answers 2

Technical Manual

Mainboard D1692-Bxx

English

FUJITSU COMPUTERS SIEMENS

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- your sales outlet

The latest information and updates (e. g. BIOS update) on our mainboards can be found on the Internet under: *http://www.fujitsu-siemens.com*

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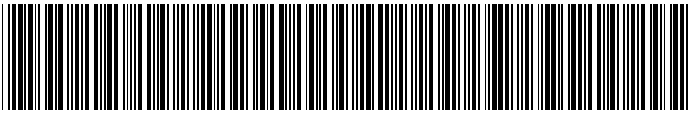

A26361-D1692-Z121-1-7619

English

Mainboard D1692-Bxx

Technical Manual

May 2004 edition

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Mainboard D1692-Bxx

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.

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 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 "Replacing 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

Processor

- Dual µPGA 940-pin ZIF sockets
- Supports up to two AMD Opteron™ processors
- Two onboard 3-phase VRMs
- 128-bit DDR dual-channel memory controller integrated in CPU

Chipset

- AMD-8131™ PCI-X Tunnel
- AMD-8151™ AGP Tunnel
- AMD-8111™ I/O Hub
- Winbond W83627HF Super I/O

Memory

- 128-bit DDR dual-channel memory bus
- Eight DIMM sockets (four per CPU)
- Supports a total of 32GB of DDR RAM
- Requires registered RAM
- Supports ECC or non-ECC
- Supports PC3200, PC2700, PC2100, PC1600

Integrated I/O

- One floppy, Two serial (one header and one connector), and one parallel port connector
- PS/2 KB/mouse connectors
- Total six USB connections (three rear connectors, two front USB headers and one internal USB header with Chipcardreader support)
- One LCD connector

Expansion Slots

- One 8x AGP / AGP-PRO 110 W slot
  (110 W only with 550 W power supply, else AGP-Pro 50 W)
- Four PCI-X slots
- Two 64-bit (3.3 V) PCI-X slots support up to 133 MHz on Bus B
- Two 64-bit (3.3 V) PCI-X slots support up to 100 MHz on Bus A
- One legacy 32-bit 33 MHz PCI slot (5V)
- Total of six usable slots

System Management

- Four 3-pin fan headers with tachometer monitoring and speed control
- 3-pin Chassis Intrusion header

Integrated Enhanced IDE Controller

- Two ports for up to four EIDE devices
- Supports up to ATA-133 IDE devices

Integrated Audio

- AMD-8111 AC97 Audio Controller
- Analog Devices AD1981b Audio Codec
- One RCA SPDIF digital connector
- Line-in, line-out (headphone capable), mic-in, rear connectors
- Line out (headphone capable) & MIC front panel headers
- Two 4-pin ATAPI Audio headers

Integrated SATA Controller

- Silicon Image SIL3114 SATA
- Four SATA 1.0 channels
- IDE RAID 0, 1, 0+1 (option)
- 48-bit LBA support

Integrated PCI Firewire

- TI TSB43AB22A IEEE1394A controller
- One external and one internal connector

Integrated Gigabit Ethernet

- Broadcom® BCM5703C Gigabit Ethernet
- RJ-45 LAN connector with LEDs
- Connected to PCI-X Bridge A
- (64-bit 100 MHz)

Regulatory

- FCC Class B (Declaration of Conformity)
- European Community CE (Declaration of Conformity)

BIOS

- Phoenix BIOS V4.06 on 4Mbit LPC Flash ROM
- ACPI - 2.0
- PXE via Ethernet
- USB device boot
- 48-bit LBA Support

Form Factor

- SSI EEB v3.0 footprint (13" x 12" 330.2x304.8 mm)
- EPS12V SSI Workstation Spec 2.0 (24-pin + 8-pin + 6-pin) power connector
- Serial (one) connector
- Stacked USB 1.1 (three) connectors
- Stacked PS/2 KB/Mouse connectors
- One RJ-45 LAN connectors with LED
- Line-in/Out, Mic, & SPDIF Audio Connectors

Software Specifications

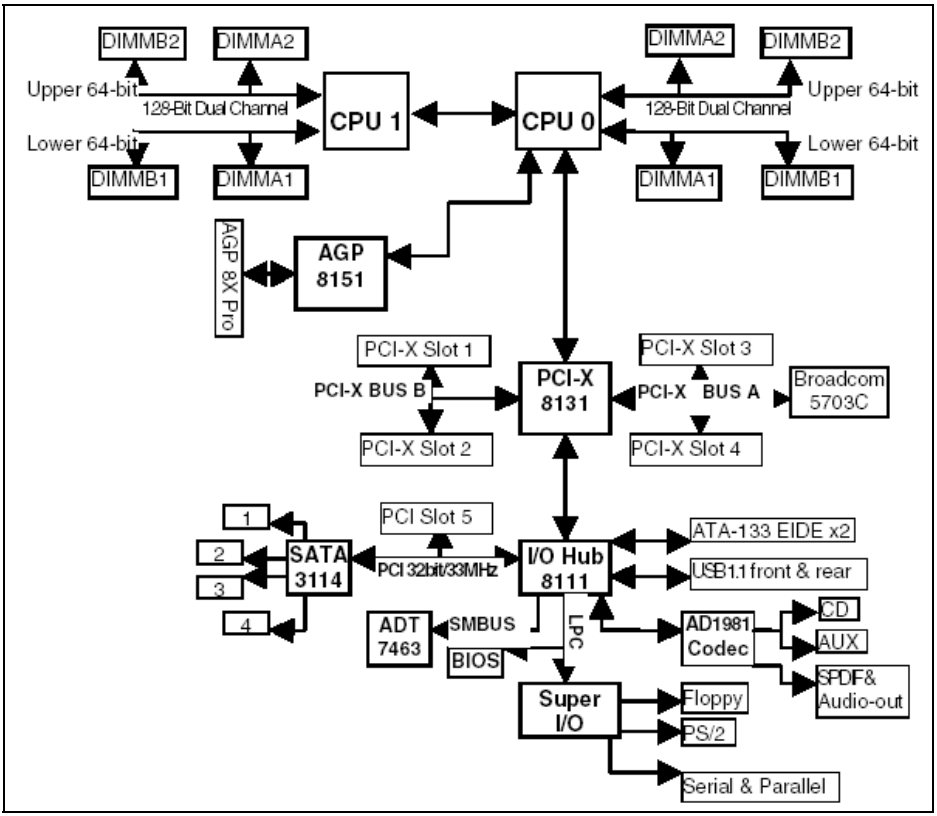
- OS (Operating System) Support
- Microsoft Windows XP Professional
- Microsoft Windows XP x86/64 Professional
- SuSE Linux
- Red Hat

