



**P5CR-VM**

# Motherboard

**E1835**

**First Edition V1  
January 2005**

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# Notices

## Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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## Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**This class B digital apparatus complies with Canadian ICES-003.**

# Safety information

## Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

## Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

# About this guide

This user guide contains the information you need when installing and configuring the motherboard.

## How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**  
This chapter describes the features of the motherboard and the new technology it supports.
- **Chapter 2: Hardware information**  
This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.
- **Chapter 3: Powering up**  
This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.
- **Chapter 4: BIOS setup**  
This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.
- **Appendix: Reference information**  
This appendix includes additional information that you may refer to when configuring the motherboard.

## Where to find more information

Refer to the following sources for additional information and for product and software updates.

### 1. ASUS websites

The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

### 2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.



## Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



**DANGER/WARNING:** Information to prevent injury to yourself when trying to complete a task.



**CAUTION:** Information to prevent damage to the components when trying to complete a task.



**IMPORTANT:** Instructions that you **MUST** follow to complete a task.



**NOTE:** Tips and additional information to help you complete a task.

## Typography

### **Bold text**

Indicates a menu or an item to select.

### *Italics*

Used to emphasize a word or a phrase.

### <Key>

Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key.

Example: <Enter> means that you must press the Enter or Return key.

### <Key1+Key2+Key3>

If you must press two or more keys simultaneously, the key names are linked with a plus sign (+).

Example: <Ctrl+Alt+D>

### **Command**

Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets.

Example: At the DOS prompt, type the command line:

**afudos /i[filename]**

**afudos /iP5CR-VM.ROM**

## P5CR-VM specifications summary

<b>CPU</b>	LGA775 socket for Intel® Pentium® 4 processor with Extended Memory 64-bit Technology (EM64T) Supports Intel® Hyper-Threading Technology
<b>Chipset</b>	Northbridge: Intel® E7221 Memory Controller Hub (MCH) Southbridge: Intel® ICH6R
<b>Front Side Bus</b>	800/533 MHz
<b>Memory</b>	Dual-channel memory architecture 4 x 240-pin DIMM sockets support ECC/non-ECC unbuffered 533/400 MHz DDR2 memory modules Supports 256 MB up to 4 GB of system memory
<b>Expansion slots</b>	2 x PCI 33 MHz/32-bit/5V (PCI 2.3) 1 x PCI Express™ x8 slot (PCI Express™ 1.0a) 1 x PCI Express™ x1 slot (PCI Express™ 1.0a) 1 x Mini-PCI socket for the ASUS Server Management Board
<b>Storage</b>	Intel® ICH6R Southbridge supports: <ul style="list-style-type: none"> <li>- 2 x Ultra DMA 100/66/33 hard disk drives</li> <li>- 4 x Serial ATA hard disks with RAID 0, RAID 1 configuration</li> </ul>
<b>LAN</b>	Dual Broadcom BCM5721 Gigabit LAN controller (PCI Express™ 1.0a specifications compliant)
<b>USB</b>	Intel® ICH6R Southbridge supports: <ul style="list-style-type: none"> <li>- 8 x USB 2.0 ports (2 on the rear panel, 6 at midboard)</li> </ul>
<b>Special features</b>	ASUS Smart Fan ASUS CrashFree BIOS 2 ASUS EZ Flash ASUS MyLogo2™
<b>BIOS features</b>	AMI BIOS, 8 MB FWH, Green, PnP, DMI2.0a, ACPI 2.0A, SMBIOS 2.3, Trend ChipAway Virus™ (TCAV) software
<b>Rear panel</b>	1 x PS/2 mouse port 1 x PS/2 keyboard port 2 x USB 2.0 ports 1 x Parallel port 1 x Serial (COM1) port 2 x LAN (RJ-45) ports 1 x VGA port

(continued on the next page)

## P5CR-VM specifications summary

<b>Internal connectors</b>	1 x Floppy disk drive connector 1x IDE connector 4 x Serial ATA connectors 2 x CPU fan connectors 4 x System fan connectors 3 x USB connectors 1 x 24-pin SSI power connector 1 x 4-pin ATX 12 V power connector 1 x Serial port connector 1 x Backplane SMBus connector 1 x Power supply SMBus connector 1 x BMC connector 1 x TRPWR connector 1 x Auxiliary panel connector 1 x System panel connector
<b>Power Requirement</b>	SSI power supply (with 24-pin and 4-pin 12 V plugs) ATX 12 V 2.0 compliant
<b>Form Factor</b>	uATX form factor: 9.6 in x 9.6 in (25 cm x 25 cm)
<b>Support CD contents</b>	Device drivers ASUS Live Update utility ASUS System Web-based Management (ASWM®)

\*Specifications are subject to change without notice.



This chapter describes the motherboard features and the new technologies it supports.

# Product introduction



# Chapter summary



1.1	Welcome! .....	1-1
1.2	Package contents .....	1-1
1.3	Special features .....	1-2

## 1.1 Welcome!

**Thank you for buying an ASUS® P5CR-VM motherboard!**

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

## 1.2 Package contents

Check your motherboard package for the following items.

<b>Motherboard</b>	ASUS P5CR-VM motherboard
<b>Cables</b>	2-in-1 disk drive cable (IDE and floppy disk drive cable) 4 x Serial ATA signal cables 4 x Serial ATA power cables
<b>Accessory</b>	I/O shield
<b>Application CD</b>	ASUS motherboard support CD
<b>Documentation</b>	User guide



If any of the above items is damaged or missing, contact your retailer.

## 1.3 Special features

### 1.3.1 Product highlights

#### Latest processor technology



The motherboard comes with a 775-pin surface mount Land Grid Array (LGA) socket designed for the Intel® Pentium® 4 processor in the 775-land package. The motherboard supports the Intel® Pentium® 4 processor with 800/533 MHz Front Side Bus (FSB). The motherboard also supports the Intel® Hyper-Threading technology and is fully compatible with Intel® O4B and O4A processors. See page 2-6 for details.

#### Intel® E7221/Intel® ICH6R chipset

The Intel® E7221 Memory Controller Hub (MCH) and Intel® ICH6R I/O controller hub (ICH) provide the vital interfaces for the motherboard.

The MCH provides the processor, dual-channel DDR2 memory, and x8 PCI Express interfaces. The integrated graphics engine supports standard SVGA display. The ICH is a new generation server class I/O controller hub that provides bridging functions for the PCI Express and PCI interface.

#### DDR2 533/400 memory support



The motherboard supports DDR2 memory, which features data transfer rates of 533/400 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR2 architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 8.5 GB/s. See page 2-13 for details.

#### Serial ATA technology



The motherboard supports the Serial ATA technology through the Serial ATA interfaces controlled by the Intel® ICH6R Southbridge. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 150 MB/s data transfer rate. See page 2-26 for details.

#### Built-in RAID solution



The Intel® ICH6R allows RAID 0 and RAID 1 configuration for four Serial ATA connectors. See page 2-26 for details.



## PCI Express™ interface

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high speed interface is software compatible with existing PCI specifications. See page 2-17 for details.

## Gigabit LAN solution

The motherboard comes with onboard dual Gigabit LAN controllers to provide a total solution for your networking needs. The onboard Broadcom BCM5721 controllers use the PCI Express interface with a network throughput close to Gigabit bandwidth. See pages 2-20, 2-21, and 2-23 for details.

## USB 2.0 technology

The motherboard implements the Universal Serial Bus (USB) 2.0 specification, dramatically increasing the connection speed from the 12 Mbps bandwidth on USB 1.1 to a fast 480 Mbps on USB 2.0. USB 2.0 is backward compatible with USB 1.1. See pages 2-23 and 2-28 for details.

## Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC W83792AD to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The ASIC monitors the voltage levels to ensure stable supply of current for critical components. See page 4-30 for details.

## 1.3.2 Innovative ASUS features

### ASUS Smart Fan technology



The ASUS Smart Fan technology smartly adjusts the fan speeds according to the system loading to ensure quiet, cool, and efficient operation. See page 4-30 for details.

### ASUS CrashFree BIOS 2



This feature allows you to restore the original BIOS data from the support CD in case when the BIOS codes and data are corrupted. This protection eliminates the need to buy a replacement ROM chip. See page 4-6 for details.

### ASUS MyLogo2™



This feature allows you to personalize and add style to your system with customizable boot logos. See page 4-32 for details.

### ASUS EZ Flash BIOS



With the ASUS EZ Flash, you can easily update the system BIOS even before loading the operating system. No need to use a DOS-based utility or boot from a floppy disk. See page 4-5 for details.

### ASUS Update

This utility allows you to update the motherboard BIOS through a user-friendly interface. Connect to the Internet then to the ASUS FTP site nearest you to obtain the latest BIOS version for your motherboard. See page 4-8 for details.

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

# Hardware information



## Chapter summary



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2.6	Jumpers .....	2-18
2.7	Connectors .....	2-23

## 2.1 Before you proceed

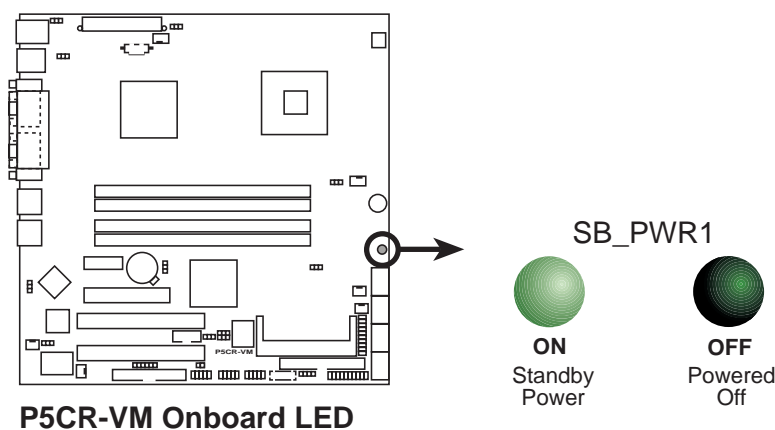
Take note of the following precautions before you install motherboard components or change any motherboard settings.



- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- **Before you install or remove any component, ensure that the power supply 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.

### Onboard LED

The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.



## 2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.



Make sure to unplug the chassis power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

### 2.2.1 Placement direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

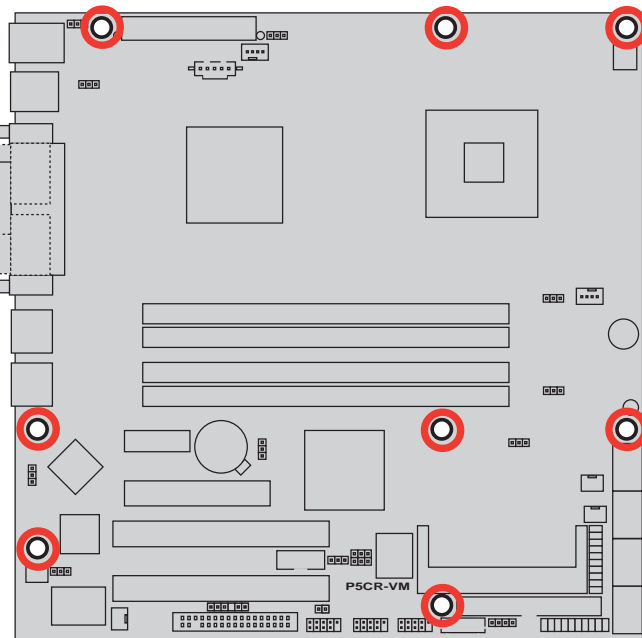
### 2.2.2 Screw holes

Place eight (8) screws into the holes indicated by circles to secure the motherboard to the chassis.

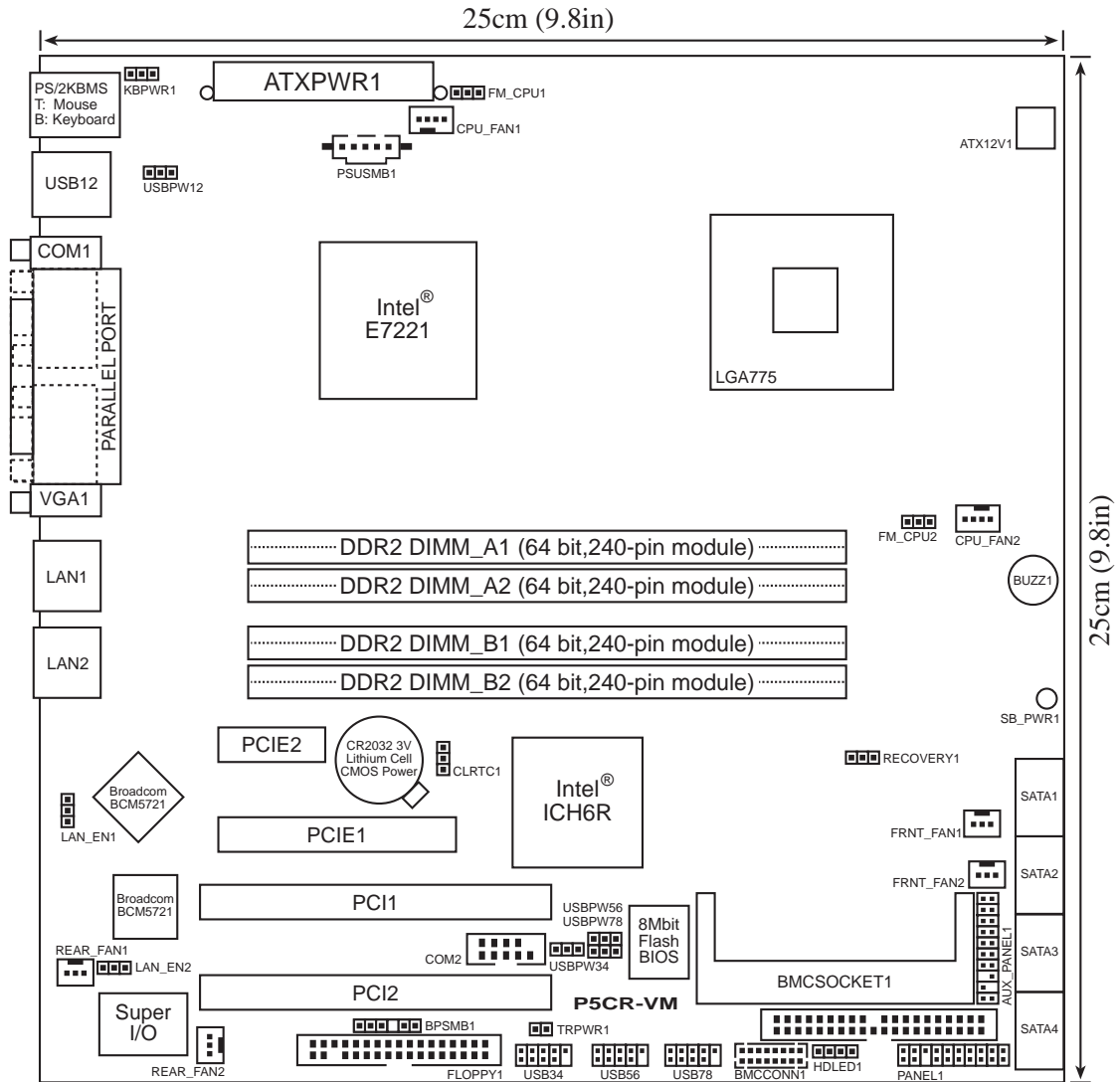


Do not overtighten the screws! Doing so can damage the motherboard.

Place this side towards  
the rear of the chassis



## 2.2.3 Motherboard layout



## 2.2.4 Layout contents

Slots	Page
1. CPU socket	2-6
2. DDR2 DIMM sockets	2-13
3. PCI/PCI Express slots	2-17

Jumpers	Page
1. Clear RTC RAM (CLRRTC1)	2-18
2. CPU fan mode selection (3-pin FM_CPU1, FM_CPU2)	2-19
3. USB device wake-up (3-pin USBPW12, USBPW34, USBPW56 USBPW78)	2-19
4. Keyboard and mouse power (3-pin KBPWR1)	2-20
5. Gigabit LAN controller setting (3-pin LAN_EN1)	2-20
6. Gigabit LAN controller setting (3-pin LAN_EN2)	2-21
7. BIOS recovery (3-pin RECOVERY1)	2-22

Rear panel connectors	Page
1. PS/2 mouse port	2-23
2. Parallel port	2-23
3. PS/2 keyboard port	2-23
4. USB 2.0 ports 1 and 2	2-23
5. Serial (COM1) port	2-23
6. VGA port	2-23
7. LAN 1 (RJ-45) port	2-23
8. LAN 2 (RJ-45) port	2-23



Internal connectors	Page
1. Floppy disk drive connector (34-1 pin FLOPPY1)	2-24
2. IDE connector (40-1 pin PRI_IDE1))	2-25
3. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)	2-26
5. CPU fan connectors (4-pin CPU_FAN1/CPU_FAN2))	2-27
6. System fan connectors (3-pin REAR_FAN1/REAR_FAN2, FRNT_FAN1/FRNT_FAN2)	2-27
7. Hard disk activity LED connector (4-pin HDLED1)	2-28
8. USB connectors (10-1 pin USB34, USB56, USB78)	2-28
8. SSI power connectors (24-pin ATXPWR1, 4-pin ATX12V1)	2-29
9. Serial port connector (10-1 pin COM2)	2-30
10. Backplane SMBus connector (6-1 pin BPSMB1)	2-30
11. Power supply SMBus connector (5-pin PSUSMB1)	2-31
12. BMC connector (16-pin BMCCONN1)	2-31
13. TRPWR connector (2-pin TRPWR1)	2-32
14. Auxiliary panel connector (20-pin AUX_PANEL1)	2-33
<ul style="list-style-type: none"> <li>• Chassis Intrusion connector (3-pin CASEOPEN)</li> <li>• LAN1 link activity LED (2-pin LAN1_LINKACTLED)</li> <li>• LAN2 link activity LED (2-pin LAN2_LINKACTLED)</li> <li>• Locator LED 1 (2-pin LOCATORLED1)</li> <li>• Locator LED 2 (2-pin LOCATORLED2)</li> <li>• Locator Button/Switch (2-pin LOCATORBTN)</li> <li>• Front Panel SMBus (6-1 pin)</li> </ul>	
15. System panel connector (20-pin PANEL1)	2-34
<ul style="list-style-type: none"> <li>• System power LED (Green 3-pin PLED)</li> <li>• Hard disk drive activity LED (Red 2-pin HDLED)</li> <li>• System warning speaker (Orange 4-pin SPEAKER)</li> <li>• ATX power button/soft-off button (Yellow 2-pin POWERBTN)</li> <li>• Reset button (Blue 2-pin RESETCON)</li> </ul>	

## 2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount LGA775 socket designed for the Intel® Pentium® 4 processor in the 775-land package.

