MS - 9211

1U Rackmount Server

User's Guide

Version 1.0
G52-S9211X1

Manual Rev: 1.0
Release Date: December 2002

CE N1996

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International MS-9211

FC **Tested to comply with FCC Standard**

For Home or Office Use

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date
V1.0	First release	December 2002

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw/**
- Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment has not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged.
    - The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

CONTENTS

Getting Started

Congratulations on your purchase of the MS-9211 1U Rackmount Server. This high-performance barebone system supports the powerful Intel® Pentium® 4 processor and the industry-leading hardwares and provides the most efficient and professional solution to meet your needs.

Mainboard Specifications

CPU

➤ Supports Intel® P4 Northwood processor in 478-pin package
➤ Supports 1.5GHz~2.8GHz and up

Chipset

➤ Intel® 845E chipset
- Support 100MHz/133MHz system clock
- Intel® NetBurst micro-architecture supports 400MHz/533MHz system bus

➤ Intel® ICH4 chipset
- Hi-Speed USB (USB2.0) controller, 480Mb/sec
- PCI Master 2.2
- I/O APIC
- 3 UHCI Host controllers and 1 EHCI Host controller

MainMemory

➤ Supports four memory banks using two 184-pin DDR DIMMs
➤ Supports up to 2GB PC2100/PC1600 DDR SDRAMs
➤ Supports 2.5v DDR SDRAM

Slots

➤ One 32-bit Master PCI bus slot (support 3.3v/5v PCI bus interface)

On-BoardIDE

➤ An IDE controller on the ICH4 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA100/66/33 operation modes
➤ ATA133 RAID supported by Promise PDC20276 controller

On-Board Peripherals

➤ On-Board Peripherals include:
- 1 serial port (COM 1 rear port)
- Two RJ-45 LAN ports
- 1 VGA port
- 1 IrDA connector for SIR/ASKIR/HPSIR
- Four USB 2.0 ports (Rear * 2/ Front * 2)

Video

➤ ATI Rage™ XL graphics controller
- Built-in DVD decoding.

- Onboard 8MB video SDRAM.

LAN

➤ Option 1: Dual Intel® 82551 10/100Mbps LAN controllers.
➤ Option 2: One Intel® 82551 10/100Mbps LAN controller & One Intel® 82540 1Gbps LAN controller.

Server Management (optional)

➤ National Semiconductor® PC87431HM mBMC (mini-Baseboard Management Controller)
- Incorporates an embedded microcontroller, three System Management Bus (SMBus®) interfaces, a Chassis Management interface, Bi-color LED control, an integrated EEPROM, Fan control, 12 ADC channels, and Digital Input Event and General-Purpose Output pins.
- Interfaces with the host via a slave SMBus interface; it interfaces with the LAN On Motherboard (LOM) and with peripherals via two independent master SMBus interfaces.

BIOS

➤ The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically.
➤ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

Mounting

➤ 9 mounting holes.

Others

➤ Support LAN wake-up function
➤ Support Modem card wake-up function (external modem not supported)
➤ Support IDE RAID (Ultra DMA/ATA133)

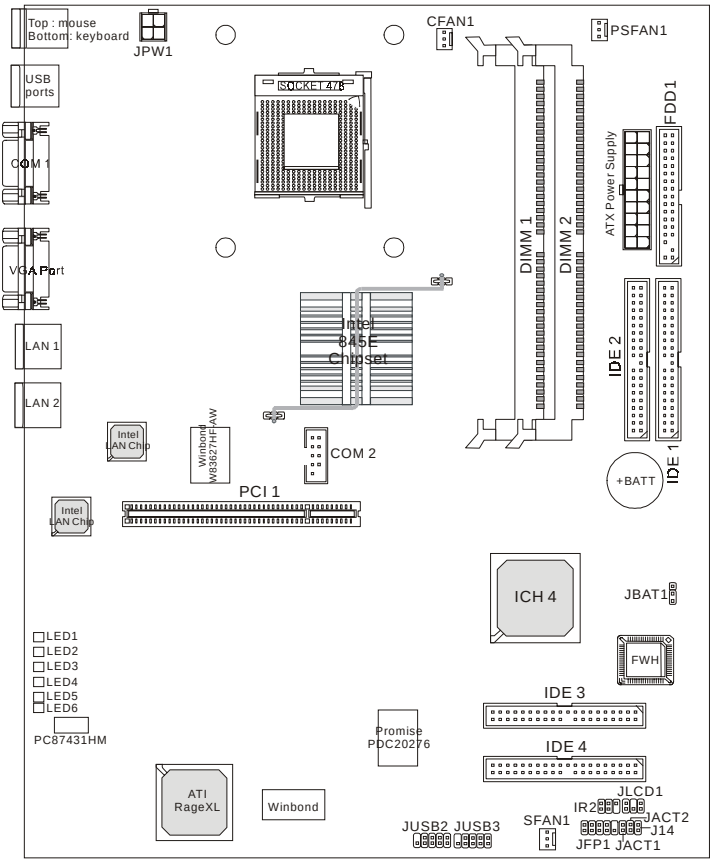
Devices

➤ 2 35" IDE HDD cages
➤ 1 Slim CD-ROM drive (optional)
➤ 1 6x2 LCD Display Panel

Power Supply

➤ 200W Max. output
➤ Active PFC
➤ Full range 100~240V

Mainboard Layout



845E Master-LR (MS-9129 v1.X) ATX Mainboard

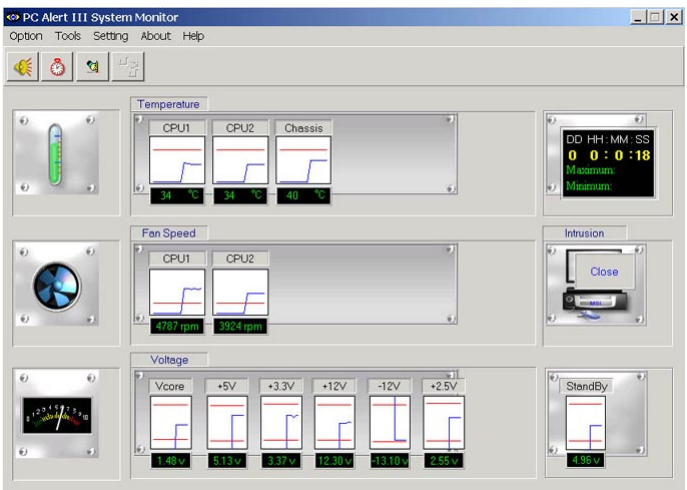
MSI Special Features

PC Alert™ III

The PC Alert™ III is a utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect the following PC hardware status during real time operation:

- ✦ monitor CPU & system temperatures
- ✦ monitor fan speed(s)
- ✦ monitor system voltage
- ✦ monitor chassis intrusion

If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until user disables the warning.



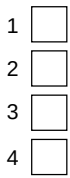
MSI Reminds You...

1. Items shown on PC Alert™ III vary depending on your system status.

2. The mainboard bound with mBMC chip (Server Management Features) won't support PC Alert™ III.

D-LED™ (Optional)

The D-LED™ (Diagnostic LED) uses graphic signal display to help users understand their system. Four LEDs (LED1 ~ LED4) embedded on the mainboard provide up to 16 combinations of signals to debug the system. The 4 LEDs can debug all problems that fail the system, such as VGA, RAM or other failures. This special feature is very useful for the overclocking users. These users can use the feature to detect if there are any problems or failures. The definitions of LED signal combinations are listed below:



Diagnostic LED

■ **Red** □ **Green**

D-LED	Description
1 2 3 4 ■ ■ ■ ■	System Power ON - The D-LED will hang here if the processor is damaged or not installed properly.
□ ■ ■ ■	Early Chipset Initialization
■ □ ■ ■	Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.
□ □ ■ ■	Decompressing BIOS image to RAM for fast booting.
■ ■ □ ■	Initializing Keyboard Controller.
□ ■ □ ■	Testing VGA BIOS - This will start writing VGA sign-on message to the screen.

■ □ □ ■	Processor Initialization - This will show information regarding the processor (like brand name, system bus, etc…)
□ □ □ ■	Testing RTC (Real Time Clock)
■ ■ ■ □	Initializing Video Interface - This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter.
□ ■ ■ □	BIOS Sign On - This will start showing information about logo, processor brand name, etc….
■ □ ■ □	Testing Base and Extended Memory - Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.
□ □ ■ □	Assign Resources to all ISA.
■ ■ □ □	Initializing Hard Drive Controller - This will initialize IDE drive and controller.
□ ■ □ □	Initializing Floppy Drive Controller - This will initializing Floppy Drive and controller.
■ □ □ □	Boot Attempt - This will set low stack and boot via INT 19h.
□ □ □ □	Operating System Booting

LCD Front Panel Control

Installing the LCD Control Service

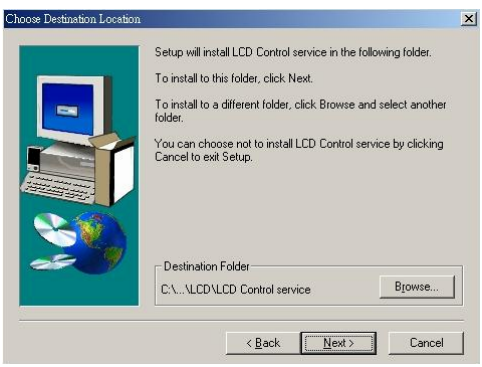
Version: V2.2

OS supported: Windows NT 4 with Service Pack 4 or latest version
Windows 2000, Windows XP

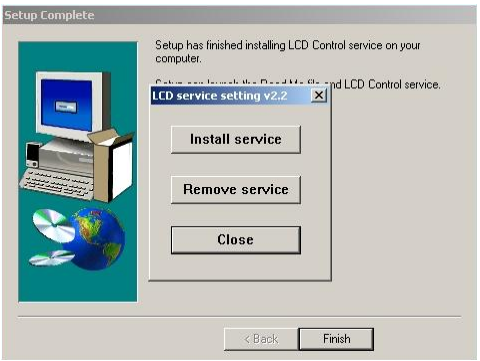
Step 1: Insert the installation CD into the CD-ROM drive. Browse to the CD-ROM drive and double-click the executable file "setup.exe" to start the Setup program.

Step 2: The screen will show the **Welcome** dialog box as shown below. Click **Next** to continue.

Step 3: To install the LCD Control Service, click **Next** to use the default folder or **Browse** to install to another designated folder. Click **Cancel** to exit the Setup program.



Step 4: Setup has finished installing the LCD Control service on your computer. Click **Install service** to enable the LCD Control service.



Step 5: Click **OK** to continue. You can restart the computer now.

Un-installing the LCD Control Service

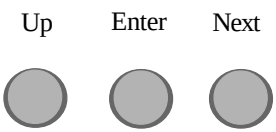
Step 1: Click **Start**, and then point to **Programs**.
Under **Programs**, Click **LCD Control Panel** and the following screen will pop up. Click **Remove service** to disable the LCD Control service.

Step 2: Click **OK** to continue.

Step 3: Under **Control Panel,** click **Add/Remove Programs**. Follow the on-screen instructions to complete the un-installation process.

