



SW500 Motherboard User's Guide

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Release Date: Nov. 2005

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INSTALL

BIOS
SETUP

APPENDIX

Arima ServerBoard Manual

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Overview

Thank you for choosing this high performance server motherboard. The SSI MEB form factor motherboard (M/B) includes Quad AMD® Opteron μPGA 940 processors, Serverworks HT2000 + HT1000 chipset, on-board Gigabit Ethernet controllers, an on-board MT25208 PCI-E x8 Infiniband controller, and integrated SATA II ports.

Sixteen memory sockets in four banks of four, support for up to 64 GB of registered ECC DDR 400/333/266 memory.

Expansion is possible with one 64-bit/133MHz PCI-X slot, and one PCI-E X8 slot. These PCI slots permit the use of numerous add-on cards.

Other features include advanced system management comprising Super I/O PC87417, hardware monitor ADM1026 + ADM1031, Arima™ SmartWatch™ server management software, and a mini PCI slot for Scorpio card.

Before installation or configuration of the motherboard is attempted, it is important to cover some precautions to ensure the safety of both the equipment and the technician/operator. Please read the General Safety, ESD precautions, and Operating Precautions in their entirety before beginning.

This Section is divided as follows:

GENERAL SAFETY PRECAUTIONS	2
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GENERAL SAFETY PRECAUTIONS

- Keep the area around the equipment clean and free of clutter.
- Servers are heavy. They can average about 50 lbs. (~22.68 kg). When lifting the system, two people should lift slowly from opposite ends with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed, away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose items such as neckties and unbuttoned shirt sleeves. They can come into contact with electrical circuits or get pulled into a cooling fan.
- Remove any jewelry or metal objects from your body which are electrical conductors. They can create short circuits and cause injury if they come into contact with printed circuit boards or areas where power is present.

¡System Safety!

ESD PRECAUTIONS

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides good conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

OPERATING PRECAUTIONS

Care must be taken to ensure that the chassis cover is in place when the server is operating to assure proper cooling. Out of warranty damage to the server can occur if this practice is not strictly followed.

ABOUT THIS USER'S MANUAL

This manual explains how to build your system in detail. Follow the procedures in this User Manual carefully and pay special attention to these icons.

 IMPORTANT	This icon informs you of particularly important details regarding the setup or maintenance of your system. Although some paragraphs are specifically highlighted, you should read each section carefully.
 WARNING	This icon alerts you to potential dangers during the setup of your system. These warnings should not be considered a complete list of safety precautions. Never forget that computers are electronic devices and may cause electrical shocks or become damaged by static discharges. Minimize the chance of damage to yourself and your motherboard by always working with proper grounding straps and making sure that your system is turned off and unplugged whenever you are working on it,
 NOTE	This icon brings certain notes to your attention during the setup process. It provides you with useful information especially for setting up a new system.
 TIP	This icon gives you tips on how to configure your system in simple and easy ways. This icon provides useful descriptions in helping you configure your system.

GETTING HELP

If a problem arises with your system during installation or operation, you should first ask your dealer for help as they have likely configured your system. They generally have the best grasp of your issues and the fastest response for your symptoms. If your dealer is near your location, it is recommended that you first bring your system to them to have it serviced instead of attempting to solve the problem yourself.

If those options don't work for you, Arima also provides some helpful resources to help you.

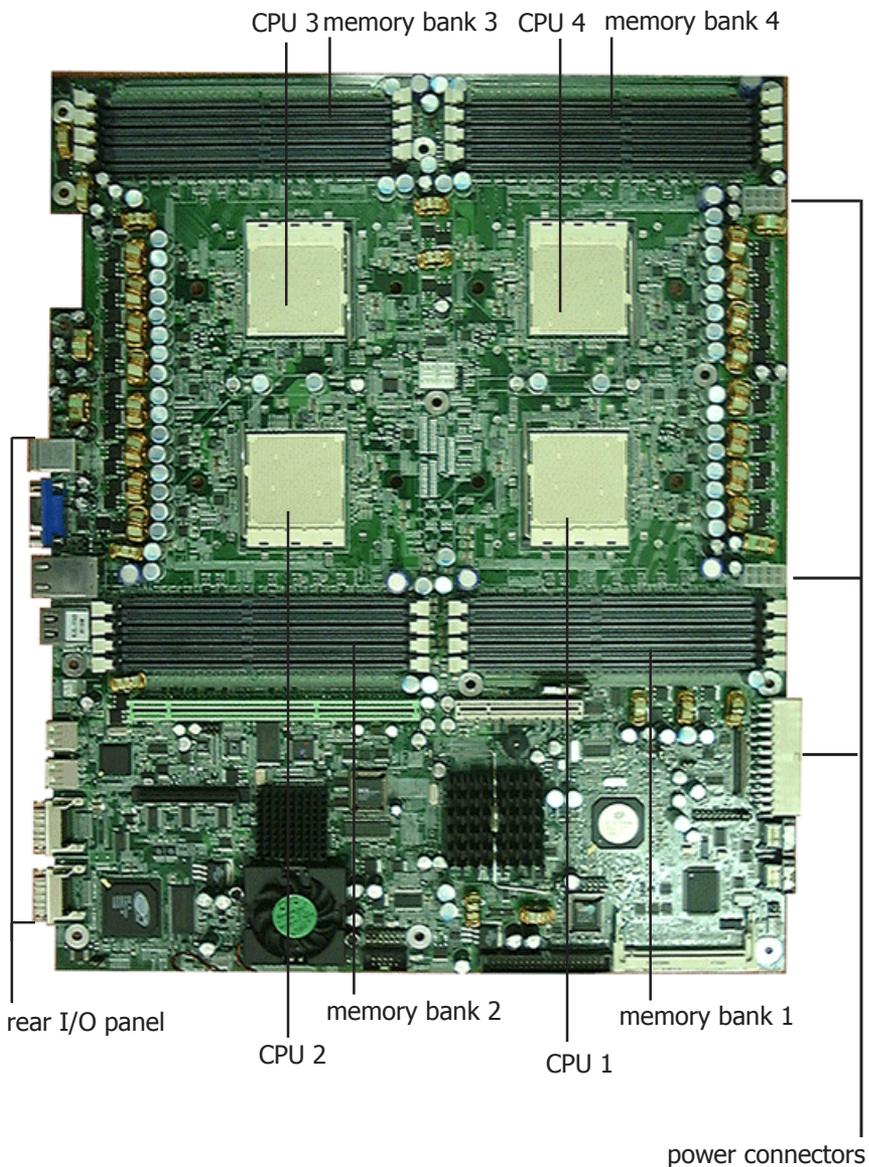
1. Visit the Arima website at www.arima.com.tw/server and navigate to your product's page. The page contains links to product updates such as Jumper settings or BIOS updates.
2. Email us at: server_usa@arima.com.tw, server_europe@arima.com.tw, server_asia@arima.com.tw, or server_japan@arima.com.tw, depending on your location, and we will try to answer your questions within 24 hours. Before you email your symptoms, fill in the symptom report to inform and aid our engineers in solving your problem quickly.

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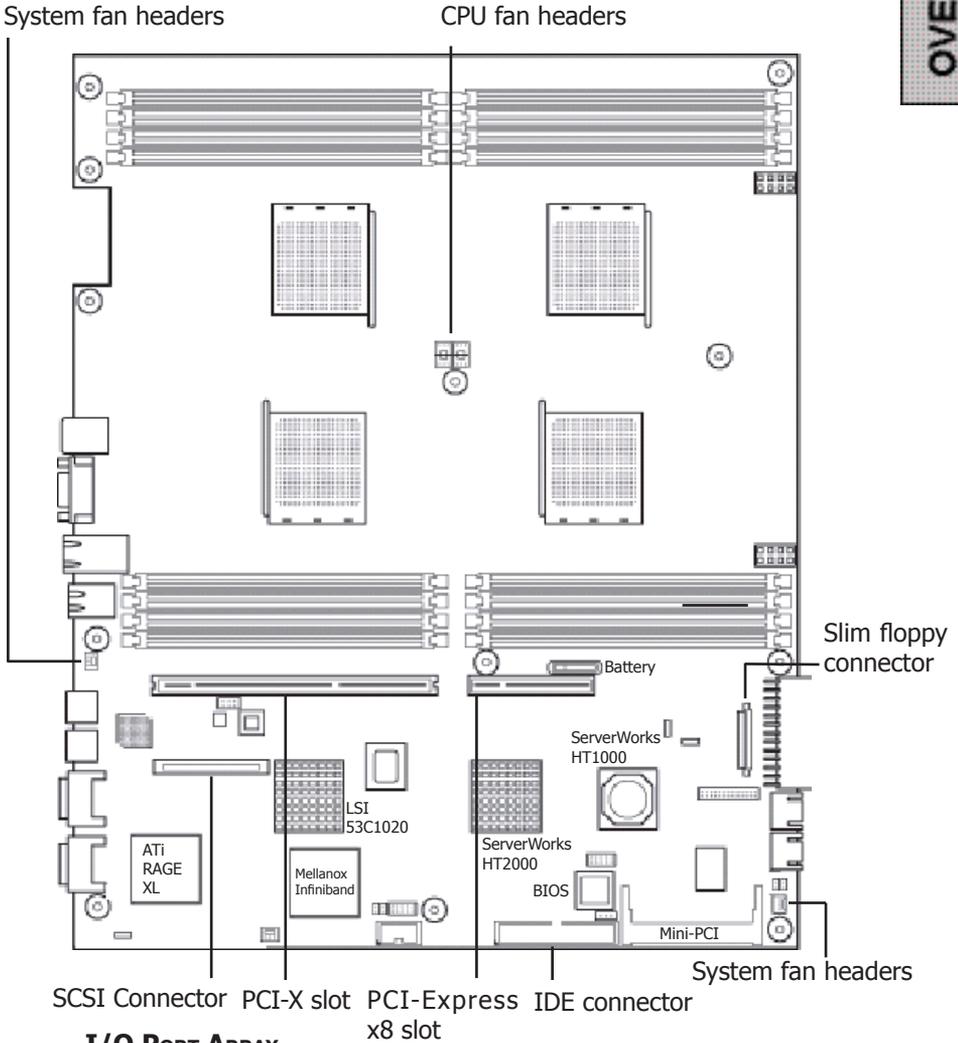
MOTHERBOARD SPECIFICATIONS

