



## **System Board User's Manual**

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## FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. 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 the receiver.
- Connect the equipment into 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.

### Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

# Table of Contents

|                                                      |     |
|------------------------------------------------------|-----|
| Warranty.....                                        | 5   |
| Static Electricity Precaution.....                   | 6   |
| Safety Measures.....                                 | 6   |
| About the Package.....                               | 7   |
| Before Using the System Board.....                   | 7   |
| <br>Chapter 1 - Introduction.....                    | 8   |
| Specifications.....                                  | 8   |
| Features.....                                        | 10  |
| <br>Chapter 2 - Hardware Installation.....           | 15  |
| System Board Layout .....                            | 15  |
| System Memory.....                                   | 16  |
| CPU.....                                             | 22  |
| Northbridge Heat Sink.....                           | 27  |
| Jumper Settings.....                                 | 28  |
| Rear Panel I/O Ports.....                            | 31  |
| Internal I/O Connectors.....                         | 35  |
| <br>Chapter 3 - BIOS Setup.....                      | 47  |
| Award BIOS Setup Utility.....                        | 47  |
| RAID BIOS.....                                       | 103 |
| Updating the BIOS.....                               | 104 |
| <br>Chapter 4 - Supported Software.....              | 106 |
| Chapter 5 - RAID.....                                | 119 |
| Chapter 6 - ATI CrossFire Technology.....            | 126 |
| Appendix A - ABS.....                                | 133 |
| Appendix B - Troubleshooting.....                    | 141 |
| Appendix C -Debug LED POST and Troubleshooting ..... | 145 |

## Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

## Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



### Important:

*Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.*

## Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

## About the Package

The system board package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- ☑ The system board
- ☑ One IDE cable
- ☑ One FDD cable
- ☑ Two Serial ATA data cables
- ☑ One power cable with 2 Serial ATA power connectors
- ☑ Smart connectors
- ☑ One I/O shield
- ☑ One RAID floppy diskette
- ☑ One "Mainboard Utility" CD
- ☑ A user's manual
- ☑ Auto Boost System (ABS) installation guide

The system board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

## Before Using the System Board

Before using the system board, prepare basic system components.

If you are installing the system board in a new system, you will need at least the following internal components.

- A CPU
- Memory module
- Storage devices such as hard disk drive, CD-ROM, etc.

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

# Chapter 1 - Introduction

---

## Specifications

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor       | <ul style="list-style-type: none"><li>• LGA 775 socket for:<ul style="list-style-type: none"><li>- Intel® Core™2 Quad and Intel® Core™2 Duo</li></ul></li><li>• Supports Intel Enhanced Memory 64 Technology (EMT64T)</li><li>• Supports Enhanced Intel SpeedStep Technology (EIST)</li><li>• Supports Intel Hyper-Threading Technology</li><li>• Supports 1333/1066/800MHz FSB</li></ul>                                                                                                                                                                                     |
| Chipset         | <ul style="list-style-type: none"><li>• Intel® chipset<ul style="list-style-type: none"><li>- Northbridge:<ul style="list-style-type: none"><li>Intel® P45 Express chipset</li><li>Intel® Fast Memory Access technology</li></ul></li><li>- Southbridge: Intel® ICH10R</li></ul></li></ul>                                                                                                                                                                                                                                                                                    |
| System Memory   | <ul style="list-style-type: none"><li>• Four 240-pin DDR3 DIMM sockets</li><li>• Supports DDR3 1800(O.C.)/1600/1333/1066 MHz</li><li>• Delivers up to 21Gb/s bandwidth at 1333MHz</li><li>• Supports dual channel (128-bit wide) memory interface</li><li>• Supports non-ECC unbuffered DIMMs</li><li>• Supports up to 16GB system memory<br/>Windows® 32-bit operating system is unable to accurately detect more than 4GB system memory. Therefore, if you are using this operating system, we strongly recommend that you install a less than 3GB system memory.</li></ul> |
| Expansion Slots | <ul style="list-style-type: none"><li>• 2 PCI Express (Gen 2) x16 slots dimensionally with x16 transfer rate lanes for PCIe1 and x8 transfer rate lanes for PCIe4 (16-lane ports, 8-lane ports)<ul style="list-style-type: none"><li>- 2-way CrossFire: One slot operating at x16 (16-lane port) or two slots each operating at x8 (8-lane ports) bandwidth</li></ul></li><li>• 2 PCI Express x1 slots</li><li>• 2 PCI slots</li></ul>                                                                                                                                        |
| BIOS            | <ul style="list-style-type: none"><li>• Award BIOS, 8Mbit SPI flash BIOS</li><li>• CMOS Reloaded</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Audio           | <ul style="list-style-type: none"><li>• Realtek ALC885 High Definition audio CODEC</li><li>• 8-channel audio output</li><li>• DAC SNR/ADC SNR of 106dB/101dB</li><li>• Full-rate lossless content protection technology</li><li>• Optical S/PDIF-out and coaxial RCA S/PDIF-out interfaces</li></ul>                                                                                                                                                                                                                                                                          |
| LAN             | <ul style="list-style-type: none"><li>• Marvell 88E8053 PCIe Gigabit LAN controller</li><li>• Fully compliant to IEEE 802.3 (10BASE-T), 802.3u (100BASE-TX) and 802.3ab (1000BASE-T) standards</li></ul>                                                                                                                                                                                                                                                                                                                                                                      |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Storage</b>          | <ul style="list-style-type: none"> <li>• Intel ICH10R chip <ul style="list-style-type: none"> <li>- Intel Matrix Storage technology</li> <li>- Supports up to 6 SATA devices</li> <li>- SATA speed up to 3Gb/s</li> <li>- RAID 0, RAID 1, RAID 0+1 and RAID 5</li> </ul> </li> <li>• JMicron JMB363 PCI Express to SATA and PATA host controller <ul style="list-style-type: none"> <li>- Supports up to 2 UltraDMA 100Mbps IDE devices</li> <li>- Supports 2 SATA devices</li> <li>- SATA speed up to 3Gb/s</li> <li>- RAID 0 and RAID 1</li> </ul> </li> </ul>                                                                                                                                |
| <b>Rear Panel I/O</b>   | <ul style="list-style-type: none"> <li>• 1 mini-DIN-6 PS/2 mouse port</li> <li>• 1 mini-DIN-6 PS/2 keyboard port</li> <li>• 1 optical S/PDIF-out port</li> <li>• 1 coaxial RCA S/PDIF-out port</li> <li>• 6 USB 2.0/1.1 ports</li> <li>• 1 RJ45 LAN port</li> <li>• Center/subwoofer, rear R/L and side R/L jacks</li> <li>• Line-in, line-out (front R/L) and mic-in jacks</li> </ul>                                                                                                                                                                                                                                                                                                          |
| <b>Internal I/O</b>     | <ul style="list-style-type: none"> <li>• 3 connectors for 6 additional external USB 2.0 ports</li> <li>• 1 connector for an external COM port</li> <li>• 1 front audio connector</li> <li>• 1 CD-in connector</li> <li>• 1 IrDA connector</li> <li>• 8 Serial ATA connectors</li> <li>• 1 40-pin IDE connector</li> <li>• 1 floppy connector</li> <li>• 1 24-pin ATX power connector</li> <li>• 1 8-pin 12V power connector</li> <li>• 2 4-pin 5V/12V power connectors (FDD type)</li> <li>• 1 front panel connector</li> <li>• 5 fan connectors</li> <li>• 1 download flash BIOS connector</li> <li>• 1 diagnostic LED</li> <li>• EZ touch switches (power switch and reset switch)</li> </ul> |
| <b>Power Management</b> | <ul style="list-style-type: none"> <li>• ACPI and OS Directed Power Management</li> <li>• ACPI STR (Suspend to RAM) function</li> <li>• Wake-On-PS/2 Keyboard/Mouse</li> <li>• Wake-On-USB Keyboard/Mouse</li> <li>• Wake-On-LAN</li> <li>• Wake-On-Ring</li> <li>• RTC timer to power-on the system</li> <li>• AC power failure recovery</li> </ul>                                                                                                                                                                                                                                                                                                                                            |
| <b>Hardware Monitor</b> | <ul style="list-style-type: none"> <li>• Monitors CPU/system/Northbridge temperature and overheat alarm</li> <li>• Monitors Vcore/Vdimm/Vnb/VCC5/12V/V5sb/Vbat voltages</li> <li>• Monitors the speed of the cooling fans</li> <li>• CPU Overheat Protection function monitors CPU temperature and fan during system boot-up - automatic shutdown upon system overheat</li> </ul>                                                                                                                                                                                                                                                                                                               |
| <b>PCB</b>              | <ul style="list-style-type: none"> <li>• 4 layers, ATX form factor</li> <li>• 24.5cm (9.64") × 30.5cm (12")</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Features



DDR3 delivers increased system bandwidth and improved performance. It offers peak data transfer rate of up to 21 Gb/s bandwidth. The advantages of DDR3 are its higher bandwidth and its increase in performance at a lower power than DDR2.



ATI's CrossFire™ technology drives your PC to a new peak of performance by combining multiple GPUs in a single system. By connecting a Radeon CrossFire Edition graphics card and a standard PCI Express graphics card, the power of the dual GPUs (Graphics Processing Units) within the system will accelerate your gaming performance and improve image quality.



PCI Express Gen 2 is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x16 PCI Express lane supports transfer rate up to 5Gb/s.



The onboard Realtek ALC885 is a High Definition audio codec and the 6 audio jacks at the rear I/O panel provides 8-channel audio output for advanced 7.1-channel super surround sound audio system. ALC885 also supports S/PDIF output, allowing digital connections with DVD systems or other audio/video multimedia.



S/PDIF is a standard audio file transfer format that transfers digital audio signals to a device without having to be converted first to an analog format. This prevents the quality of the audio signal from degrading whenever it is converted to analog. S/PDIF is usually found on digital audio equipment such as a DAT machine or audio processing device. The S/PDIF interface on the system board sends surround sound and 3D audio signal outputs to amplifiers and speakers and to digital recording devices like CD recorders.



The JMicron JMB363 controller supports up to two UltraDMA 100Mbps IDE devices and two Serial ATA devices.



Serial ATA is a storage interface that is compliant with SATA 1.0 specification. Intel ICH10R and JMicron JMB363 both support speed of up to 3Gb/s. Serial ATA improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.



The Intel ICH10R chip allows configuring RAID on Serial ATA devices. It supports RAID 0, RAID 1, RAID 0+1 and RAID 5. The JMicron JMB363 chip allows configuring RAID on another 2 Serial ATA devices. It supports RAID 0 and RAID 1.



The Marvell 88E8053 PCI Express Gigabit LAN controller supports up to 1Gbps data rate.



CMOS Reloaded is a technology that allows storing multiple user-defined BIOS settings by using the BIOS utility to save, load and name the settings. This is especially useful to overclockers who require saving a variety of overclocked settings and being able to conveniently switch between these settings simultaneously.



The options in Genie BIOS allows configuring the system to optimize system performance and overclock capability.



The presence of the power switch and reset switch on the system board are user-friendly especially to DIY users. They provide convenience in powering on and/or re-setting the system while fine tuning the system board before it is installed into the system chassis.



The system board supports Intel processors with Hyper-Threading Technology. Enabling the functionality of Hyper-Threading Technology for your computer system requires **ALL** of the following platforms.

#### Components:

- CPU - an Intel® Pentium® 4 Processor with HT Technology
- Chipset - an Intel® chipset that supports HT Technology
- BIOS - a BIOS that supports HT Technology and has it enabled
- OS - an operating system that includes optimizations for HT Technology

For more information on Hyper-Threading Technology, go to: [www.intel.com/info/hyperthreading](http://www.intel.com/info/hyperthreading).



CPU Overheat Protection has the capability of monitoring the CPU's temperature during system boot up. Once the CPU's temperature exceeded the temperature limit pre-defined by the CPU, the system will automatically shutdown. This preventive measure has been added to protect the CPU from damage and insure a safe computing environment.



The system board is equipped with an IrDA connector for wireless connectivity between your computer and peripheral devices. The IRDA (Infrared Data Association) specification supports data transfers of 115K baud at a distance of 1 meter.



The system board supports USB 2.0 and USB 1.1 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

**Wake  
On  
Ring**

This feature allows the system that is in the Suspend mode or Soft Power Off mode to wake-up/power-on to respond to calls coming from an external modem or respond to calls from a modem PCI card that uses the PCI PME (Power Management Event) signal to remotely wake up the PC.

**Important:**

*If you are using a modem add-in card, the 5VSB power source of your power supply must support a minimum of  $\geq 720\text{mA}$ .*

**Wake  
On  
LAN**

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

**Important:**

*The 5VSB power source of your power supply must support  $\geq 720\text{mA}$ .*

**Wake  
On  
PS/2**

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

**Important:**

*The 5VSB power source of your power supply must support  $\geq 720\text{mA}$ .*

**Wake  
On  
USB**

This function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

**Important:**

*If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5VSB power source of your power supply must support  $\geq 1.5\text{A}$ . For 3 or more USB ports, the 5VSB power source of your power supply must support  $\geq 2\text{A}$ .*

**RTC**

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

**STR**

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting “Standby” when you shut down the system without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

**Important:**

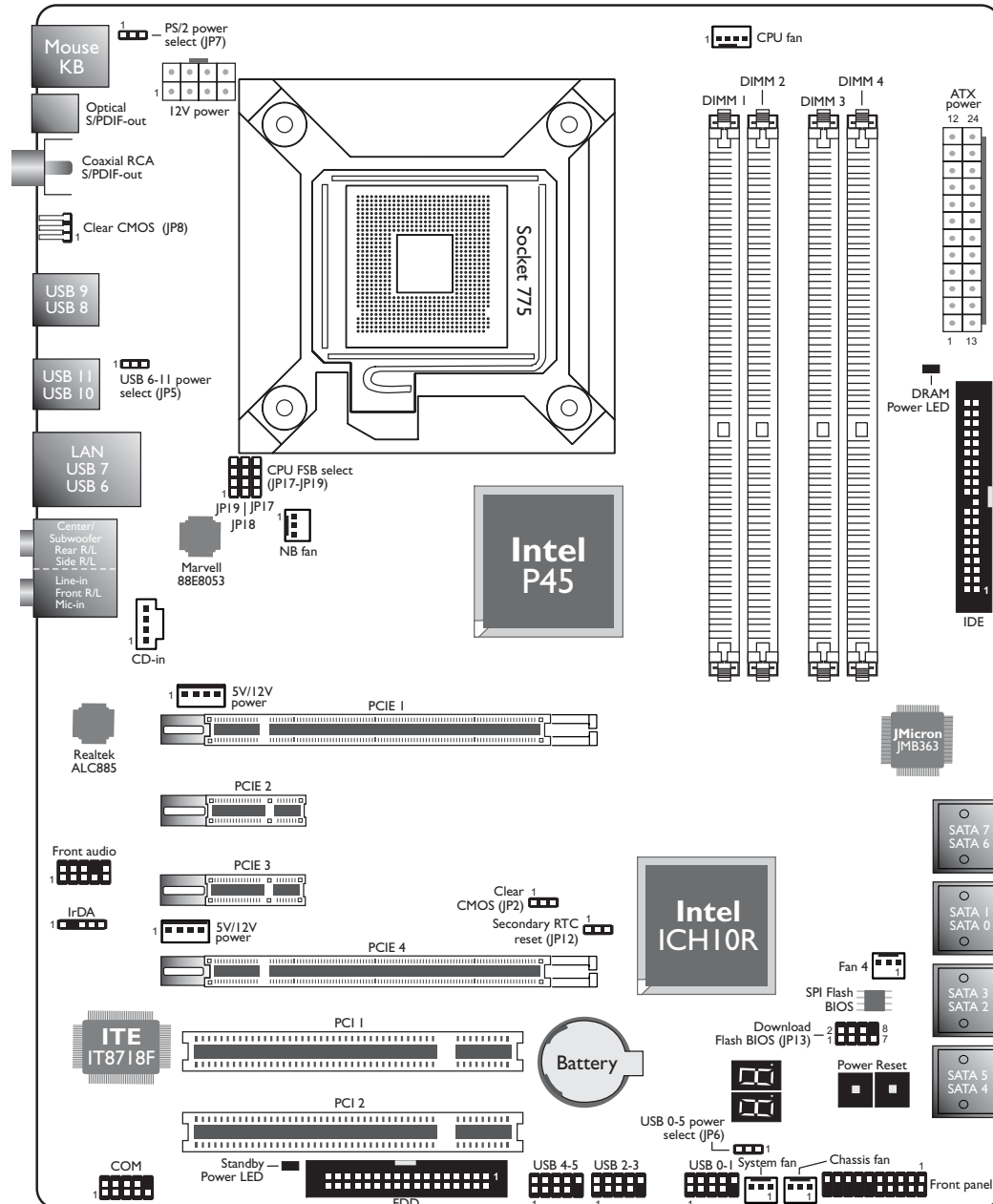
*The 5VSB power source of your power supply must support  $\geq 1A$ .*

**Power  
Failure  
Recovery**

When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

## Chapter 2 - Hardware Installation

### System Board Layout



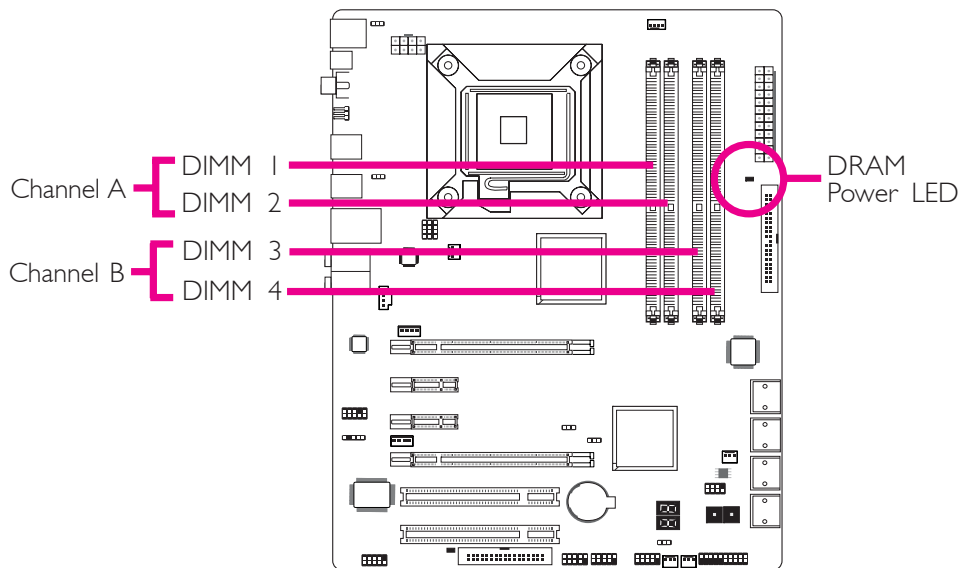
**Warning:**

Electrostatic discharge (ESD) can damage your system board, processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

## System Memory

**Warning:**

When the DRAM Power LED lit red, it indicates that power is present on the DIMM sockets. Power-off the PC then unplug the power cord prior to installing any memory modules. Failure to do so will cause severe damage to the motherboard and components.



The four DIMM sockets on the system board are divided into 2 channels:

Channel A - DIMM 1 and DIMM 2

Channel B - DIMM 3 and DIMM 4

The system board supports the following memory interface.

### Single Channel (SC)

Data will be accessed in chunks of 64 bits (8B) from the memory channels.

### Virtual Single Channel (VSC)

If both channels are populated with different memory configurations, the MCH defaults to Virtual Single Channel.

### Dual Channel (DC)

Dual channel provides better system performance because it doubles the data transfer rate.

### Dynamic Mode Addressing

This mode minimizes the overhead of opening/closing pages in memory banks allowing for row switching to be done less often.

|                         |                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Single Channel          | DIMMs are on the same channel.<br>DIMMs in a channel can be identical or completely different.<br>Not all slots need to be populated. |
| Virtual Single Channel  | DIMMs of different memory configurations are on different channels.<br>Odd number of slots can be populated.                          |
| Dual Channel            | DIMMs of the same memory configuration are on different channels.                                                                     |
| Dynamic Mode Addressing | In single channel, requires even number of rows (side of the DIMM) populated. This mode can be enabled with 1 SS, 2 SS or 2 DS.       |
|                         | In VSC mode, both channels must have identical row structure.                                                                         |

### BIOS Setting

Configure the system memory in the Genie BIOS Setting submenu of the BIOS. Refer to chapter 3 for more information.

The table below lists the various optimal operating modes that should be configured for the memory channel operation.

| Config                 | DIMM 1     | DIMM 2     | DIMM 3     | DIMM 4     |
|------------------------|------------|------------|------------|------------|
| No memory              | E          | E          | E          | E          |
| Single channel A       | P          | E          | E          | E          |
| Single channel A       | P          | P          | E          | E          |
| Single channel A       | E          | P          | E          | E          |
| Single channel B       | E          | E          | P          | E          |
| Single channel B       | E          | E          | P          | P          |
| Single channel B       | E          | E          | E          | P          |
| Virtual single channel | E          | P(**)      | E          | P(**)      |
| Virtual single channel | E          | P          | P          | E          |
| Virtual single channel | E          | P(**)      | P          | P(**)      |
| Virtual single channel | P          | E          | E          | P          |
| Virtual single channel | P(**)      | E          | P(**)      | E          |
| Virtual single channel | P(**)      | E          | P(**)      | P          |
| Virtual single channel | P          | P(**)      | E          | P(**)      |
| Virtual single channel | P(**)      | P          | P(**)      | E          |
| Virtual single channel | P(**)      | P(**)      | P(**)      | P(**)      |
| Dual channel           | E          | P(*) (2,4) | E          | P(*) (2,4) |
| Dual channel           | P(*) (1,3) | E          | P(*) (1,3) | E          |
| Dual channel           | P(*) (1,3) | P(*) (2,4) | P(*) (1,3) | P(*) (2,4) |

*Continued on the next page...*

| Config                  | DIMM 1           | DIMM 2           | DIMM 3           | DIMM 4           |
|-------------------------|------------------|------------------|------------------|------------------|
| Dynamic Mode Addressing | E                | P(*) (2,4)<br>DS | E                | P(*) (2,4)<br>DS |
| Dynamic Mode Addressing | P(*) (1,3)<br>DS | E                | P(*) (1,3)<br>DS | E                |
| Dynamic Mode Addressing | P(*) (1,3)<br>DS | P(*) (2,4)<br>DS | P(*) (1,3)<br>DS | P(*) (2,4)<br>DS |
| Dynamic Mode Addressing | E                | P(*) (2,4)<br>SS | E                | P(*) (2,4)<br>SS |
| Dynamic Mode Addressing | P(*) (1,3)<br>SS | E                | P(*) (1,3)<br>SS | E                |
| Dynamic Mode Addressing | P(*) (1,3)<br>SS | P(*) (2,4)<br>SS | P(*) (1,3)<br>SS | P(*) (2,4)<br>SS |

P - denotes populated

E - denotes empty

\* - denotes DIMMs are identical

\*\* - denotes DIMMs are not identical

SS - denotes Single Sided DIMM

DS - denotes Double Sided DIMM

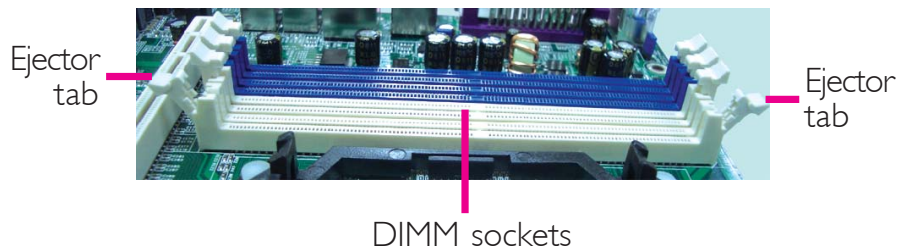
1, 2, 3 or 4 - denotes the DDR DIMM slot

## Installing the Memory Module

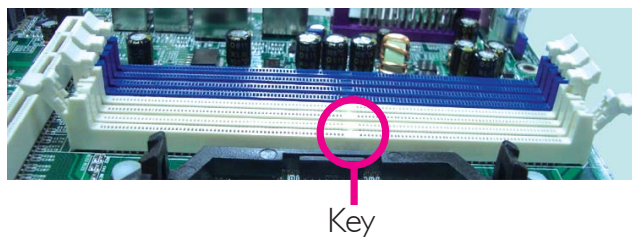
**Note:**

*The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.*

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DIMM socket on the system board.
4. Push the “ejector tabs” which are at the ends of the socket to the side.



5. Note how the module is keyed to the socket.



6. Grasping the module by its edges, position the module above the socket with the “notch” in the module aligned with the “key” on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.



7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket.



8. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



## CPU

### Overview

The system board is equipped with a surface mount LGA 775 socket. This socket is exclusively designed for installing a LGA 775 packaged Intel CPU.

**Important:**

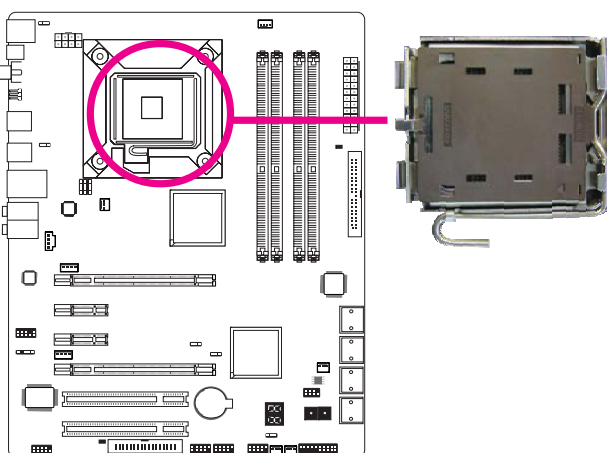
1. Before you proceed, make sure (1) the LGA775 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.
2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA775 socket comes with the protective cap.

### Installing the CPU

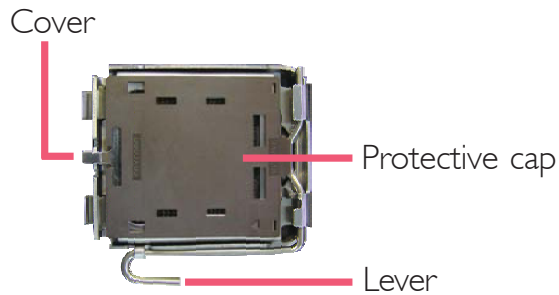
1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the LGA 775 CPU socket on the system board.

**Important:**

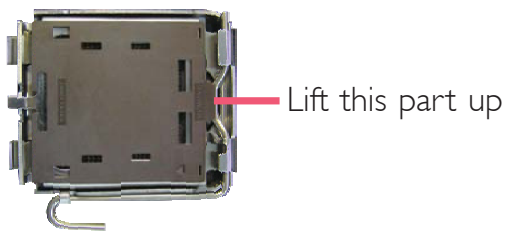
The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.



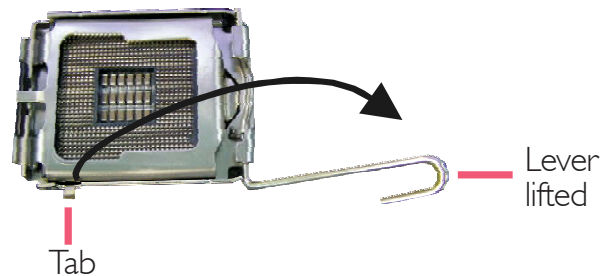
4. The CPU socket comes with a cover that is attached with a removable protective cap. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



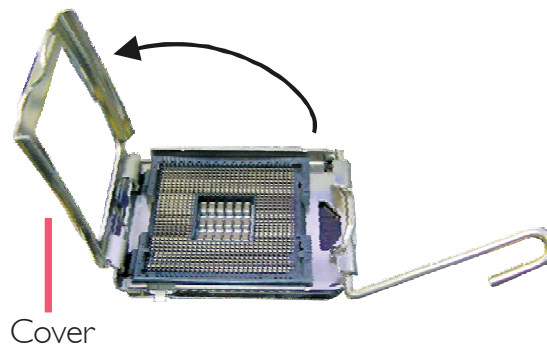
5. Lift the protective cap from the location pointed below to detach the cap from the cover.



