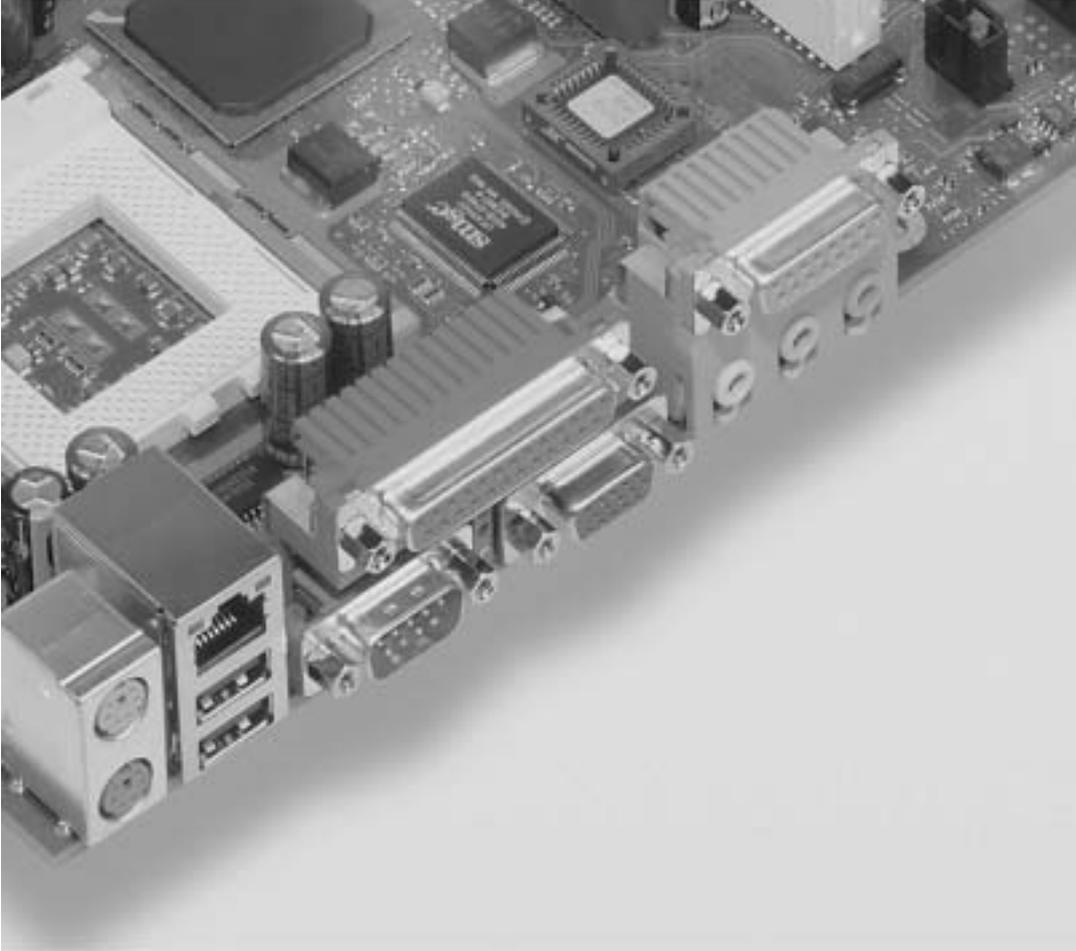


COMPONENT

.com

Technisches Handbuch / Technical Manual

Systembaugruppe / Systemboard D1215



FUJITSU COMPUTERS
SIEMENS

Are there ...

... any technical problems or other questions which you would like to be clarified?

Please contact:

- your sales partner
- your sales outlet

Further information can be found in the "Safety, Warranty and Ergonomics" booklet.

The latest information on our products, tips, updates, etc., can be found on the internet under:

<http://www.fujitsu-siemens.com>

Are there ...

... any technical problem or other question you need clarified?

Please contact:

- your sales partner
- your sales outlet

You will find further information in the manual "Safety, Warranty and Ergonomics".

The latest information on our products, tips, updates, etc., can be found on the Internet under:

<http://www.fujitsu-siemens.com>

Dieses Handbuch wurde auf Recycling-Papier gedruckt.
This manual has been printed on recycled paper.
Ce manuel est imprimé sur du papier recyclé.
Este manual ha sido impreso sobre papel reciclado.
Questo manuale è stato stampato su carta da riciclaggio.
Denna handbok är tryckt på recyclingpapper.
Dit handboek werd op recycling-papier gedrukt.

Herausgegeben von/Published by
Fujitsu Siemens Computers GmbH

Bestell-Nr./Order No.: **A26361-D1215-Z120-1-7419**
Printed in the Federal Republic of Germany
AG 0102 01/02



A26361-D1215-Z120-1-7419

German

English

**Systembaugruppe
D1215
System Board D1215**

**Technisches Handbuch
Technical Manual**

**Ausgabe Januar 2002
January 2002 edition**

Pentium and Celeron are registered trademarks of Intel Corporation, USA.

