A	± 3 %
+ 3.3 V	4.2 A	± 5 %

Power-Good-Signal

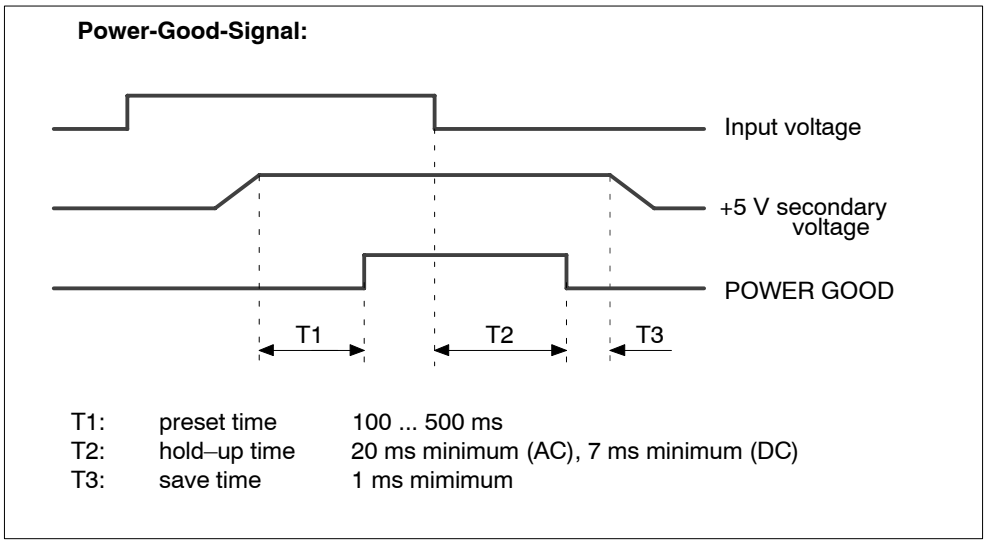


Figure 7-11 Time Characteristics of the Power Good Signal

7.8 Power Supply with 105W power output (AC and DC)

Technical Specifications

Voltage	Max. Current	Voltage Stability
+ 12 V	2.5 A	± 4 %
– 12 V	0.3 A	± 5 %
+ 5 V	13.5 A	± 3 %
+ 3.3 V	8.5 A	± 3 %

