EL332-IP

System Board
User's Manual

A14910115

Copyright

Trademarks

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

About this Manual

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

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 consequencial 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.

- ☑ One system board
- ☑ One USB cable
- ☑ Two Serial ATA data cables
- ☑ Two Serial ATA power cables
- ☑ One bracket mounted with a COM port cable
- ☑ One I/O shield
- ☑ One DVD
- ☑ One QR (Quick Reference)

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	• LGA 775 socket for: - Intel® Core™2 Quad Q9400 - Intel® Core™2 Duo E8400/E7400/E6400/E4300 - Intel® Pentium® E6500/E5300/E2160 - Intel® Celeron® E3400/E1500/440 • Supports Intel Enhanced Memory 64 Technology (EM64T) • Supports Enhanced Intel SpeedStep Technology (EIST) • 1333/1066/800MHz FSB
Chipset	• Intel® chipset - Intel® G41 Express chipset - Intel® ICH7R I/O Controller Hub
System Memory	• Two 240-pin DDR3 DIMM sockets • Supports DDR3 800/1066MHz DIMM • Maximum memory bandwidth of 17GB/s in dual-channel mode when using DDR3 1066MHz • Dual channel (128-bit wide) memory interface • Supports up to 4GB system memory • Supports unbuffered x8 and x16 DIMMs
Expansion Slots	• 1 PCI Express x16 slot (PCIE 1.1) • 2 PCI Express x1 slots (PCIE 1.1) • 1 PCI slot (PCI 2.3)
Graphics	• Integrated Intel GMA X4500 - Supports 3D, 2D and video capabilities, DX10 and OpenGL 1.5 • Display ports: DVI-I (Chrontel CH7307C) and VGA
Audio	• Realtek ALC262 2-channel High Definition Audio • DACs with 100dB SNR and ADCs with 90dB SNR
LAN	• 4 Intel WG82574L PCI Express Gigabit Ethernet controllers • Supports 10Mbps, 100Mbps and 1Gbps data transmission • IEEE 802.3u (10/100Mbps) and IEEE 802.3ab (1Gbps) compliant
Serial ATA Interface	• SATA speed up to 3Gb/s (SATA 2.0) • 9 Serial ATA interfaces compliant with SATA 1.0 specification - 4 SATA ports supported by Intel ICH7R * Supports RAID 0/1/5/10 - 4 SATA ports supported by Silicon Image SiI3114 PCI to SATA controller * PCI Local Bus Specification Rev. 2.3 compliant * APM Specification Rev. 1.0 compliant * PCI IDE Controller Specification Rev. 1.0 compliant * Supports RAID 0/1/10 - 1 SATA port supported by Genesys Logic GL830 USB to SATA bridge controller * USB Specification Rev. 2.0 compliant * USB Storage Class Specification Rev. 1.0 compliant

TPM - TRUSTED PLATFORM MODULE (optional)	• Provides a Trusted PC for secure transactions • Provides software license protection, enforcement and password protection
IDE	• Supports up to two IDE devices • Supports Ultra ATA 100/66/33
Rear Panel I/O Ports	• 2 DB-9 RS232/422/485 serial ports • 1 DB-15 VGA port • 1 DVI-I port (DVI-D signal only) • 4 RJ45 LAN ports • 2 USB 2.0/1.1 ports
I/O Connectors	• 2 connectors for 4 external USB 2.0/1.1 ports • 2 connectors for 2 external RS232/422/485 serial ports • 1 front audio connector for line-out and mic-in at front panel • 1 LAN LED connector • 1 PS/2 connector for keyboard/mouse ports • 9 Serial ATA connectors • 1 40-pin IDE connector • 1 36-bit GPIO connector • 1 24-pin ATX power connector • 1 4-pin 12V power connector • 1 chassis intrusion connector • 1 front panel connector • 3 fan connectors
BIOS	• AMI BIOS • 8 Mbit SPI BIOS
Energy Efficient Design	• ACPI v3.0b specification • System Power Management • Wake-On-Events include: - Wake-On-PS/2 Keyboard/Mouse - Wake-On-USB Keyboard/Mouse - Wake-On-LAN - RTC timer to power-on the system • Microsoft®/Intel® APM 1.2 compliant • AC power failure recovery
Damage Free Intelligence	• Monitors CPU/System/AUX temperature and overheat alarm • Monitors CPU/DIMM/3.3V/5V/12V/1.1V/VBAT voltages and failure alarm • Monitors CPU/System/2nd fan speed and failure alarm • Read back capability that displays temperature, voltage and fan speed • Watchdog timer function
Temperature	• 0°C to 60°C
Humidity	• 10% to 90%
PCB	• microATX form factor • 244mm (9.6”) x 244mm (9.6”)

Features

DDR3

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.

Graphics

The Intel northbridge chip comes integrated with the Intel Graphics Media Accelerator X4500 delivering 3D, 2D and video capabilities. With support for Microsoft DirectX 10 and OpenGL 2.1, Intel GMA X4500 delivers excellent video and 3D graphics with outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications.

PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x4 PCI Express lane supports transfer rate of 1 Gigabyte per second. The PCI Express architecture also provides a high performance graphics infrastructure by enhancing the capability of a x16 PCI Express lane to provide 4 Gigabytes per second transfer rate.

Audio

The Realtek ALC262 audio codec provides 2-channel High Definition audio output.

Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. With speed of up to 3Gbps, it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s. Intel ICH7R supports RAID 0/1/5/10 and Silicon Image SiI 3114 supports RAID 0/1/10..

Gigabit LAN

The Intel WG82574L PCI Express Gigabit controller supports up to 1Gbps data transmission.

USB

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-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 5V_standby power source of your power supply must support ≥720mA.

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 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

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 5V_standby power source of your power supply must support ≥720mA.

ACPI 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 Windows® 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.

