



P4VM890

# User Manual

Version 2.1

Published August 2007

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- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

"Perchlorate Material-special handling may apply, see [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

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## 1. Introduction

Thank you for purchasing ASRock **P4VM890** motherboard, a reliable motherboard produced under ASRock's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice. In case any modifications of this manual occur, the updated version will be available on ASRock website without further notice. You may find the latest VGA cards and CPU support lists on ASRock website as well. ASRock website <http://www.asrock.com>

### 1.1 Package Contents

ASRock **P4VM890** Motherboard

(Micro ATX Form Factor: 9.6-in x 8.0-in, 24.4 cm x 20.3 cm)

ASRock **P4VM890** Quick Installation Guide

ASRock **P4VM890** Support CD

One 80-conductor Ultra ATA 66/100/133 IDE Ribbon Cable

One Ribbon Cable for a 3.5-in Floppy Drive

One Serial ATA (SATA) Cable (Optional)

One Serial ATA (SATA) HDD Power Cable (Optional)

One ASRock 6CH I/O Plus™ Shield

## 1.2 Specifications

<b>Platform</b>	- Micro ATX Form Factor: 9.6-in x 8.0-in, 24.4 cm x 20.3 cm
<b>CPU</b>	- Socket 478 for Intel® Pentium® 4 / Celeron® D (Prescott, Northwood, Willamete) processors - FSB 800/533/400 MHz - Supports Hyper-Threading Technology (see <b>CAUTION 1</b> ) - Supports Untied Overclocking Technology (see <b>CAUTION 2</b> )
<b>Chipset</b>	- Northbridge: VIA® P4M890 - Southbridge: VIA® VT8237R Plus
<b>Memory</b>	- 2 x DDR DIMM slots - Support DDR400/333 - Max. capacity: 2GB
<b>Hybrid Booster</b>	- CPU Frequency Stepless Control (see <b>CAUTION 3</b> ) - ASRock U-COP (see <b>CAUTION 4</b> ) - Boot Failure Guard (B.F.G.)
<b>Expansion Slot</b>	- 3 x PCI slots - 1 x PCI Express x16 slot - 1 x AMR slot
<b>Graphics</b>	- Integrated VIA® UniChrome Pro 3D/2D Graphics - DirectX 7.0 VGA - Max. shared memory 64MB
<b>Audio</b>	- Realtek ALC653 5.1channel AC'97 audio codec
<b>LAN</b>	- VIA® PHY VT6103 - Speed: 10/100 Ethernet - Supports Wake-On-LAN
<b>Rear Panel I/O</b>	ASRock 6CH I/O Plus™ - 1 x PS/2 Mouse Port - 1 x PS/2 Keyboard Port - 1 x Serial Port: COM1 - 1 x VGA Port - 1 x Parallel Port (ECP/EPP Support) - 6 x Ready-to-Use USB 2.0 Ports - 1 x RJ-45 LAN Port - Audio Jack: Line in/Front Speaker/Microphone
<b>Connector</b>	- 2 x Serial ATA 1.5 Gb/s connectors, support RAID (RAID 0, RAID 1 and JBOD) and "Hot Plug" functions - 2 x ATA133 IDE connectors (support 4 x IDE devices) - 1 x Floppy connector - 1 x IR header - CPU/Chassis FAN connector

	<ul style="list-style-type: none"> <li>- 20 pin ATX power connector</li> <li>- 4 pin 12V power connector</li> <li>- CD in header</li> <li>- AUX in header</li> <li>- Front panel audio connector</li> <li>- 2 x USB 2.0 headers (support 4 USB 2.0 ports; 2 of them are shared with USB45 ports on the I/O panel) (see <b>CAUTION 5</b>)</li> </ul>
<b>BIOS Feature</b>	<ul style="list-style-type: none"> <li>- 4Mb AMI BIOS</li> <li>- AMI Legal BIOS</li> <li>- Supports "Plug and Play"</li> <li>- ACPI 1.1 Compliance Wake Up Events</li> <li>- Supports jumperfree</li> <li>- AMBIOS 2.3.1 Support</li> </ul>
<b>Support CD</b>	- Drivers, Utilities, AntiVirus Software (Trial Version)
<b>Hardware Monitor</b>	<ul style="list-style-type: none"> <li>- CPU Temperature Sensing</li> <li>- Chassis Temperature Sensing</li> <li>- CPU Fan Tachometer</li> <li>- Chassis Fan Tachometer</li> <li>- Voltage Monitoring: +12V, +5V, +3.3V, Vcore</li> </ul>
<b>OS</b>	- Microsoft® Windows® 2000 / XP compliant
<b>Certifications</b>	- FCC, CE, WHQL

**WARNING**

Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using the third-party overclocking tools. Overclocking may affect your system stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense. We are not responsible for possible damage caused by overclocking.

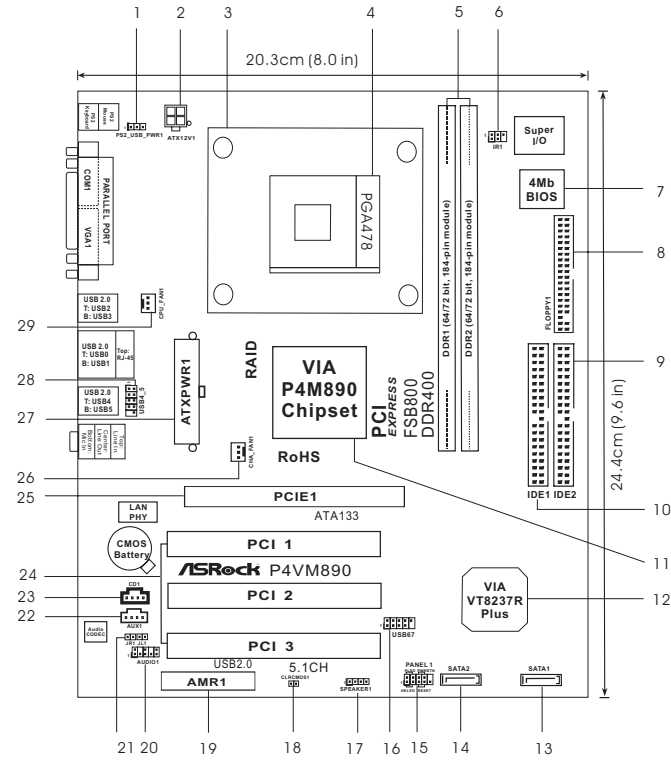
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### **CAUTION!**

1. About the setting of "Hyper Threading Technology", please check page 28.
2. This motherboard supports Untied Overclocking Technology. Please read "Untied Overclocking Technology" on page 24 for details.
3. Although this motherboard offers stepless control, it is not recommended to perform over-clocking. Frequencies other than the recommended CPU bus frequencies may cause the instability of the system or damage the CPU.
4. While CPU overheat is detected, the system will automatically shutdown. Before you resume the system, please check if the CPU fan on the motherboard functions properly and unplug the power cord, then plug it back again. To improve heat dissipation, remember to spray thermal grease between the CPU and the heatsink when you install the PC system.
5. Power Management for USB 2.0 works fine under Microsoft® Windows® XP SP1 or SP2 / 2000 SP4.



