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User Manual for a Fujitsu-Siemens PC

Help with problems and information, frequently asked questions

Dear customer

We are pleased that you have chosen a system from Fujitsu Siemens Computers. We are sure that you will not regret this decision.

The analysis of information and feedback provided by our customers led us to produce this manual and to keep it constantly updated. Our experience shows that general publications about PCs designed for users are not always helpful in every case. These documents cannot deal in concrete terms with the specifics of the PC purchased. As we know the strengths of our computers and any hidden vagaries of the system that might crop up, we are in the best position to inform our customers of these problems.

This document was produced with the support of our valued customers and the engineers in our company. We hope that the assistance it provides will make it easier for you to get to know the 'secrets' of the world of PCs.

The development process for hardware and software in computer technology is an ongoing one, and we aim to keep this guide constantly updated. However, we cannot provide any guarantee of completeness.

In terms of the explanation of installation instructions for system settings, there are normally several options. We ask for your understanding that we can only present one possible method in our explanation of system settings. The illustrations are intended solely to support understanding. They do not necessarily match the screens on your system exactly in every case. The data for devices, drivers and remarks in the illustrations are provided as examples.

Fujitsu Siemens Computer Team
August 2004

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General safety information and initial startup

1 Safety, precautionary and compliance instructions

Your PC complies with the relevant safety regulations for IT equipment. Should you have any questions with regard to whether you can use the unit where intended please contact your sales agent or our service department.

- Keep this safety information and the other documentation (such as the quick guide, operating instructions and CD) with the unit. When you pass on the unit to a third party, please also pass on all the documentation.

Risk of electrocution

- The unit requires a safety-tested power cable which complies with the regulations of the country of use.
- Check the cables and power plug for signs of damage on a regular basis.
- The unit may only be connected to an earthed power socket.
- You may only operate the unit if its rated voltage matches the local mains voltage.
- Safe disconnection from the mains supply is only guaranteed by removing the power plug from the mains socket. Just because the "Power LED" is not illuminated, does not mean that the unit is isolated. Simply switching off the PC and add-on devices is not enough.

Risk of explosion

- General warnings:
  Your system is equipped with a replaceable lithium battery. It is located on the system board. Once the battery is flat, it can be easily exchanged (see system board manual).

  Caution!
  There is a risk of explosion if the battery is exchanged incorrectly Replace only with a battery of the same type or with an equivalent recommended by the manufacturer.

Electromagnetic compatibility

- External units, such as monitors, joysticks, etc., may only be connected to the interface ports with screened cables to meet the harmonised standards under electromagnetic compatibility (EMC) legislation.
- You may only operate the unit if its rated voltage matches the local mains voltage.

Information on R&TTE Directive

- Fujitsu Siemens Computers hereby declares that the built-in modem conforms to the fundamental requirements and the relevant standards contained in the directive 1999/5/EC.
- The complete original declaration of conformity for the R&TTE Directive can be found in your PC's electronic documentation.

Computer setup

- Before you change, install or remove any components, disconnect the mains plug and, if applicable, detach the telephone cable from the PC (pull out the plug).
- Before you open the housing, you must switch the PC off and remove the plug from the socket. The proper operation (according to IEC 60950/EN 60950) of the unit is only guaranteed with a fully attached housing and covers for installation slots (electrical shock, cooling, fire prevention, noise suppression).
- Only authorised qualified personnel should open the unit. Tampering with the unit will result in a loss of the right to guarantee claims and the discontinuation of the manufacturer's guarantee obligation to uphold the harmonised standards according to the law regarding the electromagnetic compatibility of units and low voltage directive.
- All integrated circuits and memory modules, as well as the contacts on all sockets and plugs, are susceptible to static electricity. Protect these from static electricity. The effect of static electricity, rapid transients or strong electromagnetic fields on the unit may cause faults. When exchanging or installing a board or a memory module, touch an earthed object or carry a ground strap to divert any electrostatic charge from your body.
- All ports are only designed for connection of safety extra-low voltage (SELV).

- The unit can be equipped with a power output which may only be used to connect a monitor.
- Never open the power supply unit! The components (e. g. power supply) marked with a warning (e.g. lightning) may only be opened, removed or exchanged by authorised qualified personnel.
- If the BIOS needs to be updated, only use **Fujitsu Siemens Computers** updates.
- When installing additional components (e.g. hard disks) ensure that there is adequate cooling.

Repairs

- Repairs to the unit may only be carried out by authorised qualified personnel. Unauthorised opening and incorrect repairs may pose considerable risk to the user (risk of electric shock or fire).

Diskettes (applies only to systems with floppy disk drives)

- Keep diskettes away from magnets or other magnetic objects (monitors also produce a magnetic field).
- Damage to the diskette can lead to loss of data.
- The LED on the disk drive will light up while the diskette is being accessed. The disk drive should not be opened and the diskette must not be removed while the LED is illuminated. This could damage the diskette and the disk drive.

Optical drives

- Use only completely perfect storage media (e.g. CD, DVD) in your optical drive to avoid data loss, damage to the machine and injury.
- Each CD/DVD should be checked for damage such as fine cracks, fractures or similar prior to insertion in the drive.
- Note that additional adhesive changes the mechanical properties of a CD/DVD and may lead to an imbalance.
- Damaged and unbalanced CDs/DVDs may break at high drive speeds (data loss). Under some circumstances, sharp-edged fractures may penetrate the cover of the drive (damage to the machine) and be thrown out of the machine (risk of injury, in particular to exposed parts of the body such as face and neck).

- Look after the optical drive and prevent mechanical damage as well as premature ware of the storage media by taking the following advice:
  - Only insert CDs/DVDs in the drive when required and remove them after use.
  - Store the CDs/DVDs in appropriate cases. Protect them from heat and direct sunlight.

Cleaning

- Clean your PC regularly. Before doing so, switch off the PC and any peripherals, removing the plug from the socket. Use a non-abrasive cleaning product and/or a lightly dampened cloth.
- Avoid using cleaning sprays and any kind of solution containing alcohol or other flammable liquids. Therefore do not use any abrasive powder or cleaning agent which dissolves plastic for cleaning.
- Clean the monitor screen with a soft, lint-free dampened cloth.

Additional notes for proper operation

- Position the unit so that there is adequate air for cooling. Never cover the ventilation slots on the unit. This could cause overheating and thus shorten the life of your unit.
- Protect your device from very high humidity, direct sunlight as well as high and extremely low temperatures. If the device is brought from a cold environment into a warmer installation site, bedewing may occur. Wait until the temperature of the device has equalised and it is completely dry before you put it into operation (approx. 2 to 4 hours).
- The unit is not waterproof. Do not immerse it in water and protect it from spray (rain, seawater).
- Should an abnormal odour or smoke be produced and in emergencies (e.g. damage to the housing, operating controls or power cable, and liquid or foreign bodies entering the unit), switch the device off immediately, remove the plug and contact your sales agent or our hotline/Help Desk.
- Do not smoke in the vicinity of the unit. Particles of ash may settle on the monitor or inside your computer.
- Do not eat over the keyboard as crumbs may cause it to malfunction.
- Ensure that the cables from the PC do not pose any risk (danger of stumbling) and cannot be damaged.
- The computer should preferably be transported in the original packaging as it has been specially designed for the system unit.
- Use a high quality double-screened cable to connect the printer. **If your system comes with a printer cable, you should use it.**
- The ID plate may also be located underneath the housing.
- You may have to remove a securing device used during transportation from the underside of the mouse.
- When you switch off ATX and µATX systems, the system will still be in standby mode and still be connected to the mains. You will have to disconnect the mains plug to isolate the unit.
- If the monitor is connected to the power socket on the PC power supply unit (if available), it will not be turned off when the PC is switched off.
- If you have a monitor which supports power management, it will also switch to standby. If the monitor does not have this function, you must switch it off separately when you finish working with the PC.

- The hard disk has already been formatted and the operating system has been installed. It will only need to be formatted if the drive has to be reconfigured.
- The "Product Recovery" CD/DVD supplied can only be used to restore/install your operating system if a motherboard with a **Fujitsu Siemens Computers BIOS** is being used.
- Consumer PC systems are not suitable for high security and medical applications.

Data backup

- Create backup copies of your work files on a regular basis. This is the only way to protect against data loss, e.g. in the event of a hard disk fault.
- No liability shall be accepted for loss of data.

Special handling of batteries and rechargeable batteries

- The batteries/rechargeable batteries in our units do not contain any Cd or Hg compounds.
- Your system is equipped with a replaceable lithium battery. It is located on the system board. Once the battery is flat, it can be easily exchanged.

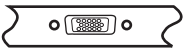
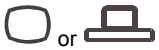
Information about the battery regulations of 27.03.1998:
Please note:
Batteries and rechargeable batteries should not be disposed of in domestic waste. They are to be returned to the manufacturer, dealer or agent free of charge to ensure that they are recycled or correctly disposed of.

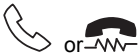
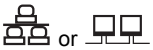
2 Startup

2.1 Connecting the computer

2.1.1 Computer connections

Most of a computer's connections are located at its rear. Which connections are present and where they can be found depends on the particular computer model. The most commonly used connections are listed in the following table.

Connection image	Icon	Colour	Connection
 Cold device plug		Black	PC power supply[1) 4)]
 PS/2 socket, 6 pole	 Keyb.	Purple	PS/2 keyboard
 PS/2 socket, 6 pole		Green	PS/2 mouse
 Subminiature D socket, 15 pole	 or VGA	Blue	Monitor
 Subminiature D socket, 25 pole	 LPT	Burgundy	Printer (parallel port)
 Subminiature D plug, 9 pole	 or SERIAL	Turquoise	COM1 (serial port)
 3.5 mm jack sockets	 Line In Line Out Mic AUDIO digital out	Light blue Light green Pink Yellow	Sound2) (external sound sources, e.g. active loudspeaker, microphone) – Soundcard - Sound onboard

 Cinch socket	SPDIF IN SPDIF Out	Yellow	Digital sound connection see also manual on the motherboard and "Tips and tricks"
 USB socket	 or USB	Black white	Connection for USB 2.0 devices (e.g. keyboard, IR sender/receiver module, scanner, printer) USB 2.03)
 or FireWire socket	 IEEE 1394	Black white	Connection for IEE-compatible devices (e.g. video recorder, digital video camera) FireWire
 RJ-11 socket	 or LINE or PHONE	None	Modem
 RJ-45 socket	 or LAN	None	Network or DSL modem
 Antenna socket	CATV	None	Cable, antenna connection
 4-pole or more socket	SVIDEO IN SVIDEO OUT	Black	Video input and output connection (see documentation about the VGA/TV card)
	SPDIF optic	Black	Digital optical sound connection
● LED	WLAN LINK	Green	WLAN operational display **Operational display only functions correctly when WLAN is installed.**

[1] **Caution:** Under the connection, there may be a toggle switch for changing the power supply from 230 V to 115 V. The factory setting is 230 V .

[2] With an additionally installed soundcard, the sound function on the motherboard is not activated or "Sound onboard" is not available.

[3] Important information on USB 2.0: In order to guarantee a reliable data transfer rate, we recommend that you use USB connecting cable with a maximum length of **4 m**.

[4] **Controls on the power supply (optional)**

	Mains on/off switch
 optional	Voltage selector

Caution! Please note the mains power supply to which your computer is to be connected and compare it with the default setting.

2.1.2 Connections, controls and indicators on the front of the PC

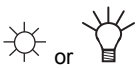
Connections

The descriptions of the various connections can be found in the previous table.

Controls

	Standby button	Button to activate the standby function and on/off for ATX systems.

Indicators

	Power LED on	The system is switched on (POWER)
	Power button	The system is switched on when the blue ring is illuminated
	HDD LED on	Shows that the hard disk is being accessed. (HDD)

2.2 Connection

Before you switch on the computer, please connect

1. the *monitor, keyboard, mouse*, printer (if applicable), modem and any other peripheral units to the PC. Please refer to the information in the chapter "Computer Connections", as well as the information in the "Quick Guide".
2. First connect the *power cable* supplied to the power socket on the PC and then plug it into a 230 V or 115 V power socket (plug strip). You may only operate the unit if its rated voltage matches the local mains voltage. If your computer has a double-voltage toggle switch, please ensure that it has been set to the correct mains voltage for your country. The manufacturer's default setting is 230 V.