6. Unlock the socket by pushing the lever down, moving it away from the side tab of the socket, then lifting it up.



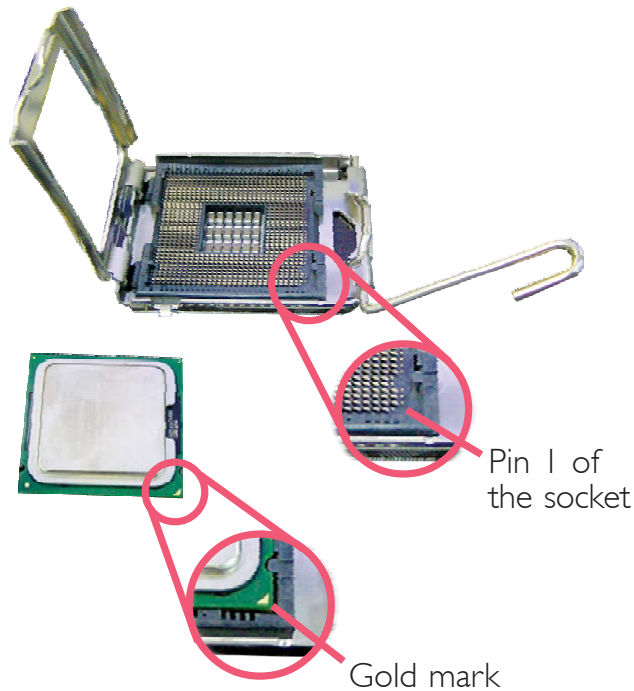
7. Now lift the cover.



8. Position the CPU above the socket. The gold mark on the CPU must align with pin 1 of the CPU socket.

**Important:**

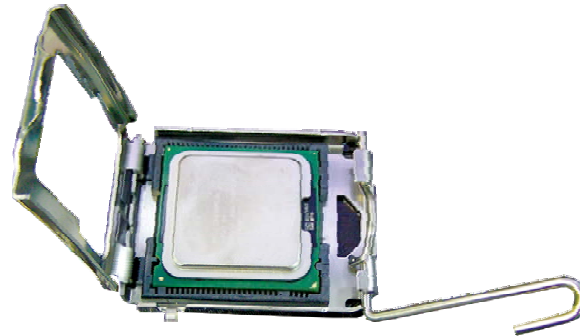
Handle the CPU by its edges and avoid touching the pins.



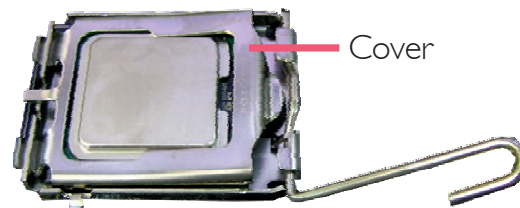
9. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force.

**Important:**

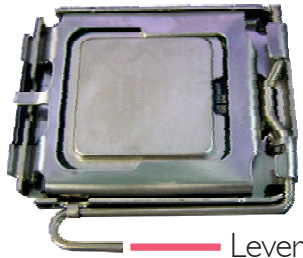
Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.



10. Once the CPU is in place, move the cover down.



11. Push the lever down to lock the socket. The lever should hook onto the side tab to indicate that the CPU is completely secured in the socket.



## Installing the Fan and Heat Sink

The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.



### Note:

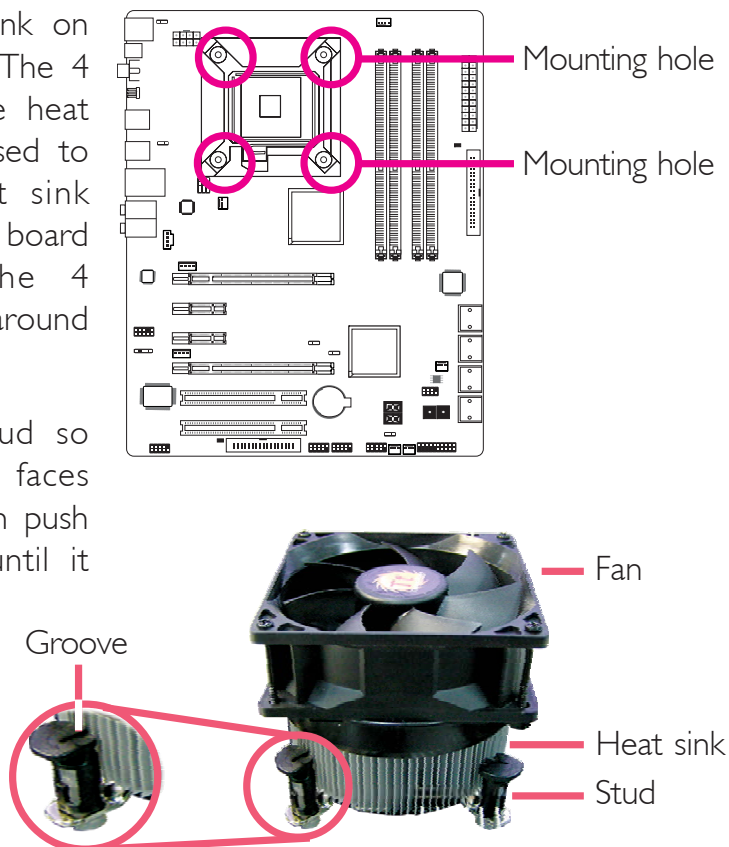
- Use only certified fan and heat sink.
- The fan and heat sink package usually contains the fan and heat sink assembly, and an installation guide. If the installation procedure in the installation guide differs from the one in this section, please follow the installation guide in the package.

1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the CPU or fan heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

Do not apply the paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

2. Place the heat sink on top of the CPU. The 4 studs around the heat sink which are used to secure the heat sink onto the system board must match the 4 mounting holes around the socket.

Position each stud so that the groove faces the heat sink then push it down firmly until it clicks into place.



**Note:**

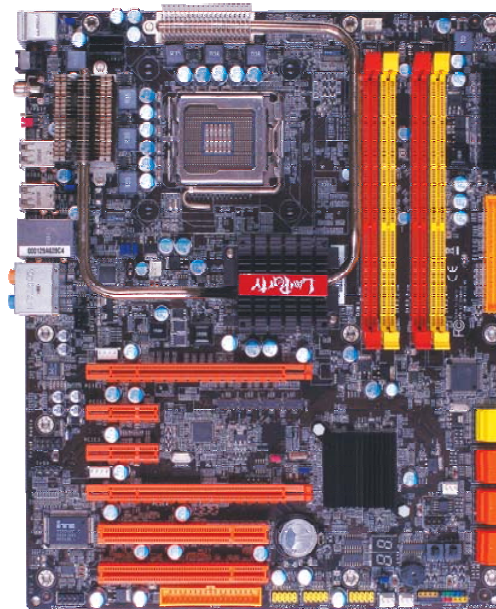
You will not be able to secure the fan and heat sink assembly in place if the groove is not facing the heat sink.

3. Connect the CPU fan's cable connector to the CPU fan connector on the system board.

## Northbridge Heat Sink

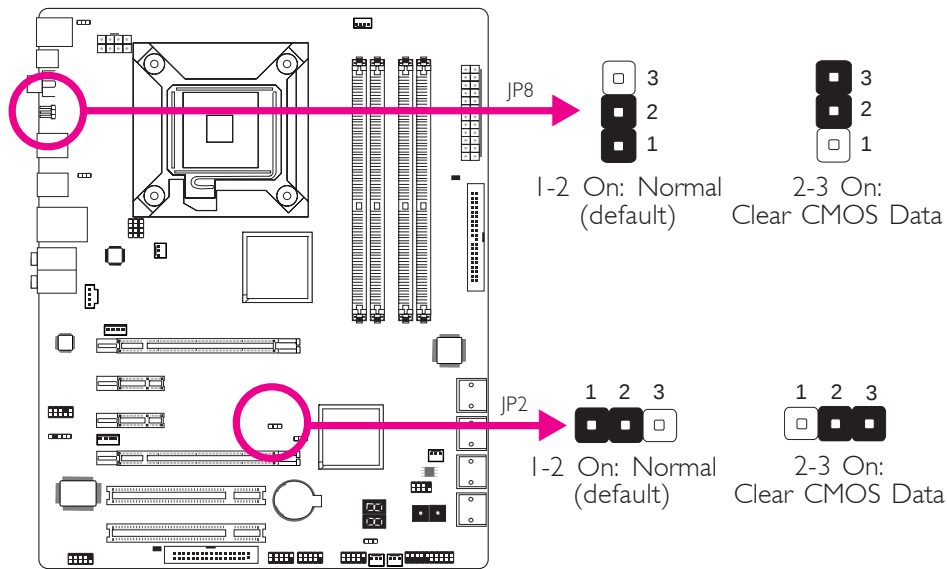
The Northbridge must be kept cool by using a heat sink. The heat sink will dissipate heat generated by the Northbridge. Without the heat sink, the Northbridge will overheat damaging both the Northbridge and the system board.

The system board comes with the heat sink already installed on the board. The copper-made heat pipe technology provides excellent heat dissipation.



## Jumper Settings

### Clear CMOS Data



If you encounter the following,

- CMOS data becomes corrupted.*
- You forgot the supervisor or user password.*
- The overclocked settings in the BIOS resulted to the system's instability or caused system boot up problems.*

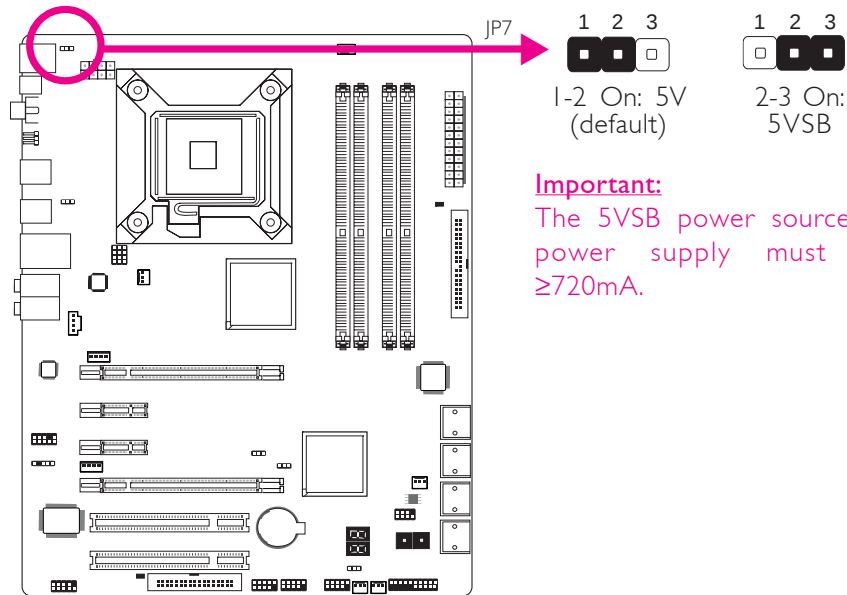
you can reconfigure the system with the default values stored in the ROM BIOS.

JP8 is accessible from the rear panel of the system. This provides convenience by allowing you to clear the CMOS without having to remove the chassis cover.

To load the default values stored in the ROM BIOS, please follow the steps below.

1. Power-off the system then unplug the power cord.
2. Set JP2 or JP8 pins 2 and 3 to On. Wait for a few seconds and set JP2 or JP8 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord then power-on the system.

## PS/2 Power Select

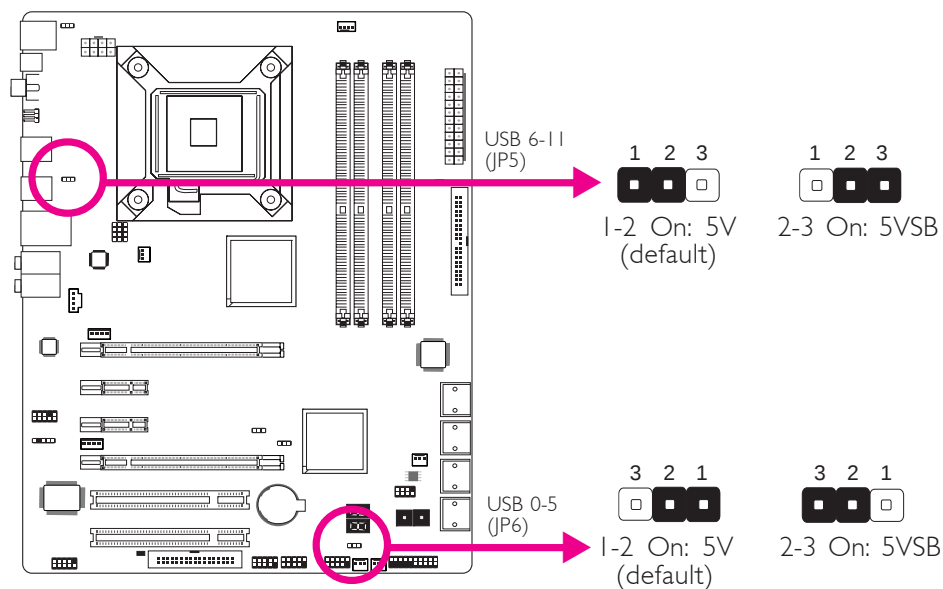


### Important:

The 5VSB power source of your power supply must support  $\geq 720\text{mA}$ .

Selecting 5VSB will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

## USB Power Select

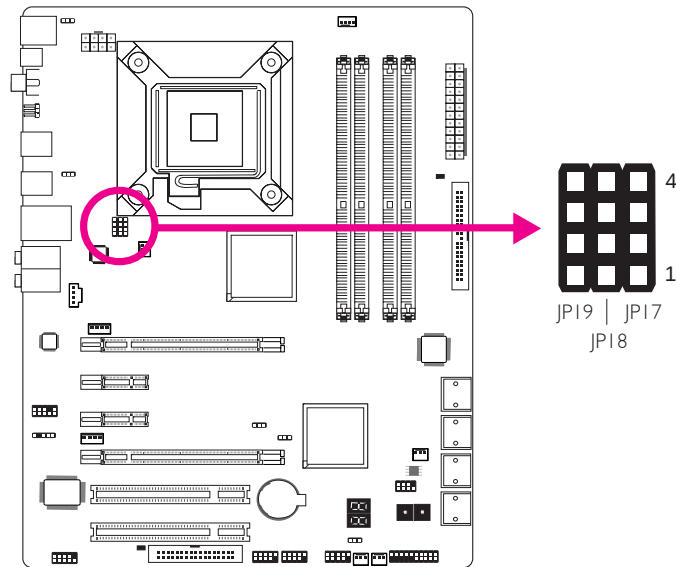


Selecting 5VSB will allow you to use the USB keyboard or USB mouse to wake up the system.

### Important:

The 5VSB power source of your power supply must support  $\geq 1.5\text{A}$  (2 devices) or  $\geq 2\text{A}$  (3 or more devices).

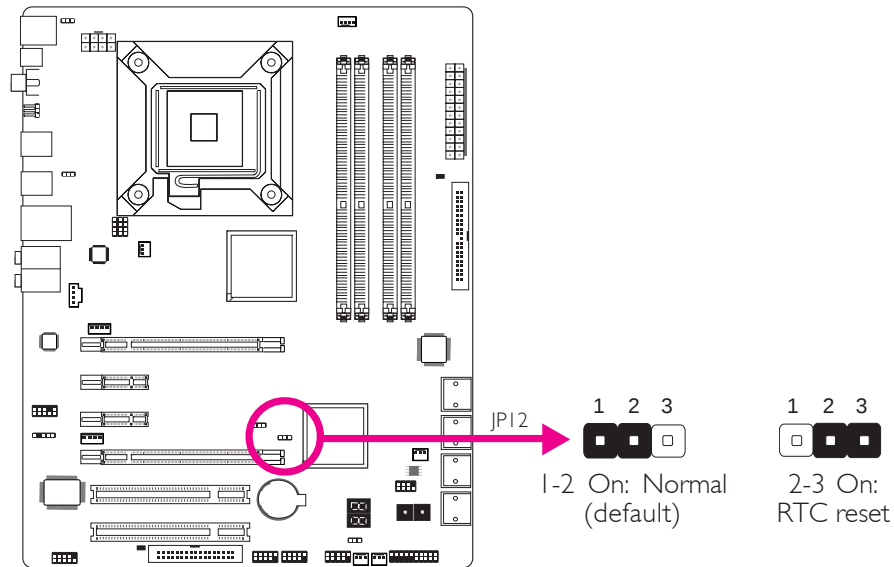
## CPU FSB Select



By default, the three jumpers are all set to pins 1 and 2 On. This setting will allow the system to automatically run according to the CPU's FSB. If you want to change the settings, please refer to the table below.

|             | By CPU | FSB 800 | FSB 1066 | FSB 1333 |
|-------------|--------|---------|----------|----------|
| <b>JP17</b> | 1-2 On | 2-3 On  | 2-3 On   | 2-3 On   |
| <b>JP18</b> | 1-2 On | 3-4 On  | 2-3 On   | 2-3 On   |
| <b>JP19</b> | 1-2 On | 2-3 On  | 2-3 On   | 3-4 On   |

## Secondary RTC Reset



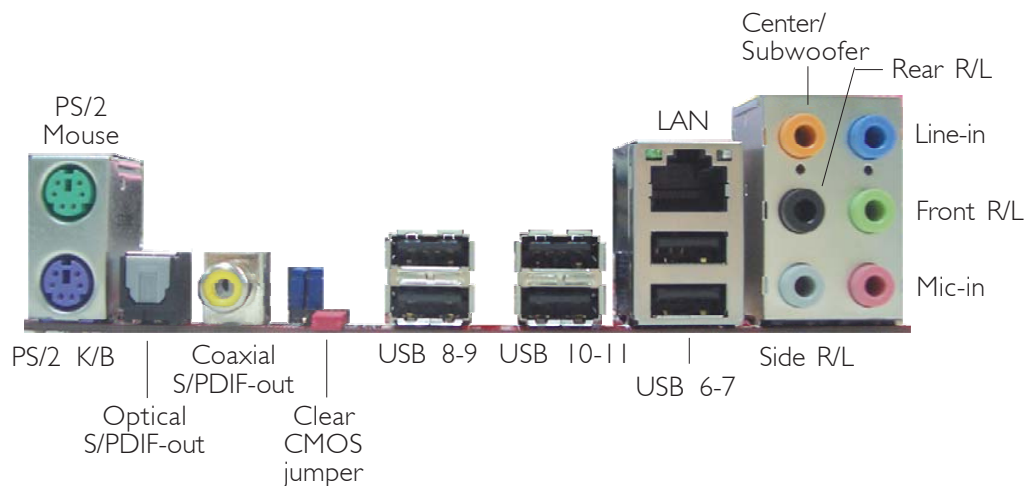
When the RTC battery is removed, this jumper resets the manageability register bits in the RTC.



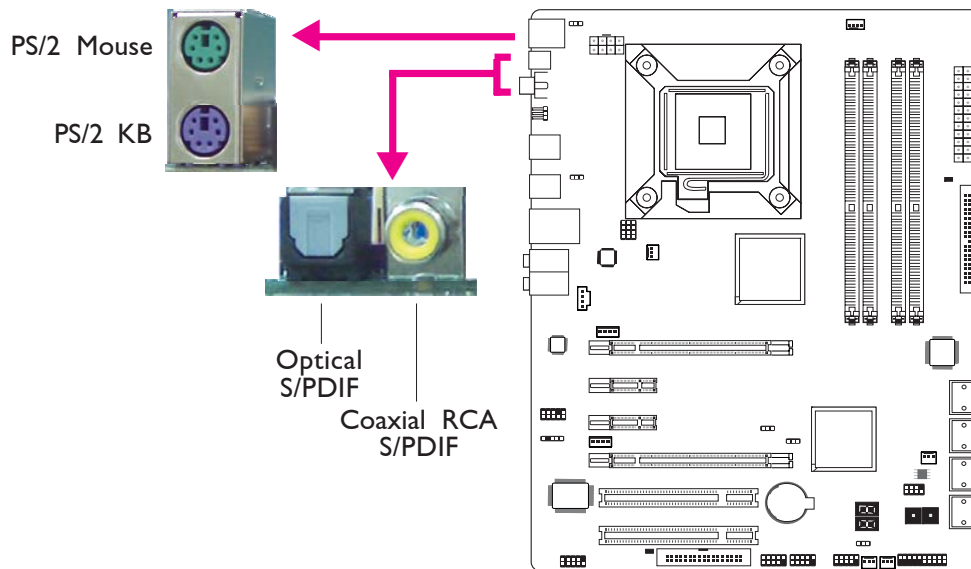
### Note:

1. The  $SRTC_{RST\#}$  input must always be high when all other RTC power planes are on.
2. In the case where the RTC battery is dead or missing on the platform, the  $SRTC_{RST\#}$  pin must rise before the  $RSMRST\#$  pin.

## Rear Panel I/O Ports



## PS/2 Ports and S/PDIF Ports



### PS/2 Mouse and PS/2 Keyboard Ports

These ports are used to connect a PS/2 mouse and a PS/2 keyboard.

### Optical S/PDIF

The optical S/PDIF jack is used to connect an external audio output device using an optical S/PDIF cable.

### Coaxial RCA S/PDIF

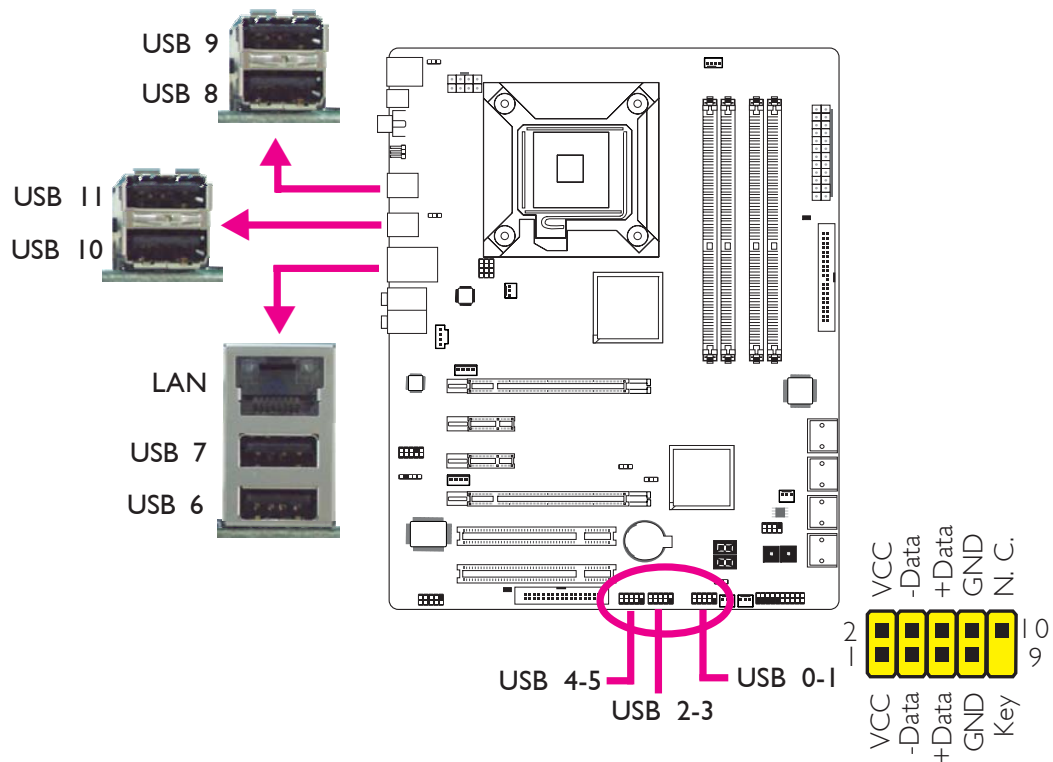
The coaxial RCA S/PDIF jack is used to connect an external audio output device using a coaxial S/PDIF cable.



#### **Important:**

*DO NOT use optical S/PDIF and Coaxial RCA S/PDIF at the same time.*

## USB Ports and LAN Port



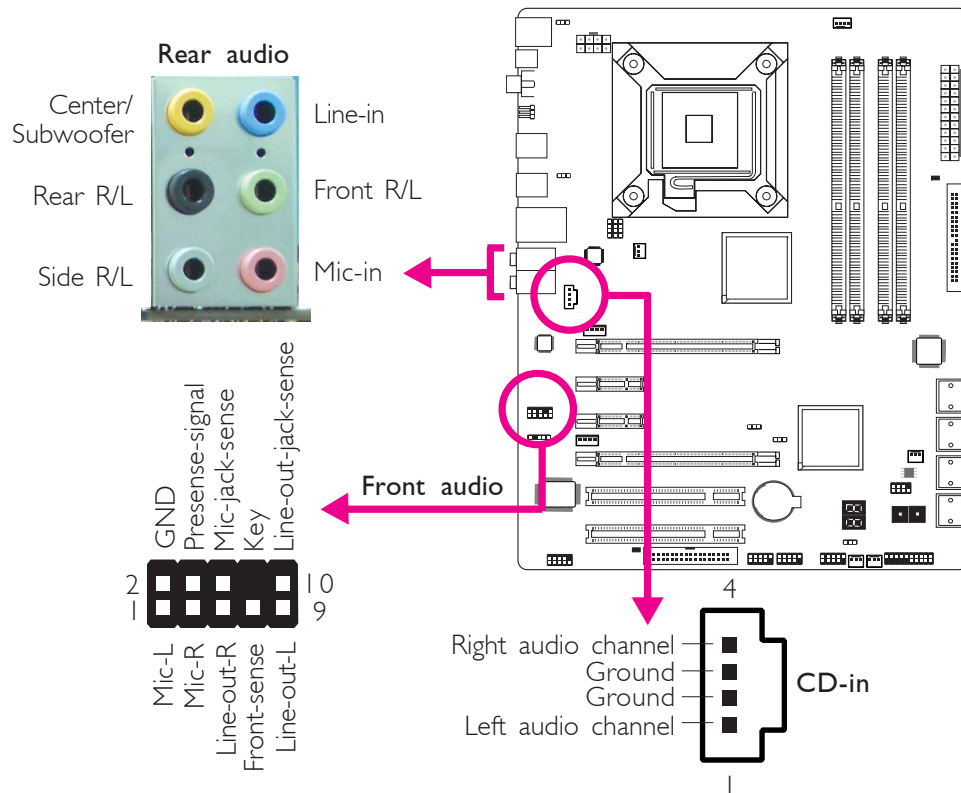
### USB Ports

The USB ports are used to connect USB 2.0/1.1 devices. The 10-pin connectors allow you to connect 6 additional USB 2.0/1.1 ports. Your USB ports may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the USB port cables to these connectors.

### LAN Port

The LAN port allows the system board to connect to a local area network by means of a network hub.

## Audio and CD-In



### Rear Panel Audio

#### Center/Subwoofer Jack (Orange)

This jack is used to connect to the center and subwoofer speakers of the audio system.

#### Rear Right/Left Jack (Black)

This jack is used to connect to the rear right and rear left speakers of the audio system.

#### Side Right/Left Jack (Gray)

This jack is used to connect to the side left and side right speakers of the audio system.

#### Line-in (Light Blue)

This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.

#### Line-out - Front Right/Left Jack (Lime)

This jack is used to connect to the front right and front left speakers of the audio system.

**Mic-in Jack (Pink)**

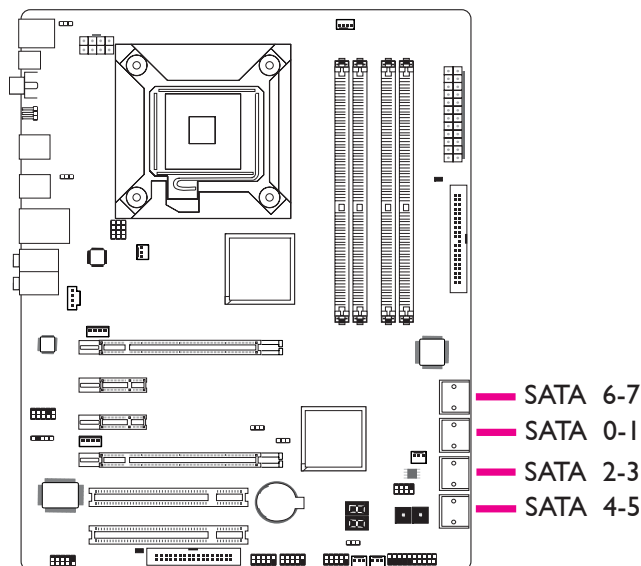
This jack is used to connect an external microphone.