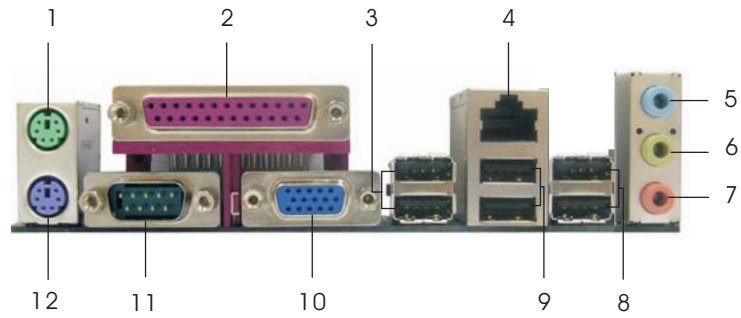
### 1.3 Motherboard Layout



- |   |   |
|---|---|
| 1 PS2_USB_PWR1 Jumper                           | 16 USB 2.0 Header (USB67, Blue)           |
| 2 ATX 12V Connector (ATX12V1)                   | 17 Chassis Speaker Header (SPEAKER 1)     |
| 3 CPU Heatsink Retention Module                 | 18 Clear CMOS Jumper (CLRCMOS1)           |
| 4 CPU Socket                                    | 19 AMR Slot (AMR1)                        |
| 5 2 x 184-pin DDR DIMM Slots (DDR1, DDR2; Blue) | 20 Front Panel Audio Header (AUDIO1)      |
| 6 Infrared Module Header (IR1)                  | 21 JR1/JL1 Jumpers                        |
| 7 Flash Memory                                  | 22 Internal Audio Connector: AUX1 (White) |
| 8 Floppy Connector (FLOPPY1)                    | 23 Internal Audio Connector: CD1 (Black)  |
| 9 Secondary IDE Connector (IDE2, Black)         | 24 3 x PCI Slots (PCI1-3)                 |
| 10 Primary IDE Connector (IDE1, Blue)           | 25 PCI Express x16 Slot (PCIE1)           |
| 11 North Bridge Controller                      | 26 Chassis Fan Connector (CHA_FAN1)       |
| 12 South Bridge Controller                      | 27 ATX Power Connector (ATXPWR1)          |
| 13 Primary Serial ATA Connector (SATA1)         | 28 Shared USB 2.0 Header (USB4_5, Blue)   |
| 14 Secondary Serial ATA Connector (SATA2)       | 29 CPU Fan Connector (CPU_FAN1)           |
| 15 System Panel Header (PANEL1)                 |   |

---

## 1.4 ASRock 6CH I/O Plus™



- |                           |                                |
|---------------------------|--------------------------------|
| 1 PS/2 Mouse Port (Green) | 7 PS/2 Keyboard Port (Purple)  |
| 2 Parallel Port           | 8 Shared USB 2.0 Ports (USB45) |
| 3 USB 2.0 Ports (USB23)   | 9 USB 2.0 Ports (USB01)        |
| 4 RJ-45 Port              | 10 VGA Port                    |
| 5 Line In (Light Blue)    | 11 COM Port                    |
| 6 PS/2 Mouse Port (Green) | 12 PS/2 Keyboard Port (Purple) |

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## 2. Installation

**P4VM890** is a Micro ATX form factor (9.6-in x 8.0-in, 24.4 cm x 20.3 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

### Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

1. Unplug the power cord from the wall socket before touching any component.
2. To avoid damaging the motherboard components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also remember to use a grounded wrist strap or touch a safety grounded object before you handle components.
3. Hold components by the edges and do not touch the ICs.
4. Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.



Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

---

## 2.1 CPU Installation

- Step 1. Unlock the socket by lifting the lever up to a 90° angle.
- Step 2. Position the CPU directly above the socket such that its marked corner matches the base of the socket lever.
- Step 3. Carefully insert the CPU into the socket until it fits in place.

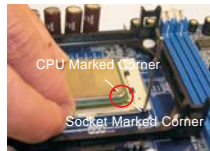


The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to avoid bending of the pins.

- Step 4. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



STEP 1:  
Lift The Socket Lever Up to 90°



STEP 2/STEP 3:  
Match The CPU Marked Corner  
to The Socket Marked Corner



STEP 4:  
Push Down And Lock  
The Socket Lever

## 2.2 Installation of CPU Fan and Heatsink

This motherboard adopts 478-pin CPU socket to support Intel® Pentium® 4 / Celeron® CPU. It requires larger heatsink and cooling fan to dissipate heat. You also need to spray thermal grease between the CPU and the heatsink to improve heat dissipation. Make sure that the CPU and the heatsink are securely fastened and in good contact with each other. Then connect the CPU fan to the CPU\_FAN connector (CPU\_FAN1, see p.9 No. 29). For proper installation, please kindly refer to the instruction manuals of the CPU fan and the heatsink.

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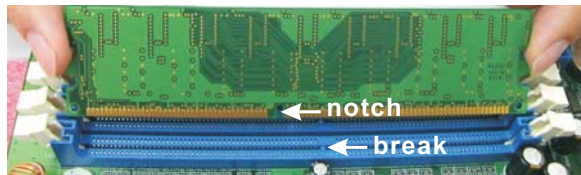
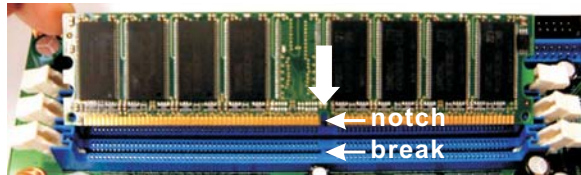
## 2.3 Installation of Memory Modules (DIMM)

*P4VM890* motherboard provides two 184-pin DDR (Double Data Rate) DIMM slots.



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

- Step 1. Unlock a DIMM slot by pressing the retaining clips outward.
- Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

- Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

---

## 2.4 Expansion Slots (PCI, AMR and PCI Express Slots)

There are 3 PCI slots, 1 AMR slot, and 1 PCI Express slot on this motherboard.