After cabling

3. Turn on your monitor.
4. Then, if applicable, switch on the on/off switch on the back of the computer. To start the computer, press the standby button located on the front of the computer.

The computer is ready for operation when the green lamp / blue ring is illuminated.

2.3 Initial startup of preinstalled software

Your computer has **Microsoft®Windows XP Home Edition** pre-installed as standard. After turning on the computer, it is ready to use. You can use the Windows operating system immediately. You may have to make some adjustments. Follow the on-screen instructions.

You can find the pre-installed software under: "**Start / All Programs**".

Note on Microsoft®Windows XP Home Edition and Professional

Fujitsu Siemens Computers has pre-installed Microsoft®Windows XP in such a way that you can use the product immediately. If you want to change critical hardware components, it may be necessary to reactivate the system. In this case, follow the program instructions after changing the hardware. In case of any queries, please contact our Help Desk (www.fujitsu-siemens.com/service).

Note on Microsoft®Word

Microsoft has provided user activation for Microsoft®Word. Follow the program instructions after starting the program. In case of any queries, please contact our Help Desk (www.fujitsu-siemens.com/service).

3 Transporting the system

If you are going to transport your computer over a long distance, for example in a vehicle, you must ensure that the data carriers are not at risk of being damaged by the transport. When transporting the computer in a vehicle, always make a complete backup of the hard disk on an external data carrier.

If you are transporting the PC only a short distance, i.e. only to another room or to a different desk, a backup need not necessarily be carried out. However, you must make sure that the unit is transported carefully.

For the onward shipment of the product or other transport, use the original packaging or other suitable packaging which provides protection against shock and impact.

Detach all external cable connections and transport all devices separately and only in their original packaging or in other suitable packaging which guarantees protection against shock and impact.

Do not drop the device and do not expose it to severe vibrations.

CAUTION! The computer should ideally be transported in the original packaging which has been specifically designed for this purpose.

We only use recyclable material to package our units.

4 Guarantee services

For our systems we generally grant guarantee claims according to the German Civil Code as well as additional guarantee services on agreement (see the corresponding service documentation for details).

The system you have purchased has been produced to environmentally sound standards and strict quality standards by our company, which is certified to DIN ISO 9001 and DIN EN ISO 144001. We provide a statutory guarantee on all of our products, or an extended warranty by arrangement.

5 Return of old units

The offer of taking back and recycling our systems is regulated and guaranteed by our environmental management which has been certified according to DIN EN ISO 14001.

As far as possible, our devices are produced from materials which can be appropriately recycled. After use, the device is taken back for re-utilisation or recycling of the materials, insofar as it is returned in a state corresponding to proper use. Non-recyclable device components are disposed of appropriately.

To return a device, please use the recycling and disposal facilities available in your country.

Further information about country-specific recycling and disposal facilities can be found on the Internet at:

www.fujitsu-siemens.com/recycling

If you have any other questions about disposal, please contact your sales agent or our Help Desk.

Technical data and operating conditions

Technical data	
Power drain when unit is switched off – ATX mains supply unit	≤ 5 W (0 W only possible when directly disconnected from the power supply – disconnect the power plug or switch off the unit with the on/off switch on the rear of the housing)
Input voltage	230 V~ (optional wide range 100 V-240 V 50/60 Hz)
Rated frequency	50 Hz (60 Hz)
Rated input current (corresponds to details on the label on the rear or underside of the unit)	4 A or 5 A at 230 V/50 Hz (9 A or 10 A at 115 V/60 Hz)
Operating conditions	
Ambient temperature Transport temperature	10 ... 35°C 20 ... 85% relative non-condensing humidity -25°C to 60°C
Loudness	
Sound power level (DIN EN27779, ISO3744, ISO 9296, RAL UZ -78)	max. 55 dB (A)
Unit classification	
Protective rating	I
Faulting class	2
Over voltage category	II

Supplement to the operating instructions

Guidelines and Environmental Protection

An important characteristic of our products, alongside quality and performance, is environmental friendliness.

(I) Protection of resources with energy-saving functions

Our units generally have energy-saving modes.

(II) Device safety

The units meet the requirements of the low voltage directive 73/23/EEC including the amendment 93/68/EEC, certified in accordance with EN 60950, and the directive on electromagnetic compatibility 89/336/EEC including the amendment 93/68/EEC.

(III) Guarantee of electromagnetic compatibility

All data and signal cables must be provided with sufficient shielding. The minimum requirement is a Category 5 shielded cable for 10/100 Ethernet, or Category 5e for Gigabit Ethernet. As described in the operating instructions, all of the housing parts must be installed.

- **Requirements for work with monitors**

Our units meet the requirements set for work with monitors in accordance with the EU screen directive 90/270/EEC for the purposes of the EU directive 89/391/EEC.

- **Lasers**

If your system has an optical drive such as a CD-ROM, CD-RW, DVD or combined drive, the following applies:

With closed PC housings, the optical drives used correspond to laser class 1 in accordance with IEC 60825-1. These contain light-emitting diodes (LED) which under some circumstances may generate a stronger light beam than laser class 1. A direct glance into this beam, even with protective eyewear, is dangerous and may lead to injury. Therefore, **no** parts of the optical drive housing are to be removed.

- **Operating Instructions**

The documentation delivered with the unit has been printed solely on chlorine-free paper.

The documents mentioned above can be viewed at the manufacturer if required.

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Help with problems and information, frequently asked questions

1 Guidelines

1.1 EMC directives

Abbreviation for "**E**lectro**M**agnetic **C**ompatibility". As well as the effects of electrical smog on human health, the effects of electronic devices and installations on other electrical systems are also an important aspect of many discussions today. It is not without good reason that the standards for electromagnetic compatibility (EMC) have recently been drastically tightened in the area of computers and radio networks.

1.2 CE directives

CE, the abbreviation for **C**ommunauté **E**uropenne, indicates that the product conforms with the directives, i.e. it is the manufacturer's confirmation that they have complied with the requirements collected in the EU directives, particularly the protection requirements for the manufacture of the product.

The CE mark on a product guarantees that the product may be brought into circulation within the EU.

Since 1996, CE conformity has been legally binding. All electrical and electronic devices must carry the CE mark, as must all data networks and their passive components, such as cables, hubs etc. From 1st January 1997, companies are no longer allowed to sell a product without the CE mark. This has created a legal framework where manufacturers have had to introduce technical measures to ensure that computer systems meet the required "standards on interference emission and resistance to interference". The housing is an important aspect of this. Even high-quality structures cannot guarantee compliance with the directives. To compensate for interference emissions, measures include the use of magnetic cores, to comply with the appropriate standards. Unused drive slots are sealed with additional slot panels.

1.3 R&TTE directive and FTE law

The purpose of the law is to control the introduction into circulation and the operation of radio equipment and telecommunications terminals falling under the jurisdiction of the R&TTE directive, and

to allow the free movement of these goods within the European internal market.

The directive, the RTTE directive 1999/5 EC (**R**adio equipment and **T**elecommunications **T**erminal **E**quipment and the mutual recognition of their conformity) has been implemented in German law by the FTEG (**F**unkanlagen und **T**elekommunikations **E**ndeinrichtungs **G**esetz – Radio equipment and Telecommunications Terminal law).

The directive was published on 7.4.1999 in the EU Official Gazette L91/1999 and was thus brought into law. The FTEG was announced in the German Federal Law Gazette Part I, No. 6 on 7 February 2001, and came into force on 8 February 2001.

1.4 Low voltage directive

In accordance with the directive 73/23/EEC, appropriate regulations have been binding since the seventies. In Germany, this directive was brought into legal effect with the Device safety law, the first prescription to the law on technical materials. Since 1st January 1997, manufacturers have not been allowed to see products without a CE mark.

The CE mark can be displayed if the product meets the safety targets specified in the low voltage directive. In general, this means meeting the technical requirements specified in a harmonised standard. This directive is applicable for all electrical equipment within particular voltage limits.

2 Hardware

Hardware is a very commonly used term in computer technology. It simply refers to all the components of a PC and its peripherals (e.g. printers, scanners etc.).

i **Our tips and hints …**

... on saving energy

- We recommend connecting the system and the peripherals to a standard switchable plug strip. This makes disconnecting the entire system from the mains easier, safer and clearer.
- PC systems and peripherals that do not have a mains switch and are connected to the mains are on "Standby" mode. Power consumption is inevitable in this mode. In "Standby" mode the system will maintain certain functions, e.g. wake on LAN, wake on RING (MODEM). To isolate the system you will either have to disconnect the mains plug or switch the system off at a plug strip.
- If you will not be using the PC for a long period of time, or if you will not be using the wake on LAN or wake on RING (MODEM) functions, turn off the entire system.

2.1 The motherboard

The motherboard (also called the mainboard) is the most important component of your computer. Among other things, it contains the CPU, the working memory and slots for additional components. You can find important and detailed information in the appropriate manual. This is supplied electronically on the "Drivers & Utility" CD/DVD or in printed form.

2.2 The CPU

CPU is an abbreviation for the term **C**entral **P**rocessing **U**nit. The CPU is the actual "brain" of the computer. It is responsible for all of

the system's control and calculation operations. The description of a PC system normally specifies the processor type and its speed.

i **Our tips and hints …**

... on the LGA-775 processor socket

A few systems are using a new Intel CPU.
The new **LGA-775** processor socket is technically configured so that the contact between the socket (pins) and the CPU (contact points) can be made with adjacent contact pins.

Caution! Conventional 478pin processors may **not** be used. If the current processor is to be changed to a 775pin processor, this must be done very carefully, if possible by technically qualified personnel.

2.3 The working memory

For the internal exchange of data, the PC requires somewhere to temporarily store information. This is done in the working memory, also called the main memory. The working memory can be accessed very quickly and at any time. However, its content is lost when the power is turned off.

2.4 Slots

The **slots** for expansion cards are located on the motherboard. There are the following slots:

for modems
AMR (**A**udio **M**odem **R**iser)
CNR (**C**ommunication **N**etwork **R**iser)

for graphics cards
AGP (**A**ccelerated **G**raphics **P**ort) In the near future these slots will be replaced by
PCI (**P**eripheral **C**omponent **I**nterconnect) **Express X16**

for other cards, e.g. multimedia, TV card, modem, the **PCI slots** are available. The trend is towards **PCI Express X1.**

Slots for memory modules to equip the working memory, so-called **DIMM sockets** (abbreviation for "**D**ual **I**n-Line **M**emory **M**odules", memory modules with two rows of contacts) are also components of the motherboard. The memory banks can be equipped with the following ***memory modules***:

- **SD RAM**, 168 pin (**S**ynchronous **D**ynamic **R**andom **A**ccess **M**emory). This memory type synchronises itself with the system clock, which controls the processor. This prevents delays when accessing the memory. It works in synchronisation with the external CPU clock.
- **R-DRAM** (**R**ambus**-D**ynamic **R**andom **A**ccess **M**emory) also known as **RIMM** (**R**ambus **I**nline **M**emory **M**odule). This memory uses a special serial memory organisation, which was developed by the company RAMBUS. With this principle, the R-DRAM modules **must** be placed in pairs. Empty RIMM slots **have to** be populated by so-called **CRIMM**s (**C**ontinuity **RIMM**). The CRIMMs prevent an interruption in the signal lines, which are a serial connection in a RAMBUS interface, and therefore ensure that the direct RAMBUS channel functions correctly. If you want to upgrade the system memory at a later date, you can remove the CRIMMs and replace them with **RIMM**s.

  When installing **RIMM**s, you must observe certain rules, in order to achieve optimum system performance.

  The RIMM slots are divided into two banks:
  - Bank 0 (RIMM slots 1 and 2)
  - Bank 1 (RIMM slots 3 and 4)

  Bank 0 **must** always be populated first, in order to ensure that RIMMS are installed in RIMM slots 1 and 2. The memory configuration (speed, number of chips, size and density) of the RIMMS installed in Bank 0 and Bank 1 must be identical.
- **DDR SDRAM**, 184 pin (**D**ouble **D**ata **R**ate **S**ynchronous **D**ynamic **R**andom **A**ccess **M**emory). This memory type uses a technology that works with both sides (flanks) of a clock pulse

to process data. This means that two memory access actions are realised per clock pulse, thereby achieving double the transmission rate.