Processor	<ul style="list-style-type: none"> • Quad AMD Opteron 800 series μPGA Socket 940 CPUs • Supports up to 2.4 GHz CPUs and better • On-board VRD (4-phase, support up to 95W, 89A) • Dual core Opteron support
Chipset	ServerWorks HT2000 + HT1000
Memory	<ul style="list-style-type: none"> • 16 sockets for registered 266/333/400 ECC DDR DIMMs • Support for up to 64 GB of memory
Internal I/O connectors	<ul style="list-style-type: none"> • Thin-type floppy connector for slim floppy drives • IDE 40-pin connector (BIOS supports IDE CD-ROM boot up) • 9-pin serial port with UART 16550 • 1 x external USB 2.0 header
On-Board VGA	ATI Rage XL video controller with 8 MB memory
On-Board LAN	<ul style="list-style-type: none"> • Dual port Gigabit Ethernet on HT2000 • Single Intel 82541 GI PCI 33 Gigabit Ethernet controller
Expansion Slots	<ul style="list-style-type: none"> • 1 x PCI-X slot up to 133 Mhz • 1 x PCI-E X8 (share slot)
Rear Panel I/O	<ul style="list-style-type: none"> • 2 x onboard USB 2.0 connectors • VGA port for on-board ATI Rage XL video controller • 3 x Gigabit Ethernet LAN, RJ-45 ports • PS/2 mouse and keyboard connectors with wake-up function • 2 x Infiniband ports
System Management	<ul style="list-style-type: none"> • Super I/O PC87417 • Hardware monitor ADM1026 + ADM1031 • Arima™ SmartWatch™ server management software • Mini PCI slot for Scorpio card • Intel LAN assigned for server management
System BIOS	<ul style="list-style-type: none"> • 4 MB Flash EEPROM with Phoenix BIOS • I2C support • Legacy USB support • SMBIOS 2.3 compliant • DMI 2.0 compliant • Soft power down • Secure boot • Multiple boot support
Form Factor	<ul style="list-style-type: none"> • SSI MEB form factor (13 x 16-inch), 10 layer • EPS 12V power connectors (24-pin + 8-pin + 8-pin)
Serial ATA II	Integrated Serial ATA II, 4 ports on-die
SCSI	LSI Logic 1020 Ultra 320, single channel SCSI adapter

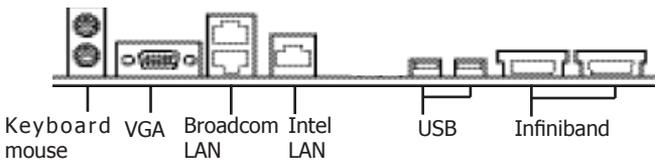
MOTHERBOARD LAYOUT



MOTHERBOARD MAP



I/O PORT ARRAY



Hardware Installation

The procedures on this section show how to install processors and other hardware components in your motherboard.

This section is divided as follows:

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**HARDWARE
INSTALL**

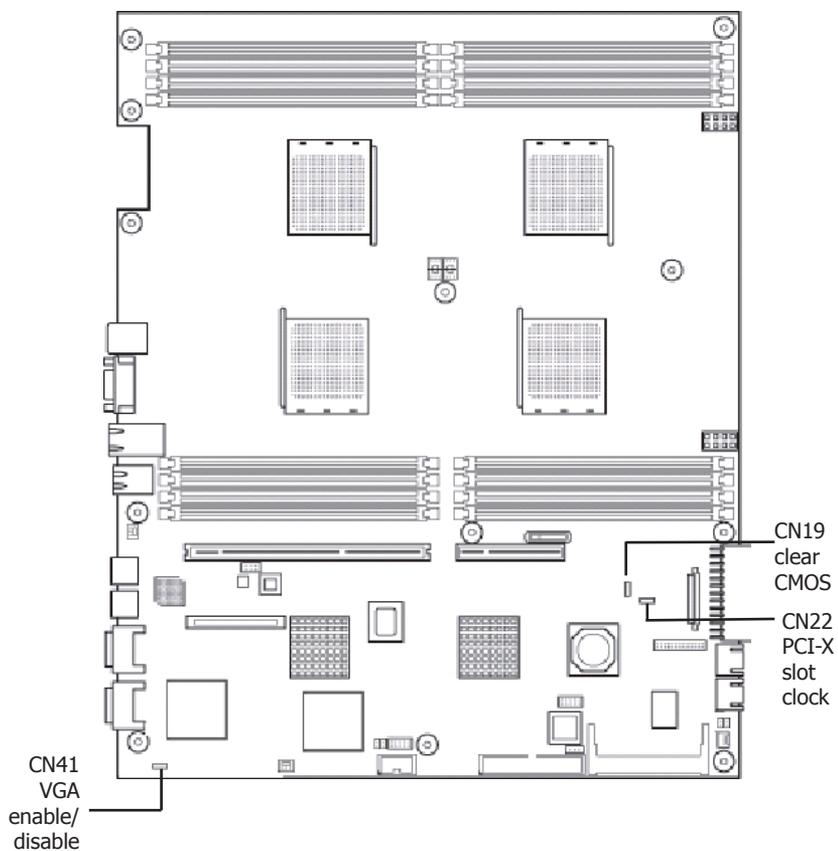


WARNING

This motherboard contains sensitive electronic components that can be easily damaged by static electricity. Follow the instructions carefully to ensure correct installation and to avoid static damage.

MAP OF JUMPERS

Refer to the following illustration to find the location of the motherboard's jumpers

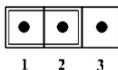


**HARDWARE
INSTALL**

JUMPER SETTINGS

On-Board VGA Select Jumper (CN41)

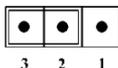
If you are going to use the onboard VGA feature, you need to set the jumper to enable the VGA header.



1-2	2-3
VGA Enabled (default)	VGA Disabled

PCI-X Slot Speed Select Jumper (CN22)

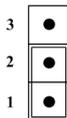
This header lets you determine the bus speed of the PCI-X slots. The speed can be set to either 133 MHz (default) or 100 MHz.



1-2	2-3
100 MHz Enabled	133 MHz Enabled (default)

Clear CMOS Header (CN19)

The onboard button cell battery powers the CMOS RAM that contains all the BIOS setup information. Keep the jumper connected to pins 1-2 (Default) to retain the RTC data as shown below.



1-2	2-3
Normal (default)	Clear CMOS

Under certain circumstances, you will need to reset BIOS settings. Follow these instructions to clear the CMOS data:

1. Turn off the computer and Remove the Power Cord
2. Short pins 2 and 3 with a jumper for a few seconds.
3. Replace the jumper to pins 1 and 2.
4. Turn on your computer by pressing the power-on button.
5. Hold down <F2> during boot and select either <Load Optimal Defaults> or <Load Failsafe Defaults> in the "Exit" section. Then go through the BIOS setup to re-enter user preferences. Refer to the BIOS section for more information.



IMPORTANT

If you do not remove the power cord, then the CMOS may NOT be cleared.

INSTALLING MEMORY

This motherboard uses Dual Inline Memory Modules (DIMM). Four 4-DIMM socket memory banks are available, one memory bank for each CPU socket. The DIMM sockets accommodate DDR266/DDR333/DDR400, Double Data Rate (DDR) memory modules in 128 MB, 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB size combinations. Total installed memory size is between a minimum of 128 MB to a maximum of 64 GB.

The design of the processor is such that the Memory Controller is built-in to the processor. Therefore, if there is no processor present, the respective DIMM bank is NOT recognized. This is important to note when not all processors are present.



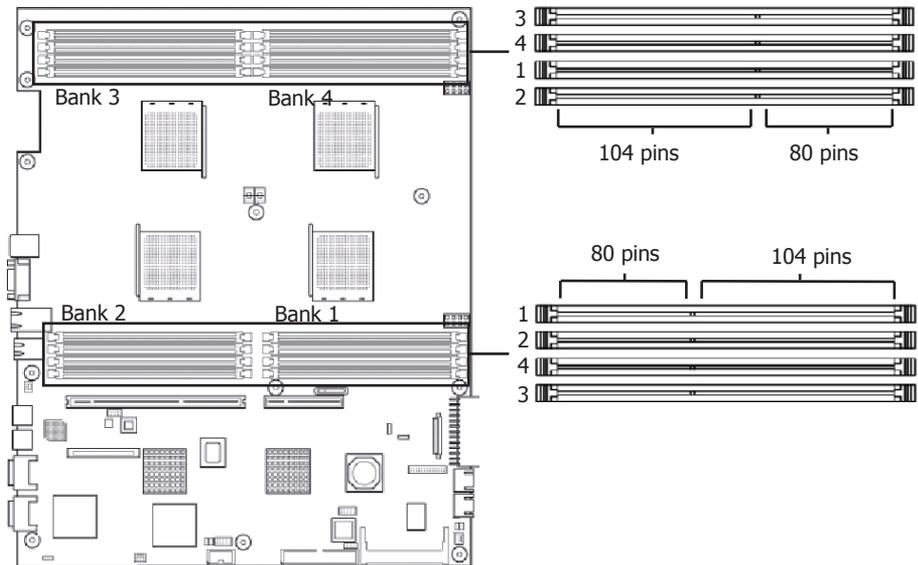
IMPORTANT

- * The motherboard has strict memory and timing requirements. Before buying DDR (Double Data Rate) DIMMs for use with the motherboard, it is recommended that you consult your local reseller for the best and most compatible memory to use.
- * The memory controller is built-in to the processor. If NO processor is present, the respective DIMM bank is NOT recognized.
- * This motherboard only supports registered DDR266/DDR333/DDR400 compliant modules.

**HARDWARE
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Memory Installation Procedures

This section outlines how to install registered DDR DIMMs into the motherboard.

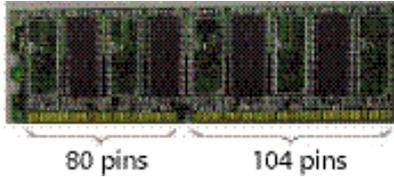


To install memory modules on your motherboard:

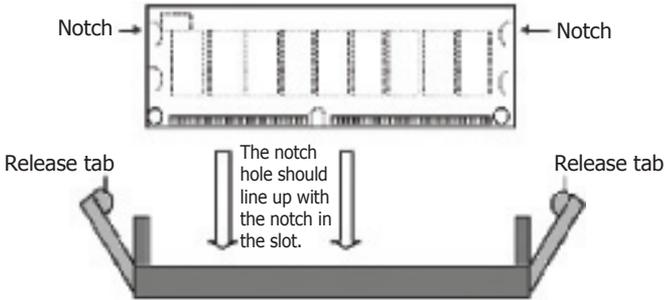
1. Locate the memory banks on the motherboard, where you will be installing the DIMMs.

Installing Memory continued...

2. Make sure the DIMM's pins are facing down, and check that the pin arrangement on the memory module resembles the one pictured below.



3. Insert the module into the DIMM socket and press down evenly on both ends firmly until the DIMM module is securely in place. (The tabs of the DIMM socket will close-up to hold the DIMM in place when the DIMM is properly installed on the socket's bottom.)



4. Repeat step 1 to step 3 for all additional DIMM modules.



IMPORTANT

- * The processors in this motherboard feature a 128-bit wide DDR memory interface. To take advantage of the 128-bit interface, you must install DIMMs in pairs. DIMM slots 1 and 2 are paired, and slots 3 and 4 are paired. If you are only installing two DIMMs in a Memory Bank, it is recommended that you install them in slots 1 and 2 to get the full bandwidth. (This is True for all memory banks on the board.)
- * Remember to populate the DIMM banks with at least 2 DIMMs for each CPU.

RECOMMENDED MEMORY CONFIGURATIONS

AMD Opteron processors have very specific memory module requirements, and due to the design of the motherboard, there are certain configurations of memory that work best to make the most effective use of the memory bandwidth.

