

answers²

Technisches Handbuch / Technical Manual

Mainboard D1837

Deutsch / English



FUJITSU COMPUTERS
SIEMENS

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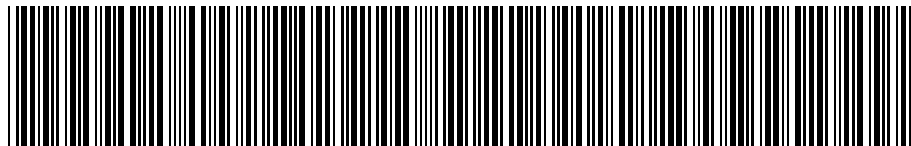
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Technisches Handbuch
Technical Manual

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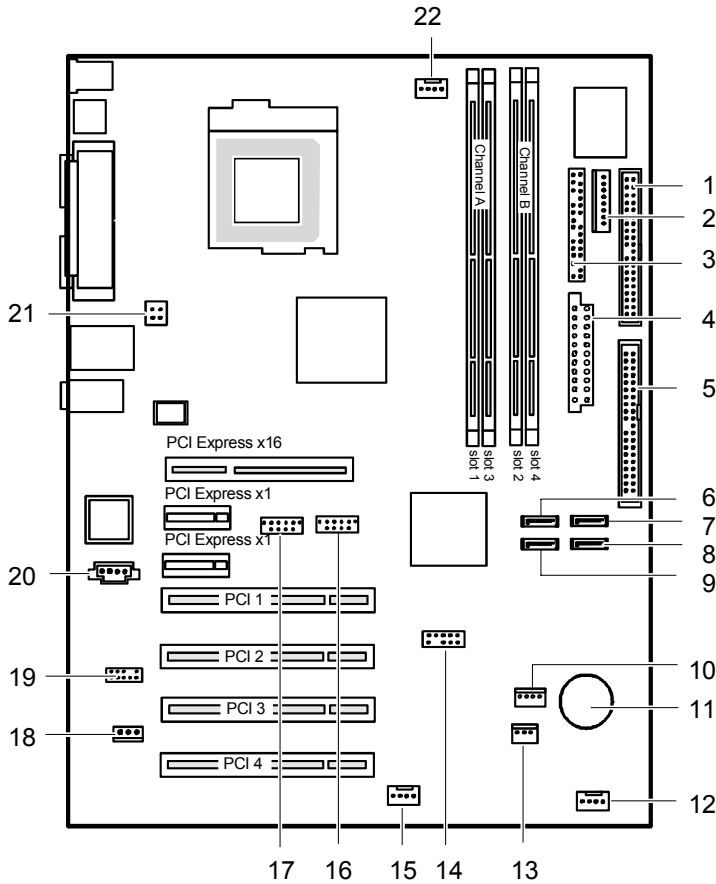
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Übersicht/Overview Mainboard D1837

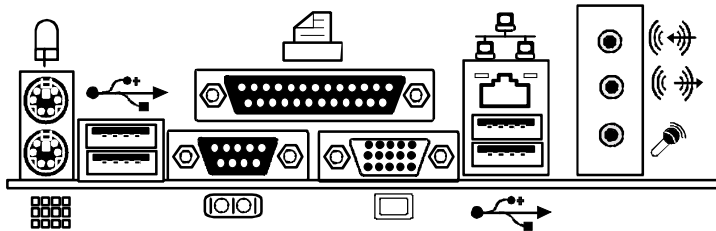
Interne Anschlüsse und Steckplätze / Internal connectors and slots



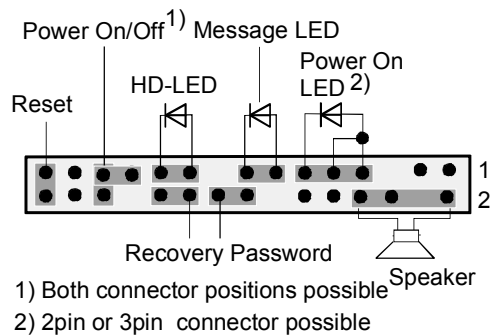
- 1 = Diskettenlaufwerk / Floppy disk drive
- 2 = Stromversorgungsüberwachung / Power supply control
- 3 = Bedienfeld / Front panel
- 4 = Stromversorgung / Power supply
- 5 = IDE-Laufwerke 1/2 / IDE-drives 1/2
- 6 = Serial ATA3
- 7 = Serial ATA4
- 8 = Serial ATA2
- 9 = Serial ATA1
- 10 = SMB
- 11 = Batterie / Battery
- 12 = Lüfter 2 / Fan 2
- 13 = Gehäuseüberwachung / Intrusion
- 14 = LCD-Anzeige / LCD display
- 15 = Lüfter 3 / Fan 3
- 16 = USB (Chipkartenleser bereit / Chipcard reader ready)
- 17 = USB (Chipkartenleser bereit / Chipcard reader ready)
- 18 = S/PDIF-Anschluss / S/PDIF connector
- 19 = Audio-Anschlüsse Vorderseite / Audio port front
- 20 = Audio in
- 21 = Zusätzliche-Stromversorgung / additional power supply
- 22 = Lüfter 1 / Fan 1

Optionale Komponenten / Optional components

Externe Anschlüsse / External connectors



Bedienfeld / Front panel



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Mainboard D1837

Your mainboard is available in different configuration levels. Depending on the configuration chosen, some of the hardware components described may not be available on your mainboard.

Additional information

Information on the *BIOS Setup* and additional descriptions of the drivers are contained:

- in the readme files on your hard disk
- on the driver floppy disks included
- on the CD "Drivers & Utilities Collection" or "Drivers & Utilities" or "ServerStart".



The programme *Acrobat Reader* must be installed to be able to open the manuals. You will find the programme on the CD-ROM directory: utls/acrobat.

For more details please read the according readme.txt files.

Notational conventions

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



indicates information which is important for your health or for preventing physical damage.



indicates additional information which is required to use the system properly.

► 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

With the mainboard installed you must open the system to access the mainboard. How to dismantle and reassemble the system is described in the operating manual accompanying the system.

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



Observe the safety notes in the operating manual of your system.

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 / Upgrading" - "Replacing the lithium battery" section.

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



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 manual for the receiving device.



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

Information about boards

To prevent damage to the mainboard, 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.

Remove the plug from the mains outlet so that system and mainboard are totally disconnected from the mains voltage.

Be 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:

- 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.

List of features

Onboard features	D1837-A
Chipset	Intel® 915G
Board size	ATX
VGA	✓
Audio / 8-channel / S/PDIF	✓ / - / -
Buzzer / int. Speaker Support	- / ✓
LAN 1 Gigabit / 100Mbit / 10 Mbit	✓ / ✓ / ✓
LAN ASF / Alert-on-LAN / WoL / Boot	✓ / - / ✓ / ✓
SATA / ATA / RAID	✓ / ✓ / -
FireWire™ / HI-SPEED USB 2.0	- / ✓
Fan monitoring PSU** / CPU (FAN1) / AUX1 (FAN2) / AUX2 (FAN3)	✓ / ✓ / ✓ / -
Fan control PSU** / CPU (FAN1) / AUX1 (FAN2) / AUX2 (FAN3)	✓ / ✓ / ✓ / -
Temperature monitoring CPU/ONB1/ONB2/OFFB	✓ / ✓ / ✓ / -
SmartCard Reader Support (USB / serial)	✓ / -
Fujitsu Siemens Computers Keyboard Power Button Support	✓

Special onboard features

Silent Fan / Silent Fan LT	✓ / -
System Guard / Silent Drives	✓ / ✓
Recovery BIOS / Desk Update / Multi Boot / Safe Standby	✓ / ✓ / ✓ / ✓
HDD Password / USB Security	✓ / ✓
Logo Boot / Intel On Screen Branding	✓ / ✓

Internal ports

DIMM Sockets (DDR 400 / DDR2 533)	- / 4
PCI Express x16 slot for graphics cards	1
PCI Express x1 slot	2
PCI slot (32 bit, 33 MHz, 5 V and 3.3 V)	4
Serial ATA interface (150 Mbyte/s) / ATA interface (100 Mbyte/s) / Floppy interface	4 / 1 / 1

Internal ports (continued)	D1837-A
S/PDIF (digital Audio)* OUT / IN	- / -
Audio Input	✓
Front panel Audio (9-pin for headphone, microphone) AC'97 / High Definition Audio	1 / -
FireWire™ * (9-Pin, Intel standard header)	-
USB Ports* (2.0, ~480 MB/s)	4
Serial Ports* (FIFO, 16550 compatible)	-
Fan Connectors PSU** / CPU (FAN1) / AUX1 (FAN2) / AUX2 (FAN3)	1 / 1 / 1 / -
SMBus Connector* (Case Temperature)	-
Cover monitoring* (Casing open)	1
BTX (24-pin) / ATX12V (20-pin) power supply	1 / 1

External ports

VGA	1
Audio Mic. In / Line in / Line out (or configurable with driver)	1 / 1 / 1
S/PDIF (digital audio, cinch)* OUT / IN	- / -
S/PDIF (digital audio, optical) OUT	-
LAN (RJ-45)	1
PS/2 mouse/keyboard	1 / 1
FireWire™ * (6-Pin, IEEE 1394 port)	-
USB Ports (2.0, ~480 MB/s)	4
Serial Ports (RS232, FIFO, 16550 compatible)	1
Parallel Port (EPP/ECP)	1

* for use with internal devices or optional Front or Rear panel

** not supported by standard power supplies

Special features

Your mainboard is available in different configuration levels. Depending on the configuration, your mainboard is equipped with or supports the features described in the following.