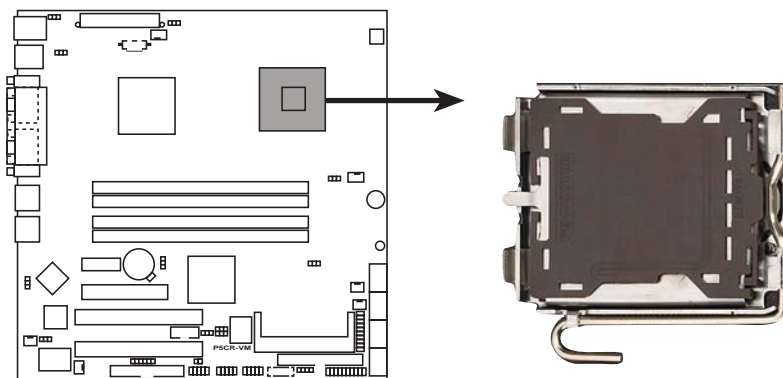


- Your boxed Intel® Pentium® 4 LGA775 processor package should come with installation instructions for the CPU, heatsink, and the retention mechanism. If the instructions in this section do not match the CPU documentation, follow the latter.
- Upon purchase of the motherboard, make sure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.
- Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the LGA775 socket.
- The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

### 2.3.1 Installing the CPU

To install a CPU:

1. Locate the CPU socket on the motherboard.

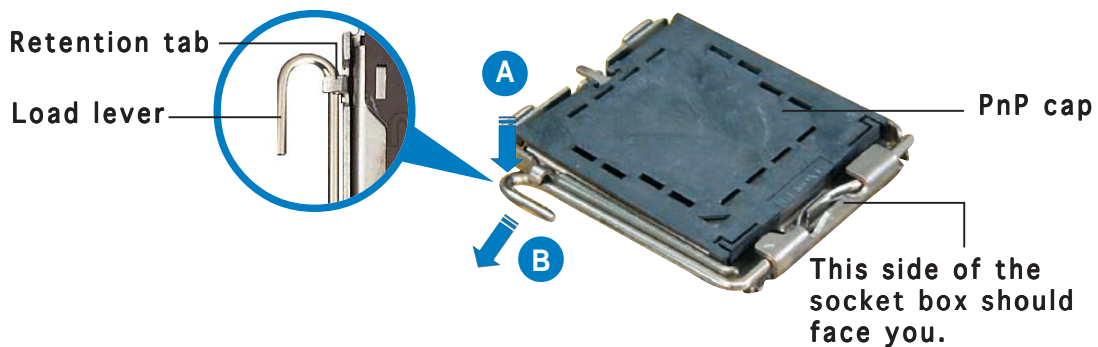


**P5CR-VM CPU Socket 775**



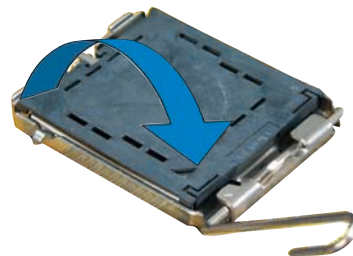
Before installing the CPU, make sure that the socket box is facing towards you and the load lever is on your left.

2. Press the load lever with your thumb (A), then move it to the left (B) until it is released from the retention tab.

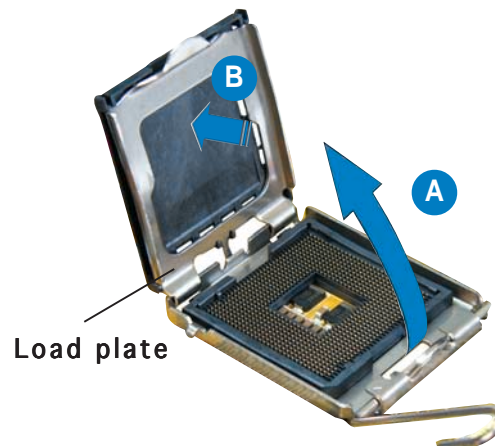


To prevent damage to the socket pins, do not remove the PnP cap unless you are installing a CPU.

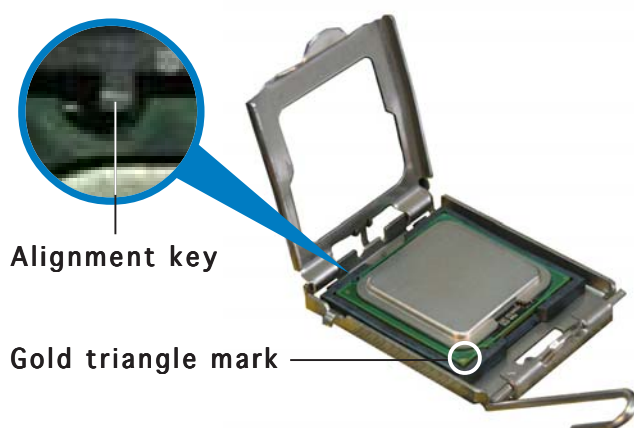
3. Lift the load lever in the direction of the arrow to a 135° angle.



4. Lift the load plate with your thumb and forefinger to a 100° angle (A), then push the PnP cap from the load plate window to remove (B).



5. Position the CPU over the socket, making sure that the gold triangle is on the bottom-left corner of the socket. The socket alignment key should fit into the CPU notch.



6. Close the load plate (A), then push the load lever (B) until it snaps into the retention tab.



---

The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU!

---

## Notes on Intel® Hyper-Threading Technology



- This motherboard supports Intel® Pentium® 4 CPUs in the 775-land package with Hyper-Threading Technology.
  - Hyper-Threading Technology is supported under Windows® 2000 Advanced Server, Windows® 2003 Server, and Linux 2.4.x (kernel) and later versions only. Under Linux, use the Hyper-Threading compiler to compile the code. If you are using any other operating systems, disable the Hyper-Threading Technology item in the BIOS to ensure system stability and performance.
  - Make sure to enable the Hyper-Threading Technology item in BIOS before installing a supported operating system.
  - For more information on Hyper-Threading Technology, visit [www.intel.com/info/hyperthreading](http://www.intel.com/info/hyperthreading).
- 

To use the Hyper-Threading Technology on this motherboard:

1. Install an Intel® Pentium® 4 CPU that supports Hyper-Threading Technology.
2. Power up the system and enter the BIOS Setup (see Chapter 4: BIOS setup). Under the Advanced Menu, make sure that the item Hyper-Threading Technology is set to Enabled. The item appears only if you installed a CPU that supports Hyper-Threading Technology.
3. Reboot the computer.

## 2.3.2 Installing the CPU heatsink and fan

The Intel® Pentium® 4 LGA775 processor requires a specially designed heatsink and fan assembly to ensure optimum thermal condition and performance.



- When you buy a boxed Intel® Pentium® 4 processor, the package includes the CPU fan and heatsink assembly.
- If you buy a CPU separately, we recommend that you use ASUS-certified multi-directional heatsink and fan. Visit the ASUS website for ([www.asus.com](http://www.asus.com)) for the updated list of certified heatsink and fan.
- Your Intel® Pentium® 4 LGA775 heatsink and fan assembly comes in a push-pin design and requires no tool to install.
- If you purchased a separate CPU heatsink and fan assembly, make sure that you have properly applied Thermal Interface Material to the CPU heatsink or CPU before you install the heatsink and fan assembly.



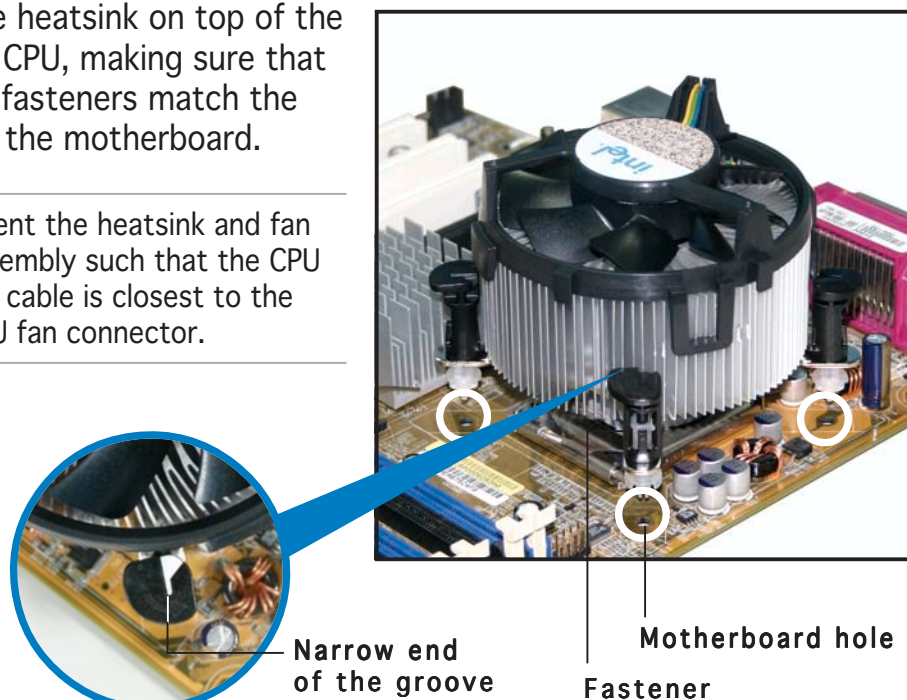
Make sure that you have installed the motherboard to the chassis before you install the CPU fan and heatsink assembly.

To install the CPU heatsink and fan:

1. Place the heatsink on top of the installed CPU, making sure that the four fasteners match the holes on the motherboard.

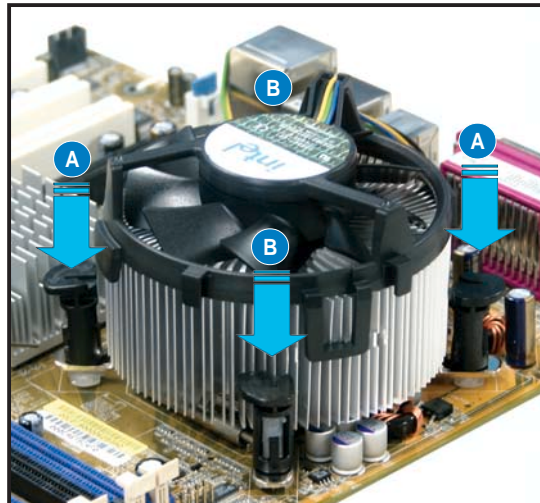
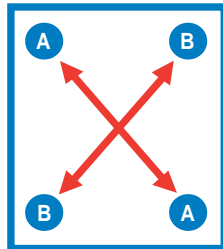


Orient the heatsink and fan assembly such that the CPU fan cable is closest to the CPU fan connector.

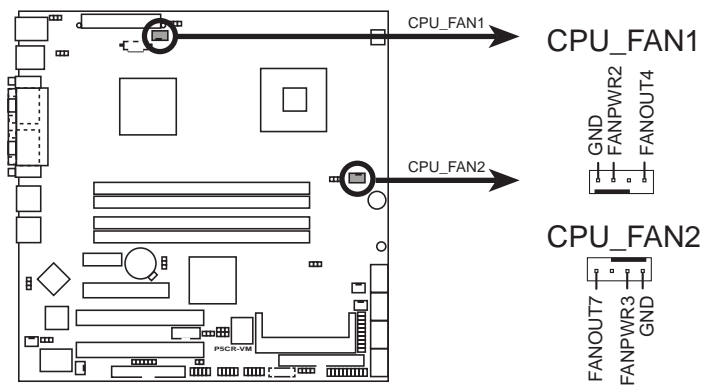


Make sure to orient each fastener with the narrow end of the groove pointing outward. (The photo shows the groove shaded for emphasis.)

2. Push down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.



3. Connect the CPU fan cable to the connectors on the motherboard labeled CPU\_FAN1/CPU\_FAN2.



**P5CR-VM CPU fan connectors**



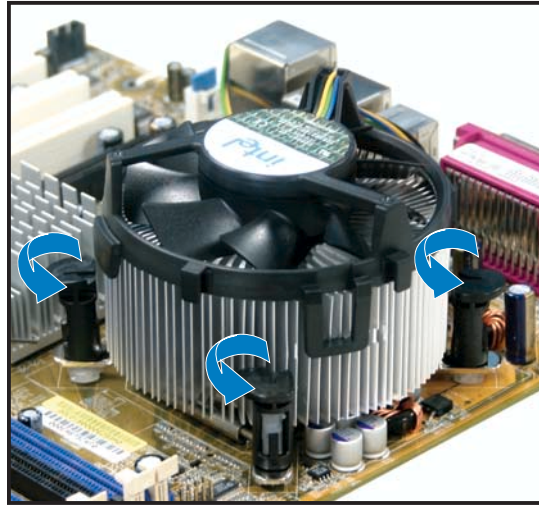
- Do not forget to connect the CPU fan connector! Hardware monitoring errors can occur if you fail to plug this connector.
- If there is only one CPU fan cable, connect it to the connector labeled CPU\_FAN1. Failure to do so may cause hardware monitoring errors.



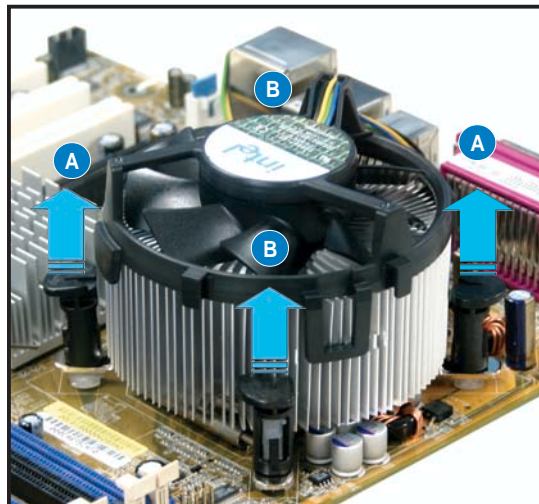
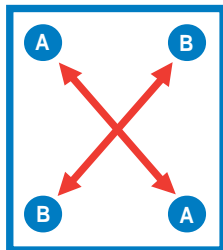
### 2.3.3 Uninstalling the CPU heatsink and fan

To uninstall the CPU heatsink and fan:

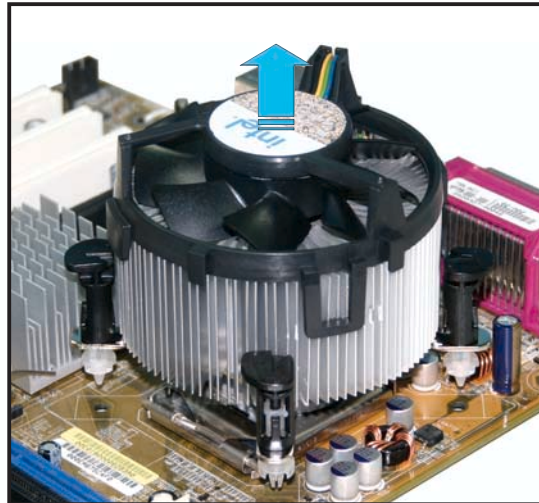
1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Rotate each fastener counterclockwise.



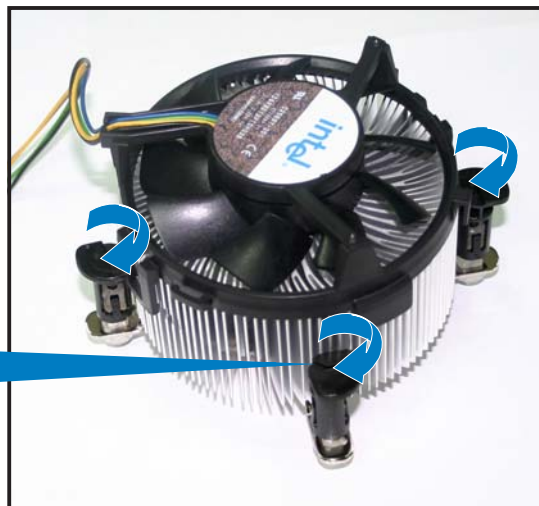
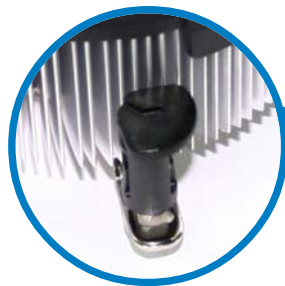
3. Pull up two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard.