The AMD Opteron features 128-bit DDR memory channels. DDR Memory Modules are only 64-bit. In order to benefit from the full bandwidth, you should always install the DIMMs in pairs. The motherboard is designed to pair up DIMM slots 1/2 and slots 3/4 for the 128-bit pathway.

The Opteron is designed with the Memory Controller built-in to the processor. The DIMM Banks are thus controlled by the processor. If a processor is NOT present, then the respective DIMM Bank is NOT recognized. When only one (1) processor is installed in CPU1, only DIMM bank 1 is active. DIMMs in other DIMM Banks will NOT be recognized.

The memory nodes are also shared over the entire bus. It is possible to operate a system with two, three, or four CPUs and only a pair of DIMMs in DIMM bank 1.

The Opteron does support 64-bit only operation, but due to the design of the DIMM banks, the single DIMM must be inserted in either DIMM slot 1 or DIMM slot 3 to function. The system will NOT boot otherwise.

The following is the recommended DIMM installation path based on the number of DIMMs being installed (Remember to check that the DIMMS are 2.5V/2.6V Registered ECC DDR PC2100/PC2700/PC3200/DDR266/DDR333/DDR400 DIMMS and that they appear on the List of Recommended Memory Modules):



IMPORTANT

- * If you only have one (1) processor, install ALL DIMMs into the H1 DIMM Bank.
- * To ensure compatibility, only use DIMM pairs of the same exact type and size and made by the same company. Refer to "Appendix A: Recommended Memory Modules" for a list of supported DIMMS.

Recommended Memory Configurations

1 DIMM	H1 Bank: Slot 1 or Slot 3 (this only provides 64-bit memory access)	
2 DIMMs	H1 Bank: Slot 1, 2 or Slot 3, 4	
4 DIMMs	Single processor	H1 Bank: Slot 1, 2, 3, 4*
	Dual processor	H1 Bank: Slot 1, 2 or Slot 3, 4 H2 Bank: Slot 1, 2, or Slot 3, 4
6 DIMMs	H1 Slot 1, 2, 3, 4* H2 Slot 1, 2	
8 DIMMs	H1 Slot 1, 2, 3, 4* H2 Slot 1, 2, 3, 4*	

* To support full speed of DDR400, please use [Single, Single, Single, Single] or [Double, Double, Single, Single] or [Single, Single, Double, Double]. Note that DDR400 is supported by CPU rev C0 and later.

INSTALLING THE PROCESSOR AND HEATSINK

The motherboard accommodates AMD® Opteron micro-PGA socket 940 processors. You must first insert a CPU into CPU socket 1 (CPU1) before installing one in CPU socket 2 (CPU2).

Processor (CPU) Installation

This section outlines how to install a CPU on the motherboard

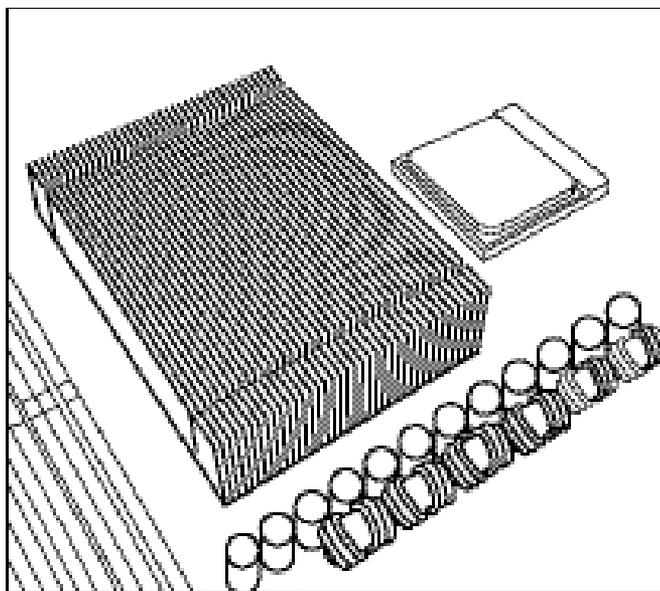
1. Locate Pin 1 on the CPU socket and Pin 1 on the CPU itself.
2. Lift up the lever on the CPU socket 940. Then line up Pin 1 on the CPU with the Pin 1 marking on the socket before inserting the CPU into the socket 940. Check that the CPU is flush in the socket, and lower the lever to lock the CPU in place.

Pin1



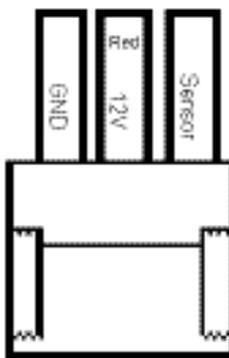
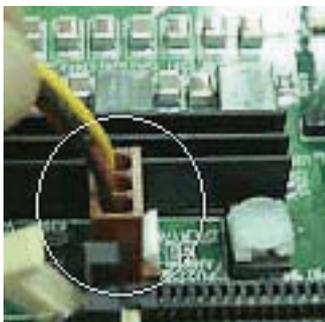
Pin 1 of CPU is lined up with Pin1 of Socket.

3. Apply thermal compound (thermal grease) to the top of the CPU.
4. Mount the Heat sink on top of the installed CPU by attaching it to the motherboard with the included screws (first on one side, then the other).



Installing the Processor and Heatsink continued...

5. Connect the 3-wire fan cable to the fan connector on the motherboard.

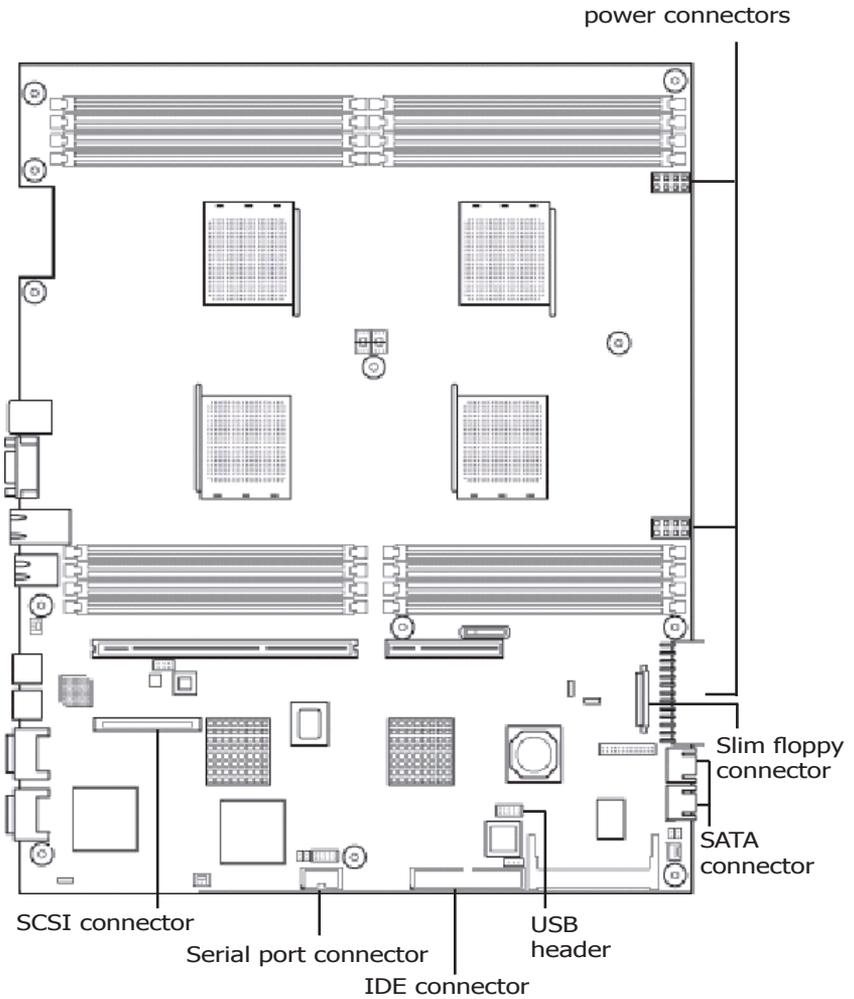


6. Repeat steps 1 through 5 for other CPUs.

**HARDWARE
INSTALL**

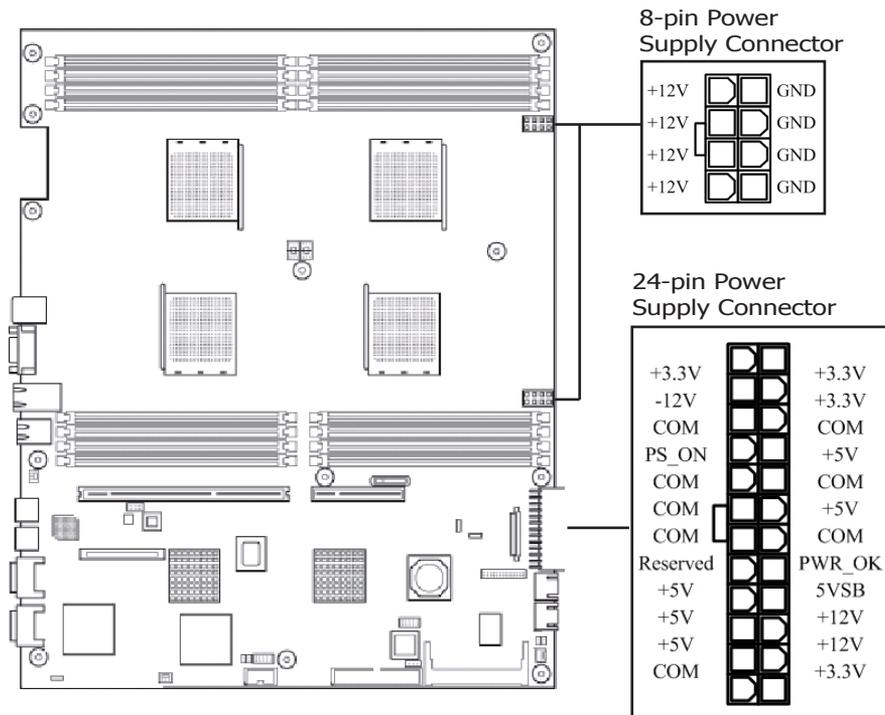
MAP OF MOTHERBOARD CABLE CONNECTORS

The following map of the motherboard illustrates the location of all the connectors on the motherboard. Use this map to aid you in connecting devices to your motherboard.



ATX POWER CONNECTORS

ATX 24-pin connectors connect the Motherboard to the ATX power supply. Find the proper orientation of the connectors and push down firmly to make sure that the pins are aligned (the connector will only insert properly when properly aligned). The 8-pin connector is a dedicated power connector to supply power for the CPUs. For Wake on LAN support, the 5-volt Stand-by lead (+5VSB) from the ATX power supply must supply at least 2A.



**HARDWARE
INSTALL**



IMPORTANT

It is recommended that you use an ATX Power Supply that complies with the Intel ATX 2.03 specification.