Silent Fan



A micro controller developed by Fujitsu Siemens Computers monitors and controls the fans in the PC and thus prevents any unnecessary noise annoyance. Should the processor become in spite of full turning ventilator too hot, then the processor clock rate will automatically be reduced so that the system continues to run stably. The microcontroller operates independently of the operating system and the processor. Therefore the micro controller protects your PC reliably against overheating and loss of data or even damage of the processor.

In addition, the microcontroller offers monitoring of, for example, system voltages (12 V, 5 V, CMOS), opening of the case and a watchdog function.

SystemGuard



With *SystemGuard* the function of the onboard Silent Fan Controller is displayed. *SystemGuard* indicates temperature, rotational speed of the fan and voltages, which are measured by the Silent Fan Controller. Moreover the software offers various setting options to optimise the noise level. *SystemGuard* is a freeware-tool, which is available on the internet.

Silent Drives



Hard disks and optical drives (CD-ROM, CD-RW, DVD etc.) are besides the fans some of the greatest sources of noise in a PC. The *BIOS-Setup* can be used to switch these drives into a quieter mode.

Recovery BIOS



If an error occurs during a BIOS update (e. g. due to a power failure), the system BIOS will be destroyed. All Fujitsu Siemens Computers mainboards are equipped with a recovery BIOS. With it a destroyed BIOS can easily be restored. Exact instructions are provided in the chapter "BIOS Recovery - Recovering System BIOS".

DeskUpdate



DeskUpdate enables simple, automatic driver installation. The function is available both on the CD "Drivers & Utilities" and on the Internet.

Multi Boot



The BIOS of the Fujitsu Siemens Computers mainboards enables booting from all types mass storage devices. In addition to IDE hard disks, this also includes optical drives, such as CD-ROM, DVD and external drives that can be connected to USB or FireWire.

Harddisk Password



A password assignment for the hard disk is only possible with suitable hard disks and prevents unauthorised access to the stored data.

For up to four hard disks one password each can be assigned in the *BIOS-Setup* (e. g. for up to four different users).

Additional information is contained in the "BIOS Setup" manual.

USB Security



USB Security is a BIOS function that offers protection against unauthorised access regardless of the operating system used. If *USB Security* is activated, the system can only be started, if the MemoryBird of Fujitsu Siemens Computers is connected to one of the existing USB-ports.

Safe Standby



With *Safe Standby* the content of the main memory is saved to the hard disk when the PC switches into the Standby mode. In case of an unexpected power failure, the content of the main memory is loaded during booting from the hard disk.

Additional information is available on the Internet at www.fujitsu-siemens.com/manageability.

Brief instructions on installing mainboard

If you have purchased a separate mainboard, you can install the mainboard in your system in accordance with the following brief instructions.

The activities described here assume a basic knowledge of PCs and cannot be carried out by a layperson. If you are not sure whether you have the necessary specialised knowledge, then leave this work to an expert.

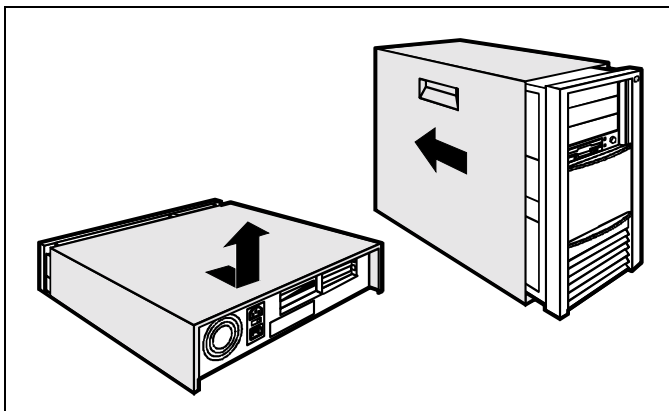
The illustrations of the system show examples of possible cases.

Prior to installation

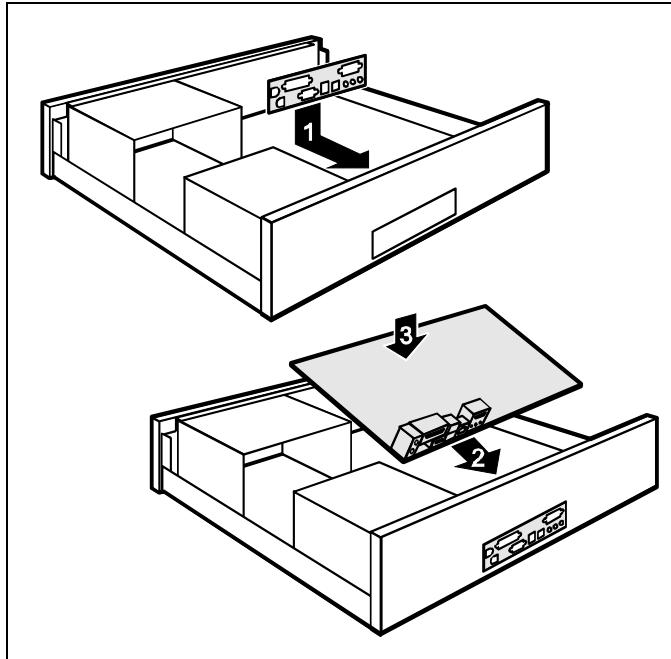
- ▶ Please take note of the safety information in the "Important notes" chapter.
- ▶ Check whether the processor, memory modules and power supply are suitable for this mainboard:
 - processor (see "Installing and removing processors" chapter).
 - memory modules (see "Upgrading main memory" chapter).
 - power supply (see "Electrical Properties" chapter).
- ▶ Make sure the current requirement of the fans (processor, case) does not exceed the loadability of the fan connections (see chapter entitled "Electrical Properties").
- ▶ First only install the components absolutely necessary (graphics card, processor and heat sink, one memory module) and only connect the required connections (power supply unit, case connections such as ATX on/off switch, hard disk or floppy disk drive). You should not install additional cards and devices until this minimum configuration successfully boots (see chapter entitled "Add-on modules / Upgrading").

Installation

- ▶ Equip the mainboard with the processor, heat sink and memory modules before installation if possible. Further information can be found in "Installing and removing processors" chapter.



- ▶ Open the casing as described in the operating manual.



- ▶ Should no suitable connection field be provided in the case, then you must install the connection field (1) provided.

Ensure the plate is aligned properly so that the connections are suitable for the mainboard later.

- ▶ Set the mainboard on the edge on which the connection field is located (2) and then insert the board in the case (3).

Make sure that spacers in the housing are only mounted at points at which there are mounting holes in the mainboard.

- ▶ Fasten the mainboard with the screws.

- ▶ Connect the plugs for the power supply, control panel and drives to the corresponding connections on the mainboard.

Driver installation

- ▶ Install the drivers for the chipset. You may find the driver on the "Drivers & Utilities" CD. Please refer to chapter "Drivers" for a description of installing drivers.

Interfaces and connectors

The positions of the interfaces and connectors are shown on page "Cover".

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

External ports

The positions of the external ports are shown on page "Cover".



PS/2 keyboard port, purple



Serial interface, turquoise



Monitor port, blue



LAN connector



Audio output (Line out), light green



Audio input (Line in), light blue



PS/2 mouse port, green



Parallel port/Printer, burgundy



USB - Universal Serial Bus, black



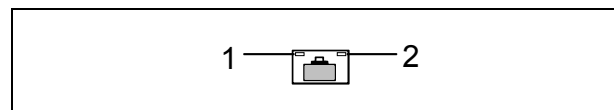
Microphone jack (mono), pink

LAN connector

The mainboard is optionally equipped with the Broadcom BCM5751 LAN controller. This LAN controller supports the transfer rates 10 Mbit/s, 100 Mbit/s and 1000 Mbit/s. The LAN controller supports the WOL functionality through Magic Packet™. The ASF 2.0 format (Alert Standard Format) is supported.

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

The LAN RJ45 connector has two LEDs (light emitting diodes).