- Carefully remove the heatsink and fan assembly from the motherboard.



- Rotate each fastener clockwise to ensure correct orientation when reinstalling.



**Narrow end of the groove**



The narrow end of the groove should point outward after resetting. (The photo shows the groove shaded for emphasis.)





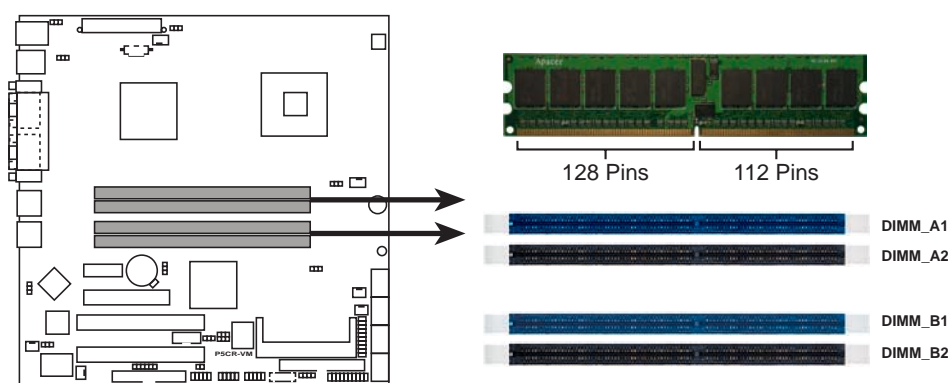
## 2.4 System memory

### 2.4.1 Overview

The motherboard comes with four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 240-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched to match the break on the socket and ensure correct installation.

The figure illustrates the location of the DDR2 DIMM sockets:



**P5CR-VM 240-pin DDR2 DIMM sockets**

### 2.4.2 Memory configurations

You may install 256 MB, 512 MB and 1 GB unbuffered ECC/non-ECC DDR2 DIMMs into the DIMM sockets.



- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Due to chipset resource allocation, the system may detect less than 4 GB system memory when you installed four 1 GB DDR2 memory modules.

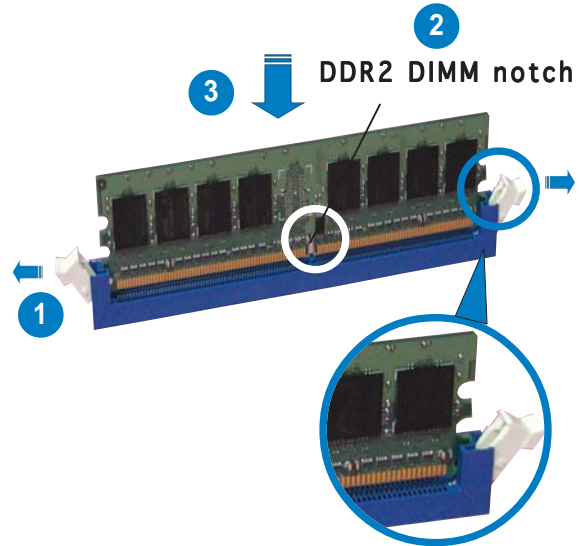
## 2.4.3 Installing a DIMM



Unplug the power supply before adding or removing DIMMs or other system components. Failure to do so can cause severe damage to both the motherboard and the components.

To install a DIMM:

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



Unlocked retaining clip



- A DDR2 DIMM is keyed with a notch so that it fits in only one direction. Do not force a DIMM into a socket to avoid damaging the DIMM.
- The DDR2 DIMM sockets do not support DDR DIMMs. DO not install DDR DIMMs to the DDR2 DIMM sockets.

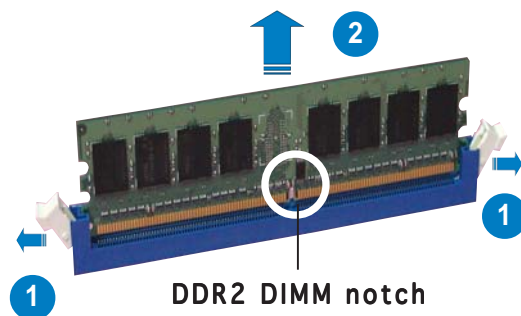
## 2.4.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.



Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.



2. Remove the DIMM from the socket.

## 2.5 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.



---

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

---

### 2.5.1 Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

### 2.5.2 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.



---

When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

---

## 2.5.3 Interrupt assignments

### Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	—	Re-direct to IRQ #9
3	11	Communications Port (COM2)*
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI steering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT1)*
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI steering*
10	5	IRQ holder for PCI steering*
11	6	IRQ holder for PCI steering*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel
15	10	Secondary IDE Channel

\* These IRQs are usually available for ISA or PCI devices.

### IRQ assignments for this motherboard

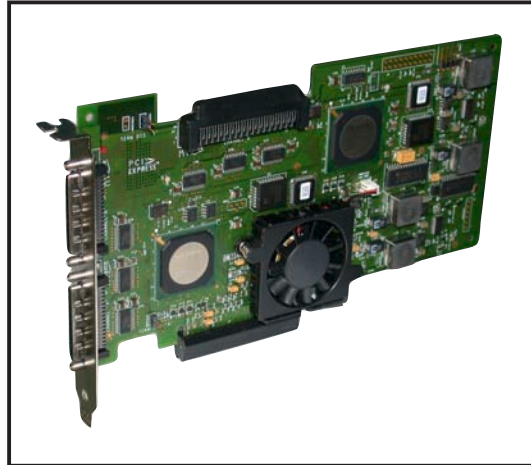
	A	B	C	D	E	F	G	H
PCI slot 1	—	—	—	—	shared	—	—	—
PCI slot 2	—	—	—	—	—	—	shared	—
PCI E x8 slot	shared	—	—	—	—	—	—	—
PCI E x1 slot	shared	—	—	—	—	—	—	—
Onboard USB controller 1	shared	—	—	—	—	—	—	—
Onboard USB controller 2	—	shared	—	—	—	—	—	—
Onboard USB controller 3	—	—	used	—	—	—	—	—
Onboard USB controller 4	—	—	—	shared	—	—	—	—
Onboard USB 2.0 controller	shared	—	—	—	—	—	—	—
Onboard IDE port	shared	—	—	—	—	—	—	—
Onboard SATA port	—	shared	—	—	—	—	—	—
Onboard PCI E x1 LAN1	—	shared	—	—	—	—	—	—
Onboard PCI E x1 LAN2	—	—	shared	—	—	—	—	—



When using PCI cards on shared slots, ensure that the drivers support “Share IRQ” or that the cards do not need IRQ assignments; otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

## 2.5.4 PCI Express x8 slot

The onboard PCI Express x8 slot provides x8 link to the MCH. This slot is designed for various server class high performance add-on cards like SCSI RAID card, fiber-channel card, etc.



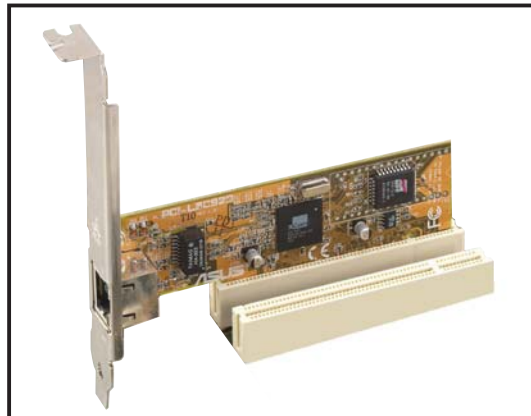
## 2.5.5 PCI Express x1 slot

This motherboard supports PCI Express x1 network cards, SCSI cards, and other cards that comply with PCI Express specifications. The figure shows a network card installed on the PCI Express x1 slot.



## 2.5.6 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI 2.3 specifications. The figure shows a LAN card installed on a PCI slot.



## 2.6 Jumpers

### 1. Clear RTC RAM (CLRTC1)

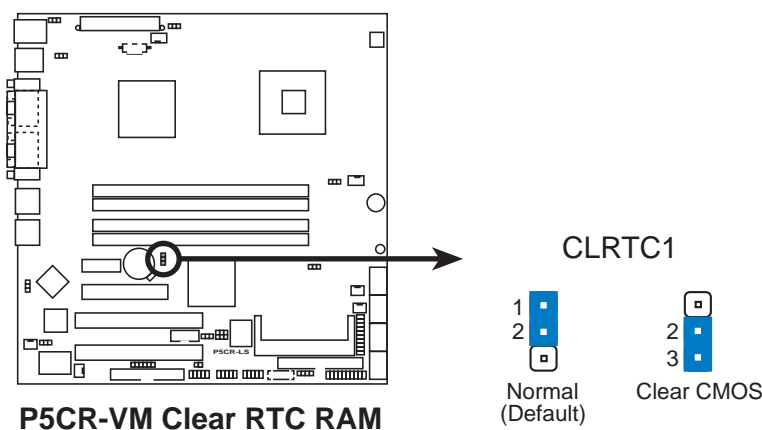
This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Reinstall the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

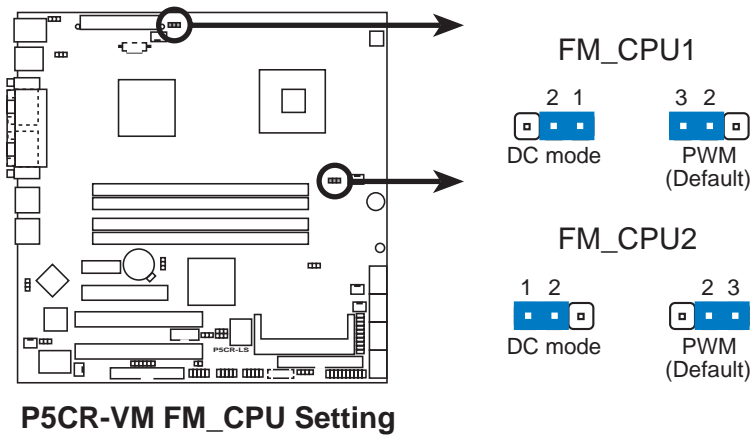


Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



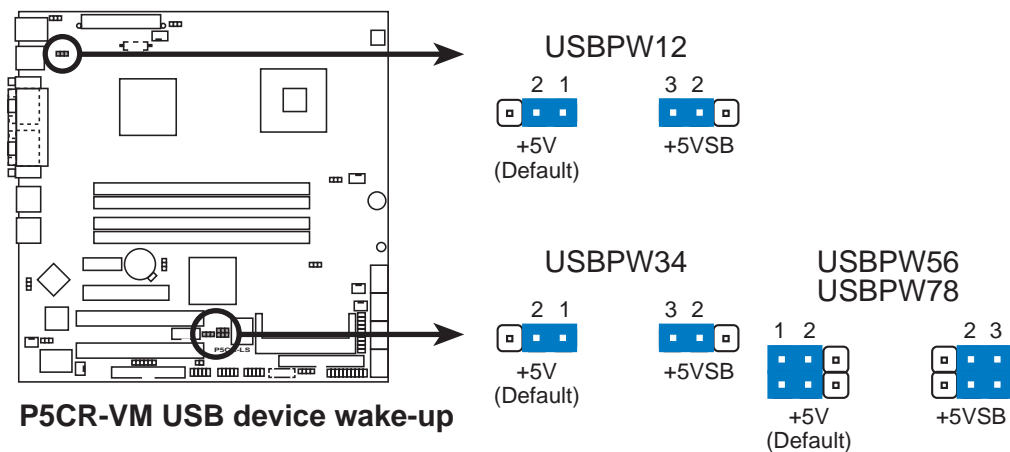
## 2. CPU fan mode selection (3-pin FM\_CPU1, FM\_CPU2)

These jumpers allow you to connect either a 3-pin or a 4-pin fan cable plug to the CPU fan connectors (CPU\_FAN1, CPU\_FAN2). Set these jumpers to pins 1-2 if you are using a 3-pin fan cable plug, or to pins 2-3 if you are using a 4-pin plug.



## 3. USB device wake-up (3-pin USBPW12, USBPW34, USBPW56, USBPW78)

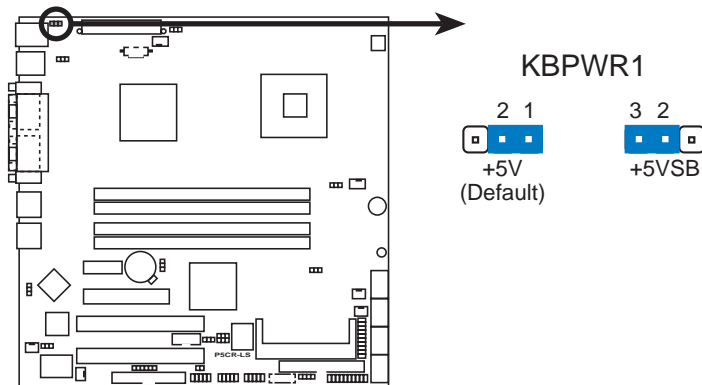
Set these jumpers to +5V to wake up the computer from S1 sleep mode using the connected USB devices. Set to +5VSB to wake up from S4 sleep mode (no power to CPU, DRAM power supply in reduced power mode).



- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

#### 4. Keyboard and mouse power (3-pin KBPWR1)

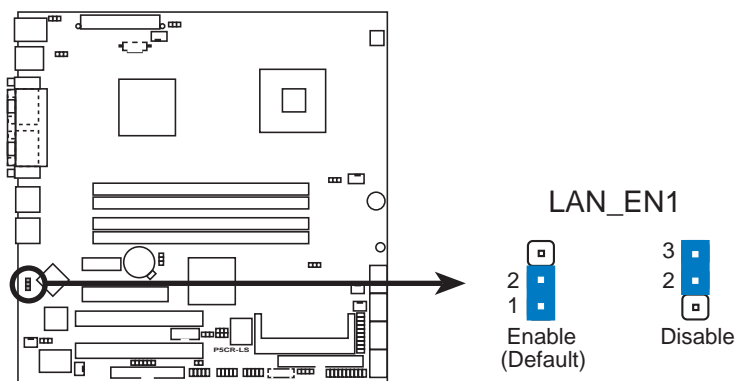
This jumper allows you to enable or disable the keyboard and mouse wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar) or click the mouse. This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



**P5CR-VM Keyboard and mouse power setting**

#### 5. Gigabit LAN controller setting (3-pin LAN\_EN1)

These jumpers allow you to enable or disable the onboard Broadcom BCM5721 Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.

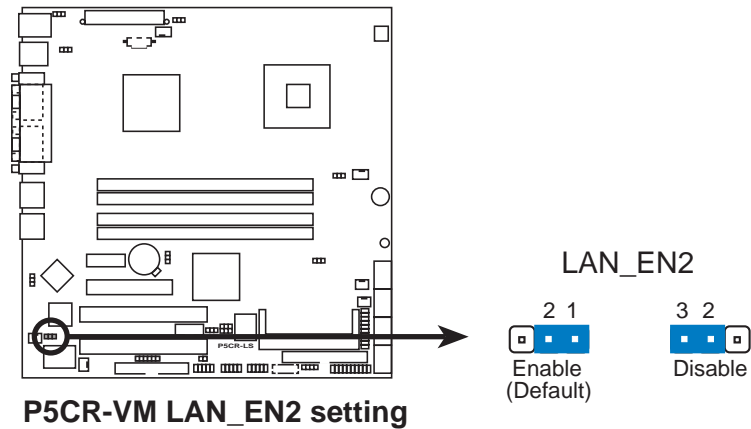


**P5CR-VM LAN\_EN1 setting**



## 6. Gigabit LAN controller setting (3-pin LAN\_EN2)

These jumpers allow you to enable or disable the onboard Broadcom BCM5721 Gigabit LAN controller. Set to pins 1-2 to activate the Gigabit LAN feature.

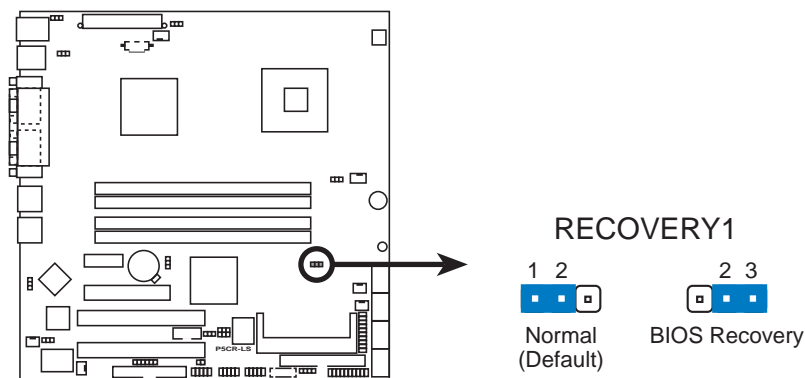


## 7. BIOS recovery (3-pin RECOVERY1)

This jumper allows you to recover your original BIOS from a floppy disk in case the BIOS codes and data are corrupted.