**Front Audio**

The front audio connector is used to connect to the line-out and mic-in jacks that are at the front panel of your system.

**CD-in**

The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

**Internal I/O Connectors****Serial ATA Connectors**

The Serial ATA (SATA) connectors are used to connect Serial ATA drives. Connect one end of the Serial ATA cable to a Serial ATA connector and the other end to your Serial ATA device.

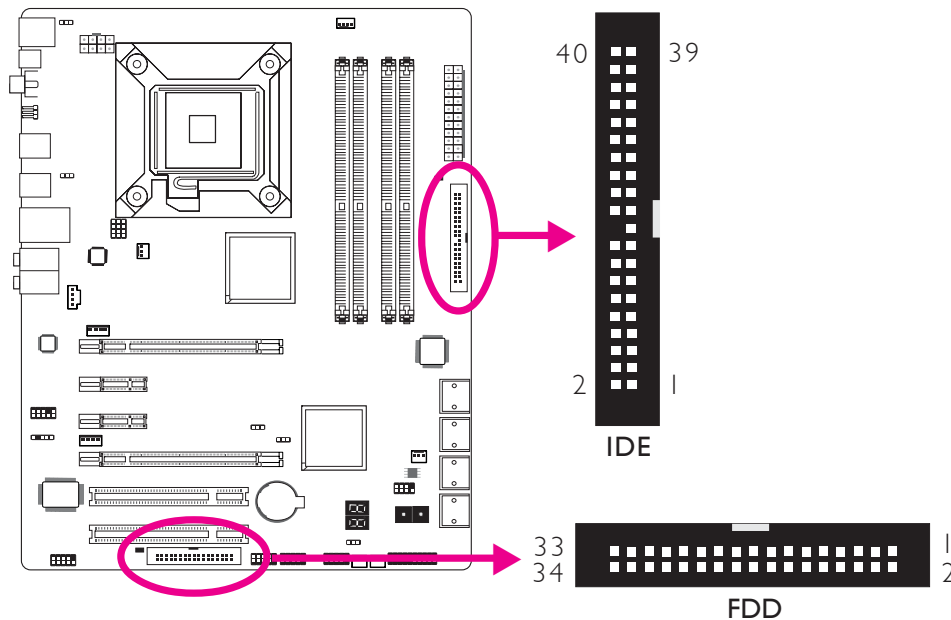
ICH10R supports SATA 0 to SATA 5.

JMB363 supports SATA 6 and SATA 7.

**Configuring RAID**

Refer to the RAID chapter in this manual for more information about creating RAID on Serial ATA drives.

## FDD Connector and IDE Connector



### FDD Connector

The floppy disk drive connector is used to connect a floppy drive. Insert one end of the floppy cable into this connector and the other end-most connector to the floppy drive. The colored edge of the cable should align with pin 1 of this connector.

### IDE Connector

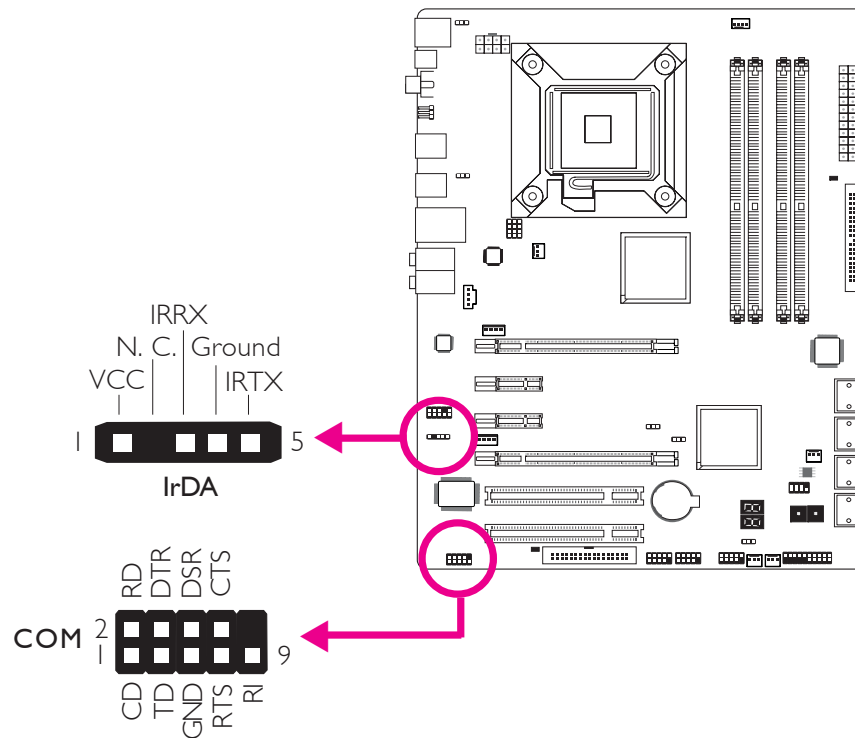
The IDE disk drive connector is used to connect 2 IDE disk drives. An IDE cable has 3 connectors on them, one that plugs into this connector and the other 2 connect to IDE devices. The connector at the end of the cable is for the Master drive and the connector in the middle of the cable is for the Slave drive. The colored edge of the cable should align with pin 1 of this connector.



#### Note:

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

## IrDA and Serial (COM) Connectors



### IrDA Connector

This connector is used to connect an IrDA module.



#### Note:

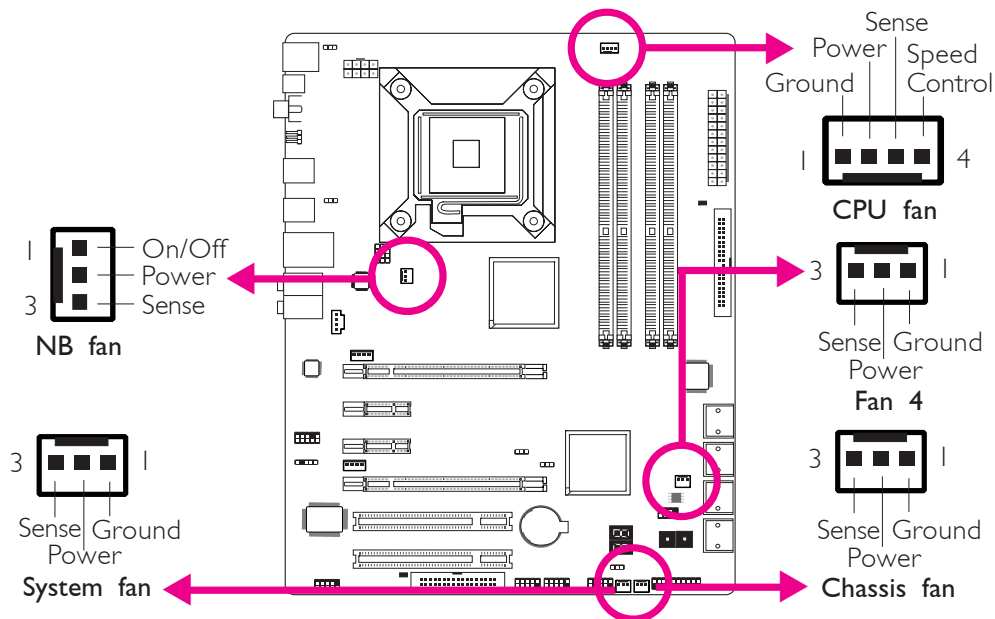
*The sequence of the pin functions on some IrDA cable may be reversed from the pin function defined on the system board. Make sure to connect the cable connector to the IrDA connector according to their pin functions.*

You may need to install the proper drivers in your operating system to use the IrDA function. Refer to your operating system's manual or documentation for more information.

### Serial (COM) Connector

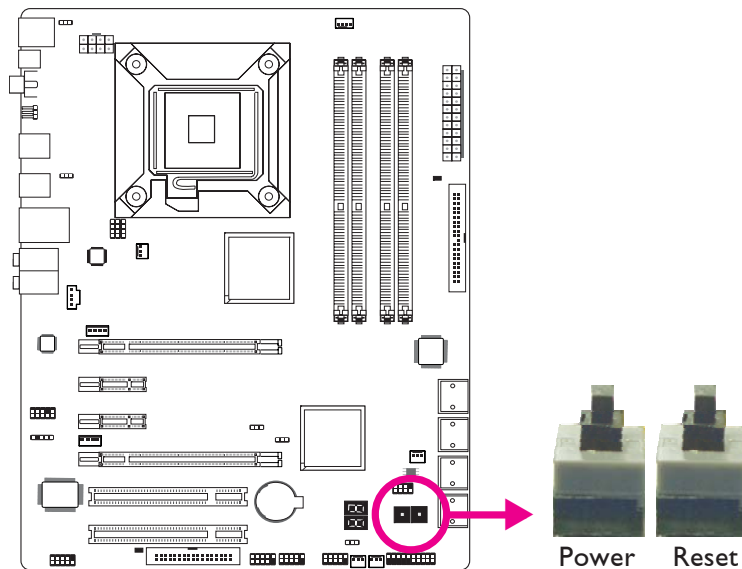
The serial (COM) connector is used to connect modems, serial printers, remote display terminals, or other serial devices. Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the serial port cable to this connector. The colored edge of the cable should align with pin 1 of this connector.

## Cooling Fan Connectors



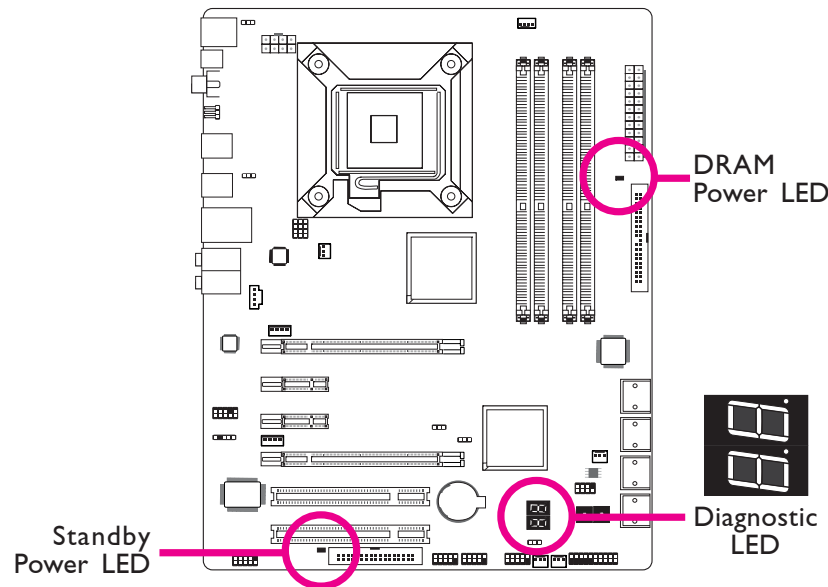
These fan connectors are used to connect cooling fans. Cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

## EZ Touch Switches



The presence of the power switch and reset switch on the system board are user-friendly especially to DIY users. They provide convenience in powering on and/or resetting the system while fine tuning the system board before it is installed into the system chassis.

## LEDs



### DRAM Power LED

This LED will light when the system's power is on.

### Standby Power LED

This LED will light when the system is in the standby mode.

### Diagnostic LED

The Diagnostic LED displays POST codes. POST (Power-On Self Tests) which is controlled by the BIOS is performed whenever you power-on the system. POST will detect the status of the system and its components. Each code displayed on the LED corresponds to a certain system status.

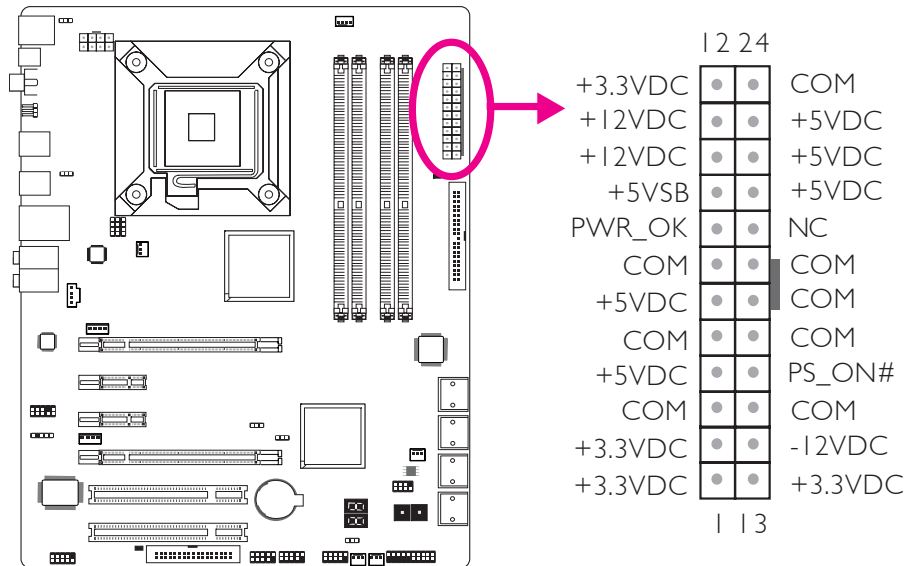


#### **Warning:**

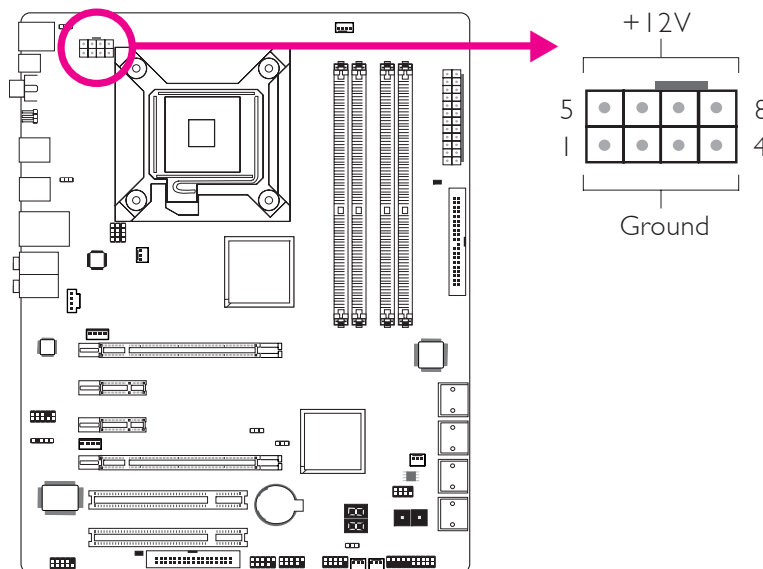
*When the DRAM Power LED and/or Standby Power LED lit red, it indicates that power is present on the DIMM sockets and/or PCI slots. Power-off the PC then unplug the power cord prior to installing any memory modules or add-in cards. Failure to do so will cause severe damage to the motherboard and components.*

## Power Connectors

Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into this connector:

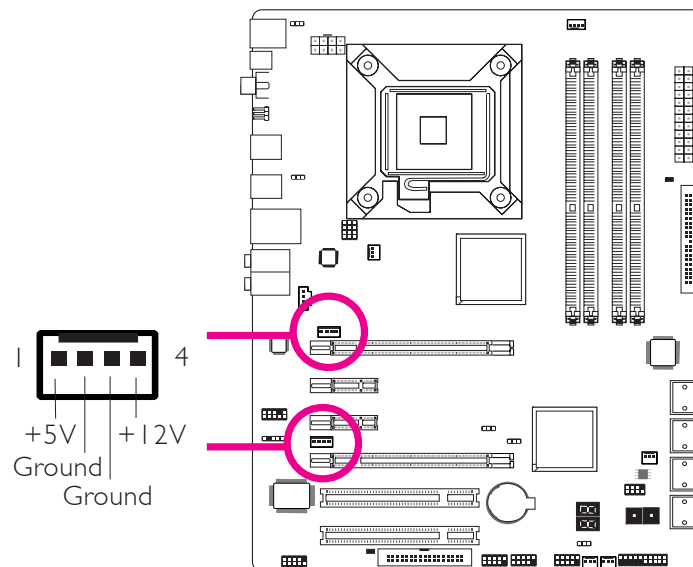


Your power supply unit may come with an 8-pin or 4-pin +12V power connector. The +12V power enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM). If available, it is preferable to use the 8-pin power; otherwise connect a 4-pin power to this connector:



The power connectors from the power supply unit are designed to fit the 24-pin and 8-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

The FDD-type power connectors are additional power connectors. If you are using more than one graphics cards, we recommend that you plug a power cable from your power supply unit to the 5V/12V power connector. This will provide more stability to the entire system. The system board will still work even if the additional power connector is not connected.



The system board requires a minimum of 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, **we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.**



**Important:**

*Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.*

### Restarting the PC

Normally, you can power-off the PC by:

1. Pressing the power button at the front panel of the chassis.  
or
2. Pressing the power switch that is on the system board (note: not all system boards come with this switch).

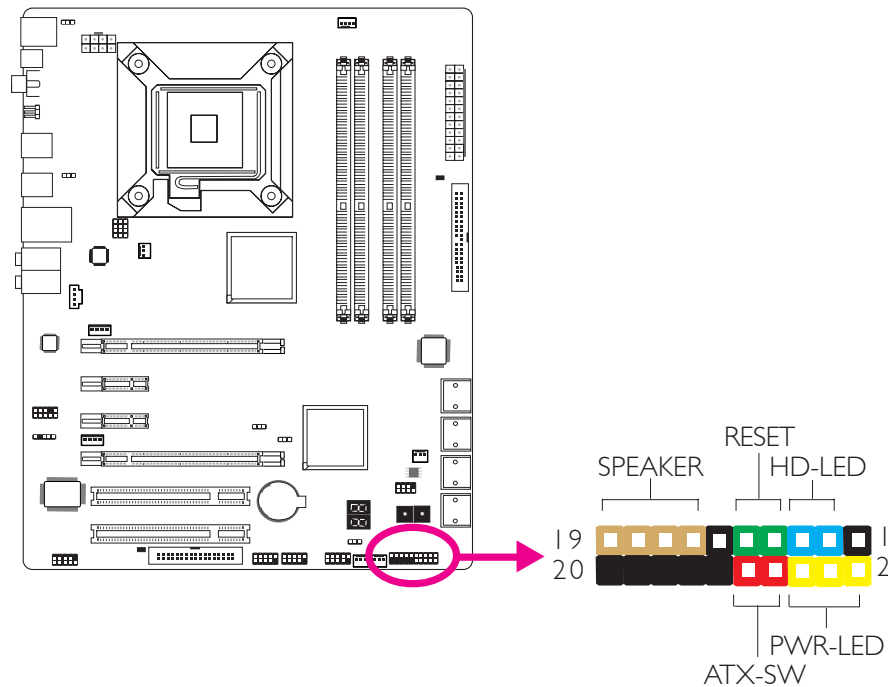
If for some reasons you need to totally cut off the power supplied to the PC, switch off the power supply or unplug the power cord. Take note though that if you intend to restart it at once, please strictly follow the steps below.

1. The time where power is totally discharged varies among power supplies. It's discharge time is highly dependent on the system's configuration such as the wattage of the power supply, the sequence of the supplied power as well as the number of peripheral devices connected to the system. Due to this reason, we strongly recommend that you wait for the Standby Power LED (refer to the "LEDs" section in this chapter for the location of the Standby Power LED) to lit off.
2. After the Standby Power LED has lit off, wait for 6 seconds before powering on the PC.

If the system board is already enclosed in a chassis which apparently will not make the Standby Power LED visible, wait for 15 seconds before you restore power connections. 15 seconds is approximately the time that will take the LED to lit off and the time needed before restoring power.

The above will ensure protection and prevent damage to the motherboard and components.

## Front Panel Connectors



### HD-LED: Primary/Secondary IDE LED

This LED will light when the hard drive is being accessed.

### RESET: Reset Switch

This switch allows you to reboot without having to power off the system thus prolonging the life of the power supply or system.

### SPEAKER: Speaker Connector

This connects to the speaker installed in the system chassis.

### ATX-SW: ATX Power Switch

Depending on the setting in the BIOS setup, this switch is a “dual function power button” that will allow your system to enter the Soft-Off or Suspend mode.

**PWR-LED: Power/Standby LED**

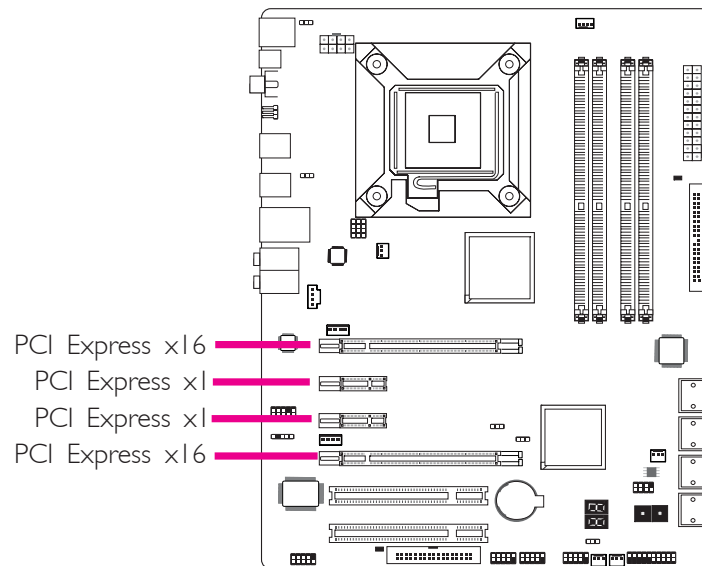
When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) or S3 (STR - Suspend To RAM) state, it will blink every second.

**Note:**

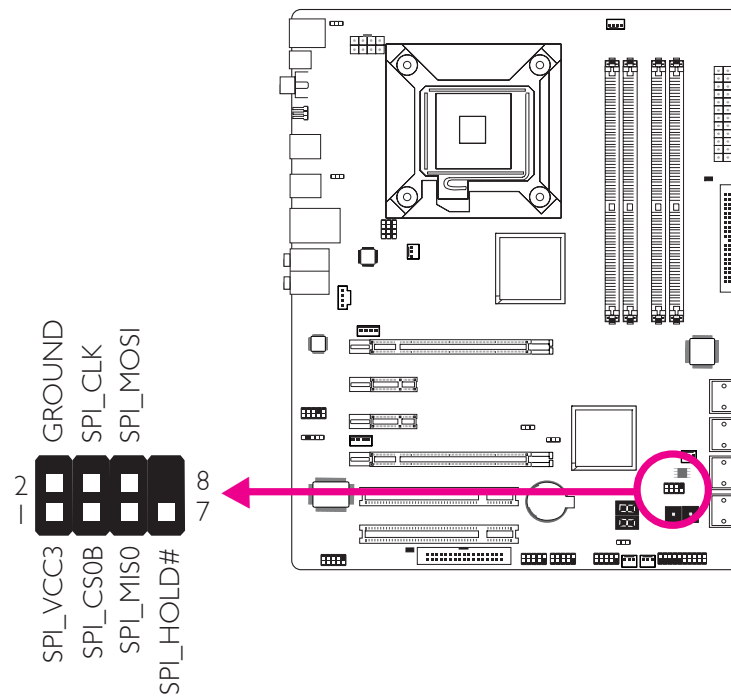
*If a system did not boot-up and the Power/Standby LED did not light after it was powered-on, it may indicate that the CPU or memory module was not installed properly. Please make sure they are properly inserted into their corresponding socket.*

|                                              | Pin                  | Pin Assignment                                                    |
|----------------------------------------------|----------------------|-------------------------------------------------------------------|
| <b>HD-LED</b><br>(Primary/Secondary IDE LED) | 3<br>5               | HDD LED Power<br>HDD                                              |
| <b>Reserved</b>                              | 14<br>16             | N. C.<br>N. C.                                                    |
| <b>ATX-SW</b><br>(ATX power switch)          | 8<br>10              | PWRBT+<br>PWRBT-                                                  |
| <b>Reserved</b>                              | 18<br>20             | N. C.<br>N. C.                                                    |
| <b>RESET</b><br>(Reset switch)               | 7<br>9               | Ground<br>H/W Reset                                               |
| <b>SPEAKER</b><br>(Speaker connector)        | 13<br>15<br>17<br>19 | Speaker Data<br>N. C.<br>Ground<br>Speaker Power                  |
| <b>PWR-LED</b><br>(Power/Standby LED)        | 2<br>4<br>6          | LED Power (+)<br>LED Power (+)<br>LED Power (-) or Standby Signal |

## PCI Express Slots

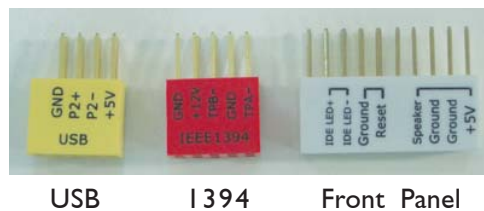


## Download Flash BIOS Connector



## Smart Connectors

The Smart Connectors (USB, IEEE 1394 and Front Panel) serve as extended connectors allowing you to easily connect cables to the connectors that are on the system board. This is specially advantageous when using the front panel connectors as this will prevent wrong cable connection.



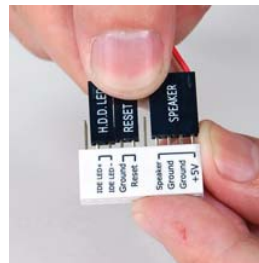
USB

1394

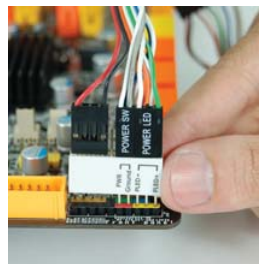
Front Panel

## Front Panel Connectors

1. Connect all front panel cables from the chassis to the front panel smart connector. Connect according to the pin definition shown on the smart connector:



2. Connect the front panel smart connector to the front panel connector on the system board.



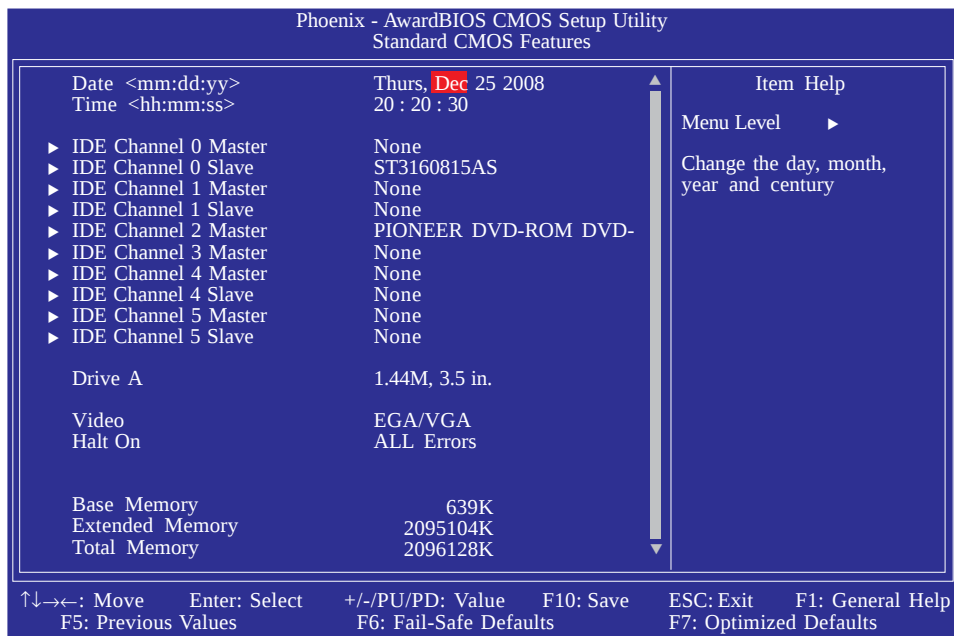
## USB and IEEE 1394 Connectors

1. Connect your USB/1394 port cable to the USB/1394 smart connector. Connect according to the pin definition shown on the smart connector.
2. Connect the USB/1394 smart connector to the respective connectors on the system board.