Power-Good-Signal

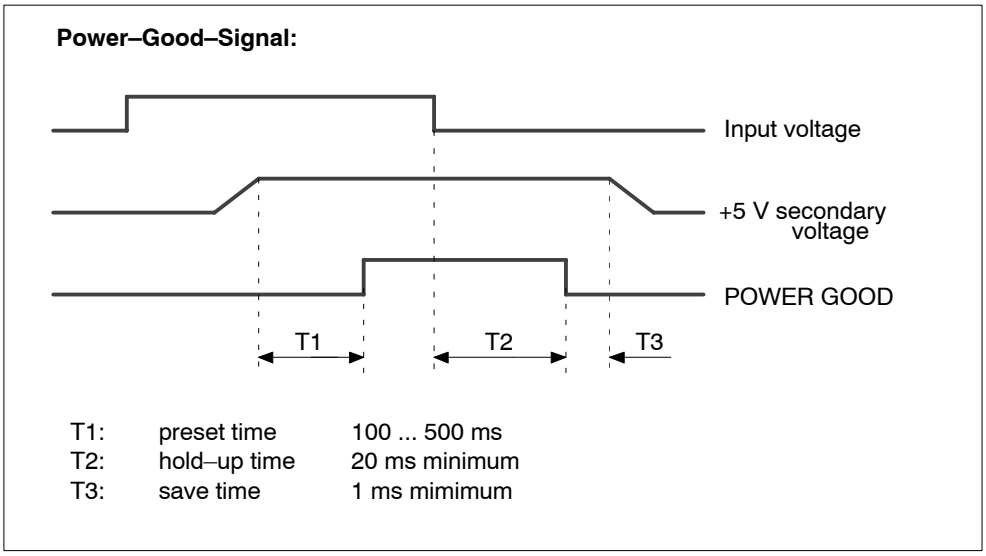


Figure 7-12 Time Characteristics of the Power Good Signal

7.9 Connecting Cables

SIMATIC S5 Connecting Cable

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

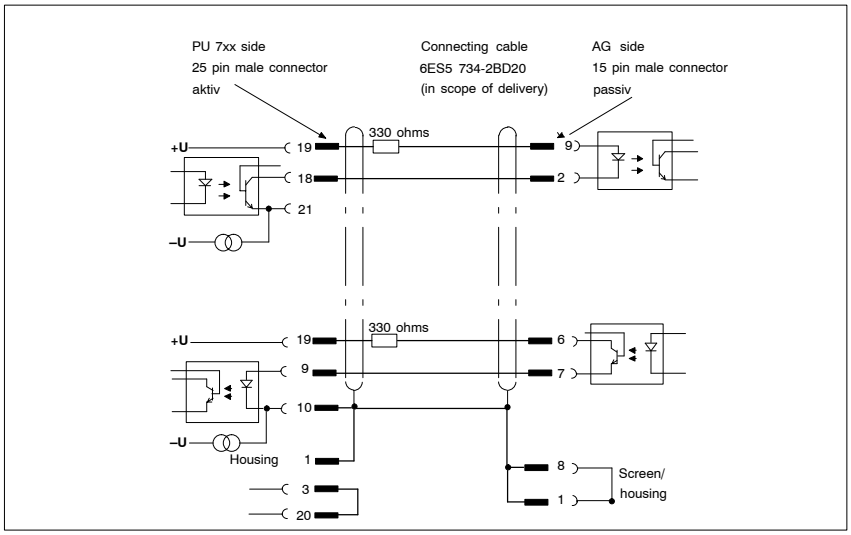


Figure 7-13 SIMATIC S5 Standard Connecting Cable

SIMATIC S7 Connecting Cable for MPI/DP

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

Reinstallation of the Software

8

What Does This Chapter Contain?

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

Chapter Overview

8.1 Restoring the Hard Disk

8.1.1 Creating Partitions under Microsoft Windows 98

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

Caution

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

The hard disk is delivered with the following installed (only for Windows 98 variants):

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

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

Primary Partition

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

Creating an Extended Partition

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

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

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

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

8.1.2 Creating Partitions under Windows NT

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

Caution

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

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

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

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

Primary Partition

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

The creation of NTFS partitions is done under the Windows NT setup program. Starting the Windows NT setup is described in Section 8.2.2.

8.1.3 Creating Partitions under Windows 2000

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

Caution

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

The hard disk is delivered with the following installed:

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

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

Primary Partition, FAT32 File System

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

Creating an Extended FAT 32 Partition

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

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

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

8.2 Installing the Windows Operating System

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

a Recovery Microsoft Windows 98,
a Recovery Microsoft Windows NT,
a Recovery Microsoft Windows 2000.

8.2.1 Installing the Recovery CD for Microsoft Windows 98

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

If no operating system is installed, proceed as follows:

1. Insert the Recovery CD in the CD ROM drive and connect the Box PC to the mains.
2. To boot from the Recovery CD proceed as follows: When the BIOS message `Press <F2> to enter Setup` appears on the screen press the ESC key. After initialization a boot menu to select the boot options is displayed.
3. Select “ATAPI CD ROM Drive” .
4. When “Microsoft Windows 98 Startup Menu” is displayed, select “1. Booten for CD-Recovery” .
   If the hard disk has not been installed, first select “2. Boot for FDISK, FORMAT or Windows-Setup (Section 8.1).
5. You have to acknowledge the “SIEMENS End User License Agreement” with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screen you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder “WIN98” is necessary for the Windows 98 installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for Windows, but the drive on which the required installation files and expansions are stored. For the Windows setup following transfer, you require an available disk space of approximately 250 MB. As a standard, Windows 98 is installed in drive C:. Therefore, when selecting the drive make sure that there will be sufficient disk space available on drive C: after data transfer.

Notice

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

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

8. After data transfer and end message acknowledgement Windows 98 setup can be started directly using the LW:\WIN98\SETUP.EXE program. (LW: Drive to which the WIN98 folder has been transferred).
9. After having started setup.exe please follow the screen instructions.

8.2.2 Installing the Recovery CD for Microsoft Windows NT

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

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

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

Windows NT Installation Sequence

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

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

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

   appears on the screen press the ESC key. After intialization a boot menu to select the boot options is displayed.
3. Select ”ATAPI CD ROM Drive”.
4. When “Microsoft Windows 98-Startup Menu” is displayed, select “1. Boot for CD-Recovery”.
   If the hard disk has not been installed, first select “2. Boot for FDISK, FORMAT or Windows Setup” (Section 8.1).
5. You have to acknowledge the “SIEMENS End User License Agreement” with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screen you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder “I386” is necessary for the Windows NT installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for Windows. For the Windows setup, you need an available disk space of approximately 300 MB on the installation drive for Windows.

Notice

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

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

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

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

Notice

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

8.2.3 Installing the Recovery CD for Microsoft Windows 2000

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

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

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

Windows 2000 Installation Sequence

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

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

1. Insert the Recovery CD in the CD-ROM drive and reboot the system.
2. To boot from the CD proceed as follows: When the BIOS message
   `Press <F2> to enter Setup`
   appears on the screen press the ESC key. After intialization a boot menu to select the boot options is displayed.
3. Select ”ATAPI CD ROM Drive”.
4. When “Microsoft Windows 98-Startup Menu” is displayed, select “1. Boot for CD-Recovery”.
   If the hard disk has not been installed, first select “2. Boot for FDISK, FORMAT or Windows-Setup (Section 8.1).
5. You have to acknowledge the “SIEMENS End User License Agreement” with the F8 function key. Pressing ESC allows you to decline the agreement and cancels the installation.
6. In the next screen you can select the components which are to be copied from the CD to the hard disk. Transfer of at least the folder “I386” is necessary for the Windows 2000 installation or setup.
7. Select the drive for data transfer. The selected drive is not the installation drive for Windows. For the Windows setup, you need an available disk space of approximately 500 MB on the installation drive for Windows.