**PCI slots:** PCI slots are used to install expansion cards that have the 32-bit PCI interface.

**AMR slot:** The AMR slot is used to insert an ASRock MR card with v.92 Modem functionality.

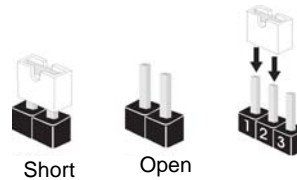
**PCI Express Slots:** PCI Express (PCIe) slots are used for PCI Express cards with x16 lane width graphics cards.

### Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).
- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

## 2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is "Short". If no jumper cap is placed on pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when jumper cap is placed on these 2 pins.



Jumper	Setting	
PS2_USB_PWR1 (see p.9, No. 1)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1_2 +5V</p> </div> <div style="text-align: center;"> <p>2_3 +5VSB</p> </div> </div>	Short pin2, pin3 to enable +5VSB (standby) for PS/2 or USB wake up events.

Note: To select +5VSB, it requires 2 Amp and higher standby current provided by power supply.

JR1(see p.9, No. 21)	<p>JR1 JL1</p>
JL1(see p.9, No. 21)	

Note: If the jumpers JL1 and JR1 are short, both the front panel and the rear panel audio connectors can work.

Clear CMOS (CLRCMOS1, 2-pin jumper) (see p.9, No. 18)	<p>2-pin jumper</p>
---	---------------------

Note: CLRCMOS1 allows you to clear the data in CMOS. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short 2 pins on CLRCMOS1 for 5 seconds.

## 2.6 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

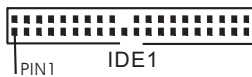
FDD Connector  
(33-pin FLOPPY1)  
(see p.9, No. 8)



Note: Make sure the red-striped side of the cable is plugged into Pin1 side of the connector.

Primary IDE Connector (Blue)  
(39-pin IDE1, see p.9, No. 10)

Secondary IDE Connector (Black)  
(39-pin IDE2, see p.9, No. 9)



connect the blue end  
to the motherboard



connect the black end  
to the IDE devices

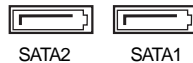
80-conductor ATA 66/100/133 cable

Note: If you use only one IDE device on this motherboard, please set the IDE device as "Master". Please refer to the instruction of your IDE device vendor for the details. Besides, to optimize compatibility and performance, please connect your hard disk drive to the primary IDE connector (IDE1, blue) and CD-ROM to the secondary IDE connector (IDE2, black).

Serial ATA Connectors

(SATA1: see p.9, No. 13)

(SATA2: see p.9, No. 14)



These two Serial ATA (SATA) connectors support SATA data cables for internal storage devices. The current SATA interface allows up to 1.5 Gb/s data transfer rate.

Serial ATA (SATA)  
Data Cable  
(Optional)



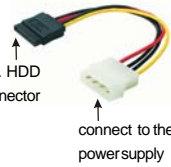
Either end of the SATA data cable can be connected to the SATA hard disk or the SATA connector on the motherboard.



**Serial ATA (SATA)  
Power Cable**

(Optional)

connect to the SATA HDD  
power connector



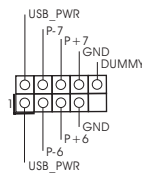
connect to the  
powersupply

Please connect the black end of SATA power cable to the power connector on the drive. Then connect the white end of SATA power cable to the power connector of the power supply.

**USB 2.0 Header**

(9-pin USB67)

(see p.9, No. 16)

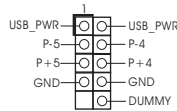


Besides six default USB 2.0 ports on the I/O panel, there are two USB 2.0 headers on this motherboard. Each USB 2.0 header can support two USB 2.0 ports. The shared USB 2.0 header (USB4\_5) is shared with USB ports 45 on the I/O panel.

**Shared USB 2.0 Header**

(9-pin USB4\_5)

(see p.9, No. 28)

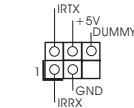


When using the front panel USB ports by attaching the front panel USB cable to USB4\_5 header, the USB ports 45 on the I/O panel will not be able to function.

**Infrared Module Header**

(5-pin IR1)

(see p.9, No. 6)



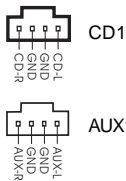
This header supports an optional wireless transmitting and receiving infrared module.

**Internal Audio Connectors**

(4-pin CD1, 4-pin AUX1)

(CD1: see p.9, No. 23)

(AUX1: see p.9, No. 22)

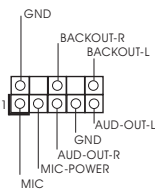


These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, DVD-ROM, TV tuner card, or MPEG card.

**Front Panel Audio Header**

(8-pin AUDIO1)

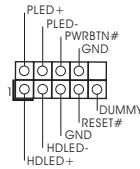
(see p.9, No. 20)



This is an interface for the front panel audio cable that allows convenient connection and control of audio devices.

### System Panel Header

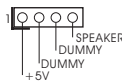
(9-pin PANEL1)  
(see p.9, No. 15)



This header accommodates several system front panel functions.

### Chassis Speaker Header

(4-pin SPEAKER 1)  
(see p.9, No. 17)



Please connect the chassis speaker to this header.

### Chassis Fan Connector

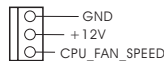
(3-pin CHA\_FAN1)  
(see p.9, No. 26)



Please connect the chassis fan cable to this connector and match the black wire to the ground pin.

### CPU Fan Connector

(3-pin CPU\_FAN1)  
(see p.9, No. 29)



Please connect the CPU fan cable to this connector and match the black wire to the ground pin.

### ATX Power Connector

(20-pin ATXPWR1)  
(see p.9, No. 27)



Please connect an ATX power supply to this connector.

### ATX 12V Connector

(4-pin ATX12V1)  
(see p.9, No. 2)



Please note that it is necessary to connect a power supply with ATX 12V plug to this connector so that it can provide sufficient power. Failing to do so will cause the failure to power up.



Please install the heatsink and the CPU fan before installing ATX 12V connector; otherwise, it may cause permanent damage!

---

## 2.7 Serial ATA (SATA) Hard Disks Installation

This motherboard adopts VIA® VT8237R Plus southbridge chipset that supports Serial ATA (SATA) hard disks and RAID (RAID 0, RAID 1 and JBOD) functions. You may install SATA hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA hard disks.

- STEP 1: Install the SATA hard disks into the drive bays of your chassis.
- STEP 2: Connect the SATA power cable to the SATA hard disk.
- STEP 3: Connect one end of the SATA data cable to the motherboard's SATA connector.
- STEP 4: Connect the other end of the SATA data cable to the SATA hard disk.