With some memory modules, the configuration of the memory banks is dependent on the motherboard's chip set. Information on this can be found in the motherboard documentation.

Detailed information about slots and the BIOS can be found in the documentation for the motherboard.

2.5 The graphics card

The graphics card is a hardware component of the computer, which allows information to be processed and displayed on a monitor.

As digital data is used inside the PC, while traditional tube monitors only work with analog signals, the fundamental task of the graphics card is to convert the digital information from the PC into analog signals for the monitor.

Recently, flat-screen monitors with DVI digital input (**D**igital **V**isual **I**nterface) have come into use. These devices process the digital image signal directly in the monitor.

The essential components of a graphics card are the graphics processor, the memory, the RAMDAC (**R**andom **A**ccess **M**emory **D**igital **A**nalog **C**onverter), the internal bus and the interfaces to the motherboard, monitor and possibly a TV.

The graphics card is inserted in a specially designed AGP (**A**ccelerated **G**raphics **P**ort) or **PCI Express X16** slot on the motherboard. The graphics card may also be integrated on the motherboard ("graphic on board").

For low-fatigue work on the PC, it is important from an ergonomic point of view that the refresh rate is set correctly. Even at high resolutions, this should not be below 85 Hz.

Modern screen designs use the "Plug and Play" function to set the optimum parameters automatically. To do this, they use the DDC (**D**isplay **D**ata **C**hannel). If the monitor and the graphics card are DDC-compatible, they exchange their information via the operating system and adjust to one other optimally.

Please follow the instructions in your monitor's user manual.

Games and graphics applications can take up a great deal of memory. It is not only the speed of the CPU that is crucial for problem-free running, but also the size of the graphics card memory. The capacity of the available graphics memory is crucial for the number of colours and their resolution that can be displayed, as the colour information for the red, green and blue (RGB) colour elements must be provided for each pixel. Graphics cards with a low memory capacity only have a limited range of colours. Essentially, the resolution of a graphics card depends on the graphics card memory, the refresh rate and the colour depth. The higher the resolution and colour depth, the lower the refresh rate.

i **Our tips and hints …**

... for setting the screen refresh rate (refresh rate)

Click on "**Start**" **–** "**Control panel**". In this menu click on "**Switch to standard view**". Double click on "**Display**". Under "**Settings**", click on "**Advanced**" and then on "**Monitor**". You can then set the "**Screen refresh rate**".

... to change the graphics card

The broadband data bus "**PCI Express**" will be used with the launch of the "**Intel® 915P**" chip set generation located on the motherboard, which was developed under the code name "Grantsdale". If your system is fitted with a **PCI Express graphics card**, please note that you may only use PCI Express cards. AGP graphics cards may **not** be installed as there are no AGP slots available.

... for the memory settings of your graphics card

If the graphics card is on board, a section of the working memory is used as a graphics card memory.

If, for applications that use a lot of memory (games etc.), it should be necessary to expand the graphic memory, then it is possible to change it in the BIOS. The motherboard manual describes how you can change the memory capacity. If the process is not described, it is not possible to adjust the graphic memory. If you are still in any doubt, contact the Hotline.

In general 64 MB of graphic memory is the default setting.

Caution! The memory capacity set for the graphics card is subtracted from the main memory capacity of your system.
E.g. 256 MB (main memory) – 64 MB (graphics memory) = 192 MB (available main memory)

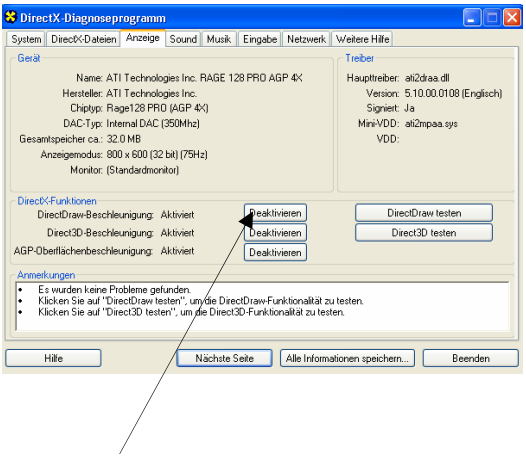
... for setting the "DirectDraw" function

Problem: During a PC session you play the same, memory-intensive 3D game. You have closed the game down properly. The second time you run it, "the computer crashes".

You can put this right as follows:

The program "**Dxdiag.**" with the 

icon can be found under **C:\WINDOWS\SYSTEM32**. Double click on the icon and select the "**Display**" tab. The following screen will appear:



Deactivate the **"DirectDraw acceleration"** function.

... on connecting and the settings for a second screen output device (TV, monitor)

If your PC is equipped with a second screen connection, this is generally located on the rear of the PC; it can be that after a driver is reinstalled the playback screen of the second output device (monitor or TV) may be dark. This may happen if you have downloaded and used a new driver version from the Internet. The standard default for the driver is only configured for one screen output device.

If you wish to use the second output, note the following from the user manual of the 2nd device:

- Which settings and which sockets do I need to use to run the device as a monitor for example?
- What television standard is for example the TV set to?

If the user manual is no longer available, contact your dealer or a television specialist in your area.

Now proceed as follows to use the second output device:

- Switch the PC and both screen devices off. Connect the screen devices to the PC. Turn the screen devices on, followed

by your PC, and then make the following settings on your computer:

- Right click on the desktop and then click on "**Properties**"
- In the "**Display properties**" window click on "**Settings**" and then on "**Advanced".**
- The settings specific to the graphics cards will appear. One or more tabs with the name of the VGA card installed will be shown.
- Refer to the documentation for the graphics card installed in your PC for the advanced settings for two display devices. You will find the documentation for your graphics card under: "**Start**"**-** "**All Programs**" "**Online Documentation**" *or* "**Manuals**".

In the documentation you will find a number of settings which will enable you to work easily with two screens.

Note: If your TV set model is too old or other settings have been made, either no picture will appear or only a black and white picture.

2.6 TV cards

The TV function in the PC is gaining in importance. If your PC is already fitted with a TV card or if you would like to fit one in it, we would like to inform you of a few basic details at this point.

The TV cards required for TV reception via a PC can be divided into two groups – in analog and digital signal-processing modules. Both modules are designed on the basis of the MPEG standard, but differ in the signal processing. TV cards are also available as combined versions.

MPEG is the abbreviation for "**M**otion **P**ictures **E**xperts **G**roup". File formats and processes for compressing and saving video and multimedia data (video, picture and audio data) in high quality were and are being established by this organisation.

Analog TV cards

With analog television, the picture and sound information to be transmitted is prepared according to a modulation process and forwarded on in wave form in a medium such as air or via a cable. This requires an analog TV card with analog antenna input.

Digital TV cards

A digital TV card is required to receive digital programmes via the PC. The signal is transmitted according to the standard for the compression of TV signals, MPEG-2 (Motion Pictures Experts Group, 2nd standard).

The digital technology packs the data as binary code in data packets which are then decoded again by the receiver. This decoding is carried out by the DVB card in the PC.

There are three options for receiving digital television

- DVB-C (**D**igital **V**ideo **B**roadcast-**C**able) reception via cable
- DVB-T (**D**igital **V**ideo **B**roadcast-**T**errestrial) reception via antenna
- DVB-S (**D**igital **V**ideo **B**roadcast-**S**atellite) reception via satellite

The reception quality is much better with DVB cards. As the digital programmes are transmitted in MPEG-2 format, the TV programme can also be processed directly on your PC hard disk.

A further difference is in the decoding of the MPEG stream. Differentiation is made between TV cards with hardware MPEG and TV cards with software MPEG.

- With hardware MPEG, the processing power is undertaken by a chip on the TV card. This means that there is practically no involvement of the PC's CPU. The majority of the CPU's processing power remains available for other applications.
- With software MPEG, the CPU is responsible for the processing power. Under some circumstances this may lead to the CPU being noticeably overloaded.

Our tips and hints …

... on DVB-C reception via cable

Find out from your cable provider which programs you can receive digitally.

... on DVB-T reception via antenna

This reception option is one of the most modern signal transmission technologies for TV reception and is still not available everywhere. Find out from your dealer or via the Internet whether you have the option of using DVB-T television.

... on retrofitting

Before considering retrofitting, you must decide how you would like to predominantly use your PC.

2.7 The soundcard

It is no longer possible to imagine many applications without sound, e.g. DVD films, TV, games, Internet radio etc.

Soundcards convert digital signals into analog signals that can be processed by speakers or amplifiers (DA converter). When recording, e.g. with a microphone, analog signals are converted into digital signals (AD converter).

The most important components of the soundcard are: Synthesiser (sound generator), AD/DA converter (**Analog D**igital / **D**igital **Analog** converter) for recording and playing back sounds. Connections for headphones or speakers and a microphone are integrated.

By default the output signal for sound playback is an **analog** signal at the corresponding connection socket. In some configurations, it is also possible to use the sound signal as a **digital** signal. The **SPDIF** (**S**ony **P**hilips **D**igital **I**nter**F**ace) connection is available for this purpose.

There are two options for processing and playing back sound on our PC systems:

- using a soundcard
- Sound on Board

Sound processing and playback using a soundcard

The soundcard is inserted into one of the PCI slots. In this variation, the original manufacturer's CD is normally supplied. This CD contains the necessary drivers, programs and documentation.

Caution! If it is necessary to restore your system, you should install the drivers and programs from the CD accompanying the soundcard, as described in the **"System recovery" manual** supplied.

- **Soundcard and SPDIF**
  You will be able to tell if **SPDIF** is available on the soundcard by the cinch socket or the digital optical sound connection labelled with **SPDIF**. If you want to use this signal, you will need a speaker system with a decoder that can process digital signals. With a digital optical sound connection you will require a loudspeaker system with decoder which has digital optical input. Make sure you follow the operating instructions for the decoder.

- **Using the multi-channel audio function (optional)** If you want to find out more about the possibilities of multi-channel sound, you will find the corresponding information in the soundcard documentation.

"Sound on Board" sound processing and playback

If your system is equipped with "Sound on Board", then the AC97 sound standard (**A**udio **C**odec 97) or the new **Intel® High Definition Audio (HDA)** sound standard are available to you.

AC97(**A**udio **C**odec 97)

This is processed by a **Codec** chip (**Co**der **Dec**oder) which is located on the motherboard. The AC97 sound standard is implemented by various chip manufacturers using the corresponding drivers and the associated programs.

HDA (Intel® **H**igh **D**efinition **A**udio)

The new **HDA** sound standard, developed under the code name "Azalia" will be introduced with the new "**Intel® 915P**" chip generation. This new audio standard will soon supersede the AC97 standard. It offers considerably improved recording and reproduction properties. The automatic assignment recognition of the audio sockets is new. When you assign an audio socket, the menu for the "**Realtek**" player automatically appears with the associated "**Audio Wizard**".

With this audio standard, the majority of the processing work is assigned to the main processor. It is responsible for synthesiser functions and mixes the digital data. The audio data is then converted and sent to a Codec. This then converts the data into audio signals.

In the recording direction, the Codec digitises the data and the processor is then responsible for converting the data into appropriate file formats and sampling rates. In the analog section, Codecs are also responsible for the mixing of other inputs and outputs such as those for the PC speakers, the microphone or the CD player.

- **"Sound on Board" and SPDIF.**
  If sound is "on board", consult the motherboard description to find out whether a connection for **SPDIF** is available on the board. If you want to use this signal, you will need a speaker system with a decoder that can process digital signals. Make sure you follow the operating instructions for the decoder.

