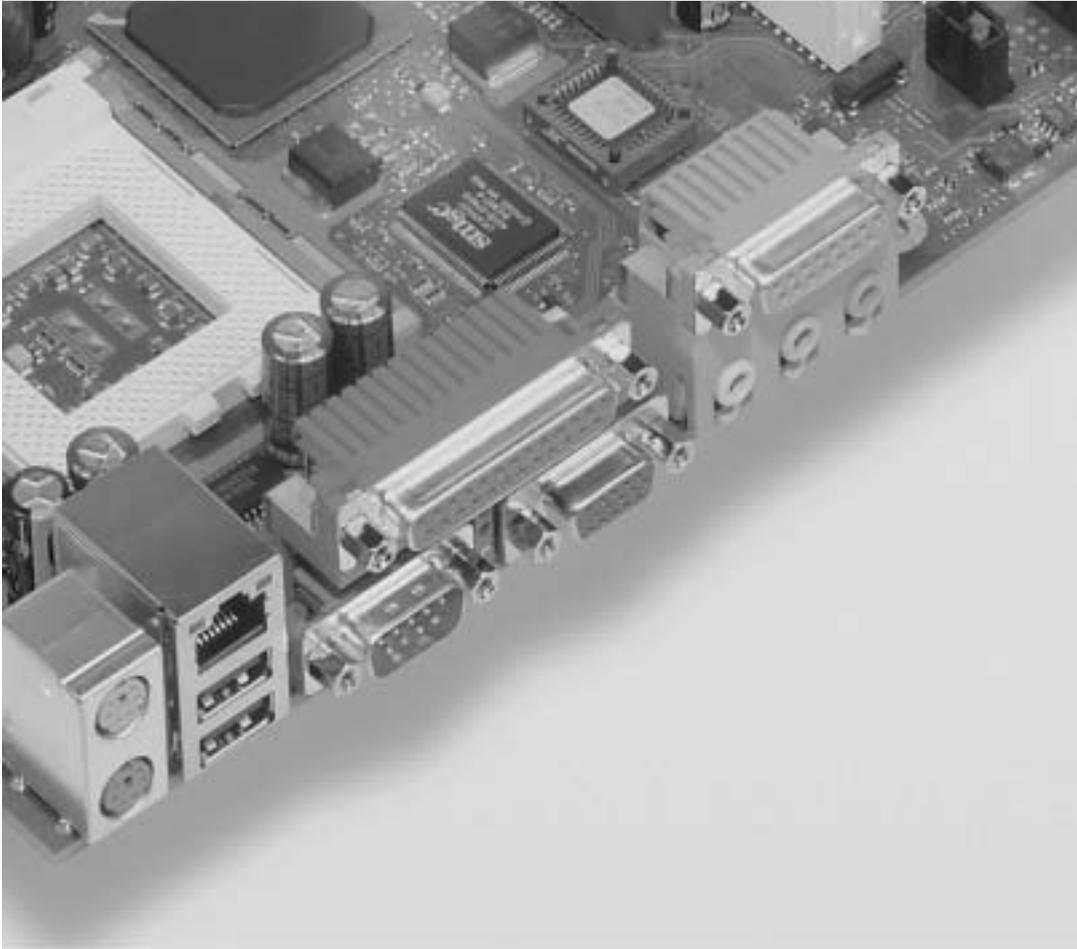


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Systembaugruppe D1329 / System board D1329



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Herausgegeben von/Published by
Fujitsu Siemens Computers GmbH

Bestell-Nr./Order No.: **A26361-D1329-Z120-1-7419**
Printed in the Federal Republic of Germany
AG 1101 11/01



A26361-D1329-Z120-1-7419

Deutsch

English

**Systembaugruppe
D1329
System Board D1329**

**Technisches Handbuch
Technical Manual**

**Ausgabe November 2001
November 2001 edition**

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Contents

Introduction.....	1
Notational conventions	1
Important notes.....	1
Information about boards	2
Features	3
External ports	4
Internal ports and connectors	5
Temperature / System monitoring.....	6
Hard disk connection	7
LAN connector.....	7
PCI bus interrupts.....	8
Settings with switches and jumpers	9
Recovering System BIOS - switch 2	9
Add-on modules	10
Installing and removing processors.....	11
Upgrading main memory.....	12
Installing network board with WOL.....	13
Replacing the lithium battery.....	14
Glossary	15

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.



Individual 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

- System board in ATX format
- mPGA478 Intel processor Pentium 4 with 400 MHz Front Side Bus.