Notice

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

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

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

Setting the Language Selection for Windows 2000

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

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

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

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

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

8.3 Installing Drivers and Software

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

- Place the CD in the CD ROM drive.
- Start the Start programm on the CD.The Acrobat Reader is started by the CD.
- Navigate to the driver list (language, operating system and device dependent).
- Please install the corresponding driver according to driver list.

Notice

When reinstalling Windows 98 and Windows 2000, make sure to install the chip set driver prior to the other drivers.

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

8.4 Installing and Operating the Burner Software

A burner software is not installed in the delivery condition. You will find instructions on installing and operating the burner software on the supplied CD ROM for the burner software.

Guidelines for handling electrostatic sensitive devices (ESD)

A

Overview of chapter

In chapter	you will find	on page
A.1	What does ESD mean?	A-2
A.2	Electrostatic charging	A-3
A.3	Basic protective measures against discharge of static electricity	A-4

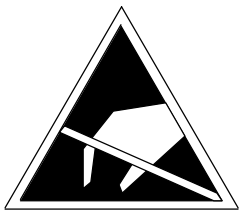
A.1 What does ESD mean?

Definition

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

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

Electrostatic sensitive assemblies are identified by the following symbol:



Caution

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

A.2 Electrostatic charging

Charging

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

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

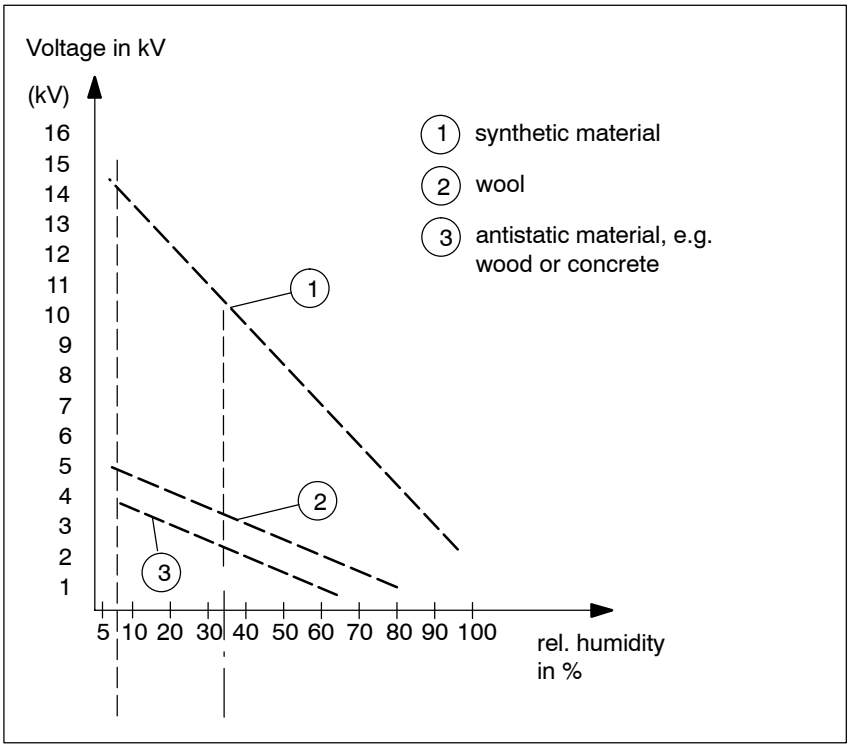


Figure A-1 Electrostatic voltages which an operator can be charged with

A.3 Basic protective measures against discharge of static electricity

Ensuring a good ground connection

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

Avoid direct contact

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

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

Technical Specifications

B

B.1 Technical Specifications of the SIMATIC Box PC 620

General	
Order nos.	See order documentation
Dimensions (w x h x d)	295x265x80 mm, without CD-ROM drive 295x265x100 mm, with CD-ROM drive
Weight	approx. 6kg (13.5 lbs.)
Supply voltage (U_N)	120 V (85 V to 132 V (AC), or 230 V (170 V to 265 V) AC (autorange) alternative: 24 V (20.4 bis 28.8 V) DC, SELV
Line voltage frequency, AC	50/60 Hz (47 to 63 Hz)
Brief voltage interruption acc. to Namur	max. 20 ms at 0.85 U_N (max. 10 times per hour; min. recovery time 1 s)
max. power consumption for 85W power supply	120W
max. power consumption for 105W power supply	132W
max. current output (DC), according to form of power supply	+5V/ 10A or 13.5A 3,3V/4.2A or 8.5A +12V/1.7 A or 2.5A –12/0.2A or 0.3A (in total max. 85W or 105W)