Board Installation

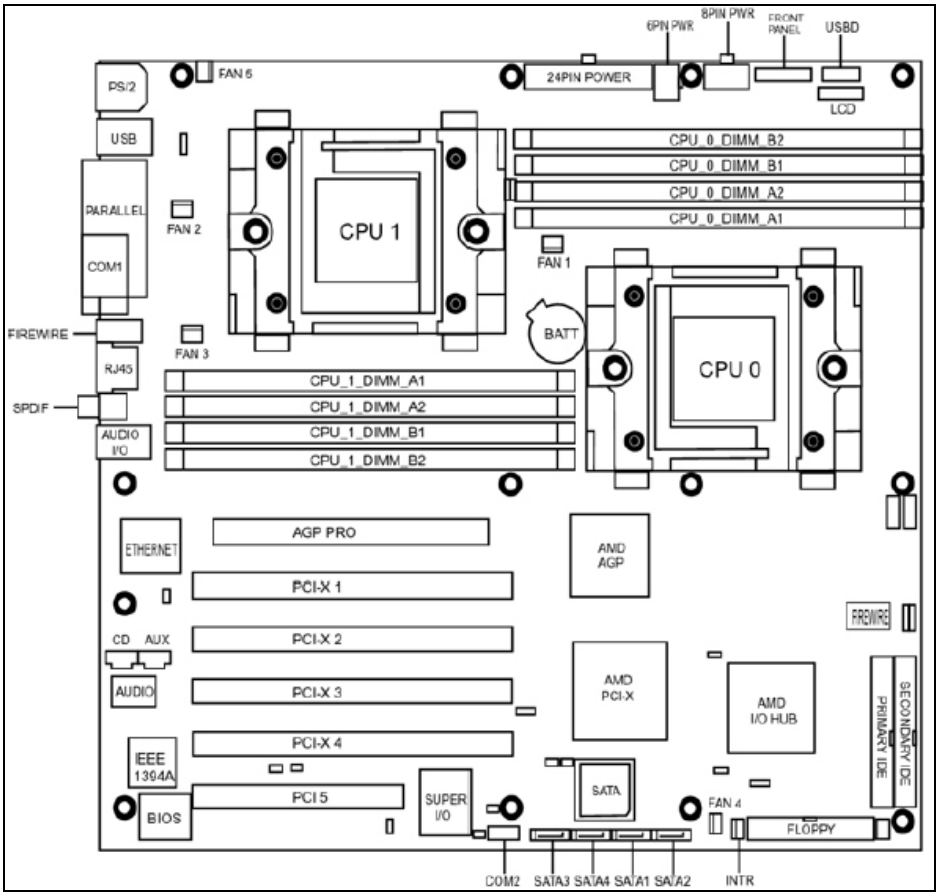
The mainboard D1692 supports EPS12V/SSI type power supplies (24-pin + 8-pin + 6-pin) and will not operate with any other types. For proper power supply installation procedures see "Installing the Power Supply" section.

DO NOT USE ATX 2.x, ATX12V or ATXGES power supplies as they will damage the board and void your warranty.