Microsoft, MS, MS-DOS and Windows are registered trademarks of Microsoft Corporation.

PS/2 and OS/2 Warp are registered trademarks of International Business Machines, Inc.

All other trademarks referenced are trademarks or registered trademarks of their respective owners, whose protected rights are acknowledged.

Copyright © Fujitsu Siemens Computers GmbH 2002

All rights, including rights of translation, reproduction by printing, copying or similar methods, in part or in whole, are reserved.

Offenders will be liable for damages.

All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

Delivery subject to availability. Right of technical modification reserved.

This manual was produced by
cognitas. Gesellschaft für Technik-Dokumentation mbH
www.cognitas.de

Intel, Pentium and Celeron are registered trademarks of Intel Corporation, USA.

Microsoft, MS, MS-DOS and Windows are registered trademarks of Microsoft Corporation.

PS/2 and OS/2 Warp are registered trademarks of International Business Machines, Inc.

All other trademarks referenced are trademarks or registered trademarks of their respective owners, whose protected rights are acknowledged.

All rights, including rights of translation, reproduction by printing, copying or similar methods, even of parts are reserved.

Offenders will be liable for damages.

All rights, including rights created by patent grant or registration of a utility model or design, are reserved. Delivery subject to availability.

Right of technical modification reserved.

This manual was produced by
cognitas. Gesellschaft für Technik-Dokumentation mbH
www.cognitas.de

Contents

| | |
|--|----|
| Introduction..... | 1 |
| Notational conventions | 1 |
| Important notes..... | 1 |
| Information about boards | 2 |
| Features | 3 |
| External ports | 5 |
| Internal ports and connectors | 6 |
| Temperature / System monitoring..... | 7 |
| Hard disk connection | 8 |
| LAN connector..... | 8 |
| Screen resolution..... | 9 |
| PCI bus interrupts..... | 9 |
| Settings with switches and jumpers | 10 |
| Recovering System BIOS - switch 2 | 10 |
| Write protection for floppy disks - switch 3..... | 10 |
| Add-on modules | 11 |
| Installing and removing processors..... | 12 |
| Upgrading main memory..... | 13 |
| Upgrading an AGP screen controller or the GPA memory | 14 |
| Installing network board with WOL..... | 14 |
| Replacing the lithium battery..... | 15 |
| Glossary | 16 |

Introduction



Depending on the configuration chosen, some of the hardware components described may not be available on your system board.

You will find further information in the "BIOS Setup" description.

Further information about drivers is provided in the readme files on the hard disk, on the supplied drivers diskettes, on the "Drivers & Utilities" or on the "ServerStart" CD.

Notational conventions

The meanings of the symbols and fonts used in this manual are as follows:



Pay particular attention to text marked with this symbol. Failure to observe this warning endangers your life, destroys the device, or may lead to loss of data.



Supplementary information, remarks, and tips follow this symbol.

- ▶ Text which follows this symbol describes activities that must be performed in the order shown.
- ┆ This symbol indicates that you must enter a blank space (press the Space Bar) at this point.
- ↵ This symbol indicates that you must press the Enter key.

Text in this typeface indicates screen outputs.

Text in this bold typeface indicates the entries you make via the keyboard.

Text in italics indicates commands or menu items.

"Quotation marks" indicate names of chapters or terms.

Important notes

Store this manual close to the device. If you pass the device on to third parties, you should pass this manual on with it.



Be sure to read this page carefully and note the information before you open the device.

You cannot access the system board components without first opening the device. How to dismantle and reassemble the device is described in the Operating Manual accompanying the device.

Please observe the safety information provided in the "Important notes" chapter in the device's operating manual.

Incorrect replacement of the lithium battery may lead to a risk of explosion. It is therefore essential to observe the instructions in the "Add-on modules" - "Replacing the lithium battery" section.



The shipped version of this board complies with the requirements of the EEC directive 89/336/EEC "Electromagnetic compatibility".

Compliance was tested in a typical PC configuration.

When installing the board, refer to the specific installation information in the Operating Manual or Technical Manual for the receiving device.

Connecting cables for peripherals must be adequately shielded to avoid interference.



Components can become very hot during operation. Ensure you do not touch components when making extensions to the system board. There is a danger of burns!



The warranty is invalidated if the device is damaged during the installation or replacement of system expansions. Information on which system expansions you can use is available from your sales outlet or the customer service centre.

Information about boards

To prevent damage to the system board or the components and conductors on it, please take great care when you insert or remove boards. Take great care to ensure that extension boards are slotted in straight, without damaging components or conductors on the system board, or any other components, for example EMI spring contacts.

Be especially careful with the locking mechanisms (catches, centring pins etc.) when you replace the system board or components on it, for example memory modules or processors.

