COMPONENT

Mainboard D1290

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Mainboard D1290

**Technisches Handbuch
Technical Manual**

**Ausgabe Juni 2002
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Contents

Introduction

This Technical Manual describes the mainboard D1290, which can be equipped with up to four Intel Xeon processors.

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.

> **i** 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 mainboard 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 "off   The system is started with the system BIOS from the mainboard. The system BIOS cannot be reprogrammed (default setting).
>
> " - "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. Make sure you do not touch components when making extensions to the mainboard. 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 mainboard 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 mainboard, or any other components, for example EMI spring contacts.

Be especially careful with the locking mechanisms (catches, centring pins etc.) when you replace the mainboard 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

- RCC Grand Champion high end chipset (CMIC, REMC, CSB5 and CIOB30)
- our processor slots for Pentium Xeon MP processors, socket 603 with 400 MHz System-Bus
- Second level cache: 256 KB
- Third level cache: 512 KB or 1 MB
- Slot for memory board
    - 16 PC1600 slots (DDR SDRAM memory modules) for up to 16/32 Gbyte main memory
- one 64 bit hot-plug PCI slot with 66 MHz
- five 64 bit hot-plug PCIX slots with 100 MHz
- two 32 bit PCI slots with 33 MHz
- 2 channel SCSI controller AIC7899W onboard with 64 bit and 66 MHz and 2x Ultra3 port
- Screen controller ATI Rage XL VGA onboard with 32 Bit, 33 MHz PCI and 8 Mbyte SDRAM memory
- Intel i82559 Ethernet LAN controller with 10 Mbits / 100 Mbit Ethernet
- Server Management with Copernicus A onboard with LAN and COM port
- IDE hard disk controller connected to PCI bus
  ultra DMA33 mode capable, supports PIO modes 0-4
- one external parallel interface (ECP- and EPP-compatible)
- two external serial ports (COM1 and COM2)
- two external and one internal USB port (USB = Universal Serial Bus)
- two external PS/2 interfaces for keyboard and mouse
- system monitoring
- Flash Disc for RemoteView inserted directly
- Hot-Spare memory function

Interfaces and connectors

1 = SCSI connections
2 = Power supply I
3 = Power supply II
4 = Data cables to the power supply board
5 = IDE drives (secondary)
6 = IDE drives (primary)
7 = Serial port for modem
8 = Switch block
9 = Internal USB port for chipcard reader
10 = Connector for memory board D1290
11 = Fan connector for CPU 4
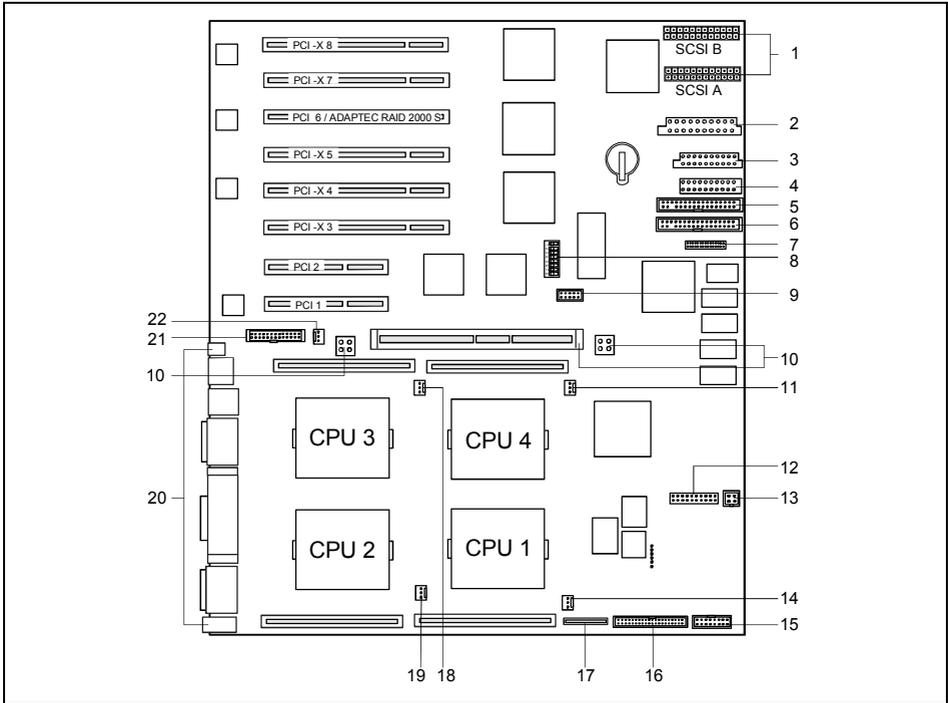
12 = Port for accumulator card
13 = Port for SMBUS debugger
14 = Fan connector for CPU 1
15 = Internal COM port for chipcard reader
16 = Floppy disk drive I
17 = Floppy disk drive I
18 = Fan connector for CPU 3
19 = Fan connector for CPU 2
20 = External ports
21 = Connector for hot plug panel
22 = Wake On LAN