To recover the BIOS:

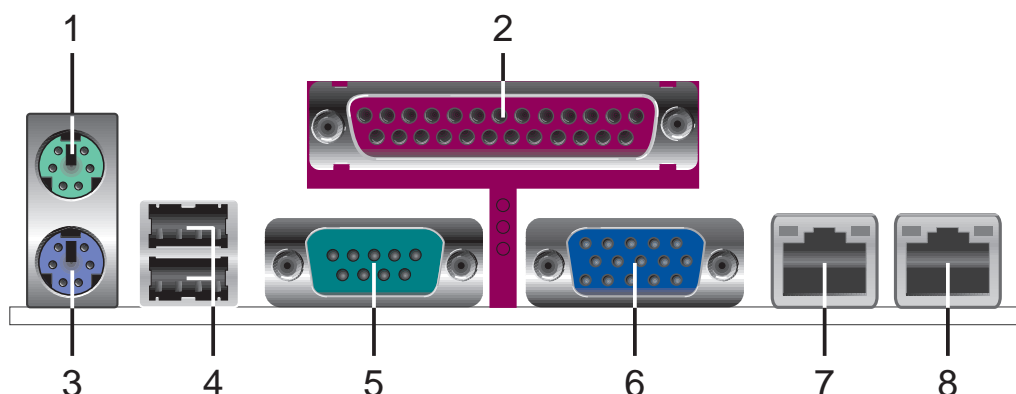
1. Turn OFF your computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3.
3. Insert a floppy disk with the original or updated BIOS file.
4. Plug the power cord and turn ON the computer.
5. The system searches for the BIOS file in the floppy then reflashes the BIOS.
6. When finished, shut down your computer.
7. Replace the jumper cap from pins 2-3 to pins 1-2.
8. Reboot your computer.
9. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.



**P5CR-VM BIOS recovery setting**

## 2.7 Connectors

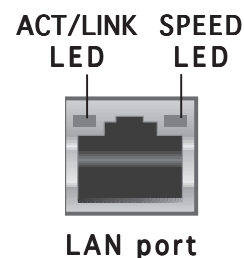
### 2.7.1 Rear panel connectors



1. **PS/2 mouse port (green).** This port is for a PS/2 mouse.
2. **Parallel port.** This 25-pin port connects a parallel printer, a scanner, or other devices.
3. **PS/2 keyboard port (purple).** This port is for a PS/2 keyboard.
4. **USB 2.0 ports 1 and 2.** These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
5. **Serial (COM1) port.** This 9-pin communication port is for pointing devices or other serial devices.
6. **Video Graphics Adapter (VGA) port.** This port is for a VGA monitor or other VGA-compatible devices.
7. **LAN 1 (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.
8. **LAN 2 (RJ-45) port.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

### LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10 Mbps connection
GREEN	Linked	ORANGE	100 Mbps connection
BLINKING	Data activity	GREEN	1 Gbps connection



## 2.7.2 Internal connectors

### 1. Floppy disk drive connector (34-1 pin FLOPPY1)

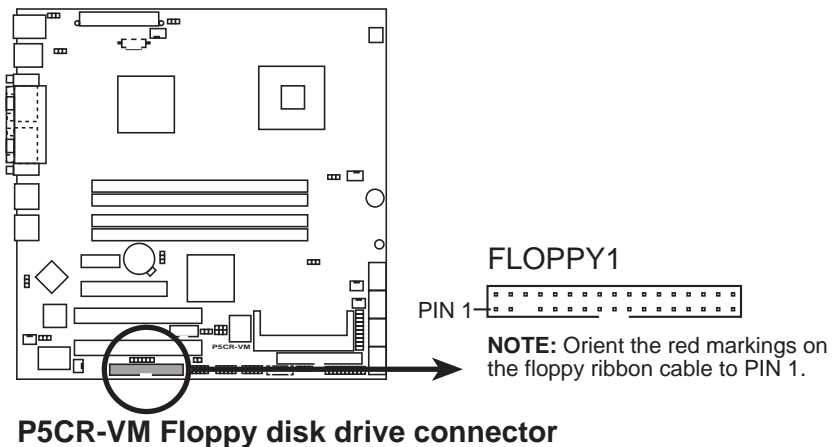
This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.



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Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.

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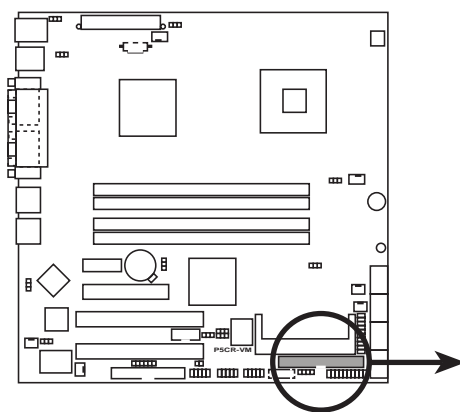


## 2. IDE connector (40-1 pin PRI\_IDE1)

This connector is for an Ultra DMA 100/66 signal cable. The Ultra DMA 100/66 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a black connector for an Ultra DMA 100/66 IDE slave device (optical drive/hard disk drive), and a gray connector for an Ultra DMA 100/66 IDE master device (hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.



- Pin 20 on the IDE connector is removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66 IDE devices.



**P5CR-VM IDE connector**



**PRI\_IDE1**

**NOTE:** Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

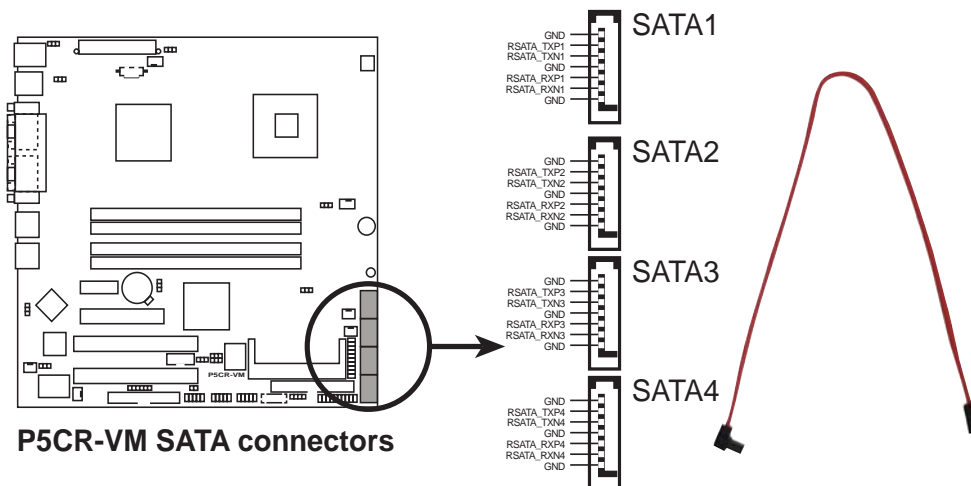
### 3. Serial ATA connectors (7-pin SATA1, SATA2, SATA3, SATA4)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

If you installed Serial ATA hard disk drives, you can create a RAID 0 or RAID 1 configuration with the onboard Intel® ICH6R RAID controller.



These connectors are set to **Standard IDE** mode by default. In **Standard IDE** mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure SATA As** item in the BIOS to [RAID]. See section “4.3.5 IDE Configuration” for details.



#### Important notes on Serial ATA

- You must install Windows® 2000 Service Pack 4, Windows® 2000 Advanced Server, or Windows® Server 2003 before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0 and RAID 1) is available only if you are using Windows® 2000/2003 Server.
- Use only two Serial ATA RAID connectors for each RAID 0 and RAID 1 set.
- When using the connectors in **Standard IDE** mode, connect the primary (boot) hard disk drive to the SATA1 or SATA2 connector. Refer to the table below for the recommended SATA hard disk drive connections.

#### Serial ATA hard disk drive connection

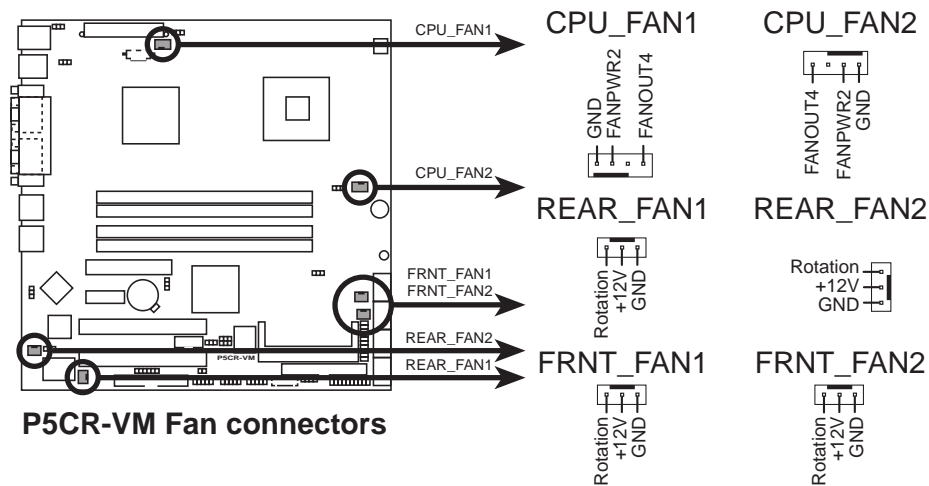
Connector	Setting	Use
SATA1, SATA2	Master	Boot disk
SATA3, SATA4	Slave	Data disk

#### 4. CPU and system fan connectors (4-pin CPU\_FAN1/2, REAR\_FAN1/2, FRNT\_FAN1/2)

The fan connectors support cooling fans of 350 mA ~ 740 mA (8.88 W max.) or a total of 2.1 A ~ 4.44 A (53.28 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

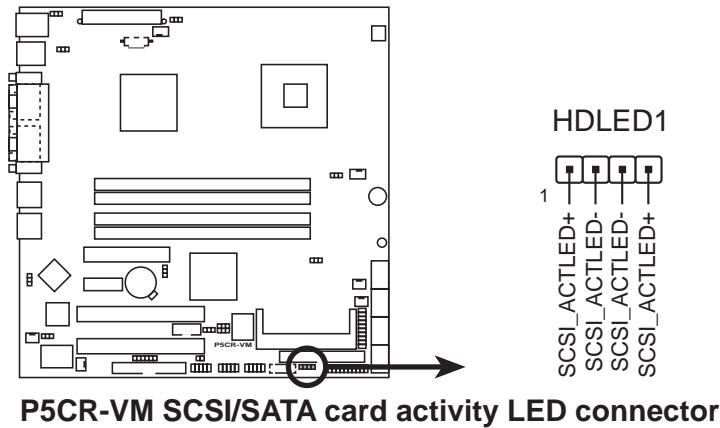


Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!



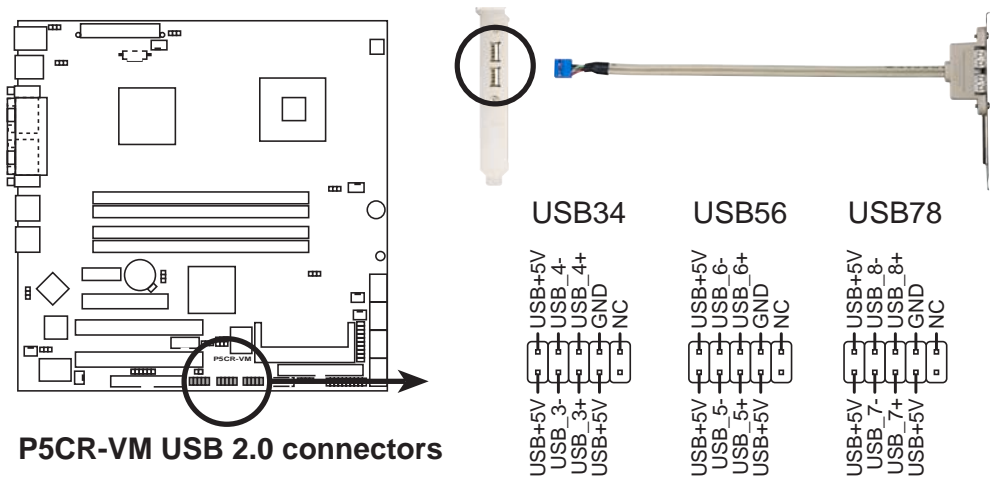
## 5. Hard disk activity LED connector (4-pin HDLED1)

This connector supplies power to the hard disk activity LED. The read or write activities of any device connected to the primary/secondary SCSI connectors or the SATA connectors cause this LED to light up.



## 6. USB connectors (10-1 pin USB34, USB56, USB78)

These connectors are for USB 2.0 ports. Connect the USB module cables to these connectors, then install the module to a slot opening at the back of the system chassis. The USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

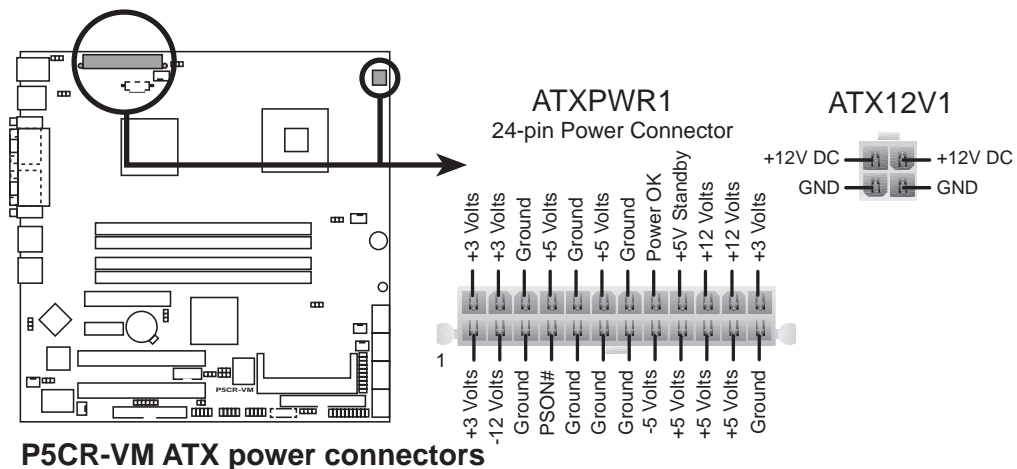


## 7. SSI power connectors (24-pin ATXPWR1, 4-pin ATX12V1)

These connectors are for SSI power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

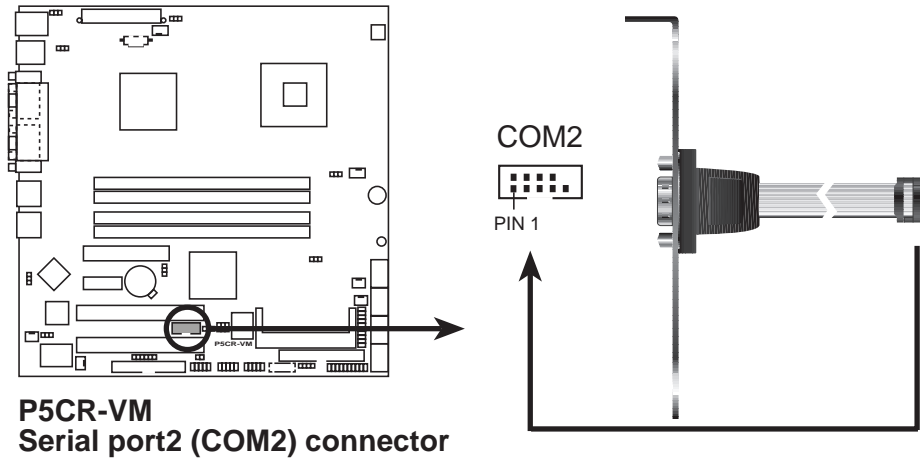


- Use of an SSI 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 450 W is recommended for a fully-configured system.
- Do not forget to connect the 4-pin ATX +12 V power plug; otherwise, the system will not boot up.
- Use of a PSU with a higher power output is recommended when configuring a system with more power consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- You must install a PSU with a higher power rating if you intend to install additional devices.