Noise emission	< 55dB(A) to DIN 45635
Enclosure	IP20
Safety	
Protection class	Protection class I pursuant IEC 60536
Safety specifications with AC power supply	UL1950/IEC 60950 corresponds to DIN VDE 0805
Safety specifications with DC power supply	UL508
Electromagnetic compatibility (EMC)	
Emitted interference with power supply 105W	EN 55022 Class A (requirement for industrial sector) for devices with AC power supply EN6100-3-2 class D and EN61000-3-3
Emitted interference with power supply 85W	EN 55022 Class B (requirement for domestic and industrial sector) for devices with AC power supply EN6100-3-2 class D and EN61000-3-3
Noise immunity: Mains borne disturbance variables on supply lines	± 2 kV (to IEC 61000-4-4; Burst) ± 1 kV (to IEC 61000-4-5; Surge symm) ± 2 kV (to IEC 61000-4-5; Surge unsymm)
Noise immunity on signal lines	± 1 kV (IEC 61000-4-4; Burst; length < 5 m) ± 2 kV (IEC 61000-4-4; Burst; length > 5 m) ± 2 kV (to IEC 61000-4-4:1995; Surge unsymm; length > 30 m)
Noise immunity to discharges of static electricity	± 6 kV Contact discharge (to IEC 61000-4-2) ± 8 kV Air discharge (to IEC 61000-4-2)
Immunity to RF interference	10 V/m 80-1000 MHz, 80% AM (to IEC 61000-4-3) 10 V/m 900 MHz and 1,89 GHz, 50% ED (to IEC 61000-4-3) 10 V 9KHz- 80MHz (to IEC 61000-4-6)
Magnetic field	30 A/m 50Hz (to IEC 61000-4-8)

Ambient Conditions	
Temperature	tested to DIN EN 60068-2-2:1994, DIN IEC 60068-2-1,DIN IEC 60068-2-14,
– operation	+ 5°C to +45°C
– storage/transport	- 20°C to +60°C
– gradient	(Max. speed of temperature change 10° C/h (50° F/h) condensation not permitted)
Relative humidity	tested to DIN IEC 60068-2-3, DIN IEC 60068-2-30,DIN IEC 60068-2-56
– operation	5% to 80% at 25°C (no condensation)
– storage/transport	5% to 95% at 25°C (no condensation)
– gradient	(Max. speed of temperature change 10° C/h (50° F/h) condensation not permitted)
Mechanical Specifications	
Vibration *)	tested to DIN IEC 60068-2-6
– operation	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 60068-2-29
– operation	50 m/s^2, 30 ms,
– storage/transport	250 m/s^2, 6 ms,
Special Features	
Quality assurance	to ISO 9001
Motherboard	
Processor	Intel Pentium III / Celeron (see order documentation)
Internal processor cache	2x 16KB first level, 128/256/512 KB second level, dependent on the processor used
Main memory	maximum 512 MB SDRAM, memory configuration (see order documentation)
2. Level Cache	Processor internal
Free expansion slots	1 shared ISA/PCI (max 175 mm long), 1 PCI (max 265mm long)
– max. permissible current input per ISA slot	5V 2A, 12V 0.3A, -12V 0.1A
– max. permissible current input per PCI slot	5V 2A, 12V 0.3A, -12V 0.1A, only for 105W power supply: 3.3 V 2A
– in total (all slots)	5V 3A, 3.3V 4A, 12V 0.6A, -12V 0.15A may not be exceeded
Drives	
Floppy disk drive / LS 240	3,5” (1.44 MB) / 3.5” (240 MB, 120 MB or 1.44 MB)
Hard disk drive	3,5” , EIDE, UDMA33, hard disk capacity (see order documentation)
CD ROM, CD RW/DVD(Combo) drive	650 MB / 4.7 GB

*) Restrictions for LS 240 with 120/240 MB data carrier and CD ROM /CD RW /DVD
10 to 58 Hz: 0.019 mm, 58 to 500 Hz: 2.5 m/s^2