## 2.8 Hot Plug and Hot Swap Functions for SATA HDDs

*P4VM890* motherboard supports Hot Plug and Hot Swap functions for SATA Devices.



### NOTE

#### What is Hot Plug Function?

If the SATA HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA HDDs while the system is still power-on and in working condition.

However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA HDD.

#### What is Hot Swap Function?

If SATA HDDs are built as RAID1 then it is called "Hot Swap" for the action to insert and remove the SATA HDDs while the system is still power-on and in working condition.

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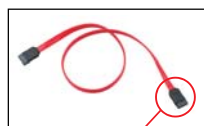
## 2.9 SATA HDD Hot Plug Feature and Operation Guide

This motherboard supports Hot Plug feature for SATA HDD. Please read below operation guide of SATA HDD Hot Plug feature carefully. Before you process the SATA HDD Hot Plug, please check below cable accessories from the motherboard gift box pack.

A. 7-pin SATA data cable

B. SATA power cable with SATA 15-pin power connector interface

A. SATA data cable (Red)



SATA 7-pin  
connector

B. SATA power cable



The SATA 15-pin power  
connector (Black) connect  
to SATA HDD

1x4-pin conventional  
power connector (White)  
connect to power supply

### Caution

1. Without SATA 15-pin power connector interface, the SATA Hot Plug cannot be processed.
2. Even some SATA HDDs provide both SATA 15-pin power connector and IDE 1x4-pin conventional power connector interfaces, the IDE 1x4-pin conventional power connector interface is definitely not able to support Hot Plug and will cause the HDD damage and data loss.

### Points of attention, before you process the Hot Plug:

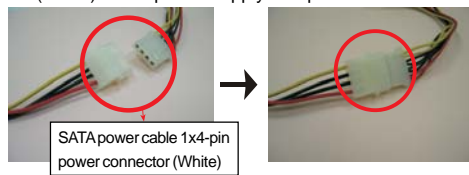
1. Below operation procedure is designed only for our motherboard, which supports SATA HDD Hot Plug.
  - \* The SATA Hot Plug feature might not be supported by the chipset because of its limitation, the SATA Hot Plug support information of our motherboard is indicated in the product spec on our website: [www.asrock.com](http://www.asrock.com)
2. Make sure your SATA HDD can support Hot Plug function from your dealer or HDD user manual. The SATA HDD, which cannot support Hot Plug function, will be damaged under the Hot Plug operation.
3. Please make sure the SATA driver is installed into system properly. The latest SATA driver is available on our support website: [www.asrock.com](http://www.asrock.com)
4. Make sure to use the SATA power cable & data cable, which are from our motherboard package.
5. Please follow below instructions step by step to reduce the risk of HDD crash or data loss.

## How to Hot Plug a SATA HDD:

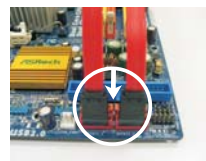
Points of attention, before you process the Hot Plug:

Please do follow below instruction sequence to process the Hot Plug, improper procedure will cause the SATA HDD damage and data loss.

**Step 1** Please connect SATA power cable 1x4-pin end (White) to the power supply 1x4-pin cable.



**Step 2** Connect SATA data cable to the motherboard's SATA connector.



**Step 3** Connect SATA 15-pin power cable connector (Black) end to SATA HDD.



**Step 4** Connect SATA data cable to the SATA HDD.

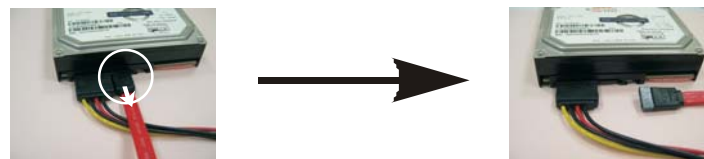


## How to Hot Unplug a SATA HDD:

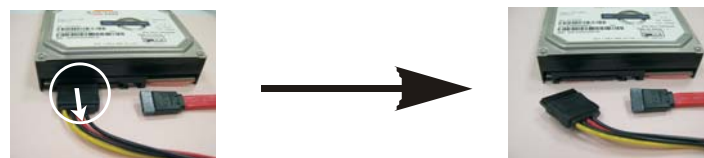
Points of attention, before you process the Hot Unplug:

Please do follow below instruction sequence to process the Hot Unplug, improper procedure will cause the SATA HDD damage and data loss.

**Step 1** Unplug SATA data cable from SATA HDD side.



**Step 2** Unplug SATA 15-pin power cable connector (Black) from SATA HDD side.



---

## 2.10 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from up to bottom side to install those required drivers. Therefore, the drivers you install can work properly.

## 2.11 AMR Card and Driver Installation

If you do not insert AMR card to this motherboard, and you finish installing all drivers to your system now, but in the future, you plan to use AMR card function on this motherboard, please follow the steps below then.

1. Insert AMR card to AMR slot on this motherboard. Please make sure that the AMR card is completely seated on the slot.
2. Install AMR card driver from our support CD to your system.
3. Reboot your system.

## 2.12 Installing Windows® 2000 / XP With RAID Functions

If you want to install Windows® 2000 / Windows® XP OS on your SATA HDDs with RAID functions, please follow below steps.

### STEP 1: Set up BIOS.

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the "SATA Operation Mode" option to [RAID].

### STEP 2: Make a SATA driver diskette.

- A. Insert the ASRock Support CD into your optical drive to boot your system.
- B. During POST at the beginning of system boot-up, press <F11> key, and then a window for boot devices selection appears. Please select CD-ROM as the boot device.
- C. When you see the message on the screen, "Generate Serial ATA driver diskette [Y/N]?", press <Y>.
- D. Then you will see these messages,  
**Please insert a blank  
formatted diskette into floppy  
drive A:  
press any key to start**  
Please insert a floppy diskette into the floppy drive, and press any key.
- E. The system will start to format the floppy diskette and copy SATA drivers into the floppy diskette.

---

**STEP 3: Use “RAID Installation Guide” to set RAID configuration.**

Before you start to configure RAID function, you need to check the RAID installation guide in the Support CD for proper configuration. Please refer to the document in the following path in the Support CD:

..\ RAID Installation Guide

**STEP 4: Install Windows® 2000 / XP OS on your system.**

After step 1, 2, 3, you can start to install Windows® 2000 / Windows® XP OS on your system. At the beginning of Windows® setup, press F6 to install a third-party RAID driver. When prompted, insert the SATA driver diskette containing the VIA® RAID driver. After reading the floppy disk, the driver will be presented. Select the driver to install according to the mode you choose and the OS you install.