D1692 Block Diagram



Board Parts, Jumpers and Connectors

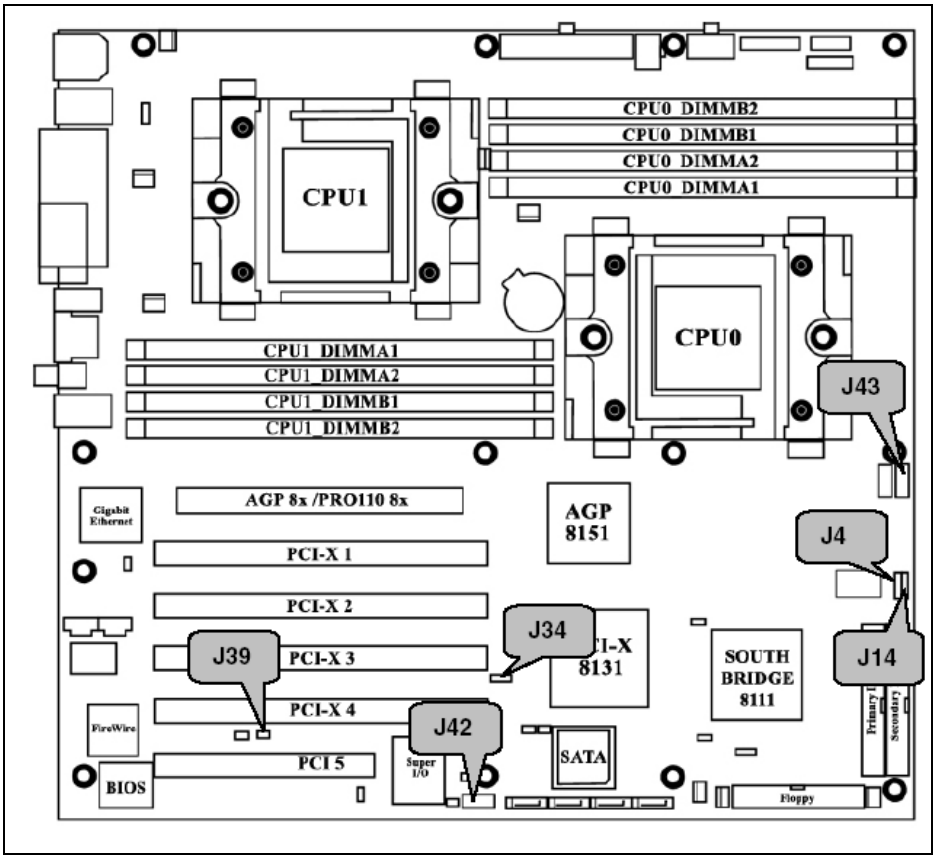


This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

Jumper Legend

	OPEN - Jumper OFF	without jumper cover
	CLOSED - Jumper ON	with jumper cover
□	Key Pin	Missing pin to indicate proper orientation

J4, J14, J34, J39, J42 and J43



SMBus 1.1 Connector (J4)

J4	SMBus 1.1 Connector			
	Use this connector to connect external SMBUS devices			
	Pin 1:	SMBUS_DATA	Pin 2:	GND
	Pin 3:	SMBUS_CLK	Pin 4:	NC

Onboard Buzzer/Speaker header (J14)

J14	Onboard Buzzer/Speaker header
	Close Pin 3 and 4 (Default) - Onboard Buzzer Enabled
	Open Pin 3 and 4 - Disable onboard buzzer or connect to chassis speaker

Clear CMOS Jumper (J34)

J34	Clear CMOS Jumper
(Clear) (Default)	You can reset CMOS settings by using this jumper if you have lost your system/setup password or need to clear system BIOS setting. There are three easy steps: Power off system and **disconnect all three power connectors from the motherboard** Use jumper cap to close Pin 2 and Pin 3 for several seconds to Clear CMOS Put jumper cap back to Pin 1 and Pin 2 (default setting) Reconnect power & power on system **NOTE:** If you do not disconnect the power connectors from the motherboard the CMOS may not clear completely.

PCI-X Slots 3 & 4 Force PCI Mode Jumper (J39)

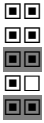
J39	PCI-X Slots 3 & 4 Force PCI Mode Jumper
	Open - (Default) Allows PCI 3 & 4 to operate in PCI-X mode
	Closed - Force PCI slots 3 & 4 to operate in PCI compatibility mode Close this jumper if the card you are using does not support PCI-X

COM2 Header (J42)

J42	COM2 Header
	Use these pin definitions to connect a port to COM2

Signal	Pin	Pin	Signal
Data Carrier Detect	1	2	Data-Set-Ready
Receive-Data	3	4	Request-to-Send
Transfer-Data	5	6	Clear-to-Send
Data Terminal Ready	7	8	Ring-Indicator
Ground	9	10	NC/KEY

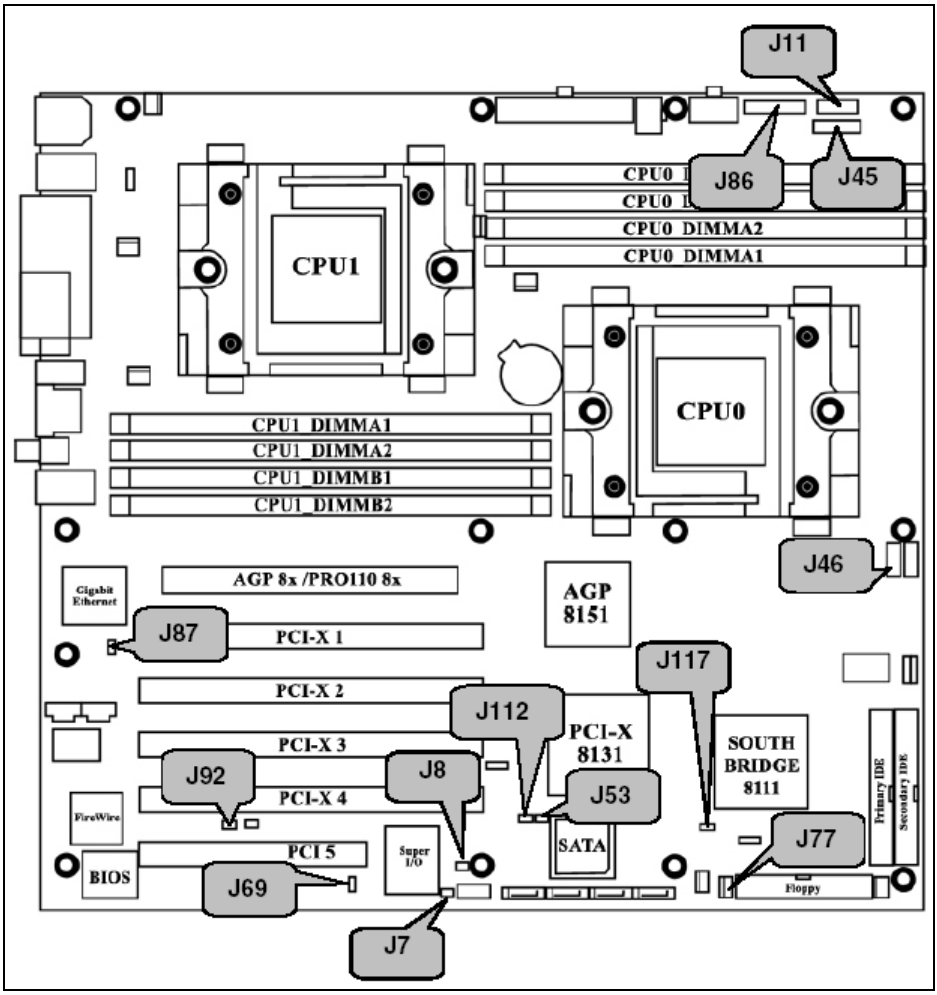
Front Panel Audio Header (J43)