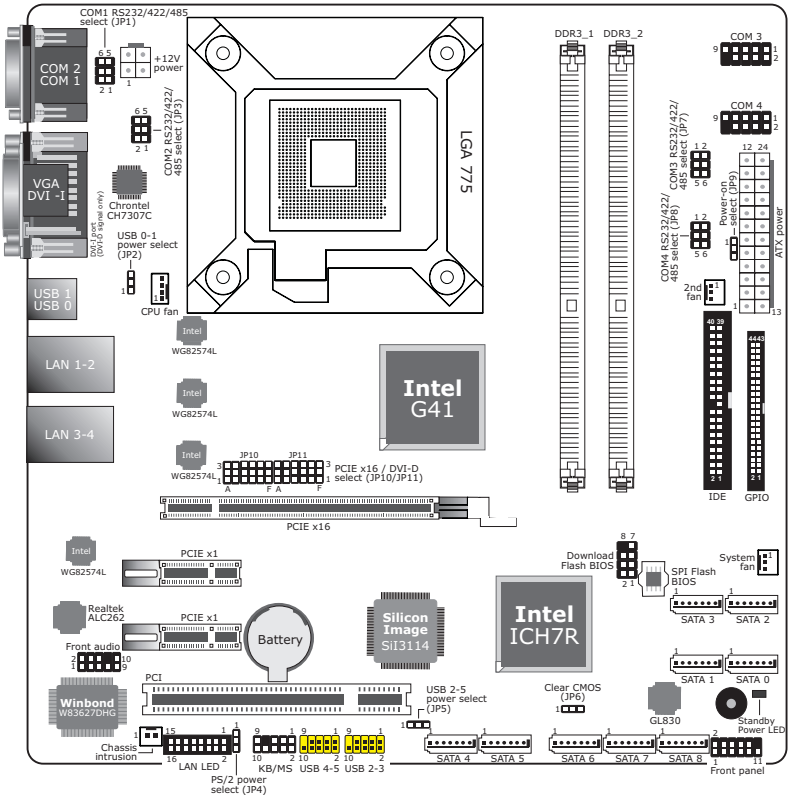
Important:
The 5V_standby power source of your power supply must support ≥720mA.

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

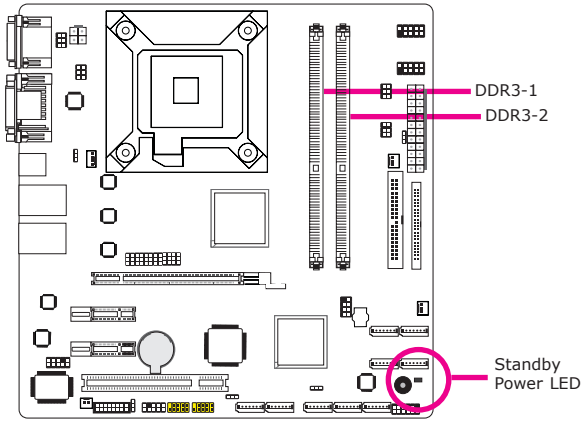
System Board Layout



Important:
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

Important:
When the Standby Power LED lit red, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



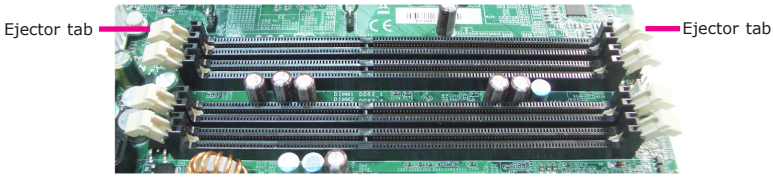
Features

- Two 240-pin DDR3 DIMM sockets
- Supports DDR3 800/1066MHz
- Supports up to 4GB system memory

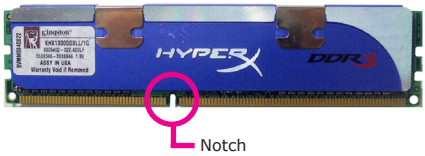
Installing the DIM Module

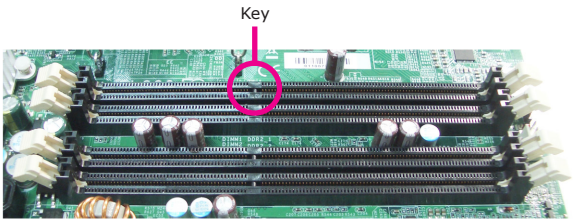
Note:
The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

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.

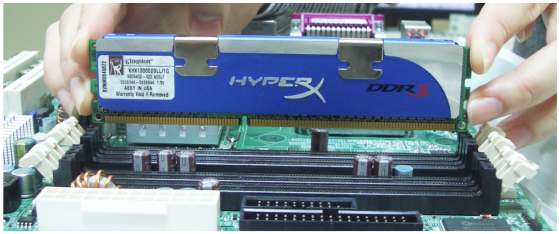


5. Note how the module is keyed to the socket.

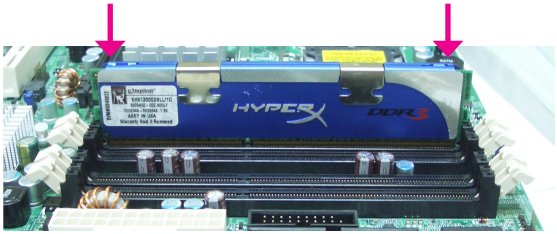




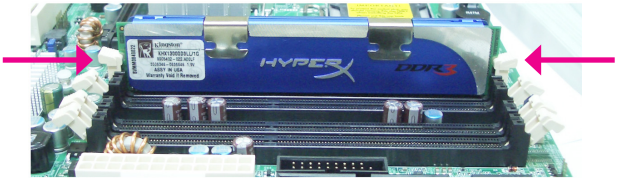
6. Grasping the module by its edges, position the module above the socket with the "notch" in the module aligned with the "key" on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.



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

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.

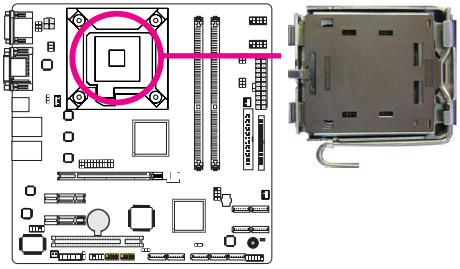
Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

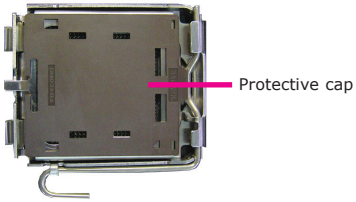
2. Disconnect all power cords and cables.

3. Locate the LGA 775 CPU socket on the system board.

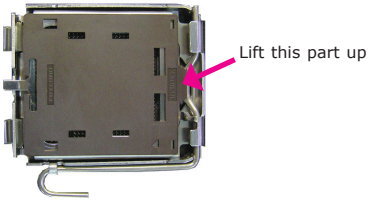
   Important:
   The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.



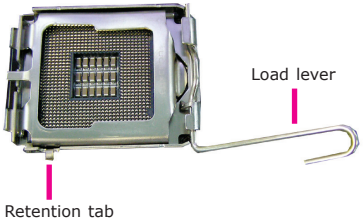
4. The CPU socket comes with a removable protective cap. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



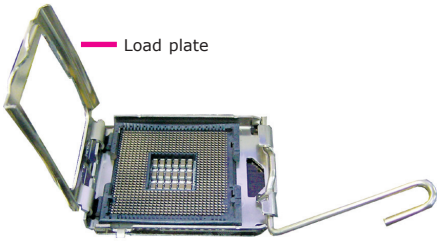
5. To remove the protective cap, lift the cap on the location pointed on the right photo.