NOTE. If you install Windows® 2000 / Windows® XP on IDE HDDs and want to manage (create, convert, delete, or rebuild) RAID functions on SATA HDDs, you still need to set up “SATA Operation Mode” to [RAID] in BIOS first. Then, please set the RAID configuration by using the document in the following path in the Support CD:

..\ RAID Installation Guide



If you want to use “VIA RAID Tool” in Windows® environment, please install SATA drivers from the Support CD again so that “VIA RAID Tool” will be installed to your system as well.

## 2.13 Installing Windows® 2000 / XP Without RAID Functions

If you want to install Windows® 2000 / Windows® XP OS on your SATA HDDs without RAID functions, please follow below steps.

**STEP 1: Set up BIOS.**

- A. Enter BIOS SETUP UTILITY → Advanced screen → IDE Configuration.
- B. Set the “SATA Operation Mode” option to [non-RAID].

**STEP 2: Install Windows® 2000 / XP OS on your system.**

After setting up BIOS, you can start to install Windows® 2000 / XP on your system.



---

## 2.14 Untied Overclocking Technology

This motherboard supports Untied Overclocking Technology, which means during overclocking, FSB enjoys better margin due to fixed PCI / PCIE bus. You may set "CPU Host Frequency" option of BIOS setup to [Auto], which will show you the actual CPU host frequency in the following item. Therefore, CPU FSB is untied during overclocking, but PCI / PCIE bus is in the fixed mode so that FSB can operate under a more stable overclocking environment.



Please refer to the warning on page 7 for the possible overclocking risk before you apply Untied Overclocking Technology.





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## 3. BIOS SETUP UTILITY

### 3.1 Introduction

This section explains how to use the BIOS SETUP UTILITY to configure your system. The Flash Memory on the motherboard stores the BIOS SETUP UTILITY. You may run the BIOS SETUP UTILITY when you start up the computer. Please press <F2> during the Power-On-Self-Test (POST) to enter the BIOS SETUP UTILITY, otherwise, POST will continue with its test routines.

If you wish to enter the BIOS SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

#### 3.1.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

- Main** To set up the system time/date information
- Advanced** To set up the advanced BIOS features
- H/W Monitor** To display current hardware status
- Boot** To set up the default system device to locate and load the Operating System
- Security** To set up the security features
- Exit** To exit the current screen or the BIOS SETUP UTILITY

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen.

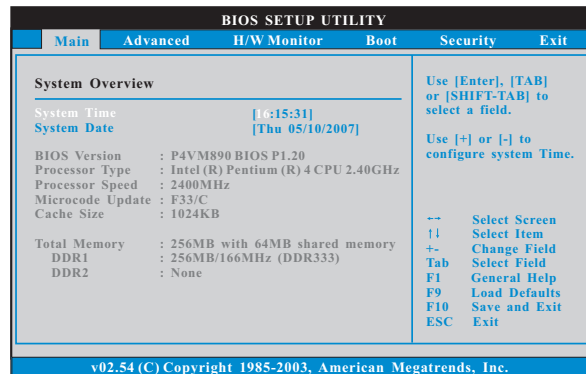
### 3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the BIOS SETUP UTILITY
<ESC>	To jump to the Exit Screen or exit the current screen

### 3.2 Main Screen

When you enter the BIOS SETUP UTILITY, the Main screen will appear and display the system overview



#### System Time [Hour:Minute:Second]

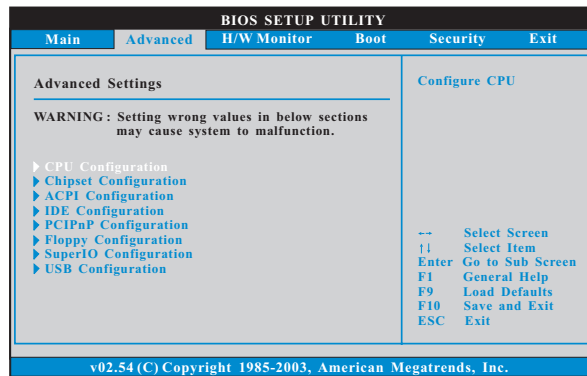
Use this item to specify the system time.

#### System Date [Day Month/Date/Year]

Use this item to specify the system date.

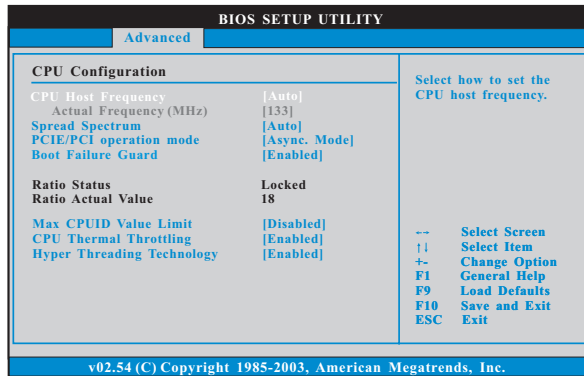
### 3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, ACPI Configuration, IDE Configuration, PCI/PnP Configuration, Floppy Configuration, SuperIO Configuration, and USB Configuration.



Setting wrong values in this section may cause the system to malfunction.

#### 3.3.1 CPU Configuration



##### CPU Host Frequency

While entering setup, BIOS auto detects the present CPU host frequency of this motherboard. The actual CPU host frequency will show in the following item.

---

### **Spread Spectrum**

The default value of this option is [Auto].

### **PCIe/PCI operatin mode**

Use this to select PCIe/PCI operation mode. The default value is [Async. mode]. Configuration options: [Async. mode] and [Sync. mode].

### **Boot Failure Guard**

Enable or disable the feature of Boot Failure Guard.

### **Ratio Status**

This is a read-only item, which displays whether the ratio status of this motherboard is "Locked" or "Unlocked". If it shows "Unlocked", you will find an item **Ratio CMOS Setting** appears to allow you changing the ratio value of this motherboard. If it shows "Locked", then the item **Ratio CMOS Setting** will be hidden. If you use the ratio value to time the CPU frequency, it will be equal to the core speed of the installed processor.

### **Ratio Actual Value**

This is a read-only item, which displays the ratio actual value of this motherboard.

### **Max CPUID Value Limit**

For Prescott CPU only, some OSes (ex. NT4.0) cannot handle the function with disable. This should be enabled in order to boot legacy OSes that cannot support CPUs with extended CPUID functions.