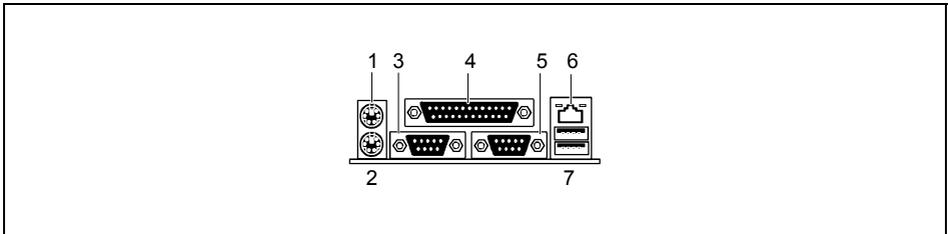
Pentium 4 processors support MMX technology and Intel Streaming SIMD Extensions. The size and frequency of first-level cache and second-level cache are dependent upon the processor used.

- Intel chipset 845
- Intel 82562EM LAN controller (10/100 Mbit/s) with RJ45 interface
WOL with Magic Packet™ is supported, as is booting from LAN with Bootix LAN BootP or Intel PXE.
- Fujitsu Siemens system monitoring and temperature monitoring
- 3 DIMM slots for 128 MB to 3 GB main memory (SDRAM memory modules meet the PC133 specification) with ECC
- Flash BIOS
- Power-on functions:
 - Wake on RTC
 - Wake on LAN
 - Wake on PCI Cards (LAN)
 - Wake on USB
 - Switching on/off via software
 - COM1 wake up support (standby / soft-off)
- Security functions:
 - 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 via *BIOS Setup*
 - Virus protection function for the boot sector
 - Flash BIOS and EEPROMs (on the memory modules) virus protection function.
- system monitoring
 - Error log for EEPROM
 - SMBus (Server Management)
 - RSB (Remote Service Board)
 - Redundant power supply monitoring
- 6 PCI slots
All PCI slots support 3.3 V and 5 V main voltages.

Features

- 1 AGP slot
The AGP slot supports 1x, 2x and 4x AGP mode. Only AGP boards with 1.5 V are 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 Kbyte, 1.44 Mbyte)
- The system board supports booting from a 120 MB IDE floppy disk drive.
- Real-time clock/calendar with integrated battery backup
- 1 internal WOL interface
- 2 internal USB ports (C / D)
- 1 external parallel port (ECP- and EPP-compatible)
- 2 external serial ports (16C550 compatible with FIFO)
- 2 external PS/2 ports for keyboard and mouse
- 2 external USB ports (A / B)

External ports



1 = PS/2 mouse port

2 = PS/2 keyboard port

3 = Serial interface 1 (COM1)

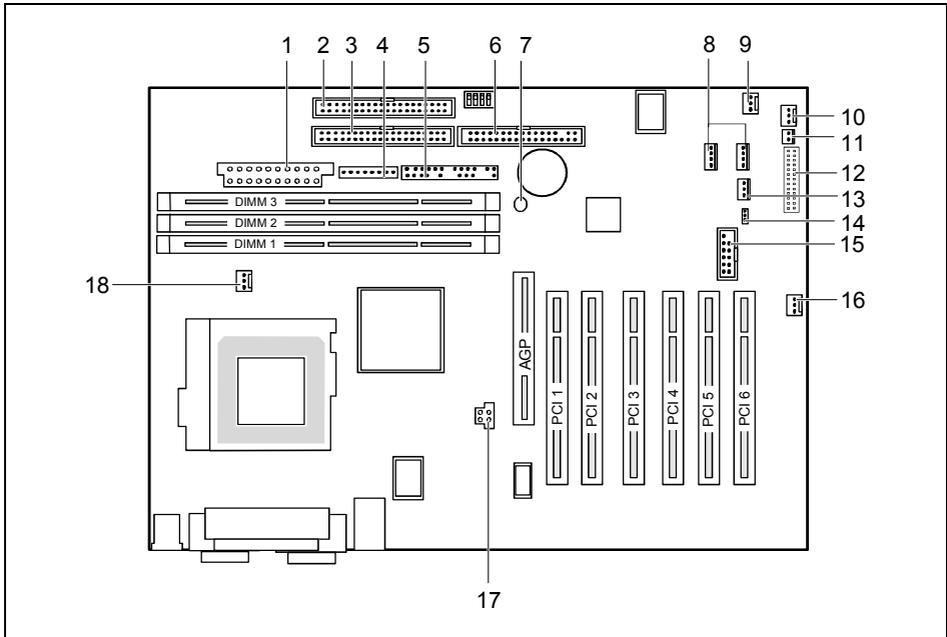
4 = Parallel port

5 = Serial interface 2 (COM2)