Graphics	
Graphic controller	UXGA LCD controller on the AGP bus
Graphic store	bis zu 32 MB SDRAM sind Bestandteil des Hauptspeichers und können konfiguriert werden (8/16/32MB)
Resolutions/frequencies/colors	CRT: up to 1600x1200/85 Hz / 65536 colors with PC133 up to 1280x1024/85 Hz / 65536 colors with PC100 memory modules
Ports	
COM1 *1	Serial port 1 (V.24 / TTY), 25 pin subminiature Cannon connector
COM2	Serial port 2 (V.24), 9 pin subminiature Cannon connector
LPT1	Parallel port (standard, EPP and ECP mode) Connection for printer with parallel port
VGA	VGA port, connection for external monitor
Keyboard	PS/2 keyboard connection
Mouse	PS/2 mouse connection
USB	3 channels (1x internal, 2x external)
Card bus	1 port (max. type III)
DP12 port, potentially isolated *2	9 pin subminiature Cannon socket, screw locking
• Transfer rate	• 9,6 kBaud to 12 Mbaud, configurable by SW
• Operating mode	• potentially isolatedt*3: - data lines A,B - control lines RTS AS, RTS_PG - 5V supply voltage (max. 90 mA) • connected to ground: - shield of the DP12 connecting line
• Physical interface	• RS485, potentially isolatedt*3
• Memory address area	• 0CC000h ...0CC7FFh or 0DC000h ...0DC7FFh
• Interrupts	• IRQ5, 10, 11 or 15 configurable by SW
Ethernet	Ethernet port (RJ45)
Function Indicators (LEDs) on the Device	
SIMATIC Box PC 620	FD/LS240 access (on FD/LS240 drive on the side of the computer box) CD ROM access (on the CD ROM drive, if fitted)

*1 The line current (TTY) interface is an optional product feature
*2 Optional product feature
*3 Electrical isolation through an extra-low voltage safety circuit (SELV)

Glossary

What Does this Chapter Contain?

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

A

AC

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

Access Protection

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

ACPI

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

APM

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

Application

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

ASCII-Editor

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

ATA

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

AuthorsW

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

Authorization Diskette

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

B

Backup

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

Base Memory

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

Battery

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

BIOS

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

Boot Diskette

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

Boot

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

Booting

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

Bps

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

C

Cache

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

Cardbus interface

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

CD ROM

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

Click

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

Cold Boot

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

COM1 Port

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

COM2 Port

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

Configuration Files

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

Configuration Software

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

Controller

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

Cursor

Collective term for mouse pointer and text cursor.

Cursor Control

Keypad on the keyboard for controlling the cursor.

D

DC

Direct **C**urrent. Unidirectional electrical current.

DIMM

Dual **I**nline **M**emory **M**odule. Memory RAM chips that are installed on the PCB, similar to the more common SIMM (Single Inline Memory Module) chips. The DIMM with its 64-bit data bus architecture has connections on both sides which are connected to different circuits for processing different instructions. SIMMs, however, have a 32-bit data bus architecture where all lines are connected to the same circuit for processing the same instructions. DIMMs can be installed in the computer as single chip, SIMMs, on the contrary, only in pairs.

Device Configuration

The configuration of a programming device contains information on hardware and device options, such as memory configuration, drive types, monitor, network address, etc. The data are stored in a configuration file and enable the operating system to load the correct device drivers and configure the correct device parameters.

If changes are made to the hardware configuration, the user can change entries in the configuration file using the SETUP program.

Disk Drive

The disk drive (floppy disk drive) is used to store programs and data on diskette (write access) or to load from diskette to the computer (read access).

Diskette

The diskette (floppy disk) is an external data access memory on which all types of files and programs can be stored. The storage medium is a round magnetic disk in a plastic cover to protect it from getting scratched.

Display

Flat screen monitor of the PG.

Dormancy

An energy saving power management mode that shuts down the monitor and hard disk after all data found in the work memory have been saved to the hard disk (Save to Disk). The PG will then be shut down.

Double-Click

Pressing and releasing the left mouse button very quickly twice in succession without moving the mouse. This action is normally to open an object or program.

Drives

Devices for operating rotary disk media (diskettes, hard disk, CDs).

Drivers

These are programs which are part of the operating system. They adapt user program data to the specific formats required by I/O devices such as hard disk, printers, and monitors.

Drop-Down Menu

In graphics-supported programs, a menu line is positioned on the top edge of the screen. The menu titles contained in this line can be set either as drop-down or pull-down menus. Drop-down menus “roll” down as soon as the mouse pointer passes over a menu title. Pull-down menus only “roll” down when the menu title is clicked on. Different functions can then be called from these menus by moving the mouse and clicking on an item in a menu.

DVD

Digital **V**ideo **D**isc. A digital video disc can store greater amounts of data than a traditional CD. A standard single-layer, single-sided digital video disc can store 4.7 GB of data; a two-layer standard increases the single-sided disc capacity to 8.5 GB. Digital video discs can be double-sided with a maximum storage of 17 GB per disc. A digital video disc player is needed to read digital video discs; this player is equipped to read older optical storage technologies.

E

EIDE

Enhanced **I**ntegrated **D**rive **E**lectronics. An extension of the IDE standard, EIDE is a hardware interface standard for disk drive designs that house control circuits in the drives themselves. It allows for standardized interfaces to the system bus while providing for advanced features, such as burst data transfer and direct data access. EIDE accommodates drives as large as 8.4 gigabytes (IDE supports up to 528 megabytes).