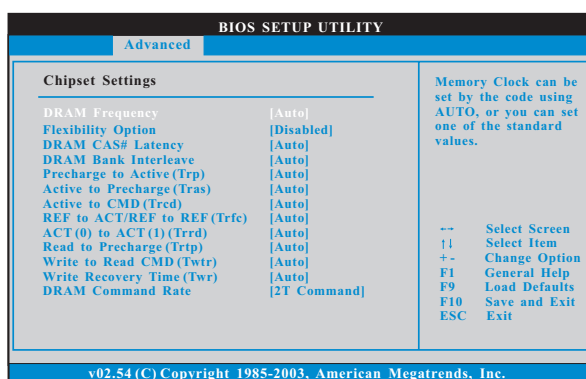
### **CPU Thermal Throttling**

You may select [Enabled] to enable P4 CPU internal thermal control mechanism to keep the CPU from overheated.

### **Hyper Threading Technology**

To enable this feature, it requires a computer system with an Intel Pentium® 4 processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP. Set to [Enabled] if using Microsoft® Windows® XP, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

### 3.3.2 Chipset Configuration



#### DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assigns appropriate frequency automatically. You may also select other value as operating frequency: [166MHz (DDR 333)] and [200MHz (DDR 400)].

#### Flexibility Option

The default value of this option is [Disabled]. It will allow better tolerance for memory compatibility when it is set to [Enabled].

#### DRAM CAS# Latency

Use this item to adjust the means of memory accessing. Configuration options: [Auto], [2], [2.5], and [3].

#### DRAM Bank Interleave

Use this option to select DRAM Bank Interleave. Configuration options: [Auto], [Disabled], [2-Way], [4-Way], and [8-Way]. The default value is set to [Auto] to set the timing by dram SPD.

#### Precharge to Active (Trp)

Use this option to select Precharge to Active (Trp). Configuration options: [Auto], [2T], [3T], [4T], and [5T]. The default value is set to [Auto] to set the timing by dram SPD.

#### Active to Precharge (Tras)

Use this option to select Active to Precharge (Tras). Configuration options: [Auto], [5T] to [20]. The default value is set to [Auto] to set the timing by dram SPD.

#### Active to CMD (Trcd)

Use this option to select Active to CMD (Trcd). Configuration options: [Auto], [2T], [3T], [4T], and [5T]. The default value is set to [Auto] to set the timing by dram SPD.

---

**REF to ACT / REF to REF (Trfc)**

Use this option to select REF to ACT / REF to REF (Trfc). Configuration options: [Auto], [8T] to [71T]. The default value is set to [Auto] to set the timing by dram SPD.

**ACT(0) to ACT (1) (Trrd)**

Use this option to select ACT(0) to ACT (1) (Trrd). Configuration options: [Auto], [2T], [3T], [4T], and [5T]. The default value is set to [Auto] to set the timing by dram SPD.

**Read to Precharge (Trtp)**

Use this option to select Read to Precharge (Trtp). Configuration options: [Auto], [2T], [3T]. The default value is set to [Auto] to set the timing by dram SPD.

**Write to Read CMD (Twtr)**

Use this option to select Write to Read CMD (Twtr). Configuration options: [Auto], [1T], [2T]. The default value is set to [Auto] to set the timing by dram SPD.

**Write Recovery Time (Twr)**

Use this option to select Write Recovery Time (Twr). Configuration options: [Auto], [2T], [3T], [4T], and [5T]. The default value is set to [Auto] to set the timing by dram SPD.

**DRAM Command Rate**

Use this to select among [2T Command] and [1T Command] for DRAM Command Rate. The default value is [2T Command].

**DRAM Voltage**

Use this to select DRAM voltage. Configuration options: [Auto], [Normal] and [High]. The default value is [Auto].

**VDDQ Voltage**

Use this to select VDDQ voltage. Configuration options: [Auto], [Normal] and [High]. The default value is [Auto].

**Primary Graphics Adapter**

This item will switch the PCI Bus scanning order while searching for video card. It allows you to select the type of Primary VGA in case of multiple video controllers. The default value of this feature is [PCI]. Configuration options: [Onboard], [PCI] and [PCI Express].

**Share Memory**

This allows you to set share memory feature. The default value is [Auto]. Configuration options: [Auto], [32MB] and [64MB].

**V-Link Speed**

This allows you to set the North Bridge and South Bridge V-Link Speed of VIA chipset. configuration options: [Normal], [Fast]. The default value is [Normal].



---

**PCI Delay Transaction**

Enable PCI Delay Transaction to allow other PCI masters to use the PCI BUS while the transaction is being carried out on the target device. Disable this feature when using PCI cards that are not PCI 2.1 compliant.

**IDE Drive Strength**

This allows you to set the drive strength of the onboard IDE controller. Configuration options: [Normal], [Low], [Lowest] and [Highest]. The default value is [Normal].

**OnBoard LAN**

This allows you to enable or disable the onboard LAN feature.

**OnBoard AC'97 Audio**

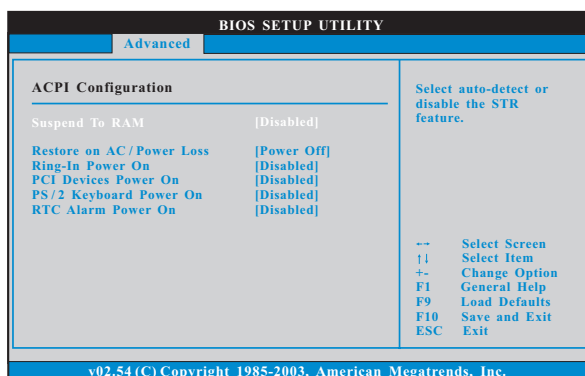
Select [Auto] or [Disabled] for the onboard AC'97 Audio feature.

**OnBoard MC'97 Modem**

Select [Auto] or [Disabled] for the onboard MC'97 Modem feature.



### 3.3.3 ACPI Configuration



#### Suspend to RAM

This field allows you to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the system supports it.

#### Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/Power loss. If [Power Off] is selected, the AC/Power remains off when the power recovers. If [Power On] is selected, the AC/Power resumes and the system starts to boot up when the power recovers.

#### Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

#### PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

#### PS/2 Keyboard Power On

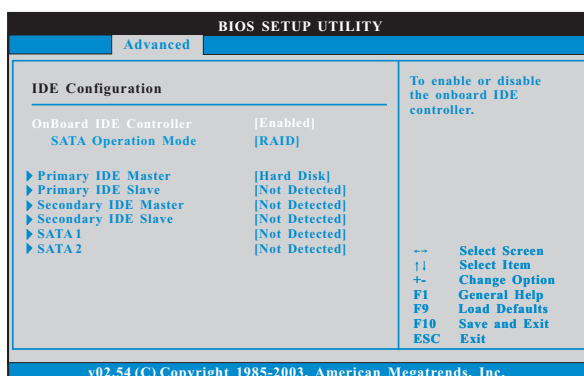
Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

#### RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.



### 3.3.4 IDE Configuration



#### OnBoard IDE Controller

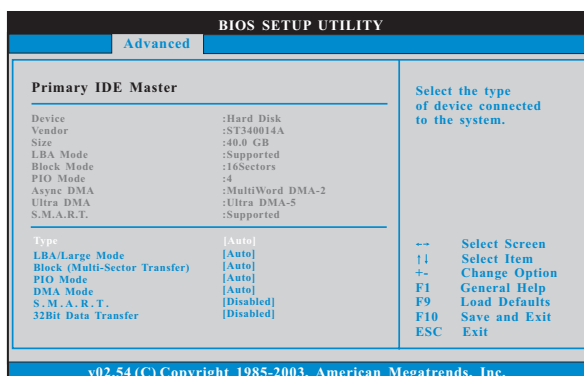
Use this item to enable or disable onboard IDE controller. Configuration options: [Enabled] and [Disabled].

