SYSTEM BOARD D1192

TECHNICAL MANUAL

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Systembaugruppe D1192
System Board D1192

Technisches Handbuch
Technical Manual

Contents

Introduction

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

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

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

Notational conventions

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

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

i Supplementary information, remarks and tips follow this symbol.

► Texts which follow this symbol describe activities that must be performed in the order shown.

␣ This symbol means that you must enter a blank space at this point.

⏎ This symbol means that you must press the Enter key.

Texts in this typeface are screen outputs.

Texts in this bold typeface are the entries you make via the keyboard.

Texts in italics indicate commands or menu items.

"Quotation marks" indicate names of chapters and terms that are being emphasized.

Important notes

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

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

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

Please note the information provided in the chapter "Safety" in the Operating Manual of the device.

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

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 of the receiving device.

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

Components can become very hot during operation.Make sure 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 center.

Information on 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 care above all 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, centering 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 observe the following points under all circumstances:

- You must always discharge yourself (e. g. by touching a grounded object) before working.

- The equipment and tools you use must be free of static charges.

- Pull out the power plug before inserting or pulling out 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 ATX format
- PGA 423 Pentium 4 processor with 100 MHz Front Side Bus and 400 MHz data transfer rate.

Size and frequency of first-level cache and second-level cache are depending on the processor used.

- Intel chipset i850
  consisting of ICH 2
- Intel 82550 LAN controller (10/100Mbit/s) with integrated IPSEC accelerator and RJ45 interface
  WOL with Magic Packet™ is supported, as is booting from LAN with Bootix LAN BootP or Intel
  PXE and Basic and Advanced AOL II.
- AC'97 Audio Codec
  internal: Stereo CD-In, Stereo AUX-In
  external: Mono Micro-In, Stereo Line-In, Game/Midi-Port, Stereo Line-Out (max. 2x 0,5 W/8 Ω)
- Fujitsu Siemens system monitoring and temperature monitoring
- 4 RIMM slots for 128 to 2 Gbyte main memory (RIMM PC800 or PC600)Only 1-32 RDRAM are
  supported per RAMBUS channel.
- Flash BIOS
- Energy saving functions:
  - ACPI S3 / Save-to-RAM (requires an operating system that supports ACPI).
  - ACPI S4 / Save-to-Disk (requires an operating system that supports ACPI).
  - Switching on/off, standby mode, suspend mode via on/off switch
  - Switching on/off via software
  - Wake on RTC
  - Wake on Serial Port 1
  - Wake on LAN
  - Wake on PCI Cards
- Security functions:
  - Cover monitoring: The cover monitoring reports when the cover has been opened without
    authorization.
  - Chipcard reader interface
  - System, Setup and Keyboard password
  - parallel and serial ports can be deactivated
  - Floppy disk write-protection
  - Virus protection function for the flash BIOS and the EEPROMs on the memory modules
- 5 PCI slots
  PCI slots support 3.3 V main and auxiliary voltages.
- 1 AGP slot
  AGP slot supports AGP and 4x AGP modes. The AGP slot supports 1.5 V AGP boards only.
- 1 CNR slot

- 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 and ultra DMA mode capable
- Floppy disk drive controller (possible formats: 720 Kbyte, 1.44 Mbyte, 2.88 Mbyte)
- The system board supports booting from a 120 Mbyte IDE floppy disk drive.
- 1 external parallel port (ECP- and EPP-compatible)
- 1 external serial port (16C550 compatible with FIFO)
- 1 internal chipcard reader interface. As an alternative 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
- Real-time clock/calendar with integrated battery backup