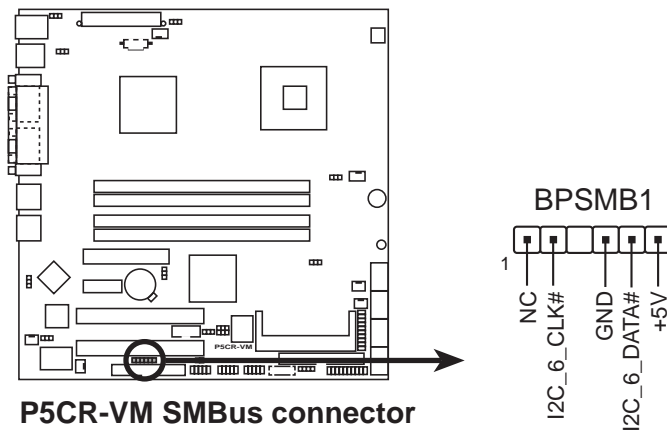
## 8. Serial port connector (10-1 pin COM2)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



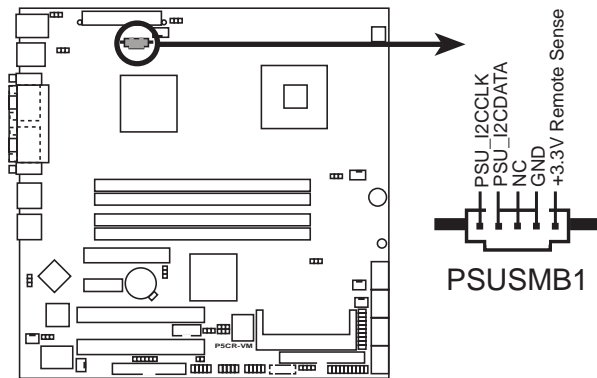
## 9. Backplane SMBus connector (6-1 pin BPSMB1)

This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



## 10. Power supply SMBus connector (5-pin PSUSMB1)

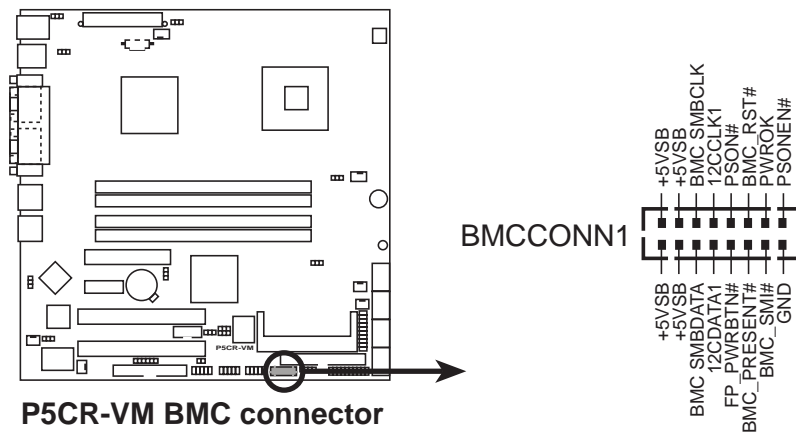
This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



**P5CR-VM Power supply SMBus connector**

## 11. BMC connector (16-pin BMCCONN1)

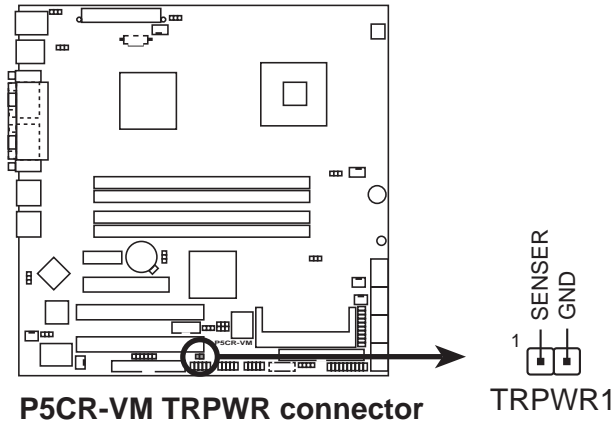
This connector is for an ASUS server management card.



**P5CR-VM BMC connector**

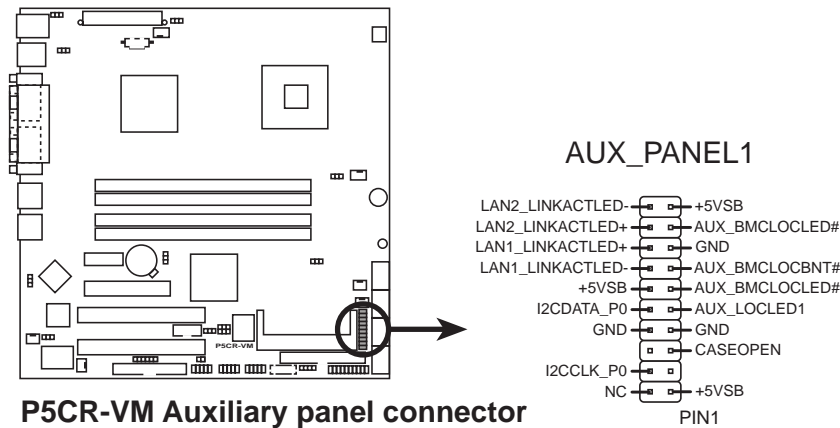
## 12. TRPWR connector (2-pin TRPWR1)

This connector is for an internal temperature sensor/probe.



### 13. Auxiliary panel connector (20-pin AUX\_PANEL1)

This connector supports several server system functions.

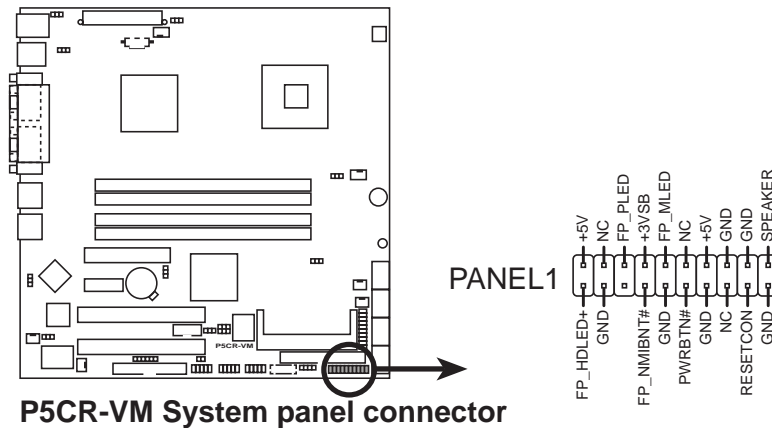


**P5CR-VM Auxiliary panel connector**

- **Chassis Intrusion connector (3-pin CASEOPEN)**  
This lead is for a chassis with an intrusion detection feature. This requires an external detection mechanism such as a chassis intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to this lead to record a chassis intrusion event.
- **LAN1 link activity LED (2-pin LAN1\_LINKACTLED)**  
This 2-pin connector is for the LAN1 Activity LED. Connect the LAN1 Activity LED cable to this connector. This LED blinks during a network activity and is always lit when linked.
- **LAN2 link activity LED (2-pin LAN2\_LINKACTLED)**  
This 2-pin connector is for the LAN2 Activity LED. Connect the LAN2 Activity LED cable to this connector. This LED blinks during a network activity and lights up when linked.
- **Locator LED 1 (2-pin LOCATORLED1)**  
This 2-pin connector is for the Locator LED 1. Connect the Locator LED 1 cable to this connector. This LED lights up when the Locator button is pressed and if there is no LAN1 connection (e.g. the LAN1 controller is broken).
- **Locator LED 2 (2-pin LOCATORLED2)**  
This 2-pin connector is for the Locator LED 2. Connect the Locator LED 2 cable to this connector. This LED is synchronized with the LAN2 LED.
- **Locator Button/Switch (2-pin LOCATORBTN)**  
This connector is for the locator button. This button queries the state of the system locator.
- **Front Panel SMBus (6-1 pin)**  
This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.

## 14. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



P5CR-VM System panel connector



The system panel connector is color-coded for easy connection.

- **System power LED (Green 3-pin PLED)**  
This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Hard disk drive activity LED (Red 2-pin HDLED)**  
This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.
- **System warning speaker (Orange 4-pin SPEAKER)**  
This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
- **ATX power button/soft-off button (Yellow 2-pin PWRBTN)**  
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.
- **Reset button (Blue 2-pin RESETCON)**  
This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

This chapter describes the power up sequence, the vocal POST messages, and ways of shutting down the system.

# Powering up

## Chapter summary

# 3

- 3.1 Starting up for the first time ..... 3-1
- 3.2 Powering off the computer ..... 3-2



## 3.1 Starting up for the first time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off.
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
  - a. Monitor
  - b. External SCSI devices (starting with the last device on the chain)
  - c. System power
6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with “green” standards or if it has a “power standby” feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

The system then runs the power-on self tests or POST. While the tests are running, the BIOS beeps (see BIOS beep codes table below) or additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

### AMI BIOS beep codes

Beep Description	Error
One beep	Keyboard controller error Refresh Time error No master drive detected
Two continuous beeps followed by two short beeps	Floppy controller failure
Two continuous beeps followed by four short beeps	Hardware component failure

7. At power on, hold down the <Delete> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

## 3.2 Powering off the computer

### Using the OS shut down function

If you are using Windows® Server 2000:

1. Click the **Start** button then click **Shut Down...**
2. Make sure that the **Shut Down** option button is selected, then click the **OK** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

If you are using Windows® Server 2003:

1. Click the **Start** button then select **Turn Off Computer.**
2. Click the **Turn Off** button to shut down the computer.
3. The power supply should turn off after Windows® shuts down.

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

# BIOS setup

## Chapter summary

# 4

4.1	Managing and updating your BIOS .....	4-1
4.2	BIOS setup program .....	4-11
4.3	Main menu .....	4-14
4.4	Advanced menu .....	4-19
4.5	Power menu .....	4-29
4.6	Boot menu .....	4-32
4.7	Exit menu .....	4-36

## 4.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a bootable floppy disk.)
2. **ASUS EZ Flash** (Updates the BIOS using a floppy disk during POST.)
3. **ASUS CrashFree BIOS 2** (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
4. **ASUS Update** (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.



---

Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or AFUDOS utilities.

---

### 4.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.

#### DOS environment

- a. Insert a 1.44MB floppy disk into the drive.
- b. At the DOS prompt, type **format A:/S** then press <Enter>.

#### Windows® Server 2003

- a. Insert a 1.44 MB floppy disk to the floppy disk drive.
- b. Click **Start** from the Windows® desktop, then select **My Computer**.
- c. Select the 3 1/2 Floppy Drive icon.
- d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.
- e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

### Windows® 2000 environment

To create a set of boot disks for Windows® 2000:

- a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
  - b. Insert the Windows® 2000 CD to the optical drive.
  - c. Click **Start**, then select **Run**.
  - d. In the **Open** field, type `D:\bootdisk\makeboot a:` assuming that D is your optical drive letter.
  - e. Press <Enter>, then follow screen instructions to continue.
2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

## 4.1.2 AFUDOS utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

### Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:



- Make sure that the floppy disk is not write-protected and has at least 600 KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

```
afudos /o[filename]
```

where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

```
A:\>afudos /oOLDBIOS1 .rom
```

Main filename      Extension name

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19 (ASUS V2.07 (03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
  Reading flash ..... done
  Write to file..... ok
A:\>
```

The utility returns to the DOS prompt after copying the current BIOS file.

## Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website ([www.asus.com](http://www.asus.com)) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.



---

Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

---

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
3. Boot the system in DOS mode, then at the prompt type:

```
afudos /i[filename]
```

where [filename] is the latest or the original BIOS file on the bootable floppy disk.

```
A:\>afudos /iP5CR-VM.ROM
```

4. The utility verifies the file and starts updating the BIOS.

```
A:\>afudos /iP5CR-VM.ROM /pbnc
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... 0x0008CC00 (9%)
```



---

Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

---

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iP5CR-VM.ROM /pbnc
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

WARNING!! Do not turn off power during flash BIOS
Reading file ..... done
Reading flash ..... done

Advance Check .....
Erasing flash ..... done
Writing flash ..... done
Verifying flash .... done

Please restart your computer

A:\>
```



### 4.1.3 ASUS EZ Flash utility

The ASUS EZ Flash feature allows you to update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash utility is built-in the BIOS chip so it is accessible by pressing <Alt> + <F2> during the Power-On Self Tests (POST).

To update the BIOS using EZ Flash:

1. Visit the ASUS website ([www.asus.com](http://www.asus.com)) to download the latest BIOS file for the motherboard and rename the same to **P5CR-VM.ROM**.
2. Save the BIOS file to a floppy disk, then restart the system.
3. Press <Alt> + <F2> during POST to display the following.

```
EZFlash starting BIOS update
Checking for floppy...
```

4. Insert the floppy disk that contains the BIOS file to the floppy disk drive. When the correct BIOS file is found, EZ Flash performs the BIOS update process and automatically reboots the system when done.

```
EZFlash starting BIOS update
Checking for floppy...
Floppy found!
Reading file "P5CR-VM.ROM". Completed.
Start erasing.....|
Start programming...|
Flashed successfully. Rebooting.
```



- Do not shut down or reset the system while updating the BIOS to prevent system boot failure!
- A “Floppy not found!” error message appears if there is no floppy disk in the drive. A “P5CR-VM.ROM not found!” error message appears if the correct BIOS file is not found in the floppy disk. Make sure that you rename the BIOS file to P5CR-VM.ROM.

## 4.1.4 ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or the floppy disk that contains the updated BIOS file.



- Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
- Make sure that you rename the original or updated BIOS file in the floppy disk to **P5CR-VM.ROM**.

### Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "P5CR-VM.ROM". Completed.
Start flashing...
```



**DO NOT** shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

## Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to the optical drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...  
Checking for floppy...
```

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...  
Checking for floppy...  
Floppy not found!  
Checking for CD-ROM...  
CD-ROM found!  
Reading file "P5CR-VM.ROM". Completed.  
Start flashing...
```



---

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

---

4. Restart the system after the utility completes the updating process.



---

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website ([www.asus.com](http://www.asus.com)) to download the latest BIOS file.

---

## 4.1.5 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Save the current BIOS file
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Update the BIOS directly from the Internet, and
- View the BIOS version information.

This utility is available in the support CD that comes with the motherboard package.



---

ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

---

## Installing ASUS Update

To install ASUS Update:

1. Place the support CD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**.
3. The ASUS Update utility is copied to your system.



---

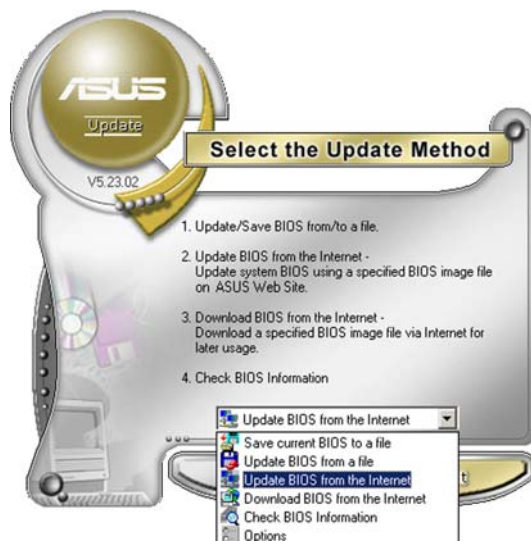
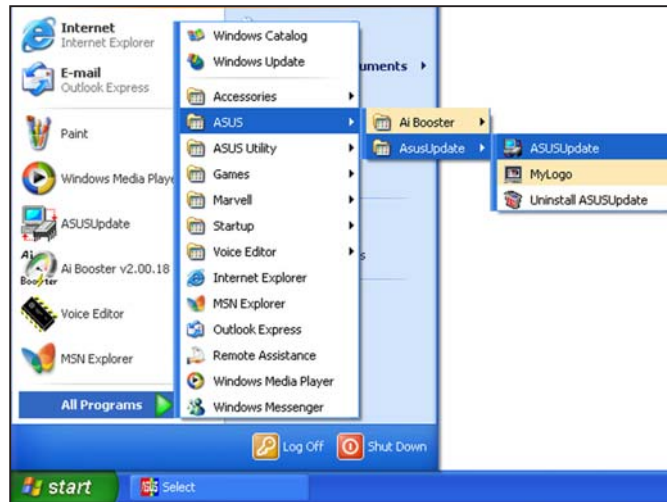
Quit all Windows® applications before you update the BIOS using this utility.

---

## Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.



2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.



3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click Next.
5. Follow the screen instructions to complete the update process.



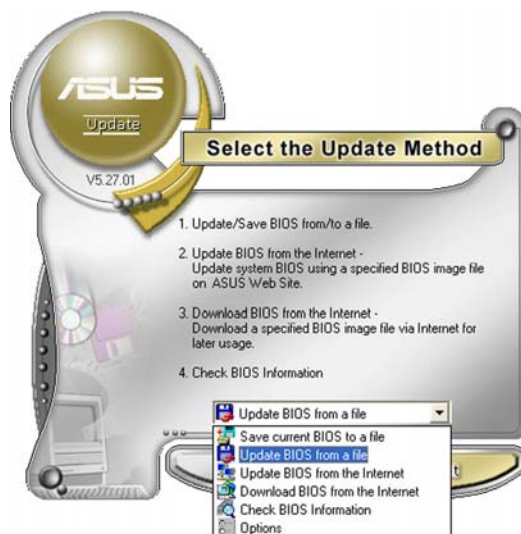
The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail of all its features.



## Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update main window appears.
2. Select **Update BIOS from a file** option from the drop-down menu, then click **Next**.



3. Locate the BIOS file from the **Open** window, then click **Save**.
4. Follow the screen instructions to complete the update process.

## 4.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section “4.1 Managing and updating your BIOS.”

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup.” This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

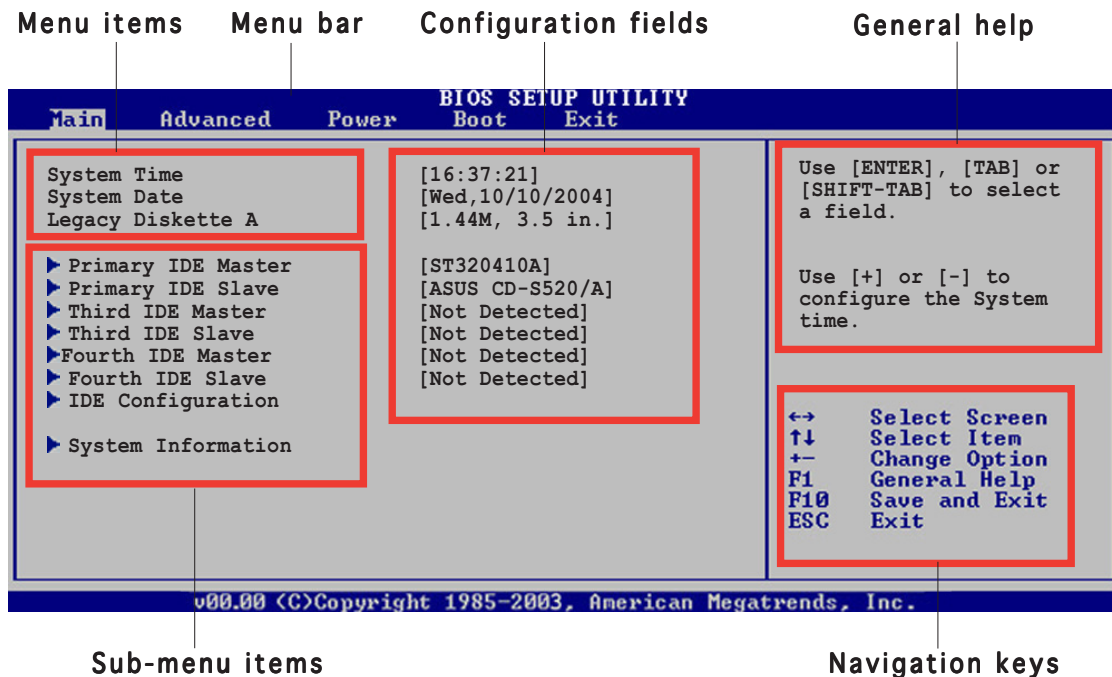
The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.



- 
- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section “4.7 Exit Menu.”
  - The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
  - Visit the ASUS website ([www.asus.com](http://www.asus.com)) to download the latest BIOS file for this motherboard.
-



## 4.2.1 BIOS menu screen



## 4.2.2 Menu bar

The menu bar on top of the screen has the following main items:

<b>Main</b>	For changing the basic system configuration
<b>Advanced</b>	For changing the advanced system settings
<b>Power</b>	For changing the advanced power management (APM) configuration
<b>Boot</b>	For changing the system boot configuration
<b>Exit</b>	For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

## 4.2.3 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.



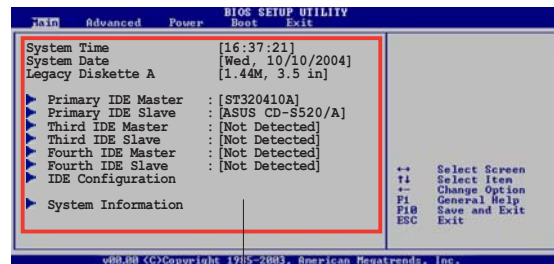
Some of the navigation keys differ from one screen to another.



## 4.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.



Main menu items

## 4.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the item has a sub-menu. To display the sub-menu, select the item and press <Enter>.

## 4.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

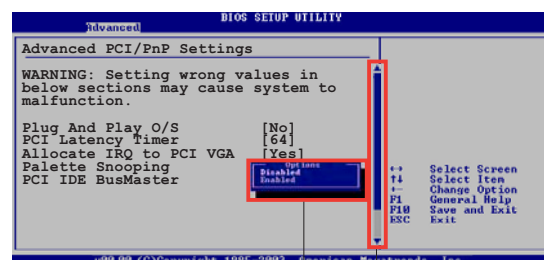
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to “4.2.7 Pop-up window.”

## 4.2.7 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

## 4.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.



Pop-up window

Scroll bar

## 4.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

## 4.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears, giving you an overview of the basic system information.



Refer to section “4.2.1 BIOS menu screen” for information on the menu screen items and how to navigate through them.