## Standard CMOS Features

Use the arrow keys to highlight “Standard CMOS Features” then press <Enter>. A screen similar to the one below will appear:



The screen above list all the fields available in the Standard CMOS Features submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

### Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1994 to 2079.

### Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

## IDE Channel 0 Master to IDE Channel 5 Slave

To configure the IDE drives, move the cursor to a field then press <Enter>. The following screen will appear:

| Phoenix - AwardBIOS CMOS Setup Utility |             |                                                        |
|----------------------------------------|-------------|--------------------------------------------------------|
| IDE Channel 0 Master                   |             |                                                        |
| IDE HDD Auto-Detection                 | Press Enter | Item Help                                              |
| IDE Channel 0 Master                   | Auto        | Menu Level ▶▶                                          |
| Access Mode                            | Auto        |                                                        |
| Capacity                               | 0MB         | To auto-detect the HDD's size, head... on this channel |
| Cylinder                               | 0           |                                                        |
| Head                                   | 0           |                                                        |
| Precomp                                | 0           |                                                        |
| Landing Zone                           | 0           |                                                        |
| Sector                                 | 0           |                                                        |

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The settings on the screen are for reference only. Your version may not be identical to this one.

## IDE HDD Auto-Detection

Detects the parameters of the drive. The parameters will automatically be shown on the screen.

## IDE Channel 0 Master to IDE Channel 5 Slave

The drive type information should be included in the documentation from your hard disk vendor. If you select "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show the IDE for the HDD & CD-ROM drive. If a hard disk has not been installed, select "None".

## Access Mode

For hard drives larger than 528MB, you would typically select the LBA type. Certain operating systems require that you select CHS or Large. Please check your operating system's manual or Help desk on which one to select.

### Capacity

Displays the approximate capacity of the disk drive. Usually the size is slightly greater than the size of a formatted disk given by a disk checking program.

### Cylinder

This field displays the number of cylinders.

### Head

This field displays the number of read/write heads.

### Precomp

This field displays the number of cylinders at which to change the write timing.

### Landing Zone

This field displays the number of cylinders specified as the landing zone for the read/write heads.

### Sector

This field displays the number sectors per track.

### Drive A

This field identifies the type of floppy disk drive installed.

|                       |                                                      |
|-----------------------|------------------------------------------------------|
| <i>None</i>           | No floppy drive is installed                         |
| <i>360K, 5.25 in.</i> | 5-1/4 in. standard drive; 360KB capacity             |
| <i>1.2M, 5.25 in.</i> | 5-1/4 in. AT-type high-density drive; 1.2MB capacity |
| <i>720K, 3.5 in.</i>  | 3-1/2 in. double-sided drive; 720KB capacity         |
| <i>1.44M, 3.5 in.</i> | 3-1/2 in. double-sided drive; 1.44MB capacity        |
| <i>2.88M, 3.5 in.</i> | 3-1/2 in. double-sided drive; 2.88MB capacity        |

## Video

This field selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type. The default setting is EGA/VGA.

|                |                                                                                              |
|----------------|----------------------------------------------------------------------------------------------|
| <i>EGA/VGA</i> | Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters. |
| <i>CGA 40</i>  | Color Graphics Adapter. Power up in 40-column mode.                                          |
| <i>CGA 80</i>  | Color Graphics Adapter. Power up in 80-column mode.                                          |
| <i>Mono</i>    | Monochrome adapter. Includes high resolution monochrome adapters.                            |

## Halt On

This field determines whether the system will stop if an error is detected during power up. The default setting is All Errors.

|                          |                                                                                                |
|--------------------------|------------------------------------------------------------------------------------------------|
| <i>No Errors</i>         | The system boot will not stop for any errors detected.                                         |
| <i>All Errors</i>        | The system boot will stop whenever the BIOS detects a non-fatal error.                         |
| <i>All, But Keyboard</i> | The system boot will not stop for a keyboard error; it will stop for all other errors.         |
| <i>All, But Diskette</i> | The system boot will not stop for a disk error; it will stop for all other errors.             |
| <i>All, But Disk/Key</i> | The system boot will not stop for a disk or keyboard error; it will stop for all other errors. |

## Base Memory

Displays the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard or 640K for systems with 640K or more memory installed on the motherboard.

### Extended Memory

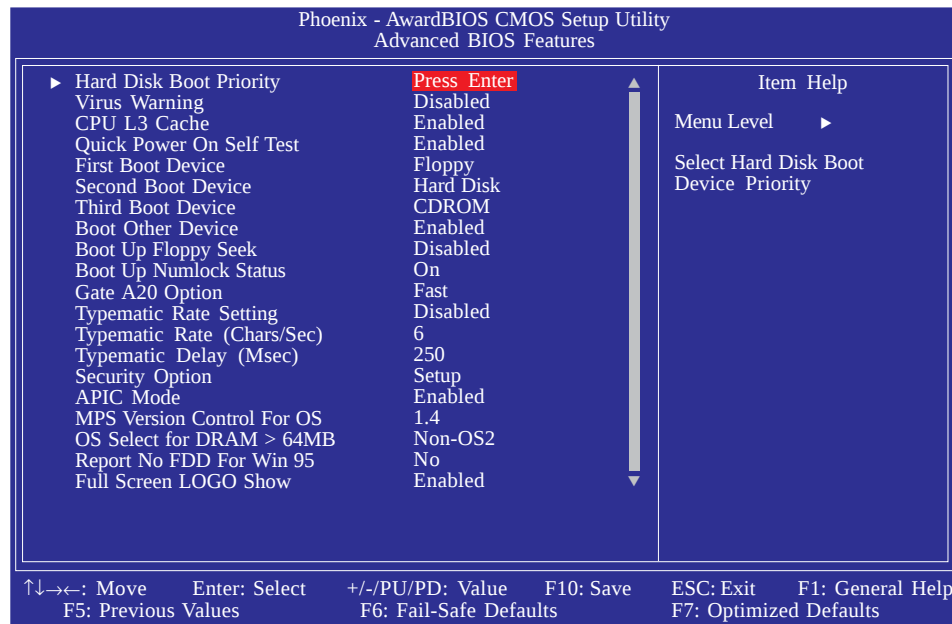
Displays the amount of extended memory detected during boot-up.

### Total Memory

Displays the total memory available in the system.

## Advanced BIOS Features

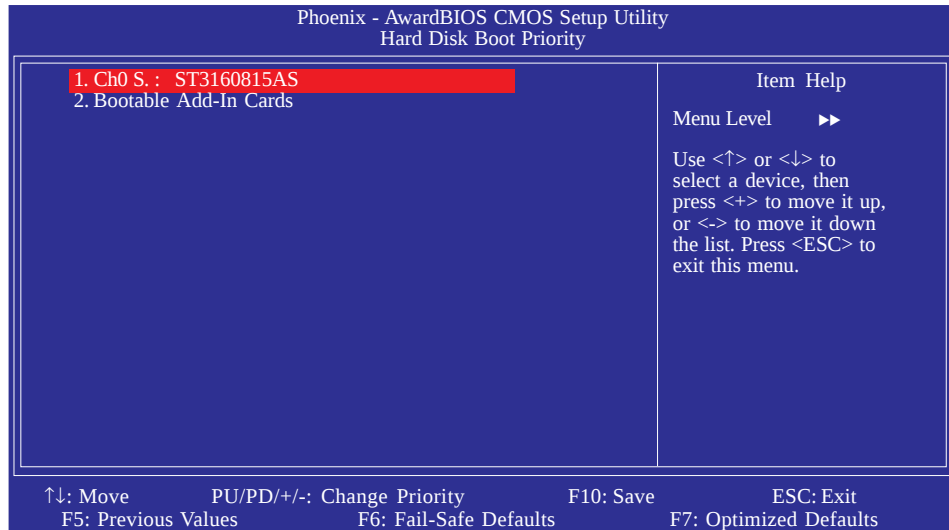
The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.



The screen above list all the fields available in the Advanced BIOS Features submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

### Hard Disk Boot Priority

This field is used to select the boot sequence of the hard drives. Move the cursor to this field then press <Enter>. Use the Up or Down arrow keys to select a device then press <+> to move it up or <-> to move it down the list.



The settings on the screen are for reference only. Your version may not be identical to this one.

### Virus Warning

This field protects the boot sector and partition table of your hard disk drive. When this field is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive. If an attempt is made to write to the boot sector or partition table of the hard disk drive, the BIOS will halt the system and an error message will appear.

After seeing the error message, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

Many disk diagnostic programs which attempt to access the boot sector table will cause the warning message to appear. If you are running such a program, we recommend that you first disable this field.

### CPU L3 Cache

This field is used to enable or disable the CPU's L3 cache.

### Quick Power On Self Test

This field speeds up Power On Self Test (POST) whenever the system is powered on. The BIOS will shorten or skip some check items during POST. To attain the shortest POST time, select "Fast".

### First Boot Device, Second Boot Device, Third Boot Device and Boot Other Device

Select the drive to boot first, second and third in the "First Boot Device" "Second Boot Device" and "Third Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected. Set "Boot Other Device" to Enabled if you wish to boot from another device.

### Boot Up Floppy Seek

When enabled, the BIOS will check whether the floppy disk drive installed is 40 or 80 tracks. Note that the BIOS cannot distinguish between 720K, 1.2M, 1.44M and 2.88M drive types as they are all 80 tracks. When disabled, the BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360KB.

### Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

### Gate A20 Option

This field allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 Mbyte. Initially, gate A20 was handled via the keyboard controller. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20. A20 refers to the first 64KB of extended memory.

|               |                                                     |
|---------------|-----------------------------------------------------|
| <i>Fast</i>   | The chipset controls Gate A20.                      |
| <i>Normal</i> | A pin in the keyboard controller controls Gate A20. |

### Typematic Rate Setting

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Disabled</i> | Continually holding down a key on your keyboard will cause the BIOS to report that the key is down.                                                                                                                                                                                                                                                                                                                              |
| <i>Enabled</i>  | The BIOS will not only report that the key is down, but will first wait for a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys. You can then select the typematic rate and typematic delay in the "Typematic Rate (Chars/Sec)" and "Typematic Delay (Msec)" fields below. |

### Typematic Rate (Chars/Sec)

This field allows you to select the rate at which the keys are accelerated.

### Typematic Delay (Msec)

This field allows you to select the delay between when the key was first depressed and when the acceleration begins.

## Security Option

This field determines when the system will prompt for the password-everytime the system boots or only when you enter the BIOS setup. Set the password in the Set Supervisor/User Password submenu.

|               |                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------|
| <i>System</i> | The system will not boot and access to Setup will be denied unless the correct password is entered at the prompt. |
| <i>Setup</i>  | The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.    |

## APIC Mode

Leave this field in its default setting.

## MPS Version Control for OS

This field is used to select the MPS version that the system board is using.

## OS Select for DRAM > 64MB

Select the "OS2" option only if the system that is running an OS/2 operating system has greater than 64MB RAM.

## Report No FDD For Win95

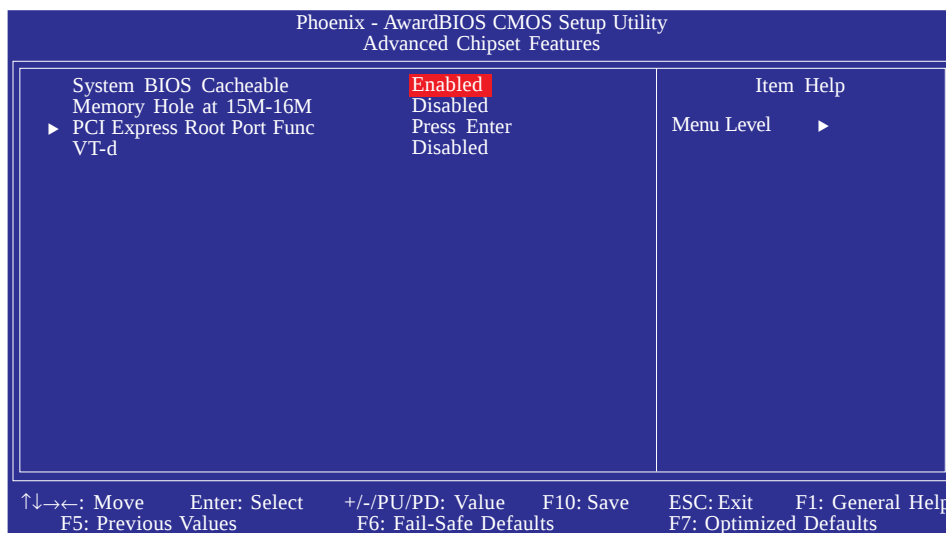
|            |                                         |
|------------|-----------------------------------------|
| <i>Yes</i> | Will report no FDD for Windows® 95.     |
| <i>No</i>  | Will not report no FDD for Windows® 95. |

## Full Screen LOGO Show

This field is applicable only if you want a particular logo to appear during system boot-up.

|                 |                                                            |
|-----------------|------------------------------------------------------------|
| <i>Enabled</i>  | The logo will appear in full screen during system boot-up. |
| <i>Disabled</i> | The logo will not appear during system boot-up.            |

## Advanced Chipset Features



The settings on the screen are for reference only. Your version may not be identical to this one.

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources. **These items should not be altered unless necessary.** The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system.

### System BIOS Cacheable

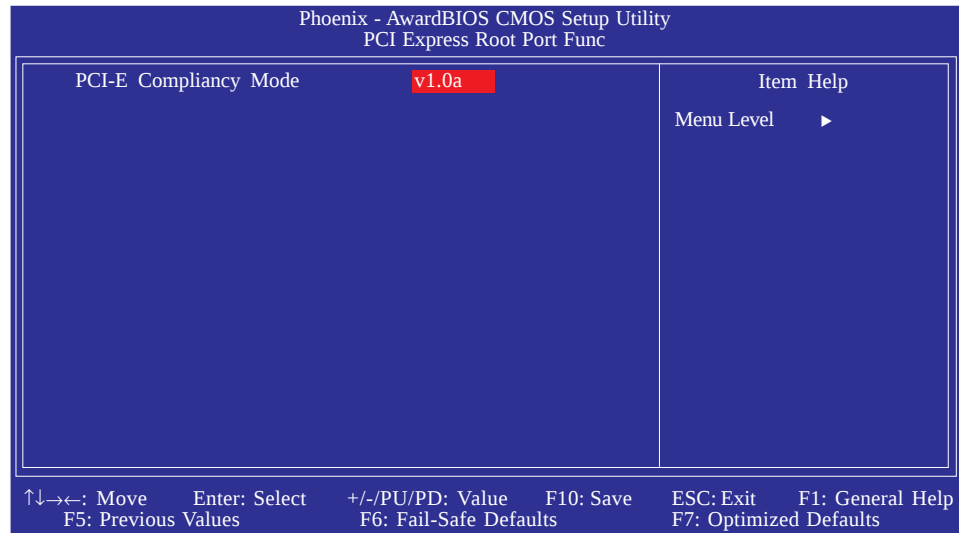
When this field is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. The larger the range of the Cache RAM, the higher the efficiency of the system.

### Memory Hole At 15M-16M

In order to improve system performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB. When enabled, the CPU assumes the 15-16MB memory range is allocated to the hidden ISA address range instead of the actual system DRAM. When disabled, the CPU assumes the 15-16MB address range actually contains DRAM memory. If more than 16MB of system memory is installed, this field must be disabled to provide contiguous system memory.

## PCI Express Root Port Func

Move the cursor to this field and press <Enter>. The following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

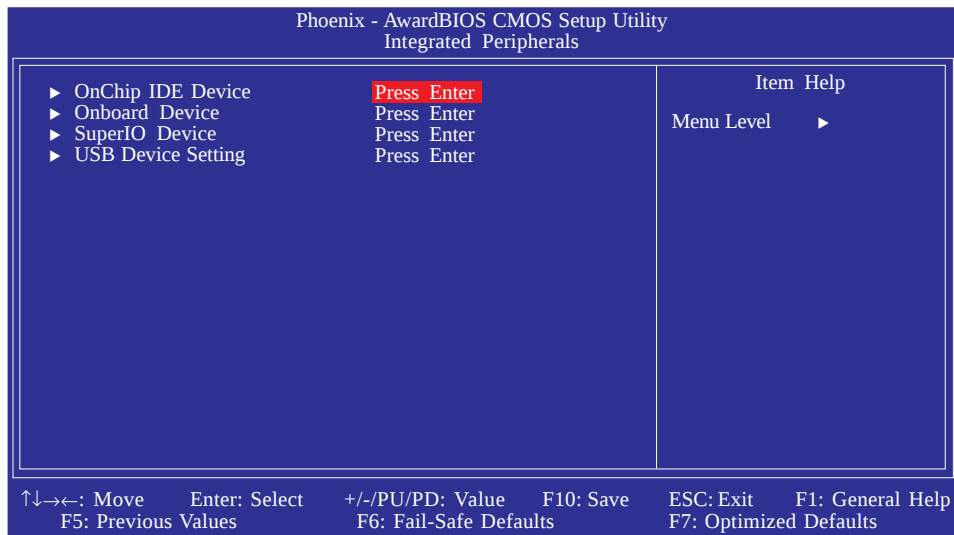
## PCI-E Compliancy Mode

This field is used to select the mode for the PCI Express add-in card.

## VT-d

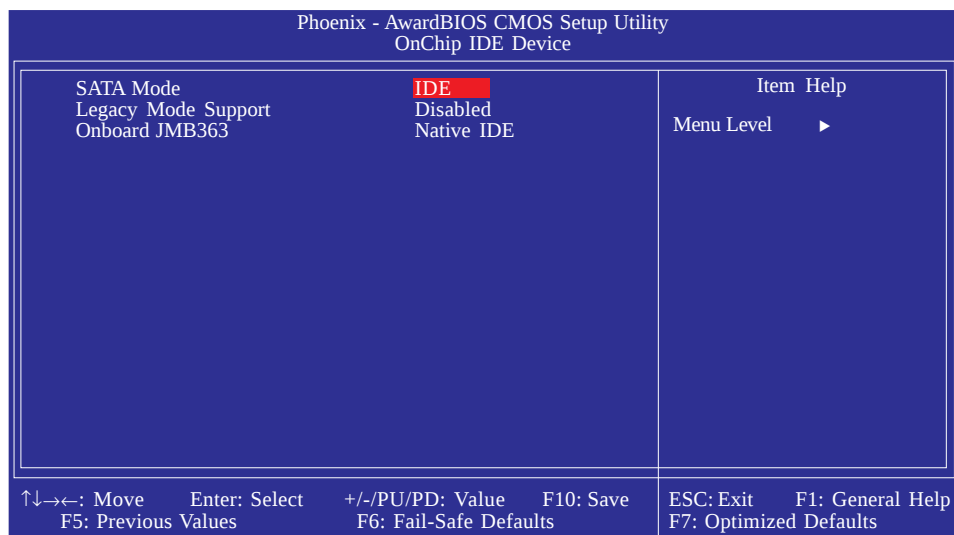
The options are Enabled and Disabled.

## Integrated Peripherals



The settings on the screen are for reference only. Your version may not be identical to this one.

## OnChip IDE Device



The settings on the screen are for reference only. Your version may not be identical to this one.

### SATA Mode

This field is used to configure the SATA devices supported by the southbridge.

- IDE* This option configures the Serial ATA drives as Parallel ATA storage devices.
- RAID* This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.
- AHCI* This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).

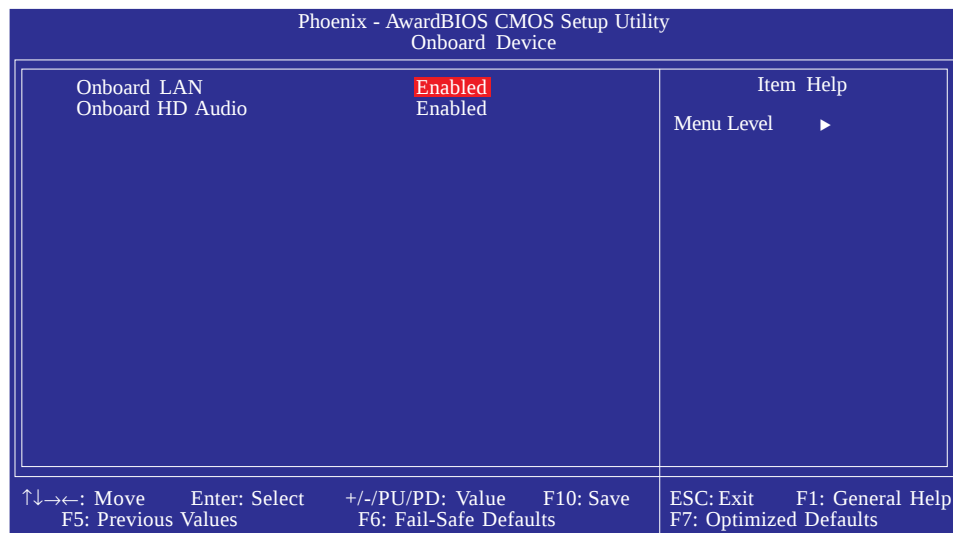
### Legacy Mode Support

The options are Enabled and Disabled.

### Onboard JMB363

This field is used to configure the onboard JMB363 controller. The options are RAID+IDE, Native IDE and Disabled.

## Onboard Device



The settings on the screen are for reference only. Your version may not be identical to this one.

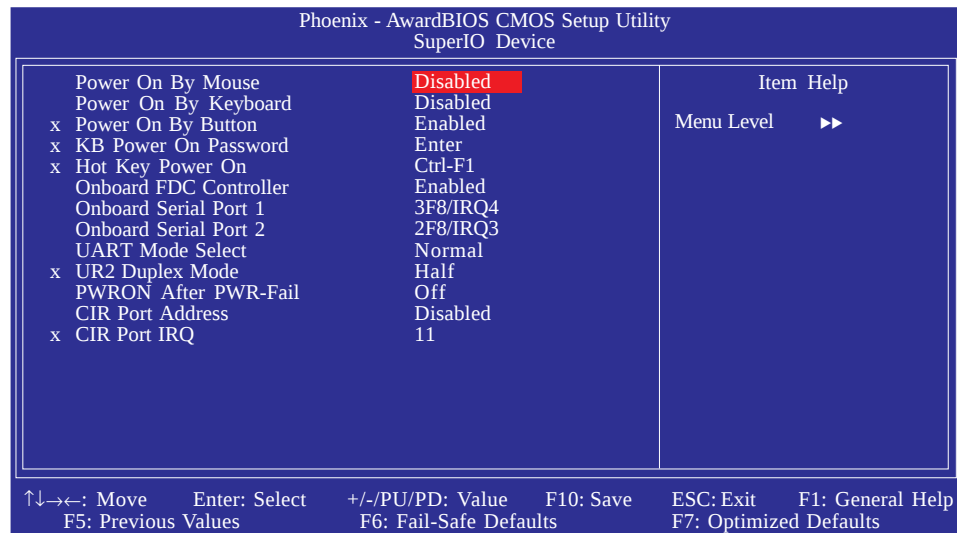
### Onboard LAN

This field is used to enable or disable the onboard LAN.

### Onboard HD Audio

This field is used to enable or disable the onboard HD audio.

## Super IO Device



The settings on the screen are for reference only. Your version may not be identical to this one.

### Power On By Mouse

|                 |                                       |
|-----------------|---------------------------------------|
| <i>Disabled</i> | Disables the mouse power-on function. |
| <i>Enabled</i>  | Enables the mouse power-on function.  |

### Power On By Keyboard

This field allows you to use the keyboard to power-on the system.

|                    |                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <i>Disabled</i>    | Disables the keyboard power-on function.                                                                                            |
| <i>Password</i>    | When this option is selected, set the password you would like to use to power-on the system in the "KB Power On Password" field.    |
| <i>Hot Key</i>     | When this option is selected, select the function key you would like to use to power-on the system in the "Hot Key Power On" field. |
| <i>Any Key</i>     | Press any key to power-on the system.                                                                                               |
| <i>Keyboard 98</i> | When this option is selected, press the "wake up" key of the Windows 98 compatible keyboard to power-on the system.                 |

### Power On By Button

To use the power button to power on the system, set this field to Enabled.

### KB Power On Password

Move the cursor to this field and press <Enter>. Enter your password. You can enter up to 5 characters. Type in exactly the same password to confirm, then press <Enter>.

The power button will not function once a keyboard password has been set in this field. You must type the correct password to power-on the system. If you forgot the password, power-off the system and remove the battery. Wait for a few seconds and install it back before powering-on the system.

### Hot Key Power On

This field is used to select a function key that you would like to use to power-on the system.

### Onboard FDC Controller

|                 |                                              |
|-----------------|----------------------------------------------|
| <i>Enabled</i>  | Enables the onboard floppy disk controller.  |
| <i>Disabled</i> | Disables the onboard floppy disk controller. |

### Onboard Serial Port 1 and Onboard Serial Port 2

|                                               |                                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------|
| <i>Auto</i>                                   | The system will automatically select an I/O address for the onboard serial port 1 and serial port 2. |
| <i>3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3</i> | Allows you to manually select an I/O address for the onboard serial port 1 and serial port 2.        |
| <i>Disabled</i>                               | Disables the onboard serial port 1 and/or serial port 2.                                             |

### UART Mode Select

This field is used to select the type of IrDA standard supported by your IrDA device. For better transmission of data, your IrDA peripheral device must be within a 30° angle and within a distance of 1 meter.

### UR2 Duplex Mode

|             |                                                       |
|-------------|-------------------------------------------------------|
| <i>Half</i> | Data is completely transmitted before receiving data. |
| <i>Full</i> | Transmits and receives data simultaneously.           |

### PWRON After PWR-Fail

|                   |                                                                                                                                                                                                                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Off</i>        | When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.                                                                                                                                                                                                           |
| <i>On</i>         | When power returns after an AC power failure, the system will automatically power-on.                                                                                                                                                                                                                                                      |
| <i>Former-Sts</i> | When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns. |

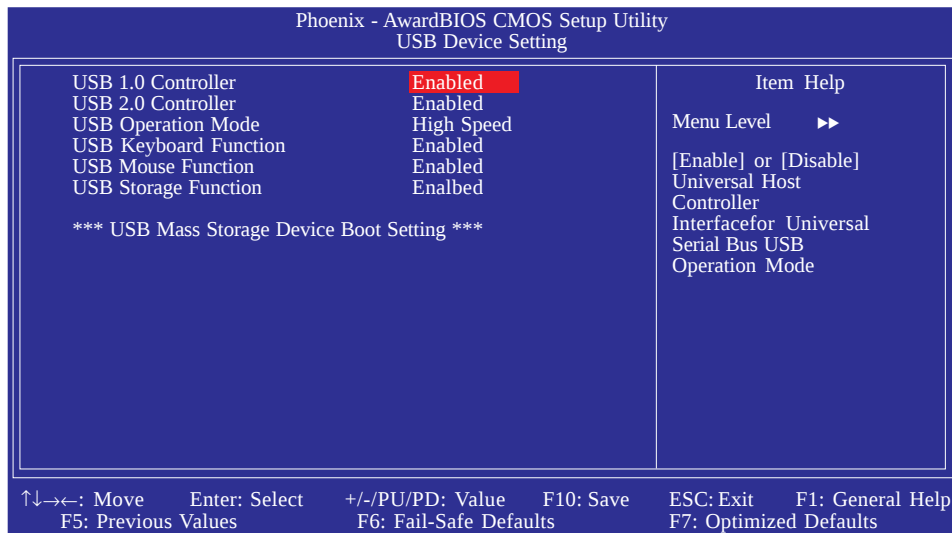
### CIR Port Address

This field is used to select an I/O address for the CIR device.

### CIR Port IRQ

This field is used to select an IRQ for the CIR device.