Energy Options

With Energy Options, you can reduce energy consumption of your computer while it always remains to be ready to use. This function can be configured in Windows via **Settings > Control Panel > Energy Options**.

EPROM/EEPROM Submodules

These are plug-in submodules with EPROM/EEPROM chips. S5 user programs can be stored on them. These programmed submodules are then plugged into specially designed slots in the programmable logic controller.

Ethernet

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

Extended Memory

Memory extensions can be installed in the programming device to increase the width of the memory.

F

File

A complete, named collection of information, such as a program, a set of data used by a program, or a user-created document. A file is the basic unit of storage that enables a computer to distinguish one set of information from another.

Formatting

Formatting divides the memory area on a magnetic data medium into tracks and sectors. Formatting deletes all the data on a data medium. Every data medium must be formatted before it is used for the first time.

Function Keys

Function keys can be divided into two different types; the normal function keys which are assigned a particular function of the computer (for example, delete key), and programmable function keys (softkeys).

G

Gender Changer

The Gender Changer is used to convert the COM1/V24/PLC interface of the SIMATIC PC family to a common socket.

H

Hard Copy

The output of the complete contents of the screen on a printer is called a hard copy.

Hard Disk Drive

Hard disk drives (Winchester drives) are a form of magnetic disk memory where the magnetic disks are permanently built into the drive.

Hibernate

See **Dormancy**.

HMI

Human **M**achine **I**nterface

HTML

Hyper**t**ext **M**arkup **L**anguage is the markup language used for documents on the World Wide Web. HTML is an application of SGML (Standard Generalized Markup Language) that uses tags to mark elements, such as text and graphics, in a document to indicate how Web browsers should display these elements to the user and should respond to user actions such as activation of a link by means of a key press or mouse click.

HTTP

Hyper**t**ext **T**ransfer **P**rotocol is the protocol used to carry requests from a browser to a Web server and to transport pages from Web servers back to the requesting browser.

Hub

In a network, a device joining communication lines at a central location, providing a common connection to all devices on the network. The term is an analogy to the hub of a wheel.

Hyperlink

A connection between an element in a hypertext document, such as a word, phrase, symbol, or image, and a different element in the document, another document, a file, or a script. The user activates the link by clicking on the linked element, which is usually underlined or in a color different from the rest of the document to indicate that the element is linked.

I

IDE

Integrated **D**evice **E**lectronics is a type of disk–drive interface in which the controller electronics reside on the drive itself, eliminating the need for a separate adapter card.

Infrarot

Acronym: IR. Having a frequency in the electromagnetic spectrum in the range just below that of red light. Objects radiate infrared in proportion to their temperature.

Industrial Ethernet

Bus system based on the Ethernet standard. Components of the SIMATIC S5 and S7 series (programming devices, programmable logic controllers, programmable control systems) can be networked using Industrial Ethernet NICs.

Interface module

Module for the connection of peripheral hardware.

Interrupt

When the processor receives an interrupt, it suspends its current operations, saves the status of its work, and transfers control to a special routine known as an interrupt handler. This routine processes an instruction set to deal with the particular situation that caused the interrupt. Interrupts can be generated by various hardware devices to request service or report problems.

Interface

- An interface is the connection between individual hardware elements such as PLCs, programming devices, printers, or monitors via physical connections (cables).
- An interface is also the connection between different programs, to enable them to work together.

Interface Module

Module which controls and extends the hardware periphery.

IRQ

Acronym for interrupt request. One of a set of possible hardware interrupts, identified by a number. The number of the IRQ determines which interrupt handler will be used. In the AT bus, ISA, and EISA, 15 IRQs are available. Each device's IRQ is hardwired or set by a jumper or DIP switch.

ISA

Industrial **S**tandard **A**rchitecture (bus for expansion modules)

J

JEIDA

Japanese **E**lectronics **I**ndustry **D**evelopment **A**ssociation. Association of Japanese electronics manufacturers whose aim is to set up standards worldwide for the miniaturization and flexible application of PC expansion cards. Cooperates with PCMCIA.

K

Keyboard

A keyboard is the collection of keys which are used to input data, text, characters, letters, numbers, special characters, and control commands in a computer. The keyboard forms the input interface between the user and the computer.

L

LCD

Liquid **C**rystal **D**isplay. Display type on the base of liquid crystals with a thin film polarized molecular structure, enclosed between two transparent electrodes.

LED

Light **E**mitting **D**iode (for example, status display). Semiconductor diode that transforms electrical energy into light.

Lid Switch

The device is switched off by closing the display lid.

LPT1 Port

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

LS240 Drive

Floppy disk drive that is capable of storing 240 MB of data on a single 3.5-inch floppy disk. LS-240 drives are also compatible with other floppy disk formats.