6. Unlock the socket by pushing the load lever down, moving it sideways until it is released from the retention tab; then lift it up.

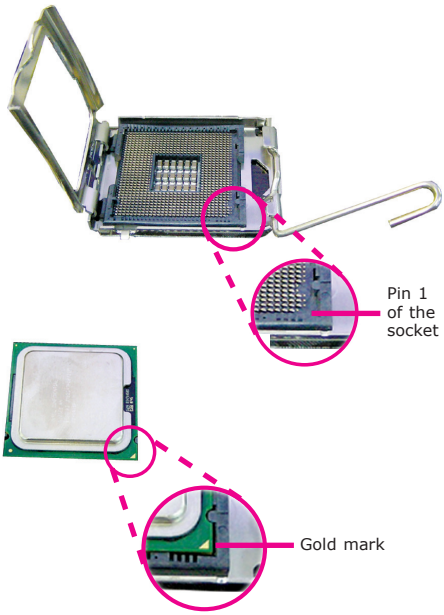


7. Life the load plate.



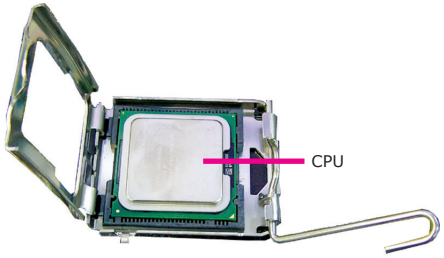
8. Position the CPU above the socket. The gold mark on the CPU must align with pin 1 of the CPU socket.

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

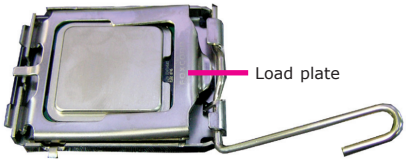


9. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force.

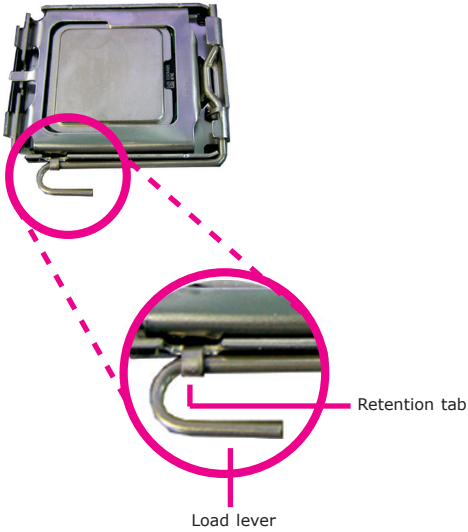
Important:
Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.



10. Close the load plate.



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



Installing the Fan and Heat Sink

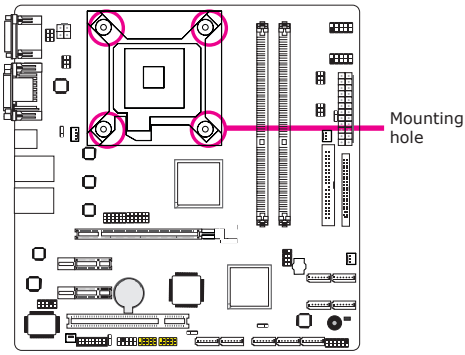
The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.

Note:
A boxed Intel® processor already includes the CPU fan and heat sink assembly. If your CPU was purchased separately, make sure to only use Intel®-certified fan and heat sink.

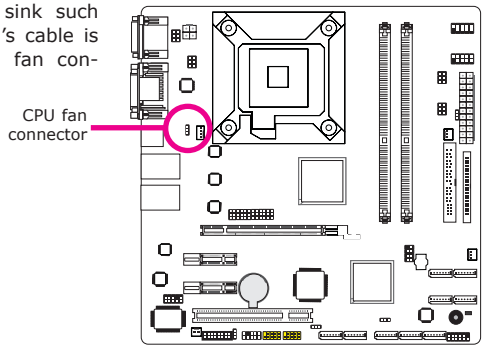
1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will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

   Some heat sinks come with a patch of pre-applied thermal paste. Do not apply thermal 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 push-pins 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.

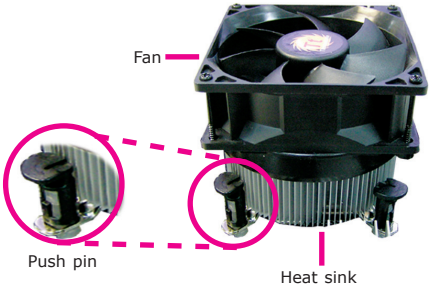


3. Orient the heat sink such that the CPU fan's cable is nearest the CPU fan con-



4. Rotate each push-pin according to the direction of the arrow shown on top of the pin.

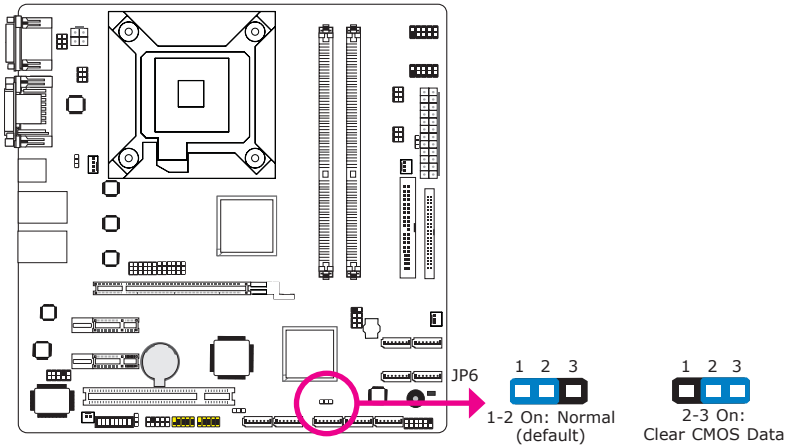
   Push down two pushpins that are diagonally across the heat sink. Perform the same procedure for the other two push-pins.



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

Jumper Settings

Clear CMOS Data



If you encounter the following,

a) CMOS data becomes corrupted.
b) You forgot the supervisor or user password.