## USB Device Setting



The settings on the screen are for reference only. Your version may not be identical to this one.

### USB 1.0 Controller

This field is used to enable or disable the Universal Host Controller Interface (USB 1.0).

### USB 2.0 Controller

This field is used to enable or disable the Enhanced Host Controller Interface (USB 2.0).

### USB Operation Mode

- High Speed*      If the USB device is a high speed device, it will operate in high speed mode. If it is a full/low speed device, it will operate in full/low speed mode.
- Full/Low Speed*      Regardless of the speed of the USB device, it will always operate in full/low speed mode.

### USB Keyboard Function

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

### USB Mouse Function

Due to the limited space of the BIOS ROM, the support for legacy USB mouse (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

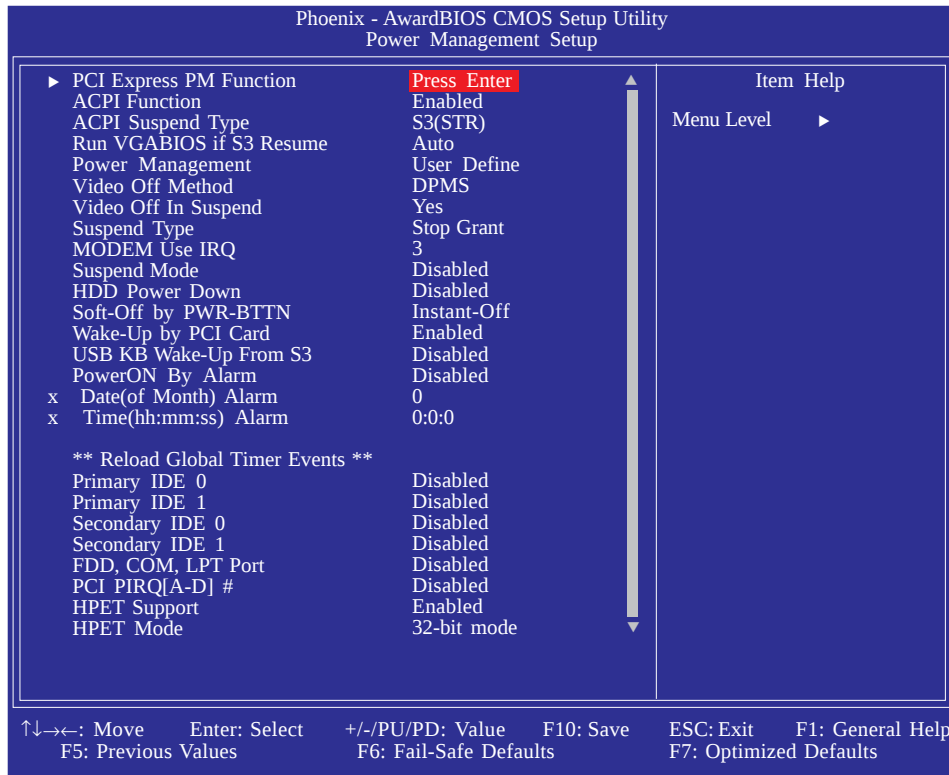
If a PS/2 mouse is not available and you need to use a USB mouse to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

### USB Storage Function

This field is used to enable or disable the support for legacy USB mass storage.

## Power Management Setup

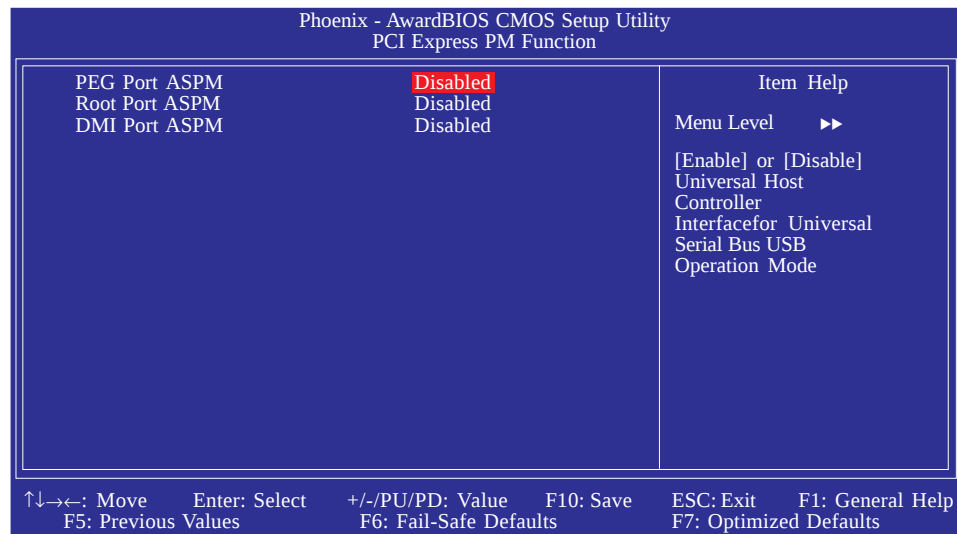
The Power Management Setup allows you to configure your system to most effectively save energy.



The screen above list all the fields available in the Power Management Setup submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

## PCI Express PM Function

This field is used to configure the PCI Express PM function.



The settings on the screen are for reference only. Your version may not be identical to this one.

### PEG Port ASPM

The options are Disabled, L0s and L1/L0s.

### Root Port ASPM

The options are Disabled, L0s, L1 and L1/L0s.

### DMI Port ASPM

The options are Enabled and Disabled.

## ACPI Function

By default, the ACPI function is enabled. This function should be enabled only in operating systems that support ACPI.

### ACPI Suspend Type

This field is used to select the type of Suspend mode.

- S1(POS)    Enables the Power On Suspend function.
- S3(STR)    Enables the Suspend to RAM function.

### Run VGABIOS if S3 Resume

When this field is set to Auto, the system will initialize the VGA BIOS when it wakes up from the S3 state. This can be configured only if the “ACPI Suspend Type” field is set to “S3(STR)”. When this feature is disabled, the system resume time is shortened but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

### Power Management

This field allows you to select the type (or degree) of power saving by changing the length of idle time that elapses before the HDD Power Down field is activated.

|                    |                                                                        |
|--------------------|------------------------------------------------------------------------|
| <i>Min Saving</i>  | Minimum power saving time for the HDD Power Down = 15 min.             |
| <i>Max Saving</i>  | Maximum power saving time for the HDD Power Down = 1 min.              |
| <i>User Define</i> | Allows you to set the power saving time in the “HDD Power Down” field. |
| <i>Disabled</i>    | Disables the Power Management function.                                |

### Video Off Method

This determines the manner in which the monitor is blanked.

|                         |                                                                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <i>V/H SYNC + Blank</i> | This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer. |
| <i>Blank Screen</i>     | This option only writes blanks to the video buffer.                                                                                      |
| <i>DPMS Support</i>     | Initializes display power management signaling. Use this option if your video board supports it.                                         |

### Video Off In Suspend

This field is used to activate the video off feature when the system enters the Suspend mode. The options are Yes and No.

### Suspend Type

The options are Stop Grant and PwrOn Suspend.

### MODEM Use IRQ

This field is used to set an IRQ channel for the modem installed in your system.

### Suspend Mode

This is configurable only when the Power Management field is set to "User Define". When the system enters the power saving time set in this field, the CPU and onboard peripherals will be shut off.

### HDD Power Down

This is configurable only when the Power Management field is set to User Define. When the system enters the power saving time set in this field, the hard disk drive will be powered down while all other devices remain active.

### Soft-Off by PWR-BTTN

This field allows you to select the method of powering off your system.

*Delay 4 Sec.* Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally "hit" or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.

*Instant-Off* Pressing and then releasing the power button at once will immediately power off your system.

### Wake-Up by PCI Card

|                 |                                                                                                                                                                                                                                                                                                        |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Enabled</i>  | This field should be set to Enabled only if your PCI card such as LAN card or modem card uses the PCI PME (Power Management Event) signal to remotely wake up the system. Access to the LAN card or PCI card will cause the system to wake up. Refer to the card's documentation for more information. |
| <i>Disabled</i> | The system will not wake up despite access to the PCI card.                                                                                                                                                                                                                                            |

### USB KB Wake-Up From S3

This field, when enabled, allows you to use a USB keyboard to wake up a system that is in the S3 (STR - Suspend To RAM) state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

### PowerOn By Alarm

|                 |                                                                                                                                                                                                                                                                                                                        |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Enabled</i>  | When Enabled, you can set the time you would like the Soft Power Down (Soft-Off) PC to power-on in the "Time (dd:hh:mm) of Alarm" field. However, if the system is being accessed by incoming calls or the network prior to the time set in the field, the system will give priority to the incoming calls or network. |
| <i>Disabled</i> | Disables the automatic power-on function. (default).                                                                                                                                                                                                                                                                   |

### Date (of Month) Alarm

|      |                                                                                                                                                   |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 0    | The system will power-on everyday according to the time set in the "Time (hh:mm:ss) Alarm" field.                                                 |
| 1-31 | Select a date you would like the system to power-on. The system will power-on on the set date, and time set in the "Time (hh:mm:ss) Alarm" field. |

### Time (hh:mm:ss) of Alarm

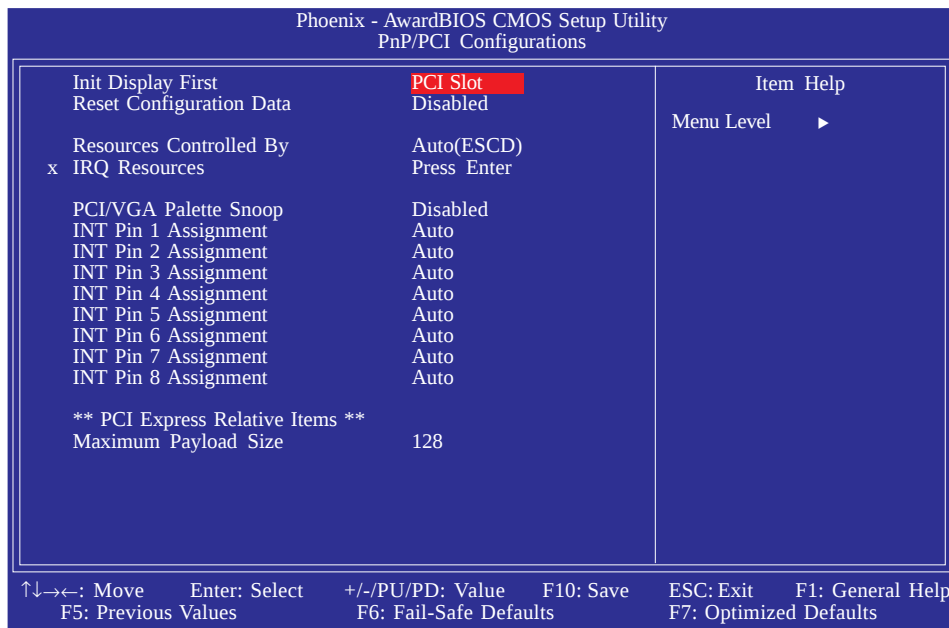
This is used to set the time you would like the system to power-on.

### Reload Global Timer Events

When enabled, access to the specified field (Primary IDE 0/I, Secondary IDE 0/I, FDD/COM/LPT Port, PCI PIRQ[A-D]#, HPET Support or HPET Mode) will cause the system to wake up completely from the power management mode. When disabled, the system will not wake up from the power management mode despite access to the specified field.

## PnP/PCI Configurations

This section describes configuring the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



The settings on the screen are for reference only. Your version may not be identical to this one.

### Init Display First

This field is used to select whether to initialize the PCI Express or PCI first when the system boots.

|                 |                                                                                    |
|-----------------|------------------------------------------------------------------------------------|
| <i>PCIEx</i>    | When the system boots, it will first initialize the PCI Express x16 graphics card. |
| <i>PCI Slot</i> | When the system boots, it will first initialize PCI.                               |

### Reset Configuration Data

|                 |                                                                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Enabled</i>  | The BIOS will automatically reset the Extended System Configuration Data (ESCD) once. It will then recreate a new set of configuration data. |
| <i>Disabled</i> | The BIOS will not reset the configuration data.                                                                                              |

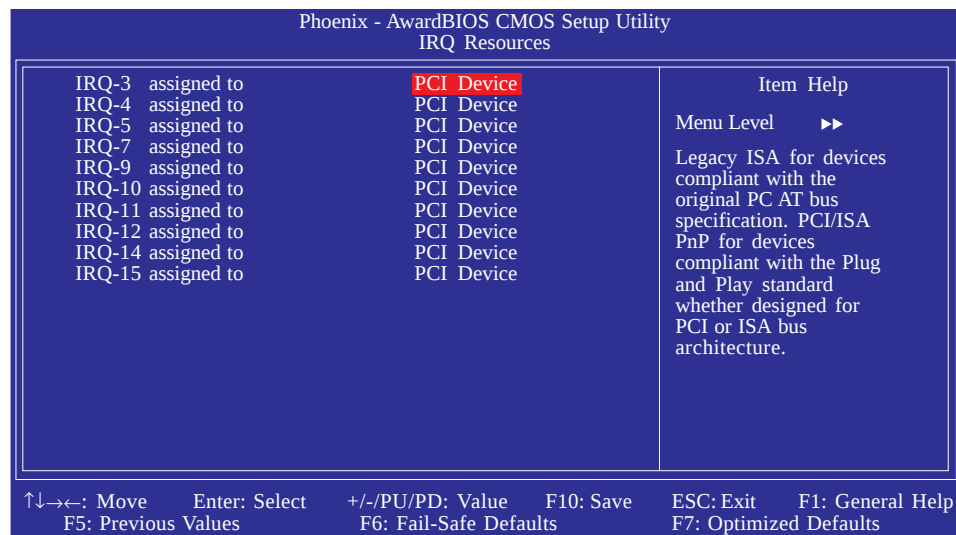
## Resources Controlled By

The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug and Play compatible devices.

- Auto(ESCD)* The system will automatically detect the settings for you.
- Manual* Choose the specific IRQ in the “IRQ Resources” field.

## IRQ Resources

Move the cursor to this field and press <Enter>. This field is used to set each system interrupt to either Reserved or PCI Device.



The settings on the screen are for reference only. Your version may not be identical to this one.

## PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not.

- Enabled* MPEG ISA/VESA VGA cards work with PCI/VGA.
- Disabled* MPEG ISA/VESA VGA cards does not work with PCI/VGA.

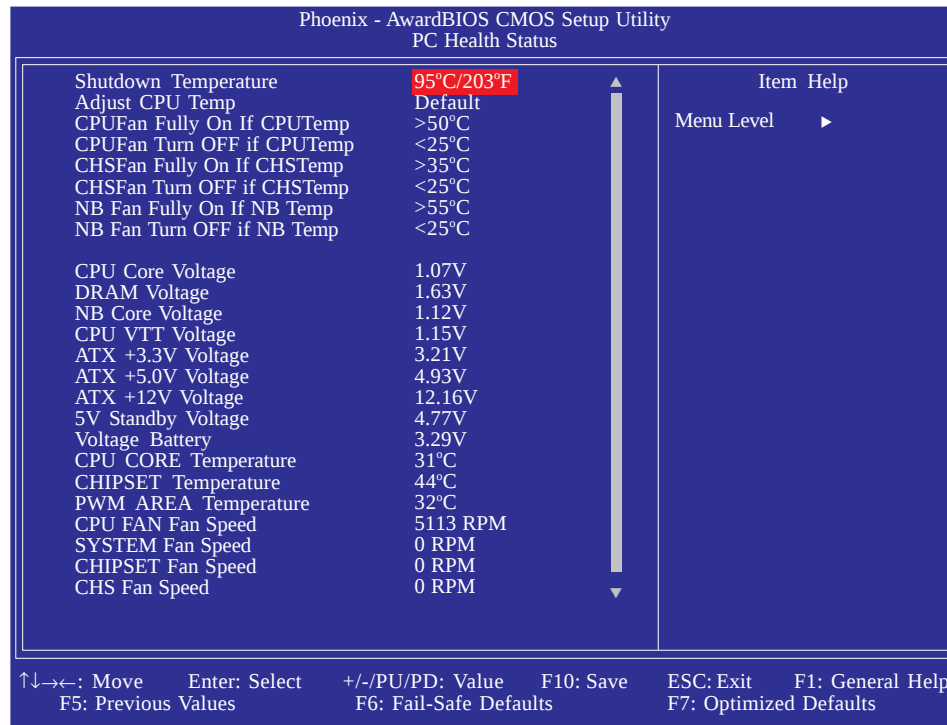
### INT Pin 1 Assignment to INT Pin 8 Assignment

By default, a device is automatically assigned to each INT. You can also manually assign an INT for each device.

### Maximum Payload Size

This field is used to select the maximum TLP payload size of the PCI Express devices. The unit is byte.

## PC Health Status



The screen above list all the fields available in the PC Health Status submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

## Shutdown Temperature

You can prevent the system from overheating by selecting a temperature at which the system will shutdown. If the system detected that its temperature exceeded the one set in this field, it will automatically shutdown. This function will work only if your operating system supports the ACPI feature.

## Adjust CPU Temp

This field is used to adjust the CPU's temperature.

### CPUFan Fully On If CPUTemp

This field is used to select the CPU's temperature at which the CPU fan will rotate at full speed.

### CPUFan Turn Off If CPUTemp

This field is used to select the CPU's temperature at which the CPU fan will rotate at a start speed which is the slowest speed.



**Note:**

1. If the CPU temperature runs between the highest (set in the "CPUFan Fully On If CPUTemp" field) and lowest (set in the "CPUFan Turn Off If CPUTemp" field) temperature, the system will automatically adjust the CPU fan's speed according to the temperature.
2. If you want to reduce the CPU fan's noise or prevent CPU overheat, select a lower temperature in the "CPUFan Fully On If CPUTemp" field to allow the CPU fan to rotate full speed at the selected lower temperature.

### CHSFan Fully On If CHSTemp

This field is used to select the system's temperature at which the chassis fan will rotate at full speed.

### CHSFan Turn Off If CHSTemp

This field is used to select the system's temperature at which the chassis fan will rotate at a start speed which is the slowest speed.



**Note:**

If the system's temperature runs between the highest (set in the "CHSFan Fully On If CHSTemp" field) and lowest (set in the "CHSFan Turn Off If CHSTemp" field) temperature, the system will automatically adjust the chassis fan's speed according to the temperature.

### NB Fan Fully On If NB Temp

This field is used to select the Northbridge chip's temperature at which the chip's fan will rotate at full speed.

### NB Fan Turn Off If NB Temp

This field is used to select the Northbridge chip's temperature at which the chip's fan will rotate at a start speed which is the slowest speed.



**Note:**

*If the Northbridge chip's temperature runs between the highest (set in the "NB Fan Fully On If NB Temp" field) and lowest (set in the "NB Fan Turn Off If NB Temp" field) temperature, the system will automatically adjust the fan speed of the Northbridge chip according to the temperature.*

### CPU Core Voltage to CHS Fan Speed

These fields will show the output voltage, temperature and fan speed of the monitored devices or components.

## Genie BIOS Setting

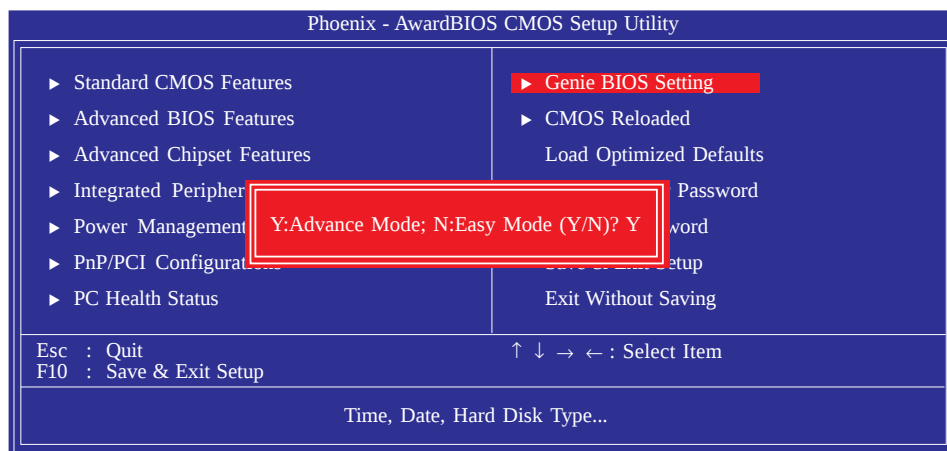
Aimed to provide convenience and superb overclockability, this submenu comes available in Easy mode (default mode) and Advance mode.

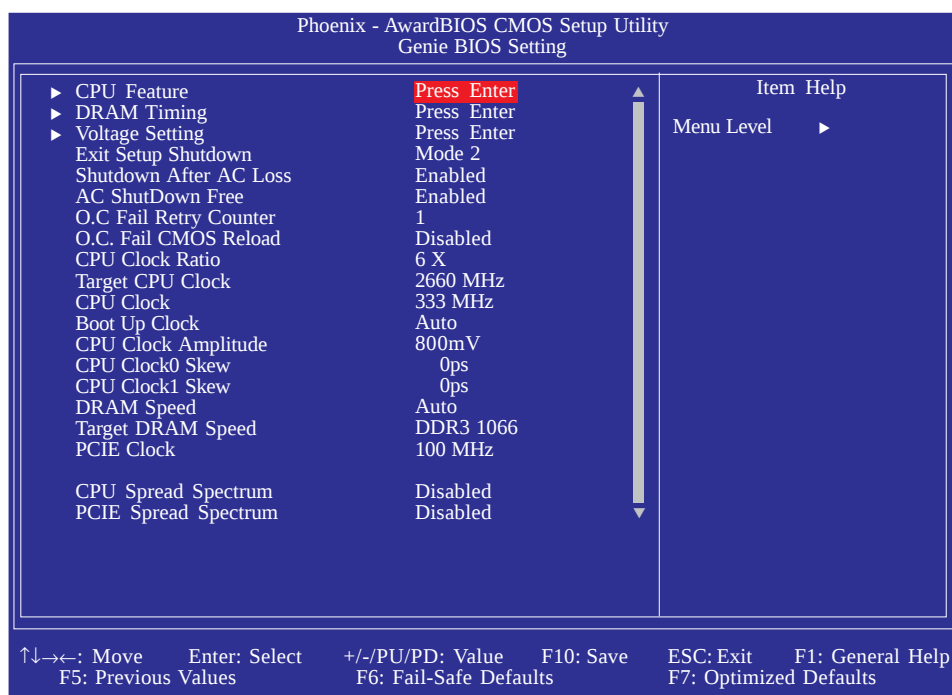
### Easy Mode

Easy mode displays fields commonly used by users.

### Advance Mode

If you intend to tweak your PC or boost its overclock features, you can switch the Genie BIOS Setting submenu from Easy mode to Advance mode by simply pressing <F9> in the main menu of the Award BIOS utility then pressing <Y> to select Advance Mode. The Advance mode will display a wide range of fields useful in overclocking the board.





The screen above list all the fields available in the Genie BIOS Setting submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

### CPU Feature

### DRAM Timing

### Voltage Setting

Refer to the following pages for more information on these submenus.

### Exit Setup Shutdown

The options are Mode 1 and Mode 2.

### Shutdown After AC Loss

The options are Enabled and Disabled.

### AC Shutdown Free

The options are Enabled and Disabled.

### O.C. Fail Retry Counter

The options are 0, 1, 2 and 3.

### O.C. Fail CMOS Reload

The options are Disabled, Bank 1, Bank 2, Bank 3 and Bank 4.

### CPU Clock Ratio

This field is used to select the CPU's frequency ratio.

### Target CPU Clock

This field will show the targeted CPU clock.

### CPU Clock

This field is used to select the CPU clock.

### Boot Up Clock

This field is used to select the boot up clock.

### CPU Clock Amplitude

The options are 700mV, 800mV, 900mV and 1000mV.

### CPU Clock0 Skew and CPU Clock1 Skew

These fields are used to select a skew control value of the CPU clock.

### DRAM Speed

This field is used to select the clock speed of the DIMM.

### Target DRAM Speed

This field will show the targeted DRAM speed.

### PCIE Clock

This field is used to select the bus clock of the PCI Express.

### CPU Spread Spectrum

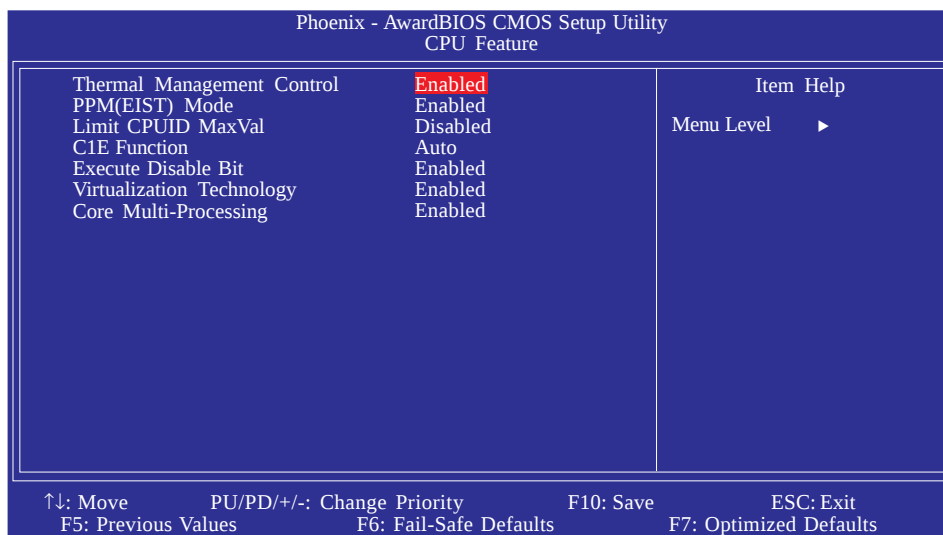
The options are Disabled,  $\pm 0.25\%$  and  $\pm 0.30\%$ .

### PCIE Spread Spectrum

The options are Disabled,  $\pm 0.25\%$  and  $\pm 0.30\%$ .

## CPU Feature

Move the cursor to this field and press <Enter>, the following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

## Thermal Management Control

This field is used to enable or disable thermal management.

## PPM (EIST) Mode

The options are Enabled and Disabled.

## Limit CPUID MaxVal

The CPUID instruction of some newer CPUs will return a value greater than 3. Problems will occur only in certain operating systems. The default is Disabled because this problem does not exist in the Windows series operating systems. If you are using an operating system other than Windows, this problem may occur. To avoid this problem, enable this field to limit the return value to 3 or lesser than 3.

## C1E Function

The options are Auto and Disabled.

### Execute Disable Bit

When this field is set to Disabled, it will force the XD feature flag to always return to 0.

### Virtualization Technology

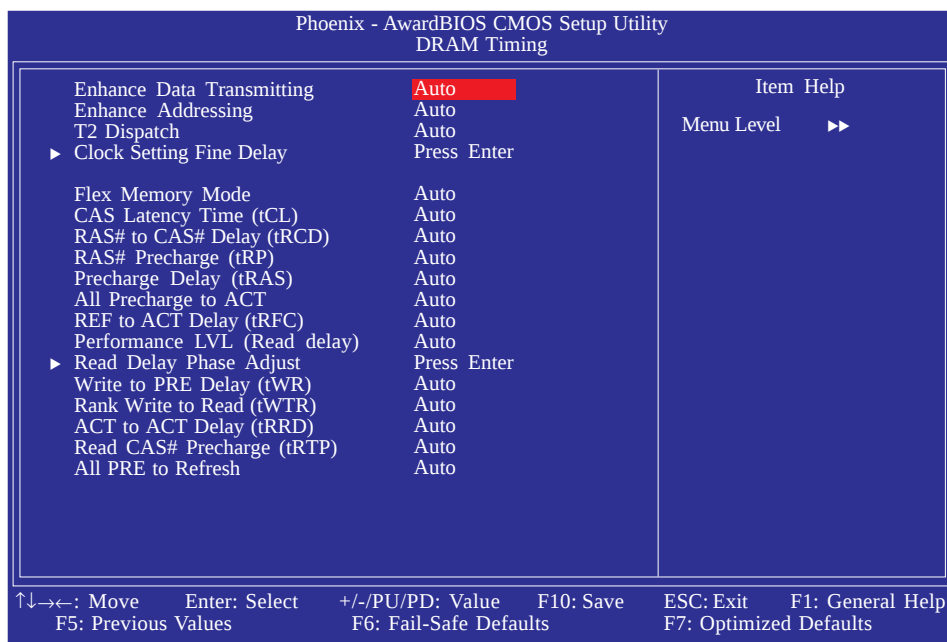
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

### Core Multi-Processing

The options are Enabled and Disabled.