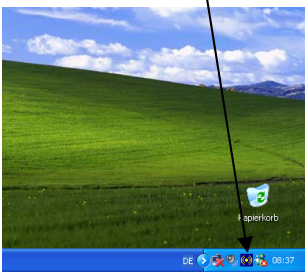
- **Using the multi-channel audio function (optional)**
  If your motherboard is equipped with an appropriate Codec chip, you can use the multi-channel audio function. In general, the drivers for the Codec chip are linked to a program, which allows you to make the appropriate settings. If this function is available, you will find the corresponding manufacturer's information in the motherboard documentation.

Our tips and hints …

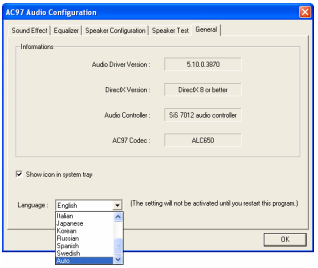
... Example AC97 setting

Below, we illustrate how to make the appropriate settings using the example of the "ALC 650" Codec chip for AC 97.

1. Click on the icon in the bottom right of the task bar.

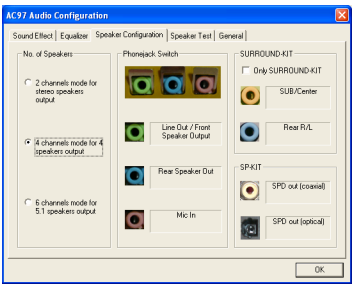


2. The following screen will appear. You can then select the language. Confirm with "**OK**".

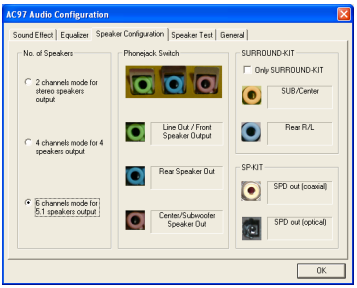


3. If you then select the "Speaker Configuration" tab, you can activate the desired 2, 4 or 6-channel mode. This program also shows the connections for the speakers.

4-channel



6-channel



... Example of the HDA setting

When you use an audio socket, the menu for the "**Realtek**" player automatically appears with the associated "**Audio Wizard**". The socket in use flashes.

Fig.1: Front of the PC

Fig. 2: Rear of the PC

The appropriate socket can be configured here.

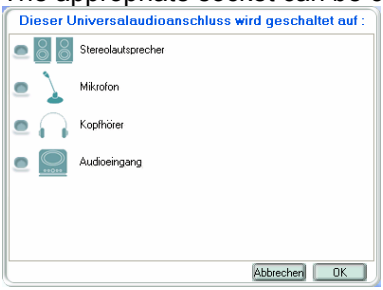


Fig. 3
Here you can select the audio equipment which you have connected to the front of the PC.

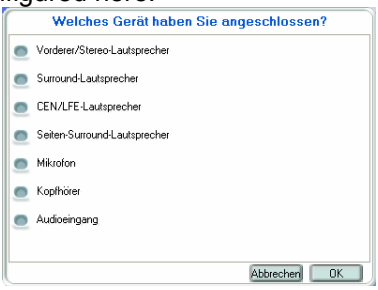


Fig. 4
Here you can select the audio equipment which you have connected to the rear of the PC.

Should a socket be incorrectly used, the system will direct you to the right socket using an animated arrow (see fig. 5).

Fig. 5

... for testing the microphone connection

Some system configurations are supplied with an activated front microphone connection as standard.
If the microphone connection is not working, you should check whether the microphone connection is activated.

- Right click on the "**Speaker icon**" in the "**Task bar**".
- Click on "**Adjust audio properties**". "**Sound and audio equipment properties**" appears.
- "**Recording control**" appears under "**Voice**" **–** "**Voice recording**" **–** "**Volume**". Check whether the microphone is activated.
- Close "**Recording control**" and click on "**Test hardware**". Follow the instructions for the test.

... for changing the microphone connection from a front microphone connection to a microphone connection on the back of the PC

If you want to make use of the option of using the microphone on the rear of the PC, the procedure is as follows:

- Double click on the "**Speaker icon**" in the "**Task bar**".
- In "**Playback control**" / "**Volume control**", click on "**Options**". Activate "**Advanced controls**". Click on "**Properties**" in this window. Select "**Recording**" and confirm with "**OK**".
- Under "**Microphone**", go to "**Advanced**". "**Advanced controls for microphone**" appears. In this window, deactivate "**Mic 2**

Select" or "**Alternative microphone**" and close the open window.

This setting activates the microphone connection on the rear of the PC. (if necessary test as above)

2.8 Modem and ISDN card

MODEM

Modem is an abbreviation for "**MOD**ulator/**DEM**odulator". The modem is a remote data transmission device, which

- establishes a connection to a remote station,
- converts (modulates) signals coming from the computer into sounds,
- sends these to the remote station,
- and, used on the other end of the line, reconverts (demodulates) the sounds received into machine-recognisable signals.

There are countless standards – protocols – for modems to ensure that they can communicate with one another. These standards are defined by the CCITT (**C**omité **C**onsultatif **I**nternational **T**élégraphique et **T**éléphonique).
The most recent analog modem standard V.92 was confirmed by the ITU (**I**nternational **T**elecommunication **U**nion). Downstream communication is unchanged at 56 kbit/s. The three most important improvements compared to the V.90 standard that is widely used today are:

- Upload at up to 48 kbit/s possible (only 33 kbit/s with V.90)
- Faster connection setup
- Supports the "**modem on hold**" function. This means that when you receive a telephone call while online, you will be notified. The modem function will be "parked" and you will be able to return to your Internet function once you have completed your phone conversation.

If you want to use this standard and your modem is compatible with this standard, then find out from your provider whether they support V.92.

i **Our tips and hints …**

... for setting the country code

When dialling country and area codes, WindowsXP uses the settings that are entered under "Telephony" in the Control Panel.

After installation of Windows a country, e.g. "United Kingdom", may already be entered under Location/Country. This may lead to wrong numbers being dialled when using the modem. Before using your modem for the first time, you should therefore change this setting to the country in which you are running the PC and by entering the appropriate number under "Area code".

For example, for the United Kingdom, the procedure is as follows:

- Open "**Start**" / "**Control Panel**" / "**Printers and other hardware**" / "**Telephone and modem options**".
- Select the "**Dialling rules**" tab, by double clicking on "**New location**" under Location. "**Edit location**" appears.
- Under "**Country/Region**" select "**United Kingdom**" and enter your local area code under "**Area code**", then click on "**Apply**" and confirm with "**OK**".

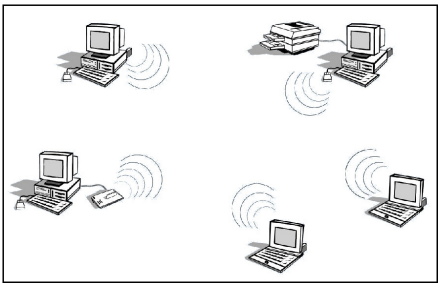
ISDN

ISDN is the abbreviation for **I**ntegrated **S**ervices **D**igital **N**etwork. ISDN cards are used to establish a data connection between any two compatible terminals. In contrast to a modem, these terminals (ISDN cards) work on an exclusively digital basis (no modulation/demodulation). Data transmission takes place on two channels, each at 64kbit/s. These channels are known as B channels. A further channel known as the D channel is responsible for the exchange of control signals for the transmission terminals.

2.9 Wireless LAN (WLAN)

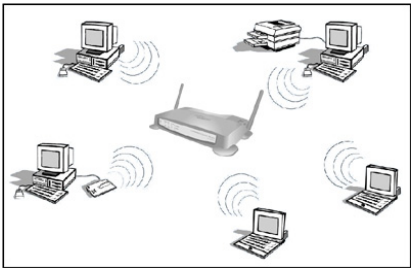
WLAN stands for **W**ireless **L**ocal **A**rea **N**etwork, i.e. a cable-free network. The IEEE standard 802.11(**I**nstitute of **E**lectrical and **E**lectronics **E**ngineers) for wireless LANs (WLANs) offers two configuration methods for wireless networks, the ad-hoc mode and the infrastructure mode.

Ad-hoc mode (peer-to-peer work group)



In an ad-hoc network, individual computers are connected to each other as required. In other words, there is no fixed structure or fixed points in the network. As a rule, any node may communicate with any other node. In this configuration there is no AccessPoint. This enables a small WLAN work group may be quickly established. The individual members of the group can exchange data with each other and share printers, as permitted by the Microsoft network functions of the various Windows operating systems. A few providers also refer to an ad-hoc network as a peer-to-peer network. In this configuration, data packets are transmitted directly from a transmitting to the corresponding receiving station. Insofar as the individual stations are located within its respective range, this is the most simple and least costly method of establishing a WLAN.

Infrastructure mode (AccessPoint)



With a wireless AccessPoint your can operate a WLAN in the infrastructure mode. You may then connect a wireless connection to several wireless devices within a specified area or the range of the AccessPoint. Communication with the wireless nodes is via an antenna. In infrastructure mode, the wireless AccessPoint converts the data transmitted in the form of radio waves into Ethernet data and thereby forms the bridge between the individual wireless clients and the wired LAN. By connecting several AccessPoints via an Ethernet backbone, the range of a wireless network can be expanded. If a mobile device falls outside the range of an AccessPoint, it falls within the range of another. This means that wireless clients can be moved freely from the domain of one AccessPoint to the next, thereby maintaining a wireless connection to the network.

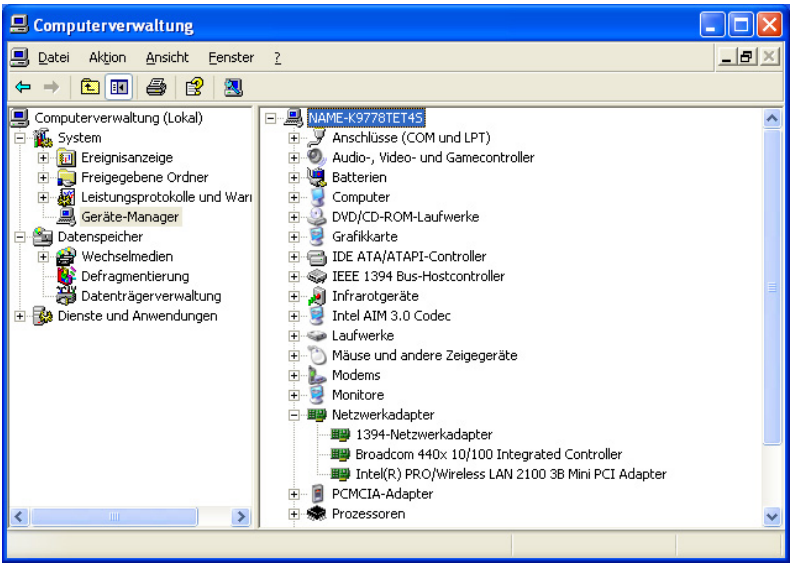
Our tips and hints …

... on establishing WLANs

Checking the hardware and drivers

Switch your WLAN adapter on. The operating instructions for your device will tell you where to activate the WLAN function.

Proceed as follows:
Click on "**Start**" > "**Control Panel**" > "**Performance and Maintenance**" > "**System**" > "**Hardware**" > "**Device manager**".
Double click on **Network adapter**.



Caution! The name of the WLAN adapter may differ from device to device.

Should a yellow exclamation mark or a red cross appear against the listed WLAN adapter, there is a resource conflict or an incorrect configuration.

When you double click on the WLAN adapter, you will see its properties such as manufacturer, driver version and date as well as resource settings.

... for configuring a WLAN connection

1. Click on "**Start**" > "**Connect with**" > "**Wireless network connection**". The following window will appear.

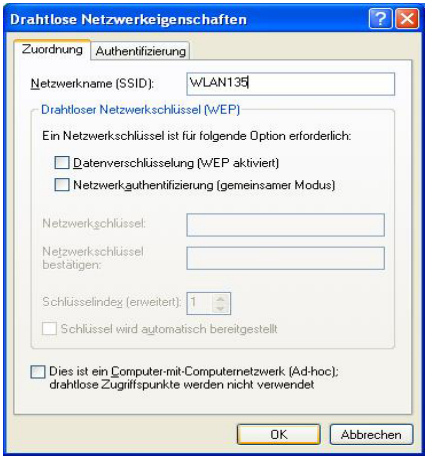
   Should there be another WLAN device in range, this will be displayed in the list of "**available wireless networks**" as shown here **in the example**. The displayed name "CONNECT2AIR" represents the device's **SSID**. This may be anything.