J43	Front Panel Audio Header
	If you remove the front panel audio cable you have to put jumpers on Pin 5&6 and Pin 9&10 to get audio or microphone signals on your front or rear audio connections.

Signal	Pin	Pin	Signal
MIC In FP	1	2	Audio GND
MIC BIAS	3	4	Audio Analog
Right Front out	5	6	Right Rear In
No Connect	7	8	Key
Left Front Out	9	10	Left Rear In

WARNING: Do not place jumpers on this header in any other configuration. Doing so could result in damage to the motherboard!

J46, J53, J69, J77, J86, J87, J92, J112, J7, J8, J11, J45 and J117



USB E/F (Front Panel Header) (J46)

J46	USB E/F (Front Panel Header)

Signal	Pin	Pin	Signal
VCC	1	2	VCC
Data -	3	4	Data -
Data +	5	6	Data +
GND	7	8	GND
KEY	9	10	GND

PCI-X Slots 1 & 2 Bus Speed Override (J53)

J53	PCI-X Slots 1 & 2 Bus Speed Override
	Open – (Default) Allows PCI slots 1 & 2 to operate at up to 133 MHz (Maximum one PCI-X 133 device)
	Closed – Forces PCI slots 1 & 2 to operate at a maximum bus speed of 100 MHz Close this jumper if using more than one PCI-X 133 card on this bus

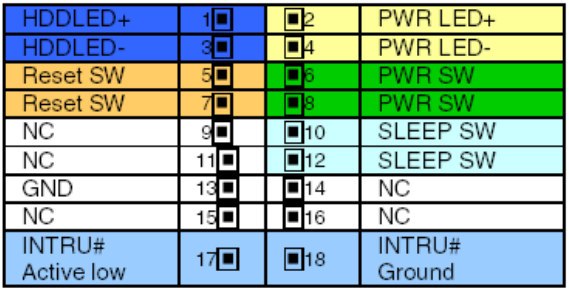
Firewire Disable Jumper (J69)

J69	Firewire Disable Jumper
	Open – (Default) Enables onboard FireWire controller
	Closed – Disables onboard FireWire controller

INTR – Chassis Intrusion Header (J77)

J77	INTR – Chassis Intrusion Header					
	Active Low					
	Pin 1:	Presence Detect	Pin 2:	Case Open	Pin 3:	GND

Front Panel Header (J86)

J86	Front Panel Header
	

Gigabit Ethernet Disable (J87)

J87	Gigabit Ethernet Disable
▣▣	**Open –** (Default) Enable onboard LAN Controller
▣▣	**Closed –** Disable onboard LAN Controller

PCI-X Slots 3 & 4 Bus Speed Override (J92)

J92	PCI-X Slots 3 & 4 Bus Speed Override
▣▣	**Open –** (Default) Allows PCI 3 & 4 to operate at up to 100 MHz
▣▣	**Closed –** Force PCI slots 3 & 4 to operate in at a maximum 66 MHz

Note: This jumper affects integrated Ethernet on the same bus

SATA (Serial ATA) Controller Disable (J112)

J112	SATA (Serial ATA) Controller Disable
▣▣	**Open –** (Default) Enable onboard SATA Controller
▣▣	**Closed –** Disable onboard SATA Controller

RCV (BIOS Recovery) (J7)

J7	RCV (BIOS Recovery)
▣▣	**Open –** (Default)
▣▣	**Closed –** Recovery mode

BIOS Write Protect (J8)

J8	BIOS Write Protect
	Open – (Default)
	Closed – FWH write protection

USB D (with Chipcardreader support) (J11)

J11	USB D (with Chipcardreader support)

Signal	Pin	Pin	Signal
Key	1	2	CCR on
n.c.	3	4	VCC
n. c.	5	6	Data +
n. c.	7	8	Data -
n. c.	9	10	GND
Key	11	12	n. c.