Interfaces and connectors
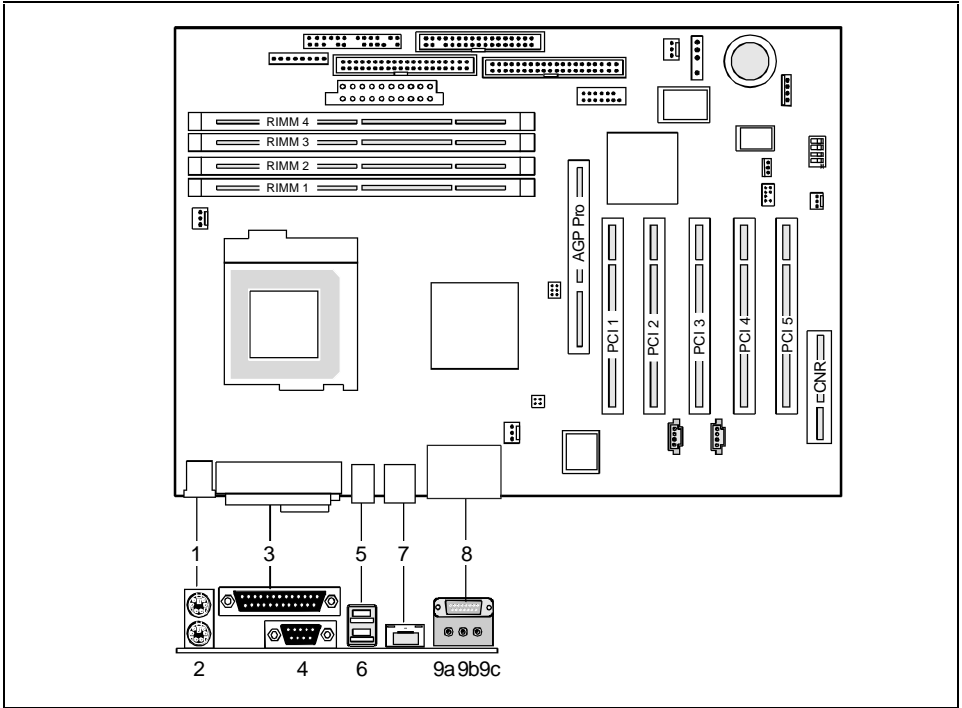
1 = PS/2 mouse port
2 = PS/2 keyboard port
3 = Parallel port
4 = Serial port 1
5 = USB port 2
6 = USB port 1
7 = LAN port

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

The components and connectors marked are not necessarily present on the system board.
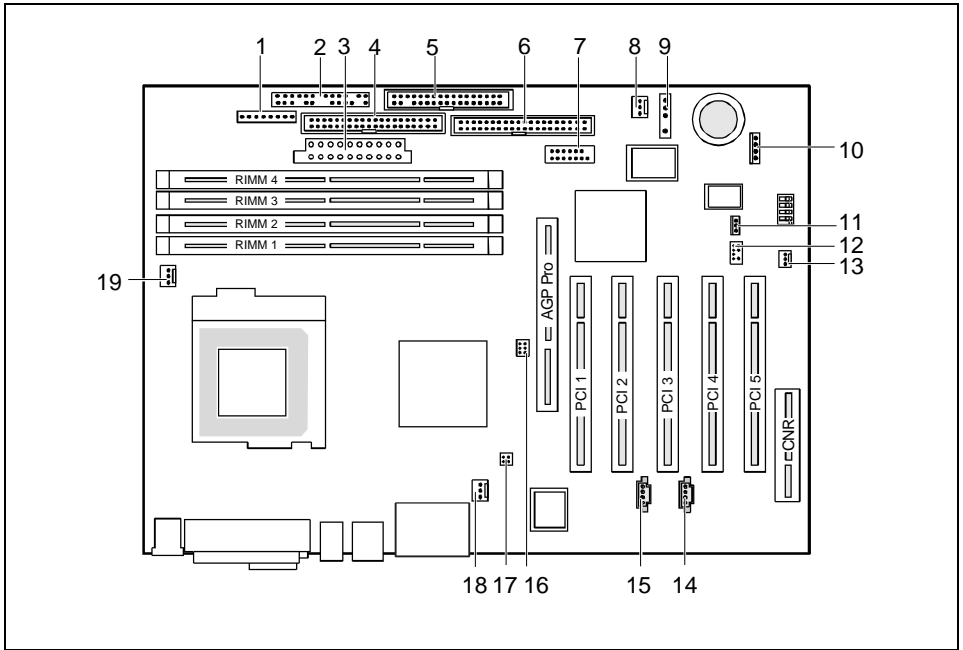
1 = Power supply monitoring
2 = Connector for control panel and loudspeaker
3 = Power supply
4 = IDE drives 3 and 4 (secondary)
5 = Floppy disk drive
6 = IDE drives 1 and 2 (primary)
7 = Serial chipcard reader interface or serial port 2
8 = Fan 2 (AUX)
9 = IrDA