6 = LAN connector

7 = USB ports A and B

Internal ports and connectors



- | | |
|---|---|
| 1 = Power supply ATX | 10 = Fan 3 |
| 2 = Floppy Disk Drive | 11 = VCC_RSB (Remote Service Board) |
| 3 = IDE drives 3 and 4 (secondary) | 12 = RSB (Remote Service Board) |
| 4 = Power supply monitoring | 13 = Cover monitoring |
| 5 = Connection for control panel and optical indicators | 14 = NMI |
| 6 = IDE drives 1 and 2 (primary) | 15 = USB ports C / D |
| 7 = Voltage indicator LED | 16 = WOL |
| 8 = SMB 1 / SMB 2 | 17 = Power supply +12 V (for processor) |
| 9 = Fan 2 (for the processor fan) | 18 = Fan 1 (for system fan) |

Temperature / System monitoring

Temperature and system monitoring aim to reliably protect the computer hardware against damage caused by overheating. However, unnecessary noise is to be prevented with a fan speed adapted to the temperature conditions. In addition, important information on the operating state of the device (temperature, operating voltage, fan speeds, error states) is provided. The cover monitoring system indicates an unauthorized opening of the device.

These functions are controlled by an onboard controller developed by Fujitsu Siemens Computers.

The following functions are supported:

Temperature monitoring:

Measurement of the processor temperature, measurement of the air temperature upon entry with a temperature sensor.

Temperature control:

The fan speed of the system fan is controlled depending on the air temperature upon entry. When a specified temperature limit is exceeded, the processor clock frequency is also reduced (throttling mode) to prevent further warming of and damage to the processor.

Fan monitoring:

Blocked fans or a reduced fan speed due to ageing can be detected with the fan monitoring function. Blocked fans are operated with 12 V pulse voltage. An attempt is made to restart a blocked system fan with a cyclical voltage pulse. If the system fan is removed with the device switched off, this results in an error message when the device is switched on again. This is indicated optically by the flashing of the system error LED on the control panel. In addition, an entry is generated in the BIOS Error Log.

Fan control:

The system fan and power supply fan are controlled in dependence on the temperature.

Sensor monitoring:

The installed sensors are also monitored. If a sensor outputs an impermissible value, this results in an increase in the fan speed to the maximum value in order to ensure the maximum possible protection of the hardware.

A failed sensor results in an error message. This is indicated optically by the flashing of the system error LED on the control panel. In addition, an entry is generated in the BIOS Error Log.

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.

This procedure generates an entry in the BIOS Error Log.

Voltage monitoring:

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

If the voltage lies outside the specified tolerances, an error message is generated. This is indicated optically by the flashing of the system error LED on the control panel. In addition, an entry is generated in the BIOS Error Log.

Advantages of hardware system monitoring

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

Hard disk connection

The system is equipped with two independent Ultra ATA/100 interfaces. An Ultra ATA/100 hard disk must be connected with a special IDE cable (80-wire, 40-pin).

- ▶ Connect the end of the cable marked with blue to the system board.
- ▶ Insert the socket of the IDE cable marked in blue in one of the two blue plugs on the system board.

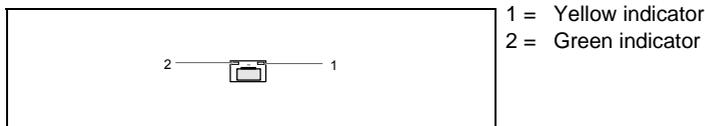
LAN connector

The system board has an Intel 82562EM LAN controller. The LAN controller is equipped with a 3 KB transmission and receiving buffer (FIFO) and supports WOL function through Magic Packet™.

In addition, Bootix LAN BootP and Intel PXE are also supported (support of systems without hard disks).

Basic AOL II is also supported. Basic AOL II helps to protect systems against theft or damage. Basic AOL 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 = Yellow indicator
- 2 = Green indicator

Yellow a connection exists (e.g. to a hub).

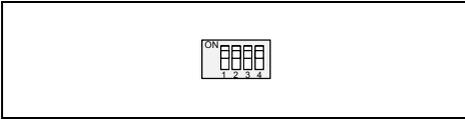
Green Link Mode: the LAN connection is active.
 WOL mode: a Magic Packet™ is being received.

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
E, F, G, H	PCI bus slot 4
F, G, H, A	PCI bus slot 5
G, H, A, B	PCI bus slot 6
A, B	AGP slot
D	First USB controller
H	Second USB controller
E	LAN controller
B	SMBus

Settings with switches and jumpers



Switch 1 = must always be set to *off*
Switch 2 = System BIOS recovery
Switch 3 = must always be set to *off*
Switch 4 = must always 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).