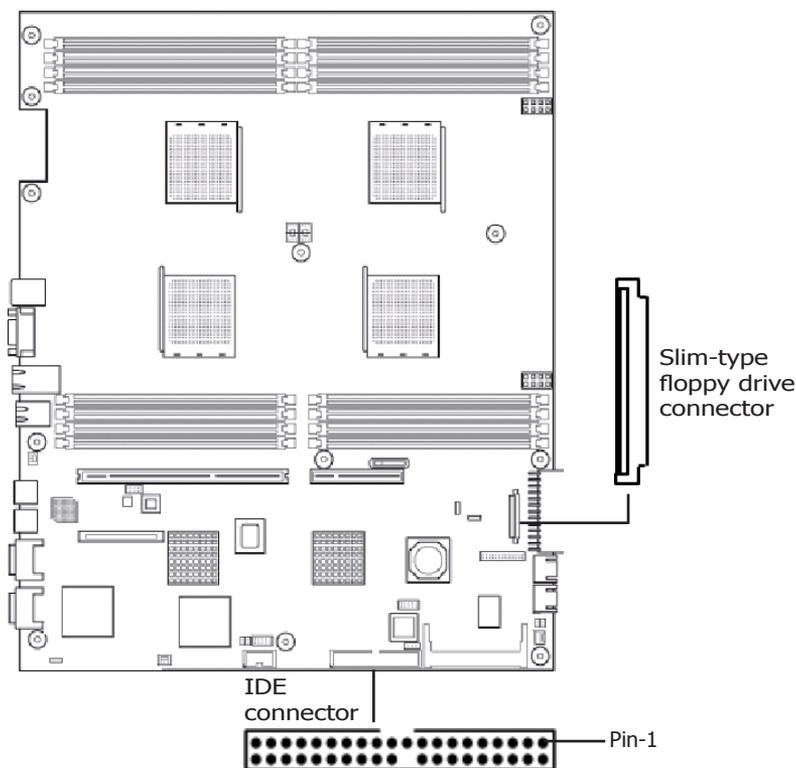
SLIM FLOPPY DISK DRIVE CONNECTOR

The thin-type ribbon connector is specifically designed for use with slim floppy drives that connect directly to the motherboard.

PRIMARY IDE CONNECTOR

The 40-pin IDE connector supports a 40-wire IDE ribbon cable. Connect the single connector end to the motherboard. Then, connect the two connectors at the other end to your IDE device(s). If you connect two hard disks to the same cable, you must set the second drive as a Slave using its jumper settings. Refer to the IDE device's documentation for the specific jumper settings. The motherboard BIOS now supports IDE HDD or IDE CD-ROM bootup. (Pin 20 is removed to prevent the connector from being inserted in the wrong orientation when using ribbon cables with pin 20 plugged in). The BIOS supports Ultra DMA 33/66/100/133.

HARDWARE
INSTALL



IMPORTANT

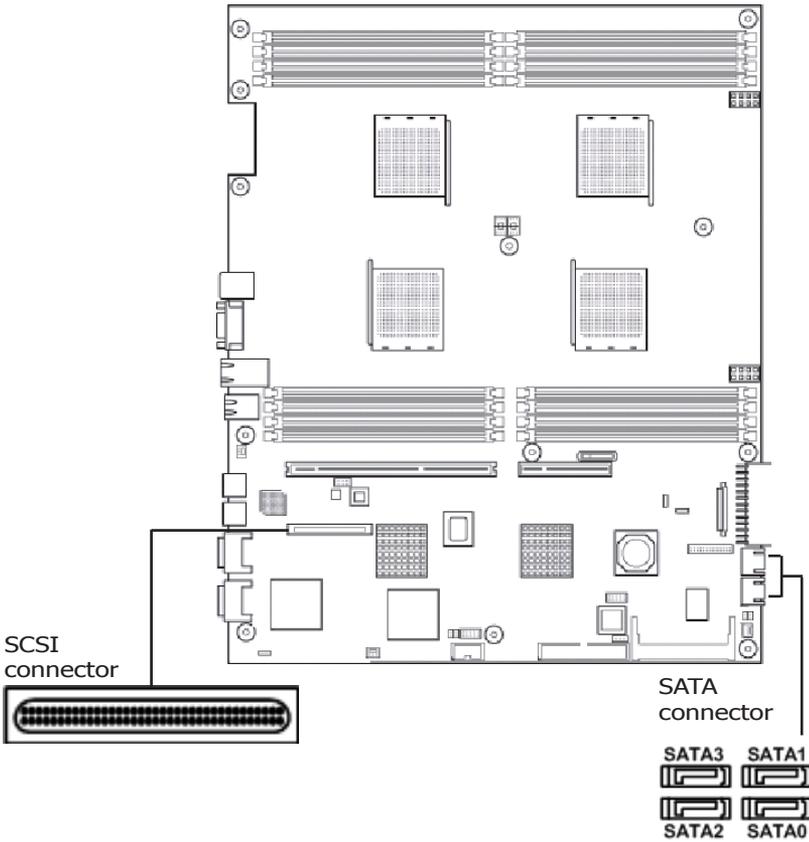
Ribbon cables should always be connected with the red stripe on the Pin 1 side of the connector. IDE ribbon cables must be less than 46 cm (18 inches) long, with the second drive connector no more than 15 cm (6-inches) away from the first connector.

SCSI AND SATA CONNECTORS

SCSI is a hardware interface that allows for the connection of up to 15 peripheral devices to a single board.

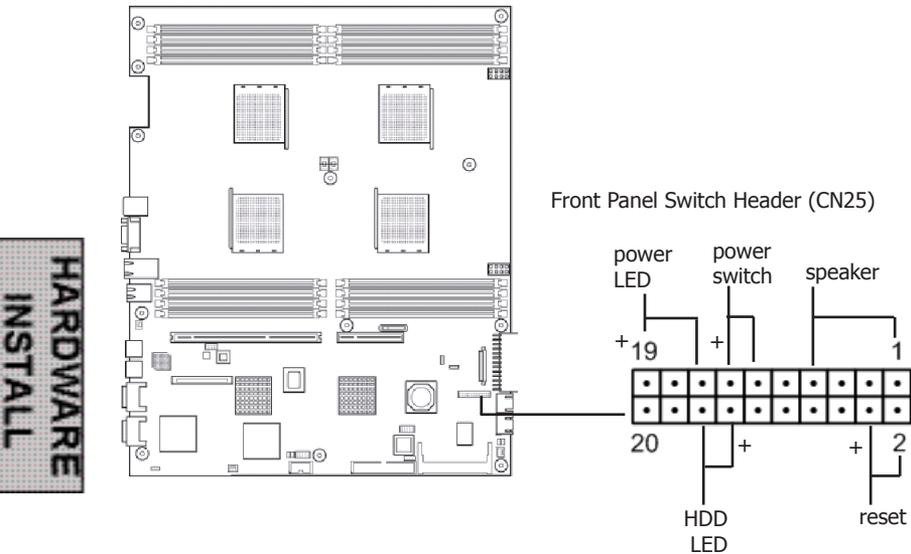
The motherboard features an LSI 1020 single channel SCSI controller.

Besides, there are 4 ports SATA II by HT1000, ordered as pictured.



FRONT PANEL SWITCHES

The front panel switches header connects the front control panel buttons and LEDs to the motherboard.



Reset Switch (2-pin RST)

This 2-pin connector connects to the chassis-mounted reset switch for rebooting your computer without turning your power switch off and on. This is a preferred method of rebooting your system to prolong the life of your system's power supply.

Hard Disk Activity LED (2-pin HDD_LED)

This connector supplies power to the chassis's HDD/IDE activity LED. Read and Write activity by devices connected to the Primary or Secondary IDE connectors will cause the front panel LED to light up.

Speaker Connector (4-pin SPEAKER)

There is one jumper over pin1 and pin2 (default setting) for the internal buzzer. If you want to use the external case-mounted speaker instead of the internal buzzer, remove the jumper and connect the speaker wire to the 4-pin connector.

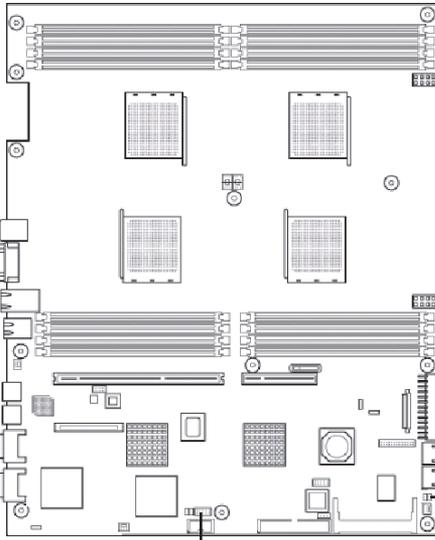
ATX Power Switch / Soft Power Switch (2-pin PWR_SW)

A momentary switch connected to this 2-pin connector controls the system power. Pressing the button once will switch the system between ON and SLEEP mode. The system power LED shows the status of the system's power.

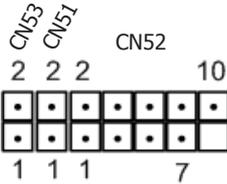
System Power LED (3-pin PWR_LED)

This 3-pin connector connects to the chassis-mounted system power LED, which lights up when the system is powered on.

LED HEADER MAP



LAN & Infiniband LED header (CN51/52/53)

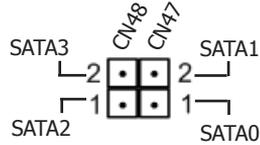


CN53 Pin Assignments	
Pin	Description
1	GND
2	VCC3

CN51 Pin Assignments	
Pin	Description
1	Intel LAN Link LED
2	Intel LAN Active LED

CN52 Pin Assignments	
Pin	Description
1	Broadcom Link1 LED
2	Broadcom Active1 LED
3	Broadcom Link2 LED
4	Broadcom Active2 LED
5	Infiniband Link1 LED
6	Infiniband Active1 LED
7	Infiniband Link2 LED
8	Infiniband Active2 LED
10	System fail LED

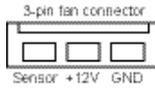
SATA LED header (CN47/48)



**HARDWARE
INSTALL**

FRONT/BACK/CPU/AUX FAN CONNECTORS

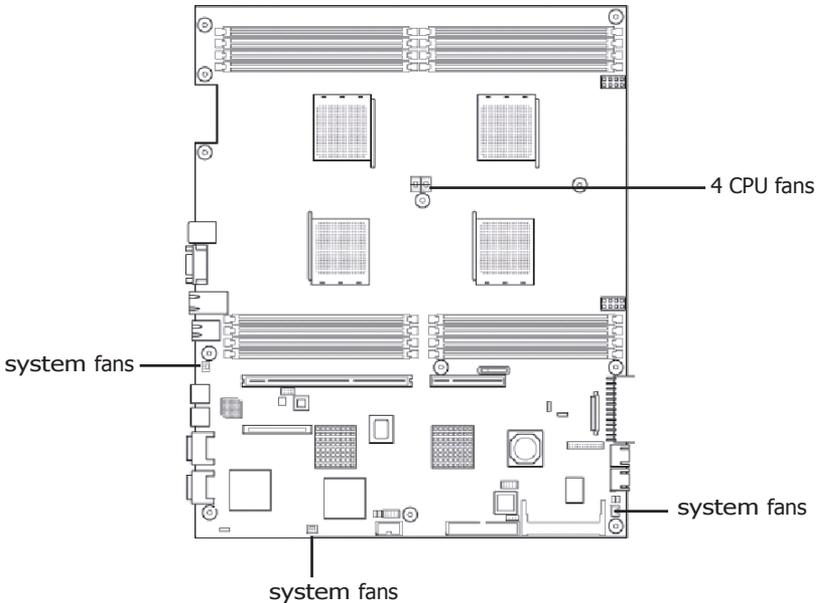
There are seven 3-pin fan connectors on the motherboard. Four fans are used for the four CPUs; the rest are for cooling other components. These connectors support cooling fans of 500mA (6W) or less. Depending on the fan manufacturer, the wiring and plug may be different. Connect each fan plug to the motherboard noting the polarity of the fan connector.



