

**SYSTEMBAUGRUPPE D1194**  
**SYSTEM BOARD D1194**

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**TECHNICAL MANUAL**

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**Systembaugruppe  
D1194  
System Board D1194**

**Technisches Handbuch  
Technical Manual**

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# 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 note the information provided in the "Safety" 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 of 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.

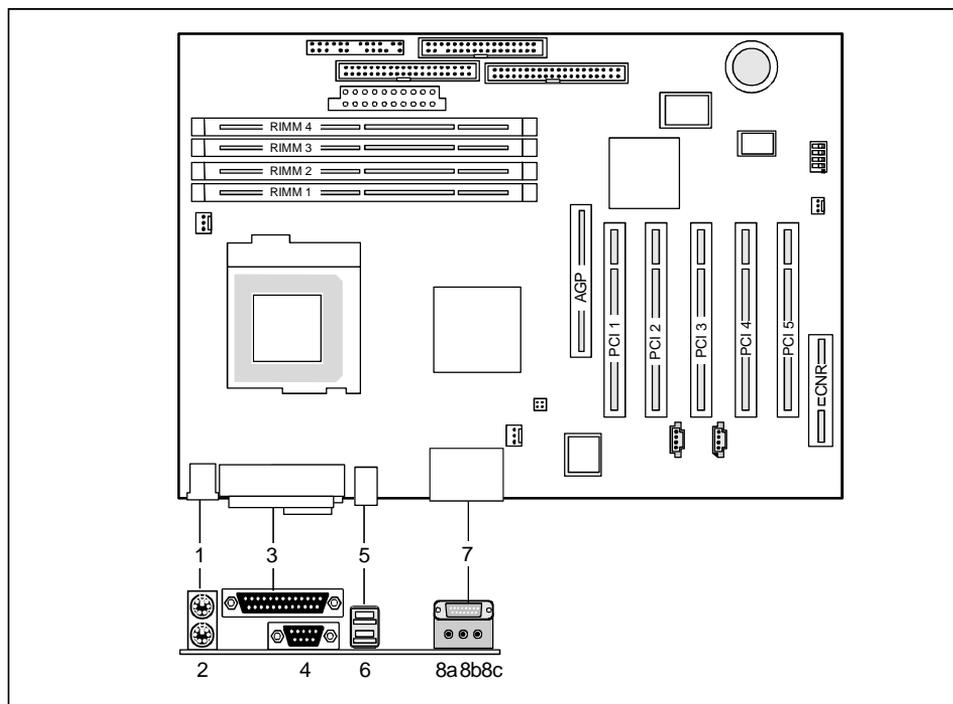
- System board in ATX format
- PGA 423 Pentium 4 processor with 100 MHz Front Side Bus and 400 MHz data transfer rate.

The size and frequency of first-level cache and second-level cache are dependent upon the processor used.

- Intel chipset i850 consisting of ICH 2
- 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. 2 x 0,5 W/8 Ω)
- 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:
  - System, Setup and Keyboard password
  - parallel and serial ports can be deactivated
  - Floppy disk write-protection
  - Flash BIOS and EEPROMs (on the memory modules) virus protection function.
- 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 KB, 1.44 MB, 2.88 MB)
- The system board supports booting from a 120 MB IDE floppy disk drive.
- 1 external parallel port (ECP- and EPP-compatible)
- 1 external serial port (16C550 compatible with FIFO)
- 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

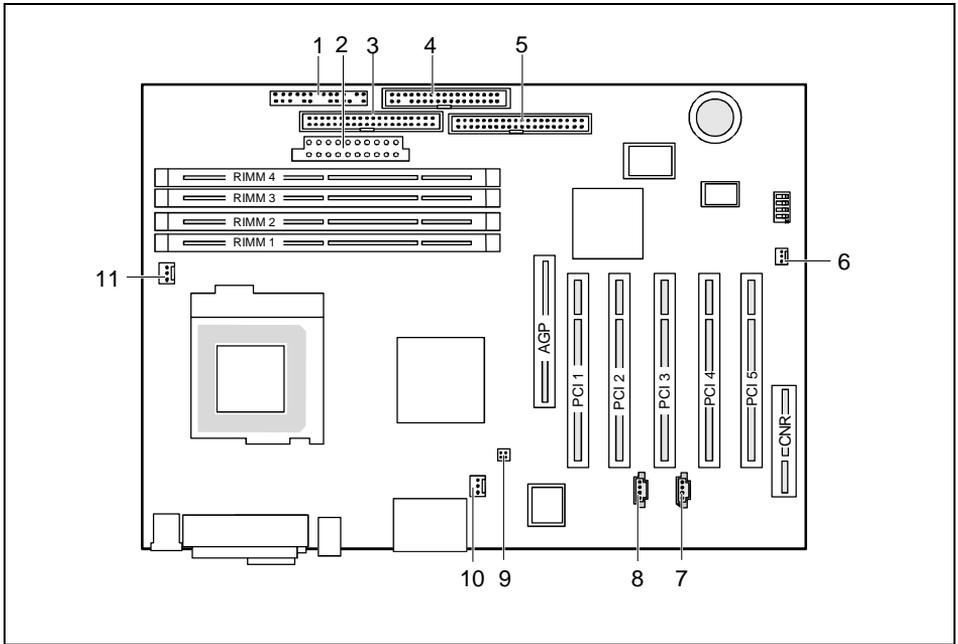
## Interfaces and connectors



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

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



- 1 = Connector for control panel and loudspeaker
- 2 = Power supply
- 3 = IDE drives 3 and 4 (secondary)
- 4 = Floppy disk drive
- 5 = IDE drives 1 and 2 (primary)
- 6 = Wake On LAN (WOL)