10 = I²C port
11 = Cover monitoring
12 = USB chipcard reader or USB front panel
13 = Wake On LAN (WOL)
14 = CD audio input
15 = AUX audio input
16 = Power supply +3.3 V for AGP Pro
17 = Power supply +12 V
18 = Fan (system)
19 = Fan 1 (for the processor)

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

Temperature monitoring / system monitoring

One goal of temperature and system monitoring is to reliably protect the computer hardware against damage caused by overheating. In addition, any unnecessary noise is also to be prevented with a reduced fan speed, and information is to be provided on the system state. The cover monitoring protects the system from unauthorized opening.

The temperature and system monitoring 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 system temperature with an onboard temperature sensor, measurement of the device temperature with an optional temperature sensor (AUX).

Temperature control:

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

Fan monitoring:

Fans that are no longer available, blocked or sticky fans are detected. Blocked or sticky fans are operated with 12 V pulse voltage. If the device has a message indicator fans removed while the system is switched off are signaled by the message indicator LED when the system is switched on again and processed by the BIOS or the application.

Fan control:

The fans are regulated according to temperature with the exception of the auxiliary fan (AUX).

Sensor monitoring:

A fault or removal of a temperature sensor is detected. In this case all fans affected by this sensor run at maximum speed to achieve the greatest possible protection of the hardware. If the device has a message indicator fans removed while the system is switched off are signaled by the message indicator LED when the system is switched on again and processed by the BIOS or the application.

Cover monitoring:

Unauthorized opening of the cover is detected, even when the system is switched off. However, this will not be indicated until the system is operating 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 hard disk must be connected with a cable especially designed for the ATA/66/100 mode.

► Connect the blue marked end of the cable to the system board.

LAN port

This system board is equipped with the Intel 82550 LAN controller as an option. This LAN controller supports the transfer speeds 10 Mbit/s and 100 Mbit/s. The LAN controller is equipped with a 3 Kbyte transmission and receiving buffer (FIFO) and supports the WOL function through Magic Packet™.

It is also possible to boot a device without its own boot hard disk via LAN. Here Bootix LAN BootP and Intel PXE are supported.

The LAN RJ45 connector is equipped with a yellow and a green LED (light emitting diode).
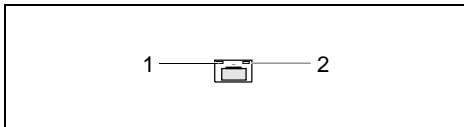
1 = Yellow indicator
2 = Green indicator

Green	a connection exists (e. g. to a hub).
Yellow	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 on the system board are assigned.

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, C, D	PCI bus slot 4
B, C, D, A	PCI bus slot 5
A, B	AGP slot
D	USB controller
D	LAN controller
A	Graphics processor
B	SMBus
B	AC'97 Audio