## DRAM Timing

Move the cursor to this field and press <Enter>. The following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

### Enhance Data Transmitting

The options are Auto, Normal, Fast and Turbo.

### Enhance Addressing

The options are Auto, Normal and Fast.

### T2 Dispatch

The options are Auto and Disabled.

### Clock Setting Fine Delay

Refer to the following pages for more information on this submenu.

### Flex Memory Mode

This field is used to configure the flex memory mode. The options are Auto and Disabled.

### CAS Latency Time (tCL)

This field is used to select the clock cycle of the CAS latency time. The option selected specifies the timing delay before SDRAM starts a read command after receiving it.

### RAS# to CAS# Delay (tRCD)

This field is used to select the RAS# to CAS# delay time when reading and writing to the same bank.

### RAS# Precharge (tRP)

This field is used to select the idle clocks after issuing a precharge command to the DRAM.

### Precharge Delay (tRAS)

The options are Auto, and 9 to 15.

### ALL Precharge to Act

The options are Auto, and 2 to 9.

### REF to ACT Delay (tRFC)

The options are Auto, and 16 to 33.

### Performance LVL (Read Delay)

The options are Auto, and 1 to 15.

### Read Delay Phase Adjust

Refer to the following pages for more information on this submenu.

### Write to PRE Delay (tWR)

The options are Auto, and 6 to 18.

### Rank Write to Read (tWTR)

The options are Auto, and 6 to 18.

### ACT to ACT Delay (tRRD)

The options are Auto, and 1 to 15.

### Read CAS# Precharge (tRTP)

The options are Auto, and 1 to 15.

### ALL PRE to Refresh

The options are Auto, and 1 to 15.

## Clock Setting Fine Delay

Move the cursor to this field and press <Enter>. The following screen will appear:

Phoenix - AwardBIOS CMOS Setup Utility  
Clock Setting Fine Delay

|                            |               |  |               |
|----------------------------|---------------|--|---------------|
| DLL and RCOMP Settings     | Auto          |  | Item Help     |
| x CH1 DRAM Default Skew    | Model 0       |  | Menu Level ►► |
| x CH2 DRAM Default Skew    | Model 0       |  |               |
| x RCOMP Setting            | Model 0       |  |               |
| Fine Delay Step Degree     | 70ps          |  |               |
| Ch1 Clock Crossing Setting | Auto          |  |               |
| DIMM 1 Clock Fine Delay    | Current 745ps |  |               |
| DIMM 2 Clock Fine Delay    | Current 876ps |  |               |
| Ch1 Control0 Fine Delay    | Current 765ps |  |               |
| Ch1 Control1 Fine Delay    | Current 765ps |  |               |
| Ch1 Control2 Fine Delay    | Current 902ps |  |               |
| Ch1 Control3 Fine Delay    | Current 902ps |  |               |
| Ch1 Command Fine Delay     | Current 0ps   |  |               |
| Ch2 Clock Crossing Setting | Auto          |  |               |
| DIMM 3 Clock Fine Delay    | Current 745ps |  |               |
| DIMM 4 Clock Fine Delay    | Current 876ps |  |               |
| Ch2 Control0 Fine Delay    | Current 765ps |  |               |
| Ch2 Control1 Fine Delay    | Current 765ps |  |               |
| Ch2 Control2 Fine Delay    | Current 902ps |  |               |
| Ch2 Control3 Fine Delay    | Current 902ps |  |               |
| Ch2 Command Fine Delay     | Current 0ps   |  |               |
| Ch1Ch2 CommonClock Setting | Auto          |  |               |
| Ch1 RDCAS GNT-Chip Delay   | Auto          |  |               |
| Ch1 WRCAS GNT-Chip Delay   | Auto          |  |               |
| Ch1 Command to CS Delay    | Auto          |  |               |
| Ch2 RDCAS GNT-Chip Delay   | Auto          |  |               |
| Ch2 WRCAS GNT-Chip Delay   | Auto          |  |               |
| Ch2 Command to CS Delay    | Auto          |  |               |

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

The screen above list all the fields available in the Clock Setting Fine Delay submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

## DLL and RECOMP Settings

This field is used to configure the DLL and RECOMP settings. The options are Auto and By Menu.

## CH1 DRAM Default Skew and CH2 DRAM Default Skew

These fields are used to select the DRAM's default skew. The options are Model 0 to Model 7.

### RECOMP Setting

This field is used to configure the RECOMP setting.

### Fine Delay Step Degree

This is used to select the fine delay step degree. The options are 10ps to 160ps.

### Ch1 Clock Crossing Setting and Ch2 Clock Crossing Setting

The options are Auto, More Aggressive, Aggressive, Nominal, Relaxed and More Relaxed.

### DIMM Clock Fine Delay, Ch Control Fine Delay and Ch Command Fine Delay

The options are Current, 1 DEG to 31 DEG.

### Ch1Ch2 CommonClock Setting

The options are Auto, More Aggressive, Aggressive, Nominal, Relaxed and More Relaxed.

### Ch1 RDCAS GNT-Chip Delay

The options are Auto, 1CLK to 7CLK.

### Ch1 WRCAS GNT-Chip Delay

The options are Auto, 1CLK to 7CLK.

### Ch1 Command to CS Delay

The options are Auto, 1CLK to 7CLK.

### Ch2 RDCAS GNT-Chip Delay

The options are Auto, 1CLK to 7CLK.

### Ch2 WRCAS GNT-Chip Delay

The options are Auto, 1CLK to 7CLK.

### Ch2 Command to CS Delay

The options are Auto, 1CLK to 7CLK.

## Read Delay Phase Adjust

Move the cursor to this field and press <Enter>. The following screen will appear:

| Phoenix - AwardBIOS CMOS Setup Utility |           |               |
|----------------------------------------|-----------|---------------|
| Read Delay Phase Adjust                |           |               |
| Ch1 Read delay phase (4~0)             | 7-7-7-7-7 | Item Help     |
| Channel 1 Phase 0 Pull-In              | Auto      | Menu Level ▶▶ |
| Channel 1 Phase 1 Pull-In              | Auto      |               |
| Channel 1 Phase 2 Pull-In              | Auto      |               |
| Channel 1 Phase 3 Pull-In              | Auto      |               |
| Channel 1 Phase 4 Pull-In              | Auto      |               |
| Ch2 Read delay phase (4~0)             | 7-7-7-7-7 |               |
| Channel 2 Phase 0 Pull-In              | Auto      |               |
| Channel 2 Phase 1 Pull-In              | Auto      |               |
| Channel 2 Phase 2 Pull-In              | Auto      |               |
| Channel 2 Phase 3 Pull-In              | Auto      |               |
| Channel 2 Phase 4 Pull-In              | Auto      |               |

↑↓→←: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

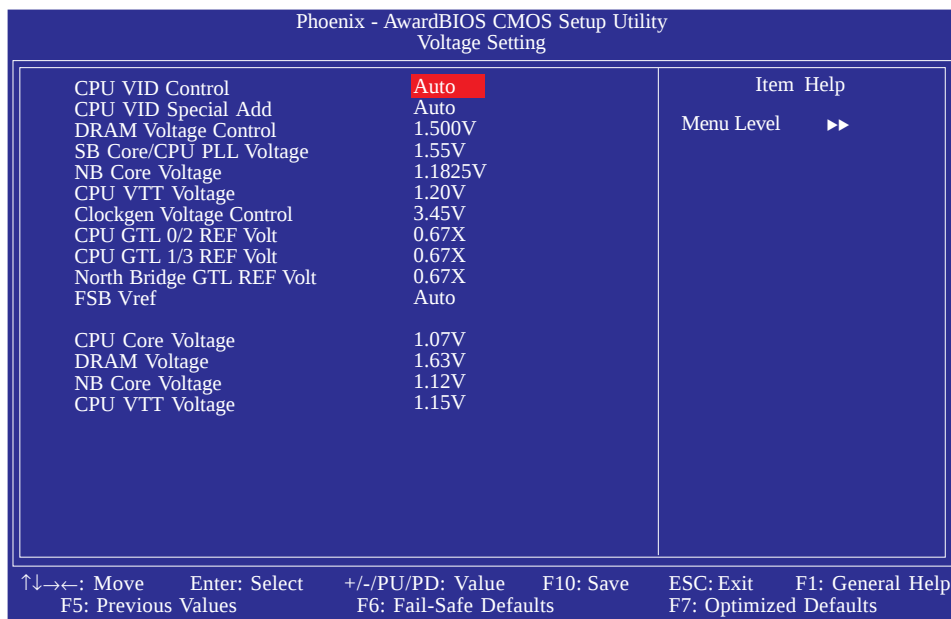
The settings on the screen are for reference only. Your version may not be identical to this one.

## Channel Phase 0 Pull-In to Channel Phase 4 Pull-In

The options are Auto and Enabled.

## Voltage Setting

Move the cursor to this field and press <Enter>. The following screen will appear:



The settings on the screen are for reference only. Your version may not be identical to this one.

## CPUVID Control

This field allows you to manually adjust to a higher core voltage that is supplied to the CPU. If you want to use the CPU's default core voltage, leave this field in its default setting. The CPU's Vcore will be generated according to the CPU VID configuration.



### Important:

*Although this function is supported, we do not recommend that you use a higher voltage because unstable current may be supplied to the system board causing damage.*

## CPU VID Special Add

This field provides more options to further adjust the voltage of the CPU. The options are Auto, 100.23% to 114.88%.

## DRAM Voltage Control

This field allows you to manually select higher voltage supplied to the DRAM.

### SB Core/CPU PLL Voltage

The options are 1.55V, 1.75V, 1.95V and 2.15V.

### NB Core Voltage

The options are 1.140V to 1.740V.

### CPU VTT Voltage

This field is used to select the CPU's voltage.

### Clockgen Voltage Control

This field is used to select the clock generator's voltage.

### CPU GTL 0/2 REF Volt and CPU GTL 1/3 REF Volt

These fields are used to configure the CPU GTL REF voltage. The options are 0.6075 to 0.7025.

### North Bridge GTL REF Volt

The options are 0.67X, 0.63X, 0.61X and 0.58X.

### FSB Vref

This field is used to configure the FSB Vref. The options are Auto, 21 to 00.

### CPU Core Voltage

This field will show the CPU's current voltage.

### DRAM Voltage

This field will show the DRAM's current voltage.

### NB Core Voltage

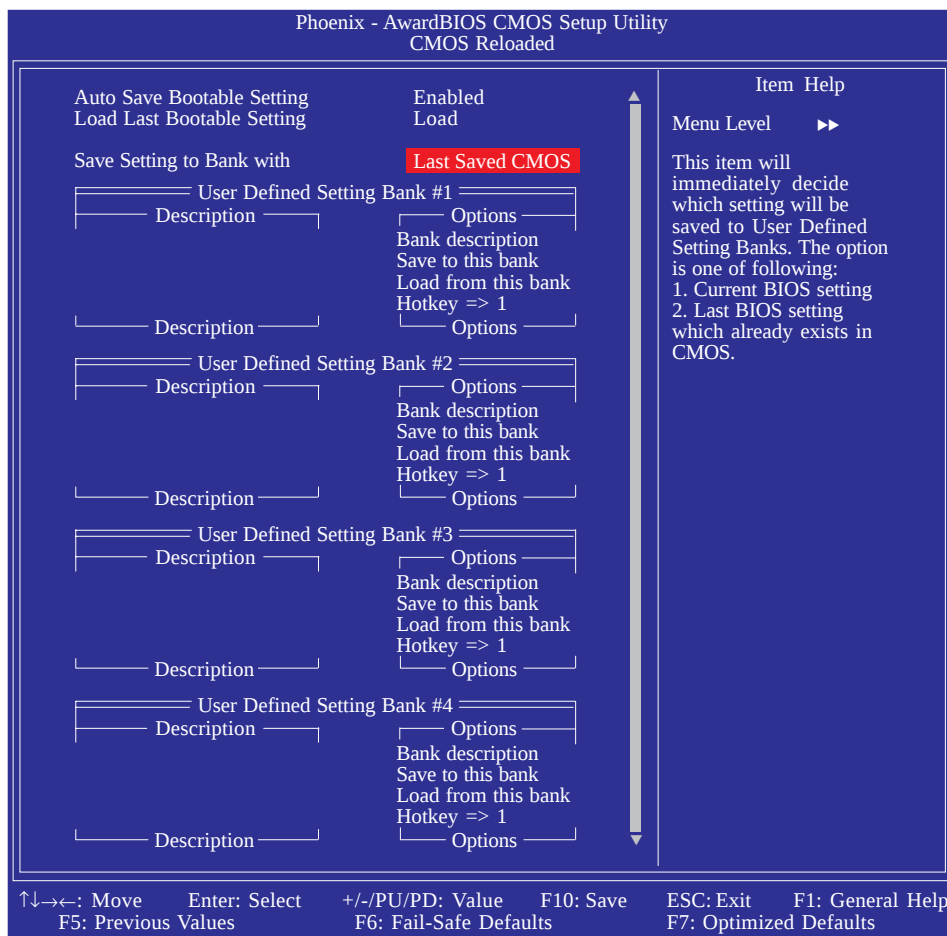
This field will show the NB's current core voltage.

### CPU VTT Voltage

This field will show the HT Link's current voltage.

## CMOS Reloaded

The CMOS Reloaded submenu allows you to save different configurations and when needed, allows you to conveniently restore one of these previously saved configurations. Highlight CMOS Reloaded in the main menu then press <Enter>.



The screen above lists all the fields available in the CMOS Reloaded submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

CMOS Reloaded is especially helpful to overclockers who often go through the tiresome trial and error process of repeatedly changing the BIOS settings to come up with the most ideal overclocked setting. By being able to save and load the settings, it eliminates the tedious job of remembering several settings and/or repeatedly resetting settings during the trial process. The settings are stored in the SEEPROM. SEEPROM is divided into 5 banks - the backup bank and the 4 user defined banks.

### Auto Save Bootable Setting

This field is used to automatically save the last bootable setting from CMOS to an area in the EEPROM referred to as the backup bank. To use this function:

1. Set this field to Enabled.
2. Select “Save & Exit Setup” in the main menu then press <Enter>.
3. Type <Y> then press <Enter>.

If the changes to the setting allowed the system to boot, the setting will be stored in the EEPROM. In other words, if the system did not boot up, the setting will not be stored. You may then follow the steps in the next section to load the last bootable setting.

### Load Last Bootable Setting

If, during the trial and error process, the setting resulted to the system's instability or worse yet, not being able to boot up the system, please follow the steps below to use the Load function.



**Note:**

*You can use the Load function only if you have set the “Auto Save Bootable Setting” to Enabled.*

1. If the system did not boot up properly but you were able to enter the BIOS utility:
  - a. Select “CMOS Reloaded” in the main menu then press <Enter>.
  - b. Move the cursor to “Load Last Bootable Setting” then press “Load”.
  - c. Press <Y> to load the last bootable setting that was stored in the backup bank.
2. If you cannot enter the BIOS utility:
  - a. Use the Clear CMOS jumper to clear the CMOS. Refer to chapter 2 for more information about clearing CMOS.
  - b. Enter the BIOS utility then perform steps 1a to 1c.

### Saving, Loading and Naming BIOS Settings

For overclockers who require different sets of settings for various system environments or operating systems, CMOS Reloaded allows you to save, load and name up to four sets of BIOS settings - in the "User Defined Setting Bank #1" to "User Defined Setting Bank #4" fields.

#### Save Setting to Bank With

This field is used to select the type of setting you would like saved to a User Defined Setting Bank when you use the "Save to this Bank" function of that bank.

*Current BIOS Setting* This option will save the current BIOS setting to the User Defined Setting Bank.

*Last BIOS Setting* This option will save the last saved BIOS setting to the User Defined Setting Bank.

#### User Defined Setting Bank #1/2/3/4

##### *Bank Description*

To name the BIOS setting, move the cursor to "Bank Description" then press <Enter>. You can enter up to 60 characters. Providing a name to the BIOS setting will allow you to easily remember the settings in the bank.

##### *Save to this Bank*

To save the BIOS setting, move the cursor to "Save to this Bank" then press <Enter>. Type <Y> then press <Enter>. This will save the current setting or the last saved setting to this bank; depending on the option selected in the "Save Setting to Bank With" field.

If you want to immediately reboot to use the new settings, make sure to save before you exit the BIOS setup utility by selecting "Y" in the "Save & Exit Setup" submenu.

***Load from this Bank***

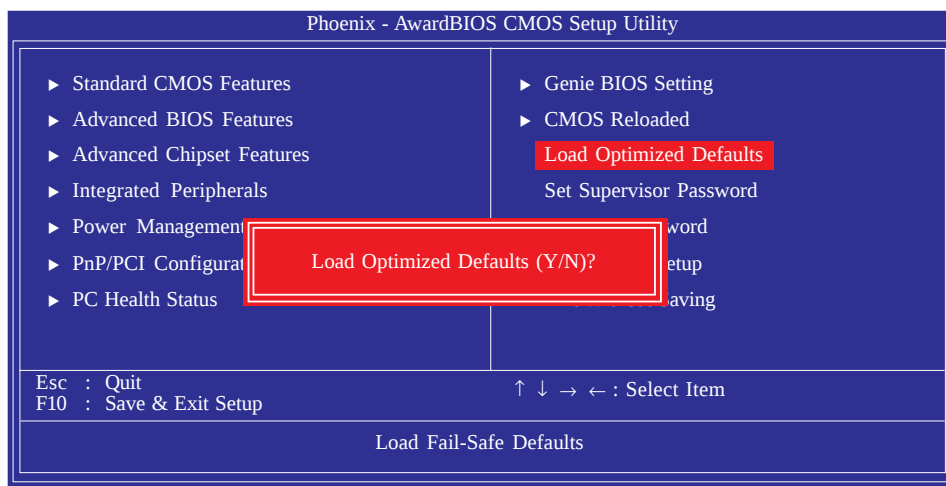
To load the setting saved in the bank, move the cursor to “Load from this Bank” then press <Enter>. The setting in this bank will replace the current setting. Make sure to save before you exit the BIOS setup utility by selecting “Y” in the “Save & Exit Setup” submenu.

***Hotkey***

You can now load a BIOS setting during system boot up; bypassing the lengthy process of entering the BIOS utility to load a setting. Move the cursor to “Hotkey” then press <Enter>. Select the key you would like to use to load the settings from the bank. When the system boots up, press the key to load the setting.

## Load Optimized Defaults

The “Load Optimized Defaults” option loads optimized settings from the BIOS ROM. Use the default values as standard values for your system. Highlight this option in the main menu and press <Enter>.

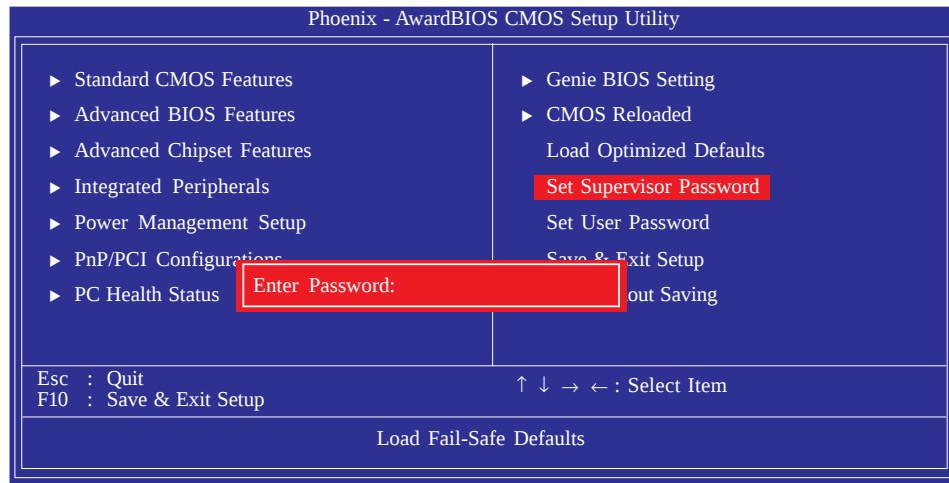


Type <Y> and press <Enter> to load the Setup default values.

## Set Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor's password with the "System" option selected in the Advanced BIOS Features. If you want to protect access to setup only, but not your system, set a supervisor's password with the "Setup" option selected in the Advanced BIOS Features. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight "Set Supervisor Password" and press <Enter>.



Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

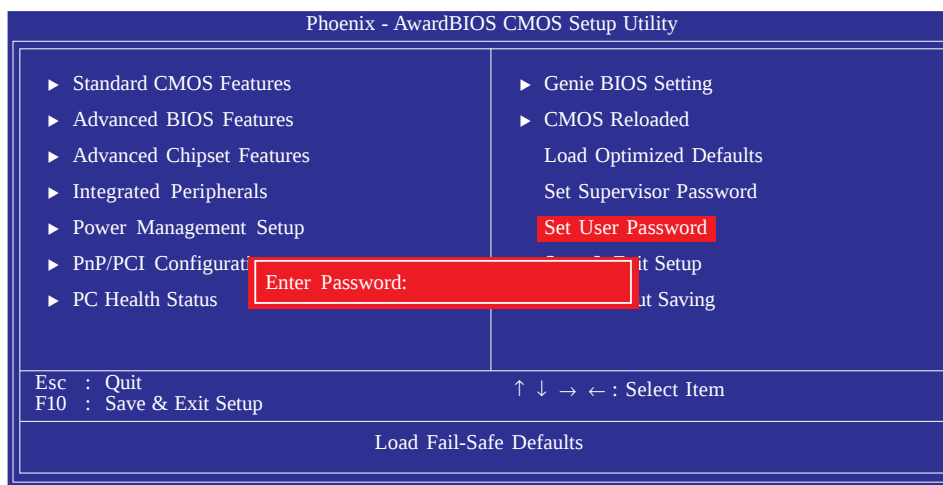
You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

## Set User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the Advanced BIOS Features. If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the Advanced BIOS Features.

Using user's password to enter Setup allows a user to access only "Set User Password" that appears in the main menu screen. Access to all other options is denied.

Use the arrow keys to highlight "Set User Password" and press <Enter>.



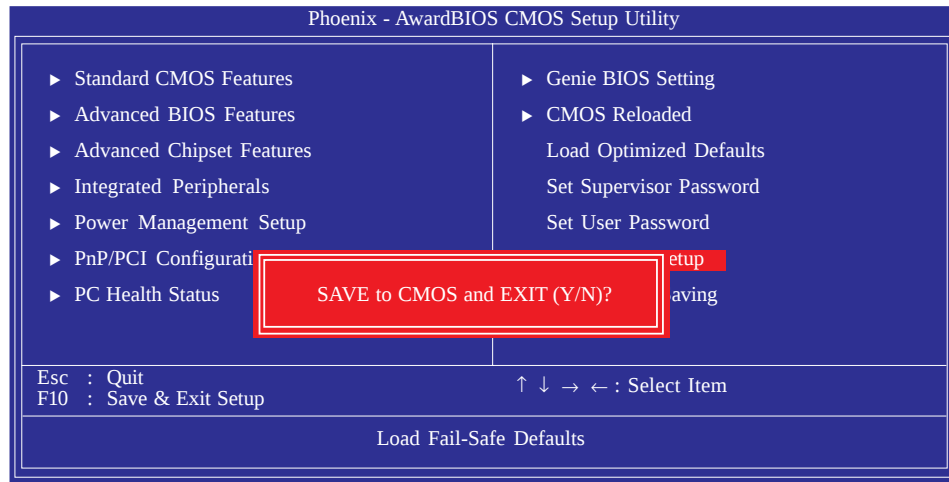
Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set User Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

## Save & Exit Setup

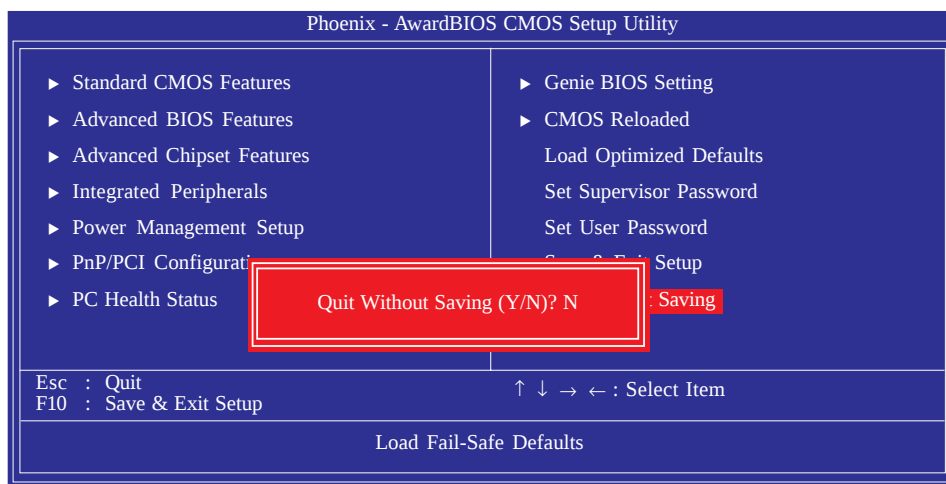
When all the changes have been made, highlight “Save & Exit Setup” and press <Enter>.



Type “Y” and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> <Del> simultaneously after memory testing is done.

## Exit Without Saving

When you do not want to save the changes you have made, highlight “Exit Without Saving” and press <Enter>.



Type “Y” and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> <Del> simultaneously after memory testing is done.

## RAID BIOS

### Intel RAID BIOS

The Intel RAID BIOS utility is used to configure and manage RAID on Serial ATA drives connected to SATA 0 to SATA 5.

When the system powers-up and all drives have been detected, the Intel RAID BIOS status message screen will appear. Press the <Ctrl> and <I> keys simultaneously to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

### JMicron RAID BIOS

The JMicron RAID BIOS utility is used to configure and manage RAID on Serial ATA drives connected to SATA 6 and SATA 7.

When the system powers-up and all hard disk drives have been detected, the JMicron RAID BIOS status message screen will appear. Press the <Ctrl> and <J> keys simultaneously to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.



#### **Important:**

*Before creating RAID, make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.*

Refer to chapter 5 for steps in configuring RAID.

## Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWDFLASH.EXE. You can download them from DFI's web site or contact technical support or your sales representative.

1. Save the new BIOS file along with the flash utility AWDFLASH.EXE to a floppy disk.
2. Reboot the system and enter the Award BIOS Setup Utility to set the first boot drive to "Floppy".
3. Save the setting and reboot the system.
4. After the system booted from the floppy disk, execute the flash utility by typing AWDFLASH.EXE. The following screen will appear:

|                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------|
| <p>Award BIOS Flash Utility V.8.15B<br/>(C) Phoenix Technologies Ltd. All Rights Reserved.</p>                     |
| <p>(The current BIOS information will appear in this area.)</p> <p>File Name to Program : <input type="text"/></p> |

5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

6. The following will appear:

Do You Want to Save BIOS (Y/N)

This question refers to the current existing BIOS in your system. We recommend that you save the current BIOS and its flash utility; just in case you need to reinstall the BIOS. To save the current BIOS, press <Y> then enter the file name of the current BIOS. Otherwise, press <N>.

7. The following will then appear:

Press "Y" to Program or "N" to Exit

8. Press <Y> to flash the new BIOS.

## Chapter 4 - Supported Software

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### Drivers, Utilities and Software Applications

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen will appear. If after inserting the CD, "Autorun" did not automatically start, please go directly to the root directory of the CD and double-click "Setup".