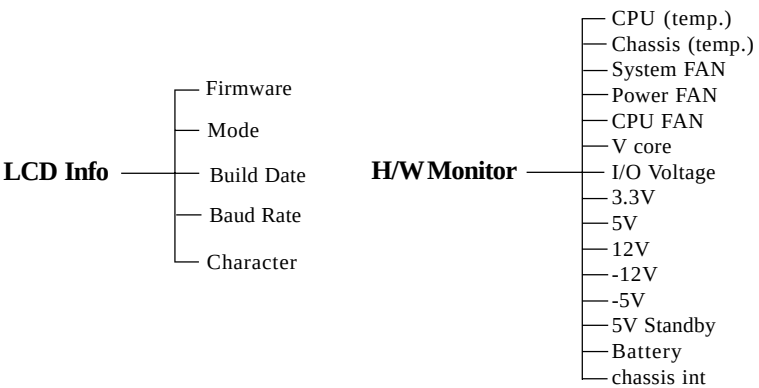
LCD Function Menu

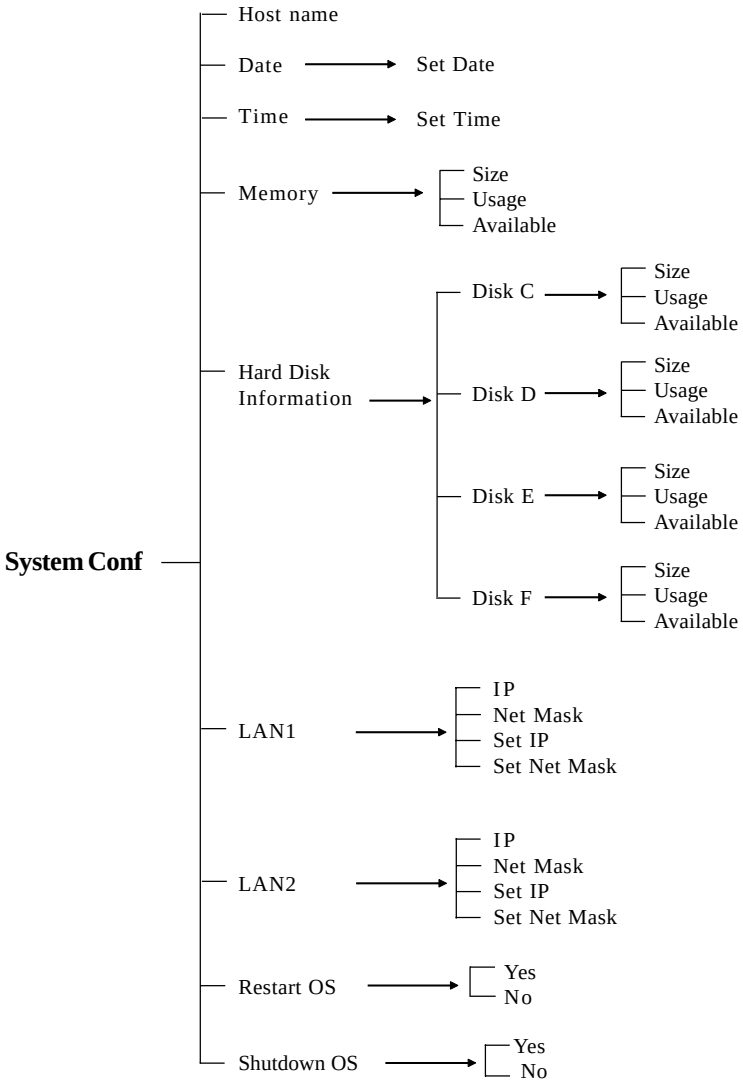
Here shows the LCD Front Panel and its three control buttons.



Up	Go to the previous selection.
Enter	Execute the command.
Next	Go to the next selection.

After you have installed the LCD Control Panel Service, you can simply use the LCD Front Panel Control buttons to get access to the information under *LCD Info, H/W Monitor and System Conf* menus.




System Conf
Host name
Date
Set Date
Time
Set Time
Memory
Size
Usage
Available
Hard Disk Information
Disk C
Size
Usage
Available
Disk D
Size
Usage
Available
Disk E
Size
Usage
Available
Disk F
Size
Usage
Available
LAN1
IP
Net Mask
Set IP
Set Net Mask
LAN2
IP
Net Mask
Set IP
Set Net Mask
Restart OS
Yes
No
Shutdown OS
Yes
No

Before Boot to OS (Debug Function)	
Function	**Description**
LCD Panel v1.1 Initialize OK	Show product information and version
BIOS POST: C1 Msg: Mem Sizing	If the system has memory issues, it will stop at C1.
BIOS POST: C3 Msg: BIOS chsum	If the system has BIOS issues, it will stop at C3.
BIOS POST: 18 Msg: CPU Init.	If the system has CPU issues, it will stop at 18.
BIOS POST: 2B Msg: VGA Init.	If the system has VGA issues, it will stop at 2B.
BIOS POST: 2D Msg: Sign-on Msg.	It shows information about logo processor brand name.
BIOS POST: 52 Msg: Ext. Mem Test	If the system has memory issues, it will stop at 52.
BIOS POST: 75 Msg: IDE Init.	If the system has IDE issues, it will stop at 75.
BIOS POST: 8B Msg: PCI ROM Init.	If the system has PCI issues, it will stop at 8B.
BIOS POST: 94 Msg: disp summary	
<Boot to OS>	If the system is problem free, it will boot to OS.

LCD Info	
Function	**Description**
Firmware 1/5 V1.1	Show LCD Firmware version
Mode 2/5 Communication	Show LCD working mode
Build date 3/5 2002/03/25	Show LCD Firmware build date
Baud Rate 4/5 9600	Show LCD communication speed with COM port For PC and LCD link
Character 5/5 16X2	Show LCD characters

H/W Monitor	
Function	**Description**
CPU 1/15 42C	Show CPU temperature information
Chassis 2/15 28C	Show chassis temperature information
System FAN 3/15 0 RPM	Show System FAN speed information
Power FAN 4/15 4219 RPM	Show Power FAN speed information
CPU FAN 5/15 0 RPM	Show CPU FAN speed information
V core 6/15 1.46V	Show V core voltage information
I/O Voltage 7/15 1.08V	Show I/O voltage information
3.3V 8/15 3.26V	Show 3.3V voltage information
+5V 9/15 5.07V	Show +5V voltage information
+12V 10/15 12.02V	Show +12V voltage information
-12V 11/15 -11.98V	Show -12V voltage information
-5V 12/15 -5.09V	Show -5V voltage information
5V Standby 13/15 4.94V	Show 5V voltage information
Battery 14/15 3.04V	Show battery information
Chassis int 15/15 OFF	Show chassis intrusion detect information

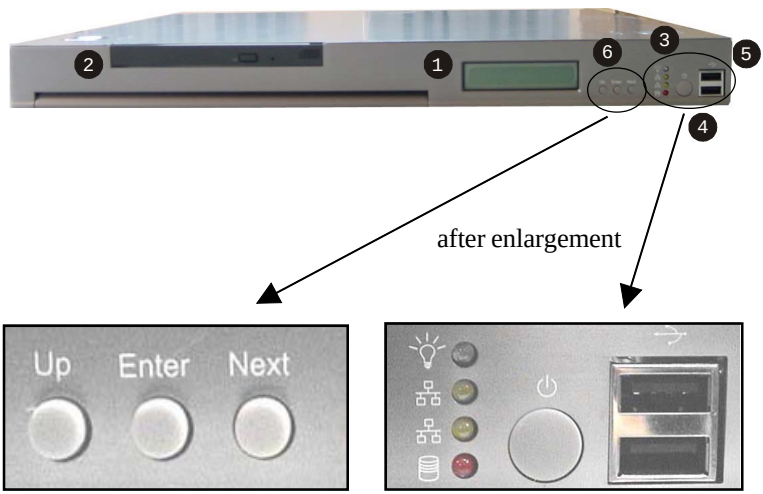
System Conf		
Function	**Description**	
Host name 1/9	Show system's host name	
Date 2/9 2002.8.21	Set Date 1/1	Show the date and allow to set the date
Time 3/9 13:24:50	Set Time 1.1	Show the time and allow to set the time
Memory 4/9	Size 1/3 511MB	Show memory's size
	Usage 2/3 153MB	Unable to show used memory size
	Available 3/3 358MB	Unable to show available memory size
Hard Disk 5/9 Information	It can detect 4 disks on this system.	
Disk C 1/4 3698MB	Size 1/3 3698MB	Show this partition's size
	Usage 2/3 1485MB	Unable to show the used size
	Available 3/3 2213MB	Unable to show the available size
Disk D 2/4 15393MB	Size 1/3 15393MB	Show this partition's size
	Usage 2/3 494MB	Unable to show the used size
	Available 3/3 14899MB	Unable to show the available size
Disk E 3/4 0MB	Size 1/3 0MB	Show this partition's size
	Usage 2/3 0MB	Unable to show the used size

System Conf (continued)	
Function	**Description**
	Available 3/3 Unable to show the available size 0MB
Disk F 4/4 0MB	Size 1/3 Show this partition's size 0MB
	Usage 2/3 Unable to show the used size 0MB
	Available 3/3 Unable to show the available size 0MB
LAN1 6/9 100.100.100.101	IP 1/4 Show the system IP information 100.100.100.101
	Netmask 2/4 Show the system Net Mask information 255.255.255.0
	Set IP Allow users to set the system's IP 000.000.000.000
	Setmask Allow users to set the system's Net Mask 000.000.000.000
LAN2 7/9 100.100.100.101	IP 1/4 Show the system IP information 100.100.100.101
	Netmask 2/4 Show the system Net Mask information 255.255.255.0
	Set IP Allow users to set the system's IP 000.000.000.000
	Setmask Allow users to set the system's Net Mask 000.000.000.000
Restart 8/9 Restart OS	Yes/No Restart your Windows OS
Shutdown 9/9 Shutdown OS	Yes/No Shut down your Windows OS

System Configuration

This section shows the configuration of the MS-9211 from different angles, and the connectors and buttons on the front and back panel.

Front View



1. LCD Front Panel
2. Slim CD-ROM Drive (optional)
3. LED Indicators
4. Power Button
5. USB Ports
6. LCD Control Buttons

Power Button

This main power button is used to turn on or off the system.

Power Indicator

This indicator shows the power status of the system. It glows when the main power is turned on.

LAN Status Indicators

These two LED indicators flash to show the activity status on LAN1 and LAN2.

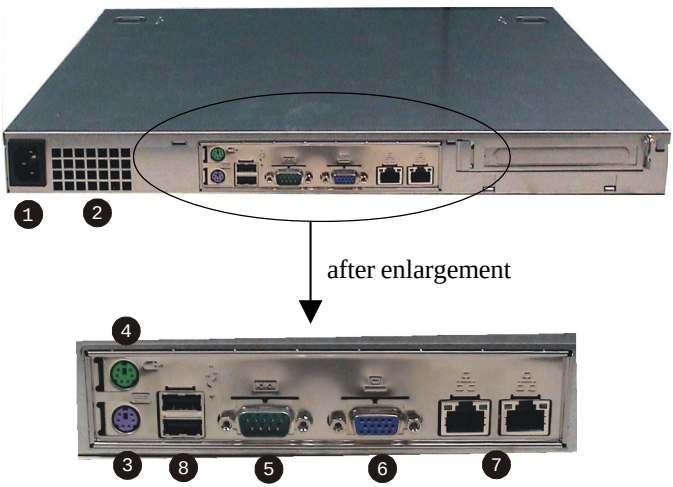
Hard Disk Drive In-use Indicator

This indicator shows the activity status of the hard disk drive. It flashes when the system is accessing data on the hard disk.

USB Ports

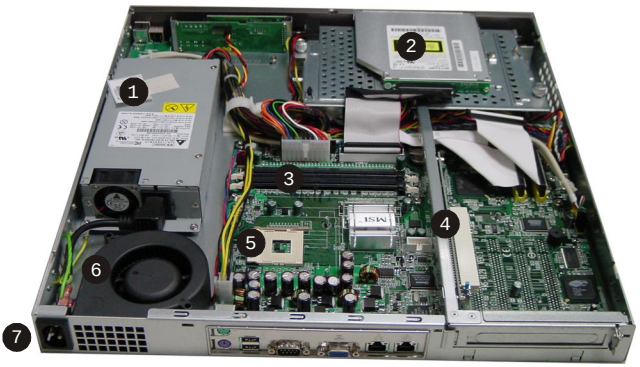
With the four USB port (2 in the front, 2 in the rear) design, you can easily add new capacities to your PC like never before.