LED 1 lights green - a connection exists (e.g. to a hub). LED is blinking green: activity

LED 2 lights up differently depending on the transfer rate:

10 Mbit/s	off
100 Mbit/s	green
1000 Mbit/s	yellow

Graphics port

Technical data

Function: 2D/3D graphics controller, Dynamic Video memory Technology, 400 Mhz integrated 24-bit RAMDAC

Features: Display Data Channel (DDC), 2 DVO channels (up to 165 megapixels per channel), dual-view support for ADD2 boards

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)	Colour
640 x 480	120	32 bit
800 x 600	120	32 bit
1024 x 768	120	32 bit
1280 x 1024	120	32 bit
1600 x 1200	120	32 bit
1920 x 1440	85	32 bit
2048 x 1536	75	32 bit

Internal ports and connectors

The positions of the internal ports and connectors are shown on the Cover. Additional information on some ports is also provided here.

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 mainboard.

A serial ATA/150 hard disk must be connected with a serial ATA cable.

- ▶ Connect the cable to the hard disk and to the connector on the mainboard.

If you have connected one or two hard disks to a serial ATA (one hard disk is possible per serial ATA connection), you must configure the respective settings in the *BIOS Setup* (further information you can find in the *BIOS Setup* manual).

Audio front panel

If you want to use the internal connection for the audio front panel for the front side of the system, then proceed as follows:

- ▶ Remove all plug-in jumpers from the audio front panel connection.
- ▶ Connect the cable for the audio front panel.



If you connect audio devices on both the front and the back of the system, you can only use the connections Line out and Microphone once each.

If you have connected audio devices to both Line out connections, only the connection on the front of the system is active.

If you have connected audio devices to both Microphone connections, only the connection on the back of the system is active.

Pin assignment of internal ports

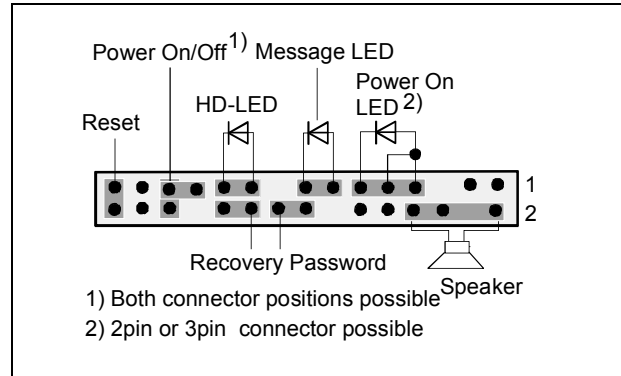
The pin assignment of some internal connections is shown in English in the following.



Some of the following connectors may be optional!

Front panel

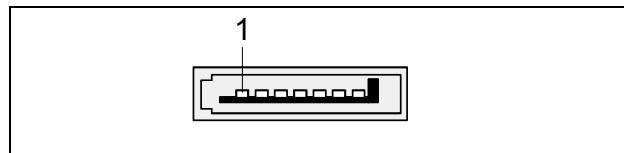
Watch the poling of the LEDs. The positive pole of the connection cables is often indicated with a coloured wire.



Connection	Note
Reset	Connector for reset switch
Power On/Off	Connection for ATX On/Off switch
HD LED	Indicates HDD (hard disk) activity
Message LED	Indicates system management error
Power On LED	Indicates the system state APM or ACPI together with the Sleep LED (see chapter entitled "APM and ACPI system status, energy-saving modes").
Recovery	see "Jumper settings" chapter
Password	see "Jumper settings" chapter
Speaker	0,5 W at 8 Ohm

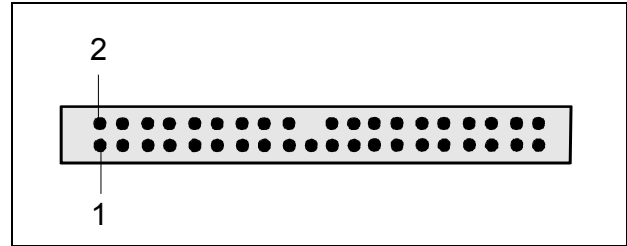
Pin	Signal	Pin	Signal
1	GND	2	Speaker -
3	"Stand by" LED +	4	Key
5	Key	6	GND
7	"Power On" LED +	8	Speaker +
9	"Power On" LED +	10	Reserved
11	"Power On" LED - "Stand by" LED - (GND)	12	Reserved
13	"Message" LED +	14	Key
15	"Message" LED -	16	Password Skip
17	Key	18	"SCSI" LED Input (low asserted)
19	"HD" LED +	20	"SCSI" LED Input (low asserted)
21	"HD" LED -	22	Recover BIOS
23	GND	24	Key
25	Power-Button (low asserted)	26	GND
27	reserved	28	GND
29	Reset-Button (low asserted)	30	GND

Serial ATA



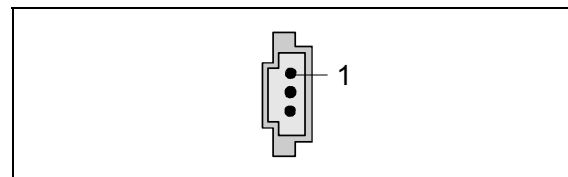
Pin	Signal	Pin	Signal
1	GND	2	Transmit data positive
3	Transmit data negative	4	GND
5	Receive data negative	6	Receive data positive
7	GND	8	Key

IDE/ATA interface



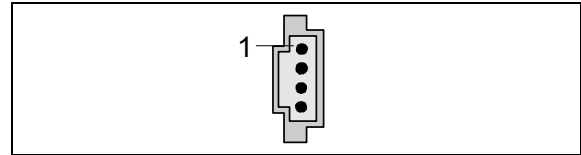
Pin	Signal	Pin	Signal
1	Reset drive (low asserted)	2	GND
3	Data 7 (high asserted)	4	Data 8 (high asserted)
5	Data 6 (high asserted)	6	Data 9 (high asserted)
7	Data 5 (high asserted)	8	Data 10 (high asserted)
9	Data 4 (high asserted)	10	Data 11 (high asserted)
11	Data 3 (high asserted)	12	Data 12 (high asserted)
13	Data 2 (high asserted)	14	Data 13 (high asserted)
15	Data 1 (high asserted)	16	Data 14 (high asserted)
17	Data 0 (high asserted)	18	Data 15 (high asserted)
19	GND	20	Key
21	DRQ (high asserted)	22	GND
23	I/O write (low asserted)	24	GND
25	I/O read (low asserted)	26	GND
27	I/O ready (low asserted)	28	Cable select
29	DAK (low asserted)	30	GND
31	IRQ (high asserted)	32	not connected
33	ADR 1 (high asserted)	34	ATA66 Detect (low asserted)
35	ADR 0 (high asserted)	36	ADR 2 (high asserted)
37	CS 1 (low asserted)	38	CS 3 (low asserted)
39	IDE-LED (low asserted)	40	GND

Audio S/PDIF (optional)



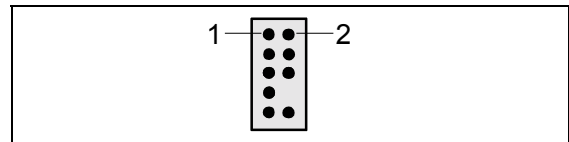
Pin	Signal
1	VCC
2	SPDIF out
3	GND

Audio Input



Pin	Signal
1	Left audio input
2	Audio GND
3	Audio GND
4	Right audio input

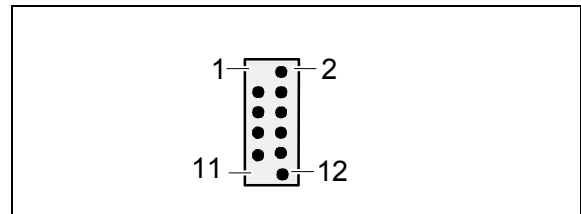
Audio port front



Pin	Signal	Pin	Signal
1	Micro input	2	Analogue GND
3	Micro bias	4	Analogue VCC
5	Right line output	6	Right line return
7	not connected	8	Key
9	Left line output	10	Left line return

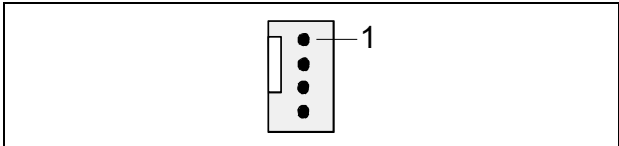
If the audio front panel is not used, you must plug jumpers on pin pairs 5/6 and 9/10.