WARNING

The CPU and motherboard will overheat if there is not enough airflow across the CPU and onboard heatsinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. These are NOT jumpers, do NOT place jumper caps over these pins.

HARDWARE
INSTALL

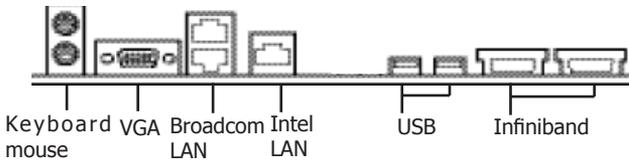


NOTE

The "Rotation" signal can only be used with fans specially designed for the rotation signal.

REAR PANEL I/O PORTS

This is an illustration of the motherboard rear I/O port array



PS/2 Mouse Connector (6-pin Female)

The system will direct IRQ12 to the PS/2 mouse if one is detected. If no mouse is detected, IRQ12 will be free for expansion cards to use.

PS/2 Keyboard Connector (6-pin Female)

This connection is for standard keyboards using a PS/2 (mini DIN) plug. This connector will not accept standard AT size (large DIN) keyboard plugs. You will need a DIN to mini DIN adapter for standard AT keyboards.

Universal Serial BUS Ports (Two 4-pin Female)

Two onboard external USB 2.0 ports are available for connecting USB devices.

VGA Connector (15-pin Female)

The VGA port connects to a display device. See BIOS for more information VGA setup.

Onboard LAN Ports (Broadcom LAN, Intel LAN)

This motherboard uses the Broadcom and Intel Gigabit Ethernet Controllers. There are three RJ-45 ports available for connecting to networks. The controllers consists of both the Media Access Controller (MAC) and Gbps Physical Layer (PHY) interface. Besides, Intel LAN is assigned for server management (IPMI 2.0). Refer to the "Onboard LAN User Guide" for further information.

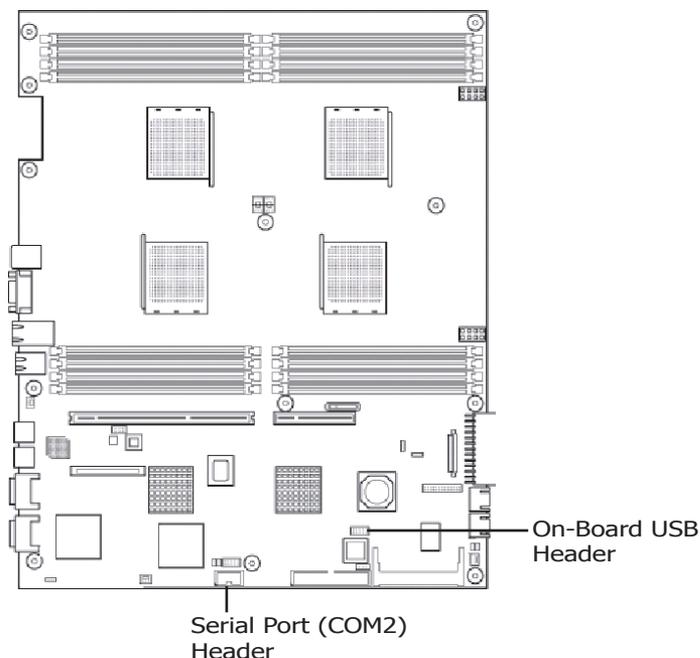
Infiniband

The two on-board Infiniband connectors provide a highspeed I/O facility similar to PCI express.

ADDITIONAL I/O CONNECTORS

The ServerBoard also contains connectors for adding additional ports and devices to the serverboard.

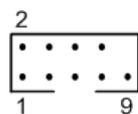
**HARDWARE
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Serial Port (COM2) Header (9-pin)

This is for connecting an additional serial port to the motherboard. This is generally used adding a 25-pin female serial connector. See BIOS for setup information.

9-pin Serial Port Header

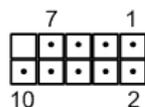


COM2 Pin Assignments			
	Desc.		Desc.
1	DCD	2	DSR
3	Serial In	4	RTS
5	Serial Out	6	CTS
7	DTR	8	RI
9	GND		

On-Board USB Header (5-pin)

This header is for connecting two additional USB ports to the motherboard. See BIOS for setup information.

two 5-pin Onboard USB Headers



USB Pin Assignments	
Pin	Description
1, 2	VCC
3, 4	Data -
5, 6	Data +
7, 8	Ground
10	NC / Key

INSTALLING EXPANSION CARDS

This outlines the procedure for adding expansion cards to your motherboard. Remember to read the documentation for your expansion cards and make the necessary hardware and software setting changes (i.e. jumper settings).

The motherboard features 1 PCI-X (64-bit, 133Mhz) slot, and 1 PCI-E x8 slot to accommodate PCI expansion cards.

1. Remove the bracket plate on the slot you intend to use. Keep the bracket for possible future use.
2. Insert the PCI card into the correct slot on the motherboard, pushing down with your thumbs evenly on both sides of the card.
3. Secure the card on the slot with the screw you removed above.



WARNING

Completely power OFF your power supply when adding or removing any expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

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POWERING ON YOUR SYSTEM

Follow these instructions to power on the computer after you have installed the motherboard and all system devices.

1. Be sure that all switches are off (in some systems, Off is marked by "O").
2. After double-checking all jumper settings and connections, close the system chassis cover.
3. Connect the power cord to the power cord connector located on the power supply at the back of your system chassis and plug the power cord into a power outlet that is equipped with a surge protector.
4. Turn on your devices in the following order:
 - Monitor
 - System power

For ATX power supplies, you need to switch On the power supply, then press the ATX power switch on the front of the chassis the first time you start up the system.

5. The power LED on the front panel of the system case will light up. For ATX power supplies, the system LED will light up when the ATX power switch is pressed. The monitor LED may light up after the system's LED if it complies with "Green" standards or if it has a power standby feature. The system will first run its "power-on" tests. While the tests are running, additional messages will appear on the screen. If you do not see anything on the screen within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Re-check your jumper settings and connections. Contact your retailer/dealer for assistance if everything else fail.
6. During power-on, hold down <F2> to enter BIOS setup. Follow the instructions in BIOS for further setup information.



NOTE

To Power OFF your system, you have to first exit or shut down your operating system before switching OFF the power switch. In most operating systems with ATX power supplies, the Advanced Power Management Interface (APMI) features will turn the computer off automatically. In some ATX power supplies, you need to press the ATX power switch after exiting or shutting down your operating system to turn off your system.

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**HARDWARE
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BIOS

This chapter discusses the PhoenixBIOS Setup program built into the ROM BIOS. The Setup program allows you to modify the basic system configurations according to your requirements.

The BIOS is the Basic Input / Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The PhoenixBIOS flash chip stores the system parameters, such as type of disk drives, video displays, etc. in the CMOS. When the computer is turned off, a back-up battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the computer is powered-on the computer is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot-up.

The PhoenixBIOS installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

This section is divided up as follows:

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STARTING THE BIOS SETUP

The PhoenixBIOS is immediately activated every time you power on the system. The BIOS reads the system information contained in the CMOS and begins the process of checking the system and configuring it. After configuring the system, the BIOS follows the Boot Order to seek an operating system. The BIOS then turns control of the system over to the operating system.

The CMOS information that determines the system parameters is changed by entering the BIOS Setup utility:

1. Power on the System.

Note: Normally, the only visible POST (Power On Self Test) routine is the memory test.

2. As the memory is being tested, you can access the BIOS Setup Utility by pressing the <F2> key when "Press F2 to enter SETUP" appears briefly at the bottom of the screen.

From the main menu of the BIOS Setup Utility, you can access the other setup screens, such as the Security and Power menus.

USING THE BIOS SETUP UTILITY

Navigating through the BIOS Setup Utility is straight forward. Use the arrow keys to highlight items, press <Enter> to select items in menus, and press <Esc> to quit. The following table provides more details about how to navigate in the Setup program using the keyboard.

Up Arrow Key	Moves to the previous item.
Down Arrow Key	Moves to the next item.
Left Arrow Key	Moves to the previous menu.
Right Arrow Key	Moves to the next menu.
<Esc> key, <Alt-X>	In submenus this exits the submenu. In the BIOS main menu this quits without saving changes.
<Enter> Key, <Tab>	Selects the highlighted item. When available, a pop-up list or submenu displays.
<PgUp> Key, + Key	Increases the numeric value or make change.
<PgDn> Key, - Key	Decreases the numeric value or make change.
<F1> Key	Displays general help on setup navigation keys. Press <F1> key to view a small help window that describes the appropriate keys to use and the possible options for the highlighted item. To exit the Help Window, press <ESC> or <F1> key again.
<F9> Key	Loads default values for the page.
<F10> Key	Loads previous values for the page.

Navigating the Menu

Use the arrow keys to move between the options. The scroll bar on the right of any window indicates that there is more than one page of information in the window. Use <PgUp> and <PgDn> to navigate between the pages. Pressing <Home> and <End> displays the first and last page. Press <Esc> to exit the current window.

The Menu Item Help Window

The help window on the right side of the screen displays help for the currently selected item. It updates as you move through each item.

Activating SubMenus

Use the arrow keys to move the cursor over the desired submenu option. Press <Enter> to access the submenu. A ► symbol designates menu items with a submenu.

Saving Settings

To save the changes you have made, move the cursor to the Exit Menu. Select Exit Saving Changes to save all values.



IMPORTANT

The BIOS does NOT automatically save values that you have modified. If you do not save your values before you exit the BIOS Setup Utility, all your changes will be lost.

If after making and saving system changes with the BIOS Setup Utility, you discover that your computer is no longer able to boot, the PhoenixBIOS supports an override, which will reset your system to the Failsafe defaults. If that fails, it is possible to manually clear the present CMOS information through the "Clear CMOS Header" on the motherboard (Refer to Jumper Settings for more information).

The best advice is to ONLY alter settings which you thoroughly understand. The default settings have been carefully chosen by PhoenixBIOS to provide the maximum system performance and reliability. Even a slight change to the chipset setup may cause potential and unpredictable failure to the system.

BIOS SETUP MAIN MENU

This is the first screen that is displayed when you enter the BIOS Setup Utility.