M

Main Memory

Main memory is a RAM memory in the CPU that is accessed by the CPU during user program processing.

Memory Card

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

Micro Memory Card

New and very compact card for SIMATIC.

Memory Expansion

See Extended Memory

Modem

Communications device that enables a computer to send and receive data over a telephone line. **Mo**dulator and **dem**odulator of a signal transmission facility. It converts the digital pulses from a computer into analog signals (and vice versa).

Module

Modules are boards (printed circuit boards) which can be plugged into a programmable logic controller or programming device. They are available, for instance, as central controller modules, interface modules, or as bulk memory modules.

Monitor

The device on which images generated by the computer's video adapter are displayed.

Mother Board

The mother board is the core of the programming device. From here data are processed and stored, interfaces and device I/Os are controlled and managed.

Mouse

The mouse is a pointing device with which the user inputs coordinates (x,y). By moving the mouse, the mouse pointer can be moved at will around the screen. By pressing the left mouse button, the position is marked. The other mouse keys may have different assignments according to the application. With the mouse, objects can be selected, menus processed, and functions started.

Mouse Pointer

The mouse pointer is moved across the worktop (screen) by means of the mouse. The mouse pointer selects, for example, objects which are to be processed.

MS-DOS

The single **M**icro**s**oft-**D**isk-**O**perating-**S**ystem is one of the standard OS for PCs.

Multimedia

The combination of sound, graphics, animation, and video. In the world of computers, multimedia is a subset of hypermedia, which combines the aforementioned elements with hypertext.

N

Network

Link between programming devices and programmable controllers by means of interface modules, physical cables, and the corresponding software to allow data exchange between the devices.

O

Operating System

Collective term for all functions which, in conjunction with the hardware, control and monitor execution of the user programs, the distribution of resources among the individual user programs, and the maintenance of the operating mode (for example, Windows 98, MS-DOS).

P

Parallel Interface

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

Password

Unique sequence of characters that is entered for user identification. See Access Protection.

PC

Personal computer

PC Card

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

PCI

Peripheral **C**omponent **I**nterconnect (high-speed I/O expansion bus)

PCMCIA

(Personal Computer Memory Card International Association). Association of about 450 computer companies with the aim of setting worldwide standards for miniaturizing PC expansion cards and making their use more flexible, offering the market a basis for development. Cooperates with JEIDA. See Cardbus interface.

PG

Compact programming device especially for industrial applications. The PG is fully equipped for programming SIMATIC PLCs.

PG LINK

Serial interface on a CPU, CP/IP module and coordination module (PG-MUX). Used to connect a programming device. Some CPUs are optionally equipped with two PG links.

Pixel

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

PIC

SIMATIC S5 programmable logic controller

Plug and Play

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

Power Button

The device can be switched on or off with the power button.

Power Management

The Power Management of a modern PC can regulate the consumption of energy of the most important components of the computer (e.g. monitor, hard disk and CPU) individually, while the current active operations will not be affected. This function is particularly important for portable computers.

PROFIBUS

Bus system based on the PROFIBUS standard. Components of the SIMATIC S5 and S7 series (programming devices, programmable logic controllers, programmable control systems, distributed I/Os) can be networked using PROFIBUS.

Programmable Logic Controller System

The programmable logic controllers (PLC) of the SIMATIC S5 system consist of one or more CPUs and various I/O modules. The PLCs of the SIMATIC S7 system (for example, S7-200, S7-300, S7-400) consist of one or more CPUs and various I/O modules.

Programmable Controller (AS)

This programmable controller (PLC) consists of the central unit, a CPU and of diverse I/O modules.

Pull-Down Menu

See Drop-Down Menu

R

RAM

RAM (**R**andom **A**ccess **M**emory) is a volatile read/write memory in which every memory location can be addressed individually and its contents changed. RAM is used to store data and programs.

Rechargeable Battery

Reachargeable battery is used as a power source for laptop and notebook computers independent of external power supply. It also prevents the loss of data as a result of power failure.

Restart

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

ROM

ROM (**R**ead **O**nly **M**emory) is a non-volatile memory in which every memory location can be addressed individually. They contain factory set programs and data that are not lost in the event of a power failure.

RS-232 Interface

The RS-232 interface is a standardized interface for data transmission. Printers, modems and other hardware modules can be connected to a RS-232 interface.

RTC

Real Time Clock

S

SCSI Interface

Small **C**omputer **S**ystem **I**nterface. Interface for connecting SCSI devices (hard disk drives, CD-ROM drives).

Serial Interface

Data is transmitted one bit at a time via a serial interface (port); serial interfaces are therefore slower than parallel interfaces.

SETUP

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

SIMATIC S5 Memory Submodules

Memory submodules for SIMATIC S5 which are programmed with the PG and can be plugged into an S5 programmable logic controller.