USB - dual channel



Pin	Signal	Pin	Signal
1	Key	2	Chipcard reader on or not connected
3	VCC 1 or 3	4	VCC 2 or 4
5	Data negative 1 or 3	6	Data negative 2 or 4
7	Data positive 1 or 3	8	Data positive 2 or 4
9	GND	10	GND
11	Key	12	not connected

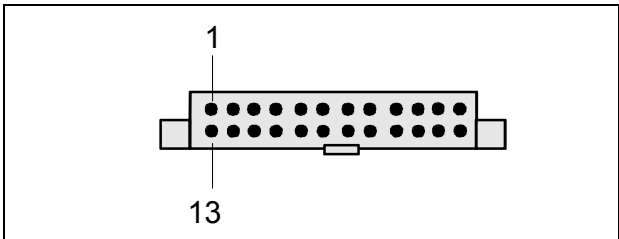
Fan 1, 2 and 3



Pin	Signal
1	GND
2	+12 V
3	Fan sense
4	Fan Control

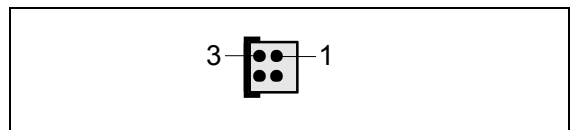
Power supply BTX

(ATX compatible)

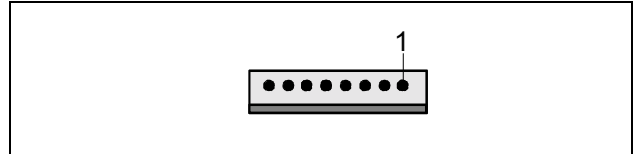


Pin	Signal	Pin	Signal
1	+3,3 V (P3V3P)	13	+3,3 V (P3V3P)
2	+3,3 V (P3V3P)	14	-12 V (P12VN)
3	GND	15	GND
4	+5V (VCC)	16	PS on (low asserted)
5	GND	17	GND
6	+5V (VCC)	18	GND
7	GND	19	GND
8	Powergood (high asserted)	20	-5 V (P5VN)
9	+5 V Auxiliary (VCC Aux)	21	+5 V (VCC)
10	+12 V (P12VP)	22	+5 V (VCC)
11	+12 V (P12VP)	23	+5 V (VCC)
12		24	GND

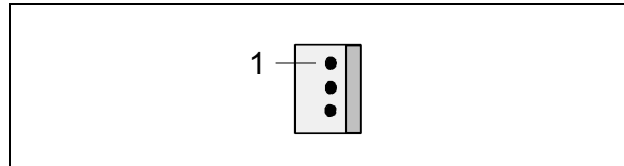
Additional power supply ATX12 V



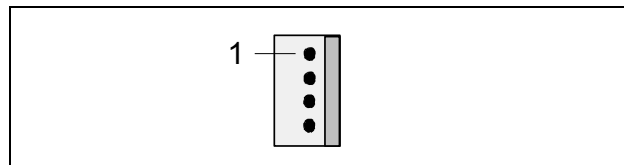
Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12 V	4	+12 V

Power control (system monitoring)

Pin	Signal
1	Power Guard Control
2	PS FAN Control
3	
4	PS FAN Sense
5	
6	
7	
8	

Intrusion connector

Pin	Signal
1	GND
2	Case open (low asserted)
3	Intrusion switch present (low asserted)

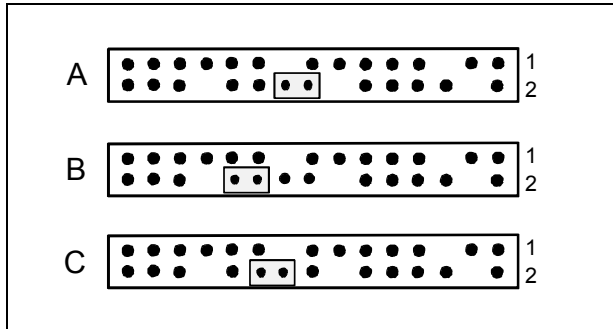
Temperature sensor SMB

Pin	Signal
1	P3V3P DUAL
2	SMB CLK
3	SMB DATA
4	GND

Jumper settings

The positions of the jumpers are shown on page "Cover".

Setting via control-panel plug connector



Pin pair A inserted =
Skipping system and BIOS Setup password

Pin pair B inserted =
System BIOS recovery

Pin pair C inserted =
factory setting



Please pay attention on the exact position of the pin pairs!

Skipping system and BIOS Setup password - pinpair A

Pinpair A enables skipping the system and BIOS Setup password.

Inserted System and BIOS Setup password are skipped when the device is switched on and may be changed.

not inserted System and BIOS Setup password must be entered when the device is switched on.

Recovering System BIOS - pinpair B

Pinpair B enables recovery of the old system BIOS after an attempt to update has failed. To restore the old BIOS you need a Flash BIOS Diskette (see "BIOS update" chapter).

Inserted The System BIOS executes from floppy drive A: and the inserted "Flash-BIOS-Diskette" restores the System BIOS on the mainboard.

not inserted Normal operation (default setting).

Add-on modules / Upgrading



Exit energy-saving mode, switch off the system and remove the power plug from the mains outlet, before carrying out any of the procedures described in this chapter! Even when you have run down the device, parts of the device (e.g. memory modules, PCI extension boards) are still energised.

Installing and removing processors

Technical data

- Intel Pentium 4 with 533 or 800 MHz front side bus in the LGA775 design.
- A current list of the processors supported by this mainboard is available on the Internet at: www.fujitsu-siemens.com/mainboards.