Rear View



1. Power Connector
2. Heat Dissipation Opening
3. PS/2 Keyboard Connector
4. PS/2 Mouse Connector
5. Serial Port COM A
6. VGA Port
7. LAN Jacks 1 & 2
8. USB Ports 1 & 2

Top View



1. ATX Power Supply
2. Slim CD-ROM Drive (optional)
3. DIMM Slots
4. Riser Card Bracket
5. CPU Socket
6. Blower
7. AC Power Connector

Packing Checklist

Unpack the package and check if all items listed below are present. If any item contained in the package is damaged or missing, please contact your local dealer for replacement. In addition, keep the box and packing materials for possible future use.

Your MS-9211 1U Rackmount Server Barebone package should contain the following items:

MS-9211 1U Rackmount Server (includes a mainboard, a ATX Power Supply and a Fan Duct)

User's Guide

Server Driver CD

Heat Sink

Ear Set

2 ears

M4x6 black screws x4

M5x12 screws x2

Chassis Rail Bracket Set

4 brackets

4 secure plates

M5x8 screws x8

M4 Nut x8

M4x6 screws x8

Rail Set

2 rails

M4x4 screws x8

Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

Central Processing Unit: CPU

The mainboard supports Intel® P4 Northwood processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Core Speed Derivation Procedure

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4 GHz

MSI Reminds You...

Overheating

Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Replacing the CPU

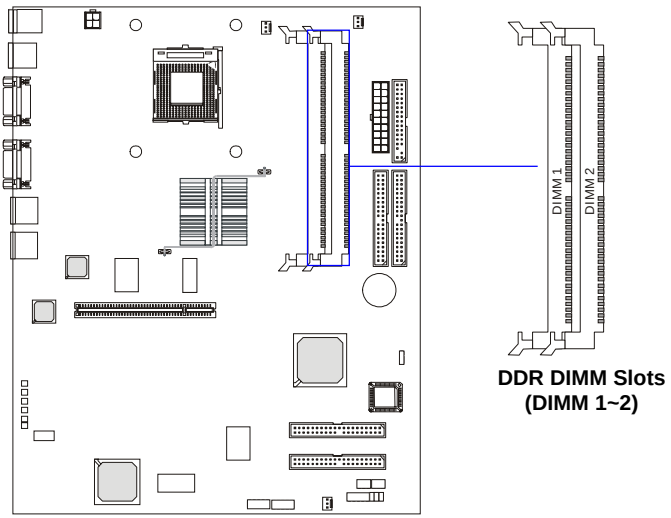
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

Overclocking

This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

Memory

The mainboard provides 2 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 2GB. You can install PC2100/DDR266 or PC1600/DDR200 modules on the DDR DIMM slots (DIMM 1~2).



DDR DIMM Slots (DIMM 1~2)

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DIMM Module Combination

Install at least one DIMM module on the slots. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

Slot	Memory Module	Total Memory
DIMM 1 (Bank 0 & 1)	S/D	64MB~1GB
DIMM 2 (Bank 2 & 3)	S/D	64MB~1GB
Maximum System Memory Supported		64MB~2GB

S: Single Side **D: Double Side**

NOTES

Power Supply

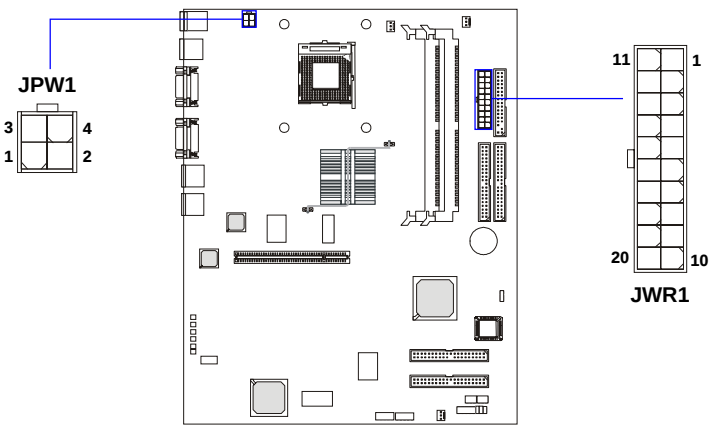
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: JWR1

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.



JPW1 Pin Definition

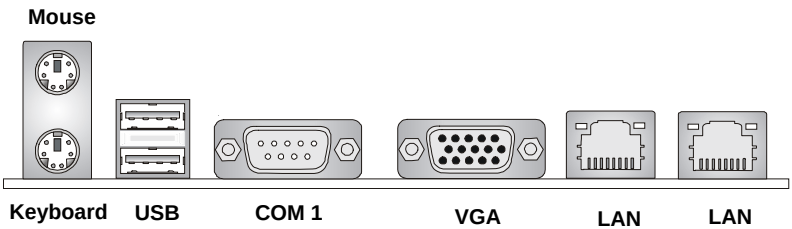
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

JWR1 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

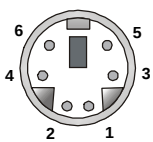
Back Panel

The back panel provides the following connectors:



Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:



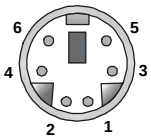
PS/2 Mouse (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

Keyboard Connector

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.



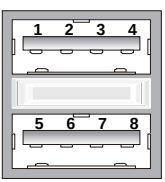
PS/2 Keyboard (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

USB Connectors

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.



USB Ports

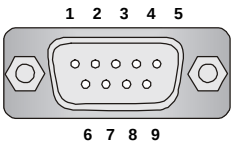
USB Port Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

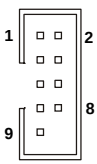
Serial Port Connectors: COM 1 & COM2

The mainboard offers two 9-pin connectors as serial port COM 1 & COM 2. The ports are 16550A high speed communication ports that send/ receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.

COM 1



9-Pin Serial Port Connector



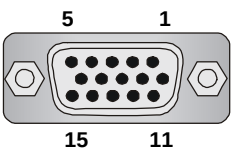
COM 2

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

VGA DB 15 Pin Connector: VGA1

One DB 15-pin VGA connector is provided for connection to a VGA monitor.



DB 15-Pin Female Connector

Pin Definition

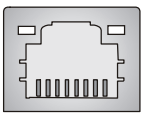
Analog Video Display Connector (DB-15S)	
PIN	SIGNAL DESCRIPTION
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Power
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

RJ-45 LAN Jacks: 10/100 LAN or Giga-bit LAN

The mainboard provides two standard RJ-45 jacks for connection to Local Area Network (LAN). Two options are available upon request:

1. Dual 10/100 LAN.
2. One 10/100 LAN & one Giga-bit LAN.

Giga-bit LAN enables data to be transferred at 1000, 100 or 10Mbps. 10/100 LAN enables data to be transferred at 100 or 10Mbps. You can connect a network cable to either LAN jack.



RJ-45 LAN Jack

10/100 LAN Pin Definition

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Giga-bit LAN Pin Definition

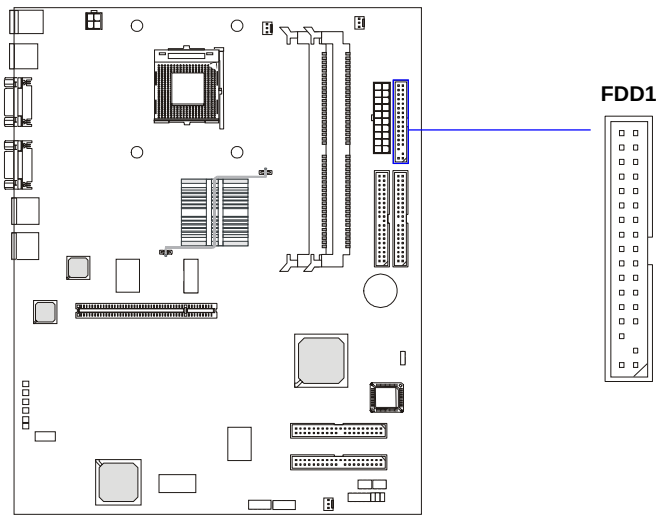
PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, modem, LAN, USB Ports, IR module and CPU/System/Power Supply FAN.

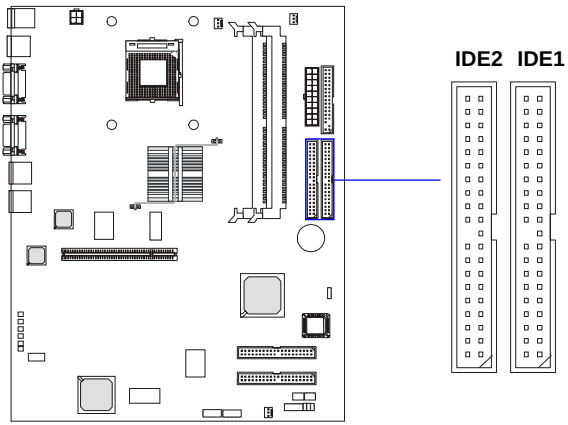
Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...

If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

ATA133 RAID Connectors: IDE3 & IDE4 (Optional)

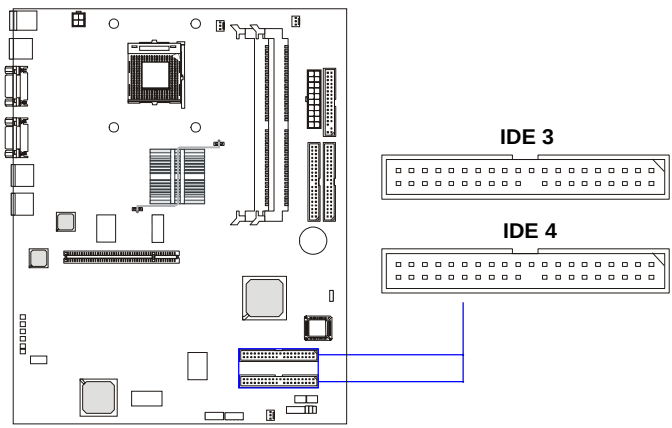
The mainboard offers high-end Ultra ATA/133 RAID (0 or 1) hard drive interface specifications supported through Promise® PDC20276 controller .

The Ultra ATA/133 interface boosts data transfer rates between the computer and the hard drive up to 133 megabytes (MB) per second. The new interface is one-third faster than earlier record-breaking Ultra ATA/100 technology and is backward compatible with the existing Ultra ATA interface.

The low-cost RAID (Redundant Array of Independent Disks) solution integrates two IDE RAID connectors that support PIO mode 0-4, Bus Master, and Ultra DMA 33/66/100/133 modes. The IDE RAID connectors allow you to connect Ultra ATA/DMA hard disks and use RAID technology (RAID 0 striping or RAID 1 mirroring) for high performance, data security and fault tolerance.