```
BIOS SETUP UTILITY
Main  Advanced  Power  Boot  Exit

System Time           [16:37:21]
System Date           [Wed,10/10/2004]
Legacy Diskette A    [1.44M, 3.5 in.]

▶ Primary IDE Master   : [ST320410A]
▶ Primary IDE Slave   : [ASUS CD-S520/A]
▶ Third IDE Master    : [Not Detected]
▶ Third IDE Slave     : [Not Detected]
▶ Fourth IDE Master   : [Not Detected]
▶ Fourth IDE Slave    : [Not Detected]
▶ IDE Configuration

▶ System Information

Use [ENTER], [TAB] or
[SHIFT-TAB] to select
a field.

Use [+] or [-] to
configure the System
time.

↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

v00.00 (C)Copyright 1985-2003, American Megatrends, Inc.
```

### 4.3.1 System Time [xx:xx:xx]

Sets the system time.

### 4.3.2 System Date [Day xx/xx/xxxx]

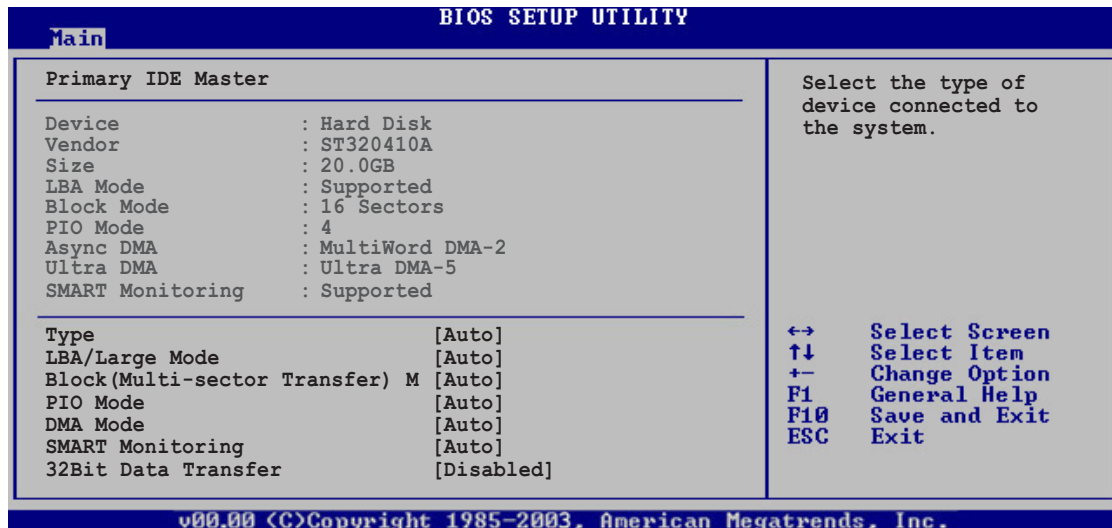
Sets the system date.

### 4.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled]  
[360K, 5.25 in.] [1.2M, 5.25 in.] [720K, 3.5 in.] [1.44M, 3.5 in.]  
[2.88M, 3.5 in.]

### 4.3.4 Primary, Third, and Fourth IDE Master/Slave

While entering Setup, the BIOS automatically detects the presence of IDE devices. There is a separate sub-menu for each IDE device. Select a device item then press <Enter> to display the IDE device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show "Not Detected" if no IDE device is installed in the system.

#### Type [Auto]

Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive. Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

#### LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

#### Block (Multi-sector Transfer) [Auto]

Enables or disables data multi-sectors transfers. When set to Auto, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time. Configuration options: [Disabled] [Auto]

### **PIO Mode [Auto]**

Selects the PIO mode.

Configuration options: [Auto] [0] [1] [2] [3] [4]

### **DMA Mode [Auto]**

Selects the DMA mode. Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

### **SMART Monitoring [Auto]**

Sets the Smart Monitoring, Analysis, and Reporting Technology.

Configuration options: [Auto] [Disabled] [Enabled]

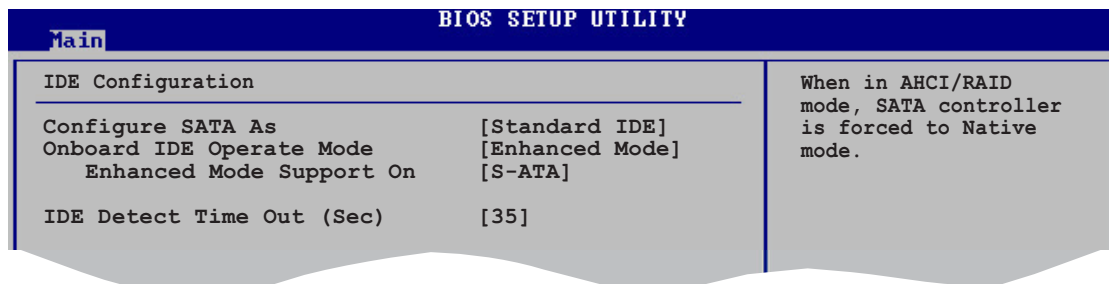
### **32Bit Data Transfer [Disabled]**

Enables or disables 32-bit data transfer.

Configuration options: [Disabled] [Enabled]

## **4.3.5 IDE Configuration**

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you want to configure the item.



### **Configure SATA As [Standard IDE]**

Sets the Serial ATA configuration. When set in Advanced Host Controller Interface (AHCI) or RAID mode the SATA controller is set to Native mode.

Configuration options: [Standard IDE] [AHCI] [RAID]

### **Onboard IDE Operate Mode [Enhanced Mode]**

Allows selection of the IDE operation mode depending on the operating system (OS) that you installed. Set to Enhanced Mode if you are using native OS, such as Windows® 2000/XP. Configuration options: [Disabled] [Compatible Mode] [Enhanced Mode]

### Enhanced Mode Support On [S-ATA]

The default setting SATA allows you to use native OS on Serial ATA and Parallel ATA ports. We recommend that you do not change the default setting for better OS compatibility. In this setting, you may use legacy OS on the Parallel ATA ports **only** if you did not install any Serial ATA device.

The S-ATA+P-ATA and P-ATA options are for advanced users only. If you set to any of these options and encounter problems, revert to the default setting **SATA**. Configuration options: [S-ATA+P-ATA] [S-ATA] [P-ATA]



---

The **Onboard IDE Operate Mode** and its submenu items appear only when the **Configure SATA As** item is set to Standard IDE.

---

### Onboard Serial-ATA BOOTROOM [Disabled]

Enables or disables the onboard Serial ATA boot ROM. Configuration options: [Disabled] [Enabled]



---

The **Onboard Serial-ATA BOOTROM** item appears only when the **Configure SATA As** item is set to RAID.

---

### ALPE and ASP [Disabled]

Enables or disables the ALPE and ASP. Configuration options: [Disabled] [Enabled]

### **Stagger Spinup Support [Disabled]**

Enables or disables the stagger spinup support. Configuration options: [Disabled] [Enabled]

### **AHCI Port 3 Interlock Switch [Disabled]**

Enables or disables the Advanced Host Controller Interface (AHCI) Port 3 interlock switch. Configuration options: [Disabled] [Enabled]



---

The **ALPE and ASP** item appears only when the **Configure SATA As** item is set to AHCI.

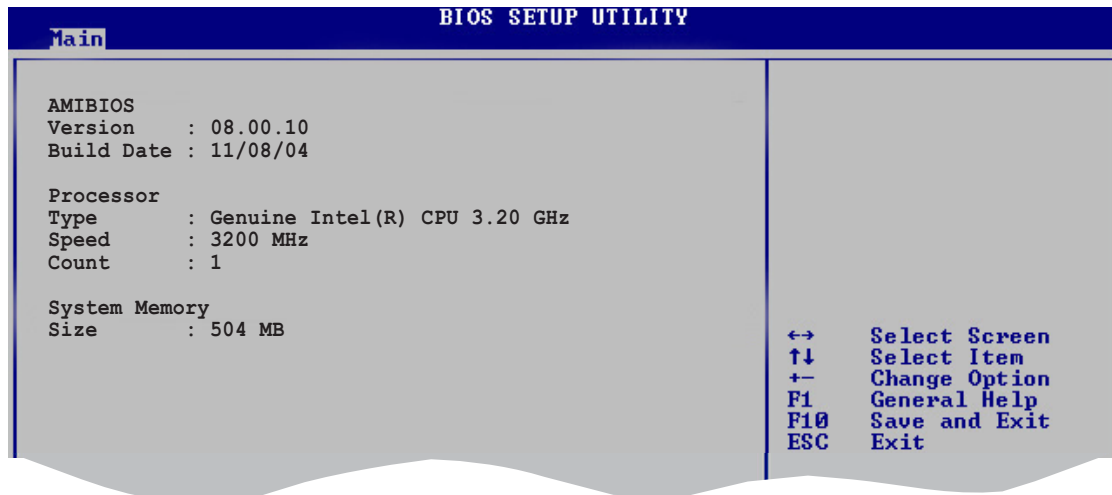
---

## **IDE Detect Time Out [35]**

Selects the time out value for detecting ATA/ATAPI devices. Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

## 4.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



### AMI BIOS

Displays the auto-detected BIOS information

### Processor

Displays the auto-detected CPU specification

### System Memory

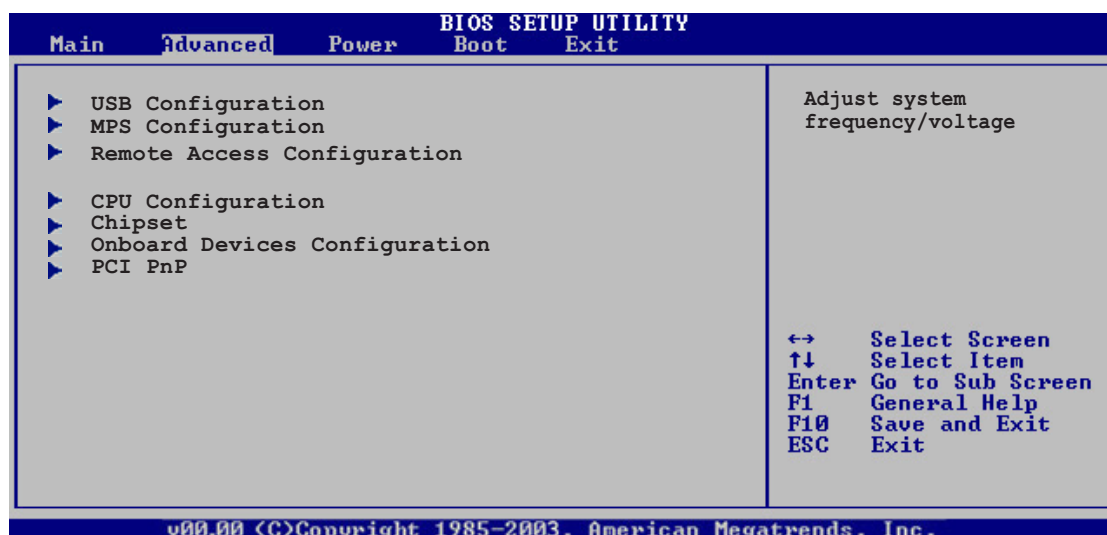
Displays the auto-detected system memory

## 4.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

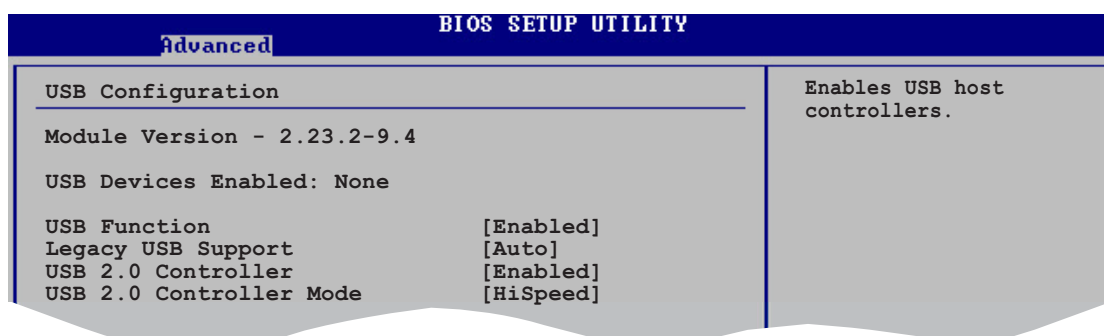


Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



### 4.4.1 USB Configuration

The items in this menu allow you to change the USB-related features. Select an item then press <Enter> to display the configuration options.



The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the item shows **None**.

### USB Function [Enabled]

Allows you to enable or disable the USB function.

Configuration options: [Disabled] [Enabled]

## Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB devices. Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled. Configuration options: [Disabled] [Enabled] [Auto]

## USB 2.0 Controller [Enabled]

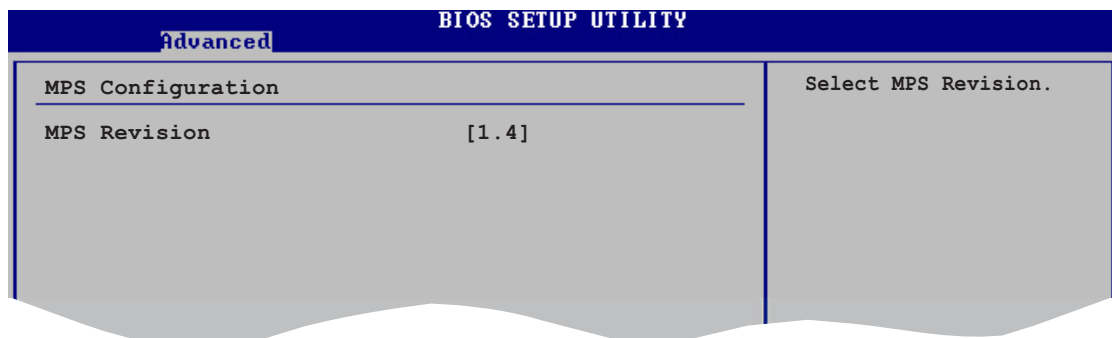
Allows you to enable or disable the USB 2.0 controller. Configuration options: [Enabled] [Disabled]

## USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps). Configuration options: [FullSpeed ] [HiSpeed ]

## 4.4.2 MPS Configuration

This menu allows you to configure the Multi-Processor table. Select an item then press <Enter> to display the configuration options.



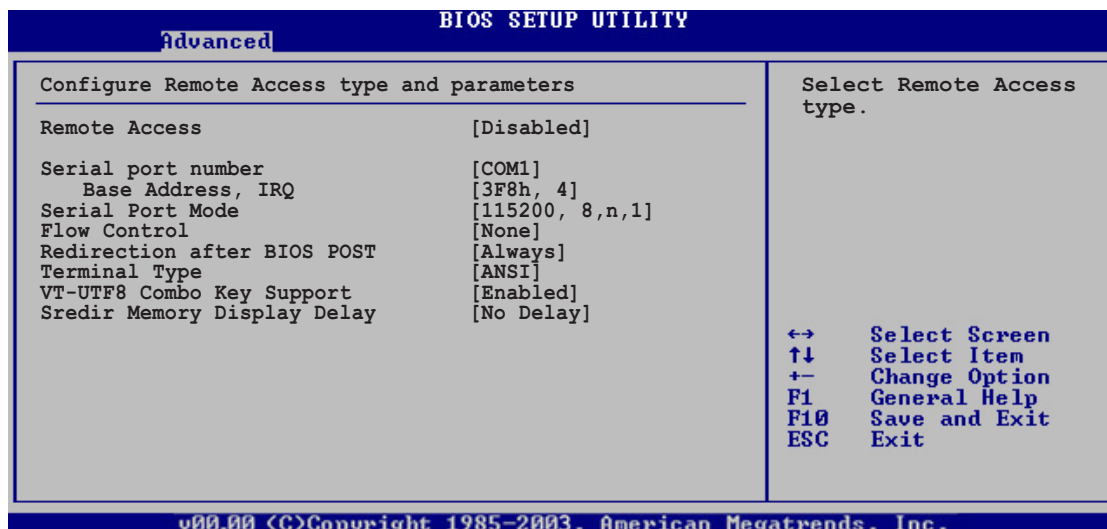
## MPS Revision [1.4]

Allows you to choose the MPS revision. Configuration options: [1.1] [1.4]



### 4.4.3 Remote Access Configuration

The items in this menu allow you to configure the Remote Access features. Select an item then press <Enter> to display the configuration options.



#### Remote Access [Disabled]

Enables or disables the remote access feature.

Configuration options: [Disabled] [Enabled]



The succeeding items appear when the item **Remote Access** is set to [Enabled].

#### Serial port number [COM1]

Sets the serial port for console redirection. Make sure the selected port is enabled. Configuration options: [COM1] [COM2]

#### Base Address, IRQ [3F8h, 4]

Sets the base address and IRQ assignment of the selected serial port. This item is auto-detected and is not user-configurable.

#### Serial Port Mode [115200, 8,n,1]

Allows you to select the serial port mode settings.

Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1] [19200 8,n,1] [09600 8,n,1]

#### Flow Control [None]

Allows you to select the flow control for console redirection.

Configuration options: [None] [Hardware] [Software]

## Redirection after BIOS POST [Always]

Sets the redirection mode after the BIOS Power-On-Self-Test (POST). Some operating systems may not work when this item is set to [Always].

Configuration options: [Disabled] [Boot Loader] [Always]

## Terminal Type [ANSI]

Allows you to select the target terminal type.

Configuration options: [ANSI] [VT100] [VT-UTF8]