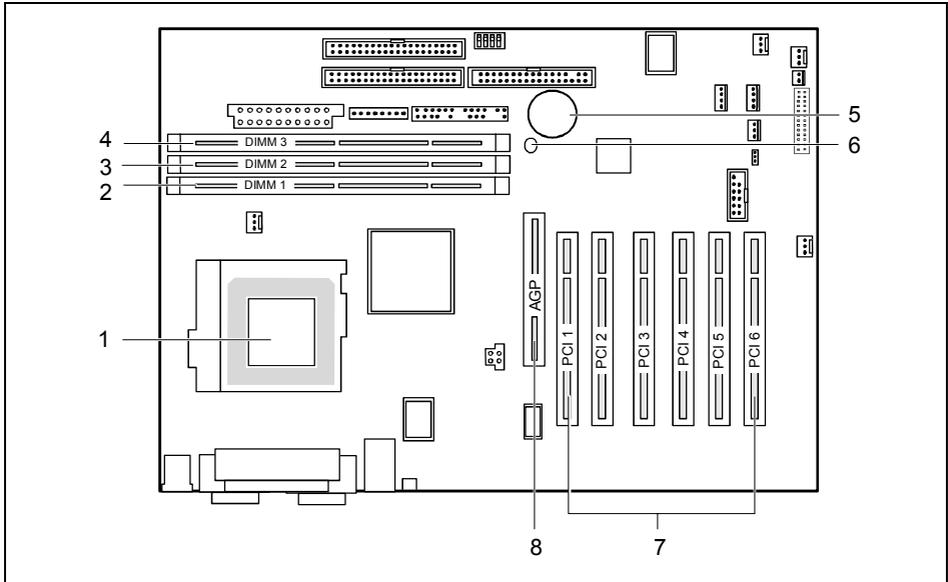
Add-on modules



Exit the operating system and wait until the device has switched off. Pull the power plug out of the mains outlet!

Even with the system switched off, certain parts of the device (e.g. memory modules, AGP and PCI expansion boards) may still be energised. This is indicated by the red voltage indicator LED next to the battery. These components may only be replaced when the voltage indicator LED is not lit up.

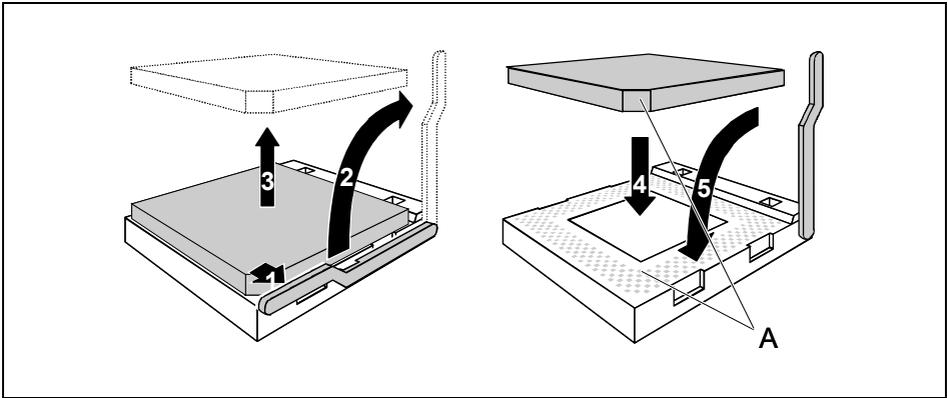
All PCI slots are supplied with both 3.3 V and 5 V main voltage. The AGP slot is supplied with 1.5 V main voltage.



- 1 = Socket for processor with heat sink
- 2 = Location bank 1 for main memory
- 3 = Location bank 2 for main memory
- 4 = Location bank 3 for main memory

- 5 = Lithium battery
- 6 = Voltage indicator LED
- 7 = PCI slots 1, 2, 3, 4, 5, 6
- 8 = AGP slot

Installing and removing processors



Before you install or remove the processor, you must remove the processor heat sink.



Processor heat sinks can become very hot.

Wait until the processor heat sink has cooled before removing it.

- ▶ Release the bracket for the processor heat sink.
- ▶ Lift the heat sink off the processor and lay the heat sink aside.
- ▶ 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).
- ▶ Push the lever back down until it clicks into place (5).
- ▶ Before you refit the processor heat sink, carefully remove the residues of the heat conducting paste from the surface of the processor heat sink.
- ▶ Apply an even coat of new heat conducting paste to the entire surface of the processor or use a new heat conducting pad.