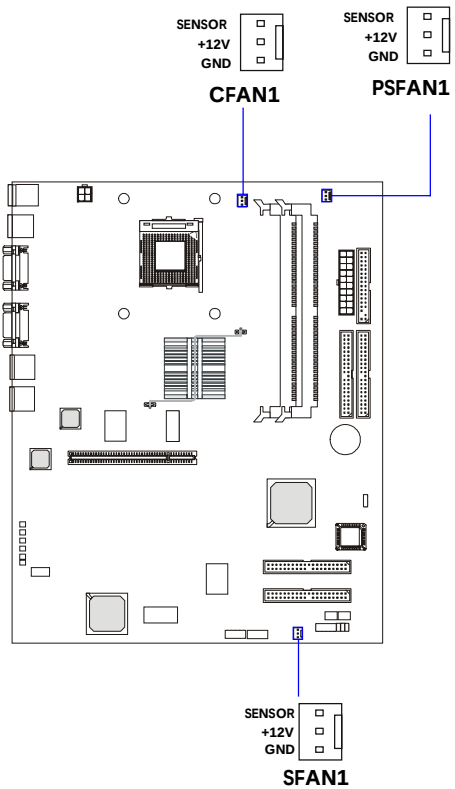
ATA133 RAID Connectors:

- You can connect a Master drive to each IDE RAID connector.
- The two connectors support **hard disk drives** only.
- For more information on ATA133 RAID, please refer to ***ATA133 RAID 0 or 1 Quick User's Guide***.



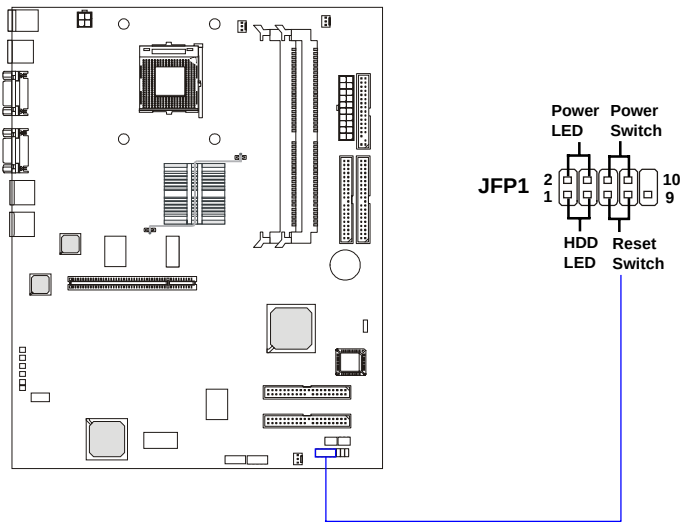
Fan Power Connectors: CFAN1/SFAN1/PSFAN1

The CFAN1 (processor fan), SFAN1 (system fan), and PSFAN1 (power supply fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



Front Panel Connectors: JFP1

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

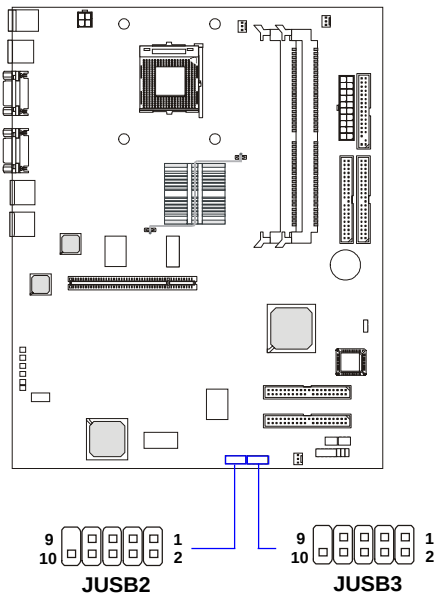


Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

Front USB Connectors: JUSB2, JUSB3

The mainboard provides two USB 2.0 pin headers *JUSB2* & *JUSB3* (optional USB 2.0 bracket available) that are compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

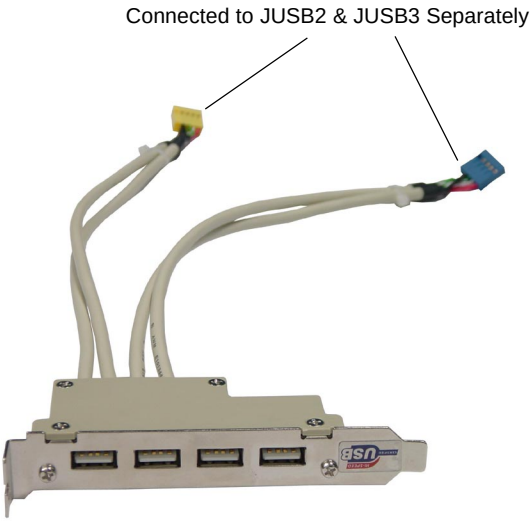


JUSB2/3 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	USBPWR	2	USBPWR
3	USBP2-	4	USBP3-
5	USBP2+	6	USBP3+
7	GND	8	GND
9	NC	10	USBOC

To Attach the Optional USB 2.0 Ports:

1. Take out the ***USB2.0 Bracket*** (optional accessory upon request).
2. Locate the USB pinheaders JUSB2 and JUSB3 on the motherboard.
3. Connect the USB cables from USB 2.0 bracket to the JUSB2 and JUSB3 pin headers separately.



USB 2.0 Bracket (optional)

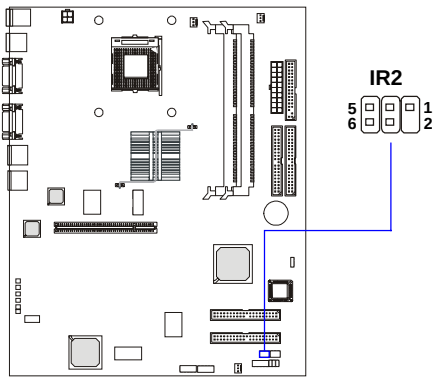
4. Place the USB 2.0 bracket into the appropriate slot of the system case.

MSI Reminds You...

The USB 2.0 controller is backwards compatible with USB 1.1 spec. To use the USB 2.0 ports, you still need to install USB 2.0 driver, which is supplied by Microsoft for Windows® 2000 and XP. If you have any problems regarding USB 2.0 driver, please visit Microsoft website for more information.

IrDA Infrared Module Header: IR2

The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. The IR2 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

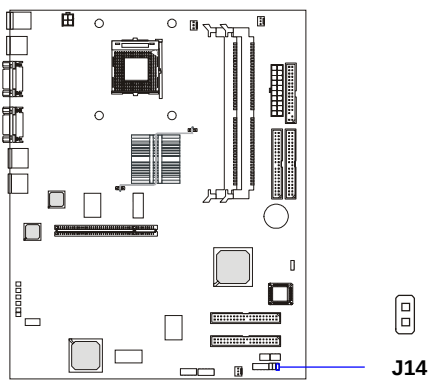


Pin Definition

Pin	Signal
1	NC
2	NC
3	VCC5
4	GND
5	IRTX
6	IRRX

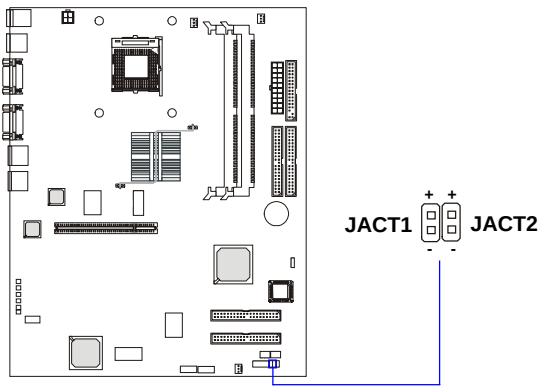
Event Input Connector: J14

This connector is used to link the Event Input Button to facililtate the management of the remote platforms in connection. When event inputs are detected, push the button and the signal indicator of the remote platform where the event inputs originated will be lit. The J14 works only when National Semiconductor® PC87431HM server management controller is onboard.



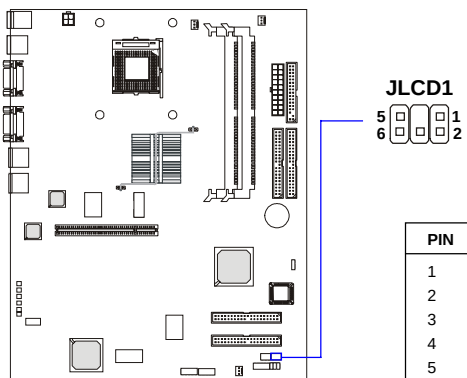
LAN LED Connectors: JACT1, JACT2

The LAN LED connectors are used to connect to LAN LEDs, which show the activity of the LAN. JACT1 is for LAN 1 jack and the JACT2 is for LAN2 jack. Both LAN1 & LAN2 jacks are located on the back panel.



LCD Panel Connector: JLCD1

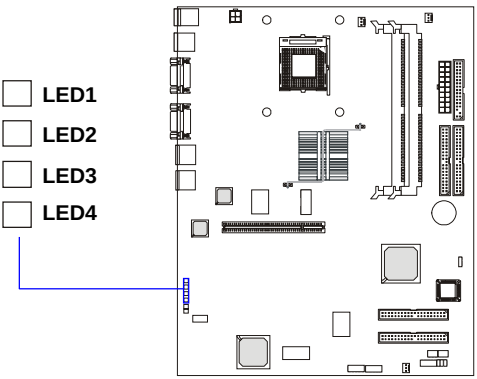
The connector is additionally provided for connection to a LCD panel, which shows information on the panel for you to identify the current status or mode of the connected system.



PIN	SIGNAL
1	TX
2	RX
3	NC
4	GND1
5	GND0
6	VCC

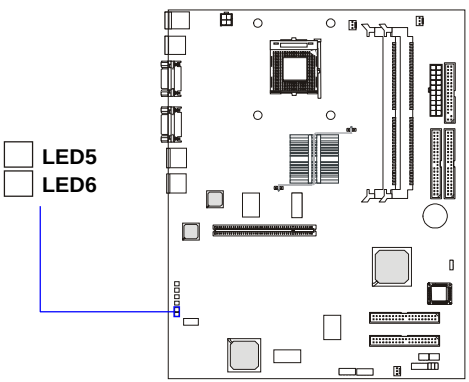
Diagnostic LEDs: LED1, LED2, LED3, LED4 (Optional)

The mainboard comes with four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *D-LED*™ in *Chapter 1*.



Server Management LEDs: LED5, LED6

The two LEDs are designed for server management and will work only when National Semiconductor® PC87431HM server management controller is onboard.

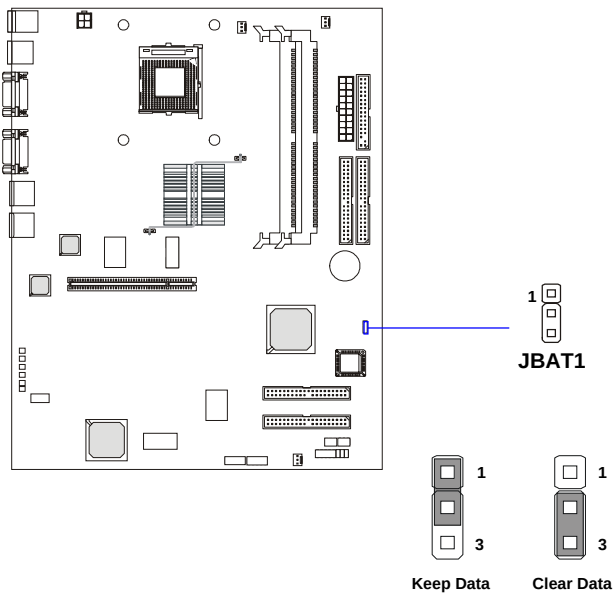


Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

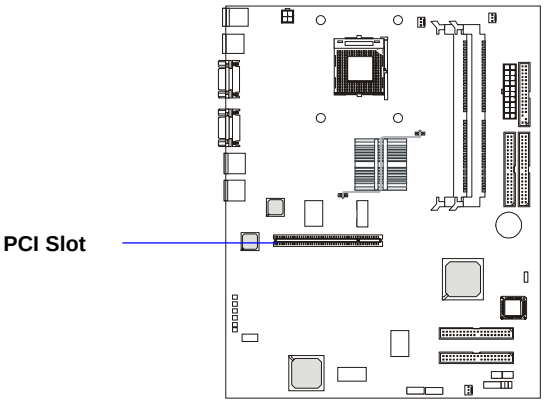


MSI Reminds You...