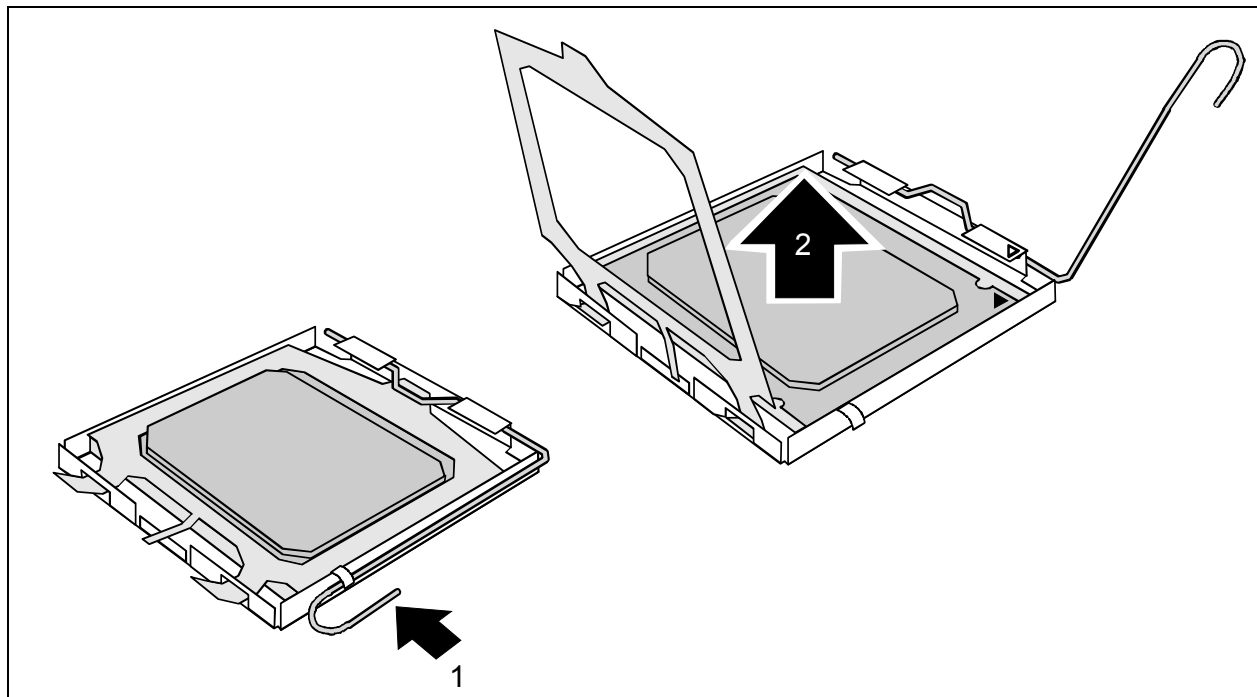
Installing processor with heat sink



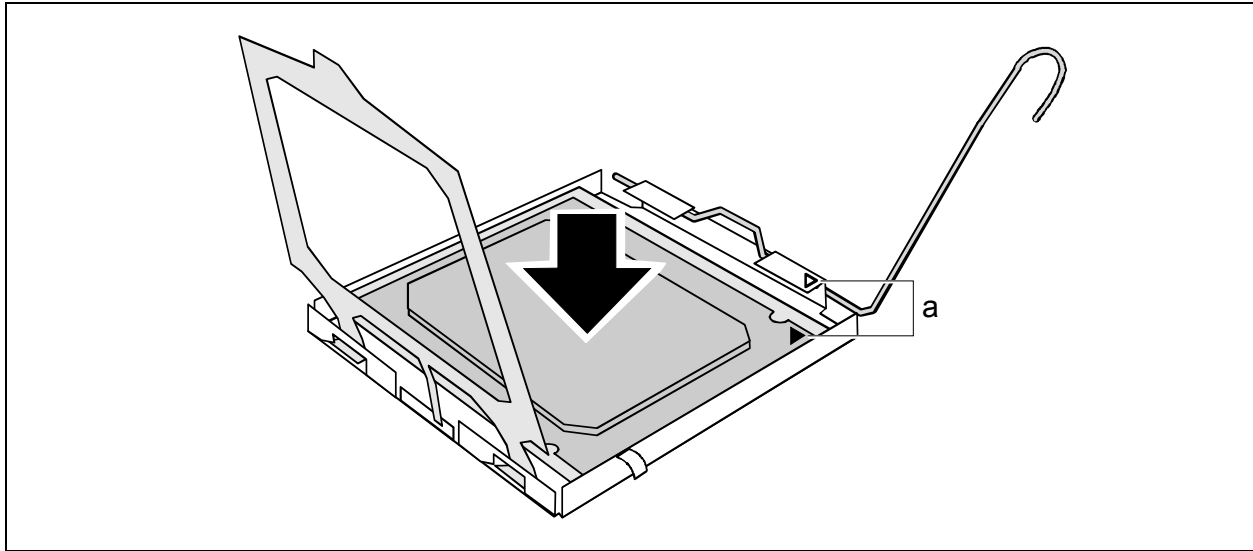
Never touch the underside of the processor. Even minor soiling such as grease from the skin can impair the processor's operation or destroy the processor.

Place the processor in the socket with extreme care, as the spring contacts of the socket are very delicate and must not be bent.

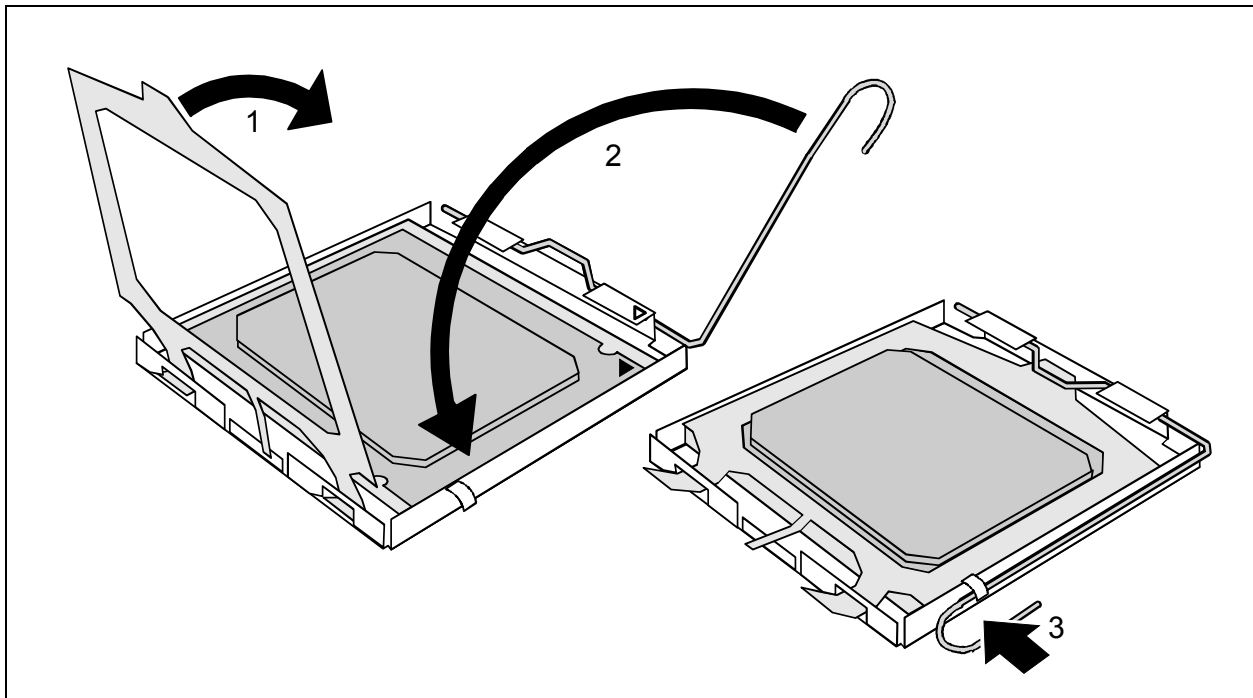
- ▶ Remove the heat sink.



- ▶ Press down the lever (1) and unhook it.
- ▶ Fold up the frame.
- ▶ Remove the old processor (2) from the socket.



- ▶ Insert the new processor in the socket so that the marking of the processor is aligned with the marking on the socket (a).



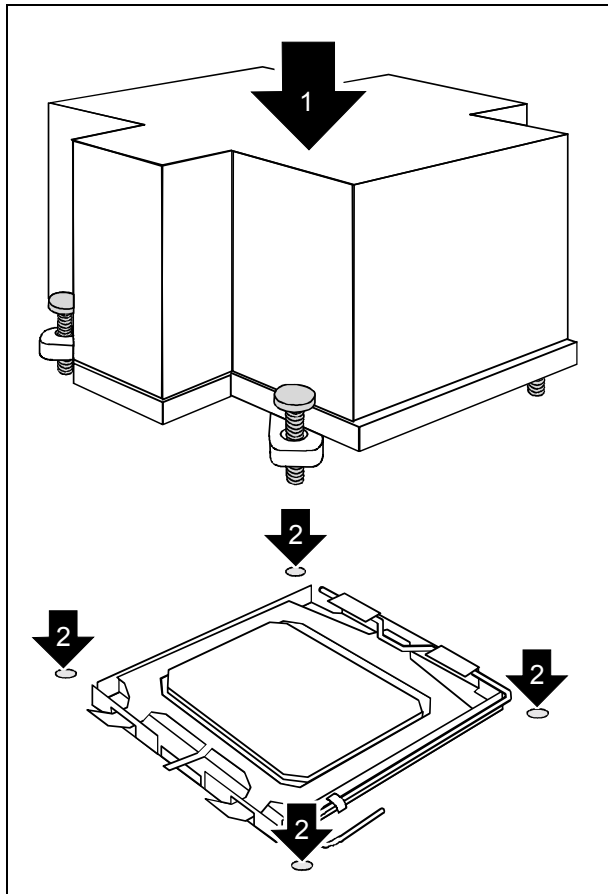
- ▶ Fold down the frame (1).
- ▶ Press the lever downward (2) until it is hooked in again (3).

Mounting heat sink

Be sure to use heat conducting material between the processor and the heat sink. If a heat conducting pad (rubber-like foil) is already applied to the heat sink, then use it. Otherwise you must apply a very thin layer of heat conducting paste.

Heat conducting pads can only be used once. If you remove the heat sink, you must clean it and apply new heat conducting paste before you remount it.

Please note that, depending on the heat sink used, different heat sink mounts are required on the mainboard.



- ▶ Depending on the configuration variant, you must pull a protective foil off the heat sink or coat the heat sink with heat conducting paste before fitting it.
- ▶ Secure the heat sink - depending on the model - with four screws or push it into the mounts.

Upgrading main memory

Technical data

Technology: DDR2 400 / DDR2 533 unbuffered DIMM modules
184-Pin; 1.8 V; 64 Bit, no ECC

Size: 256 Mbytes to 4 Gbytes DDR2

Granularity: 256, 512 or 1024 Mbyte for one socket

- A current list of the memory modules recommended for this mainboard is available on the Internet at: www.fujitsu-siemens.com.

At least one memory module must be installed. Memory modules with different memory capacities can be combined.



You may only use unbuffered 1,8 V memory modules. Buffered memory modules are not supported.

DDR2 memory modules must meet the PC3200 or PC4300 specification.



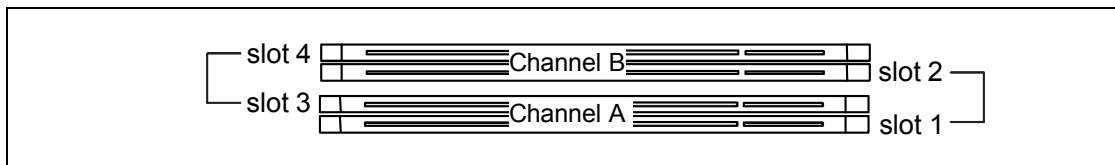
The mainboard has two memory channels (channel A and channel B) with two slots each (slot 1 and 3 or slot 2 and 4).