LCD header (J45)

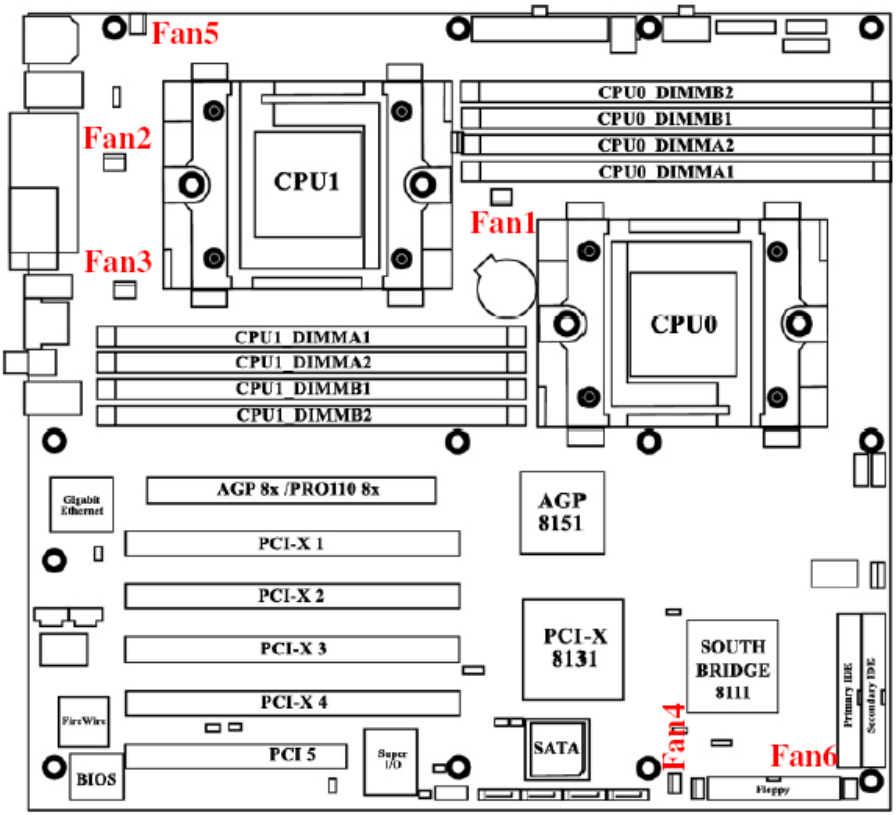
J45	LCD header

Signal	Pin	Pin	Signal
Clock	1	2	GND
Data	3	4	GND
Key	5	6	RFU
LAN Action	7	8	LAN Link
IDE	9	10	Alert
Message	11	12	Sleep
Power	13	14	VDD

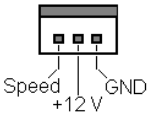
Remote Temp (J117)

J117	Remote Temp					
	Pin 1:	GND	Pin 2:	Remote_Temp	Pin 3:	GND

CPU and Chassis Fan Connectors



CPU and System Fan Specifications

	All CPU & System fan headers use the same pinout listed on the left. **FAN1:** Max 1.2 Amp CPU fan. Controlled and monitored **FAN2:** Max 1.2 Amp CPU fan.Controlled and monitored **FAN3:** Max 3.0 Amp Rear fan. Controlled and monitored **FAN6:** Max 2.0 Amp Front fan. Controlled and monitored **FAN4:** Max 2.0 Amp AUX fan. This fan header is not controlled or monitored **FAN5:** This fan header is not controlled or monitored

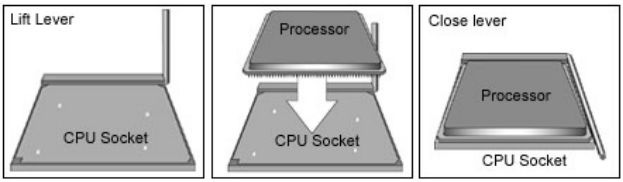
Add-on modules / Upgrading

Installing the Processor(s)

The mainboard D1692 supports the latest 64-bit processor technologies from AMD. Only AMD Opteron™ processor 200 series are certified and supported with this motherboard.

i If using a single processor, it MUST be installed in socket CPU0. When using a single processor only CPU0 memory banks are addressable.
There must be used identical processors for CPU0 and CPU1.

Fujitsu Siemens Computers is not liable for damage as a result of operating an unsupported configuration.



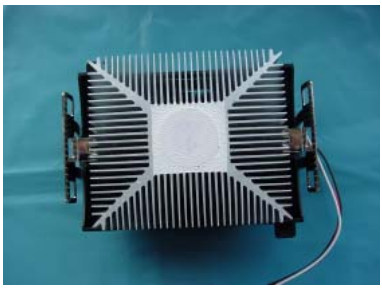
The diagram is provided as a visual guide to help you install socket processors and may not be an exact representation of the processors you have.

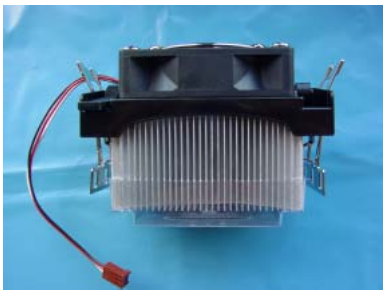
- ► Lift the lever on the socket until it is approximately 90° or as far back as possible to the socket.
- ► Align the processor with the socket. There are keyed pins underneath the processor to ensure that the processor is installed correctly.
- ► Seat the processor firmly into the socket by gently pressing down until the processor sits flush with the socket.
- ► Place the socket lever back down until it locks into place.

Your processor is installed.

Repeat these steps for the second processor if you are using two processors.