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
System Time: [17:37:51] System Date: [03-28-2995] BIOS Version Legacy Diskette A: [1.44/1.25 MB 3½"] System Memory: [xxxx KB] Extended Memory: [xxxx KB]	Item Specific Help <Tab>, <Shift-Tab>, or <Enter> selects field.	
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ► Submenu F10: Previous Values		

You can make these modifications from the Main Menu.

Item	Options	Description
System Time	HH:MM:SS	Sets the system time.
System Date	MM/DD/YYYY	Sets the system date.
BIOS Version	N/A	Displays the BIOS version.
Legacy Diskette A	360 KB, 5 ¼" 1.2 MB, 5 ¼" 720 KB, 3 ½" 1.44/1.25 MB, 3 ½" 2.88 MB, 3 ½" Not installed Disabled	Selects the type of floppy-disk drive installed in your system. 1.25 MB is a Japanese media format that requires a 3½" Mode 3 Diskette drive.
System Memory	N/A	Displays amount of conventional memory detected during boot up.
Extended Memory	N/A	Displays the amount of extended memory detected during boot up.

**BIOS
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ADVANCED MENU

The Advanced menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
Reset Configuration Data:	[No]	Item Specific Help
QuickBoot Mode:	[Disabled]	Select 'Yes' if you want to clear the Extended System configuration Data (ESCD) area.
Boot-Time Diagnostic	[Disabled]	
<ul style="list-style-type: none"> ▶ Chipset Feature ▶ Disk Configurations ▶ Integrated Perioherals ▶ Console Redirection 		
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ▶ Submenu F10: Previous Values		

Use this chart to help you configure your Advanced Menu:

Item	Options	Description
Reset Configuration Data	Yes No	Yes erases all configuration data in a section of memory reserved for ESCD (Extended System Configuration Data) which stores the configuration settings for non-PnP plug-in devices. Select Yes when required to restore the manufacturer's defaults.
QuickBoot Mode	Disabled Enabled	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Boot-Time Diagnostic	Disabled Enabled	Display the diagnostic screen during boot.
Chipset Feature	N/A	Chipset Feature submenu.
Disk Configuration	N/A	Disk Configuration submenu.
Integrated Peripherals	N/A	Intergrated Peripherals submenu.
Console Redirection	N/A	Console Redirection submenu.

CHIPSET FEATURE SUBMENU

This submenu sets disk options.

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
ACPI SRAT Table Memory Freq Downgrade Memhole mapping MTRR Mapping Method: Dram Bank Interleave:	[Enabled] [Auto] [Hardware] [Continuous] [Disabled]	Item Specific Help Enable ACPI 2.0 static resources affinity table for ccNUMA systems.
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ► Submenu F10: Previous Values		

The Disk Configuration submenu has the following options:

Item	Options	Description
ACPI SRAT Table	Enabled Disabled	Enable ACPI 2.0 static resources affinity table for ccNUMA systems.
Memory Freq Downgrade	AUTO DDR266 DDR333 DDR400	Memory Frequency Downgrade AUTO: Follow AMD spec. to downgrade MAX. memory frequency. DDR266: Downgrade MAX. frequency to 266 MHz. DDR333: Downgrade MAX. frequency to 333 MHz. DDR400: Downgrade MAX. frequency to 400 MHz.
Memhole mapping	Disabled Software Hardware	Remapping scheme for PCI memory hole.
MTRR Mapping Method	Continuous Discrete	Select the CPU MTRR mapping method. Discrete - Compatible with Linux AGP. Continuous - Default method
Dram Bank Interleave	Disabled Auto	Interleave memory blocks across dram chip selects. BIOS will AUTO detect capability on each node.

DISK CONFIGURATIONS SUBMENU

This submenu sets disk options.

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
Embedded SATA: [Enabled]		Item Specific Help
SATA mode [IDE]		Embedded SATA Enable or Disable
▶ Primary Master 6449 MB		
▶ Primary Slave None		
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ▶ Submenu F10: Previous Values		

The Disk Configuration submenu has the following options:

Item	Options	Description
Embedded SATA	Enabled/Disabled	Embedded SATA Enable or Disable
SATA mode	IDE MMIO	Select mode: IDE or MMIO
Primary Master	N/A	Primary master disk submenu. You can configure the settings of the primary master disk from here.
Primary Slave	N/A	Primary slave disk submenu. You can configure the settings of the primary slave disk from here.

INTEGRATED PERIPHERALS SUBMENU

This submenu configures intergrated peripherals including the keyboard and I/O ports.

PhoenixBIOS Setup Utility			
Main Advanced Security Power Boot Server Exit			
► Keyboard Configuratin			Item Specific Help
Legacy USB Support:	[Disabled]	Keyboard feature configuration menu.	
Floppy disk controller	[Enabled]		
Serial port A:	[Auto]		
Onboard LSI SCSI:	[Enabled]		
Onboard GLAN OPROM Scan:	[Enabled]		
Onboard Intel LAN:	[Enabled]		
F1 Help	↑↓: Select Item	+/-: Change Values	F9: Setup Defaults
Esc: Exit	←→: Select Menu	Enter: Select ► Submenu	F10: Previous Values

The Intergrated Periperals submenu has the following options:

Item	Options	Description
Keyboard Configuration	N/A	Keyboard configuration submenu.
Legacy USB Support	Enabled Disabled	Switches support for USB devices on or off for operating systems which do not recognize USB.
Floppy disk controller	Enabled Disabled	Enables an onboard legacy floppy disk controller. If this is set to Disabled, set the Legacy Diskette item in the Main menu to Disabled.
Serial port A	Auto Enabled Disabled	Sets user configuration on or off. 'OS Controlled' appears when this port is controlled by the operating system.
Onboard LSI SCSI	Enabled Disabled	Enable/Disable onboard LSI SCSI device.
Onboard GLAN OPROM Scan	Enabled Disabled	Enable/Disable onboard GLAN OPROM scan.
Onboard Intel LAN	Enabled Disabled	Enable/Disable onboard Intel LAN device.

BIOS SETUP

KEYBOARD CONFIGURATION SUBMENU

This submenu configures the keyboard options.

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
NumLock	[Auto]	Item Specific Help
Keyboard auto-repeat rate	[30/sec]	Selects Powe-on state for numLock.
Keyboard auto-repeat delay	[1/2 sec]	
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ► Submenu F10: Previous Values		

The Keyboard Configuration submenu has the following options:

Item	Options	Description
NumLock	Auto On Off	Sets the status of the numlock function on boot.
Keyboard auto-repeat rate		Sets the keyboard auto-repeat rate.
Keyboard auto-repeat delay		Sets the keyboard auto-repeat delay.

CONSOLE REDIRECTION SUBMENU

This submenu controls the configuration to remotely control the system.

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
Com Port Address	[Disabled]	Item Specific Help
Console Connection	[Direct]	If enabled, it will use a port on the motherboard.
Baud Rate	[57.6K]	
Flow Control	[None]	
Console Type	[ANSI]	
Continue CR after POST	[Off]	
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ► Submenu F10: Previous Values		

The Console Redirection submenu has the following options:

Item	Options	Description
COM Port Address	Disabled Onboard COM A Onboard COM B	If Enabled, a port on the motherboard is used to redirect the console.
Console Connection	Direct via modem	Indicates whether the console is connected directly to the system or a modem is used to connect.
Baud Rate	300 1200 2400 9600 19.2K 38.4K 57.6K 115.2K	Selects a baud rate.
Flow Control	None XON/XOF CTS/RTS	Sets flow control on or off. XON/XOF is software flow control CTR/RTS is hardware flow control
Console Type	vt100 vt100 8bit ANSI 7bit ANSI vt100 plus UTF8	Specifies a console type.
Continue C.R. after POST	Off On	Sets console redirection after the operating system has loaded on or off

SECURITY MENU

The Security menu controls security options including setting passwords:

PhoenixBIOS Setup Utility	
Main Advanced Security Power Boot Server Exit	
Supervisor Password Is: User Password Is: Set Supervisor Password Set User Password	Item Specific Help
F1 Help ↑↓: Select Item Esc: Exit ←→: Select Menu	+/-: Change Values F9: Setup Defaults Enter: Select ► Submenu F10: Previous Values

Use this menu to specify your security settings. The settings here determine who has access to the BIOS setup utility program and to the system.

PASSWORDS

The Setup Utility allows you to specify passwords in the Security menu. The passwords control access to the BIOS and certain Security menu options during system startup. The passwords are NOT case sensitive. In other words, a password can be entered using either upper or lower case letters.

The "Supervisor Password" controls access to the BIOS Setup Utility screen and can be used to access the system during boot up. The "User Password" controls the usage of the system. If so enabled, the end-user is required to enter a password to be able to boot up the system.



NOTE

When Passwords are set and Enabled in the BIOS, the system will prompt for passwords in the appropriate situations.

- * During System Boot and BIOS entry, if three (3) WRONG passwords are entered, the system will be disabled and will require the user to reset the system.

SETTING AND USING PASSWORDS

The Security Menu allows you to set the Supervisor and User passwords for the system. Select the appropriate options and press <Enter> to start the process.

Set Supervisor Password

This field allows you to set the Supervisor password. To set the Supervisor password, highlight this field and press the [Enter] key. The following dialog box appears:

Set Supervisor Password		
Enter New Password	[]
Confirm New Password	[]

Type the password and press the [Enter] key. You can type up to seven alphanumeric characters. Symbols and other keys are ignored. To confirm the password, type the password again and press the [Enter] key. The Supervisor password is now set. This password allows full access to the BIOS Setup menus.

To Clear the Supervisor Password

To clear the Supervisor Password, highlight the "Set Supervisor Password" field and press the [Enter] key. The following dialog box appears:

Set Supervisor Password		
Enter Current Password	[]
Enter New Password	[]
Confirm New Password	[]

- * Enter the current password.
- * Leave the Enter New Password field blank and press [Enter] twice. The Password is now cleared

Set User Password

This field allows you to set the User password. (The Supervisor password must be set before the User password.) To set the User password, follow the instructions for setting the Supervisor password. The User password allows restricted access to the Setup menus.

Item	Options	Description
Password on boot	Disabled Enabled	This option requires the Supervisor password to be set. When enabled, the system will require either the Supervisor or User password before the system will bootup.
Fixed Disk Boot Sector	Normal Write Protect	This option requires the Supervisor password to be set. When set to Normal, the system will allow normal access to the HDD boot sector. When set to Write Protect, the BIOS blocks all access to the boot sector.

BIOS
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NOTE

Write protecting the HDD boot sector will protect the HDD against boot sector viruses. However, this option may interfere with the normal operation of certain operating systems or anti-virus programs which normally need access to the boot sector area.

POWER MENU

Use this menu to specify your settings for WakeUp On LAN and Resume Time. Remember that the options available depend upon the hardware installed in your system. Those shown here are from a typical system.