## VT-UTF8 Combo Key Support [Enabled]

Enables or disables the VT-UTF8 combo key support for ANSI or VT100 terminals. Configuration options: [Disabled] [Enabled]

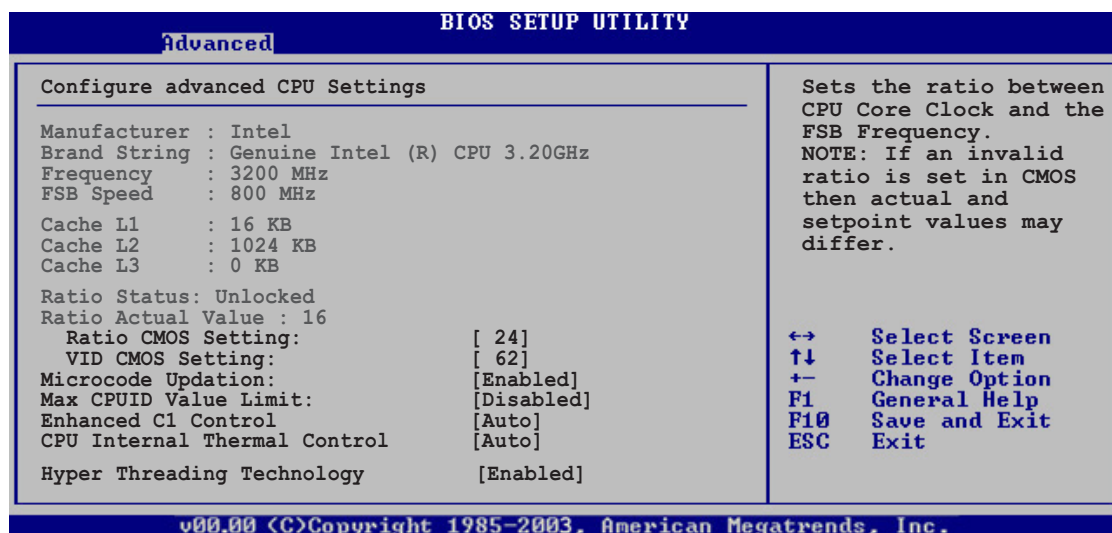
## Sredir Memory Display Delay [No Delay]

Gives the delay period (in seconds) to display memory information.

Configuration options: [No Delay] [Delay 1 Sec] [Delay 2 Sec] [Delay 4 Sec]

## 4.4.4 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.



## Ratio CMOS Setting [24]

Sets the ratio between the CPU Core Clock and the Front Side Bus frequency. The default value of this item is auto-detected by BIOS. Use the <+> or <-> keys to adjust the values.

## VID CMOS Setting [ 62]

Allows you to set the VID CMOS setting at which the processor is to run. The default value of this item is auto-detected by BIOS. Use the <+> or <-> keys to adjust the values.



---

You can only adjust the **Ratio CMOS** and the **VID CMOS** setting if you installed an unlocked CPU. Refer to the CPU documentation for details.

---

## Microcode Updation [Enabled]

Enables or disables microcode updation.  
Configuration options: [Disabled] [Enabled]

## Max CPUID Value Limit [Disabled]

Enable this item to boot legacy operating systems that cannot support CPUs with extended CPUID functions. Configuration options: [Disabled] [Enabled]

## Enhanced C1 Control [Auto]

When set to [Auto], the BIOS will automatically check the CPU's capability to enable the C1E support. In C1E mode, the CPU power consumption is lower when idle. Configuration options: [Auto] [Disabled]

## CPU Internal Thermal Control [Auto]

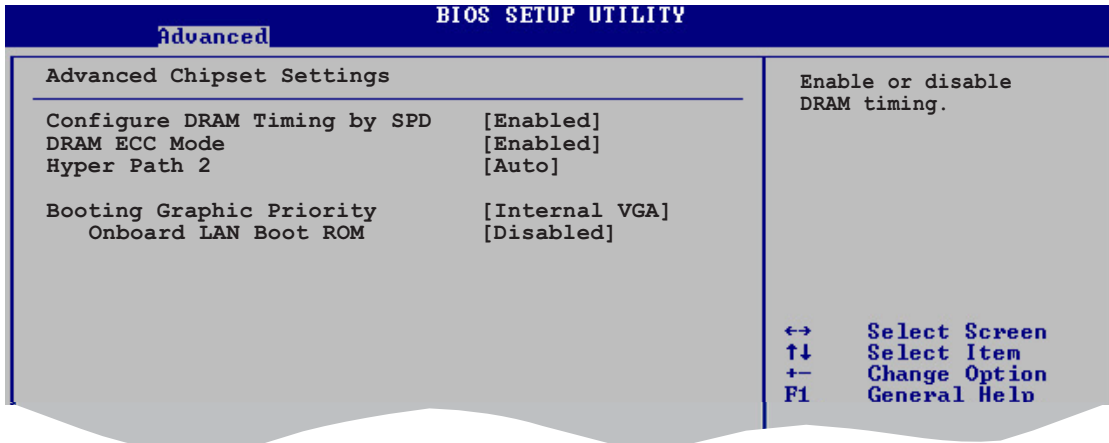
Disables or sets the CPU internal thermal control.  
Configuration options: [Auto] [Disabled]

## Hyper Threading Technology [Enabled]

Allows you to enable or disable the processor Hyper-Threading Technology.  
Configuration options: [Disabled] [Enabled]

## 4.4.5 Chipset

The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



### Advanced Chipset Settings

#### **Configure DRAM Timing by SPD [Enabled]**

When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items. Configuration options: [Disabled] [Enabled]

The following sub-items appear when this item is Disabled.

#### DRAM CAS# Latency [5 Clocks]

Controls the latency between the SDRAM read command and the time the data actually becomes available.

Configuration options: [5 Clocks] [4 Clocks] [3 Clocks]

#### DRAM RAS# Precharge [4 Clocks]

Controls the idle clocks after issuing a precharge command to the DDR SDRAM. Configuration options: [2 Clocks] [3 Clocks] [4 Clocks] [5 Clocks]

#### DRAM RAS# to CAS# Delay [4 Clocks]

Controls the latency between the DDR SDRAM active command and the read/write command. Configuration options: [2 Clocks] [3 Clocks] [4 Clocks] [5 Clocks]

#### DRAM RAS# Activate to Precharge Delay [15 Clocks]

Configuration options: [1 Clock] ~ [15 Clocks]

#### DRAM Write Recovery Time [4 Clocks]

Sets the DRAM write recovery time.

Configuration options: [2 Clocks] [3 Clocks] [4 Clocks] [5 Clocks]

## **DRAM ECC Mode [Auto]**

Allows you to enable or disable DRAM timing.  
Configuration options: [Auto] [Disabled]

## **Hyper Path 2 [Auto]**

Allows you to enable or disable the ASUS Hyper Path 2 feature.  
Configuration options: [Disabled] [Enabled] [Auto]

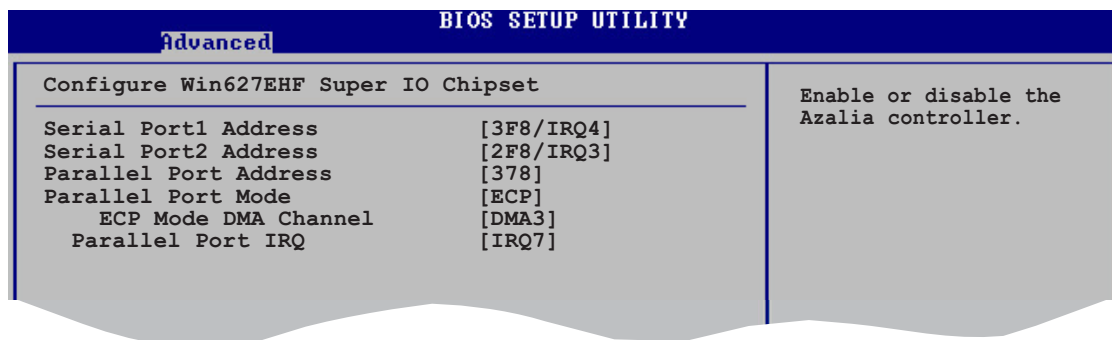
## **Booting Graphic Priority [Internal VGA]**

Allows selection of the graphics controller to use as primary boot device.  
Configuration options: [Internal VGA] [PCI/Int-VGA]

### *Onboard LAN Boot ROM [Disabled]*

Allows you to enable or disable the option ROM in the onboard LAN controller. Configuration options: [Disabled] [Enabled]

## 4.4.6 Onboard Devices Configuration



### Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.

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

### Serial Port2 Address [2F8/IRQ3]

Allows you to select the Serial Port1 base address.

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

### Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.

Configuration options: [Disabled] [378] [278] [3BC]

### Parallel Port Mode [ECP]

Allows you to select the Parallel Port mode.

Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

#### ECP Mode DMA Channel [DMA3]

Appears only when the Parallel Port Mode is set to [ECP]. This item allows you to set the Parallel Port ECP DMA.

Configuration options: [DMA0] [DMA1] [DMA3]

#### EPP Version [1.9]

Allows selection of the Parallel Port EPP version. This item appears only when the **Parallel Port Mode** is set to **EPP**.

Configuration options: [1.9] [1.7]

#### Parallel Port IRQ [IRQ7]

Allows selection of the Parallel Port IRQ.

Configuration options: [IRQ5] [IRQ7]

## 4.4.7 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.



Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction.

**BIOS SETUP UTILITY**

**Advanced**

**Advanced PCI/PnP Settings**

WARNING: Setting wrong values in below sections may cause system to malfunction.

Plug And Play O/S	[No]
PCI Latency Timer	[64]
Allocate IRQ to PCI VGA	[Yes]
Palette Snooping	[Disabled]
PCI IDE BusMaster	[Enabled]
OffBoard PCI/ISA IDE Card	[Auto]
IRQ-3 assigned to	[PCI Device]
IRQ-4 assigned to	[PCI Device]
IRQ-5 assigned to	[PCI Device]
IRQ-7 assigned to	[PCI Device]
IRQ-9 assigned to	[PCI Device]
IRQ-10 assigned to	[PCI Device]
IRQ-11 assigned to	[PCI Device]
IRQ-14 assigned to	[PCI Device]
IRQ-15 assigned to	[PCI Device]

No: Lets the BIOS configure all the devices in the system.  
Yes: Lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

↔ Select Screen  
↑↓ Select Item  
+- Change Option  
F1 General Help  
F10 Save and Exit  
ESC Exit

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Reserved Memory Size	[Disabled]
DMA Channel 0	[PCI Device]
DMA Channel 1	[PCI Device]
DMA Channel 3	[PCI Device]
DMA Channel 5	[PCI Device]
DMA Channel 6	[PCI Device]
DMA Channel 7	[PCI Device]
Active State Power-Management	[Enabled]

↔ Select Screen  
↑↓ Select Item  
+- Change Option  
F1 General Help  
F10 Save and Exit  
ESC Exit

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### Plug and Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot. Configuration options: [No] [Yes]

### PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

### **Allocate IRQ to PCI VGA [Yes]**

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [Yes] [No]

### **Palette Snooping [Disabled]**

When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

### **PCI IDE BusMaster [Enabled]**

Allows BIOS to use PCI bus mastering when reading/writing to IDE devices. Configuration options: [Disabled] [Enabled]

### **OffBoard PCI/ISA IDE Card [Auto]**

Allows you to set the PCI slot number holding a PCI IDE card that requires you to set the slot number. Configuration options: [Auto] [PCI Slot1] [PCI Slot2] [PCI Slot3] [PCI Slot4] [PCI Slot5] [PCI Slot6]

### **IRQ-xx assigned to [PCI Device]**

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

### **Reserved Memory Size [Disabled]**

Allows you to choose the size of memory block to be reserved for legacy ISA devices. Configuration options: [Disabled] [16K] [32K] [64K]

### **DMA Channel X [PCI Device]**

When set to [PCI Device], the specific DMA channel is free for use of PCI/PnP devices. When set to [Reserved], the DMA channel is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

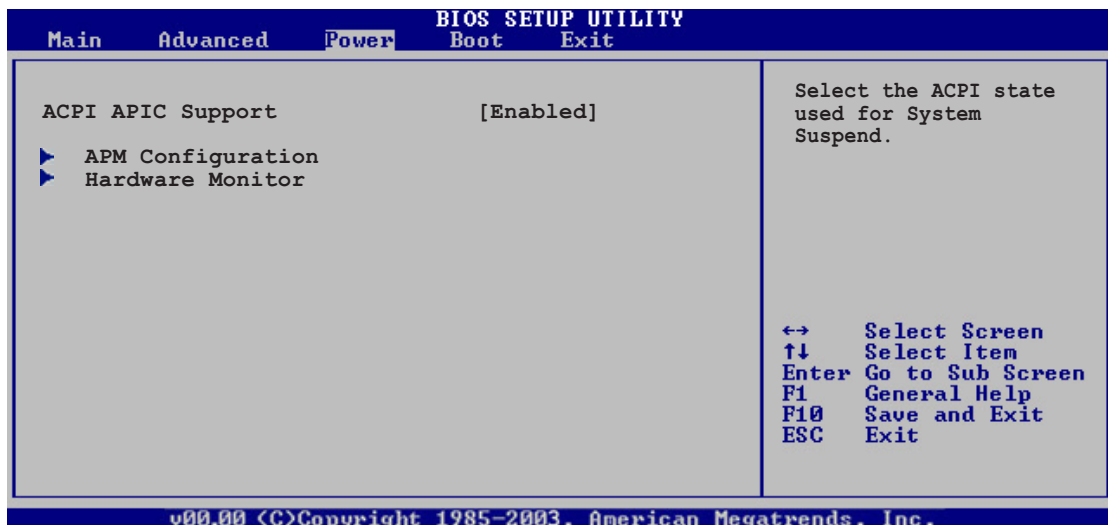
### **Active State Power-Management [Enabled]**

Allows you to enable or disable the PCI Express L0s and L1 link power states. Configuration options: [Disabled] [Enabled]