If you upgrade your device with a new processor, it is advisable to also replace the processor fan at the same time. This serves to increase the reliability of the entire system (preventative protection).

Upgrading main memory

These slots are suitable for 128, 256, 512, 1024 Mbyte SDRAM memory modules of the DIMM format.

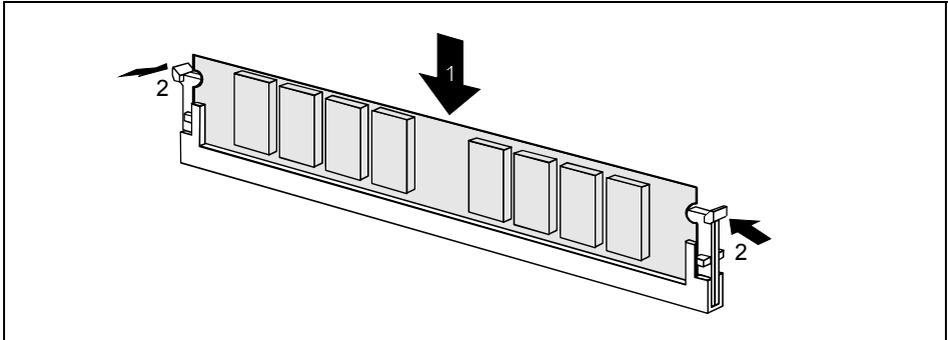
Memory modules with different memory capacities can be combined.



You may only use unbuffered 3.3 V memory modules. Buffered memory modules are not allowed and lead to a device failure.

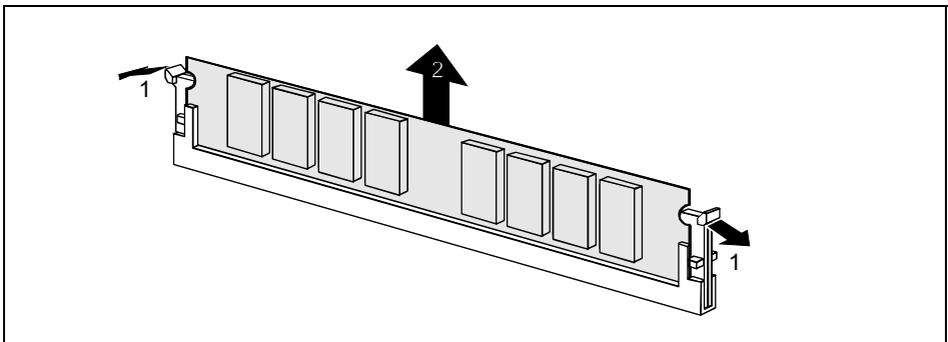
SDRAM memory modules must meet the PC133 specification.

Installing a memory module



- ▶ Push the holders on each side of the memory compartment outwards.
- ▶ Push the memory module into the location (1).
- ▶ At the same time flip the both 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).

Installing network board with WOL

- ▶ Install the network board in a free PCI slot.

The system board supports the PME cable, which replaces the additional WOL connector with cable.

However, if you want to install a network board without PME signalling, you must connect the WOL cable to the system board.

- ▶ Connect the WOL cable onto the WOL connector of the system board.

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.

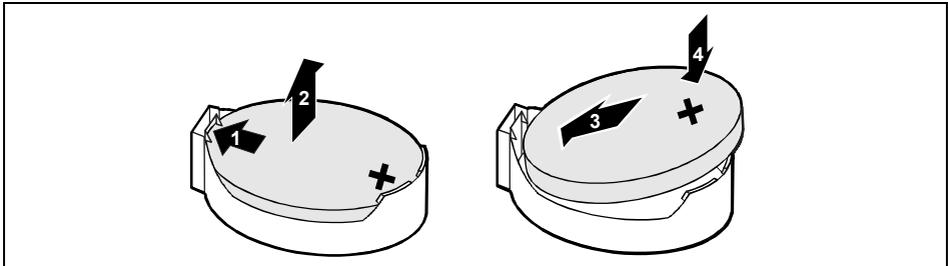
The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

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!

- **VAROITUS**
Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.
- **VARNING**
Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.
- **ADVARSEL**
Lithiumbatteri - Explosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Lever det brugte batteri tilbage til leverandøren.
- **ADVARSEL**
Explosionsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

The following graphic representation is also valid if the lithium battery is built-in vertically.



- ▶ Press the retaining spring in the direction of the arrow (1) until you can remove the lithium battery from the holder (2).
- ▶ Push the new lithium battery of the identical type into the holder (3) and make sure it engages (4).

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
DIMM	Dual Inline Memory Module
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
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