2. To connect with this network, activate the function: "**Facilitate connection with wireless network even when the network is not secure**" and click on "**Connect**". The connection will then be established to the existing network.

   Should the list be empty, then no WLAN device was found in the vicinity or the other device was configured as "hidden".

3. Click on "**Advanced…**". The following appears:

4. Activate the function **"Use Windows to configure the settings"**. Click on **"Add"**. The following appears:



5. Enter the SSID in the "**Network name (SSID)**" field of the device to which the connection is to be established. The network names (SSID) can be obtained from the operator of the receiver.

   If the connection requires data encoding, activate the function "**Data encoding**" and enter the required key in the "**Network key**" field.

6. Click on "**OK**".

To connect **two WLAN devices** with each other in ad-hoc mode, execute the specified steps for both devices and enter the same SSID in this window. Activate the function "**This is a computer-to-computer network; wireless access points are not used**". Click on "**OK**".

This display will appear in the task bar next to the clock after successful connection:

The signal strength displayed may vary due to external influences.

If you double click on the active connection (both screens in the task bar), a window containing status information will appear. This may differ depending on the network setup.

This completes the establishment of the WLAN connection.

2.10 Drives

Device, which can write and read storage media such as diskettes or hard disks, in order to save data permanently, i.e. even after the power is turned off.

2.10.1 Floppy disk drive (optional)

Your computer is optionally equipped with a floppy disk drive.

A diskette is a thin, flexible plastic disc, which is coated with a magnetic substance. This is then placed in a more or less stable housing. Diskettes are also called "floppies" or "floppy disks". They can be used to:

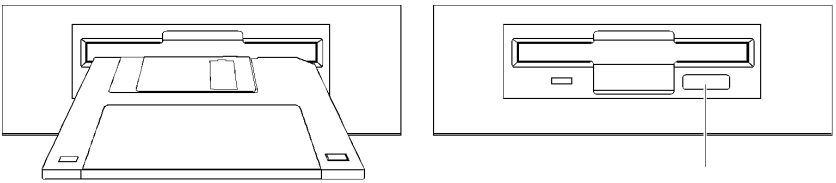
- Transfer information from one computer to another and to
- Create backup copies of the files and software on the hard disk.

Standard floppy disk drives can read and write to 3.5” diskettes, which can store up to 1.44 MB of data.

The table below shows which formats can be processed:

		Comment
DD	720 KB	
HD	1.44 MB	
ED	2.88 MB	Motherboard dependent and special floppy drive required

To work with a 3½" disk, insert it into the drive with the label facing upwards and the read/write slot first. To remove the disk, press the eject button; the disk can then be removed.



3½" drive

Caution! The LED on the disk drive will light up while the diskette is being accessed. The disk drive should not be opened and the diskette must not be removed while the LED is illuminated. This could damage the diskette and the disk drive.

2.10.2 Hard disk

The hard disk is a rigid disc, which is coated with a magnetic substance and protected by a metal housing (hard disk drive). A hard disk drive essentially consists of several discs, a spindle motor, read/write heads and a device for positioning the head. The hard disk is located inside your computer, but it can be exchanged.

Hard disks work in accordance with ATA (**A**dvanced **T**echnology **A**ttachment). This describes the protocol in accordance with which the data is transported via the cables. ATA is a drive specification for hard disk connections defined by ANSI (**A**merican **N**ational **S**tandard **I**nstitute).

There are two types in our PCs:

- For hard disks, the widely used **IDE** (**I**ntegrated **D**rive **E**lectronics) connection standard (40-pin) is used on the motherboard. The IDE connection is also called PATA (Parallel ATA). This standard PC interface is primarily used for optical drives and hard disks.
- Another connection option for hard disks is the use of the SATA (Serial ATA) interface (4-ping), if this is available on the motherboard.

The hard disk is your computer's main storage medium and you can make your work easier and more productive by copying your applications and files onto your hard disk. You can copy files to the hard disk or delete them from it as often as you want.

The hard disk drive should be handled with great care, as it is very sensitive.

i **Our tips and hints …**

... for expanding your system

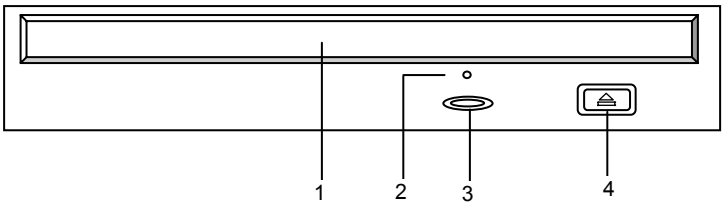
If you wish to install an additional hard disk, refer to the motherboard description to determine which connection options are available.

2.10.3 Optical drives

Front view

This is a basic overview of the controls. The manufacturer reserves the right to make technical changes / reconfigure the controls.

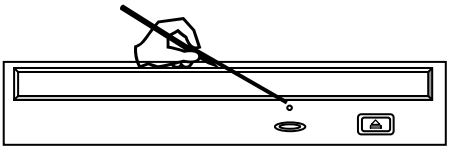
Basic diagram



1 Drive cover
This cover prevents dust entering the drive. It opens and closes automatically when the Open/Close button is pressed. To avoid damage to the mechanism, no force should be exerted when pushing in the drive.

2 Opening for emergency ejection
A thin object (e.g. paper clip) inserted in this opening can be used to eject the CD if this is no longer possible in the normal way due to a power cut or software block.

If a motor-driven ejection of the drive (power cut, software block) is not possible, proceed as follows to eject the CD:



Insert a thin item (e.g. a straightened paper clip) into the emergency ejection opening and press carefully until the drive opens. Pull the drive out by hand and remove the disk.

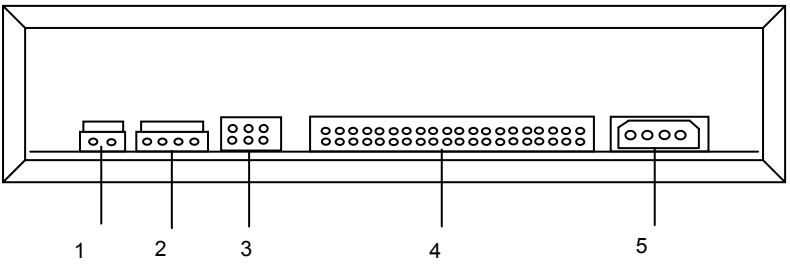
This function is intended for emergencies only. To avoid mechanical damage, this function should not normally be used.

3 LED Indicates when the drive is being accessed (Read/Write)

4 Button to open/close the disk drive (Eject)

Rear view

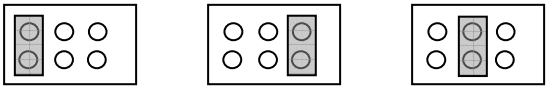
Basic diagram



1 Digital audio output
A cable for the transmission of digital audio output can be connected to this output. This function is not supported with this drive.

2 Audio output (Line Out)
A cable for analog audio output can be connected to this output. (Connection to sound card).

3 Jumper
The CD-ROM drive is configured via jumpers. These determine how the device will be addressed by the IDE controller. If the jumper is set to Master, the device works in Master mode, to Slave in Slave mode. If the jumper is set to CSEL, the device can be controlled with the help of the CSEL interface signal (**C**able **SEL**ect).



CSEL Master Slave

4 IDE connection
This socket is used for the connection of a data/control cable. This 40-pin ribbon cable connects the CD-ROM drive and the IDE controller.

5 Power supply connection
The power supply cable will be connected to this socket.

Types

There are different types of optical drives:

- CD-ROM drive
- CD-RW drive
- DVD drive
- DVD+RW drive
- DVD ±R/RW drive
- DVD+R9 or DVD+R DL drive (double layer)
- DVD/CD-RW drives

CD/DVD data carriers

The CDs/DVDs available in the market correspond to different standards. Not every CD/DVD can be read by every optical drive.

CD-ROM

Abbreviation for “**C**ompact **D**isk - **R**ead **O**nly **M**emory”. A CD ROM is a CD storage medium, on which up to 700 Mbytes of digitised data is stored. However, this data cannot be changed and can only be read by an optical drive. In principle, CD-ROMs are read in the same way as audio CDs but cannot be used in audio equipment.

CD-R

Abbreviation for "**C**ompact **D**isk **R**ecordable". A CD-R can only be written once. Once a CD-R has been finalised, it is no longer possible to delete or edit the content of the CD-R.

CD-RW

Abbreviation for "**C**ompact **D**isk **R**e**W**ritable". A CD format that allows you to write to a CD any number of times using a CD-RW drive. You can then read the information as often as you wish. The CD-RW can be compared to a floppy disk, as it can be used for the repeated storage of data.

Not all older optical drives can read CD-RWs.

DVD

Abbreviation for "**D**igital **V**ersatile **D**isk" or "**D**igital **V**ideo **D**isk". A DVD is a storage medium, similar to a CD, but with a higher memory capacity, which is achieved by narrower tracking. A DVD can be used in two positions, and on both sides (depending on the type), which means that the memory capacity can be 25 times that of a CD.

Because of the high memory capacity, DVD is particularly well suited for digitised films with additional features such as different languages or subtitles.

For DVD films, so-called regional codes were introduced in 1997, which are intended to prevent e.g. US DVDs from being

able to be played on European equipment and vice versa. For this purpose, the world was divided into six regions:

1. USA, Canada
2. Japan, Europe, Middle East, South Africa
3. South-east Asia
4. Australia, South and Central America, New Zealand
5. Africa, former USSR, India
6. China

DVD drives resemble CD-ROM drives and are downwards compatible, which means that they can also read CD-ROMs, CD-RWs and audio CDs.

DVD+RW drive

Like CD-RW drives, DVD+RW drives can both read and write storage media. Rewritable (RW) DVD+RWs are used. At 4.7 GBytes, DVD+RWs offer a memory capacity equivalent to around seven times that of a normal CD-ROM.

For the user, these drives make it possible to transfer and archive their own VHS videos, record their own videos using a digital video camera or save data quantities that are too large for CD-ROMs.

DVD ± R/RW drive

These drives enable you to use both recording processes (DVD+R/RW, DVD-R/RW).

DVD+R9 or DVD+R DL drive (double layer)
(**D**igital **V**ersatile **D**isc **+ R**ecordable **9** Gigabytes)

These drives are equipped with the new double-layer DVD recording technology. The writing of a second layer onto the DVD blank doubles the maximum data capacity from the 4.7 GB of conventional DVDs to 8.5 GB on a one-sided DVD.

i **Our tips and hints …**

... on playing DVDs with WinDVD Player

With some DVD films, you may find that the picture freezes. A possible solution to this problem is that you need to disable "**Accelerated hardware decoding**".

To do this, use the following setting:

- Right click while WinDVD Player is open.
- In the subsequent menu, click on "**Setup**" and then on "**Video**".
- Deactivate:
  "**Use accelerated hardware decoding**" (remove check mark).
- Click on "**Apply**" and then on "**OK**". This completes the process.

... for activating/deactivating properties of optical drives (e.g. AutoPlay function)

If it is necessary to modify the autostart (AutoPlay) function of DVD/CD-ROM drives, you can do this as follows:

- Right click on "**Start**" and select "**Explorer**".
- Right click on the **drive** whose autostart function you want to edit.
- Left click on "**Properties**".
- In the menu that then appears, select the "**AutoPlay**" tab. You can then set an action according to the content (content type) of the CD-ROM/DVD.

  Caution! Note that you must select the actions individually for each "**Content type**" and confirm with "**Apply**".

... for the use of regional codes

If your system is equipped with a DVD drive, please note that the regional code can only be changed a maximum of **five times**. After

the fifth time, the code is retained as a permanent code; you should therefore be **careful** about changing it. If you set the same regional code as in the last installation, this is not registered as a change. This process is determined on the hardware side and cannot be cancelled using software.