## 4.5 Power menu

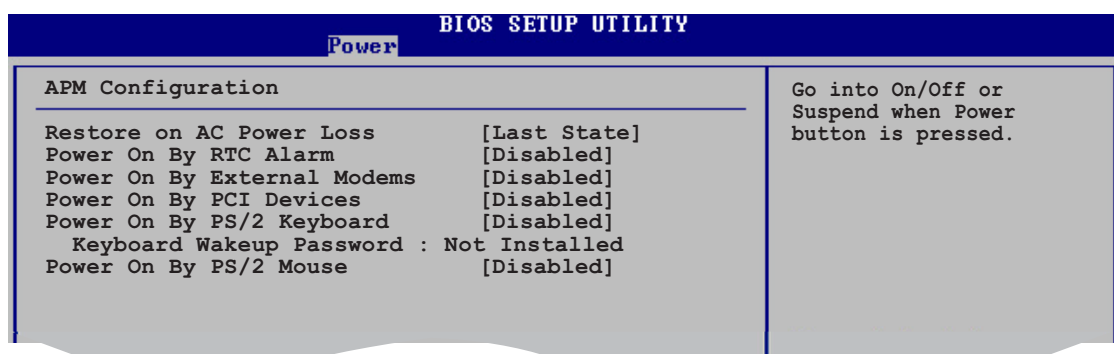
The Power menu items allow you to change the settings for the ACPI and Advanced Power Management (APM). Select an item then press <Enter> to display the configuration options.



### 4.5.1 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

### 4.5.2 APM Configuration



#### Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state, whatever the system state was before the AC power loss. Configuration options: [Power Off] [Power On] [Last State]

## Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values. Configuration options: [Disabled] [Enabled]

## Power On By External Modems [Disabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer when the external modem receives a call while the computer is in Soft-off mode. Configuration options: [Disabled] [Enabled]



---

The computer cannot receive or transmit data until the computer and applications are fully running. Thus, connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that turns the system on.

---

## Power On By PCI Devices [Disabled]

When set to [Enabled], this parameter allows you to turn on the system through a PCI LAN or modem card. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

## Power On By PS/2 Keyboard [Disabled]

Allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

## Keyboard Wakeup Password

This item appears only when the Power On By PS/2 Keyboard is set to Enabled. Select this item to set or change the keyboard wakeup password. The **Keyboard Wakeup Password** item that appears below shows the default **Not Installed**. After you have set a password, this item shows **Installed**.

## Power On By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

## 4.5.3 Hardware Monitor

BIOS SETUP UTILITY	
Power	
<b>Hardware Monitor</b>	<b>CPU1 Temperature</b>
CPU Temperature	[51°C/122.5°F]
MB Temperature	[41°C/105.5°F]
CPU1 Fan Speed	[3813 RPM]
CPU2 Fan Speed	[N/A]
Front1 Fan Speed	[N/A]
Front2 Fan Speed	[N/A]
Rear1 Fan Speed	[N/A]
Rear2 Fan Speed	[N/A]
Smart Fan Control	[Disabled]
VCORE1 Voltage	[ 1.320V]
3.3V Voltage	[ 3.345V]
5V Voltage	[ 5.094V]
5VSB Voltage	[ 4.824V]
VBAT Voltage	[3.040V]
12V Voltage	[11.880V]
	↔ Select Screen
	↑↓ Select Item
	+ - Change Option
	F1 General Help
	F10 Save and Exit
	ESC Exit

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### CPU Temperature [xxx°C/xxx°F] MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select Ignored if you do not wish to display the detected temperatures.

### CPU1/CPU2 Fan Speed [xxxxRPM] or [N/A] Front1/Front2 Fan Speed [xxxxRPM] or [N/A] Rear1/Rear2 Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the CPU fan speed in rotations per minute (RPM). If the fan is not connected to the motherboard, the field shows N/A.

### Smart Fan Control [Disabled]

Allows you to enable or disable the ASUS Smart Fan feature that smartly adjusts the fan speeds for more efficient system operation. When this field is set to [Enabled], the three succeeding items appear.

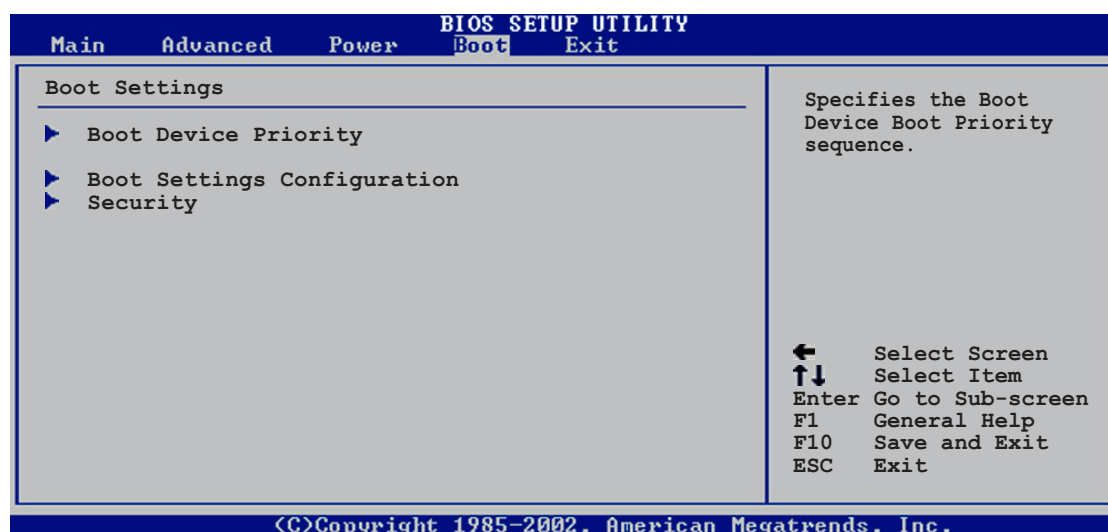
Configuration options: [Disabled] [Enabled]

### VCORE1 Voltage, 3.3V Voltage, 5V Voltage, 5VSB Voltage, VBAT Voltage, 12V Voltage

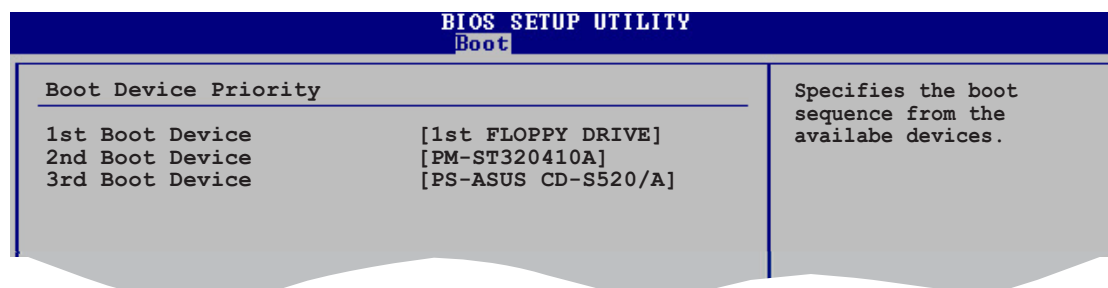
The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

## 4.6 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



### 4.6.1 Boot Device Priority



#### 1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

Configuration options: [xxxxx Drive] [Disabled]

## 4.6.2 Boot Settings Configuration

BIOS SETUP UTILITY	
Boot	
<b>Boot Settings Configuration</b>	
Quick Boot	[Enabled]
Full Screen Logo	[Enabled]
AddOn ROM Display Mode	[Add On]
Bootup Num-Lock	[On]
PS/2 Mouse Support	[Auto]
Wait For 'F1' If Error	[Enabled]
Hit 'DEL' Message Display	[Enabled]
Interrupt 19 Capture	[Disabled]

Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

### Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.

Configuration options: [Disabled] [Enabled]

### Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]



---

Set this item to [Enabled] to use the ASUS MyLogo™ feature.

---

### Add On ROM Display Mode [Add On]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current] [Add On]

### Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

### PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

### Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

## Hit 'DEL' Message Display [Enabled]

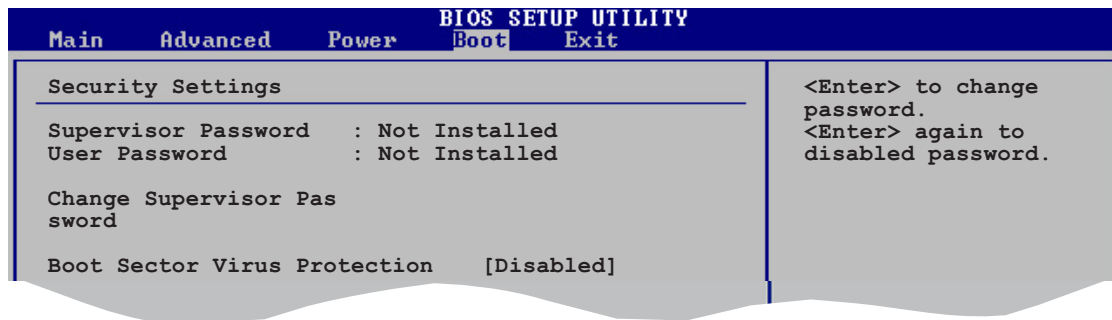
When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

## Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19. Configuration options: [Disabled] [Enabled]

### 4.6.3 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



### Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a Supervisor Password:

1. Select the Change Supervisor Password item and press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message "Password Installed" appears after you successfully set your password.

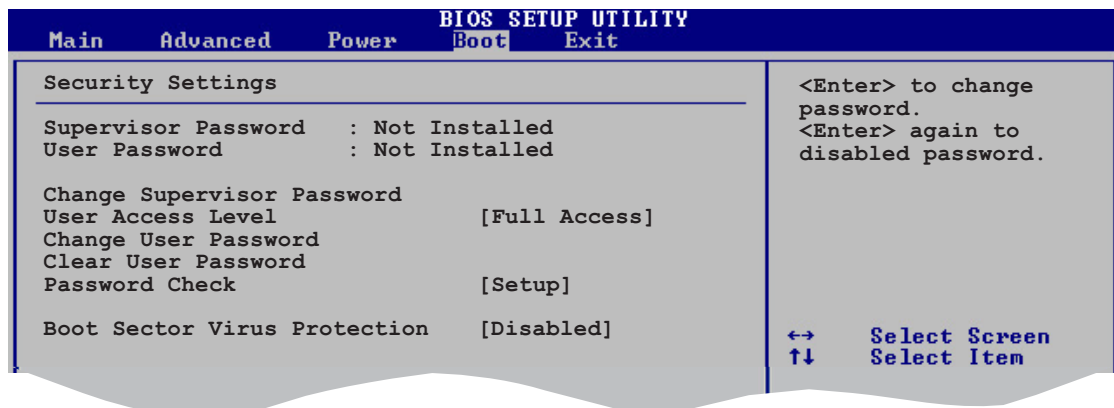
To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the Change Supervisor Password then press <Enter>. The message "Password Uninstalled" appears.



If you forget your BIOS password, you can clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section “2.6 Jumpers” for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



### User Access Level (Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

**No Access** prevents user access to the Setup utility.

**View Only** allows access but does not allow change to any field.

**Limited** allows changes only to selected fields, such as Date and Time.

**Full Access** allows viewing and changing all the fields in the Setup utility.

### Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a User Password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message “Password Installed” appears after you set your password successfully.

To change the user password, follow the same steps as in setting a user password.

## Clear User Password

Select this item to clear the user password.

## Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.

Configuration options: [Setup] [Always]

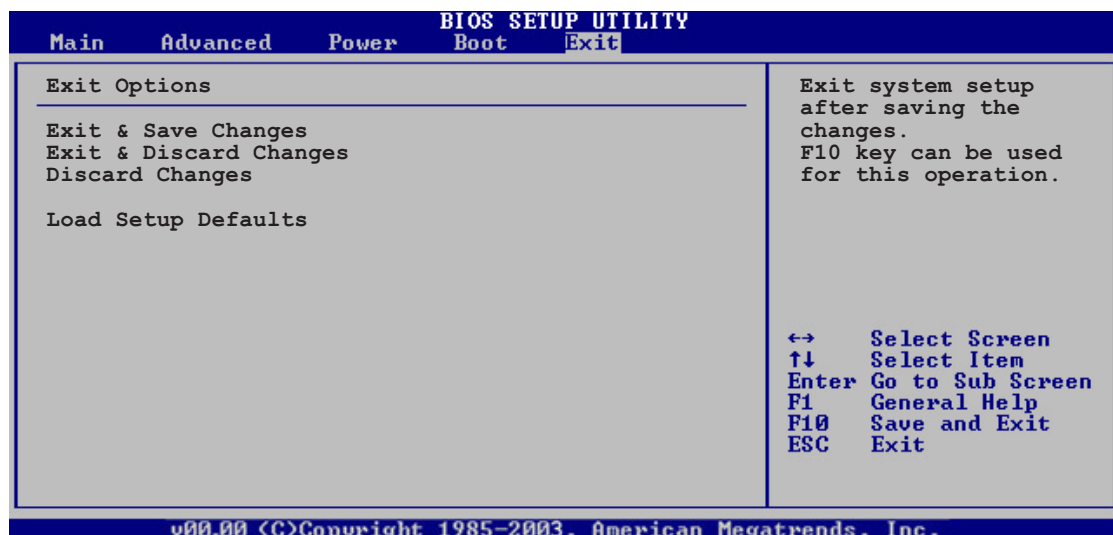
## Boot Sector Virus Protection [Disabled]

Allows you to enable or disable the boot sector virus protection.

Configuration options: [Disabled] [Enabled]

## 4.7 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.



## Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. An onboard backup battery sustains the CMOS RAM so it stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select **Yes** to save changes and exit.



---

If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Press <Enter> to save the changes while exiting.

---

## Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than System Date, System Time, and Password, the BIOS asks for a confirmation before exiting.

## Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select **Yes** to discard any changes and load the previously saved values.

## Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select **Yes** to load default values. Select **Exit & Save Changes** or make other changes before saving the values to the non-volatile RAM.



The appendix includes additional information that you may refer to when configuring the motherboard.

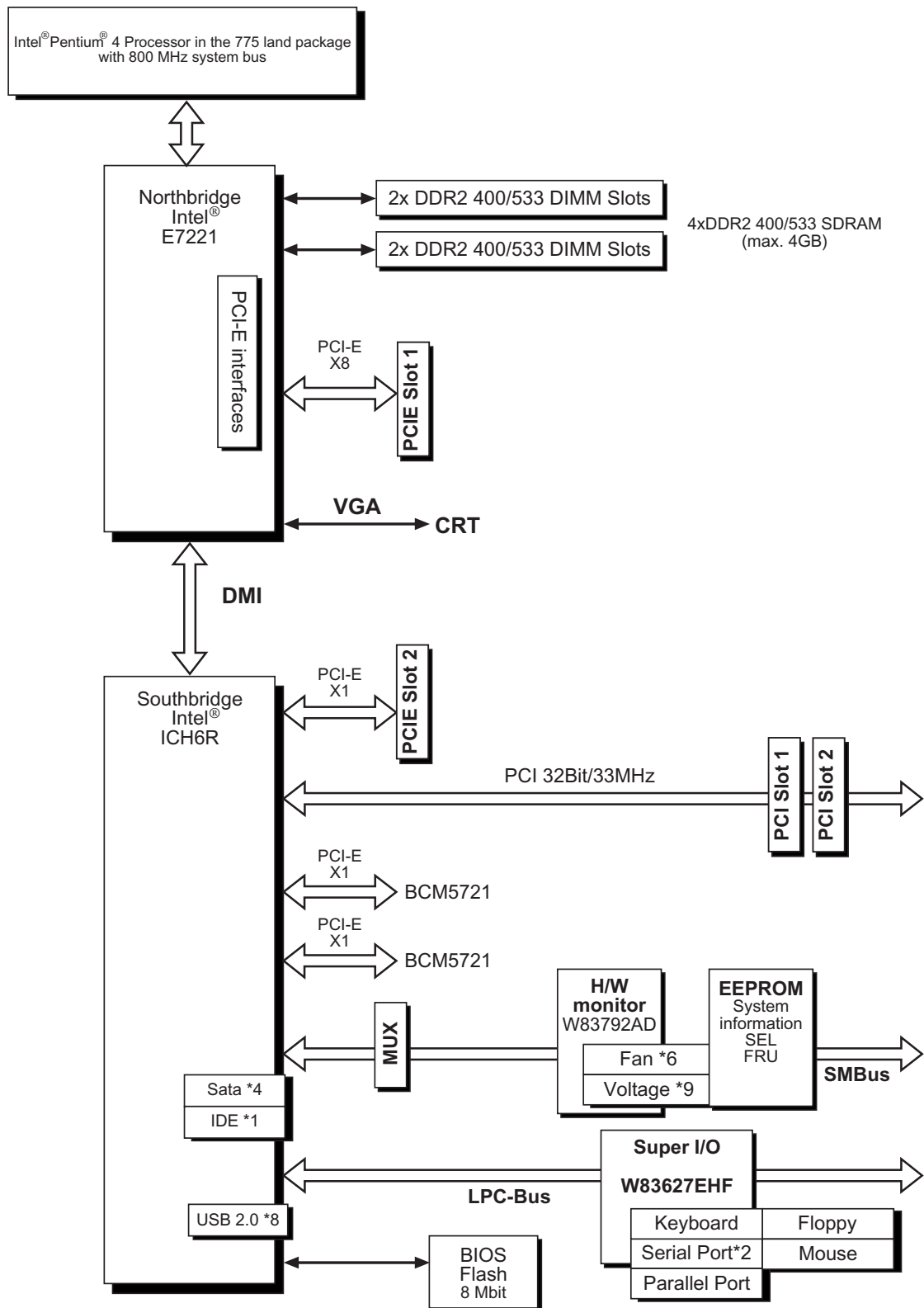
# Reference information

# Appendix summary



A.1 P5CR-VM block diagram ..... A-1

# A.1 P5CR-VM block diagram





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