#### SATA Operation Mode

Use this item to adjust SATA Operation Mode. Please set this item to [RAID] if you want to operate RAID functions with Windows® 2000 / XP. Otherwise, please set this item to [non-RAID].

#### IDE Device Configuration

You may set the IDE configuration for the device that you specify. We will use the "Primary IDE Master" as the example in the following instruction, which can be applied to the configurations of "Primary IDE Slave", "Secondary IDE Master", and "Secondary IDE Slave" as well.



---

### TYPE

Use this item to configure the type of the IDE device that you specify. Configuration options: [Not Installed], [Auto], [CD/DVD], and [ARMD].

**[Not Installed]:** Select [Not Installed] to disable the use of IDE device.

**[Auto]:** Select [Auto] to automatically detect the hard disk drive.



After selecting the hard disk information into BIOS, use a disk utility, such as FDISK, to partition and format the new IDE hard disk drives. This is necessary so that you can write or read data from the hard disk. Make sure to set the partition of the Primary IDE hard disk drives to active.

**[CD/DVD]:** This is used for IDE CD/DVD drives.

**[ARMD]:** This is used for IDE ARMD (ATAPI Removable Media Device), such as MO.

### LBA/Large Mode

Use this item to select the LBA/Large mode for a hard disk > 512 MB under DOS and Windows; for Netware and UNIX user, select [Disabled] to disable the LBA/Large mode.

### Block (Multi-Sector Transfer)

The default value of this item is [Auto]. If this feature is enabled, it will enhance hard disk performance by reading or writing more data during each transfer.

### PIO Mode

Use this item to set the PIO mode to enhance hard disk performance by optimizing the hard disk timing.

### DMA Mode

DMA capability allows the improved transfer-speed and data-integrity for compatible IDE devices.

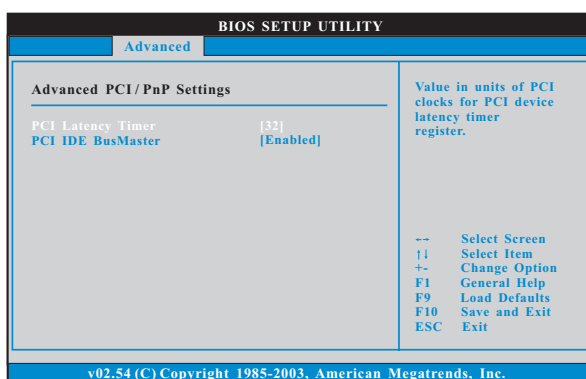
### S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled], [Auto], [Enabled].

### 32-Bit Data Transfer

Use this item to enable 32-bit access to maximize the IDE hard disk data transfer rate.

### 3.3.5 PCIPnP Configuration



#### PCI Latency Timer

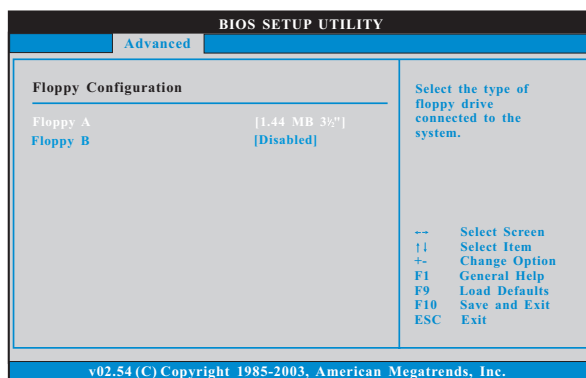
The default value is 32. It is recommended to keep the default value unless the installed PCI expansion cards' specifications require other settings.

#### PCI IDE BusMaster

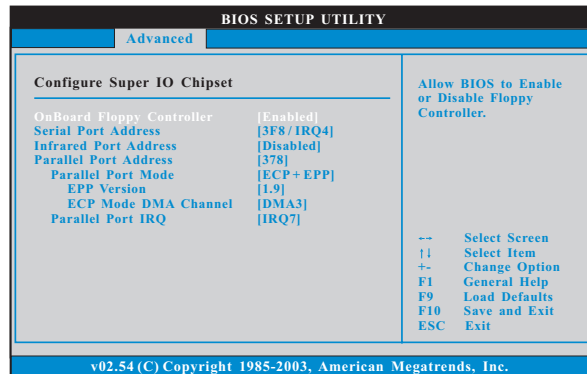
Use this item to enable or disable the PCI IDE BusMaster feature.

### 3.3.6 Floppy Configuration

In this section, you may configure the type of your floppy drive.



### 3.3.7 Super IO Configuration



#### OnBoard Floppy Controller

Use this item to enable or disable floppy drive controller.

#### Serial Port Address

Use this item to set the address for the onboard serial port or disable it.

Configuration options: [Disabled], [3F8 / IRQ4], [2F8 / IRQ3], [3E8 / IRQ4], [2E8 / IRQ3].

#### Infrared Port Address

Use this item to set the address for the onboard infrared port or disable it.

Configuration options: [Disabled], [2F8 / IRQ3], and [2E8 / IRQ3].

#### Parallel Port Address

Use this item to set the address for the onboard parallel port or disable it.

Configuration options: [Disabled], [378], and [278].

#### Parallel Port Mode

Use this item to set the operation mode of the parallel port. The default value is [ECP+EPP]. If this option is set to [ECP+EPP], it will show the EPP version in the following item, "EPP Version". Configuration options: [Normal], [Bi-Directional], and [ECP+EPP].

#### EPP Version

Use this item to set the EPP version. Configuration options: [1.9] and [1.7].