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

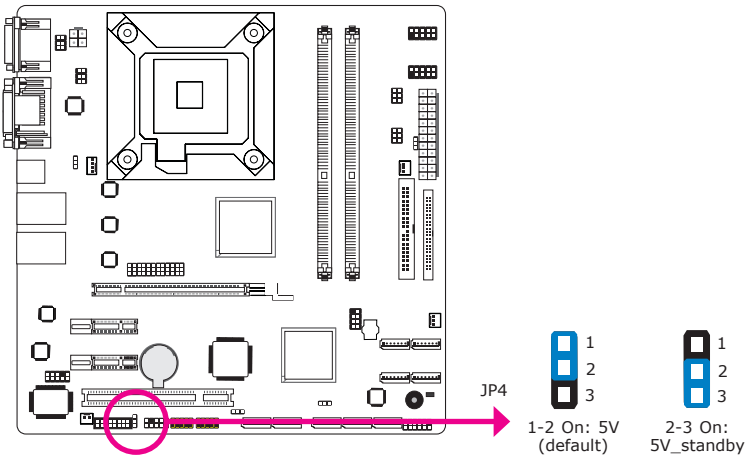
To load the default values stored in the ROM BIOS, please follow the steps below.

1. Power-off the system and unplug the power cord.

2. Set JP6 pins 2 and 3 to On. Wait for a few seconds and set JP1 back to its default setting, pins 1 and 2 On.

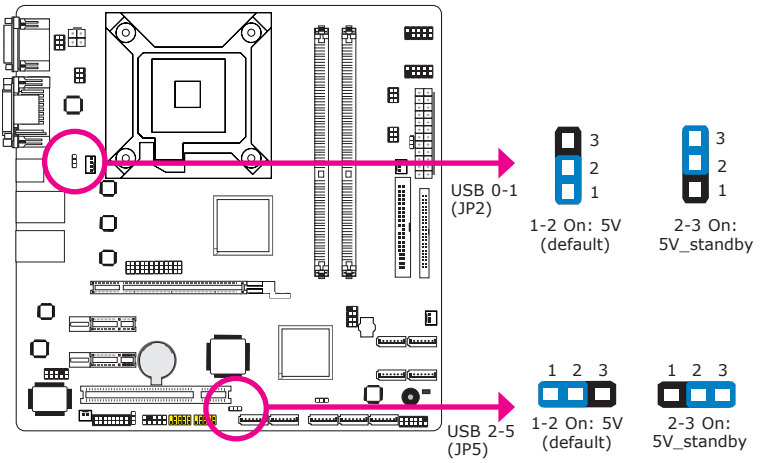
3. Now plug the power cord and power-on the system.

PS/2 Power Select



JP4 is used to select the power of the PS/2 keyboard/mouse port. Selecting 5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

USB Power Select



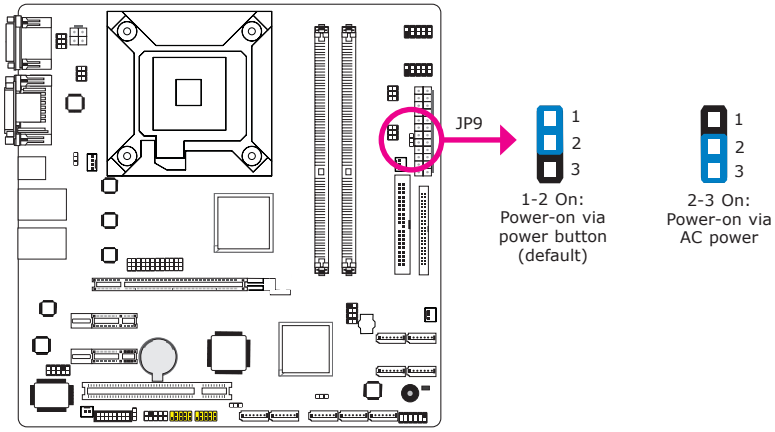
These jumpers are used to select the power of the USB ports. Selecting 5V_ standby will allow you to use a USB device to wake up the system.

BIOS Setting

"USB Device WakeUp From S3/S4" in the Advanced menu ("ACPI Configuration" -> "Chipset ACPI Configuration" submenu) of the BIOS must be set to Enabled. Refer to chapter 3 for more information.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

Power-on Select

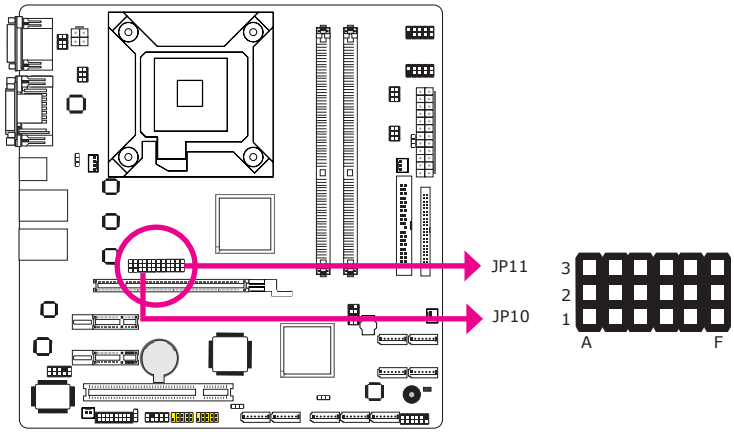


JP9 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP9 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP9 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

Note:
In order to ensure that power is resumed after a power failure that recovers within a 5 second period, JP5 must be set to pins 2-3 and the "AC Power Lose" in CMOS is set to "On".

PCIE x16 / DVI Select

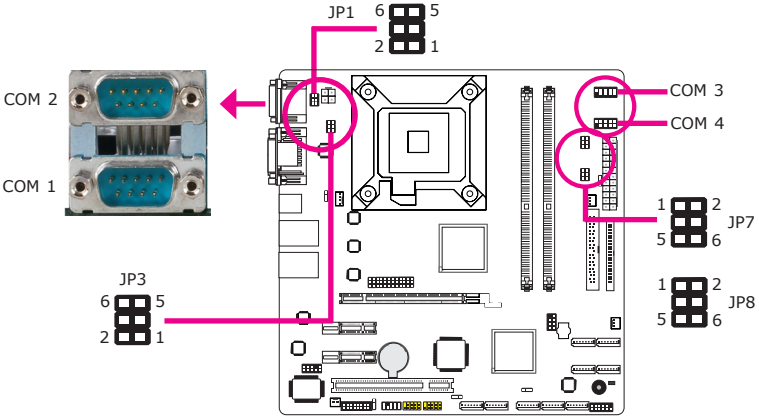


A1-A2, F1-F2 On:
PCIE x16 slot

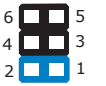
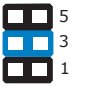
A2-A3, F2-F3 On:
DVI-D
(default)

The system board allows connecting a device to either the DVI port at the rear panel or to the PCI Express x16 card. However, you cannot use devices (connected to both the DVI port and PCI Express x16 card) at the same time. Use JP10 and JP11 to select between using PCIE x16 or DVI.