Before buying a DVD video, you should check that the regional code on the DVD video matches the code set on your PC.

... for using the correct blank DVDs

There is not a general standard for burning (writing) DVDs currently. The most common recording methods for DVD burners are: DVD+RW, DVD-RW and DVD-RAM. Although the technologies are similar, each of these formats requires specific blank DVDs and is based on a separate recording technology.

With most burning programs, you can find out under "Properties" or "Infotool" which blanks can be used.

We recommend that on systems with Fujitsu Siemens Computers DVD burners, the following blank DVDs be used:

DVD+RW rewritable blank DVDs or
DVD+R non-rewritable DVDs.

3 Software

3.1 General Information

Software is a chain of logic operations that tells the hardware, which operations are to be executed. These logic operations are known as programs. These programs consist of commands and instruction sequences. These are processed electronically in bits and bytes.

A bit is the smallest unit of electronic information. As it is very complicated to handle individual bits, 8 bits are combined in a byte. The byte is the basic unit of measurement in the computer world.

i **Our tips and hints …**

... for data backup

- Create backup copies of your work files on a regular basis. This is the only way to protect against data loss, e.g. in the event of a hard disk fault.
- No liability shall be accepted for loss of data.

... for installing programs

Before installing new programs, close all applications.

After installing programs, you should always restart your computer, even if you are not prompted to do so.

... for installing programs with and without the Autostart function

The fact that the Autostart function is not active can be due to Properties having been automatically edited when installing programs, e.g. a burning program or DVD player. If the Autostart function is activated, system errors may occur under certain

circumstances when blank CDs are inserted. Leave the Autostart function for the CD-RW drive (burner) deactivated.

... for driver installation when restoring your system

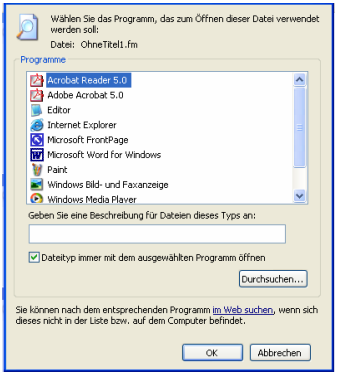
If you should need to re-install your system, we urgently recommend that, as far as possible, you backup all files before complete reinstallation.

If you have carried out your complete reinstallation using the "Product Recovery CD ROM" and the "Drivers & Utility CD/DVD", as described in the general user manual, and one of the components of your system is still not working, you can put this right, provided that it is a driver problem and there is no mechanical damage.
To do this, proceed as follows:

- Insert the "Drivers & Utility" CD/DVD in the appropriate drive. After the CD/DVD auto-starts, the "Fujitsu Siemens Help Center" appears. Close this with "**Exit**".
- With the "Drivers & Utility" CD/DVD inserted, click on "**Start**".
- Right click on "**Desktop**".
- Click on "**Properties**". "**System properties**" appears.
- By clicking on "**Hardware**" you can open up the "**Device manager**".
- The "Device manager" shows an overview of your computer's hardware. This is where you can update the drivers (or the software) for hardware devices or change the hardware settings.
- The faulty driver is normally indicated by a yellow question mark (**?**).
- Right click on this line.
- Select "**Update driver**" in the menu that appears.
- Continue with "**Install software automatically (recommended)**" and confirm with "**Next**".
- If necessary, follow the instructions on the screen.

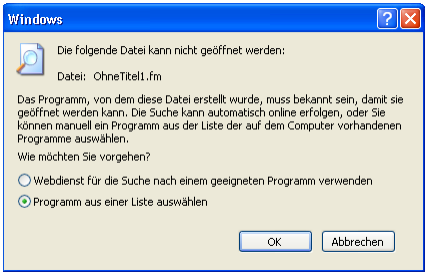
... for automatically opening files of the same format

Right click on a file icon (e.g. with the file extension **.jpg**). Select "**Open with**" and click on "**Select program**". The following screen will appear:



Here, you can assign a file type to a program which you want to use to open files of that type. If you want this file type to always be opened using the selected program, use the mouse to enter a check mark in "Always use this program to open these files".

If the following screen appears when you open a file, select the option "**Select program from list**" and confirm with "**OK**".



The first screen shown then appears. You may then proceed as described above.

Caution! Only file types supported by the selected program may be opened. Consult the appropriate program documentation for details of the file formats supported.

If you still cannot open the document, you must install a program that can process that file format.

3.2 The operating system

The operating system is the "organiser" of your computer; the operating system coordinates all functions e.g. for the graphics card, the soundcard, the modem the network card and the external devices using drivers.

If your operating system should fail to start, or if faults should occur on your hard drive, it may be necessary to reinstall the pre-installed software.

Computers from our company are supplied with a pre-installed "**Microsoft® Windows® XP Home Edition**" operating system as standard.

On your PC, you can find the registration code label as proof of the legitimate purchase of the "**Windows XP**" operating system. This registration code is not necessary for **any** reinstallation variation of the operating system, as it is a **BIOS-locked OEM** version. You should therefore only use BIOS versions that have been certified by Fujitsu Siemens Computers.

With the **BIOS-locked OEM** version, which you have purchased with your Fujitsu Siemens computer, it is not necessary to activate the "**Windows XP**" operating system. Registration is optional. For details, see the manual "**Microsoft® Windows® XP Home Edition - Getting Started**".

In case of a problem, you can restore the system to its status on an earlier date, without losing personal data files (e.g. documents, Internet favourites and e-mail). Windows XP system recovery monitors changes to the computer and generates easily identifiable recovery checkpoints on a regular basis. These recovery checkpoints allow you to restore the system to its status at an earlier point in time.

Our tips and hints …

... for creating a restore checkpoint

- Click on "**Start**"/"**Control Panel**"/"**Performance and Maintenance**" and then on "**System recovery**".
- Select the option "**Create recovery checkpoint**" and then click on "**Next**".
- In the field "**Description of recovery checkpoint**", enter a name to identify this recovery checkpoint. The system recovery automatically adds the date and time when the checkpoint was created to this name.
- Click on "Create" to complete this process.

... for restoring the system to a previous status

- Click on "**Start**"/"**Control Panel**"/"**Performance and Maintenance**" and then on "**System recovery**".
- Select the option "**Restore computer to a previous point in time**". Confirm with "**Next**". The checkpoint can be selected in the subsequent screen.
- If you have any questions or require further help, you should use the comprehensive "**Help and Support Center**", by clicking on the question mark in the top right of the screen.
- You can also create and name your own recovery checkpoints at any time.

3.3 BIOS

BIOS is the abbreviation for "**B**asic **I**nput **O**utput **S**ystem". The BIOS is the hardware-specific core of an operating system, which is not deleted when the system is turned off and is located in the EPROM. Data is written to this chip once, can only be read by the computer, and can only be changed at a later date using special programs (Flash-BIOS). Each time the computer is turned on, the BIOS first of all runs a self-test. The computer then uses the BIOS to start the operating system and to control the stream of data between the hard disk, graphics card, keyboard and printer, until the operating system takes over this task.

i **Our tips and hints …**

... for using the BIOS

The BIOS is tailored to the specific demands of the system by the manufacturer. Therefore, only the BIOS approved and certified by the manufacturer should be used.

Current BIOS updates can be found at: www.fujitsu-siemens.com

... accessing the BIOS

In its delivery state, the BIOS is optimised such that a very short boot time is achieved. To access the BIOS setup, immediately after switching on the machine, i.e. during the boot process, press the key to call the BIOS several times at short intervals until the BIOS main menu appears on your screen.

Note: Further information on setup and which key you must press (e.g. *F2* **or** *Del*) can be found in the motherboard documentation.

3.4 Drivers

Drivers are programs, which allow interaction between the computer, operating system and other components. It is therefore important to install the correct component drivers for the correct operating system.

The drivers we have tested are coordinated with the component manufacturer and tailored for the system supplied and are normally found on the "Drivers & Utility" CD/DVD or on an enclosed Drivers CD-ROM/diskette.

3.5 INTERNET

The Internet is the world's largest computer network, and consists of many individual networks linked to one another. The features or "services" of the Internet include electronic mail (e-mail) and file transfer (FTP).

When using Internet services, it is important to use antiviral software and to update it regularly.

i **Our tips and hints …**

... for establishing a connection to the Internet

You can establish an Internet connection with the help of a CD/DVD provided by an Internet service provider or without the help of a CD/DVD.

If you are establishing an Internet connection through a provider, insert the provider's CD/DVD into the CD/DVD drive and follow the on-screen instructions.

To establish an Internet connection without a CD/DVD, you must obtain the **dial-up number** of the provider which you wish to use, the **user name** and the **password**. Then proceed as follows:

- If no previous Internet connection has been set up on your PC, click on: "**Start**"; "**Control Panel**", "**Network and Internet connections**", "**Establish or create own Internet connection**". In the "**Internet properties**" screen click on "**Setup**". The "**New Connection Wizard**" will appear**.** Follow the setup procedure here.
- If an Internet connection is already set up on your PC, you can set up an additional provider using "**Start**" - "**All Programs**" – "**Accessories**" – "**Communications**" – "**New Connection Wizard**". Follow the setup procedure here also. Having an additional Internet service provider means that you can benefit from using the cheaper usage times of the different providers.

... for using antiviral software

Fujitsu Siemens Computers systems are always supplied with pre-installed antiviral software. If you have completely set up the antiviral software and you decide to purchase another piece of antiviral software, you **must always uninstall** the fully installed antiviral software **properly** first. Otherwise, installation of a second piece of antiviral software without previously uninstalling the existing software may be successful but could lead to severe software conflicts.

4 Peripherals

Peripherals are external components of the computer, i.e. devices connected to the PC such as monitor, keyboard, printer, etc..

4.1 Keyboard

4.1.1 Keyboard areas and important keys

The keyboard is the "actual" interface between the user and the computer. It is used to input commands. It is similar in design to a typewriter, but has a few more keys.

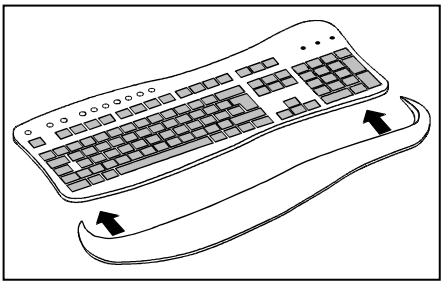
Adjusting the keyboard

The keyboard may be positioned flat or gently inclined to suit individual needs. If you look underneath the keyboard you will find two feet which can be pulled out to adjust the keyboard.

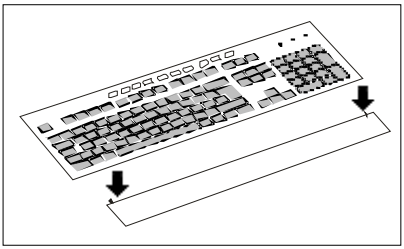
Wrist support

If your keyboard has a wrist support, please fix it to the keyboard. Depending on the keyboard type, this may be done in one of two ways:

With the *curved design* place the wrist support in front of the keyboard and push in the direction of the arrow until it slots into place.



With the *straight design* place the wrist support on a flat surface and press the keyboard down from above with the notches on the underside of the keyboard lined up with the pins on the wrist support until it slots into place.



The wrist support is intended for breaks during typing. You should not therefore rest the balls of your thumbs on the wrist support while typing.

Connecting the keyboard

Connect the keyboard before turning on the PC. Keyboards may have different plugs with which they are to be connected to the PC.

PS/2: Insert the round, purple plug of the keyboard cable into the purple PS/2 port on your computer.

USB: Insert the square, black connector of the keyboard cable into a free USB port on your computer.

Keyboards with cables do not require any batteries, even if there is a battery compartment on the underside.

Key groups

The standard Windows keyboard consists of the following sections:

- Main keyboard
- Numeric keypad
- Cursor keypad
- Function keys and
- Windows-specific keys

Main keyboard

The layout of the main keyboard essentially corresponds to that of a typewriter keyboard. Pressing a key generates the corresponding character and moves the cursor forward by one position. Most keys have a repeat function, i.e. if you hold down the key, the entry of that character is repeated. However, there are a few country-specific keys (so-called dead keys) which do not cause the cursor to move forwards when pressed.