Never use sharp objects (screwdrivers) for leverage.



Boards with electrostatic sensitive devices (ESD) are identifiable by the label shown.

When you handle boards fitted with ESDs, you must, under all circumstances, observe the following points:

- You must always discharge static build up (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Remove the power plug from the mains supply before inserting or removing boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.

Features

The components and connectors marked are not necessarily present on the system board.

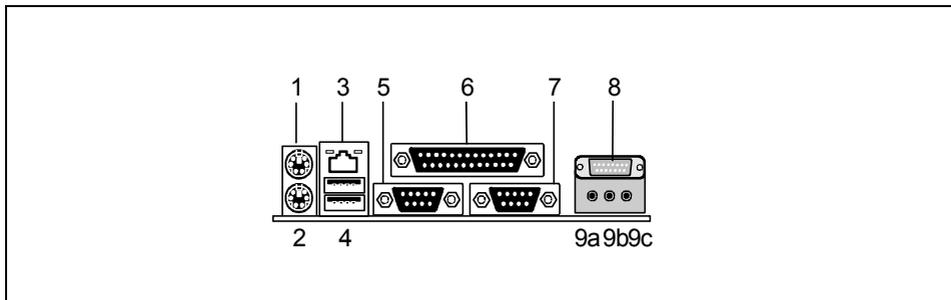
- System board in μ -ATX format
- PGA 370 Celeron processor with 66 /100 MHz Front Side Bus for PGA 370 socket and Pentium III with 100 / 133 MHz Front Side Bus for PGA 370 socket.

Celeron and Pentium III processors support MMX technology and Intel Streaming SIMD Extensions. The size and frequency of first-level cache and second-level cache are dependent upon the processor used.

- Intel chipset 815 E
consisting of GMCH 82815, ICH 82801BA
- Intel 82562EM LAN controller (10/100 Mbit/s) with RJ45 interface
WOL with Magic Packet™ is supported, remote LAN boot is also supported with Bootix LAN BootP or Intel PXE and Basic Alert On LAN II.
- Analogue Devices AD1885
- AC'97 Audio Codec (AC1885)
internal: Stereo CD-In, Stereo AUX-In
external: Mono Micro-In, Stereo Line-In
external: Game/Midi port, Stereo Line-Out / headphones
- Fujitsu Siemens system monitoring and temperature monitoring
- 2 DIMM slots for 32 to 512 Mbyte main memory (SDRAM memory modules meet the PC100/PC133 specification) without ECC
- Flash BIOS
- Power-on functions:
 - Wake on RTC
 - Wake on LAN
 - Wake on PCI Cards
 - Wake on USB
- Energy saving functions:
 - APM and ACPI (requires an operating system that supports ACPI)
 - Switching on/off, standby mode, suspend mode via on/off switch
 - Switching on/off via software
- Security functions:
 - Chipcard reader interface (SmartCard reader)
 - Processor serial number
 - Cover monitoring: cover monitoring reports when the cover has been opened without authorisation.
 - System, Setup and Keyboard password
 - parallel and serial ports can be deactivated
 - Floppy disk write-protection
 - Boot hard disk virus warning function
 - Flash BIOS and EEPROMs (on the memory modules) virus protection function.

- 1 PCI slot or 3 PCI slots
Up to three PCI slots are available, which support 3.3 V main and auxiliary voltages.
- AGP/GPA slot
The AGP slot supports the 1x, 2x and 4x AGP mode and GPA memory boards. The voltage is detected and configured automatically.
or
GPA memory boards supported.
- IDE hard disk controller connected to PCI bus for up to four IDE drives
(e.g. IDE hard disk drives, ATAPI CD-ROM drives)
The IDE hard disk controller are ATA33/66/100, ultra DMA capable and support PIO modes 0-4.
- Floppy disk drive controller (possible formats: 720 KB, 1.44 MB, 2.88 MB)
- The system board supports booting from a 120 MB IDE floppy disk drive.
- 2D/3D graphics processor, 24 bit 230 MHz RAMDAC
GPA memory modules for enhanced 3D graphics performance is supported.
- Monitor connector: Sub D
- 1 external parallel port (ECP- and EPP-compatible)
- 1 external serial port (16C550 compatible with FIFO)
- 1 internal chipcard reader interface (SmartCard reader). This interface can also be used as a second serial port (16C550 compatible with FIFO). This port does not support the ring indicator signal.
- 1 internal WOL interface
- 2 external PS/2 ports for keyboard and mouse
- 2 external USB ports
- 2 internal USB ports
- Real-time clock/calendar with integrated battery backup