- 7 = CD audio input
- 8 = AUX audio input
- 9 = Power supply +12 V
- 10 = Fan 2 (system)
- 11 = Fan 1 (for the processor)

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

## Hard disk connection

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

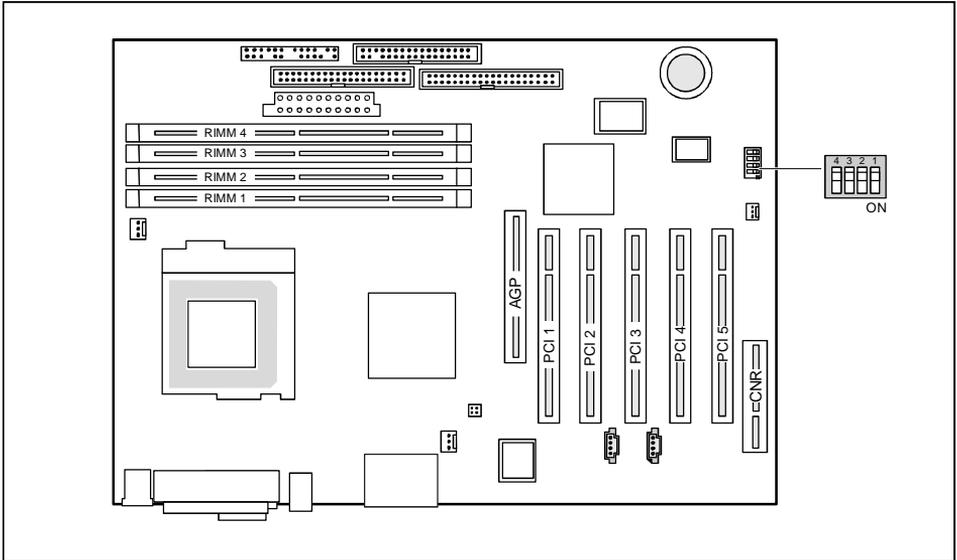
- ▶ Connect the end of the cable marked with blue to the system board.

## 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, 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 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*).

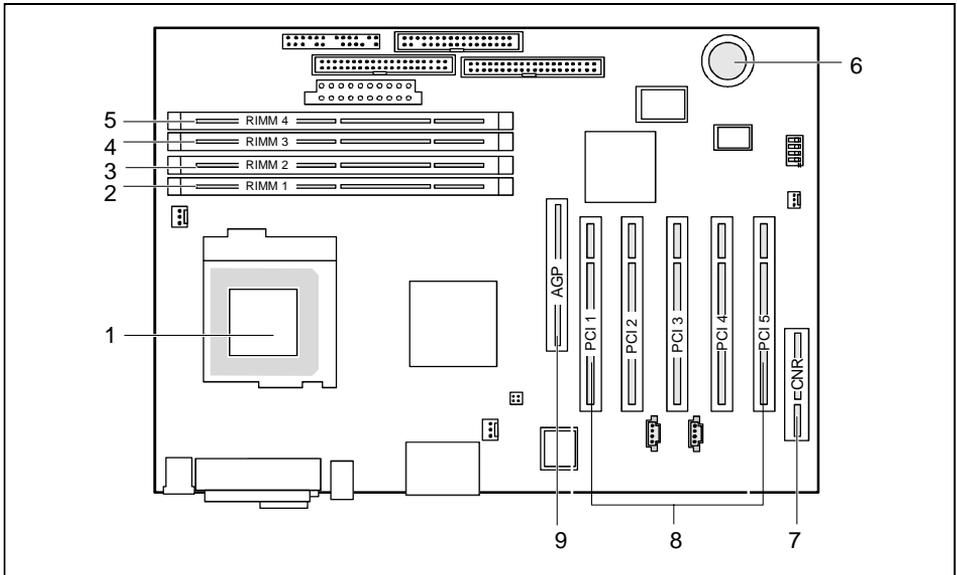
*On* The floppy disk drive is write-protected.

*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. All PCI slots support 3.3 V main and auxiliary voltages.