Settings with switches and jumpers
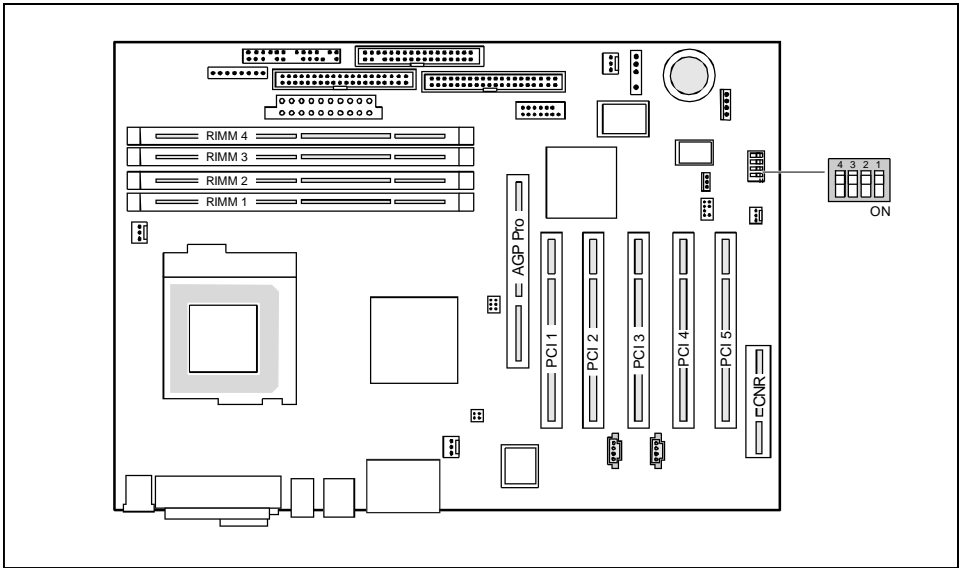
Switch 1 = must be set to *off*   Switch 3 = Write-protection for floppy disk
Switch 2 = System BIOS recovery   Switch 4 = must be set to *off*

> **i** 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 center).

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   Read, write and delete floppy disks is possible (default setting).

Add-on modules

⚠ For all steps described in this chapter exit the suspend mode before switching off the device and then pull the power plug out of the power outlet!
Even when you have run down the device, parts of the device (e.g. memory modules, AGP and PCI extension boards) are still energized.
All PCI slots support 3.3 V main and auxiliary voltages.
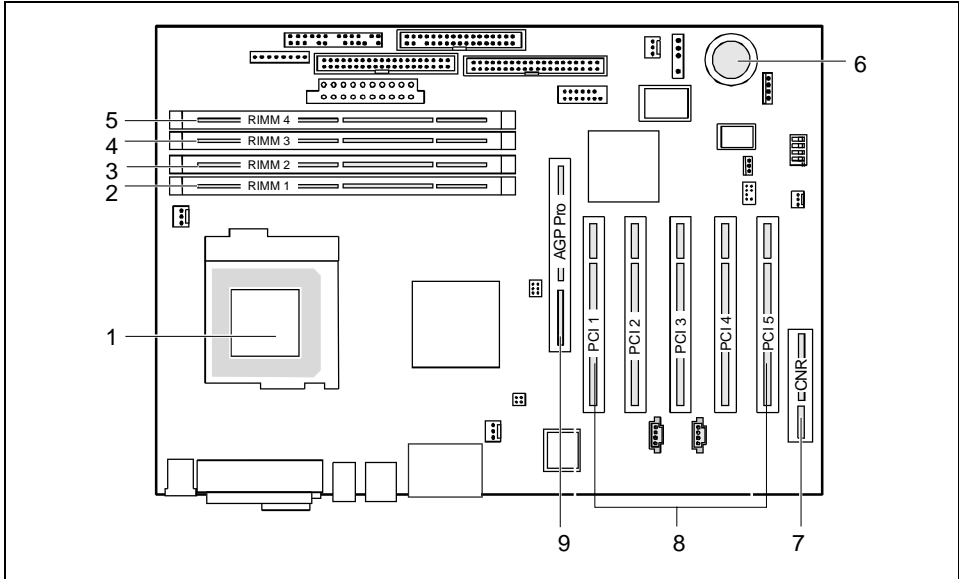
1 = Slot for processor with heat sink
2 = Location bank 0 for main memory
3 = Location bank 1 for main memory
4 = Location bank 0 for main memory
5 = Location bank 1 for main memory

6 = Lithium battery
7 = CNR slot
8 = PCI slots 1, 2, 3, 4, 5
9 = AGP Pro slot

ℹ PCI slots support 3.3 V / 5 V main voltage and 3.3 V auxiliary voltage.

Installing / removing processor

► Press the retainers in the direction of the arrow (1) and (2) and tilt it upwards.

► Lift the heat sink off the processor (3).