## Intel Chipset Device Software

On the left side of the autorun screen, click the “CHIPSET” icon.

1. Click “Intel(R) Chipset Device Software” on the main menu.



2. Setup is now ready to install the utility. Click Next.



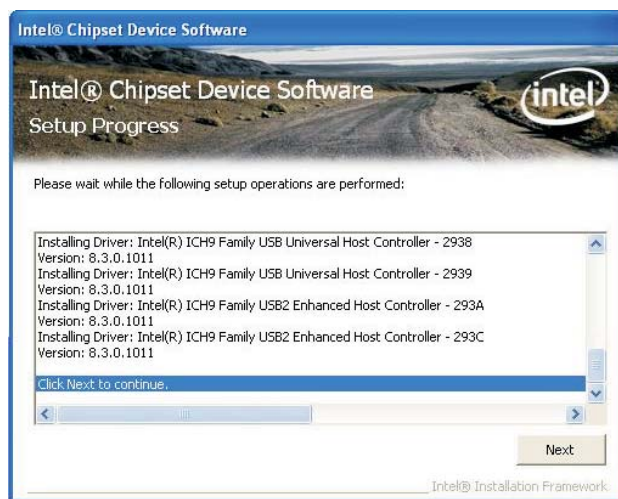
3. Read the license agreement then click Yes.



4. Go through the readme document for system requirements and installation tips then click Next.



5. Setup is now installing the driver. Click Next to continue.



6. Click “Yes, I want to restart this computer now” then click Finish.

Restarting the system will allow the new software installation to take effect.

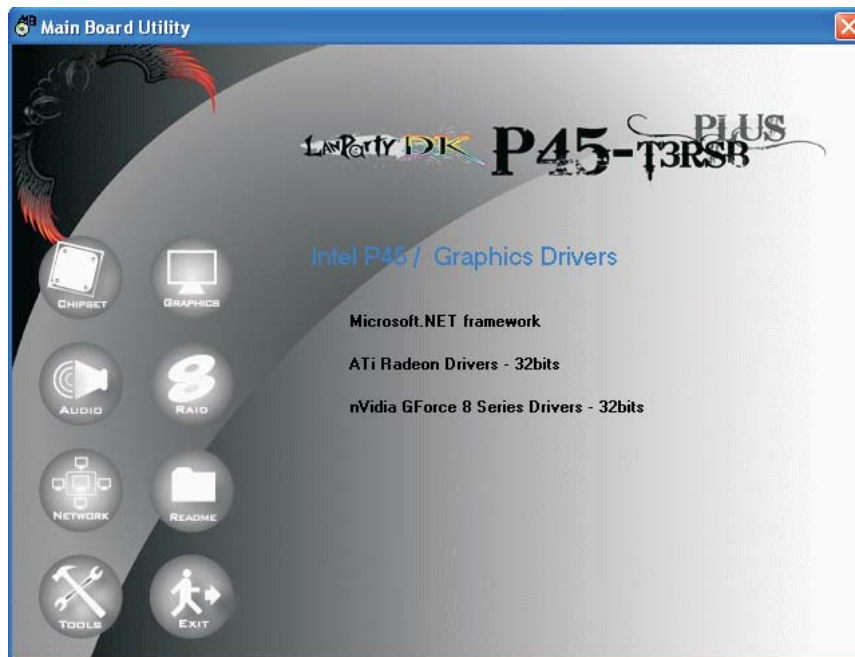


## Graphics Driver

The CD provides both ATI Radeon driver and nVidia GForce 8 series driver. Install the driver according to the graphics card that you are using.

For ATI Radeon graphics card, select ATI Radeon Drivers.

For nVidia graphics card, select nVidia GForce 8 Series Drivers.



## Realtek Audio Driver

On the left side of the autorun screen, click the “AUDIO” icon.

1. Click “Realtek Audio Driver” on the main menu.



2. Setup is now ready to install the audio driver. Click Next.



3. Setup is currently configuring the new driver's installation.



4. Setup is now processing the settings.



5. Select the desired option then click Next.



6. Click "Yes, I want to restart my computer now" then click Finish.

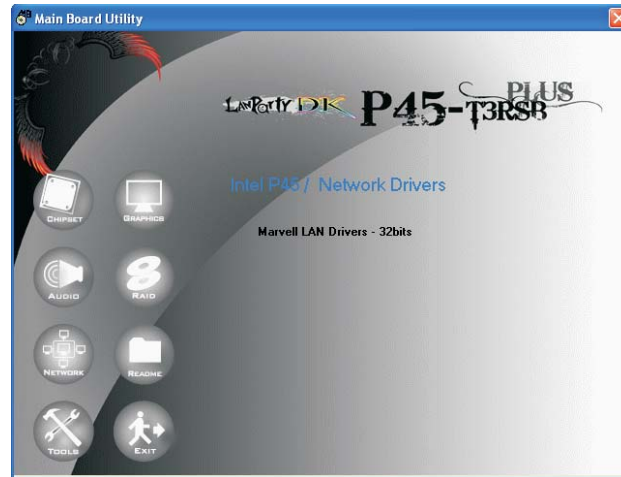
Restarting the system will allow the new software installation to take effect.



## Marvell LAN Driver

On the left side of the autorun screen, click the “NETWORK” icon.

1. Click “Marvell LAN Driver” on the main menu.



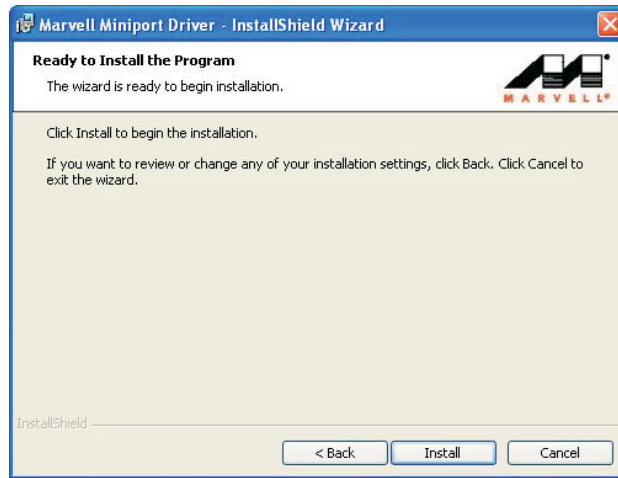
2. Setup is now ready to install the driver. Click Next.



3. Read the license agreement then click “I accept the terms in the license agreement”. Click Next.

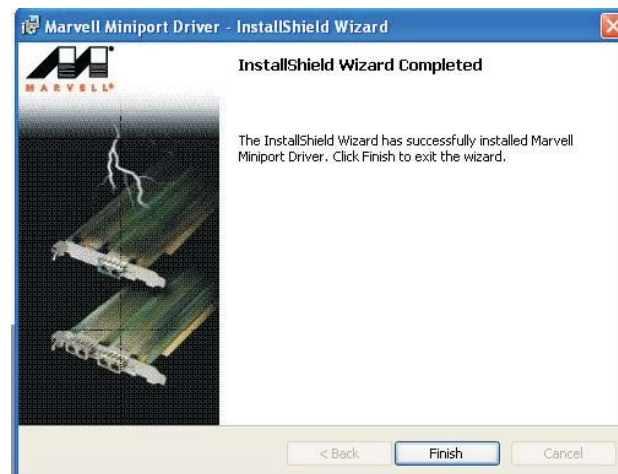


- Click Install to begin the installation.



- After completing installation, click Finish to exit setup.

Reboot your system for the new software installation to take effect.

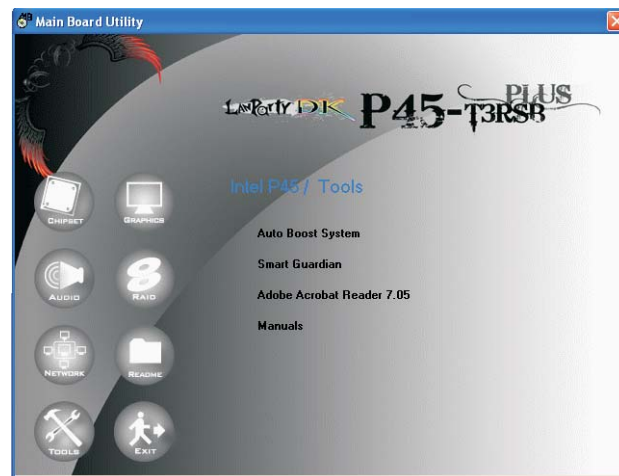


## Smart Guardian

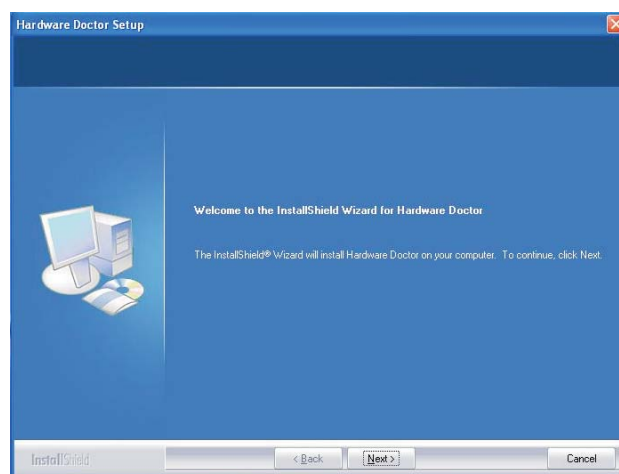
The Smart Guardian utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The utility can also be configured so that a beeping alarm will sound whenever an error occurs. We recommend that you use the "Default Setting" which is the ideal setting that would keep the system in good working condition.

On the left side of the autorun screen, click the "TOOLS" icon.

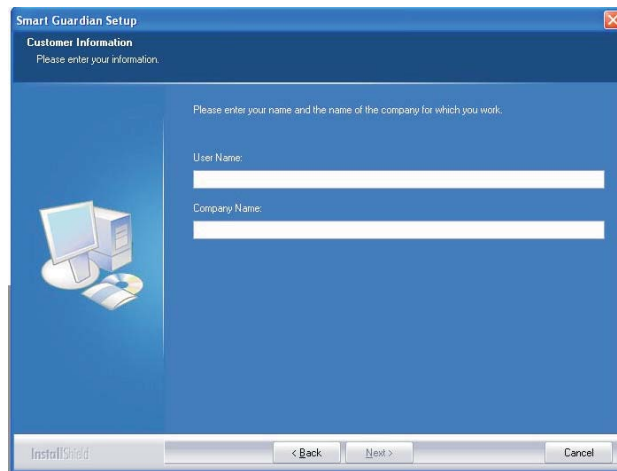
1. Click "Smart Guardian" on the main menu.



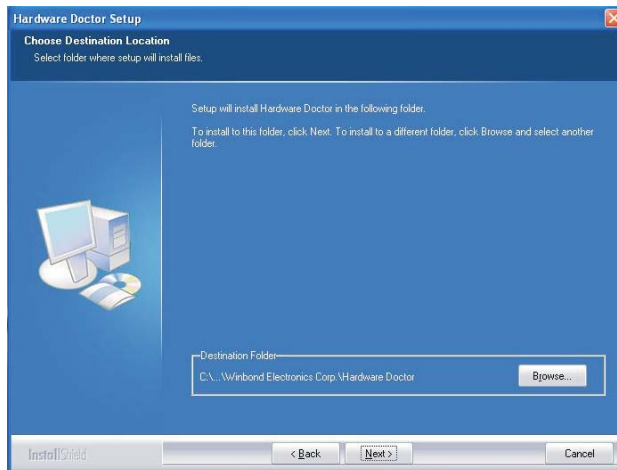
2. Setup is now ready to install the utility. Click Next.



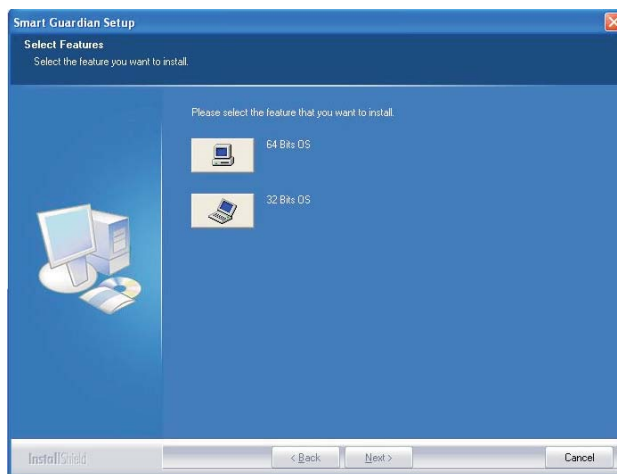
3. Fill in the necessary information then click Next.



4. Click Next to install or click Browse to select another folder.

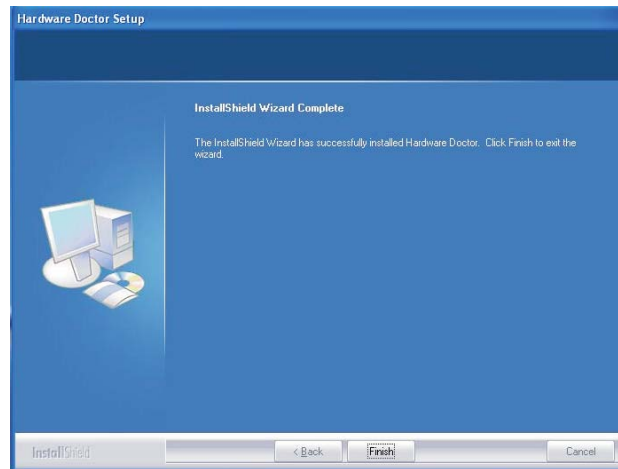


5. Select an option in accordance to the system that you are using then click Next.



6. After completing installation, click Finish to exit setup.

Restarting the system will allow the utility to take effect.



## USB 2.0 Drivers

### Windows® XP

If your Windows® XP CD already includes Service Pack 1, the USB 2.0 driver will automatically install when you install the operating system. If the CD does not include Service Pack 1, it is available for download at Microsoft's Windows Update website.

### Windows® 2000

If your Windows® 2000 CD already includes Service Pack 4, the USB 2.0 driver will automatically install when you install the operating system. If the CD does not include Service Pack 4, it is available for download at Microsoft's Windows Update website.

## Installation Notes

1. "Autorun" ONLY supports the Windows® XP and Windows® Vista operating systems. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".
2. The drivers for Windows® 2000 are also included in the CD however "Autorun" is not supported for this operating system. Therefore you must manually install the drivers from the respective folders of each driver.
3. All steps or procedures to install software drivers are subject to change without notice as the softwares are occasionally updated. Please contact technical support or your sales representative for the latest version of the drivers or software applications.

## Chapter 5 - RAID

---

The Intel ICH10R chip allows configuring RAID on Serial ATA drives connected to SATA 0 to SATA 5. It supports RAID 0, RAID 1, RAID 0+1 and RAID 5.

The JMicron JMB363 chip allows configuring RAID on another 2 Serial ATA drives connected to SATA 6 and SATA 7. It supports RAID 0 and RAID 1.

### RAID Levels

#### **RAID 0 (Striped Disk Array without Fault Tolerance)**

RAID 0 uses two new identical hard disk drives to read and write data in parallel, interleaved stacks. Data is divided into stripes and each stripe is written alternately between two disk drives. This improves the I/O performance of the drives at different channel; however it is not fault tolerant. A failed disk will result in data loss in the disk array.

#### **RAID 1 (Mirroring Disk Array with Fault Tolerance)**

RAID 1 copies and maintains an identical image of the data from one drive to the other drive. If a drive fails to function, the disk array management software directs all applications to the other drive since it contains a complete copy of the drive's data. This enhances data protection and increases fault tolerance to the entire system. Use two new drives or an existing drive and a new drive but the size of the new drive must be the same or larger than the existing drive.

#### **RAID 0+1 (Striping and Mirroring)**

RAID 0+1 is a combination of data striping and data mirroring providing the benefits of both RAID 0 and RAID 1. Use four new drives or an existing drive and three new drives for this configuration.

#### **RAID 5**

RAID 5 stripes data and parity information across hard drives. It is fault tolerant and provides better hard drive performance and more storage capacity.

## Settings

To enable the RAID function, the following settings are required.

1. Connect the Serial ATA drives.
2. Configure Serial ATA in the Award BIOS.
3. Configure RAID in the RAID BIOS.
4. Install the RAID driver during OS installation.
5. Install the Intel Matrix Storage Manager
6. Install the JMB36X Driver

### Step 1: Connect the Serial ATA Drives

Refer to chapter 2 for details on connecting the Serial ATA drives.

#### **Important:**

1. Make sure you have installed the Serial ATA drives and connected the data cables otherwise you won't be able to enter the RAID BIOS utility.
2. Treat the cables with extreme caution especially while creating RAID. A damaged cable will ruin the entire installation process and operating system. The system will not boot and you will lost all data in the hard drives. Please give special attention to this warning because there is no way of recovering back the data.

### Step 2: Configure Serial ATA in the Award BIOS

1. Power-on the system then press <Del> to enter the main menu of the Award BIOS.
2. Configure Serial ATA in the appropriate fields.
3. Press <Esc> to return to the main menu of the BIOS setup utility. Select "Save & Exit Setup" then press <Enter>.
4. Type <Y> and press <Enter>.
5. Reboot the system.

### tep 3: Configure RAID in the RAID BIOS

#### Configure RAID in the Intel RAID BIOS

When the system powers-up and all drives have been detected, the Intel RAID BIOS status message screen will appear. Press the <Ctrl> and <I> keys simultaneously to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

## Configure RAID in the JMicron RAID BIOS

When the system powers-up and all hard disk drives have been detected, the JMicron RAID BIOS status message screen will appear. Press the <Ctrl> and <J> keys simultaneously to enter the utility. The utility allows you to build a RAID system on Serial ATA drives.

### Step 4: Install the RAID Driver During OS Installation

The RAID driver must be installed during the Windows® XP or Windows® 2000 installation using the F6 installation method. This is required in order to install the operating system onto a hard drive or RAID volume when in RAID mode or onto a hard drive when in AHCI mode.

1. Start Windows Setup by booting from the installation CD.
2. Press <F6> when prompted in the status line with the 'Press F6 if you need to install a third party SCSI or RAID driver' message.
3. Press <S> to "Specify Additional Device".
4. At this point you will be prompted to insert a floppy disk containing the RAID driver. Insert the provided RAID driver diskette.
5. Locate for the drive where you inserted the diskette then select RAID or AHCI controller that corresponds to your BIOS setup. Press <Enter> to confirm.

You have successfully installed the driver. However you must continue installing the OS. Leave the floppy disk in the floppy drive until the system reboots itself because Windows setup will need to copy the files again from the floppy disk to the Windows installation folders. After Windows setup has copied these files again, remove the floppy diskette so that Windows setup can reboot as needed.

### Step 5: Install the Intel Matrix Storage Manager

The Intel Matrix Storage Manager can be installed from within Windows. It allows RAID volume management (create, delete, migrate) from within the operating system. It will also display useful SATA device and RAID volume information. The user interface, tray icon service and monitor service allow you to monitor the current status of the RAID volume and/or SATA drives. It enables enhanced performance and power management for the storage subsystem.

1. Insert the CD into a CD-ROM drive.
2. On the left side of the autorun screen, click the “CHIPSET” icon.
3. Click “Intel(R) Matrix Storage Manager” on the main menu.



4. Setup is now ready to install the utility. Click Next.



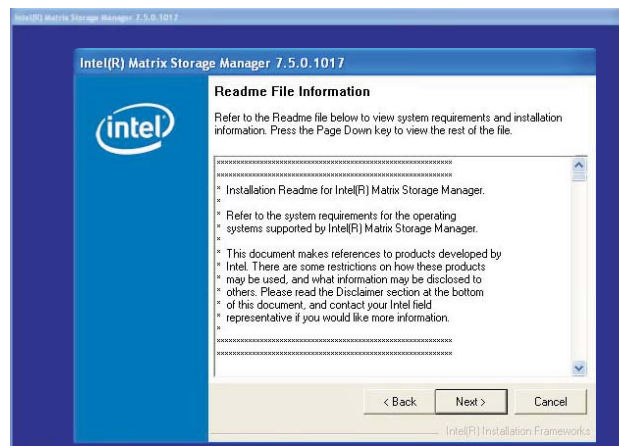
5. Read the warning carefully then click Next.



6. Read the license agreement then click Yes.



7. Go through the readme document to view system requirements and installation information then click Next.



8. Follow the remainder of the steps shown on the screen; clicking "next" each time you finish a step.
9. Click Finish to complete installation and reboot the system.

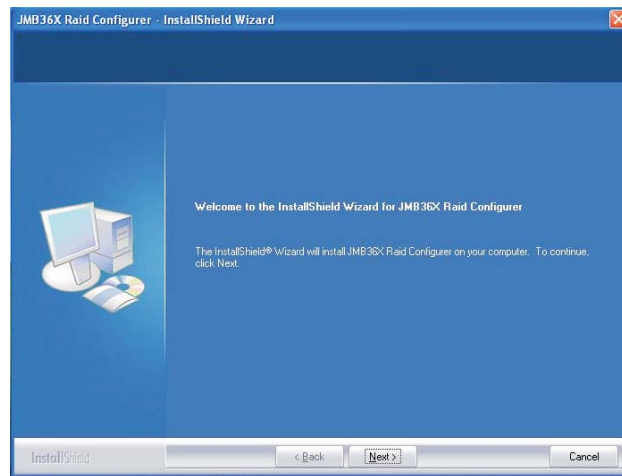
## Step 6: Install the JMB36X Driver

On the left side of the autorun screen, click the “RAID” icon.

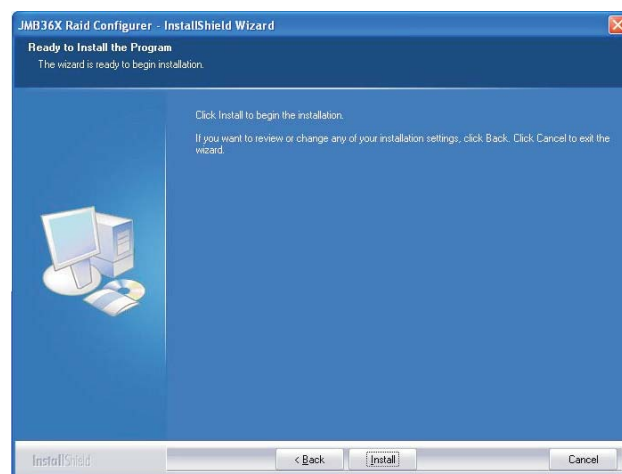
1. Click “JMB36X Driver” on the main menu.



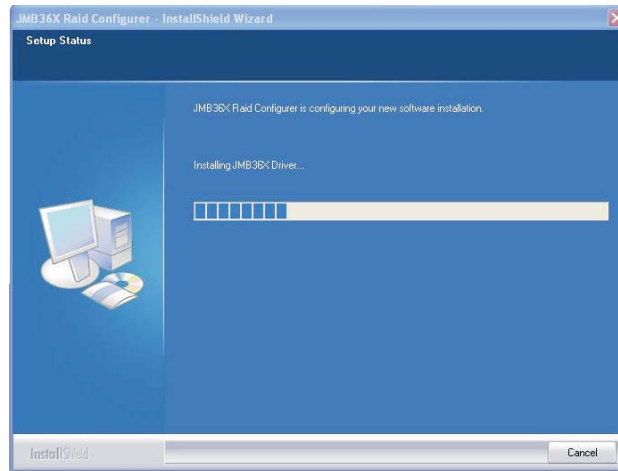
2. Setup is now ready to install the driver. Click Next.



3. Click Install to begin the installation.

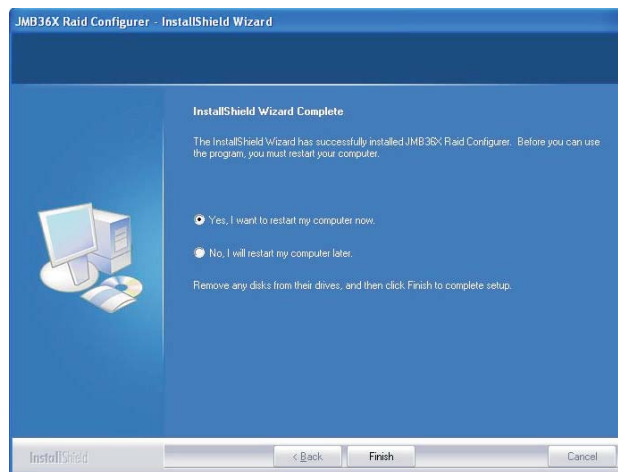


4. Setup is now installing the driver:



5. Follow the remainder of the steps listed on the screen; clicking “next” each time you finish a step.
6. Click “Yes, I want to restart my computer now” then click Finish.

Restarting the system will allow the new software installation to take effect.



## Chapter 6 - ATI CrossFire Technology

---

ATI's CrossFire technology drives your PC to a new peak of performance. By connecting a Radeon CrossFire Edition graphics card and a standard PCI Express graphics card, the power of these multiple GPUs (Graphics Processing Units) within the system will accelerate your gaming performance and improve image quality.

### How CrossFire Works

CrossFire's key objective is to maximize the speed of a multi-GPU system. This is achieved by dividing the rendering workload to each of the two GPUs. When each GPU has completed its assigned tasks for a given frame, the Compositing Engine on the CrossFire Edition graphics card combines the results from each GPU (according to the selected operating mode) then sends the final frames out to the display device. The result will be a complete frame rendered at up to twice the performance of a single graphics card.

3D games are made up of a number of different tasks such as input processing, game state updating, artificial intelligence, physics, rendering, networking, audio, etc. The Data Parallel Processing (DPP) computing tasks simultaneously executes a common set of instructions across a large set of input data. Besides rendering, the detailed physics simulations allow these GPUs to take on an expanded role in game computing. Multiple GPUs can enhance a game by providing generous amounts of additional computing power for certain specific tasks.

## Features

Regardless of the type of operating mode used, the completed frames from both GPUs are sent to the Compositing Engine on the CrossFire Edition graphics card, which then sends them on to the display device.

- **Supertile Mode**

Supertiling divides your screen image into subsections like “tiles” in alternating tile pattern such that half of the tiles are assigned to each of the two GPUs.

- **Scissor Mode**

In Scissor mode, each frame is split into two sections, either horizontal or vertical, with each section being processed by one GPU.

- **Alternate Frame Rendering (AFR)**

In AFR mode, all even frames are rendered on one GPU, while all odd frames are rendered on the other.

- **Super AA (Anti-Aliasing)**

The Super AA mode provides even higher quality anti-aliasing on multi-GPU systems. It works by having each GPU render the same frame with anti-aliasing enabled but using different sample locations for each. When both versions of the frame are completed, they are blended in the CrossFire Compositing engine. The resulting image is twice the number of samples, so 4x and 6x AA become 8x and 12x Super AA respectively.

## Graphics Cards Requirements

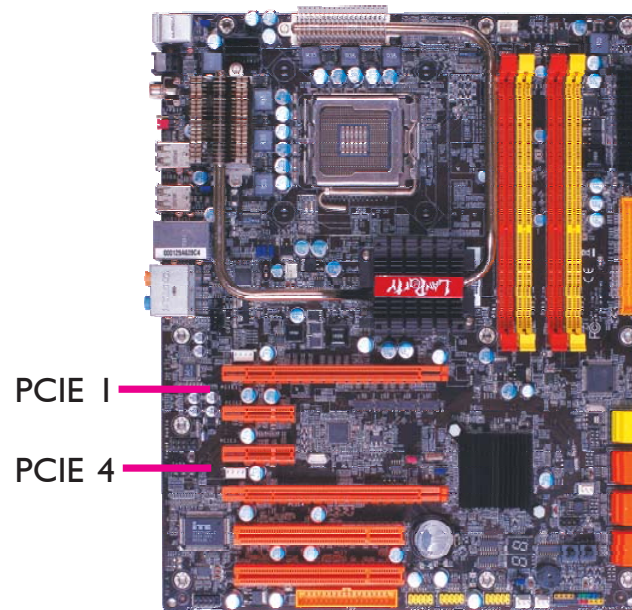
1. One Radeon™ CrossFire™ Edition graphics card.
2. One standard PCI Express Radeon™ graphics card.