RS232/RS422/RS485 Select



JP1 (for COM1), JP3 (for COM2), JP7 (for COM3) and JP8 (for COM4) are used to configure the COM ports to RS232, RS422 (Half Duplex) or RS485.

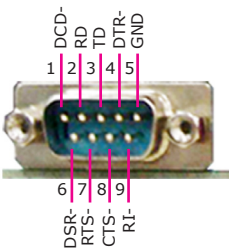
JP1/JP3		
		
1-2 On: RS232 (default)	3-4 On: RS422 Half Duplex	5-6 On: RS485

JP7/JP8		
		
1-2 On: RS232 (default)	3-4 On: RS422 Half Duplex	5-6 On: RS485

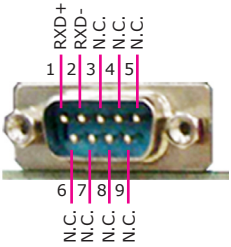
Pin Functions

The pin function of the COM ports will vary according to the jumper's setting.

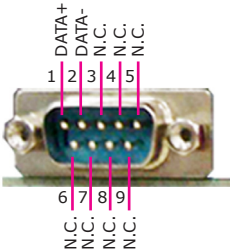
COM 1 / COM 2



RS232

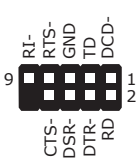


RS422
Half Duplex

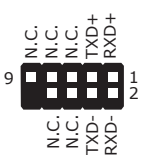


RS485

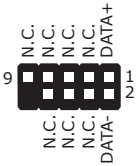
COM 3 / COM 4



RS232

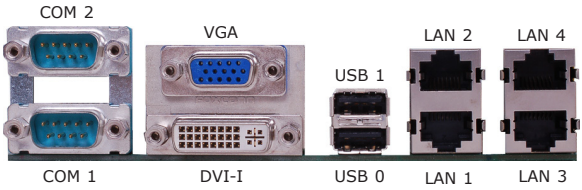


RS422
Half Duplex



RS485

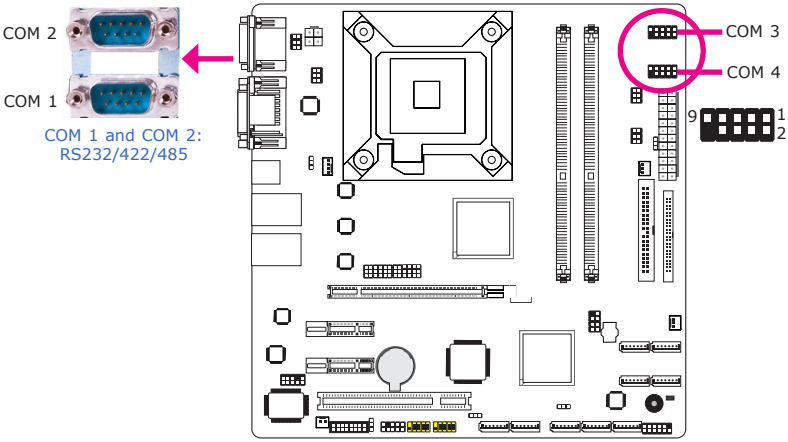
Rear Panel I/O Ports



The rear panel I/O ports consist of the following:

- 2 DB-9 RS232/422/485 serial ports
- 1 DB-15 VGA port
- 1 DVI-I port (DVI-D signal only)
- 4 RJ45 LAN ports
- 2 USB 2.2/1.1 ports

COM (Serial) Ports



The pin function of COM 1 to COM 4 ports will vary according to JP1/JP3/JP7/JP8's setting. Refer to "RS232/RS422/RS485 Select" in this chapter for more information.

The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

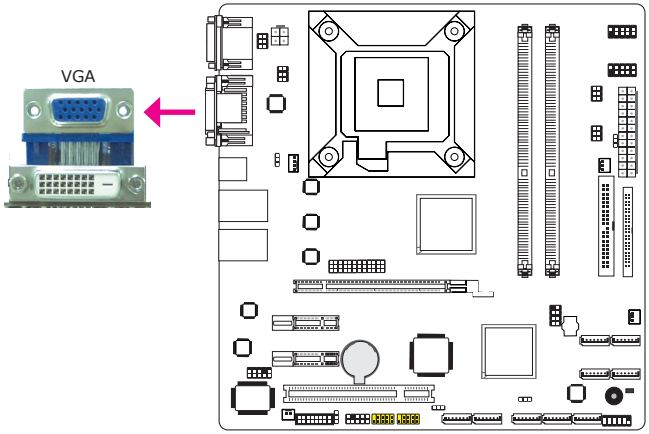
Connecting External Serial Ports

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 insert the serial port cable to the COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

BIOS Setting

Configure the serial ports in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

VGA Port



The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

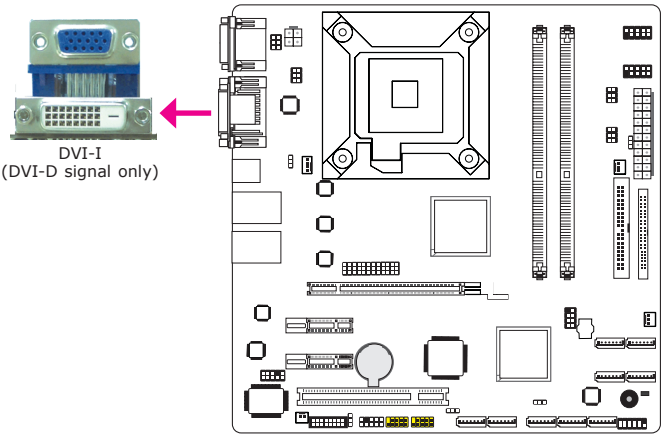
BIOS Setting

Configure the onboard VGA in the Chipset menu ("North Bridge Chipset Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the graphics driver. Refer to chapter 4 for more information.