The Power menu selection in the menu bar on top of the screen displays the following:

PhoenixBIOS Setup Utility			
Main Advanced Security Power Boot Server Exit			
WakeUp On LAN	[Enabled]	Item Specific Help	
Resume On Time:	[Off]	WakeUp On LAN	
Resume Time:	[00:00:00]		
F1 Help	↑↓: Select Item	+/-: Change Values	F9: Setup Defaults
Esc: Exit	←→: Select Menu	Enter: Select ► Submenu	F10: Previous Values

Item	Options	Description
WakeUp On LAN	Disabled Enabled	WakeUp On LAN
Resume On Time	Off On	Enabled Wakes the system up at a specific time.
Resume Time		Specify the time when the system is to wake up

BOOT MENU

After you turn on your computer, it will attempt to load an operating system from the first device set in the Boot Menu. If it cannot find an operating system on that device, it will attempt to load it from one or more other devices in the order specified in the Boot Menu. Boot devices can include: hard drives, floppy drives, CD-ROMs, removable devices (e.g., Iomega Zip drives), and network cards.



NOTE

Specifying any device as a boot device on the Boot Menu requires the availability of an operating system on that device. Most systems come with an operating system already installed on drive C.

The Boot menu sets boot up options:

PhoenixBIOS Setup Utility		
Main Advanced Security Power Boot Server Exit		
Boot Summary Screen:	[Disabled]	Item Specific Help
▶ Boot Priority		Display system configuration on boot.
F1 Help Esc: Exit	↑↓: Select Item ←→: Select Menu	+/-: Change Values Enter: Select ▶ Submenu F9: Setup Defaults F10: Previous Values

Item	Options	Description
Boot Summary Screen	Enabled Disabled	Sets whether the boot summary screen is displayed at boot up.

BOOT PRIOTITY SUBMENU

Use this menu to arrange to specify the priority of the devices from which the BIOS will attempt to boot the Operating System.

Removable Devices, Hard Drive, and Network Boot are the generic types of devices on your system from which you can boot an operating system. You may have more than one device of each type. If so, the generic type is marked with a plus sign. Use the <Enter> key to expand or collapse the devices marked with a <+> or <->. Press <Ctrl+Enter> to expand all such devices

Boot Menu continued...

To change a device's priority on the list, first select it with the up-or-down arrows, and move it up or down using the <+> and <-> keys. Pressing <n> moves a device between the Removable Devices and Hard Drive. Pressing <Shift+1> enables or disables a device

Item	Options	Description
Removable Devices	Legacy Floppy Drive	The computer attempts to boot from the floppy disk drive.
Hard Drive	Primary Master	To attempt to boot the primary master IDE Device
	Bootable Add-in Cards	To attempt to boot from Bootable cards (such as LAN or SCSI cards)
CD-ROM Drive		The computer attempts to boot from the CD-ROM drive.
Network Boot		The computer attempts to boot from the network through the on-board LAN connection.
IBA GE Slot 0028 v1222 MBA v8.2.5 Slot 0420 MBA v8.2.5 Slot 0421		The computer attempts to boot from the network through the On-Board LAN connection.

SERVER MENU

It contains two sub-menus: Hardware Monitor and IPMI.

PhoenixBIOS Setup Utility			
Main Advanced Security Power Boot Server Exit			
Display without KB Err Msg [No]		Item Specific Help	
<ul style="list-style-type: none"> ▶ Hardware Monitor ▶ IPMI 		Control the Post Error Message display or not when without KB	
F1 Help	↑↓: Select Item	+/-: Change Values	F9: Setup Defaults
Esc: Exit	←→: Select Menu	Enter: Select ▶ Submenu	F10: Previous Values

Item	Options	Description
Display without KB Err Msg	Yes No	Control the Post Error Message display or not when without KB

HARDWARE MONITOR SUBMENU

This menu allows you to see current state of system hardware such as CPU fan speed, CPU temperature, Voltage, etc.

PhoenixBIOS Setup Utility			
Main Advanced Security Power Boot Server Exit			
CPU1 Fan Speed = 3234 RPM		Item Specific Help	
CPU2 Fan Speed = 5736 RPM		All items on this menu cannot be modified in user mode. If any items require changes, please consult your system supervisor.	
CPU3 Fan Speed = No Function			
CPU4 Fan Speed = No Function			
System Fan1 Speed = No Function			
System Fan2 Speed = No Function			
CPU1 Temperature = 46 C			
CPU2 Temperature = 44 C			
CPU3 Temperature = 0 C			
CPU4 Temperature = 0 C			
Vbat : 3.2738 V			
Vcc (5V) : 5.403 V			
-12V : -11.8789 V			
+12V : +11.9587 V			
Vcore1 : 1.4800 V			
Vcore2 : 1.3513 V			
F1 Help	↑↓: Select Item	+/-: Change Values	F9: Setup Defaults
Esc: Exit	←→: Select Menu	Enter: Select ▶ Submenu	F10: Previous Values

BIOS SETUP

Server Menu continued...

IPMI SUBMENU

This menu allows you to see current state of system hardware such as CPU fan speed, CPU temperature, Voltage, etc.

PhoenixBIOS Setup Utility	
Main Advanced Security Power Boot Server Exit	
BMC/ Scorpio Configuration [Enabled] IP Address [192.168.254.001] Subnet Mask Address [255.255.255.000] Default Gateway Address [192.168.254.000]	Item Specific Help Enabling this selection will force the BIOS to Configuration IP Address / Subnet Mask Address / Gateway Address on the next cold boot.
IPMI Specification Version (unknown) BMC Firmware Version (unknown) System Event Logging [Enabled] Existing Event Log number 0 Event Log Control SYS Firmware Progress [Disabled] BIOS POST Errors [Enabled]	
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ► Submenu F10: Previous Values	

BIOS SETUP

Item	Options	Description
BMC/Scorpio Configuration	Disabled Enabled	Enabling this selection will force the BIOS to Configuration IP Address
IP Address Subnet Mask Default Gateway	No options.	Display/Set IP Address, Subnet Mask, and Gateway.
System Event Logging	Disabled Enabled	Enable/Disable IPMI event logging. Disabling will still log events received via the system interface.
SYS Firmware Progress	Disabled Enabled	Enabling this selection will log POST Progress.
BIOS POST Errors	Disabled Enabled	Enabling this selection will log POST errors.



NOTE

To learn more about the IPMI selections, please refer to a separated Arima IPMI manual for its usage.

EXIT MENU

The Exit menu allows you to save or discard changes and exit BIOS.

PhoenixBIOS Setup Utility	
Main Advanced Security Power Boot Server Exit	
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes	Item Specific Help Exit system setup and save your changes to CMOS.
F1 Help ↑↓: Select Item +/-: Change Values F9: Setup Defaults Esc: Exit ←→: Select Menu Enter: Select ► Submenu F10: Previous Values	

The Exit menu has the following options. Note that <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Item	Description
Exit Saving Changes	Saves changes to CMOS and exits BIOS.
Exit Discarding Changes	Discards any changes made and exits BIOS.
Load Setup Defaults	Restores all settings to the default values.
Discard changes	Discards and changes made since the last time settings were saved.
Save changes	Saves changes to CMOS.

PHOENIX BOOT UTILITIES

This motherboard comes with the following boot utilities:

- * Phoenix QuietBoot™: Phoenix QuietBoot displays a graphic illustration rather than the traditional POST messages while keeping you informed of diagnostic problems.
- * Phoenix MultiBoot™: Phoenix MultiBoot is a boot screen that displays a selection of boot devices from which you can boot your operating system.

USING PHOENIX QUIETBOOT

Right after you turn on or reset the computer, Phoenix QuietBoot displays the QuietBoot Screen, a graphic illustration created by the computer manufacturer instead of the text-based POST screen, which displays a series of PC diagnostic messages.

To exit the QuietBoot screen and run Setup, display the MultiBoot menu, or simply display the PC diagnostic messages, you can simply press one of the hot keys described below.

The QuietBoot Screen stays up until just before the operating system loads unless one of the following actions occurs:

- * Press <Esc> to display the diagnostic/POST screen
- * Press <F2> to enter Setup
- * POST issues an error message
- * The BIOS or an option ROM requests keyboard input

Here are the possible QuietBoot scenarios in greater detail:

When Escape is pressed	Pressing <Esc> switches to the POST screen and takes one of two actions: <ol style="list-style-type: none">1. If MultiBoot is installed, the boot process continues with the POST screen until the end of POST, and then displays the Boot First Menu, text-based with these options:<ul style="list-style-type: none">* Load the operating system from the boot device of your choice.* Enter the BIOS Setup Utility.* Exit the Boot First Menu (with <Esc>) and load the operating system from the boot devices specified in the BIOS Setup. <p>OR</p> <ol style="list-style-type: none">2. If MultiBoot is not installed, the boot process continues as usual.
Press <F2> to enter Setup	Pressing <F2> at any time during POST switches to the POST screen (if not already displayed) and enters Setup.
POST issues an error message	Whenever POST detects a non-fatal error, QuietBoot switches to the POST screen and displays the errors. It then displays this message: Press <F1> to resume, <F2> to Setup Press <F1> to continue with the boot. Press <F2> if you want to correct the error in Setup.

PHOENIX MULTIBOOT

Phoenix MultiBoot expands your boot options by letting you choose your boot device on startup, which could be a hard disk, floppy disk, or a CD-ROM. You can configure your boot device in Setup, or you can choose a different device each time you boot during POST by selecting your boot device in The Boot First Menu.

MultiBoot consists of:

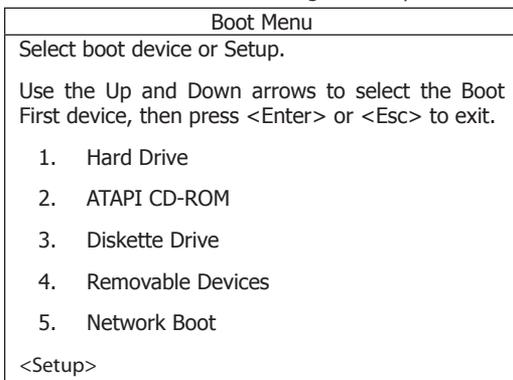
- * The Setup Boot Menu
- * The Boot First Menu

Refer to the Boot Menu in BIOS Setup for more information on the Setup Boot Menu. The following describes the Boot First Menu.

The Boot First Menu

Display the Boot First Menu by pressing <Esc> during the POST. In response, the BIOS first displays the message, "Entering Boot Menu ..." and then displays the Boot Menu at the end of POST. Use the menu to select any of these options:

- * Override the existing boot sequence (for this boot only) by selecting another boot device. If the specified device does not load the operating system, the BIOS reverts to the boot sequence stored in Setup.
- * Enter Setup.
- * Press <Esc> to continue with the existing boot sequence



If there is more than one bootable hard drive, then the first one in the Setup Boot menu is the one represented here.

BIOS FLASH UPGRADE UTILITY

Phoenix Phlash gives you the ability to update your BIOS from a floppy disk without having to install a new ROM BIOS chip.

Phoenix Phlash is a utility for "flashing" (copying) a BIOS to the Flash ROM installed on your computer from a floppy disk. A Flash ROM is a Read-Only Memory chip that you can write to using a special method called "flashing."

Phoenix Phlash automatically updates or replaces the current BIOS with the one which your OEM or dealer supplies you (it's a .ROM file).