External ports
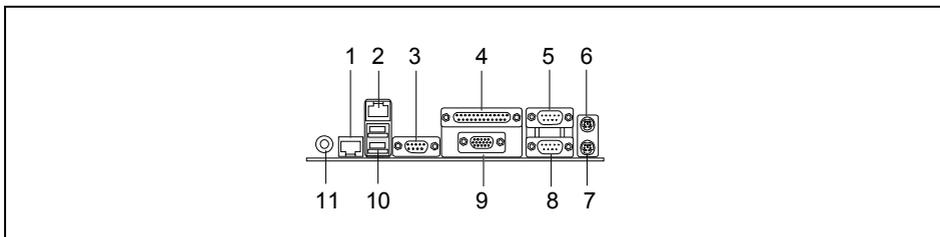
1 = LAN port for Server Management
2 = LAN connector
3 = Serial port COM for Server Management
4 = Parallel port LPT
5 = Serial port COM2
6 = PS/2 mouse port

7 = PS/2 keyboard port
8 = Serial port COM1
9 = VGA port
10 = USB ports (below 1, above 2)
11 = DC power external for Server Management

⚠ If a chipcard reader is installed, no device may be connected to serial interface 2 (COM2).

Please use the current driver from the internet under *http://www.fujitsu-siemens.com – "Service & Support"* for the chipcard reader.

LAN connector: indicators
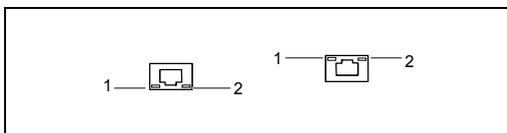
1 = lighting orange: 100 Mbit/s
    does not light: 10 Mbit/s
2 = lighting green: existing connection
    flashes green: data transfer takes place

ISA bus resources

Device	IRQ	Address	DMA
Keyboard	1		
Serial port COM2	3	03F8, **02F8**, 03E8, 02E8	
Serial port COM1	4	**03F8**, 02F8, 03E8, 02E8	
	5		
Floppy disk drive controller	6		2
Parallel interface LPT1	7	0278, **0378**	0, 1, 3
Real-time clock (RTC)	8		
free	9, 10, 11		
Mouse controller	12		
Numeric processor	13		
IDE controller	14	1F0-1F7	
free	15		

"IRQ" = interrupt assigned as shipped
"Address" = this address can be used for your particular device
"Address" = this DMA can be used for your particular device
Default settings are shown in bold print.

PCI bus resources

PCI slots

The following table shows an overview of the PCI slots:

PCI slot	64bit/32bit	Frequency in MHz	Hot plug	PCIX	Description
1	32 bit	33	no	no	32 bit PCI bus slot
2	32 bit	33	no	no	32 bit PCI bus slot
3	64 bit	100	yes	yes	64 bit PCI bus slot
4	64 bit	100	yes	yes	64 bit PCI bus slot
5	64 bit	100	yes	yes	64 bit PCI bus slot
6	64 bit	66	yes	no	64 bit PCI bus slot
7	64 bit	100	yes	yes	64 bit PCI bus slot
8	64 bit	100	yes	yes	64 bit PCI bus slot

i PCI slot 6 and SCSI controller are connected to the same PCI bus.

Together with "Adaptec 2000S Controller" a RAID solution can be realised. This controller may be installed only in PCI slot 6.

PCI IRQ line x - Assignment of the PCI interrupts

Defines which ISA interrupts are used for the separate PCI slots.

Multifunctional PCI boards or boards with an integrated PCI-to-PCI bridge can use several PCI interrupts (INTA#, INTB#, INTC#, INTD#). Monofunctional PCI boards (default) only use one PCI interrupt (INTA#) per PCI slot.

The PCI interrupts INTA#, INTB#, INTC# and INTD# are available for every PCI slot.