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The motherboard provides one 32-bit Master PCI bus slot.



PCI (Peripheral Component Interconnect) Slot

The PCI slot allows you to insert the expansion card to meet your needs. When adding or removing the expansion card, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI/LAN/VGA/ATA133 RAID IRQ pins are typically connected to the PCI bus INT A# ~ INT H# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
LAN1	INT F#			
LAN2	INT H#			
VGA	INT E#			
ATA133 RAID	INT G#			

3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
<F7>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

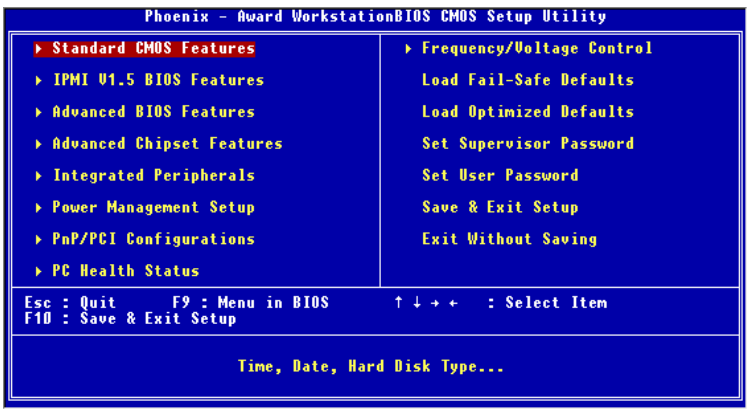
The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

MSI Reminds You...

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

The Main Menu

Once you enter Phoenix-Award WorkstationBIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu displays thirteen configurable functions and two exit choices. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.



Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

IPMI V1.5 BIOS Features *(for mainboards with mBMC chip)*
Use this menu to configure the Platform Event Filter (PEF) status and WatchDog TimeOut features.

Advanced BIOS Features
Use this menu to configure the special enhanced features.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

PC Health Status *(for mainboards without mBMC chip)*
This entry shows your PC health status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the BIOS default values for minimal but stable system performance.

Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal system operations.

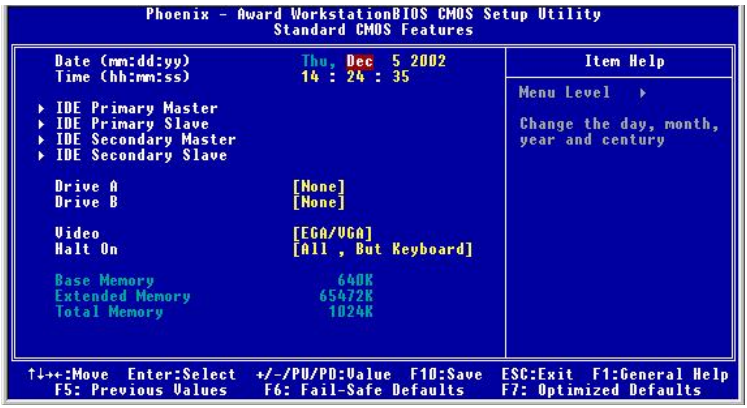
Set Supervisor/User Password
Use this menu to set user and supervisor passwords.

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items inside Standard CMOS Features menu are divided into 10 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.



Date (mm:dd:yy)

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

Time (hh:mm:ss)

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select *Manual*, *None*, *Auto* type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If

your hard disk drive type is not matched or listed, you can use *Manual* to define your own drive type manually.

If you select *Manual*, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be "*None*". If the controller of HDD interface is CD-ROM, the selection shall be "*None*".

Access Mode	The settings are *CHS, LBA, Large, Auto*.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation.
Landing Zone	Cylinder location of the landing zone.
Sector	Number of sectors.

Drive A/B

This item allows you to set the type of floppy drives installed. Available options are *None, 360K, 5.25 in., 1.2M, 5.25 in., 720K,* 3.5 in., *1.44M, 3.5 in., 2.88M, 3.5 in.*

Video

The setting controls the type of video adapter used for the primary monitor of the system. Available options are *EGA/VGA , CGA 40, CGA 80* and *Mono*.

Halt On

The setting determines whether the system will stop if an error is detected at boot. Available options are:

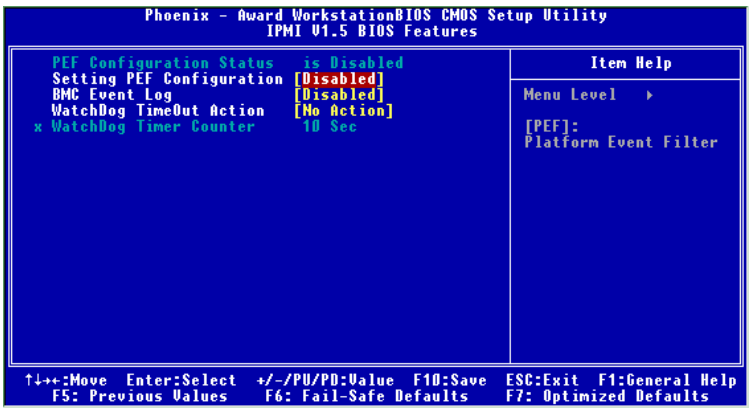
All Errors	The system stops when any error is detected.
No Errors	The system doesn't stop for any detected error.
All, But Keyboard	The system doesn't stop for a keyboard error.
All, But Diskette	The system doesn't stop for a disk error.
All, But Disk/Key	The system doesn't stop for either a disk or a keyboard error.

Base/Extended/Total Memory

The three items show the memory status of the system. (Read only)

IPMI V1.5 BIOS Features

This setup screen appears ***only when the mBMC chip (for Server Management) is integrated on the mainboard***.



PEF Configuration Status
This option shows the current Platform Event Filter (PEF) configuration status. (Read only)

Setting PEF Configuration
This setting is used to set the Platform Event Filter (PEF) configuration. When [Enabled] is selected, the server will send the event signal to the BMC. Setting options: *Enabled, Disabled.*

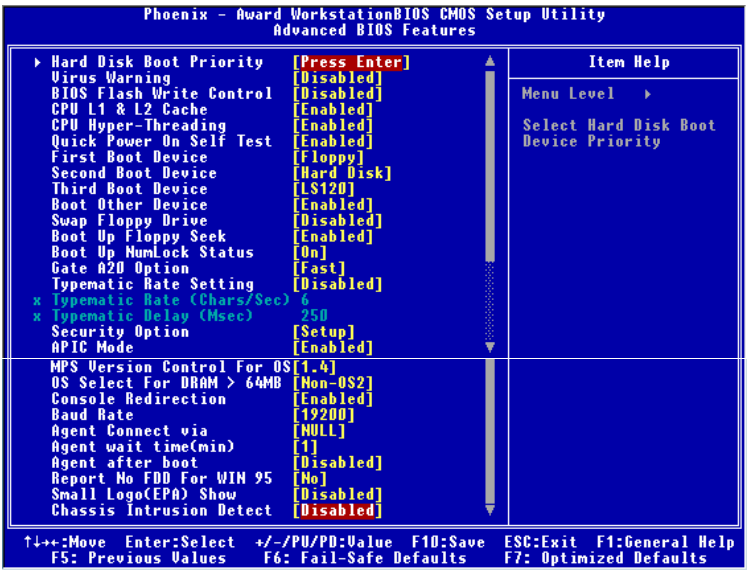
BMC Event Log
Select [Enabled] to store POST error or initial messages to the BMC Event log. If you don't want to store POST error or initial messages to the DMI Event log, select [Disabled]. When [Cleared] is selected, the BMC event log will be cleared at next POST stage. Setting options: *Disabled, Enabled, Cleared.*

WatchDog TimeOut Action
The Watch Dog Timer (WDT) is a special hardware device to monitor if the computer system works normally. If the system does not work normally, it will have some measures to fix up the system. The following actions are avail-

able on expiration of the Watchdog Timer: *No Action, Hard Reset, Power Down, Power Cycle.*

WatchDog Timer Counter
This feature allows users to set the time interval to reboot the computer if a timeout event occurs. Setting options: *10 Sec, 20 Sec, 30 Sec, 40 Sec.*

Advanced BIOS Features



Hard Disk Boot Priority
This setting determines the boot priority of the installed hard disks.

Virus Warning
The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep. Setting options: *Disabled, Enabled.*

BIOS Flash Write Control
This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When disabled, the BIOS' data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you'll need to enable this BIOS Flash Write Control function. Setting options: *Disabled, Enabled.*

CPU L1 & L2 Cache
Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The settings enable/disable the internal cache (also known as L1 or level 1 cache) and external cache (also known as L2 or level 2 cache). Setting options: *Disabled, Enabled.*

CPU Hyper-Threading
With Intel® Hyper-Threading Technology, a single Hyper-Threading-enabled processor can simultaneously process two threads of code, improving the performance of multi-threaded code running on a single processor platform. Setting this function to *Enabled* will improve overall system performance, increase number of users a platform can support, improve reaction and response time, and increase number of transaction that can be executed. Setting options: *Enabled*, *Disabled*.

MSI Reminds You...
Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:
**CPU: Intel® Pentium® 4 or Xeon™ Processors with HT Technology;*
**Chipset: Intel® Chipsets that support HT Technology;*
**BIOS: A BIOS that supports HT Technology and has it enabled;*
**OS: An operating system that supports HT Technology.*
For more information on Hyper-threading Technology, go to:
http://www.intel.com/info/hyperthreading

Quick Power On Self Test
The option speeds up Power On Self Test (POST) after you power on the computer. When setting the item to *Enabled*, BIOS will shorten or skip some check items during POST. Settings: *Enabled, Disabled.*

First/Second/Third Boot Device
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

MSI Reminds You...
Available settings for "First/Second/Third Boot Device" vary depending on the bootable devices you have installed. For example, if you did not install a floppy drive, the setting "Floppy" does not show up.

Boot Other Device
Setting the option to *Enabled* allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device.

Swap Floppy Drive
Setting to *Enabled* will swap floppy drives A: and B:.

Boot Up Floppy Seek
This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process: the drive activity light will come on and the head will move back and forth once. First A: will be done and then B: if it exists. Setting options: *Disabled, Enabled.*

Boot Up NumLock Status
This setting is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow users to use the arrow keys on the numeric keypad. Setting options: *On, Off.*

Gate A20 Option
This item is to set the Gate A20 status. A20 refers to the first 64KB of extended memory. When the default value *Fast* is selected, the Gate A20 is controlled by Port92 or chipset specific method resulting in faster system performance. When *Normal* is selected, A20 is controlled by a keyboard controller or chipset hardware.

Typematic Rate Setting
This item is used to enable or disable the typematic rate setting including Typematic Rate & Typematic Delay.

Typematic Rate (Chars/Sec)
After *Typematic Rate Setting* is enabled, this item allows you to set the rate

(characters/second) at which the keys are accelerated. Settings: *6*, *8*, *10*, *12*, *15*, *20*, *24* and *30*.

Typematic Delay (Msec)
This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250*, *500*, *750* and *1000*.

Security Option
This specifies the type of BIOS password protection that is implemented. Settings are described below:

Option	Description
Setup	The password prompt appears only when end users try to run Setup.
System	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

APIC Mode
This setting is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance to PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQs resources for the system. Setting options: *Enabled*, *Disabled*.