DVI-I Port



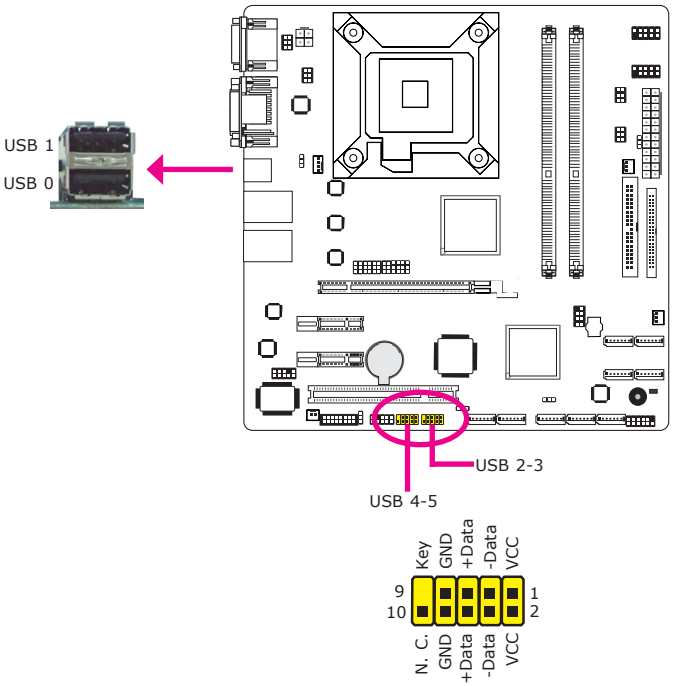
The DVI-I port is used to connect an LCD monitor. This port supports DVI-D signal only.

Connect the display device's cable connector to the DVI-I port. After you plug the cable connector into the port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the display device in the Chipset menu ("North Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

USB Ports



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 2.0/1.1 ports. The two 10-pin connectors allow you to connect 4 additional USB 2.0/1.1 ports. The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the USB port cables to a connector.

BIOS Setting

Configure the onboard USB in the Chipset menu and Advanced menu ("USB Configuration" and "South Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

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

Wake-On-USB Keyboard/Mouse

The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state. To use this function:

- Jumper Setting

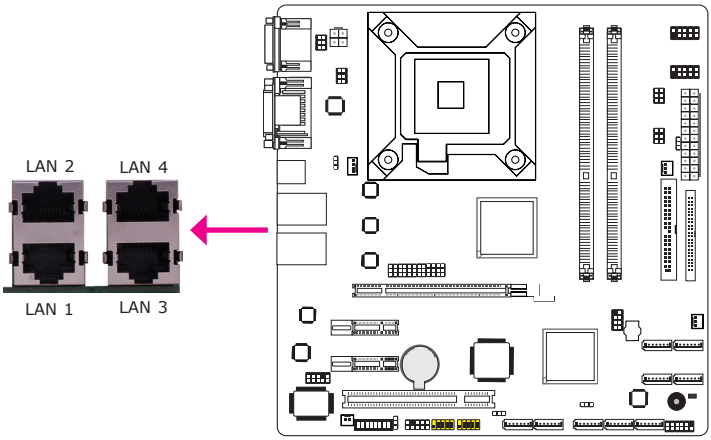
  JP2 and/or JP5 must be set to "2-3 On: 5V_standby". Refer to "USB Power Select" in this chapter for more information.

- BIOS Setting

  "USB Device WakeUp From S3/S4" in the Advanced menu ("ACPI Configuration" -> "Chipset ACPI Configuration" submenu) of the BIOS must be set to Enabled. Refer to chapter 3 for more information.

Important:
If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V_standby power source of your power supply must support ≥1.5A. For 3 or more USB ports, the 5V_standby power source of your power supply must support ≥2A.

RJ45 LAN Ports



Features

- 4 Intel WG82574L PCI Express Gigabit controllers
- Realtek RTL8111DL PCI Express Gigabit LAN controller

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

BIOS Setting

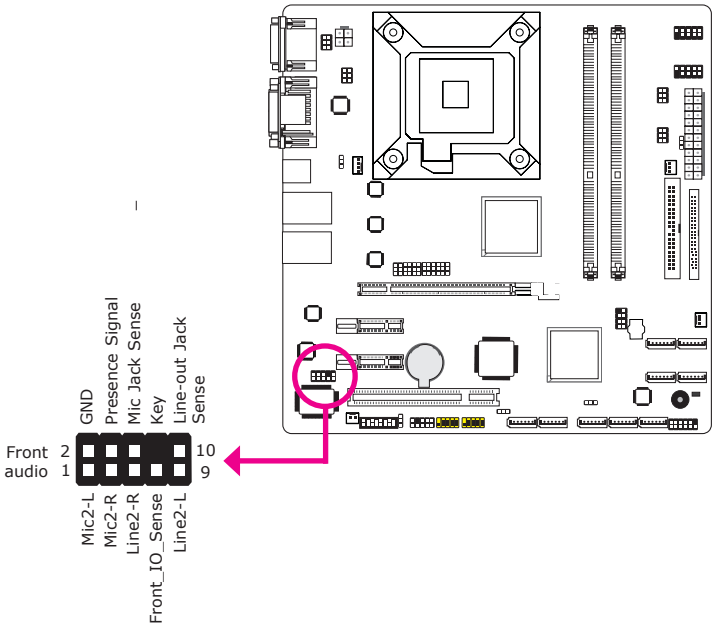
Configure the onboard LAN in the Chipset menu ("South Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to chapter 4 for more information.

I/O Connectors

Front Audio

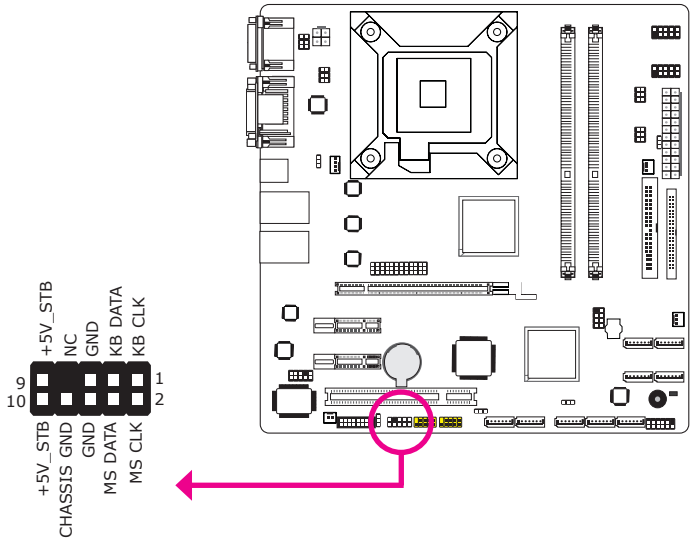


The front audio connector allows you to connect to the second line-out and mic-in jacks that are at the front panel of your system.

Driver Installation

Install the audio driver. Refer to chapter 4 for more information.

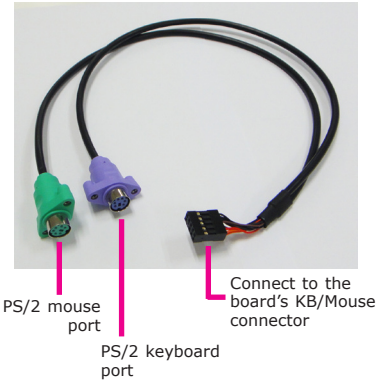
KB/Mouse Connector



The KB/Mouse connector is used to connect PS/2 keyboard and PS/2 mouse by means of a PS/2 cable.