A few PC-specific keys on the main keyboard are assigned special functions:

The RETURN, ENTER key <↵>

This key is used to have the current command input executed by the computer. After inputting a text line, pressing this key moves the cursor to the beginning of a new line. Depending on the program in use, the function of the <RETURN> key on the main keyboard and <Enter> on the numeric keypad may be different.

The BACKSPACE key <←>

This key moves the cursor one space to the left and deletes the last character.

The SPACE BAR < >

Pressing this key moves the cursor one space to the right and inserts an empty space at the same time. Please note that an empty space is treated in the same way as a letter or number.

The TAB key <⇤⇥>

In word-processing programs, this key is used to move the cursor to the next tab stop. Depending on the program in use, the key may also be used for other cursor movements or functions.

The SHIFT key <⇧>

Two identical shift keys are located on the left and right sides of the main keyboard. Pressing the shift key while simultaneously pressing a letter or number generates the letter in upper case or the relevant special character. In connection with the numeric

keypad, it is possible to toggle between cursor movement and the input of numbers.

The CAPS LOCK key <⇩>

This key is used to enter upper case letters. If this key is engaged, the central LED ("Caps Lock" / "<⇩>" / "A") is illuminated on the keyboard. Pressing the CAPS LOCK key again reverses the lock (depending on the operating system).

The <Alt> key

The function of this key is program-dependent. It is always used in connection with other keys. Like the SHIFT key, when pressed alone it generally has no function. In the operating system as well as in many programs, special characters which cannot be found on the keyboard can be entered with the aid of the ALT key and commands can be generated.

The <Alt Gr> key

This key is used to enter the special characters shown on some keys as a third option. E.g. if you wish to enter the "\" character, hold down <Alt Gr> while also pressing the <ß> key.

The <Ctrl> key

This key is a control key. Like the ALT key it is only active in combination with other keys. Its meaning varies from program to program.

The <Esc> key

This is program-dependent. When working in the operating system, the current prompt entered in the command buffer will be deleted.

Windows-specific keys:

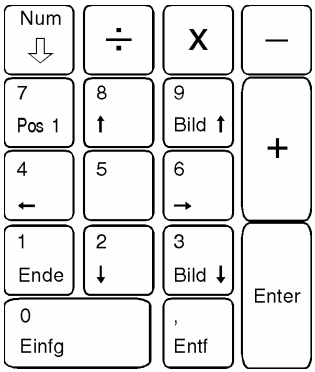
These keys only exist on a Windows keyboard as they support Windows-specific functions. The keys are:
1 stkey: between <Ctrl> and <ALT>, left side
2ndkey: between <Alt Gr> and <Ctrl>, right side next to <Alt Gr>
3rdkey: next to 2nd key

Description of the Windows-specific keys:

WIN key	Function	Description
1 st& 2nd key	<Ctrl> + <Esc>	Windows Manual Appendix Key combinations
3rdkey	<Shift> + <F10>	Windows Manual Appendix Key combination

You can also work with this keyboard if you do not have Windows installed. If this is the case, these keys have no function.

The numeric keypad



Number keys

The keys in this block have two purposes. Firstly, they represent the **numbers** 0 to 9 and the comma, secondly the **cursor control functions.** They can be switched from one function to the other with the <Num Lock ⇩> key. Pressing it once switches from the cursor control function to the numbers, pressing it again returns to cursor control. The setting in use is indicated by the LED located at the top left ("Num" / "Num Lock" / "1").

Numbers: The LED at the top left is illuminated.
Cursor control: The LED at the top left is not illuminated.

The <Ins> key

The <Ins> key is the Insert key. In the operating system mode, characters on the screen can be replaced by being overwritten with a new character. The <Ins> key can be switched to the insert mode, and the newly entered characters are inserted at the cursor position.

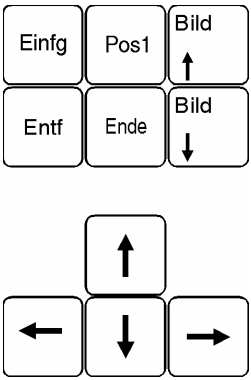
Please note that the use of this key may be program-dependent.

The <Del> key

The <Del> key is used to delete the character at which or before which the cursor stands.

Programs may assign this key other functions.

Cursor keys



The keys in the cursor keypad and the correspondingly designated keys of the numeric keypad have the same use. It is also possible for programs to assign other uses to these keys.

<↑>	moves the cursor one line up
<↓>	moves the cursor one line down
<→>	moves the cursor one character to the right

<←>	moves the cursor one character to the left
<Home>	moves the cursor to the beginning of the line or to the top left corner of the screen
<End>	moves the cursor to the end of the line or to the bottom right corner of the screen
<Page Down>	moves the display one screen page down
<Page Up>	moves the display one screen page up

Function keys

The general function keys, labelled <F1> to <F12>, each have a different use depending on the program being used. Their use in the operating system is detailed in the associated manual.

The <Print Screen> key

Pressing <Print Screen> produces a copy of the content of the screen.

The <Scroll Lock> / ⤓ key

The <Scroll lock ⇩> key is used to change the function of the cursor keys. This is program-dependent. If the "Scroll Lock" mode is activated, the LED ("Scroll Lock" / ⤓) at the top right is illuminated.

The <Pause/Break> key

Used by the operating system and a few applications.

Functions accessed by pressing several keys simultaneously

The following key combinations are used in the WINDOWS operating system control panel; their function is to some extent program-dependent:

<Ctrl> + <Alt> + <Del>	System reboot Pressing the three keys simultaneously aborts the current program and reboots the operating system. **Caution**: Data which has not been saved to the main memory will be lost.
<Ctrl> + <Pause>	Program halt Simultaneously pressing Ctrl and Pause aborts the current program.
<Ctrl> + <Home>	This key combination moves the cursor to the beginning of a document.
<Ctrl> + <End>	This key combination moves the cursor to the end of a document.

4.1.2 The multifunction keyboard

Multifunction keyboards have additional keys (multimedia keys) which can be used to activate functions more quickly. The following description of the keys applies for: Windows ME, Windows 2000, Windows XP.

Previous track

This button can be used to skip back to the previous track in the active play-back device.

Stop

This button stops the playing of a track.

Play/pause

This button is used to start playing a track as with a CD player or to pause a track briefly.

Next track

This button can be used to skip to the next track in the active play-back device.

Lower volume of loudspeaker

This button lowers the volume of the loudspeaker connected.

Turn loudspeaker on/off

This button turns the loudspeaker connected on and off

Increase volume of loudspeaker

This button increases the volume of the loudspeaker connected.

E-mail

This button is used to access your system's standard e-mail program.

Web browser

This button starts your system's standard browser.

Standby mode

The computer enters standby mode in accordance with the BIOS and operating system settings.

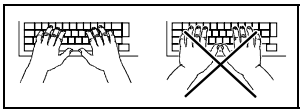
4.1.3 Wireless keyboard

If your PC comes with a wireless keyboard, usually in combination with a wireless mouse, please refer to the special instructions in the accompanying manual.

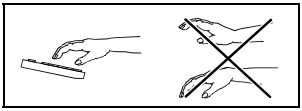
Using the keyboard

The keyboard is configured for ergonomic and healthy working. Awkward configuration of the input and output devices, incorrect arm or seat posture and uninterrupted use of the keyboard or mouse may lead to tension, tiredness and injury to the musculo-skeletal system (nerves, muscles, tendons and joints). This risks can be considerably reduced if you follow the advice below.

- Arrange your workstation in accordance with the recommendations for an ergonomic workstation in the PC's operating instructions.
- Position the keyboard such that it can be operated without noticeable burden. The keyboard should be arranged in parallel to your upper body. This position facilitates a relaxed shoulder and arm position.
- The distance between the keyboard and edge of the desk should be between 5 and 10 cm.
- While typing, hold your hands and lower arms such that they form the most natural line possible. Do not bend your hands too much to the side.



- Keep your wrists straight while typing. Do not bend your hands up or down. Adjust the tilt of the keyboard to meet your individual needs using the fold-out support on its base.



- While typing do not support your hands on the balls of your thumbs and do not hit the keys too hard.
- Relax your hands and wrists by taking regular breaks. During these typing breaks you should support your hands on the balls of your thumbs or rest your lower arms on the armrests. If necessary, perform appropriate loosening exercises.

i **Our tips and hints …**

... on the keyboard connection cable

Should your keyboard be equipped with a keyboard where the connection cable and the keyboard are delivered separately, attach the

- the circular 6-pin PS/2 plug (mini DIN connector, purple) to the corresponding socket on the PC, and
- the square 6-pin keyboard connector to the keyboard.

... on the functions of the keyboard

If you require further information about the functions of the keyboard and want to access the menus for changing the settings, the procedure is as follows:

- Click on "**Start**" and select "**Control panel**".
- Click on the icon or name "**Keyboard**" to open the "**Keyboard properties**" dialog box.

Properties such as the refresh rate and cursor flashing rate can be adjusted here to suit your working methods.

4.2 Mouse

The mouse is an input device which is guided by hand over a flat and horizontal surface. The recording of the movement takes place mechanically or optically. The mouse movement is analysed by the computer and the cursor is moved accordingly across the screen. At appropriate positions, the mouse buttons can be used to activate actions such as inputs, opening and closing files or charts.

The two-button wheel mouse can be used as a two-button mouse in all operating systems. Under Windows operating systems, you can use the wheel by turning it to navigate within the application window and as a third button by pressing it.

The symmetrically designed mice are equally suitable for right-handed and left-handed users.

Mice may have different plugs with which they are to be connected to the PC.

PS/2: Insert the round, green plug into the green socket on the PC before switching it on.

USB: Insert the square, black connector of the mouse cable into a free USB port on your computer or a connected USB hub.

USB-PS/ adapter: Some mice have a green USB-PS/2 adapter. Without this adapter, the mouse can be used in a USB socket, with the adapter in the PS/2 interface. This adapter can only be used for the mouse with which it was delivered.

i **Our tips and hints …**

... ...for the function of the wheel mouse

If you require further information about the functions of the wheel mouse and want to access the menus for assigning functions and changing the settings, the procedure is as follows:

- Click on "**Start**" and select "**Control panel**".
- Click on the icon or name "**Mouse**" to open the "**Mouse properties**" dialog box.

Here, you can adjust the mouse properties individually to match your working methods.

... on using an optical mouse

The scanning system of an optical mouse works on many surfaces. However, please note that heavily reflective or red surfaces may cause faults.

... on using a mechanical mouse

Make sure that you use a mechanical mouse on a clean, flat surface. The use of a mouse pad is recommended.

Clean the ball and the mechanical scanning system regularly. Carefully remove the ball cover and take out the ball. This will also provide access to the axes of the mechanical system for cleaning. Carefully refit the parts in reverse order.

4.3 Monitor

A monitor is, of course, part of the PC. It is the visual medium of communication between the user and the machine.

It is important that you follow the instructions relating to ergonomics, which should be contained in the instruction manual for the monitor. These include: Correct posture, correct distance between the eyes and the monitor (approx. 50 cm), positioning of the keyboard within optimum reach of the hands.

4.4 Printers

Printers are output devices, which can output electronic data in paper form as a so-called print medium.

In order for the printer to receive the desired data from the PC, it must be connected to the computer's printer port. This port normally has the designation LPT1. However, it is also possible to communicate with modern printers via the USB port.

The printer setup program is a component of Windows. If you want to connect a new printer to your computer, you must inform your PC of this. The printer setup program helps you to install the driver and informs Windows which new printer you have connected and how the operating system selects it.

4.5 Scanners

Similar to a copier, a scanner makes a kind of electronic photograph of a document. The scanner converts this "photograph" to a file, which can be understood by a computer. A photograph is thus turned into a digital image, which you can save as a file and process using appropriate graphics programs.

5 Expansion of performance

5.1 Upgrading the system

Your system is of a modular configuration. This means that in general you have the option of upgrading your system with various components and modules (e.g. working memory, hard disk, graphics card, etc.) obtainable from your specialist dealer or a computer shop.

i **Our tips and hints …**

... on component expansion

Before expanding your system, find out from the motherboard description which components are compatible with your system.