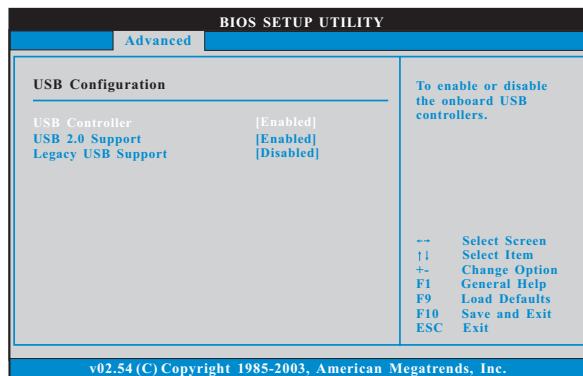
#### ECP Mode DMA Channel

Use this item to set the ECP mode DMA channel. Configuration options: [DMA0], [DMA1], and [DMA3].

#### Parallel Port IRQ

Use this item to set the IRQ for the parallel port. Configuration options: [IRQ5] and [IRQ7].

### 3.3.8 USB Configuration



#### USB Controller

Use this item to enable or disable the use of USB controller.

#### USB 2.0 Support

Use this item to enable or disable the USB 2.0 support.

#### Legacy USB Support

Use this item to enable or disable the support to emulate legacy I/O devices such as mouse, keyboard,... etc. Or you may select [Auto] so that the system will start to auto-detect; if there is no USB device connected, "Auto" option will disable the legacy USB support.

### 3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.

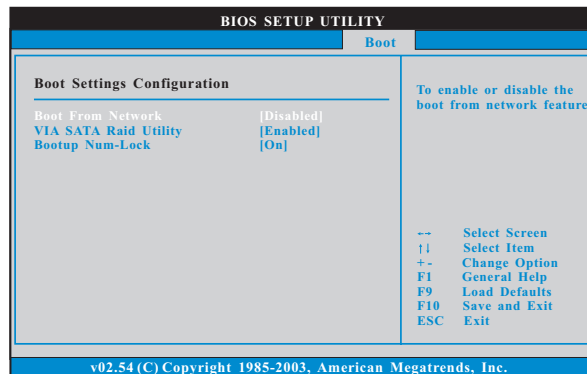
BIOS SETUP UTILITY					
Main	Advanced	H/W Monitor	Boot	Security	Exit
<b>Hardware Health Event Monitoring</b>					
CPU Temperature	:	37°C / 98°F			
M/B Temperature	:	31°C / 87°F			
CPU Fan Speed	:	2463 RPM			
Chassis Fan Speed	:	N/A			
Vcore	:	1.629V	--	Select Screen	
+ 3.30V	:	3.306V	↑↓	Select Item	
+ 5.00V	:	5.067V	F1	General Help	
+ 12.00V	:	11.890V	F9	Load Defaults	
			F10	Save and Exit	
			ESC	Exit	
v02.54 (C) Copyright 1985-2003, American Megatrends, Inc.					

### 3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.

BIOS SETUP UTILITY					
Main	Advanced	H/W Monitor	Boot	Security	Exit
<b>Boot Settings</b>			Configure Settings during System Boot.		
▶ Boot Settings Configuration					
1st Boot Device	:	[1st Floppy Device]			
2nd Boot Device	:	[HDD: PM-MAXTOR 6L08]			
3rd Boot Device	:	[CD / DVD]			
4th Boot Device	:	[USB]			
▶ Hard Disk Drives					
▶ Removable Drives					
			--	Select Screen	
			↑↓	Select Item	
			Enter	Go to Sub Screen	
			F1	General Help	
			F9	Load Defaults	
			F10	Save and Exit	
			ESC	Exit	
v02.54 (C) Copyright 1985-2003, American Megatrends, Inc.					

### 3.5.1 Boot Settings Configuration



#### Boot From Network

Use this item to enable or disable the Boot From Network feature.

#### VIA SATA Raid Utility

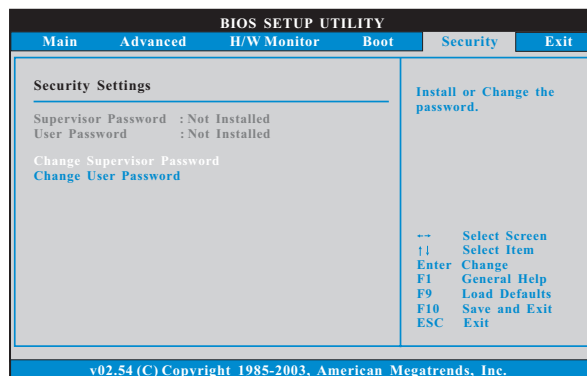
Use this to enable or disable VIA® VT8237R Plus SATA Raid BIOS Utility during POST.

#### Boot Up Num-Lock

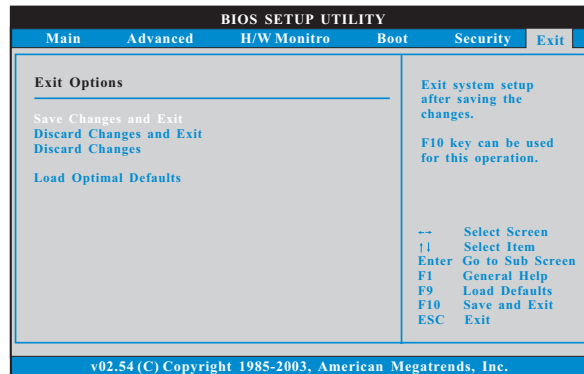
If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

### 3.6 Security Screen

In this section, you may set or change the supervisor/user password for the system. For the user password, you may also clear it.



### 3.7 Exit Screen



#### Save Changes and Exit

When you select this option, it will pop-out the following message, "Save configuration changes and exit setup?" Select [OK] to save the changes and exit the BIOS SETUP UTILITY.

#### Discard Changes and Exit

When you select this option, it will pop-out the following message, "Discard changes and exit setup?" Select [OK] to exit the BIOS SETUP UTILITY without saving any changes.

#### Discard Changes

When you select this option, it will pop-out the following message, "Discard changes?" Select [OK] to discard all changes.

#### Load Optimal Defaults

When you select this option, it will pop-out the following message, "Load optimal defaults?" Select [OK] to load the default values for all the setup configurations.



---

## **4. Software Support**

### **4.1 Install Operating System**

This motherboard supports various Microsoft® Windows® operating systems: 2000 / XP. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer to your OS documentation for more information.

### **4.2 Support CD Information**

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

#### **4.2.1 Running The Support CD**

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

#### **4.2.2 Drivers Menu**

The Drivers Menu shows the available devices drivers. Please install the necessary drivers to activate the devices.

#### **4.2.3 Utilities Menu**

The Utilities Menu shows the applications software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

#### **4.2.4 Contact Information**

If you need to contact ASRock or want to know more about ASRock, welcome to visit ASRock's website at <http://www.asrock.com>; or you may contact your dealer for further information.