**Note:**

*If the clock speed of the CrossFire Edition graphics card and standard PCI Express graphics card are different, both cards will operate at their individual clock speeds.*

## The PCI Express x16 Slots



### CrossFire Configuration

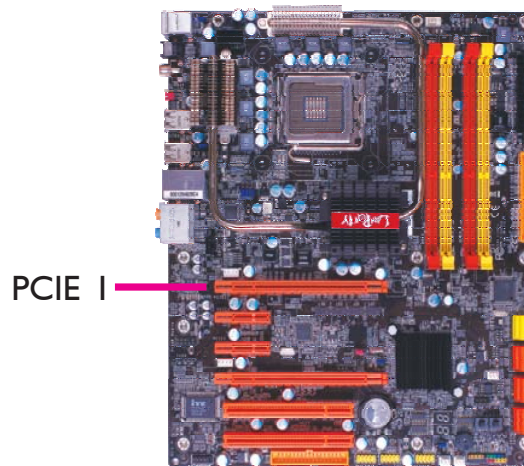
- 2-way CrossFire:  
One slot operating at x16 (16-lane port) or two slots each operating at x8 (8-lane ports) bandwidth

## CrossFire Setup

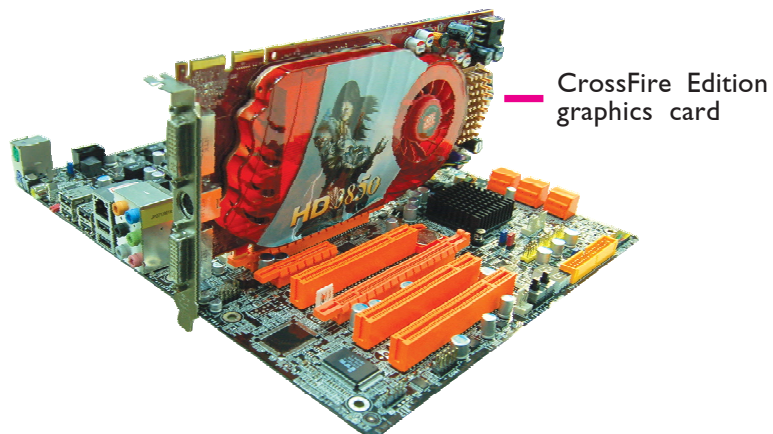
**Note:**

*The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.*

1. Power-off the system and monitor then unplug the power cord.
2. Remove the screw of the bracket that is opposite the PCIE 1 slot then remove the bracket.

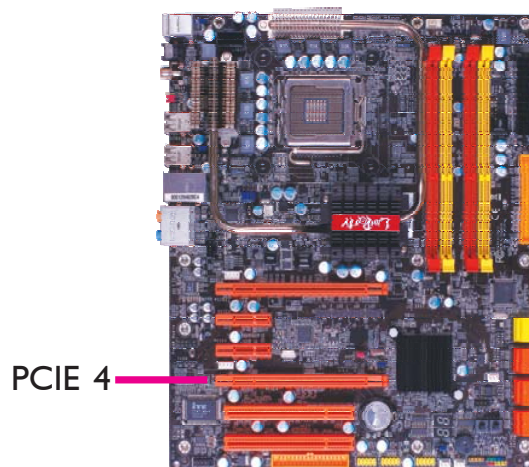


3. Align the CrossFire Edition graphics card (Master) above the PCIE 1 slot then press it down firmly until it is completely seated in the slot.

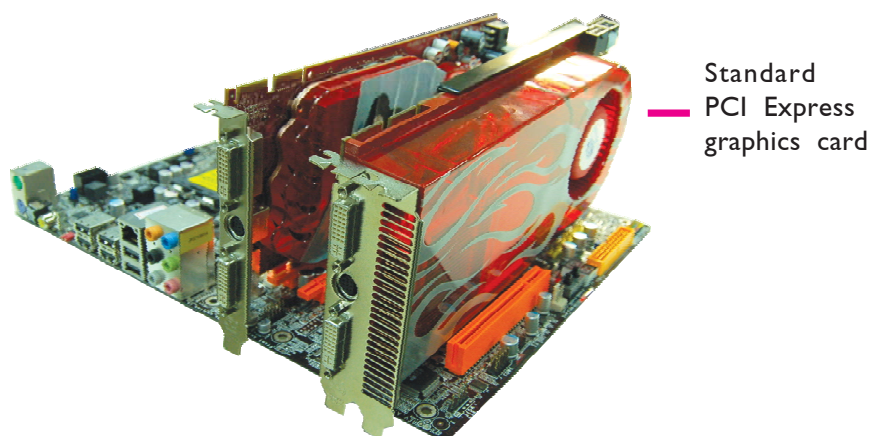


4. Secure the graphics card with the screw you removed in step 2.

5. Remove the screw of the bracket that is opposite the PCIE 4 slot then remove the bracket.



6. Align the standard PCI Express graphics card (Slave) above the PCIE 4 slot then press it down firmly until it is completely seated in the slot.



7. Secure the graphics card with the screw you removed in step 5.
8. Connect the two graphics cards by using the cable that came with the graphics card. Refer to the graphics card's user guide for details.
9. Connect auxiliary power source from the power supply unit to the graphics cards.

10. Install the graphics cards' drivers then restart the system for the drivers to take effect.
11. When you enter the operating system, you will notice the ATI Catalyst Control Center icon added onto your desktop. Double-click this icon.



12. Click the View tab then select Custom View.



13. In the Graphics Settings menu (left side of screen), click CrossFire. The CrossFire Settings screen will appear on the main window. Click "Enable CrossFire" then click "Yes" to continue.



14. The screen on the right indicates that CrossFire has been enabled. Make sure to restart the PC for CrossFire to take effect.



## Appendix A - ABS: Auto Boost System

---



The ABS (Auto Boost System) technology provides the convenience of saving and loading several OC settings. It allows you to use the best OC setting to optimize your system's performance. You can "Auto Boost" your system by simply pressing the <F1> key.

ABS provides the following functions that are easy for users to operate.

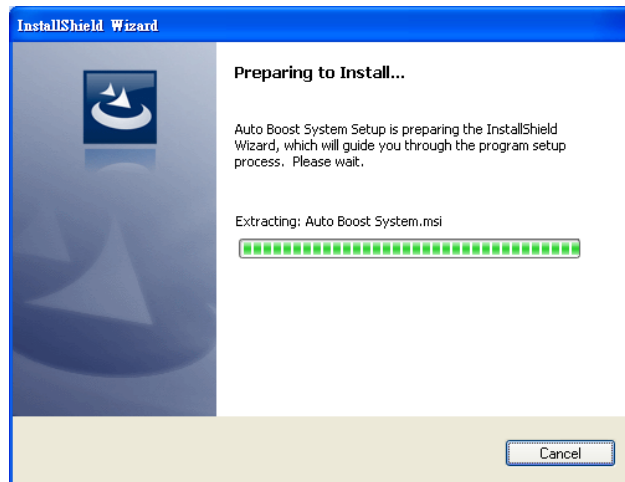
- Backup OC profile
- Load OC profile
- Exchange OC profile

### Installing ABS

1. The ABS utility is included in the provided CD. Insert the CD into a CD-ROM drive. On the left side of the autorun screen, click the "TOOLS" icon.
2. Click "Auto Boost System" on the main menu.



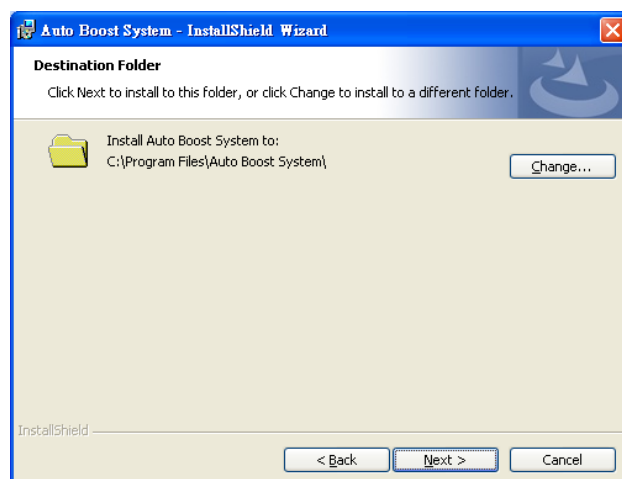
- The installation wizard is extracting the files needed to install the utility. The wizard will lead you to complete the installation.



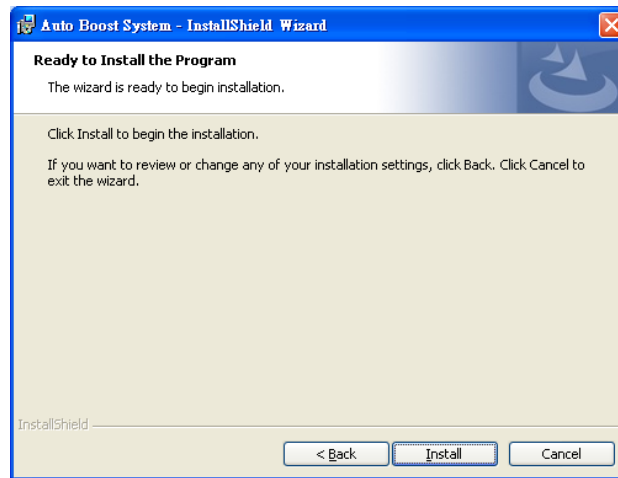
- Setup is now ready to install the utility. Click Next.



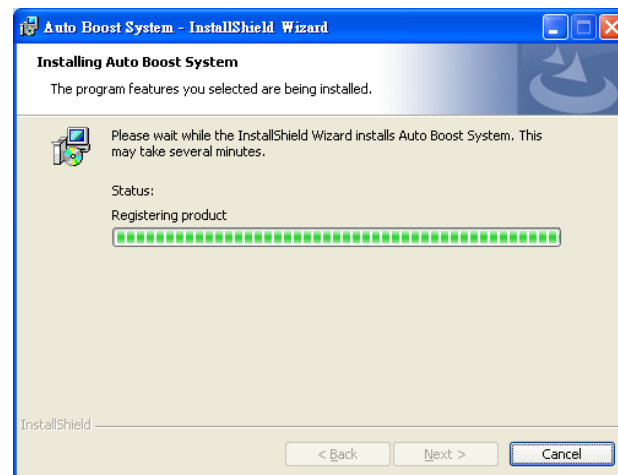
- Click Next to install to the destination folder or click Change to select another folder.



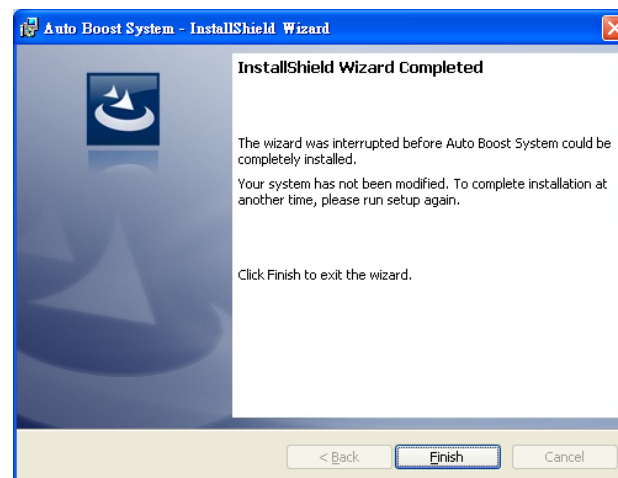
6. Click Install to begin the installation.



7. The installation wizard will copy all the necessary files and optimize the ABS features.

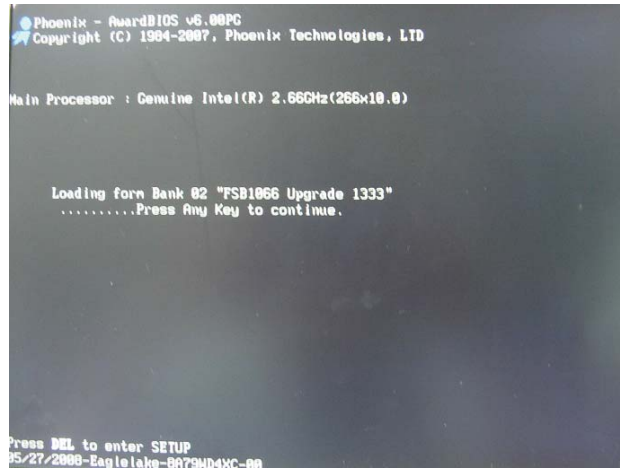


8. Click Finish to exit setup.



## The ABS Utility

1. To run the ABS utility, power up your system then press F1. The screen will show the CPU upgrade information. Press "Any Key" to continue.



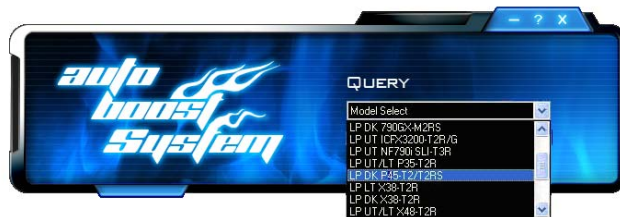
2. When the system enters the operating system, the ABS utility will appear and display the system's information. Click Auto Upgrade.



3. The screen on the right will appear.



4. Select the system board in use.



5. Click Confirm.



6. ABS supports Win Reloaded and Auto Upgrade features. Click Auto Upgrade.



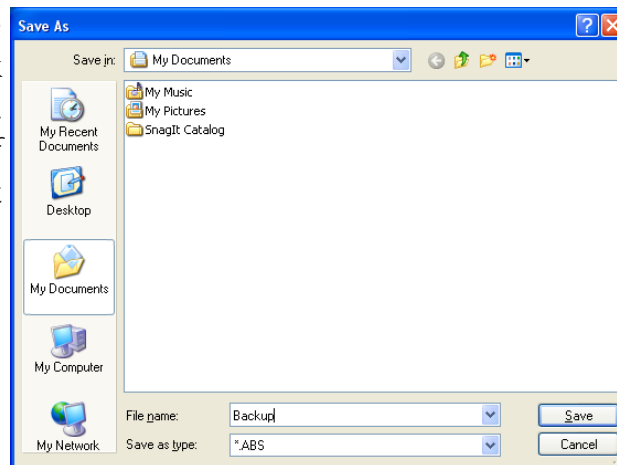
7. Click Backup.



8. The default settings will appear on the screen. Click Save.



9. Enter a name for the default setting then click Save. You have just created a backup file of the board's default setting.



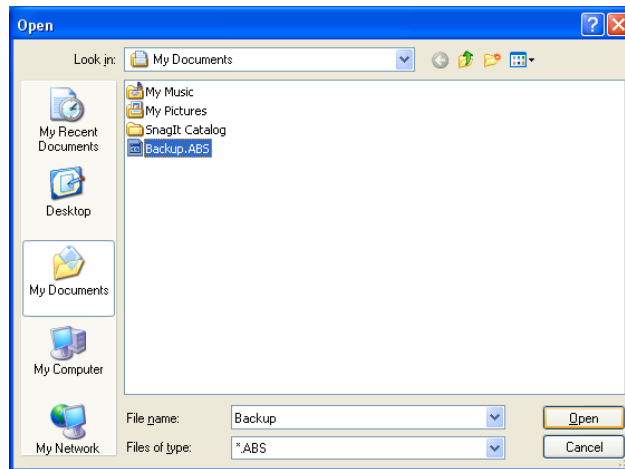
10. If in any case a new OC setting causes system instability, you can always retrieve the backup file saved earlier by clicking Reload.



11. Click Open.



12. Select the backup file then click Open.



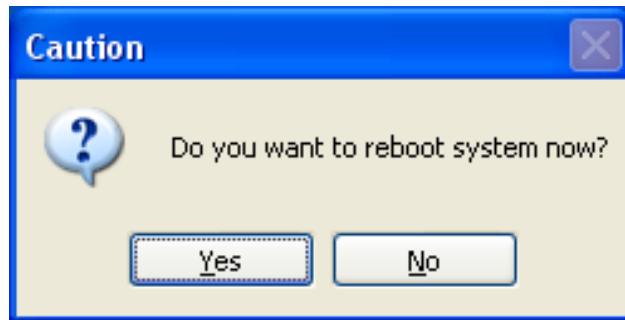
13. Click Write to load Banks 1-4 into the BIOS.



If you want the system to auto upgrade the setting the next time you boot the system, click "Enable Auto Upgrade Next Boot".



14. Click Yes to reboot.



**Important:**

1. We strongly recommend that you backup the default setting. If in any case your overclock setting causes system instability, you can always retrieve the default setting by reloading the backup file.
2. Everytime you change the BIOS settings, remember to always backup the file because the previous backup file will not match the new BIOS settings therefore it will not work.

## Appendix B - Troubleshooting

---

### Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

### Monitor/Display

**If the display screen remains dark after the system is turned on:**

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

**The picture seems to be constantly moving.**

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

**The screen seems to be constantly wavering.**

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

**Power Supply****When the computer is turned on, nothing happens.**

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

**Floppy Drive****The computer cannot access the floppy drive.**

1. The floppy diskette may not be formatted. Format the diskette and try again.
2. The diskette may be write-protected. Use a diskette that is not write-protected.
3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

## Hard Drive

### Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

### Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

## Parallel Port

### The parallel printer doesn't respond when you try to print.

1. Make sure that your printer is turned on and that the printer is on-line.
2. Make sure your software is configured for the right type of printer attached.
3. Verify that the onboard LPT port's I/O address and IRQ settings are configured correctly.
4. Verify that the attached device works by attaching it to a parallel port that is working and configured correctly. If it works, the printer can be assumed to be in good condition. If the printer remains inoperative, replace the printer cable and try again.

## Serial Port

### The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.

3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

## Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

## System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.

## Appendix C - Debug LED Post and Troubleshooting

### General Debug LED POST and Troubleshooting

| POST (hex) | Debug Code Action                  | BIOS Program Definition                                                  | Possible Cause                                                                                                                         | Solution                                                                                                                                                                                                         |
|------------|------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power on   | None, blank                        | Nil                                                                      | 1. CMOS jumper is set at pins 2-3.<br>2. 5Vsb of PSU is insufficient. (Minimum required - 2A)                                          | 1. Set the CMOS jumper to pins 1-2 (default).<br>2. Replace a suitable PSU.                                                                                                                                      |
| 00         | Power on -> Stopped at 00          | BIOS program starts to set VID/FID to initialize CPU. (Boot Block area). | 1. Mixed-up BIOS data.<br>2. Defective CPU connection.<br>3. Incompatible PSU.<br>4. No CPU power.<br>5. Reset button short-circuited. | 1. Clear the CMOS data.<br>2. Remove and reinstall the CPU.<br>3. Replace a suitable PSU.<br>4. Inspect the 12V connection.<br>5. Inspect the cable that connects the reset button to the front panel connector. |
| 00         | Power on -> 00 -> Reset -> Looping | CPU VID is incorrect.                                                    | PSU does not comply with the system's requirement.                                                                                     | Replace a PSU that will provide adequate power to the system.                                                                                                                                                    |
| A0         | 00 -> C1 -> Stopped at A0          | A0~AF Definition: Initializing memory check code.                        | 1. Incompatible memory modules.<br>2. Mixed-up BIOS data.                                                                              | 1. Remove and reinstall the memory modules.<br>2. Clear the CMOS data.                                                                                                                                           |
| b8         | 00 -> C1 -> Stopped at b8          | B0~BF Definition: Initializing memory/devices check code (registers).    | 1. Mixed-up BIOS data.<br>2. Incompatible memory modules.<br>3. Incompatible PCI devices.                                              | 1. Clear the CMOS data.<br>2. Remove and reinstall the memory modules.<br>3. Remove and reconnect the PCI devices.                                                                                               |
| C0         | 00 -> Stopped at C0                | Initializing memory.                                                     | 1. Probing for failed memory devices.<br>2. SPD value is lost or empty.                                                                | 1. Make sure the memory modules are installed properly in the slots.<br>2. Replace the memory modules.                                                                                                           |

| POST (hex) | Debug Code Action                                                       | BIOS Program Definition                                                               | Possible Cause                             | Solution                                       |
|------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------|
| C1         | 00 -> C0 -> Stopped at C1<br>(00 -> C0 -> C1 -><br>Reset -> Looping)    | Detecting memory.<br>Detecting DRAM size and type.<br>ECC auto-detection of L2 cache. | 1. Incompatible memory modules.            | 1. Remove and reinstall the memory modules.    |
|            |                                                                         |                                                                                       | 2. Overclocking issue (tight DRAM timing). | 2. Clear the CMOS then load the default speed. |
|            |                                                                         |                                                                                       | 3. One of the memory modules is defective. | 3. Try installing a single module only.        |
| C3/C5      | C0 -> C1 -> Stopped at C3/C5<br>(C0 -> C1 -> C3 -><br>Reset -> Looping) | Expanding compressed BIOS code to the DRAM.                                           | 1. Tight DRAM timing (system is unstable). | 1. Clear the CMOS then load the default speed. |
|            |                                                                         |                                                                                       | 2. Insufficient DRAM voltage.              | 2. Increase the DRAM's voltage.                |
|            |                                                                         |                                                                                       | 3. Overclocking issue.                     | 3. Remove and reinstall the memory modules.    |
| CF         | Shutdown -> Stopped at CF<br>(Shutdown -> CF -> Reset)                  | Resume on S1/S3 failed.                                                               | 1. Insufficient DRAM voltage.              | 1. Increase the DRAM's voltage.                |
|            |                                                                         |                                                                                       | 2. Incompatible memory modules.            | 2. Remove and reinstall the memory modules.    |
|            |                                                                         |                                                                                       | 3. Overclocking issue (tight DRAM timing). | 3. Load the default DRAM speed.                |
|            |                                                                         |                                                                                       | 4. BIOS issue.                             | 4. Upgrade to the latest BIOS.                 |
| E0         | C0 -> C1 -> Stopped at E0                                               | E0-EF Definition: Initializing PCIe device check code.                                | 1. Mixed-up BIOS data.                     | 1. Clear the CMOS data.                        |
|            |                                                                         |                                                                                       | 2. Incompatible PCI devices.               | 2. Remove and reinstall the PCI device.        |

| POST (hex) | Debug Code Action                  | BIOS Program Definition                                                                                                                                                                                          | Possible Cause                                                               | Solution                                                                                                                                                             |
|------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 25         | 00 -> C1 -> C3 -><br>Stopped at 25 | Enumerating PCI bus number.<br>Assigning memory & I/O resource -<br>searching for a valid VGA device &<br>VGA BIOS then placing it in C000:0.                                                                    | 1. Incompatible PCI devices.                                                 | 1. Remove all PCI/PCI-E devices and leave only the graphics card to test first. Test the devices one at a time to determine the one with problem.                    |
|            |                                    |                                                                                                                                                                                                                  | 2. Incompatible USB devices.                                                 | 2. Remove all USB devices including the USB keyboard and instead use a PS/2 keyboard to test.                                                                        |
|            |                                    |                                                                                                                                                                                                                  | 3. Defective graphics card.<br>(VGA BIOS did not initialize)                 | 3. Replace the graphics card.                                                                                                                                        |
|            |                                    |                                                                                                                                                                                                                  | 4. The graphics card was not installed properly.                             | 4. Remove and reinstall the graphics card.                                                                                                                           |
| 26         | 00 -> C1 -> C3 -><br>Stopped at 26 | Initializing display card.<br>Initializing onboard clock generator.<br>Disabling respective clock resource to empty PCI & DIMM slots.<br>Initializing onboard PWM3.<br>Initializing onboard H/W monitor devices. | 1. Defective graphics card.                                                  | 1. Replace the graphics card.                                                                                                                                        |
|            |                                    |                                                                                                                                                                                                                  | 2. Initialized wrong BIOS process.<br>(Clock-gen circuit / Super IO circuit) | 2. Clear the CMOS data.                                                                                                                                              |
| 41         | C3 -> 25 -> 26 -><br>Stopped at 41 | Initializing the FDD device.                                                                                                                                                                                     | Detected floppy error.                                                       | Unplug the FDD cable and check for errors or check the BIOS settings.                                                                                                |
|            |                                    |                                                                                                                                                                                                                  | * Mixed-up BIOS data could be one of the causes too.                         | * Replace a new BIOS chip.                                                                                                                                           |
| 50         | Power on -> Stopped at 50          | Initializing USB devices.                                                                                                                                                                                        | 1. USB failed to boot. (BBS issue)                                           | 1. Clear the CMOS data first.                                                                                                                                        |
|            |                                    |                                                                                                                                                                                                                  | 2. Incompatible USB devices.                                                 | 2. Try connecting the device to another USB port.<br>3. Test the USB devices one by one.<br>4. Set the USB power source to 5V by means of the 5V/5Vsb select jumper. |

| POST (hex) | Debug Code Action                                                                                          | BIOS Program Definition                                                                                                                         | Possible Cause                                                                                                                                                                                                                    | Solution                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 75         | Power on -> Stopped at <b>75</b>                                                                           | Initializing storage devices.<br>(Probing for IDE devices or SATA devices)                                                                      | 1. Lost power source of some devices.<br>2. Incompatible SATA or PATA device.<br>3. CD-ROM's spin took too long.                                                                                                                  | 1. Inspect the power cable connection.<br>2. Inspect the IDE cable connection or replace another PATA/ SATA device.<br>3. Remove the disc, if present, from the CD-ROM device.        |
| 7F         | Power on -> Stopped at <b>7F</b><br>* Checksum error always appear after the BIOS default has been loaded. | BIOS setup module in progress.<br>Reporting BIOS check errors.<br>Waiting for keys:<br>DEL key to load the BIOS default.<br>F1 key to continue. | 1. Checksum error occurred.<br>(Change/add devices such as CPU/ DRAM)<br>2. Error occurred after clearing the CMOS.<br>3. Onboard battery is depleted.<br>4. Overclocking issue.<br>* The battery circuit of the MB is defective. | 1. Load the optimized default setting of the BIOS.<br>2. Alter or adjust the BIOS setting.<br>3. Replace a new battery.<br>4. Decrease the overclock range.<br>* RMA action required. |
| FF         | Power on -> Run to <b>FF</b><br>* Blank Screen                                                             | Boot attempt (INT 19h)<br>System booted normally.                                                                                               | Normal Operation<br>* The graphics card was not connected properly or it is defective.                                                                                                                                            | Nil<br>* Remove and reinstall the graphics card.                                                                                                                                      |

## Abnormal Debug LED POST and Troubleshooting

| POST (hex) | Debug Code Action                       | BIOS Program Definition                                                                                                                 | Possible Cause                                                               | Solution                                           |
|------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------|
| 79         | Power on -> Prompt Stopped at <b>79</b> | There is no "79" definition on the Award BIOS code.<br>(BIOS program executed the wrong process therefore showing the wrong POST code.) | 1. Mixed-up BIOS data.<br>2. MB is defective.<br>(NB chip may be defective.) | 1. Clear the CMOS data.<br>2. RMA action required. |
| 88         | Power on -> Prompt Stopped at <b>88</b> | There is no "88" definition on the Award BIOS code.<br>(BIOS program executed the wrong process therefore showing the wrong POST code.) | 1. Mixed-up BIOS data.<br>2. MB is defective.<br>(NB chip may be defective.) | 1. Clear the CMOS data.<br>2. RMA action required. |
| FF         | Power on -> Prompt Stopped at <b>FF</b> | Definition: BIOS process completed.<br>(BIOS program executed the wrong process therefore showing the wrong POST code.)                 | 1. Mixed-up BIOS data.<br>2. MB is defective.<br>(NB chip may be defective.) | 1. Clear the CMOS data.<br>2. RMA action required. |

## Index

### Clearing CMOS Data

1. Turn-off and unplug the AC power.
2. Move the jumper cap from pins 1-2 to pins 2-3.
3. Wait for 5 seconds then move the jumper cap back to pins 1-2.



### Totally Discharging the Motherboard

Unplug the AC power and remove the battery for 5 minutes then reinstall the battery and plug the AC power back on.