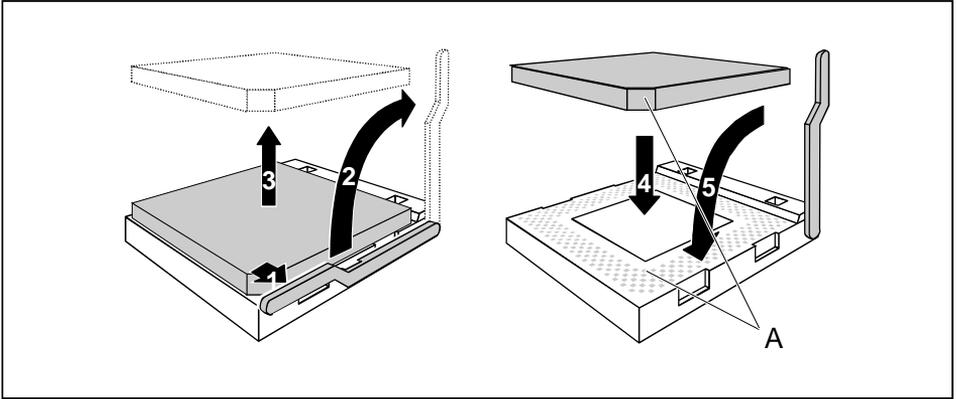
1 = Socket for processor with heat sink  
 2 = Location bank 0 for main memory  
 3 = Location bank 1 for main memory  
 4 = Location bank 0 for main memory  
 5 = Location bank 1 for main memory

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



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

## Installing and removing processors



- ▶ 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:

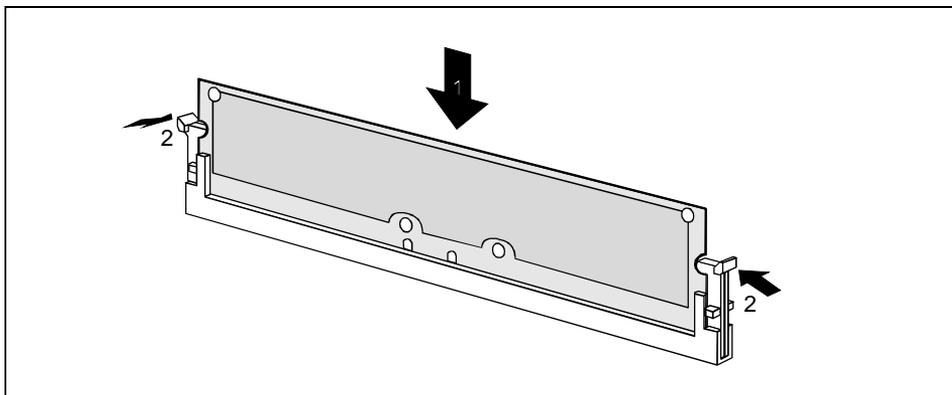
	Total size of RIMM	Number of chips
64Mbit technology	128 MB	16
128Mbit technology	128 MB	8
	192 MB	12
	256 MB	16
256Mbit technology	128 MB	4
	256 MB	8
	384 MB	12
	512 MB	16



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.

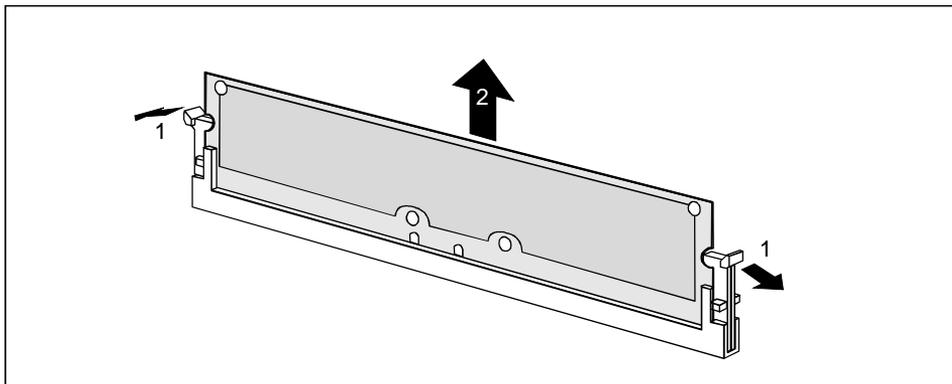
Slot	Occupation 1	Occupation 2
RIMM1	RIMM	RIMM
RIMM2	C-RIMM	RIMM
RIMM3	RIMM	RIMM
RIMM4	C-RIMM	RIMM

### 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).

## 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



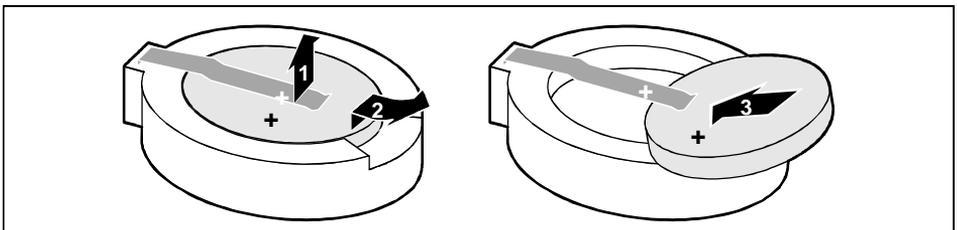
Incorrect replacement of the lithium battery may lead to a risk of explosion.

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!

- **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 apparatillverkaren. 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 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 <sup>2</sup> 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