External ports

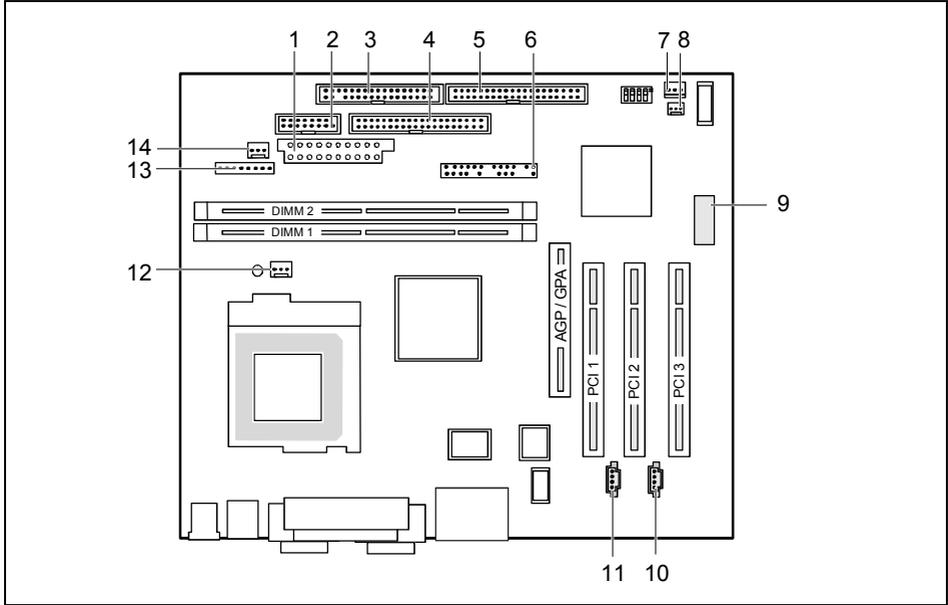


- 1 = PS/2 mouse port
- 2 = PS/2 keyboard port
- 3 = LAN connector
- 4 = USB ports 1 and 2
- 5 = Serial port 1
- 6 = Parallel port

- 7 = VGA port
- 8 = Game/Midi port
- 9a = Audio Line-Out
- Headphones
- 9b = Audio Line-In
- 9c = Audio Micro-In

The components and connectors marked are not necessarily present on the system board.

Internal ports and connectors



- | | |
|---|-------------------------------------|
| 1 = Power supply | 8 = Wake On LAN |
| 2 = Chipcard reader interface or serial port 2 | 9 = USB ports C / D 1 |
| 3 = Floppy Disk Drive | 10 = CD audio input |
| 4 = IDE drives 3 and 4 (secondary) | 11 = AUX audio input |
| 5 = IDE drives 1 and 2 (primary) | 12 = Fan 1 (e.g. for the processor) |
| 6 = Connector for control panel and loudspeaker | 13 = Power supply monitoring |
| 7 = Fan 2 (e.g. for the processor) | 14 = Cover monitoring |

The components and connectors marked are not necessarily present on the system board.

Temperature / System monitoring

Temperature and system monitoring aim to reliably protect the computer hardware against damage caused by overheating. In addition, any unnecessary noise is also prevented by reducing the fan speed, and information is provided about the system status. Cover monitoring protects the system from unauthorised opening.

An onboard controller developed by Fujitsu Siemens Computers controls the temperature and system monitoring.

The following functions are supported:

Temperature monitoring:

Measurement of the processor and the system temperature with an onboard temperature sensor.

Temperature control:

The temperature is controlled by adjusting the fan speed and/or by reducing the clock frequency of the processor. The clock frequency of the processor is dependent upon the setting in the *BIOS Setup*. Temperature-dependent processor speed control enables a reduced fan speed, decreasing noise.

Fan monitoring:

Fans which have been removed, blocked or sticky fans are detected and blocked or sticky fans are operated with 12 V pulse voltage. If the device has a monitored fan removed while the system is switched off this is indicated by the message LED when the system is switched on again and processed by the BIOS or the application.

Fan control:

With the exception of the auxiliary fan (AUX), the fans are regulated according to temperature.

Sensor monitoring:

The removal of, or a fault in, a temperature sensor is detected. Should this happen all fans monitored by this sensor run at maximum speed, to achieve the greatest possible protection of the hardware. If the device has a monitored fan removed while the system is switched off this is indicated by the message LED when the system is switched on again and processed by the BIOS or the application.

Cover monitoring:

Unauthorised opening of the cover is detected, even when the system is switched off. However, this will only be indicated when the system is switched on again.

Voltage monitoring:

The voltages 12 V, 5 V and the CMOS battery are monitored.

With hardware monitoring - regardless of the operating system and processor - the advantages compared to conventional software monitoring are clear:

- suitable for all operating systems and processor types
- no additional load on processor (performance)
- optimum temperature protection, even if process faults or faults are present in the operating system
- optimum noise reduction

Three different operating modes are available and can be configured in *BIOS Setup - System Management*.

Hard disk connection

An ultra ATA/66 or ultra ATA/100 hard disk must be connected with a cable especially designed for the ultra ATA/66 or ultra ATA/100 mode.