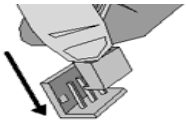
Heat sink Installation





- The thermal interface material is attached to the heat sink and protected with a plastic cover. Remove the plastic cover from the heat sink.
- Place the heat sink directly on the processor.
- Secure the metal clips to the plastic retention brackets.

After you have finished installing the heat sink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heat sink) to the motherboard.



The diagram illustrates how to connect fans onto the motherboard.

Installing the Memory

Before attempting to install any memory, make sure that the memory you have is compatible with the motherboard as well as the processor.

The following diagram shows common types of DDR SDRAM modules:

Here are a few key points to note before installing memory into your mainboard D1692.

- Always install memory beginning with CPU0 / DIMMA1 and CPU0 / DIMMA2.
- In order to access memory on CPU1; both processors must be installed.
- Configure memory symmetrically for each CPU for best performance.
- AMD OpteronTM processors support 64bit (non-interleaved) or 128bit (interleaved) memory configurations (See chart).
- At least one Registered DDR SDRAM module (CPU0/DIMMA1 or CPU0/DIMMB1) must be installed for the system to turn on and POST (power on self test).
- 128 MB, 256 MB, 512 MB, 1 GB, 2 GB and 4 GB Registered PC3200 / PC2700 / PC2100 / PC1600 DDR SDRAM memory modules are supported.
- 4GB memory modules run at a speed of 266 MHz.
- All installed memory will be automatically detected.
- The mainboard D1692 supports up to 32 GB with two CPUs installed.
- Use only identical DIMMs for one channel.
- Memory must be installed in pairs of DIMMs (CPU0 / DIMMA1 and CPU0 / DIMMA2, CPU0 / DIMMB1 and CPU0 / DIMMB2, CPU1 / DIMMA1 and CPU1 / DIMMA2, CPU1 / DIMMB1 and CPU1 / DIMMA2).

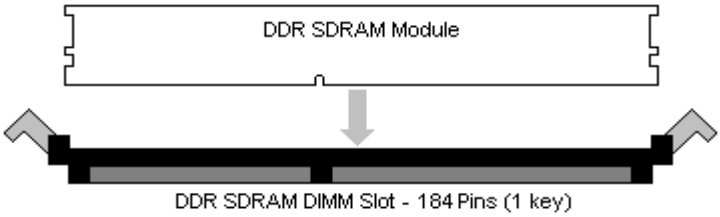
Following memory configurations are allowed

X indicates a populated CPU socket or a populated DIMM Slot.

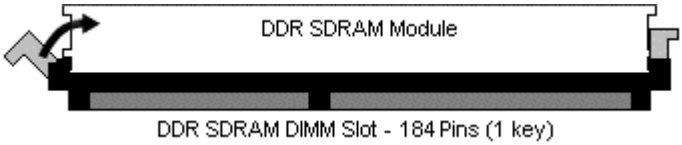
CPU0	CPU1	CPU0/ DIMMA1	CPU0/ DIMMA2	CPU0/ DIMMB1	CPU0/ DIMMB2	CPU1/ DIMMA1	CPU1/ DIMMA2	CPU1/ DIMMB1	CPU1/ DIMMB
X		X	X						
X		X	X	X	X				
X	X	X	X			X	X		
X	X	X	X	X	X	X	X	X	X

Memory Installation Procedure

When you install the memory modules, make sure the module aligns properly with the memory slot. The modules are keyed to ensure that it is inserted only one way. The method of installing memory modules are detailed by the following diagrams.



Once the memory modules are firmly seated in the slot, two latches on either side will close and secure the module into the slot. Sometimes you may need to close the latches yourself.



To remove the memory module, simply push the latches outwards until the memory module pops up. Then remove the module.

YOU MUST ALWAYS unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

Attaching Drive Cables

Attaching the IDE drive cable is simple. These cables are "keyed" to only allow them to be connected in the correct manner. The mainboard D1692 has two on-board IDE channels, each supporting two drives. The black connector designates the Primary channel, while the white connector designates the Secondary channel.

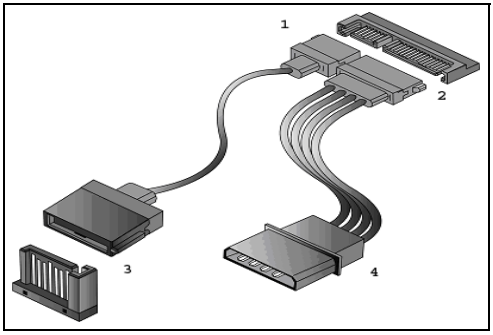
Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each ATA-133 IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

Notes:

- Always remember to properly set the drive jumpers.
- If only using one device on a channel, it should be set as Master.
- If only using one device on a channel connect it to the last connector.
- The maximum supported length of an IDE cable is 18".
- There are no Master/Slave jumpers on SATA drives.

The mainboard D1692 is also equipped with four Serial ATA (SATA) channels.

The following pictures illustrate how to connect an SATA drive.



1 = SATA drive cable connection
2 = SATA drive power connection
3 = SATA cable motherboard connector
4 = SATA drive power adapter

Floppy Drives

Attaching floppy diskette drives are done in a similar manner to hard drives. In most cases, there will be a key pin on the cable which will force a proper connection of the cable. Attach floppy drive (drive A:) to the end of the cable with the twist in it.