Connecting the PS/2 Cable

The system board package comes with a PS/2 cable. Connect one end of the cable to the KB/Mouse connector. The other ends are used to connect a PS/2 keyboard and a PS/2 mouse.



Wake-On-PS/2 Keyboard/Mouse

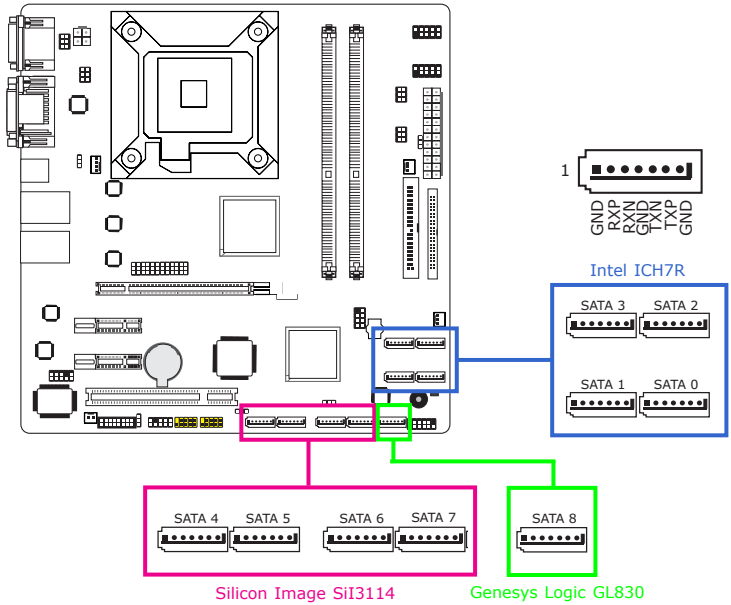
The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

- Jumper Setting

  JP2 must be set to "2-3 On: 5V_standby". Refer to "PS/2 Power Select" in this chapter for more information.

  Important:
  The 5V_standby power source of your power supply must support ≥720mA.

SATA (Serial ATA) Connectors



Features

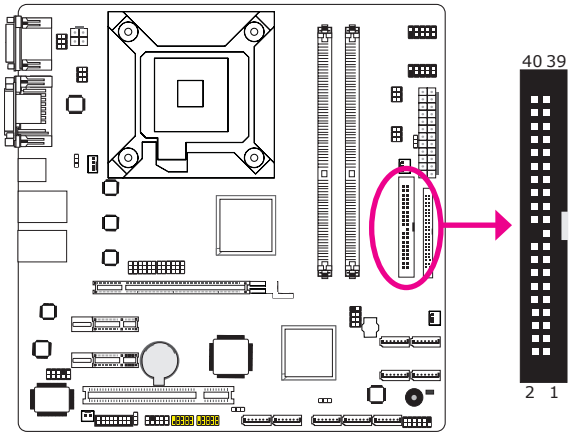
- SATA 0 to SATA 3 supported by Intel ICH7R
  - RAID 0/1/10/5
- SATA 4 to SATA 7 supported by Silicon Image SiI3114
  - RAID 0/1/10
- SATA 8 supported by Genesys Logic GL830

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

BIOS Setting

Configure the Serial ATA drives in the Advanced menu ("IDE Configuration" sub-menu) of the BIOS. Refer to chapter 3 for more information.

IDE Connector



The IDE connector is used to connect hard drives. The connector on the IDE cable can be inserted into this connector only if pin 1 of the cable is aligned with pin 1 of this connector.

The IDE connector supports 2 devices, a Master and a Slave. Use an IDE ribbon cable to connect the drives to the system board. An IDE ribbon cable have 3 connectors on them, one that plugs into the IDE connector on the system board and the other 2 connects 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.

Note:
Refer to your disk drive user's manual for information about selecting proper drive switch settings.

a Second IDE Disk Drive

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.

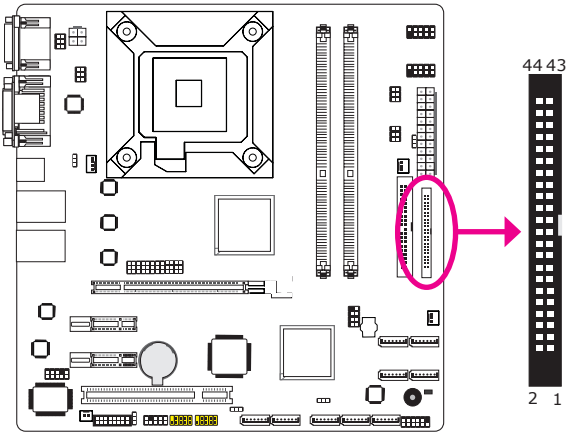
The system board supports Enhanced IDE or ATA-2, ATA/33, ATA/66, ATA/100 and ATA/133 hard drives. We recommend that you use hard drives from the same manufacturer. In a few cases, drives from two different manufacturers will not function properly when used together. The problem lies in the hard drives, not the system board.

Important:
If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.

BIOS Setting

Configure the onboard IDE in the Advanced menu ("IDE Configuration" section) of the BIOS. Refer to chapter 3 for more information.

GPIO Connectors

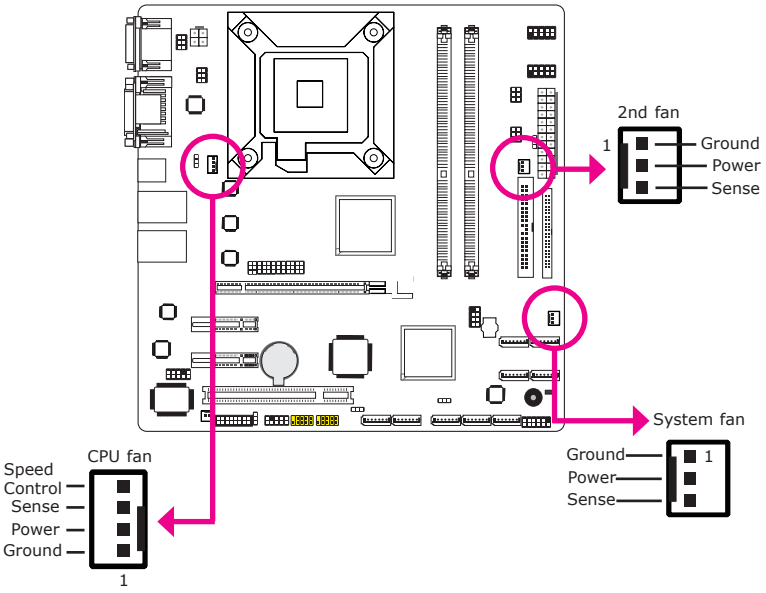


The ICH GPIO connector is the connector for the extended LAN card.