If you use more than one memory module, then make sure to distribute the memory modules over both memory channels. By doing this you use the performance advantages of the dual-channel mode.

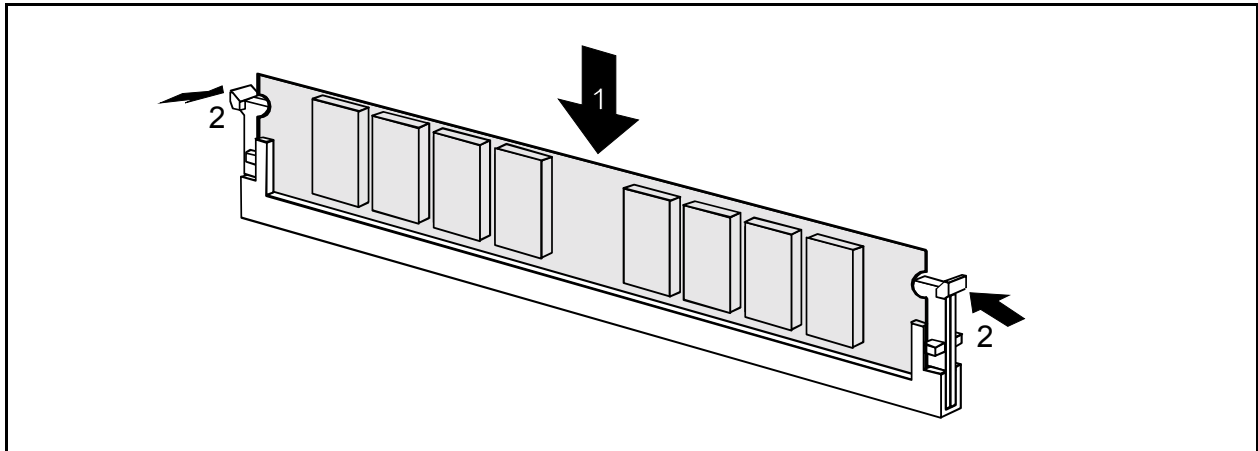
The maximum system performance is given when the same memory size is used in Channel A and Channel B.

To simplify equipping, the slots are colour coded.

With a memory configuration of 4 Gbytes the visible and usable main memory can be reduced down to 3 Gbytes (depending on the system configuration).

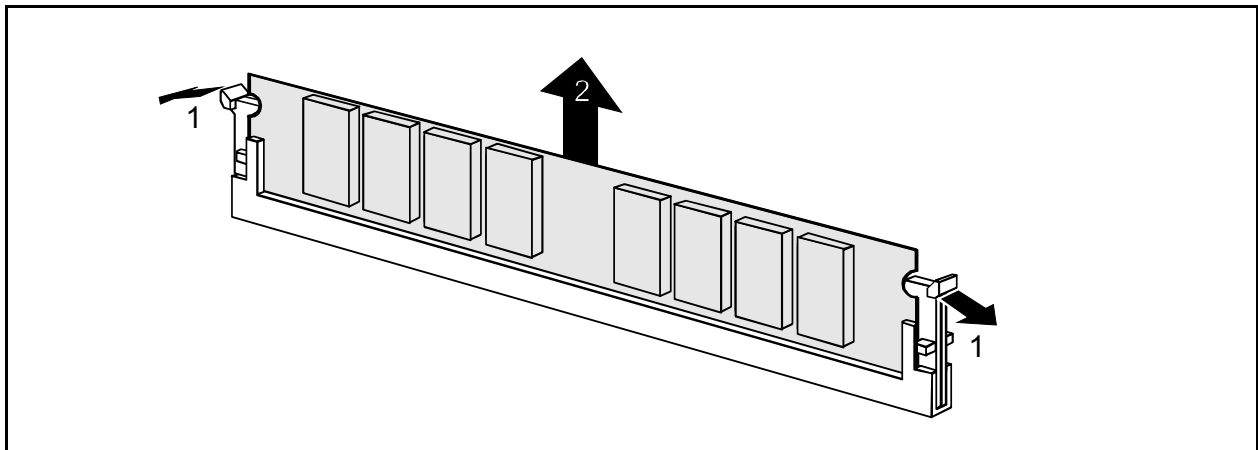


Installing a memory module



- ▶ Push the holders on each side of the memory slot 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 memory slot outward (1).
- ▶ Pull the memory module out of the memory slot (2).

Adding PCI Express cards

The PCI Express x16 slot is intended for graphics cards, and the PCI Express x1 slot for PCI Express x1 cards.

Adding PCI cards

Technical data:

32 bit / 33 MHz PCI slots
5 V and 3.3 V supply voltage
3.3 V auxiliary voltage

PCI bus interrupts - Selecting correct PCI slot



To achieve optimum stability, performance and compatibility, avoid the multiple use of IRQ Lines (IRQ sharing). Should IRQ sharing be unavoidable, then all involved devices and their drivers must support IRQ sharing.

IRQ Lines connect PCI/PCI Express slots and onboard components to the interrupt controller. IRQ Lines are permanently wired on the mainboard.

Which IRQs are assigned to the IRQ Lines is normally automatically specified by the BIOS (see description in "BIOS Setup").

Monofunctional expansions cards:

PCI/PCI Express expansion cards require a maximum of one interrupt, which is called the PCI interrupt INT A. Expansion cards that do not require an interrupt can be installed in any desired slot.

Multifunctional expansion cards or expansion cards with integrated PCI-PCI bridge:

These expansion cards require up to four PCI interrupts: INT A, INT B, INT C, INT D. How many and which of these interrupts are used is specified in the documentation provided with the card.

The assignment of the PCI interrupts to the IRQ Lines is shown in the following table:

PCI INT LINE	Controller or slot INT															
	On board controller									Mechanical slot						
	USB 1,1				USB 2,0	SMBus	AC97 / HD Audio		LAN	1	2	3	Slot PCI			
	1 st	2 nd	3 rd	4 th			Audio	HD Audio		PCIe x16	PCIe x1	PCIe x1	1	2	3	4
1 (A)	-	-	-	-	-	-	-	X	X	A	D	B	-	-	-	-
2 (B)	-	-	-	-	-	-	X	-	-	B	A	C	-	-	-	-
3 (C)	-	-	-	-	-	-	-	-	-	-	B	D	D	C	A	D
4 (D)	-	-	-	-	-	X	-	-	-	-	C	A	C	D	B	A
5 (E)	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
6 (F)	-	-	X	-	-	-	-	-	-	-	-	-	B	A	C	B
7 (G)	-	X	-	-	-	-	-	-	-	-	-	-	A	B	D	C
8 (H)	X	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-

Use first PCI/PCI Express slots that have a single IRQ Line (no IRQ sharing). If you must use another PCI/PCI Express slot with IRQ sharing, check whether the expansion card properly supports IRQ sharing with the other devices on this IRQ Line. The drivers of all cards and components on this IRQ Line must also support IRQ sharing.

Replacing the lithium battery

In order to permanently save the system information, a lithium battery is installed to provide the CMOS-memory with a current. A corresponding error message notifies the user when the charge is too low or the battery is empty. The lithium battery must then be replaced.



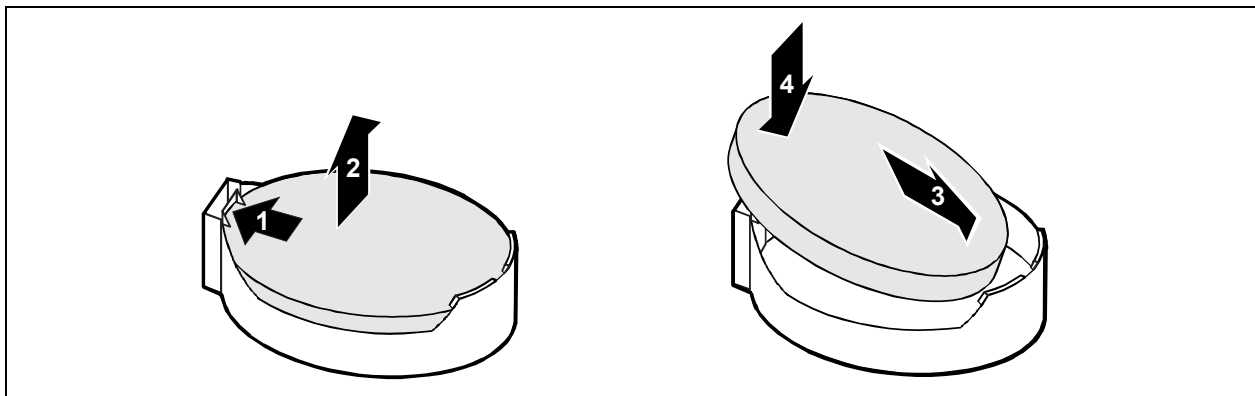
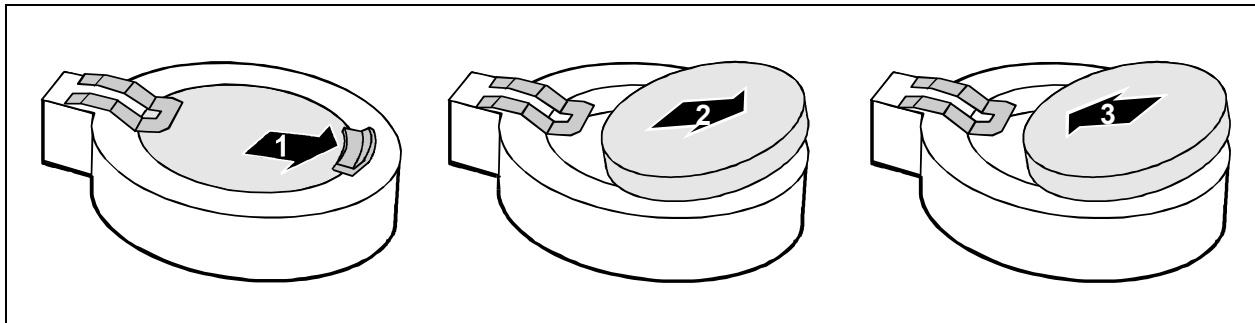
Incorrect replacement of the lithium battery may lead to a risk of explosion!