- ▶ Connect the end of the cable marked with blue to the system board.

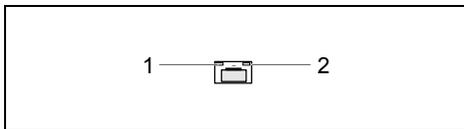
LAN connector

This system board has an optional Intel 82562EM LAN controller which supports transfer speeds of 10 Mbit/s and 100 Mbit/s. The LAN controller is equipped with a 3 Kbyte transmission and receiving buffer (FIFO) and supports WOL function through Magic Packet™.

Remote boot via LAN is supported with Bootix LAN BootP and Intel PXE.

Basic Alert On LAN II is also supported. Basic Alert On LAN II helps to protect systems against theft or damage. Basic Alert On LAN II can also inform the administrator about hardware faults and software errors.

The LAN RJ45 connector is equipped with a yellow and a green LED (light emitting diode).



- 1 = a connection exists (e.g. to a hub).
- 2 = Link Mode: the LAN connection is active.
WOL mode: a Magic Packet™ is being received.

Screen resolution

Depending on the operating system used, the screen resolutions in the following table refer to the system board screen controller.

If you are using an external screen controller, you will find details of supported screen resolutions in the Operating Manual or Technical Manual supplied with the controller.

| Screen resolution | Refresh rate (Hz) | Horizontal-rate (kHz) ** | Max. number of colours |
|-------------------|-------------------|--------------------------|------------------------|
| 640x480 | 60 - 85 | 31,5 - 43,3 | 256 |
| 640x480 | 60 - 85 | 31,5 - 43,3 | 65 K |
| 640x480 | 60 - 85 | 31,5 - 43,3 | 16.7 M |
| 800x600 | 60 - 85 | 35,1 - 53,7 | 256 |
| 800x600 | 60 - 85 | 35,1 - 53,7 | 65 K |
| 800x600 | 60 - 85 | 35,1 - 53,7 | 16.7 M |
| 1024x768 | 60 - 85 | 48,8 - 68,7 | 256 |
| 1024x768 | 60 - 85 | 48,8 - 68,7 | 65 K |
| 1024x768 | 60 - 85 | 48,8 - 68,7 | 16.7 M |
| 1024 x 768 | 60 - 100 *** | 48,8 - 68,7 | 16.7 M |
| 1152x864 | 60 - 85 | 54,4 - 76,9 | 256 |
| 1152x864 | 60 - 85 | 54,4 - 76,9 | 65 K |
| 1152x864 | 60 - 85 | 54,4 - 76,9 | 16.7 M |
| 1280x1024 | 60 - 85 | 64,0 - 91,1 | 256 |
| 1280x1024 | 60 - 85 | 64,0 - 91,1 | 65 K |
| 1280x1024 | 60 - 85 | 64,0 - 91,1 | 16.7 M |
| 1600x1200 | 60 - 75 | 75,0 - 93,8 | 256 |

* no 16 colour mode

** Horizontal values tolerance ± 0.3 kHz.

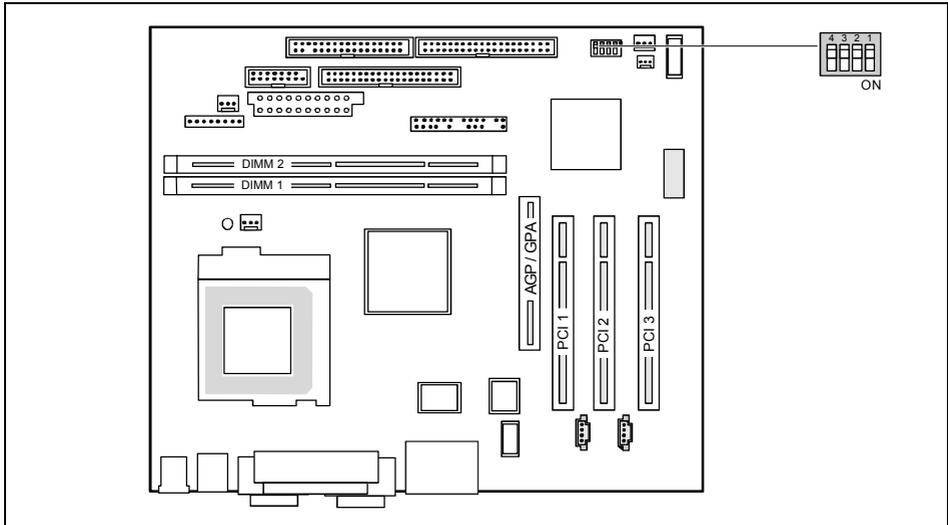
*** depends on the configuration of the system board

PCI bus interrupts

The following table shows which PCI bus interrupts are assigned on the system board.

| PCI bus interrupt | Component on system board: |
|-------------------|----------------------------|
| B, C, D, A | PCI bus slot 1 |
| C, D, A, B | PCI bus slot 2 |
| D, A, B, C | PCI bus slot 3 |
| A, B | AGP slot |
| D | First USB controller |
| E | Second USB controller |
| E | LAN controller |
| A | Graphics processor |
| B | SMBus |
| B | AC'97 Audio |

Settings with switches and jumpers



Switch 1 = must be set to *off*

Switch 2 = System BIOS recovery

Switch 3 = Write-protection for floppy disk

Switch 4 = must be set to *off*



The clock frequency of the processor is set automatically.