SIMATIC Memory Cards

Memory submodules in credit-card format for SIMATIC S5 and SIMATIC S7 which are programmed with the PG and can be plugged into an S5 or S7 programmable logic controller.

Software

The collective term for all programs which are used on a computer. The operating system and the user programs are part of the concept “software”.

SOM

Safecard **O**n **M**otherboard. Consists of a monitoring module on the motherboard, the driver and the SOM program. Provides functions for monitoring various temperatures and the program cycle (Watchdog).

Standby

Power saving status: for example, hard disk drive or display turned off.

Startup Disk

The bootstrap instructions coded into a computer’s ROM (read-only memory) and executed at startup. The startup ROM routines enable a computer to check itself and its devices (such as the keyboard and disk drives), prepare itself for operation, and run a short program to load an operating-system loader program.

STEP 5

This is a software package which represents the basis for all other STEP 5 software packages. With the programming device (PG), this package is used to program programmable logic controllers of the SIMATIC S5 family. The language used is known as STEP 5.

STEP 7

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

STN Display

Super Twist Nematic passive display

Suspend to Disk

Transition to power-off status, with prior saving of the system contents to the hard disk drive.

Suspend to RAM

Transition to power-saving status, with prior saving of the system contents to the RAM.

SVGA

Super **V**ideo **G**raphics **A**rray is a video standard established by the Video Electronics Standards Association (VESA) in 1989 to provide high-resolution color display on IBM-compatible computers.

T

Text Cursor

The cursor shows where text may be entered, for example, in text editors and in dialog windows. In many applications the position of the cursor can be changed by moving and clicking with the mouse pointer.

TFT

Thin-**F**ilm-**T**ransistor. Technology for liquid crystal displays (LCD). The display consists of a large grid of LCD cells. Each one of the pixels represents a single cell. The electrical field in the cells is supported by thin film transistors.

Touchpad

The Touchpad is used in many programs (with mouse control) as an input device for cursor control and menu operation. The Touchpad works with touch-sensitive sensors. The cursor can be moved over the screen with the touch of a finger.

Touchscreen

The Touchscreen is a computer monitor developed and modified to recognize a touch on the screen surface. The user can move the cursor or select an option by touching the screen.

U

URL

Uniform **R**esource **L**ocator is an address for a resource on the Internet. URLs are used by Web browsers to locate Internet resources. A URL specifies the protocol to be used in accessing the resource (such as http: for a World Wide Web page or ftp: for an FTP site), the name of the server on which the resource resides (such as //www.whitehouse.gov), and, optionally, the path to a resource (such as an HTML document or a file on that server).

USB

Acronym for universal serial bus. A serial bus with a data transfer rate of 12 megabits per second (Mbps) for connecting peripherals to a microcomputer. USB can connect up to 127 peripherals, such as external CD-ROM drives, printers, modems, mice, and keyboards, to the system through a single, general-purpose port. This is accomplished by daisy chaining peripherals together. USB is designed to support the ability to automatically add and configure new devices and the ability to add such devices without having to shut down and restart the system (hot plugging).

User Interface

The software-controlled menus and screens on the monitor through which the user communicates with the program.

User program

Contains all instructions, declarations and signal processing data that can be used for system or a process control. It is assigned to a programmable module (for example, CPU, FM) and can be split into smaller blocks (modules).

V

VGA

Video **G**raphics **A**rray. Industrial standard graphics adapter for use with any commonly used software.

Video Adapter

Also known as Video Controller, this electronic component generates the video signal sent through a cable to a video display. The video adapter is usually located on the computer's main system board or on an expansion board, but it is sometimes built into the terminal.

W

Warm Start

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

WAV

A file format in which Windows stores sounds as waveforms. Such files have the extension .wav.

Windows

Windows is a multitasking graphical user interface environment that runs on MS-DOS-based computers (Windows 3x and Windows for Workgroups), and as a self-contained operating system for desktop computers (Windows 9x), workstations, (Windows NT Workstation, Windows 2000 Professional), and network servers (Windows NT Server, Windows NT Enterprise Edition, Windows 2000 Server, and Windows 2000 Advanced Server). Windows provides a standard graphical interface based on drop-down menus, windowed regions on the screen, and a pointing device such as a mouse.

WWW

World **W**ide **W**eb is the total set of interlinked hypertext documents residing on HTTP servers all around the world. Documents on the World Wide Web, called pages or Web pages, are written in HTML (Hypertext Markup Language), identified by URLs (Uniform Resource Locators) that specify the particular machine and pathname by which a file can be accessed, and transmitted from server to end user under HTTP (Hypertext Transfer Protocol).

Working Memory

The memory in which a program is stored which can be processed. Also known as main memory.

Write Protection

Write protection for files or diskettes

- Write protection for files; this type of write protection is stored in the computer and is allocated by the system manager.
- Floppy disk write protection; for 3 1/2 in. diskettes by opening the write protection hole.

W2k

Another name for Windows 2000.

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