The lithium battery may be replaced only with an identical battery or with a type recommended by the manufacturer.

Do not throw lithium batteries into the household waste. They 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!

The lithium battery holder exists in different designs that function in the same way.



- ▶ Press the locking lug in the direction of the arrow; the battery jumps somewhat out of the holder (1).
- ▶ Remove the battery (2).
- ▶ Push the new lithium battery of the identical type into the holder (3) and press it downward until it engages (4).

BIOS update

When should a BIOS update be carried out?

Fujitsu Siemens Computers makes new BIOS versions available to ensure compatibility to new operating systems, new software or new hardware. In addition, new BIOS functions can also be integrated.

A BIOS update should always also be carried out when a problem exists that cannot be solved with new drivers or new software.

Where can I obtain BIOS updates?

The BIOS updates are available on the Internet at www.fujitsu-siemens.de/mainboards.

How does a BIOS update work?

You have two ways of doing this:

1. BIOS update under DOS with bootable BIOS update floppy disk - brief description

- ▶ Download the update file from our website to your PC.
- ▶ Insert an empty floppy disk (1.44 MB).
- ▶ Run the update file (e.g. *183703.EXE*).
- ▶ A bootable update floppy disk is created. Leave this floppy disk in the drive.
- ▶ Restart the PC.
- ▶ Follow the instructions on screen.



Detailed information on the BIOS update under DOS is provided in the manual on "BIOS Setup" ("Drivers & Utilities" CD).

2. BIOS update under Windows with DeskFlash utility

A BIOS update can also be carried out directly under Windows with the *DeskFlash* utility. *DeskFlash* is contained on the "Drivers & Utilities" CD (under *DeskUpdate*).

BIOS Recovery - Recovering System BIOS



All BIOS settings are reset to the default values.

- ▶ Open the casing as described in the operating manual.
- ▶ On the mainboard set the jumper to the appropriate setting to restore the system BIOS (see chapter "Jumper settings").
- ▶ Close the casing as described in the operating manual.
- ▶ Insert a BIOS update floppy disk and start the PC.
- ▶ Note the signals issued from the loudspeaker. You have successfully restored the BIOS if you hear the signal sequence "short-short- long- long- long" and the diskette access indicator is dark. This can take a few minutes.
- ▶ Open the casing as described in the operating manual.
- ▶ Restore the switch or jumper settings.
- ▶ Close the casing as described in the operating manual.
- ▶ Remove the floppy disk from the drive.
- ▶ Start the PC and invoke *BIOS Setup*.
- ▶ Select the menu item *Reset Configuration* in the menu *Advanced* and change the setting to *Yes*.
- ▶ Save the change and terminate *BIOS Setup*.

The BIOS recovery has now been completed. The system restarts.



Detailed information on the BIOS recovery is contained in the manual "BIOS Setup" ("Drivers & Utilities" CD).

Microcode Update

What is a microcode update?

As there are no drivers for processors, Intel offers the possibility from the P6 family (Pentium Pro) on to update the command set (microcode) of the processor. This enables minor errors to be corrected and the performance to be increased.

To guarantee the best possible performance and error-free operation, Intel recommends updating the microcode for every new processor. Intel refers to the use of the processor without microcode updates as operation outside the specifications.

Safety for processor on Fujitsu Siemens Computers mainboards

If the processor uses an old or incorrect microcode, error-free operation cannot be ensured. Fujitsu Siemens Computers has therefore implemented a function on its mainboards that interrupts the booting process if no suitable microcode is available for the installed processor. The output error message is

```
Patch for installed CPU not loaded. Please run the bios flash update
diskette.
```

This message appears until the microcode update has been carried out. If the computer is nevertheless operated without a microcode update, error-free operation is not ensured.

When should a microcode update be carried out?

A microcode update should be carried out after the installation of a new processor.

In contrast to the BIOS update, only an updated version of the processor command set is stored. The system BIOS remains unaffected by this.

Microcode update under DOS with bootable microcode update floppy disk - brief description

- ▶ Download the update file from our website to your PC.
- ▶ Insert an empty floppy disk (1.44 MB).
- ▶ Run the update file under DOS (e.g. *1837101.EXE*).
- ▶ A bootable update floppy disk is created. Leave the floppy disk in the drive.
- ▶ Restart the PC.
- ▶ Follow the instructions on screen.

To determine whether the latest microcode update has been loaded, the so-called Patch-ID of the processor can be read out.

- ▶ Press the **F1** key in the *BIOS Setup*.

The entry *CPU / Patch ID* is shown on the displayed information page.

A list with the current processors and the related Patch-IDs is available on the Internet.



If the processor is not recognised, you also require the microcode update tool for processors of the P6 family.

Drivers

Only when no drivers are installed on your system, or you want to update these, proceed as follows:

- ▶ Insert the CD "Drivers & Utilities Collection" into the CD-ROM drive.
- ▶ If the CD does not start automatically, run the *START.EXE* programme in the main directory of the CD.
- ▶ Select *DeskUpdate - Fully automatic installation*.
- ▶ Follow the instructions on screen.

Annex

Electrical Properties

Loadability for connections and fuses



Make sure that the connected devices do not overload the connections.

Fuse no.	Fuse	Connection	Maximum loadability
1	750 mA	Keyboard	Not specified
		Mouse	Not specified
		VGA port	Not specified
2	2000 mA	USB port 1	500 mA
		USB port 2	500 mA
		USB port 3	500 mA
		USB port 4	500 mA
3	2000 mA	USB port 5	500 mA
		USB port 6	500 mA
		USB port 7	500 mA
		USB port 8	500 mA

The fuses on this mainboard can be used several times (polyfuses). Shortly after the error state has been eliminated, the fuses reset to the original state.

Mainboard current requirement

You require a Pentium4 power supply unit according to the BTX or ATX12V specification (BTX: 24-pin + 4-pin connection; ATX12V: 20-pin + 4-pin connection) for this mainboard.

If you use an ATX power supply, a graphics card in the PCI Express x16 slot will only be supplied with 25 W of power. For high-end graphics cards that require a power supply of up to 75 W, a BTX power supply unit is required.

If you do not have a PC from Fujitsu Siemens Computer, make sure that the power supply unit provides the required amperages.

Resource	Voltage	Maximum difference	Maximum current
BTX/ATX12V power supply	+12 V	±5 %	
BTX/ATX12V power supply	-12 V	±10 %	
BTX/ATX12V power supply	+5,0 V	±5 %	
BTX/ATX12V power supply	+3,3 V	±5 %	
Standby voltage of power supply unit	+5,0 V	±5 %	2 A

The specifications apply to the onboard components and represent the least favourable case. In addition, at least 350 mA is required for PCI on 3.3 V, and 500 mA per connected device for USB on 5 V.

APM and ACPI system status, energy-saving modes

System status	ACPI Status) ¹		APM Status	Power LED) ²	Power LED) ³	Power consumption	Wake-up time
Normal operation	G0	S0	On	On/Off	On	Normal	
Simple energy-saving mode	G1	S1	Standby	Off/On	flashing	Almost like normal	Almost immediately
Maximum energy-saving mode) ⁴ "Save to DRAM"		S3					ca. 5s
Maximum energy-saving mode ** "Save To Disk"		S4					ca. 20s
"Soft Off"	G2	S5	Soft Off	Off/Off	Off	Nearly zero	Full boot time
Mechanically Off	G3		Off	Off/Off	Off	Zero	Full boot time

)¹ G = Global status; S = System status

)² Two colours

)³ One colour

)⁴ The power supply unit must provide sufficiently loadable 5 V standby voltage.