MPS Version Control For OS
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4*, *1.1*.

OS Select For DRAM > 64MB
This allows you to run the OS/2® operating system with DRAM larger than 64MB. When you choose *Non-OS2*, you cannot run the OS/2® operating system with DRAM larger than 64MB. But it is possible if you choose *OS2*.

Console Redirection
Console Redirection operates in host systems that do not have a monitor and keyboard attached. This setting enables/disables the operation of console redirection. When set to *Enabled*, BIOS redirects and sends all contents that should be displayed on the screen to the serial COM port for display on the

terminal screen. Besides, all data received from the serial port is interpreted as keystrokes from a local keyboard. Setting options: *Enabled, Disabled*.

Baud Rate
This setting specifies the transfer rate (bits per second) of *Console Redirection.* Setting options: *9600, 19200, 38400, 57600, 115200*.

Agent Connect Via
To operate the system's console redirection, you need a terminal supporting ANSI terminal protocol and a RS-232 null modem cable connected between the host system and terminal(s). This field is a read-only field, which is used to indicate the type of device connected between the host system and terminal (s). NULL stands for a null modem.

Agent Wait Time (min)
This setting controls the timeout for terminals' (console redirection) connection to the host system. Setting options: *1, 2, 4, 8* (Min).

Agent After Boot
This setting determines whether or not to keep terminals' console redirection running after the OS has booted. Setting options: *Disabled, Enabled*.

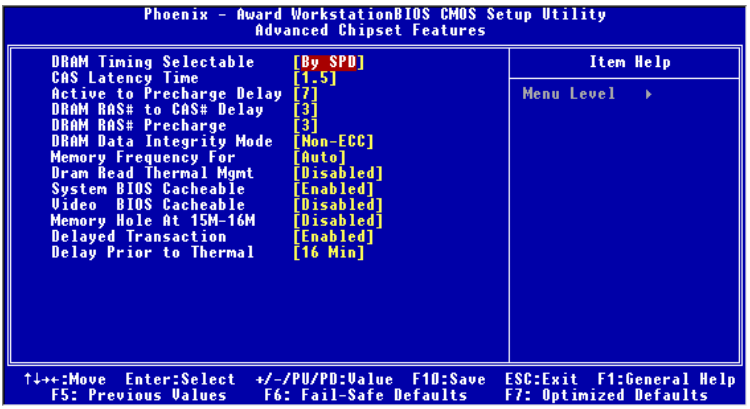
Report No FDD For WIN 95
For compatibility with Windows 95 logo certification, select *Yes* to release IRQ6 when the system contains no floppy drive. When this setting is set to *Yes*, users have to select *Disabled* for the *Onboard FDC Controller* in the Integrated Peripherals menu. Setting options: *Yes, No*.

Small Logo(EPA) Show
This setting enables you to show the EPA logo (brand specific graphics) on the bootup screen. Setting options:

Disabled	Shows the normal POST screen at boot.
Enabled	Shows a still image (EPA logo) on the screen at boot.

Chassis Intrusion Detect
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Enabled* later. Setting options: *Enabled, Reset, Disabled*.

Advanced Chipset Features



MSI Reminds You...
Change these settings only if you are familiar with the chipset.

DRAM Timing Selectable
This setting determines whether DRAM timing is configured by reading the contents of the SPD (Serial Presence Detect) EPROM on the DRAM module. Selecting *By SPD* makes the following settings automatically determined by BIOS according to the configurations on the SPD. Setting options: *By SPD, Manual*.

CAS Latency Time
This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: *1.5, 2, 2.5, 3* (clocks). *1.5* (clocks) increases the system performance the most while *3* (clocks) provides the most stable performance.

Active to Precharge Delay
This setting controls the number of clock cycles for DRAM to be allowed to precharge from the active state. Setting options: *7, 6, 5*.

DRAM RAS# to CAS# Delay
When DRAM is refreshed, both rows and columns are addressed

separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Setting options: *3*, *2*.

DRAM RAS# Precharge
This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options: *2*, *3*.

DRAM Data Integrity Mode
Select *ECC* (Error-Checking & Correcting Code) or *Non-ECC* according to the type of DRAM installed.

Memory Frequency For
Use this item to configure the clock frequency of the installed SDRAM. Setting options: *Auto, PC100, PC133*.

DRAM Read Thermal Mgmt
This setting is used to activate the thermal management mechanism for DRAM read actions. Setting options: *Enabled, Disabled*.

System BIOS Cacheable
Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: *Enabled, Disabled*.

Video BIOS Cacheable
Selecting *Enabled* allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. Setting options: *Disabled, Enabled*.

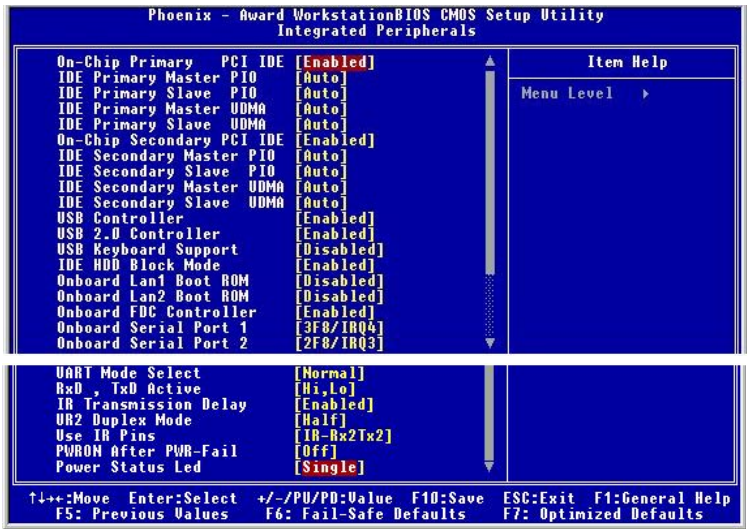
Memory Hole At 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below

16MB. When this area is reserved, it cannot be cached. Setting options: *Disabled, Enabled.*

Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delayed transactions cycles so that transactions to and from the ISA bus are buffered and PCI bus can perform other transactions while the ISA transaction is underway. Select *Enabled* to support compliance with PCI specification version 2.1. Setting options: *Enabled, Disabled.*

Delay Prior to Thermal
When the CPU temperature reaches a factory preset level, a thermal monitoring mechanism will be enabled following the appropriate timing delay specified in this field. With the thermal monitoring enabled, clock modulation controlled by the processor's internal thermal sensor is also activated to keep the processor within allowable temperature limit. Setting options: *4 Min, 8 Min, 16 Min, 32 Min.*

Integrated Peripherals



On-Chip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO
The four items allow you to set a PIO (Programmed Input/Output) mode for each of the four IDE devices that the onboard IDE interface supports. *Modes 0~4* provide increased performance. In *Auto* mode, BIOS automatically determines the best mode for each IDE device.

IDE Primary/Secondary Master/Slave UDMA
Ultra DMA implementation is possible only if your IDE device supports it and your operating environment contains a DMA driver. If both your hard drive and software support Ultra DMA 33 (or higher), select *Auto* to enable BIOS support.

USB Controller
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Setting options: *Enabled, Disabled.*

USB 2.0 Support
This setting disables/enables the support for USB 2.0 technology. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1 and is ideal for connecting high-speed USB interface peripherals such as USB HDD, digital cameras, MP3 players, printers, modems and the like. Setting options: *Disabled*, *Enabled.*

USB Keyboard Support
Set to *Enabled* if your need to use an USB keyboard in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

IDE HDD Block Mode
This allows your hard disk controller to use the fast block mode to transfer data to and from the hard disk drive. Block mode is also called block transfer, multiple commands or multiple sector read/write. *Enabled* enables IDE controller to use block mode; *Disabled* allows the controller to use standard mode.

Onboard LAN1/LAN2 Boot ROM
The items enable or disable the initialization of the onboard LAN Boot ROMs during bootup. Selecting *Disabled* will speed up the boot process.

Onboard FDC Controller
Select Enabled if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select *Disabled* in this field. The settings are: *Enabled* and *Disabled*.

Onboard Serial Port 1/Port 2
Select an address and corresponding interrupt for the first and second serial ports. The settings are: *3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto*.

UART Mode Select
This setting allows you to specify the operation mode for serial port 2. Setting options: *IrDA, ASKIR, Normal*.

Normal	RS-232C Serial Port
IrDA	IrDA-compliant Serial Infrared Port
ASKIR	Amplitude Shift Keyed Infrared Port

RxD, TxD Active
This setting controls the receiving and transmitting speed of the IR peripheral in use. Setting options: *Hi/Hi, Hi/Lo, Lo/Hi, Lo/Lo*.

IR Transmission Delay
This setting determines whether the IR transmission rate will be delayed while converting to receiving mode. Setting options: *Disabled, Enabled*.

UR2 Duplex Mode
This setting controls the operating mode of IR transmission/reception. Setting options: *Full, Half*. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed.

Use IR Pins
Please consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals. Setting options: *RxD2/TxD2, IR-Rx2Tx2*.

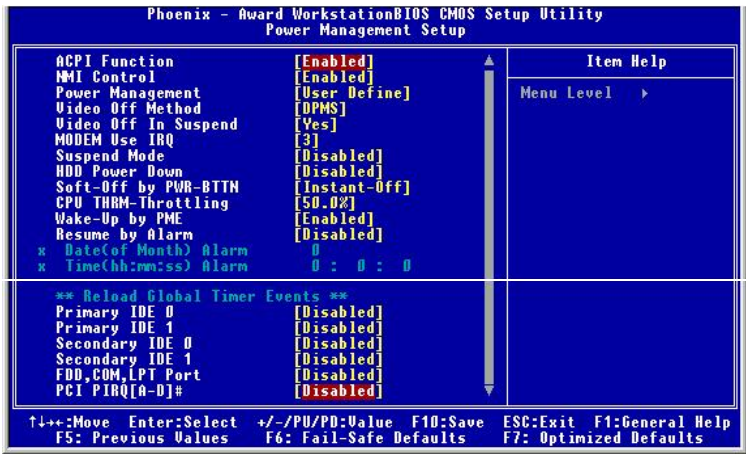
PWRON After PWR-Fail
This setting specifies whether your system will reboot after a power failure or interrupts occurs. Available settings are:

Off	Leaves the computer in the power off state.
On	Reboots the computer.
Former-Sts	Restores the system to the status before power failure or interrupt occurs.

Power Status LED
This item configures how the system uses power LED on the case to indicate the sleep state. Available options are:

Single	The power LED blinks to indicate the sleep state without changing its color.
Dual	The power LED changes its color to indicate the sleep state.

Power Management Setup



MSI Reminds You...

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

ACPI Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME, select *Enabled*. Setting options: *Enabled*, *Disabled*.

NMI Control

This feature allows users to disable or enable the non-maskable interrupts (NMI) that prevent normal operation of the computer, i.e. memory parity check. Setting options: *Enabled*, *Disabled*.

Power Management

This item is used to select the degree (or type) of power saving and is related to these modes: *Suspend Mode* and *HDD Power Down*. There are three options for power management:

Min Saving	Minimum Power Management. Suspend Mode = 1 Hour.
Max Saving	Maximum Power Management. Suspend Mode = 1 Min.
User Define	Allows end users to configure each mode separately.

Video Off Method
This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend
This setting determines whether the monitor will be turned off during suspend mode. Setting options: *Yes*, *No*.

Modem Use IRQ
Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. Settings are *3*, *4*, *5*, *7*, *9*, *10*, *11* and *NA*.

Suspend Mode
If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings are *Disabled*, *1 Min*, *2 Min*, *4 Min*, *8 Min*, *12 Min*, *20 Min*, *30 Min*, *40 Min* and *1 Hour*.