Command Example:

```
A:\> phlash16 HDMAG201.ROM /MODE=3 /BBL /C
```

Syntax:

plash16	Plash command name
HDMAG201.ROM	Filename of new BIOS ROM supplied by dealer
/BBL	Flash the Boot Block
/C	Clear CMOS
/MODE=3	Update both BIOS and DMI information



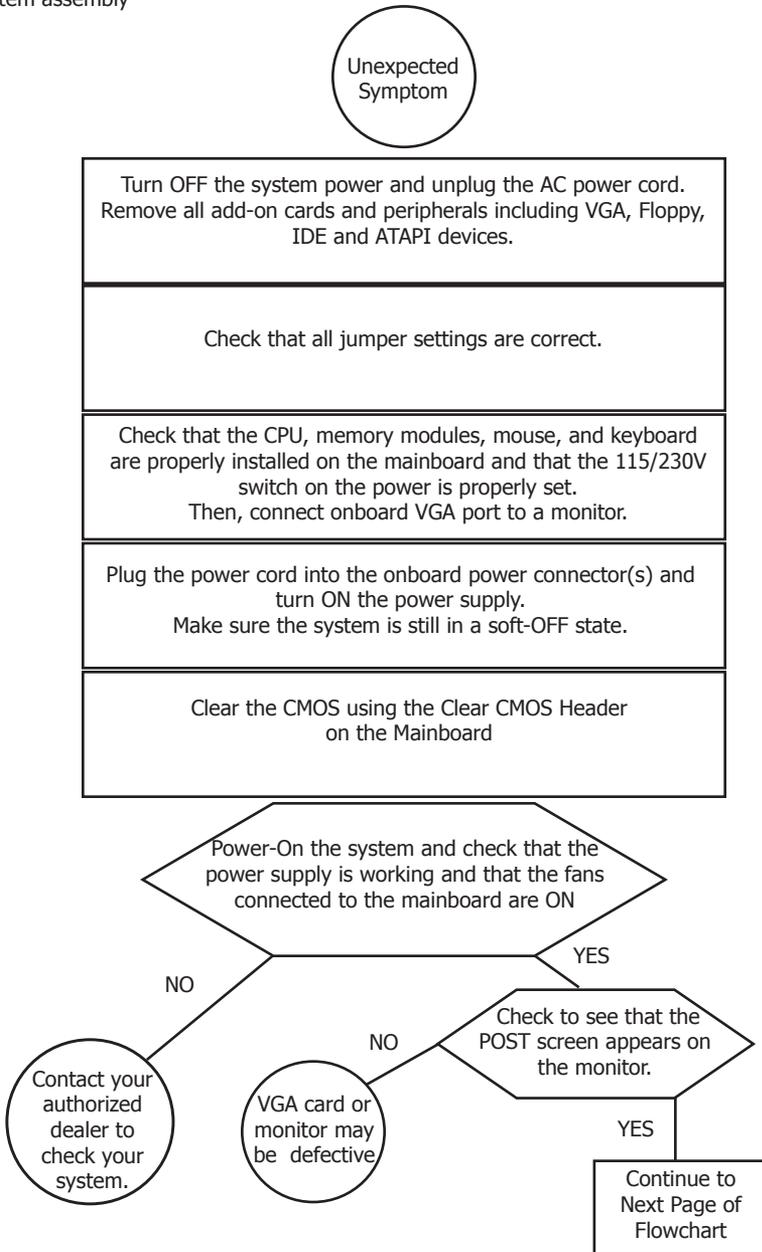
This Page is Intentionally Left Blank



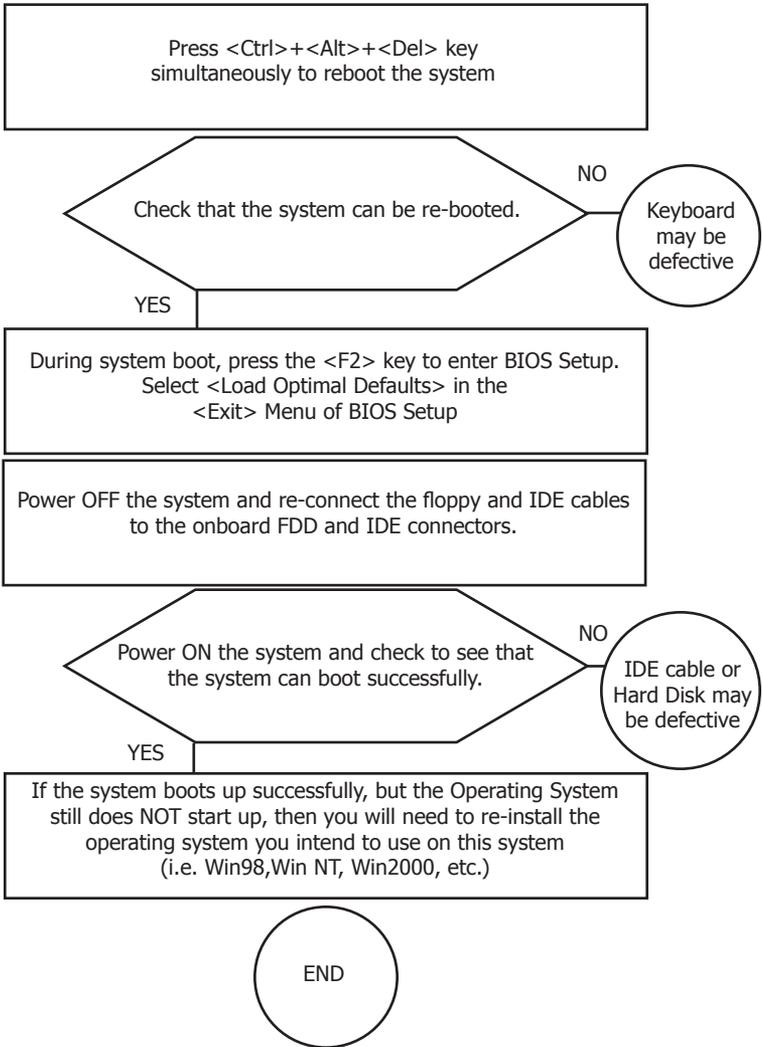
Troubleshooting

Troubleshooting Flowchart

Here are some flowcharts to help you check for common problems encountered during system assembly



Troubleshooting Flowchart continued...



WARNING

Before inserting or installing any add-on cards or hardware components in the motherboard, always remember to FIRST disconnect the power cord.

Symptom Checklist

Use this chart for more detailed information about some common problems that occur during assembly and in the maintenance of systems.

Symptom	Check point
No Power (FAN is not spinning)	<ul style="list-style-type: none"> * Make sure that no short circuit exists between the mainboard and chassis * Check that all jumpers are set to their default positions. * Check that the 115V/230V switch on the power supply is properly set. * Check that the CPU is properly inserted in the CPU socket. * Check that the power connector of the CPU fan is plugged in the correct position. * Turn the power switch ON and OFF to test the system. * Check the power of the battery on the mainboard. (In general, the battery voltage is around 3VDC)
Able to power ON the system (FAN is spinning), but NO screen display.	<ul style="list-style-type: none"> * Disconnect and remove all components from the mainboard except for the CPU, memory modules, and the CPU fans. * Check that the memory is Registered ECC DIMM. Refer to Appendix A: Recommended Memory Modules or contact your authorized dealer for a list of qualified memory vendors and models. * Check that all jumpers are set to their default positions. * Clear the CMOS through the Clear CMOS header. * Check that the onboard VGA port and the monitor are properly connected. * Use the onboard speaker to aide in determining the problem.
Memory Error(s)	<ul style="list-style-type: none"> * Check that the memory DIMM modules are inserted properly into the DIMM sockets. * Check to see if different speed memory modules are mixed in and used in the motherboard memory banks. Verify that the BIOS setup is configured for the fastest speed of RAM used. Arima recommends that you always install the same speed DDR RAM in your system. * Make sure all your memory modules in the motherboard are compliant with the PC2100/PC2700 (DDR266/DDR333) Specifications and that they appear either in Appendix A: Recommended Memory Modules or on your authorized dealer's Qualified Vendor's List of Memory Modules.

POST Errors and Beep Codes

PhoenixBIOS 4.0 Release 6.0

When you turn on or reset an IBM-compatible PC, the BIOS first performs a number of tasks, called the Power-On-Self-Test (POST). These tasks test and initialize the hardware and then boot the Operating System from the hard disk.

At the beginning of each POST task, the BIOS outputs the test-point error code to I/O port 80h. Programmers and technicians use this code during troubleshooting to establish at what point the system failed and what routine was being performed. Some motherboards are equipped with a seven segment LED display that displays the current value of port 80h.

For production boards which do not contain the LED display, you can purchase an installable "Port 80h" card that performs the same function. If the BIOS detects a terminal error condition, it issues a terminal-error beep code, attempts to display the error code on the upper left corner of the screen and on the port 80h LED display, and halts POST. It attempts repeatedly to write the error to the screen. This attempt may "hash" some CGA displays.

If the system hangs before the BIOS can process the error, the value displayed at the port 80h is the last test performed. In this case, the screen does not display the error code.

Terminal POST Errors

There are several POST routines that require success to finish POST. If they fail, they issue a POST Terminal Error and shut down the system. Before shutting down the system, the error handler issues a beep code signifying the test point error, writes the error to port 80h, attempts to initialize the video, and writes the error in the upper left corner of the screen (using both mono and color adapters).

The routine derives the beep code from the test point error as follows:

1. The 8-bit error code is broken down to four 2-bit groups.
2. Each group is made one-based (1 through 4) by adding 1.
3. Short beeps are generated for the number in each group.

Example:

Testpoint 16h = 00 01 01 10 = 1-2-2-3 beeps

POST Task Routines

The following is a list of Terminal Test Point codes written to port 80h at the start of each routine, the beep codes issued along with the terminal errors, and a description of the POST routine. Unless otherwise noted, these codes are valid for PhoenixBIOS 4.0 Release 6.0.

POST Errors and Beep Codes continued...



NOTE

The documented routines are sorted by their test point numbers assigned in the BIOS code. Their actual order of execution during the POST can be quite different.

Code	Beep	POST Routine Description
16h	1-2-2-3	BIOS ROM checksum
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
2Ch	1-3-4-1	RAM failure on address line xxxx
2Eh	1-3-4-3	RAM failure on data bits xxxx of low byte of memory bus
30h	1-4-1-1	RAM failure on data bits xxxx of high byte of memory bus
46h	2-1-2-3	Check ROM copyright notice
58h	2-2-3-1	Test for unexpected interrupts
98h	1-2	Search for Option ROMs. One long, Two short beeps on Checksum failure.
B4h	1	One short beep before BOOT
		For Boot Block in Flash ROM

If the BIOS detects an error in test codes 2Ch, 2Eh, or 30h (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed.

For Example:

"2C 0002" means address line 1 (bit one set) has failed.

"2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits.

The BIOS also sends the bitmap to the port 80h LED display. It first displays the check point code, followed by a delay, the high-order byte, another delay, and then the low-order byte of the error and a delay. The system will continually repeat this sequence.

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