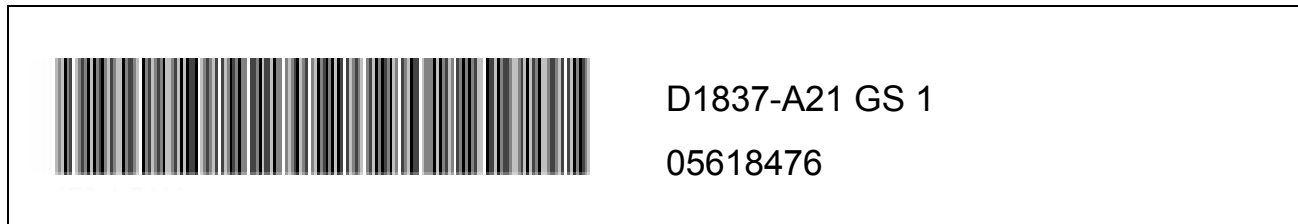
To use the WOL functionality the power supply must provide a 5 V auxiliary voltage (5VSB) of at least 1 A.

Mainboard Revision and BIOS Version

The compatibility, e.g. with new processors, can be independent of the BIOS version or the revision status of the mainboard used. The CPU and BIOS compatibility lists are available on the Internet at www.fujitsu-siemens.de/mainboards.

Mainboard Revision

The revision status of the mainboard exactly identifies which mainboard you have. It is indicated on a sticker on the edge of the mainboard:



Example Mainboard-Revision

BIOS version

The BIOS version can be displayed in the *BIOS Setup*.

- ▶ Press **F2** during booting to open the BIOS Setup.
- ▶ Press **F1**.

The BIOS version is specified on the displayed information page under the entry *BIOS Release*.

Error messages

This chapter contains error messages generated by the mainboard.

```
Available CPUs do not support the same bus frequency - System halted!  
Memory type mixing detected  
Non Fujitsu Siemens Memory Module detected - Warranty void  
There are more than 32 32 RDRAM devices in the system
```

Check whether the system configuration has changed. If necessary, correct the settings.

BIOS update for installed CPU failed

This message appears if the microcode update required for the connected processor is not contained in the system BIOS.

- ▶ Boot the system with the inserted *Flash BIOS floppy disk*.
- ▶ Abort the normal Flash BIOS update by answering the question about whether you want to perform the update with

n

- ▶ To carry out the Flash BIOS update for the processor, enter:

flashbio /p6

Check date and time settings

The system date and time are invalid. Set the current date and time in the *Main* menu of the *BIOS Setup*.

CPU ID 0x failed

Switch the server off and on again. If the message is still displayed, go into the *BIOS setup* and set the corresponding processor to *Disabled* in the *Server - CPU Status* menu; please contact your sales outlet or customer service centre.

CPU mismatch detected

You have replaced the processor or changed the frequency setting. As a result, the characteristic data of the processor have changed. Confirm this change by running the *BIOS Setup* and exiting it again.

Diskette drive A error

Diskette drive B error

Check the entry for the diskette drive in the *Main* menu of the *BIOS Setup*. Check the connections to the diskette drive.

DMA test failed
EISA CMOS not writable
Extended RAM Failed at offset: nnnn
Extended RAM Failed at address line: nnnn
Failing Bits: nnnn
Fail-Safe Timer NMI failed
Multiple-bit ECC error occurred
Memory decreased in size
Memory size found by POST differed from EISA CMOS
Single-bit ECC error occurred
Software NMI failed
System memory exceeds the CPU's caching limit
System RAM Failed at offset: nnnn
Shadow RAM Failed at offset: nnnn

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

Failure Fixed Disk 0
Failure Fixed Disk 1
Fixed Disk Controller Failure

Check the entry for the hard disk drive in the *Main* menu and the entry for the IDE drive controller in the *Advanced - Peripheral Configuration* menu of the *BIOS Setup*. Check the hard disk drive's connections and jumpers.

Incorrect Drive A - run SETUP
Incorrect Drive B - run SETUP

Correct the entry for the diskette drive in the *Main* menu of the *BIOS Setup*.

Invalid NVRAM media type

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

Invalid System Configuration Data

In the *Advanced* menu of the *BIOS Setup* set the entry *Reset Configuration Data* to *Yes*.

Invalid System Configuration Data - run configuration utility
Press F1 to resume, F2 to Setup

This error message may be displayed if the machine was switched off during system start-up.

Call *BIOS Setup* and switch to the *Advanced* menu. Select the menu item *Reset Configuration Data* and change the setting to *Yes*. Save the change and terminate *BIOS Setup*. Reboot the device.

Keyboard controller error

Connect another keyboard or another mouse. If the message is still displayed, please contact your sales outlet or customer service centre.

Keyboard error

Check that the keyboard is connected properly.

Keyboard error nn
nn Stuck Key

Release the key on the keyboard (*nn* is the hexadecimal code for the key).

Missing or invalid NVRAM token

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

Monitor type does not match CMOS - RUN SETUP

Correct the entry for the monitor type in the *Main* menu of the *BIOS Setup*.

On Board PCI VGA not configured for Bus Master

In the *BIOS Setup*, in the *Advanced* menu, submenu *PCI Configuration*, set the *Shared PCI Master Assignment* entry to *VGA*.

One or more RDRAM devices are not used
One or more RDRAM devices have bad architecture/timing
One or more RDRAM devices are disabled

Contact your system administrator or contact our customer service centre.

Operating system not found

Check the entries for the hard disk drive and the floppy disk drive in the *Main* menu and the entries for *Boot Sequence* submenu of the *BIOS Setup*.

Parity Check 1
Parity Check 2

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

Previous boot incomplete - Default configuration used

By pressing function key **F2** you can check and correct the settings in *BIOS Setup*. By pressing function key **F1** the system starts with incomplete system configuration. If the message is still displayed, please contact your sales outlet or customer service centre.

Real time clock error

Call the *BIOS Setup* and enter the correct time in the *Main* menu. If the message is still displayed, please contact your sales outlet or customer service centre.

System battery is dead - Replace and run SETUP

Replace the lithium battery on the mainboard and redo the settings in the *BIOS Setup*.

System Cache Error - Cache disabled

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

System CMOS checksum bad - - Default configuration used

Call the *BIOS Setup* and correct the previously made entries or set the default entries.

System Management Configuration changed or Problem occurred

A system fan or system sensor has failed. Check the hardware operation.

System timer error

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

Uncorrectable ECC DRAM error

DRAM Parity error

Unknown PCI error

Switch the device off and on again. If the message is still displayed, please contact your sales outlet or customer service centre.

Verify CPU frequency selection in Setup

The frequency setting for the processor is invalid. Correct the *BIOS Setup* and the setting.

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.

AC'97	Audio Codec '97
ACPI	Advanced Configuration and Power Management Interface
AMR	Audio Modem Riser
AOL	Alert On LAN
APM	Advanced Power Management
ASF	Alert Standard Format
ATA	Advanced Technology Attachment
BIOS	Basic Input Output System
BMC	Baseboard management controller
CAN	Controller Area Network
CNR	Communication Network Riser
CPU	Central Processing Unit
C-RIMM	Continuity Rambus Inline Memory Module
DIMM	Dual Inline Memory Module
ECC	Error Correcting Code
ECP	Enhanced Capability Port
EEPROM	Electrical Erasable Programmable Read Only Memory
EPP	Enhanced Parallel Port
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
HDD	Hard Disk Drive
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
LAN	Local Area Network
LFE	Low Frequent Effects
LSA	LAN Desk Service Agent
MCH	Memory Controller Hub
MMX	MultiMedia eXtension
P64H	PCI64 Hub
PCI	Peripheral Component Interconnect
PCI Express	Peripheral Component Interconnect Express
PSB	Processor System Bus
PSU	Power Supply Unit
PXE	Preboot eXecution Environment
RAID	Redundant Array of Independent Disks
RAM	Random Access Memory
RAMDAC	Random Access Memory Digital Analogue Converter
RDRAM	Rambus Dynamic Random Access Memory
RTC	Real Time Clock
S/PDIF	Sony/Philips Digital Interface
SATA	Serial Advanced Technology Attachment
SB	Soundblaster
SDRAM	Synchronous Dynamic Random Access Memory
SGRAM	Synchronous Graphic Random Access Memory

SIMD	Streaming Mode Instruction (S ingle Instruction M ultiple D ata)
SMBus	System Management Bus
SVGA	Super Video Graphic Adapter
TEMP	Temperature
USB	Video Graphic Adapter
USB	Universal Serial Bus
VGA	Video Graphic Adapter
WOL	Wake On LAN