HDD Power Down
When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active. The settings are: *Disable*, *1~15 Min.*

Soft-Off by PWR-BTTN
This feature allows users to configure the power button function. Settings are:

Instant-Off	The power button functions as a normal power-on/-off button.
Delay 4 Sec.	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

CPU THRM-Throttling
The item allows you to specify the CPU speed (at percentage) to which it will slow down when the CPU reaches the predetermined overheat temperature.

Settings range from *12.5%* to *87.5%* at 12.5% increment.

Wake-Up by PME
When setting to *Enabled*, the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event). Settings: *Enabled* and *Disabled.*

Resume By Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

Date (of Month) Alarm
The field specifies the date for *Resume by Alarm.* Settings: 0~31.

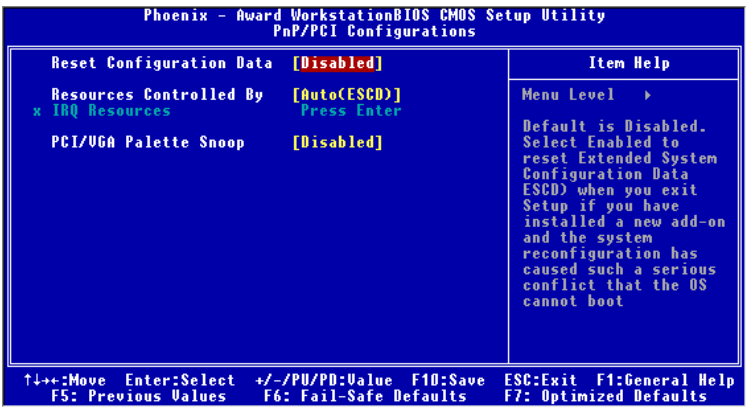
Time (hh:mm:ss) Alarm
The field specifies the time for *Resume by Alarm. F*ormat is <hour> <minute><second>.

MSI Reminds You...
If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

Reload Global Timer Events: Primary IDE 0/1, Secondary IDE 0/1, FDD/ COM/LPT Port, PCI PIRQ [A-D]#
Global Timer Events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device that is configured as *Enabled*, even when the system is in a power down mode.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



Reset Configuration Data

Normally, you leave this field *Disabled*. Select *Enabled* to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on card and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. Setting options: *Enabled*, *Disabled*.

Resource Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95/98. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢"). The settings are: *Auto (ESCD)*, *Manual*.

IRQ Resources

The items are adjustable only when *Resources Controlled By* is set to *Manual*. Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

PCI Device	For Plug & Play compatible devices designed for PCI bus architecture.
Reserved	The IRQ will be reserved for further request.

PCI/VGA Palette Snoop

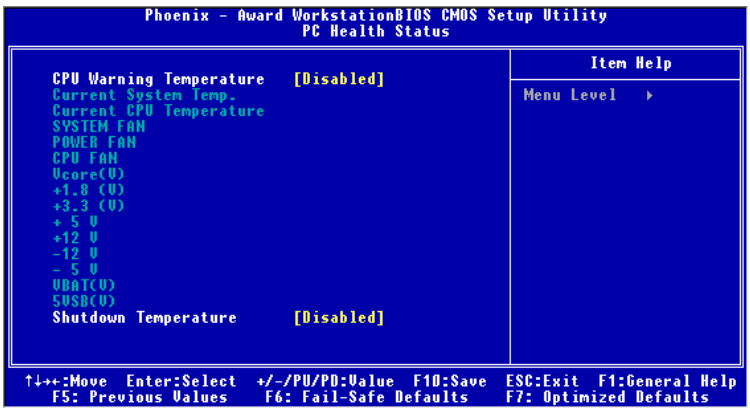
When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

VGA Palette Snoop Bit Setting	**Action**
Disabled	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

PC Health Status

This setup screen monitors the status of your CPU, fan, overall system status,.. etc and ***will not show up when the mBMC chip (for Server Management) is integrated on the mainboard***. Monitor function is available only if there is hardware monitoring mechanism onboard.



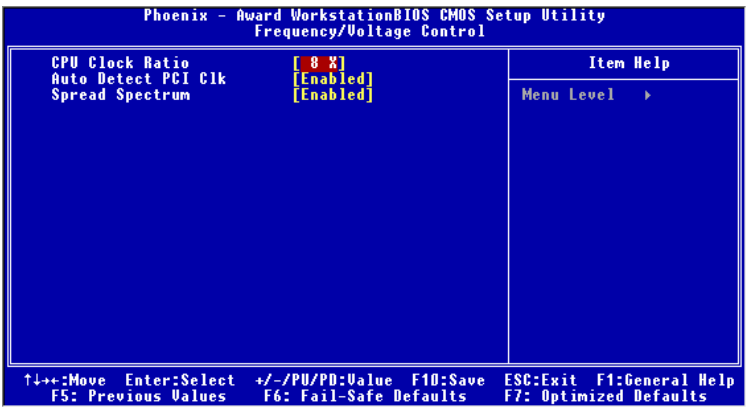
CPU Warning Temperature
If the CPU temperature reaches the upper limit preset in this setting, the warning mechanism will be activated. This helps you to prevent the CPU overheat problem.

Current System/CPU Temperature, System/Power/CPU Fan, Vcore(V), +1.8(V), +3.3(V), +5V, +12V, -12V, -5V, VBAT (V), 5VSB(V)
These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Shutdown Temperature
This option is for setting the shutdown temperature level for the processor. When the processor reaches the temperature you set, the system will be shut down.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.



CPU Clock Ratio

This setting controls the multiplier that is used to determine the internal clock speed of the processor relative to the external or motherboard clock speed.

Auto Detect PCI Clk

This item is used to auto detect the PCI slots. When set to *Enabled*, the system will remove (turn off) clocks from empty PCI slots to minimize the electromagnetic interference (EMI). Setting options: *Enabled, Disabled*.

Spread Spectrum

When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up.

Load Fail-Safe/Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select *Load Fail-Safe Defaults*, a message as below appears:

Pressing *Y* loads the BIOS default values for the most stable, minimal system performance.

When you select *Load Optimized Defaults*, a message as below appears:

Pressing *Y* loads the default factory settings for optimal system performance.

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have Award BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the *Security Option* of the *ADVANCED BIOS FEATURES* menu. If the *Security Option* is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

MSI Reminds You...

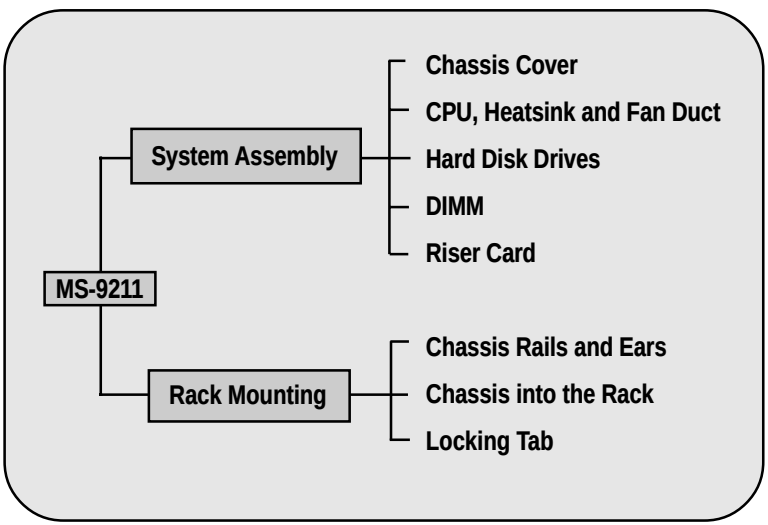
About Supervisor Password & User Password:

Supervisor password:	*Can enter and change the settings of the setup menu.*
User password:	*Can only enter but do not have the right to change the settings of the setup menu.*

4

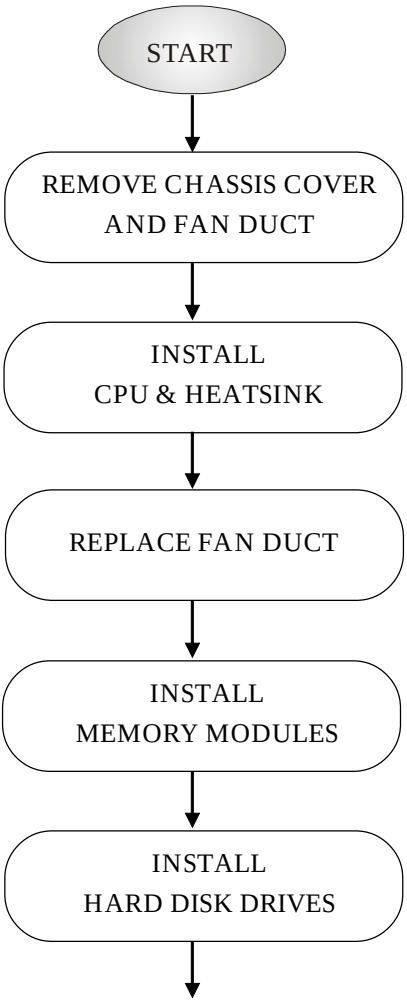
Chassis Installation

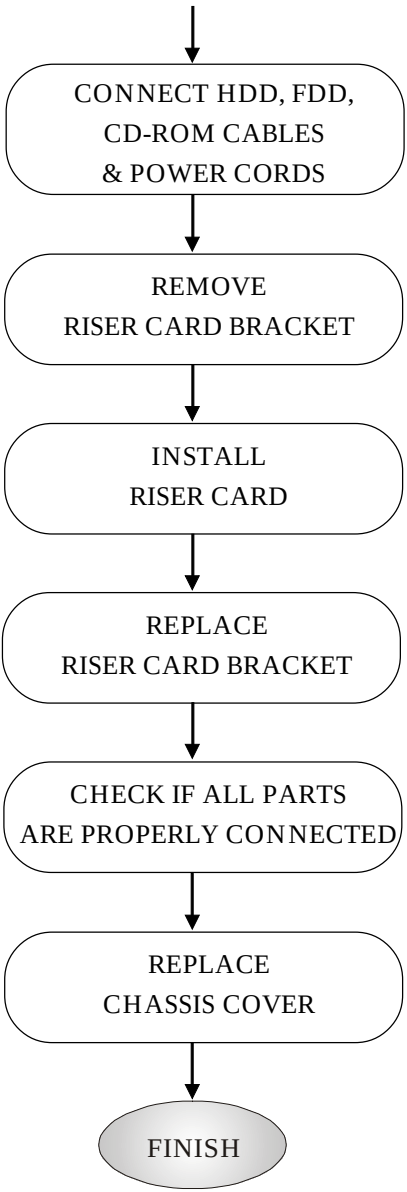
This chapter provides instructions on the hardware installation of the MS-9211 in two sections. ***System Assembly*** illustrates how to assembly each component of the MS-9211. ***Rack Mounting*** describes the procedures for mounting the unit into the rack in details. You can use the system assembly flowchart and the chart below to determine the proper sequence for removing or installing components to the server.



System Assembly Flowchart

The following flowchart shows basic system assembly procedures. Please note that always wear anti-static gloves when handling electrical components and exercise caution during the installation process. For more information, contact your local dealer or experienced technician.

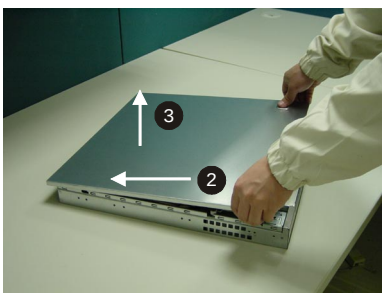



CONNECT HDD, FDD,
CD-ROM CABLES
& POWER CORDS
REMOVE
RISER CARD BRACKET
INSTALL
RISER CARD
REPLACE
RISER CARD BRACKET
CHECK IF ALL PARTS
ARE PROPERLY CONNECTED
REPLACE
CHASSIS COVER
FINISH

System Assembly

Chassis Cover

Locate the release buttons on the chassis cover.