Recovering System BIOS - switch 2

Switch 2 enables recovery of the old system BIOS after an attempt to update has failed. To restore the old system BIOS you need a Flash BIOS Diskette (please call our customer service centre).

On The System BIOS executes from floppy drive A: and the inserted "Flash-BIOS-Diskette" restores the System BIOS on the system board.

Off Normal operation (default setting).

Write protection for floppy disks - switch 3

Switch 3 is used to define whether floppy disks can be written or deleted in the floppy disk drive. To write and delete floppy disks, the write-protection in *BIOS Setup* must be disabled (in menu *Security*, the field *Diskette Write* must be set to *Enabled*).

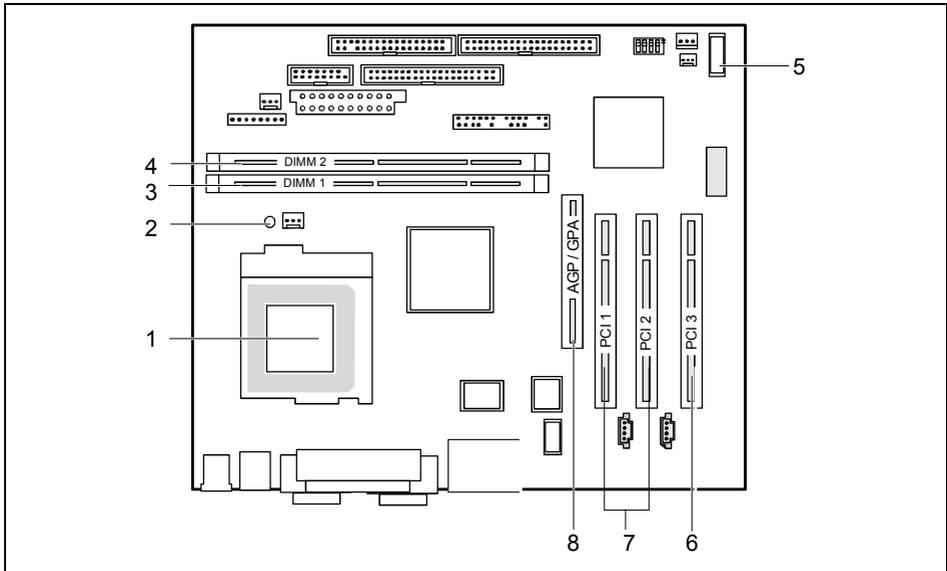
On The floppy disk drive is write-protected.

Off Floppy disks can be read, written and deleted (default setting).

Add-on modules



Exit Suspend mode, switch off the device and remove the power plug from the mains supply, before carrying out any of the procedures described in this chapter! Even when you have switched off the device, parts (e.g. memory modules, AGP and PCI extension boards) are still supplied with power. The voltage indicator LED will glow if this is the case.
All AGP and PCI slots support 3.3 V main and auxiliary voltages.

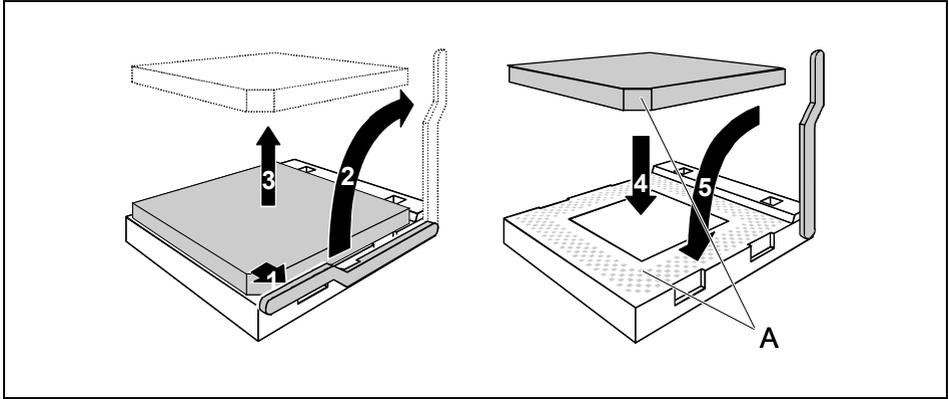


1 = Socket for processor with heat sink
2 = Voltage indicator LED
3 = Location bank 1 for main memory
4 = Location bank 2 for main memory

5 = Lithium battery
6 = PCI slot 3
7 = PCI slots 1, 2
8 = AGP slot / GPA slot

The components and connectors marked are not necessarily present on the system board.