With monofunctional PCI boards, the following *PCI IRQ Line* is assigned for INTA# of each PCI slot:

PCI slot	1	2	3	4	5	6	7	8
PCI IRQ Line for INTA#	1	3	5	7	9	11	13	15

With multifunctional PCI boards, the following *PCI IRQ Line* is assigned for INTA# to INTD# of each PCI slot:

PCI slot	1	2	3	4	5	6	7	8
PCI IRQ Line for INTA#	1	3	5	7	9	11	13	15
PCI IRQ Line for INTB#	2	4	6	8	10	12	14	16
PCI IRQ Line for INTC#	3	1	7	5	11	9	15	14
PCI IRQ Line for INTD#	4	2	8	6	12	10	16	13

PCI devices on the mainboard use the following *PCI IRQ Line*:

PCI Device	Copernicus	VGA	Ethernet	SCSI A	SCSI B
PCI IRQ Line	17	21	22	23	24

The same interrupt can be assigned simultaneously to several PCI boards. You should avoid this condition due to reduced performance.

If you use a setting other than *Auto*, the Plug&Play functionality of the system BIOS for the corresponding PCI boards is deactivated.

Auto   The PCI interrupts are assigned automatically in accordance with the Plug&Play guidelines.

Disabled   No ISA interrupt is assigned to the PCI interrupt.

3, 4, 5, 7, 10, 11, 12, 14, 15
                The selected ISA interrupt is assigned to the PCI interrupt. You may not select an ISA interrupt that is used by a component on the mainboard (e.g. controller) or an ISA board.

> **i**   With the *Auto* setting, you can use the *ICU* (*ISA Configuration Utility*) utility to check how the interrupts are assigned.

Screen resolution

Depending on the operating system used, the screen resolutions in the following table refer to the mainboard 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)	Max. number of colours
640x480	200	16.7 mio.
800x600	200	16.7 mio.
1024x768	150	16.7 mio.
1057x864	120	16.7 mio.
1280x1024	100	16.7 mio.
1600x1200	75	16.7 mio.

** Horizontal values tolerance ±0.3 kHz.

Shaded screen resolutions are not supported by LCD monitors (TFT).

Settings with switches
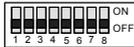
Switches 3, 4 = must always be set to *Off*
Switch 1 = clear CMOS
Switch 2 = new configuration of the memory
Switch 5 = Server Management controller

Switch 6 = Write protection for floppy disks
Switch 7 = Skipping password query
Switch 8 = Recovering system BIOS

Clear CMOS – switch 1

Switch 1 is used to define whether CMOS entries can be cleared.

on   CMOS entries are cleared.

off   CMOS entries cannot be cleared.

New configuration of the memory - switch 2

Switch 2 is used to define whether the memory configuration saved in CMOS is accepted or redetermined.

on   The memory configuration saved in CMOS is ignored and the physical memory size is redetermined.

off   The memory configuration from CMOS is used.

Server Management controller - switch 5

Swich 5 is used to define whether the Server Management controller on the mainboard is activated

or deactivated.

on   The Server Management controller on the mainboard is deactivated.

off   The Server Management Controller is activated.

Write protection for floppy disks - switch 6

Switch 6 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).

Skipping the password query - switch 7

Switch 7 is used to define whether the password is queried at system startup, if the password protection is enabled in *BIOS Setup* (in *Security* menu , the *Password* field must be set to *Enabled*).

on   The password query is effective.

off   The password query is skipped (default setting).