For example, take note of:
- the working memory type
- the hard disk type to be used (SATA or IDE)

... adequate cooling

When upgrading your PC ensure that the components have sufficient cooling. If your are unsure, contact a local computer expert.

Caution! Heat build-up in your system may lead to irreversible damage and a risk of fire due to overheating of system components.

5.2 Opening and closing the housing

CAUTION! Only qualified personnel should open the PC. Tampering with the unit will result in a loss of the right to guarantee claims and the discontinuation of the manufacturer's guarantee obligation. Compliance with the harmonised standards according to the legislation regarding electromagnetic compatibility of units and compliance with the low voltage directive may be interfered with.

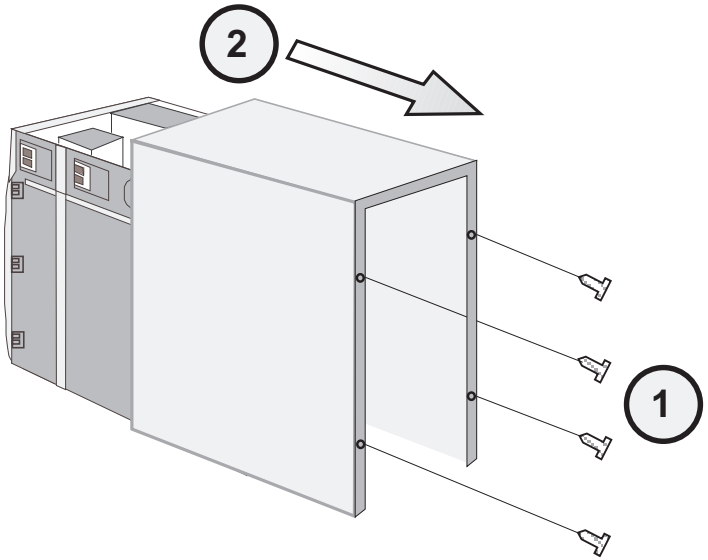
- When opening the PC it must be ensured that you do not use any force and that no locking mechanisms are damaged.
- All integrated circuits and memory modules are susceptible to static electricity. When exchanging or installing a board or memory module, we recommend touching an earthed object (e.g. housing), to divert any electrostatic charge from your body.

To open the housing, proceed as follows:

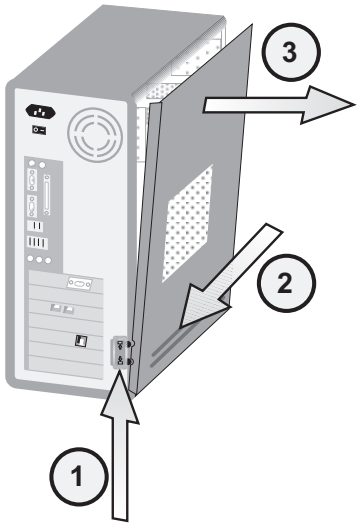
1. Turn off the PC and all connected peripherals (monitor, printer etc.).
2. Disconnect the mains plug **directly** before opening the housing to ensure that the device is not connected from the mains.
3. Disconnect all connection cables (mouse, keyboard, printer, etc.).
4. Remove the housing cover, corresponding to your model, as described below.

Opening the housing

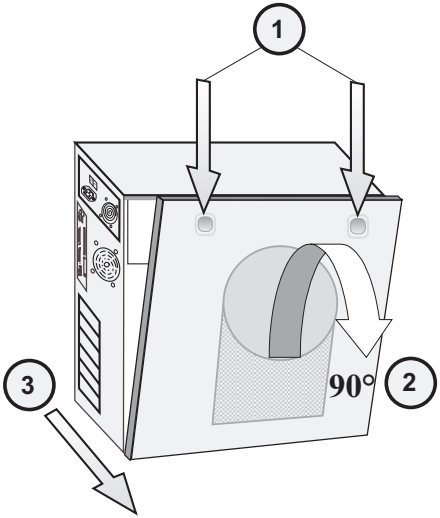
SCALEO L / SCALEO P



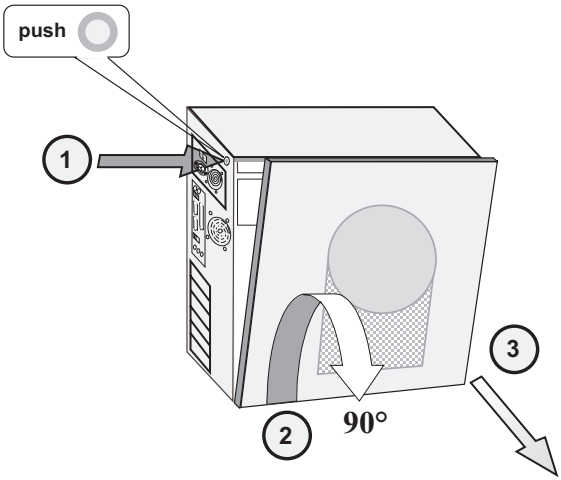
SCALEO T



SCALEO 600



SCALEO 800



Closing the housing

Follow the opening process in reverse to close the PC.

Our tips and hints …

... on the SCALEO X

With the SCALEO X, during assembly the locking mechanism locks in place itself by pressing on the side wall, as shown in step 1.

CAUTION! When closing the housing, ensure that the cover is firmly and correctly in place. Check all locking mechanisms such as screws, slides etc., to ensure that these are mounted as they were by the factory prior to you opening the housing.

5.3 Installing expansion modules

Take the following steps to install additional expansion modules:

1. Turn off the computer and all connected peripherals (monitor, printer etc.). Disconnect these from the mains network by removing the power cable from the socket.
2. Disconnect all connection cables (mouse, keyboard, printer, modem etc.).
3. Open the housing, corresponding to your model, as described in these instructions under "Opening the housing".
4. Remove the blank cover (slot cover, slot plate) on the rear of the housing corresponding to the slot you wish to use.

Removing the slot cover
*when slot cover screwed **in place***

- Loosen the screws on the slot cover in question and remove the cover.
- Install the expansion module in accordance with the manufacturer's instructions.
- Fix the module in place with the screws from the slot cover.
- Follow the opening process in reverse to close the PC.

*where slot cover **pre-punched***

- Insert a slot screwdriver in the crack visible from above and turn inwards with gentle pressure to loosen the slot cover, then pull off with a set of flat nose pliers. Any loose metal cuttings are to be removed.

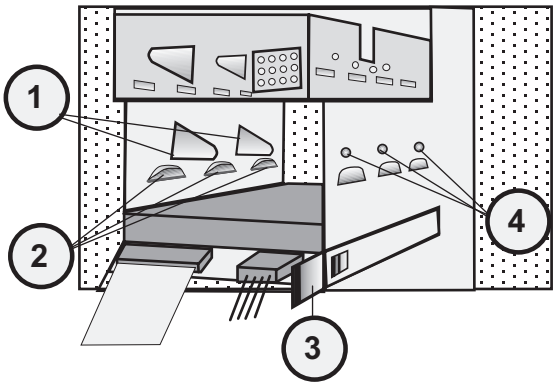
5. Install the expansion module in accordance with the module manufacturer's instructions.
6. Follow the opening process in reverse to close the PC.
7. Configure the BIOS setup if necessary (e.g. IRQ).
8. Install the required driver for the expansion module.

CAUTION! There is a risk of injury when installing and removing modules due to sharp edges caused by pulling off the slot cover.

- If you wish to remove the retrofitted module at a later date, please close the resulting opening immediately with a slot cover available from a specialist supplier.

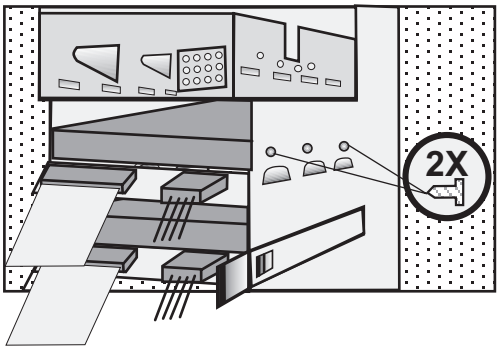
5.4 Installing additional hard disks and drives

Your PC also gives you the option of installing additional hard disks (HD) or drives. Once you have opened the housing in accordance with all of the aforementioned safety instructions, you can use the technical options available to enhance your system.



(1) Clip for securing additional components
(2) Support for additional components
(3) Factory-installed HD holder (plastic moulded part) for attaching the hard disk (HD)
(4) Screw holes for securing additional components

As shown in the diagram, a factory-installed HD holder is used to secure the components.



Two screws should be used in order to ensure that the additional components are securely fastened.

6 Troubleshooting (FAQ)

There are two general types of error message:

- Software error messages
- System error messages

6.1 Software error messages

Software error messages are displayed on the screen by the operating system or an application. These messages generally appear after you have started the operating system or when you run an application. If this type of error message appears, refer to the manual for the respective application or the operating system to find out how to resolve this error.

6.2 System error messages

A system error message indicates a computer problem.

The following checklist describes how you can eliminate small problems yourself. In the event of serious defects, you may have to contact your dealer or the customer hotline. Please refer to the relevant sections of the service documents supplied.

The computer will not start (boot)

- Your computer may not be connected to the power socket. Switch the computer off, check all the connections and then switch the computer on again.
- Your mains socket may be faulty. Check whether there is power to the mains power socket by plugging in another handy electrical device which you know is functioning correctly.
- Check whether the mains switch on the back of the computer is switched on (position "1"). It is possible that by moving the computer, a cable or similar may accidentally switch the mains switch to "0".
- If your computer is equipped with a floppy disk drive, check whether the startup process is being interrupted by a non-bootable disk in the disk drive. If this is the case, you must remove the diskette.

- The worst-case scenario is that the operating system has been damaged, e.g. by a virus. If this is the case, execute a "complete reinstallation of the operating system".
- If you correctly follow the instructions under "Complete reinstallation of the operating system" and reinstallation is still not possible, there could be a defect in one of the system components such as the power supply unit or on the hard disk. If you do not have the necessary technical expertise, repairs of this magnitude should be carried out solely by a service engineer.

Nothing appears on the screen

- Make sure that the monitor is switched on.
- Make sure that the computer and the monitor are connected correctly.
- Are you using a screen saver? Press the SHIFT KEY to restore the display.
- Are you using the automatic power-saving function? These functions switch the computer or the video display unit to power-saving mode. Press any key or move the mouse to leave this mode. You will find further information on power-saving functions in your mainboard manual.
- Adjust the contrast and brightness of the image.
- Disconnect the power and signal cable on the monitor. It could be that the signal cable pins are not correctly aligned.

The keyboard is not responding

- Make sure the keyboard is connected correctly.
- The program with which you are working may be "hanging". Press Ctrl+Alt+Del to end the task. If nothing happens, restart the computer.

The image is distorted

- Another unit nearby, e.g. a printer, may be causing the problem. Move any units which produce strong magnetic fields away from the monitor.

- Check the display settings. You will find further information on this subject in the operating instructions for your monitor.

The keyboard is producing characters other than those shown on the keys.

- Check the display light on the keyboard to make sure that the NUM LOCK or CAPS LOCK KEYS are not activated. The relevant LED at the top right of the keyboard lights up. Pressing the CAPS LOCK key again reverses the lock (depending on the operating system).
- The operating system has been installed with a keyboard driver which has a key layout different from that of your language-specific keyboard. Refer to your operating system manuals for information on changing the language-specific keyboard.

Diskettes cannot be read / written to **(applies only to systems with floppy disk drives)**

- Make sure that the diskette is inserted correctly.
- If the drive LED does not light up when accessed, the internal connections to the system unit or to the power supply may be faulty.
- There may be an incorrect setting in the BIOS setup.
- Check whether the diskette is formatted and whether it is write-protected.
- The diskette could also be defective.

The display "CMOS clear" appears

- The battery on the motherboard is flat.
  Changing this battery is described in the documentation of the motherboard.

  Caution! If you are an inexperienced PC user, seek advice from your dealer or have this battery changed by a computer expert.