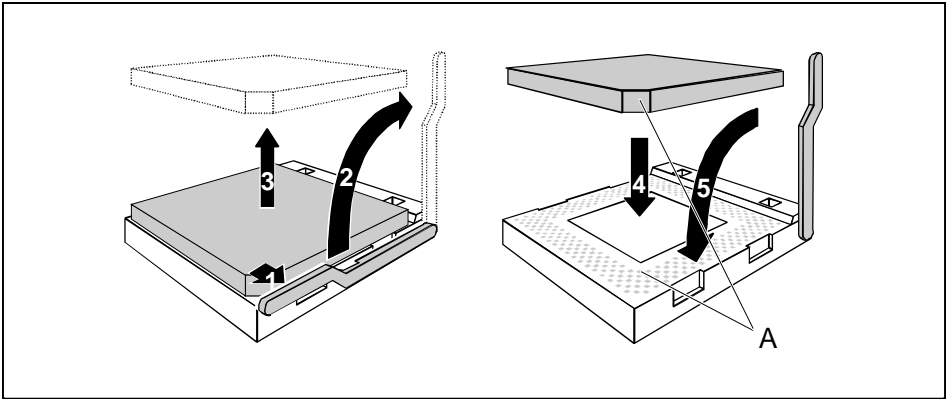► Insert the new processor in the socket so that the angled corner of the processor matches the coding on the socket (A) with regard to the position (4).

> ⚠ 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.

► Apply the heat transfer compound evenly on the underside of the heat sink (approx. 0.5 mm).

► Fit the heat sink on the new processor.

► Tilt the retainers downwards and press in the direction of the arrow (5).

Upgrading main memory

These slots are suitable for 128 to 512 Mbyte RDRAM memory modules of the RIMM format. The permissible total size of the main memory is 2 Gbyte.

You must not combine memory modules from different manufacturer, different types of modules, or modules of different capacities in the same bank. Different memory capacities are permitted in the various banks. Example: 2 x 128 MB in bank 0 and 2 x 64 MB in bank 1 are permissible; 64 MB + 128 MB in bank 0 are not permissible.

⚠ **All locations must always** be occupied. Missing memory modules must be replaced with a C-RIMM. This C-RIMM must then be installed in the order of the locations **behind** the RIMM:

Location bank 0 = RIMM
Location bank 1 = C-RIMM.

The system board supports only 32 RDRAM for each bank:

	Total size of RIMM	Number of chips
64 Mbit technology	128 Mbyte	16
128 Mbit technology	128 Mbyte	8
	192 Mbyte	12
	256 Mbyte	16
256 Mbit technology	128 Mbyte	4
	256 Mbyte	8
	384 Mbyte	12
	512 Mbyte	16

⚠ The system board supports memory modules PC800 and PC600. Always use memory modules of the same speed class. You should not mix memory modules that have different speed classes. Optimal system speed is achieved when you use PC800 RDRAM memory modules.

Installing memory modules
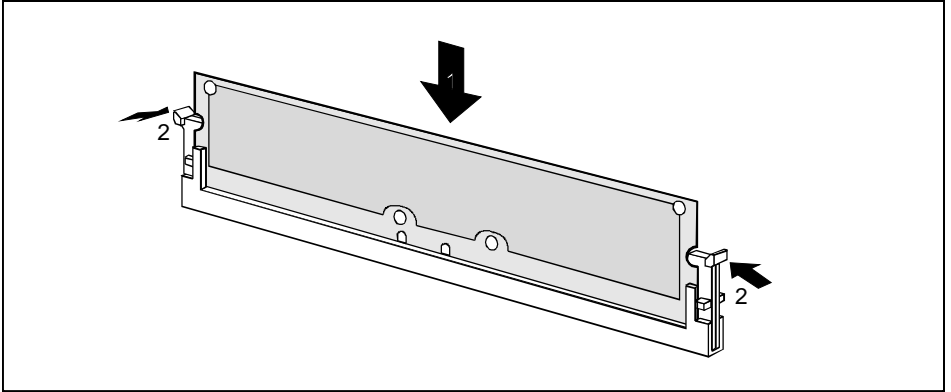
► Flip the holders on each side of the relevant location outwards.