Connecting AUX/CD Sound Cables & Speakers

There are two connectors available for CD audio AUX audio. Both connectors are 4-pin. See the illustration below for pinouts.

Audio_L

Audio_GND

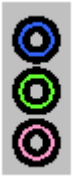
Audio_GND

Audio_R

Rear Audio Connectors

Digital SPDIF COAX

Digital interface Supports 5.1 Digital Surround Sound



Analog Connectors

Line in

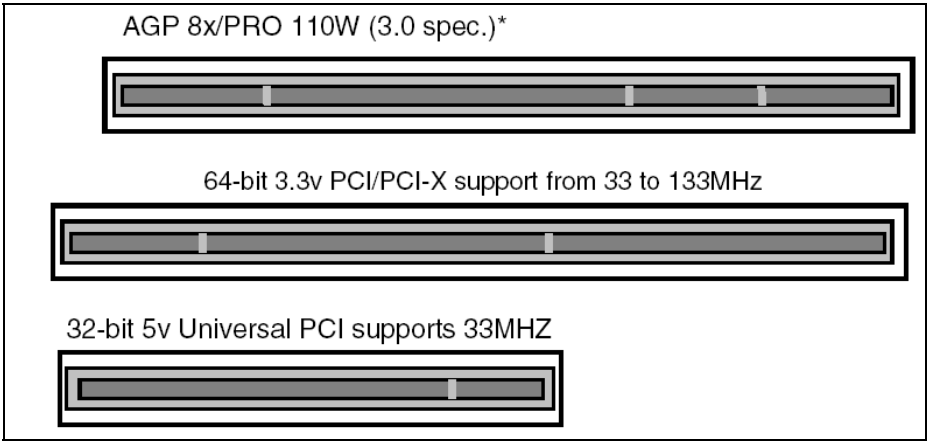
Line out (headphone capable)

Microphone In

Installing Add-In Cards

Before installing add-in cards, you should ensure that they are fully compatible with your motherboard. If in doubt, check the specifications with the manufacturer.

In order to illustrate the most common slots and what they support; we have provided the illustrations below.



Simply find the appropriate slot for your add-in card and insert the card firmly.

Never force any add-in cards into any slots if they do not seat in place. Doing so will damage the motherboard and void your warranty.

*The AGP slot supports AGPPRO & 1.5v(4x/8x) AGP cards only

PCI Interrupt Routing Table

Slot or Device	Bus#	AMD8111				AMD8131			
		A	B	C	D	A	B	C	D
AGP SLOT	N/A	**A**	B						
PCI Slot #1 (64bit)	PCIX-B					**A**	B	C	D
PCI Slot #2 (64bit)	PCIX-B					D	**A**	B	C
PCI Slot #3 (64bit)	PCIX-A					B	C	D	**A**
PCI Slot #4 (64bit)	PCIX-A					C	D	**A**	B
PCI Slot #5 (32bit)	PCI 0	**A**	B	C	D				
Onboard SATA	PCI 0		**A**						
Onboard GB LAN	PCIX-A					**A**			
Onboard FireWire	PCI 0				**A**				
IDE		**A**							
USB					**A**				
AC'97 Audio			**A**						

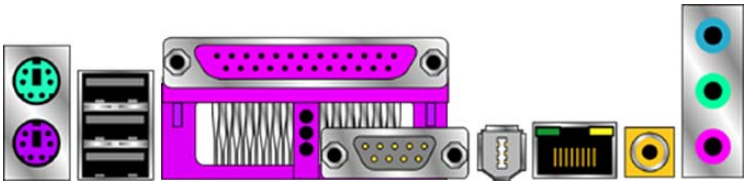
Each row represents one slot or onboard device, each column represents one PCI Interrupt Line. All devices on one column share this line. For standard PCI cards or devices (e.g. those that use only one interrupt) an "**A**" in a column means that it uses this PCI Interrupt Line. If other cards or devices also use this line, this means the line is shared. According to the PCI specification all cards and devices must support interrupt sharing. Some cards, however, might cause instabilities or performance degradation if they share an interrupt. Try moving those cards to a slot where they won't share an interrupt.

Some cards may use more than one interrupt. For these cards also take into consideration the small "B" "C" "D" entries in the table.

YOU MUST ALWAYS unplug all three power connectors from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

Connecting External Devices

Connecting external devices to the motherboard is an easy task. The standard devices you should expect to plug into the motherboard are keyboards, mice, and printer cables. The following diagram will detail the ATX port stack for the mainboard D1692:



Installing the Power Supply

There are three power connectors on your mainboard D1692.

The mainboard D1692 **requires** an EPS12V (24-pin + 8-pin) power supply to boot.

You also have an option of using an SSI V3.0 spec. Workstation power supply. This is only necessary when an AGP PRO110W card is used. (For more information see *www.ssiforum.org*)

NEVER plug the 8-pin power connector into the 6-pin motherboard connector. Doing so will damage the motherboard and/or other components

Please be aware that ATX 2.x and ATXGES power supplies are **not compatible** with the board and can damage the motherboard and/or CPU(s).