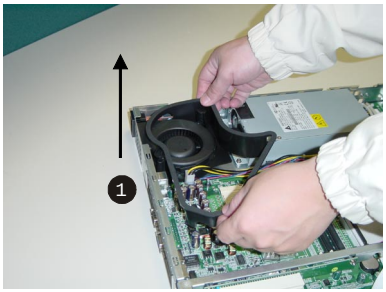


Press the release buttons and then push the cover backward to lift it up.

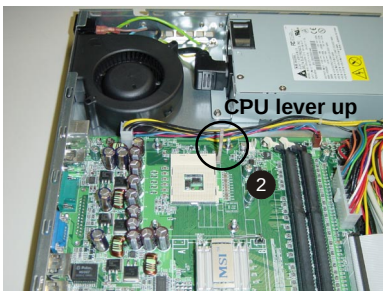
To replace the cover, slide the cover forward and make sure the safety lock fits firmly.

WARNING! *Before you remove or install these modules, make sure the server is not turned on or connected to the AC power.*

CPU, Heatsink and Fan Duct

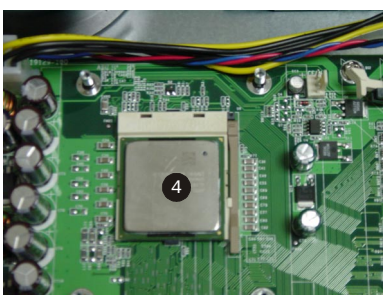


Remove the fan duct.



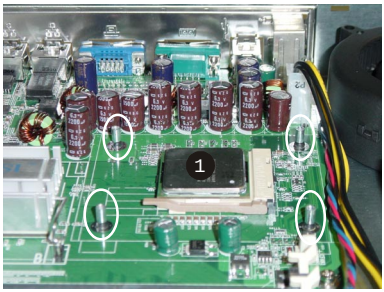
Locate the CPU socket and lift the lever up to a 90 degree angle.

Place the CPU on top of the socket with the gold arrow pointing to the lever.

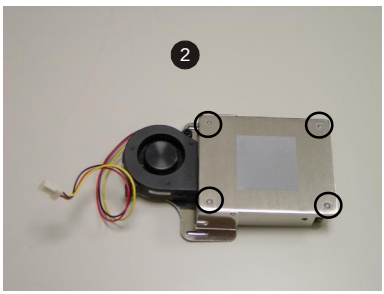


Push the lever down to secure the CPU in place.

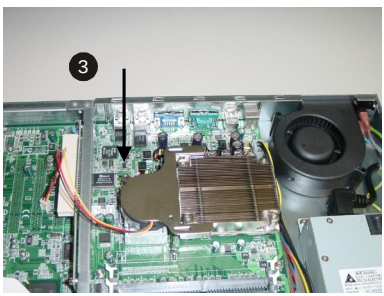
CPU, Heatsink and Fan Duct (continued)



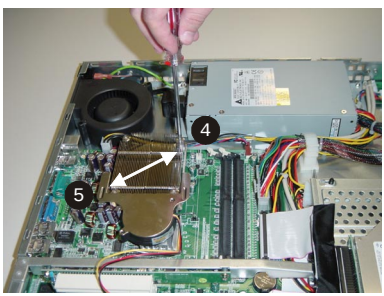
Locate the four points of the heatsink socket.



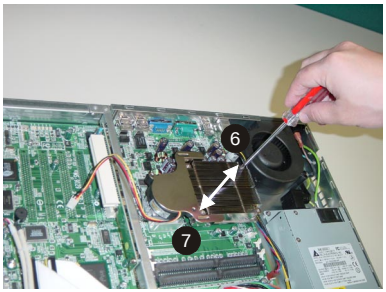
Locate the four screw holes of the PHP122 heatsink.

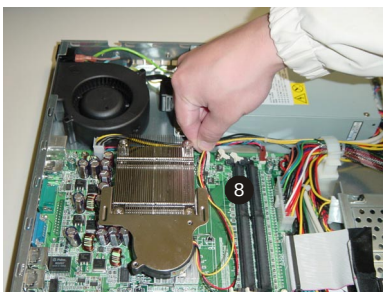


Position the PHP122 heatsink onto the heatsink socket carefully to avoid damaging the components around.

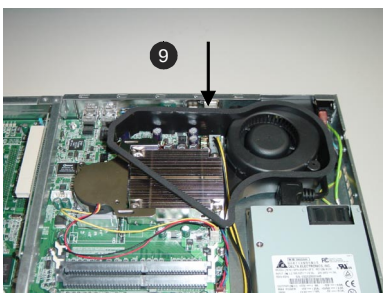


Screw the heatsink to the chassis following a diagonal sequence.





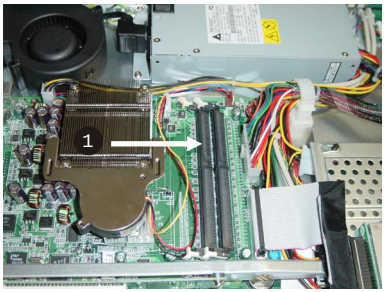
Plug in the power cord of the PHP122 heatsink.



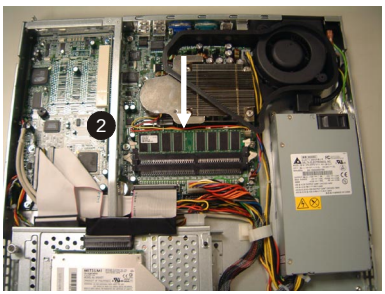
Replace the fan duct to ensure proper heat dissipation.

You have finished installing the heatsink and fan duct.

DIMM



Locate the DIMM slots on the mainboard.

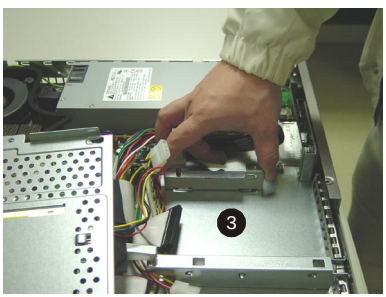


Insert the SDRAM module into the DIMM slot. The plastic clip at each side of the DIMM slot will automatically close.

Hard Disk Drives

Unscrew the HDD cover plate.

Turn over the HDD cover plate.



Remove the right bracket.

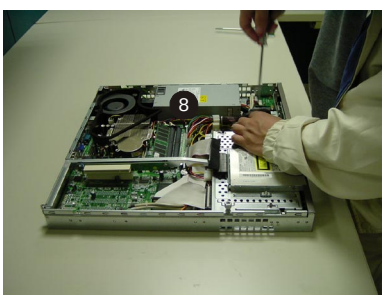
Place the first hard disk drive into the chassis and make sure the cables are properly connected.

Hard Disk Drives (continued)

Replace the right bracket.

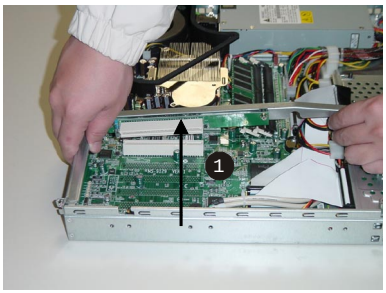
Follow the same procedures to install the second hard disk drive.

Replace the HDD cover plate.

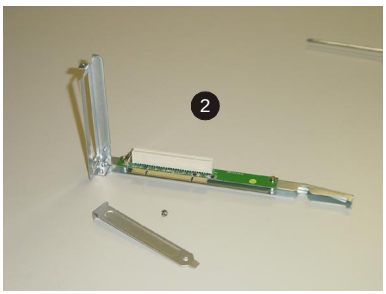


Screw the HDD cover plate in place.

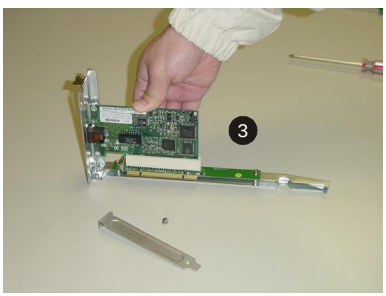
Riser Card



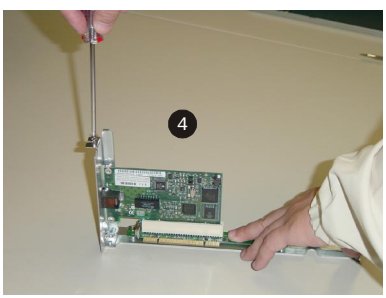
Remove the riser card bracket.



Unscrew the I/O shield from the riser card bracket. Save the screw for later use.



Insert the SCSI card into the bracket.

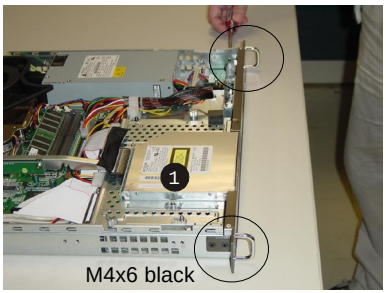


Screw the SCSI card firmly to the riser card bracket.

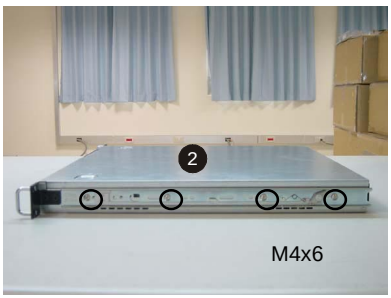
Replace the riser card bracket.

Rack Mounting

Chassis Rails and Ears



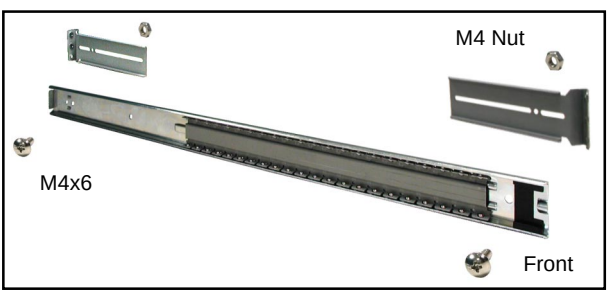
Screw the ears to both sides of the chassis.



Screw the side rails to both sides of the chassis.

TIPS

Attach the brackets (front and rear) onto the rails; the position of the rear bracket should be adjustable, which depends on the place where the system is installed into the rack.



Chassis into the Rack

Screw the rails onto the rack.

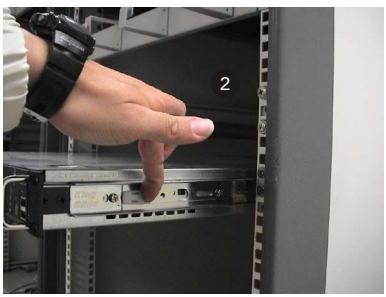
Align the chassis rails with the rack rails, and then push the system into the rack fully

Note: *The chassis rails must match the rack rails well, and the ball bearing set of the rack rails should clip into the fillister on the chassis rails.*

Secure the system with the screws.

Locking Tab

To slide the system into the rack, first align the chassis rails with the rack rails. Then simultaneously press the locking tabs on both sides of the chassis rails and slide the system backward.



The system will be locked halfway while pulling it out. Pull forward the locking tabs on both sides of the chassis rails to unlock the tab. You may now remove the system from the rack.

Note: *The chassis rail is designed with a locking tab which can (1) hold the system firmly to the rack, and (2) lock the system halfway without sliding out of the rack rails.*