► 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
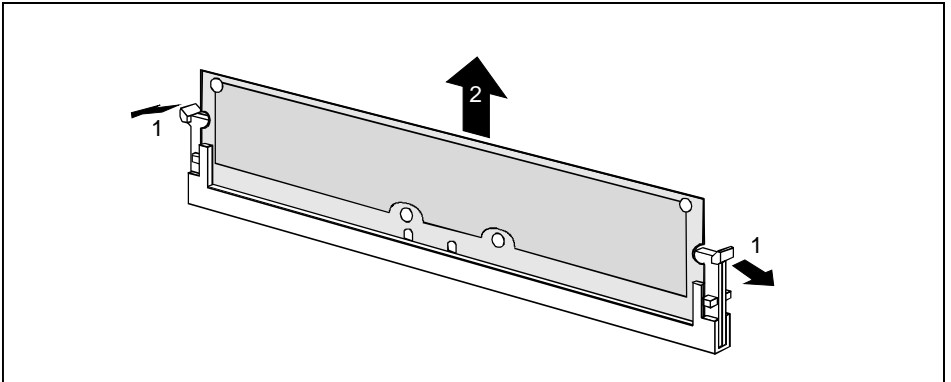
► Flip the holders to the right and left of the location outwards(1).

► Pull the memory module out of its location(2).

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.

> **i** To use the WOL functionality of a network board the power supply must provide a 5V 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 trashcan.It must be disposed of in accordance with local regulations concerning special waste.
>
> Make sure 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.
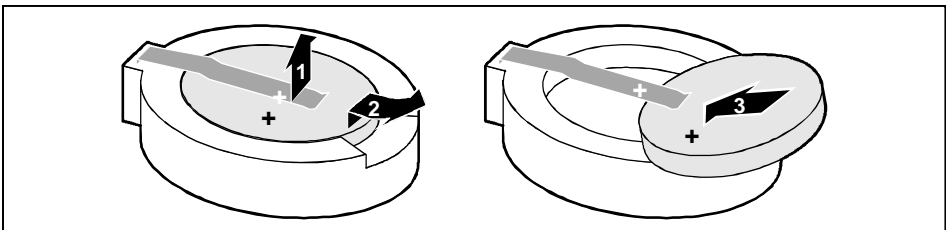
► Lift the contact (1) a few millimeters and remove the battery from its socket(2).

► Insert a new lithium battery of the same type in 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		ISA	Industrial Standard Architecture
AC'97	Audio Codec '97		LAN	Local Area Network
AGP	Accelerated Graphics Port		LSA	LAN Desk Service Agent
AIMM	AGP Inline Memory Module		MCH	Memory Controller Hub
AMR	Audio Modem Riser		MMX	MultiMedia eXtension
AOL	Alert On LAN		P64H	PCI64 Hub
APM	Advanced Power Management		PCI	Peripheral Component Interconnect
ATA	Advanced Technology Attachment		PXE	Preboot eXecution Environment
BIOS	Basic Input Output System		RAM	Random Access Memory
CAN	Controller Area Network		RAMDAC	Random Access Memory Digital Analog Converter
CPU	Central Processing Unit		RDRAM	Rambus Dynamic Random Access Memory
CNR	Communication Network Riser		RIMM	Rambus Inline Memory Module
C-RIMM	Continuity Rambus Inline Memory Module		RTC	Real Time Clock
DIMM	Dual Inline Memory Module		SB	Soundblaster
ECC	Error Correcting Code		SDRAM	Synchronous Dynamic Random Access Memory
EEPROM	Electrical Erasable Programmable Read Only Memory		SGRAM	Synchronous Graphic Random Access Memory
FDC	Floppy Disk Controller		SIMD	Streaming Mode Instruction (**S**ingle **I**nstruction **M**ultiple **D**ata)
FIFO	First-In First-Out		SMBus	System Management Bus
FSB	Front Side Bus		SVGA	Super Video Graphic Adapter
FWH	Firmware Hub		USB	Universal Serial Bus
GMCH	Graphics and Memory Controller Hub		VGA	Video Graphic Adapter
I^2C	Inter Integrated Circuit		WOL	Wake On LAN
IAPC	Instantly Available Power Managed Desktop PC Design			
ICH	I/O Controller Hub			
IDE	Intelligent Drive Electronics			
IPSEC	Internet Protocol Security			