SSI Main Power 24-pin
(Chipset & Components)

+3.3V	12		24	GND
+12V2	11		23	+5V
+12V2	10		22	+5V
+5VSB	9		21	+5V
PWR OK	8		20	RESVD
GND	7		19	GND
+5V	6		18	GND
GND	5		17	GND
+5V	4		16	PSON#
GND	3		15	GND
+3.3V	2		14	-12v
+3.3V	1		13	+3.3V

EPS12V 8-pin
(CPU Power)

GND	4		8	+12V3
GND	3		7	+12V3
GND	2		6	+12V3
GND	1		5	+12V3

SSI Workstation 6-pin
(AGP PRO)

+12V2	3		6	+12V2
3.3VDC	2		5	GND
3.3VDC	1		5	GND

Disconnect power supply from electrical outlet

- ► Connect the EPS12V 8-pin power connector.
- ► Connect the SSI Workstation 6-pin power connector (if needed).
- ► Connect the EPS12V 24-pin power connector.
- ► Connect power cable to power supply to power outlet.
- ► Make sure you have connected all three connectors before attempting to apply power to the board.

Replacing 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.

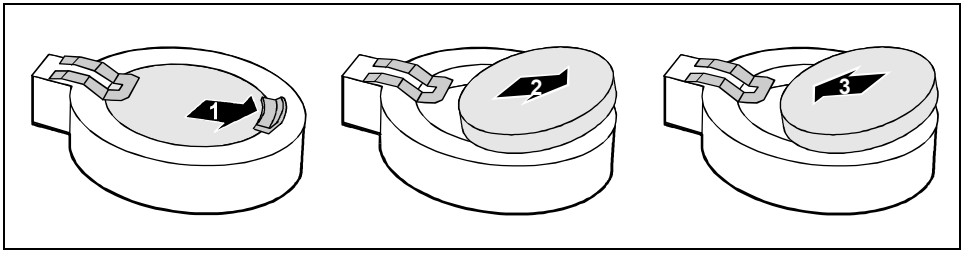
Incorrect replacement of the lithium battery may lead to a risk of explosion!

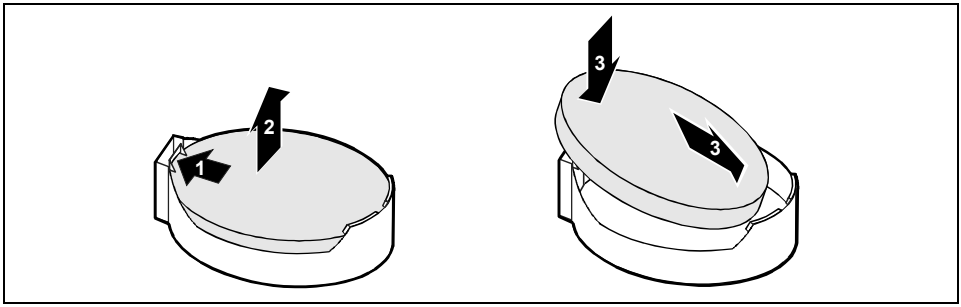
The lithium battery may be replaced only with an identical battery or with a type recommended by the manufacturer.

Do not throw lithium batteries into the household waste. They must be disposed of in accordance with local regulations concerning special waste.

Ensure 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).
- ► Insert a new lithium battery of the same type into the socket (3).

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.

How does a BIOS update work?

- ► Download the update file from our website to your PC.
- ► Insert an empty floppy disk (1.44 MB).
- ► Run the update file (e.g. *1692102.EXE*).
- ► A bootable update floppy disk is created. Leave this floppy disk in the drive.
- ► Restart the PC.
- ► Follow the instructions on screen.

BIOS Recovery

All BIOS settings are reset to the default values.

- ► Opening the casing as described in the operating manual.
- ► Close the jumper RCV (J7).
- ► Close the casing as described in the operating manual.
- ► Insert a BIOS Recovery Disk and start the PC.
- ► Note the signals issued from the buzzer or loudspeaker. You have successfully restored the BIOS if you hear one long beep.
- ► Power off your system.
- ► Open the casing as described in the operating manual.
- ► Remove the jumper RCV (J7).
- ► 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.

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 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
BMC	Baseboard management controller
CAN	Controller Area Network
CPU	Central Processing Unit
CNR	Communication Network Riser
C-RIMM	Continuity Rambus Inline Memory Module
DIMM	Dual Inline Memory Module
ECC	Error Correcting Code
EEPROM	Electrical Erasable Programmable Read Only Memory
FDC	Floppy disk controller
FIFO	First-In First-Out
FSB	Front Side Bus
FWH	Firmware Hub
GMCH	Graphics and Memory Controller Hub
GPA	Graphics Performance Accelerator
I^2C	Inter Integrated Circuit
IAPC	Instantly Available Power Managed Desktop PC Design
ICH	I/O Controller Hub

IDE	Intelligent Drive Electronics
IPSEC	Internet Protocol Security
ISA	Industrial Standard Architecture
LAN	Local Area Network
LSA	LAN Desk Service Agent
MCH	Memory Controller Hub
MMX	MultiMedia eXtension
P64H	PCI64 Hub
PCI	Peripheral Component Interconnect
PXE	Preboot eXecution Environment
RAM	Random Access Memory
RAMDAC	Random Access Memory Digital Analogue Converter
RDRAM	Rambus Dynamic Random Access Memory
RIMM	Rambus Inline Memory Module
RTC	Real Time Clock
SB	Soundblaster
SDRAM	Synchronous Dynamic Random Access Memory
SGRAM	Synchronous Graphic Random Access Memory
SIMD	Streaming Mode Instruction (**S**ingle **I**nstruction **M**ultiple **D**ata)
SMBus	System Management Bus
SVGA	Super Video Graphic Adapter
USB	Universal Serial Bus
VGA	Video Graphic Adapter
WOL	Wake On LAN

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