Recovering System BIOS - switch 8

Switch 8 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).
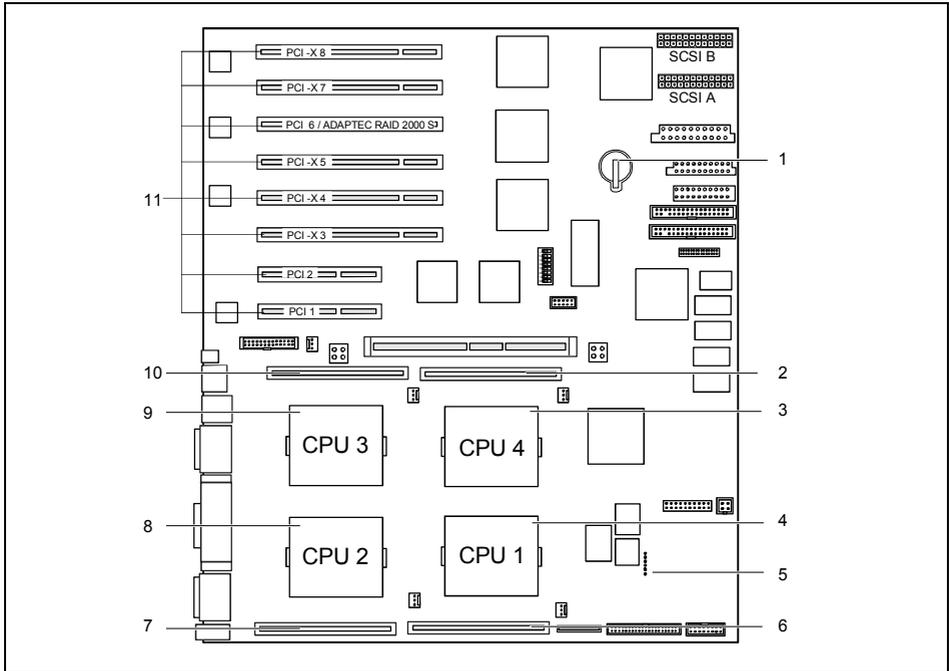
on   The system boots from the "Flash BIOS floppy disk" from Drive A and reprograms the system BIOS on the board.

off   The system is started with the system BIOS from the mainboard. The system BIOS cannot be reprogrammed (default setting).

Add-on modules

⚠ For all steps described in this chapter pull the power plug out of the mains outlet!

1 = Lithium battery
2 = Voltage Regulator Module
3 = Processor socket for CPU 4
4 = Processor socket for CPU 1
5 = LEDs
6 = Voltage Regulator Module

7 = Voltage Regulator Module
8 = Processor socket for CPU 2
9 = Processor socket for CPU 3
10 =   Voltage Regulator Module
11 =   PCI slots 1 to 8

ℹ PCI slots support 3.3 V main and auxiliary voltages.

Slot sequence

- An additional screen controller must always be inserted into PCI slot 1 or 2.

- Insert 32 bit / 33 MHz adapter first into PCI slots 1, 2 and then into PCI slots 3, 4, 5, 6, 7, 8.

- Insert 64 bit / 33 MHz adapter first into PCI slots 3, 4, 5, 6, 7, 8 and then into PCI slots 1, 2.

- Insert 64 bit / 66 MHz adapter first into PCI slots 3, 4 and then into PCI slots 5, 6, 7, 8 and then into PCI slots 1, 2

- Insert 64 bit / 100 MHz adapter or 133 MHz adapter first into PCI slots 3, 4, 5, 6, 7, 8 and then into PCI slot 6 and then into PCI slots 1, 2.

- The Adaptec 2000S Raid controller must be installed into PCI slot 6.

Memory board

i   The installation and removal of the memory board should be performed only by our service technicians.
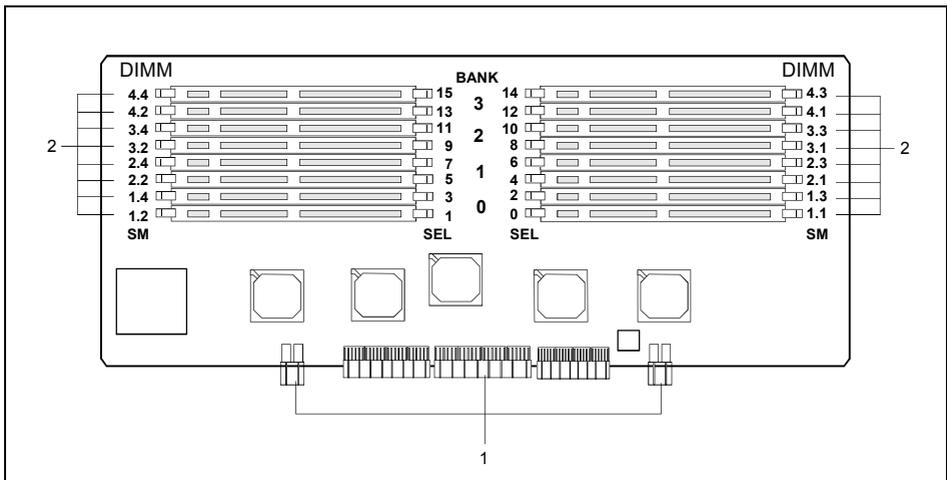
1 = Connection for mainboard D1290   2 = Location for DIMM banks 1 to -16 for main memory (DDR-SDRAM)

Upgrading main memory

These slots are suitable for 128, 256, 512 and 1024 Mbyte DDR SDRAM memory modules of the DIMM format. The organisation in four memory banks 1 to 4 enables fast memory access with four-fold interleave. The board supports a maximum of 16/32 Gbytes.