Installing and removing processors



- ▶ Pull the lever in the direction of the arrow (1) and lift it as far as it will go (2).
- ▶ Remove the old processor from the socket (3).
- ▶ Insert the new processor in the socket so that the angled corner of the processor matches the coding on the socket (A) with regard to the position (4).



The angled corner of the processor may be covered by the heat sink. In this case let yourself be guided by the marking in the rows of pins on the underside of the processor.

- ▶ Push the lever back down until it clicks into place (5).

Upgrading main memory

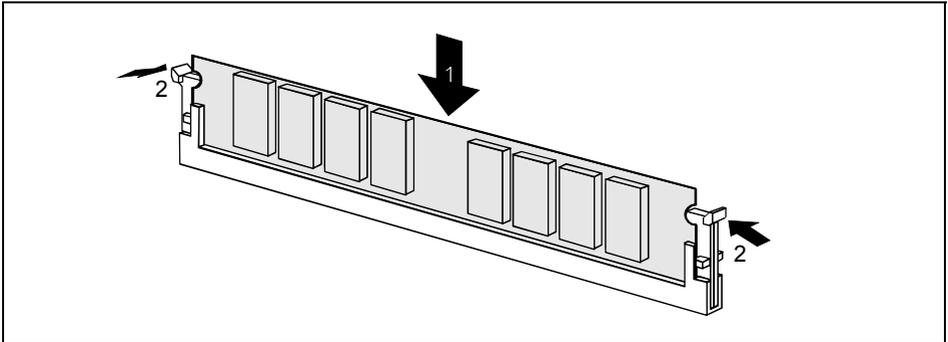
These slots are suitable for DIMM format 16, 32, 64, 128 and 256 Mbyte SDRAM memory modules. Memory modules with different memory capacities can be combined.



You may only use unbuffered 3.3 V memory modules. Buffered memory modules are not supported.

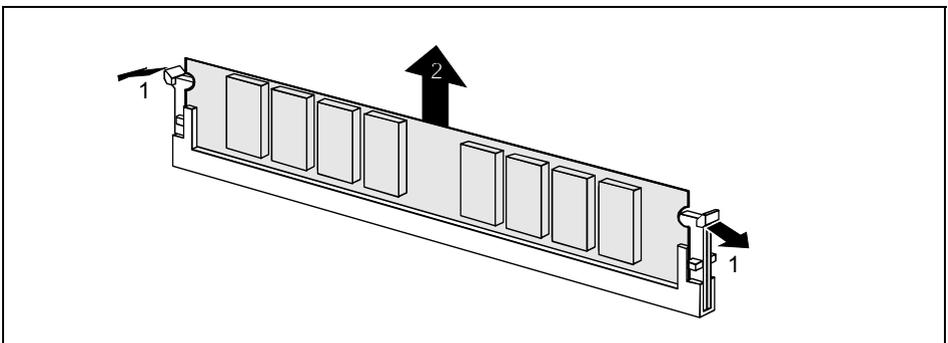
SDRAM memory modules must meet the PC100/PC133 specification. If PC133 memory modules are used, only 2 single sided or 2 double sided memory modules are supported.

Installing a memory module



- ▶ Push the holders on each side of the memory compartment outwards.
- ▶ Insert the memory module into the location (1).
- ▶ At the same time flip the lateral holders upwards until the memory module snaps in place (2).

Removing a memory module



- ▶ Push the clips on the right and left of the compartment outward (1).
- ▶ Carefully remove the memory module from the compartment (2).

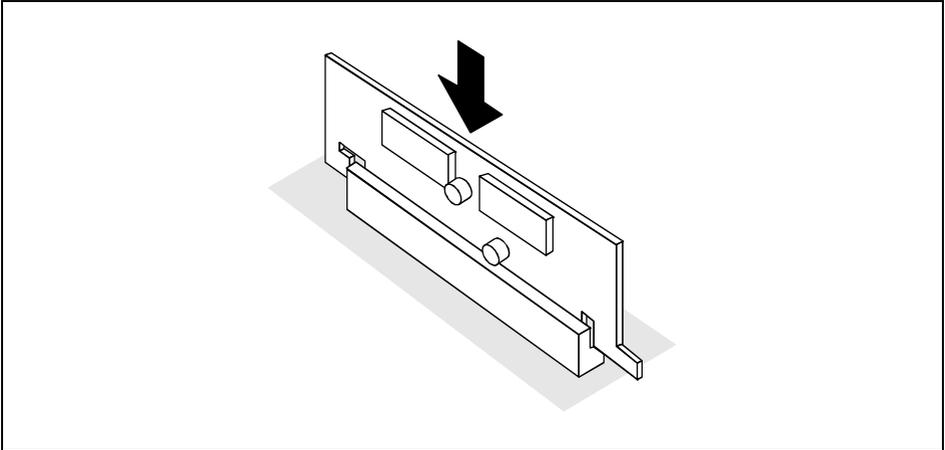
Upgrading an AGP screen controller or the GPA memory



If your system board has only one PCI slot then only one GPA memory board and no AGP screen controllers are supported by the system board.