A memory bank must always be fully equipped starting with bank 1 (SM) or 0 (SEL) in increasing order.
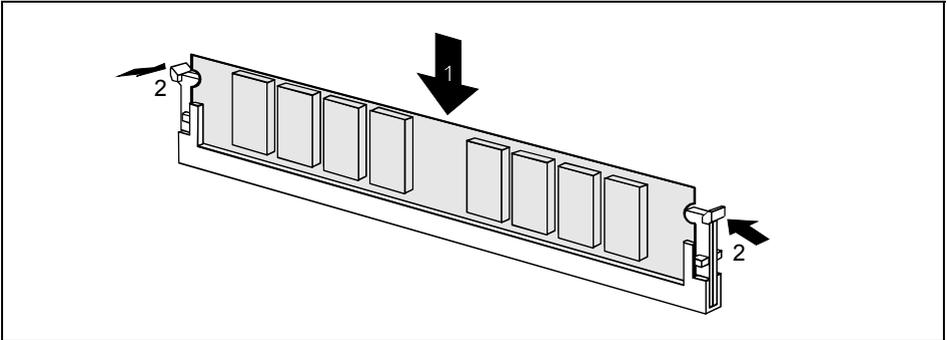
⚠️ You may only use buffered 3.3 V memory modules. Unbuffered memory modules are not permitted.

DDR SDRAM memory modules must be designed for a clock frequency of 100 MHz (meets PC1600 specification).

⚠️ To use the hot-spare memory function all memory modules installed must have the same capacity!

Installing a memory module

► Push the holders on each side of the memory compartment outwards.

► Insert the memory module in the slot while folding the side holders up until the memory module engages (2).

Removing a memory module
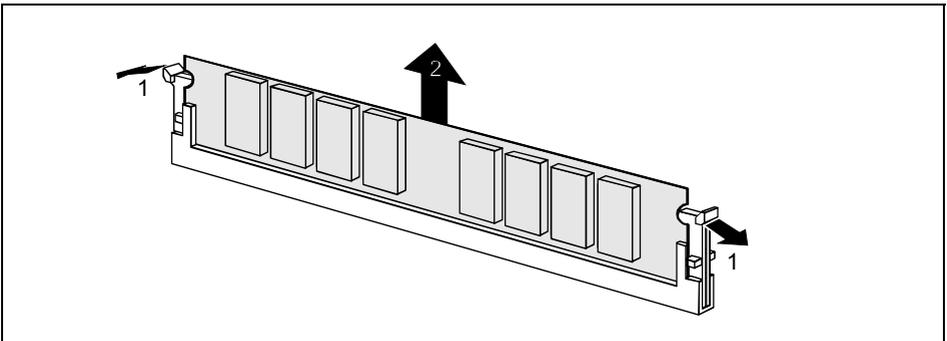
► Push the clips on the right and left of the compartment outward (1).

► Carefully remove the memory module from the compartment (2).

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!
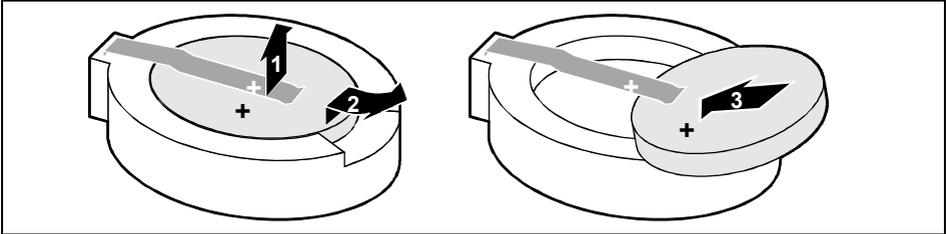
► Lift the contact (1) a few millimetres and remove the lithium battery from its socket (2).

► 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 mainboard.

ACPI	Advanced Configuration and Power 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 Analogue 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		RSB	Remote Service Board
DIMM	Dual Inline Memory Module		RTC	Real Time Clock
DDR	Double Data Rate		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
I²C	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			