If your system board is provided with three PCI slots then the system board supports AGP screen controllers with 1x, 2x and 4x AGP modes and GPA memory boards.

The GPA memory improves the speed of the screen controller on the system board with 3D applications.



- ▶ Insert the memory module into the AGP slot (1)

Installing network board with WOL

- ▶ Install the network board as described in the operating manual for your unit.
- ▶ Push the WOL cable onto the WOL plug connector of the system board.



To use the WOL functionality of a network board the power supply must provide a 5 V auxiliary voltage of at least 1 A. If the system board was not already incorporated in a device when you bought it you must check whether your power supply can provide the auxiliary voltage.

You may find further information in the supplied description of the network board.

Replacing the lithium battery

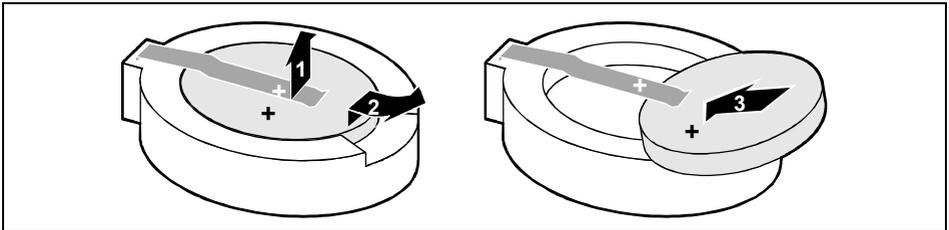


Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the household waste. They must be disposed of in accordance with local regulations concerning special waste.

Ensure that you insert the battery the right way round. The plus pole must be on the top!



- ▶ Lift the contact (1) a few millimetres and remove the lithium battery from its socket (2).
- ▶ Insert a new lithium battery of the same type into the socket (3).

Glossary

The technical terms and abbreviations given below represent only a selection of the full list of common technical terms and abbreviations.

Not all technical terms and abbreviations listed here are valid for the described system board.

| | |
|------------------|---|
| ACPI | Advanced Configuration and Power Management Interface |
| AC'97 | Audio Codec '97 |
| AGP | Accelerated Graphics Port |
| AMR | Audio Modem Riser |
| AOL | Alert On LAN |
| APM | Advanced Power Management |
| ATA | Advanced Technology Attachment |
| BIOS | Basic Input Output System |
| CAN | Controller Area Network |
| CPU | Central Processing Unit |
| CNR | Communication Network Riser |
| C-RIMM | Continuity Rambus Inline Memory Module |
| DDR | Double Data Rate |
| DIMM | Dual Inline Memory Module |
| DRAM | Dynamic Random Access Memory |
| ECC | Error Correcting Code |
| EEPROM | Electrical Erasable Programmable Read Only Memory |
| FDC | Floppy Disk Controller |
| FIFO | First-In First-Out |
| FSB | Front Side Bus |
| FWH | Firmware Hub |
| GMCH | Graphics and Memory Controller Hub |
| GPA | Graphics Performance Accelerator |
| I ² C | Inter Integrated Circuit |
| IAPC | Instantly Available Power Managed Desktop PC Design |
| ICH | I/O Controller Hub |
| IDE | Intelligent Drive Electronics |

| | |
|--------|---|
| IPSEC | Internet Protocol Security |
| ISA | Industrial Standard Architecture |
| LAN | Local Area Network |
| LSA | LAN Desk Service Agent |
| MCH | Memory Controller Hub |
| MMX | MultiMedia eXtension |
| NIC | Networking Interface Card |
| P64H | PCI64 Hub |
| PCI | Peripheral Component Interconnect |
| PXE | Preboot eXecution Environment |
| RAM | Random Access Memory |
| RAMDAC | Random Access Memory Digital Analogue Converter |
| RDRAM | Rambus Dynamic Random Access Memory |
| RIMM | Rambus Inline Memory Module |
| RTC | Real Time Clock |
| SB | Soundblaster |
| SDRAM | Synchronous Dynamic Random Access Memory |
| SGRAM | Synchronous Graphic Random Access Memory |
| SIMD | Streaming Mode Instruction (Single Instruction Multiple Data) |
| SMBus | System Management Bus |
| SVGA | Super Video Graphic Adapter |
| USB | Universal Serial Bus |
| VGA | Video Graphic Adapter |
| WOL | Wake On LAN |
| | |
| | |
| | |