Pin	Pin Assignment	Pin	Pin Assignment
1	PCA_GPIO0	2	PCA_GPIO22
3	PCA_GPIO1	4	PCA_GPIO23
5	PCA_GPIO2	6	PCA_GPIO24
7	PCA_GPIO3	8	PCA_GPIO25
9	PCA_GPIO4	10	PCA_GPIO26
11	PCA_GPIO5	12	PCA_GPIO27
13	PCA_GPIO6	14	PCA_GPIO28
15	PCA_GPIO7	16	PCA_GPIO29
17	PCA_GPIO8	18	PCA_GPIO30
19	PCA_GPIO9	20	PCA_GPIO31
21	PCA_GPIO10	22	PCA_GPIO32
23	PCA_GPIO11	24	PCA_GPIO33
25	PCA_GPIO12	26	PCA_GPIO34
27	PCA_GPIO13	28	PCA_GPIO35
29	PCA_GPIO14	30	N.C.
31	PCA_GPIO15	32	PCA_INT-
33	PCA_GPIO16	34	PCA_OE-
35	PCA_GPIO17	36	+12V

Pin	Pin Assignment	Pin	Pin Assignment
37	PCA_GPIO18	38	V5DU
39	PCA_GPIO19	40	VCC5
41	PCA_GPIO20	42	GND
43	PCA_GPIO21	44	GND

Cooling Fan Connectors

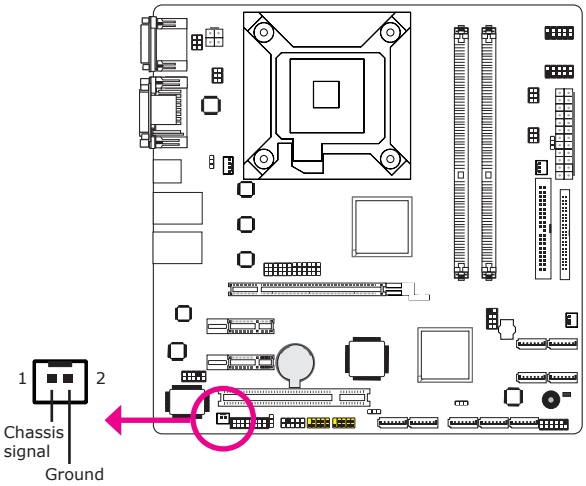


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("Hardware Health Configuration" section) of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.

Chassis Instrusion Connector

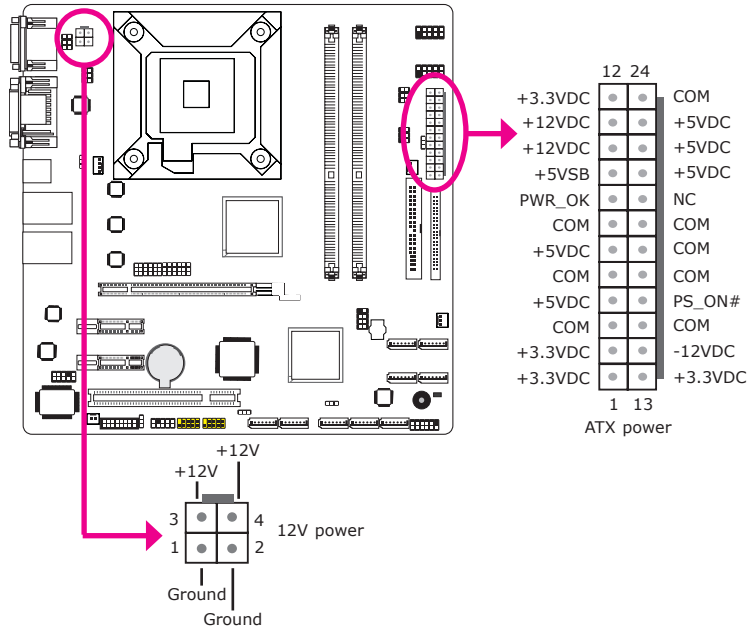


The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector.

Hardware Monitor for Windows

Install the "Hardware Monitor for Windows" utility. By default, the chassis intrusion detection function is enabled. When enabled, a warning message will appear when the chassis is open. The utility can also be configured so that a beeping alarm will sound when the chassis is open. Refer to the "Hardware Monitor for Windows" section in chapter 4 for more information.

Power Connectors



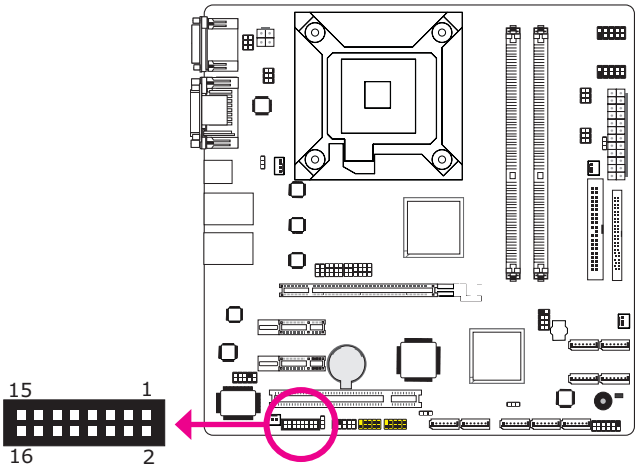
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 2.0. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

The power connectors from the power supply unit are designed to fit the 24-pin and 4-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

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.

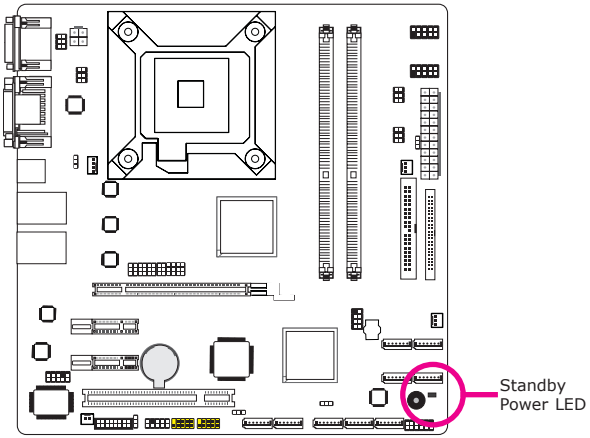
LAN LED Connector



The LAN LED connector is used to connect to the LAN LEDs that are usually located at the front panel of the chassis.

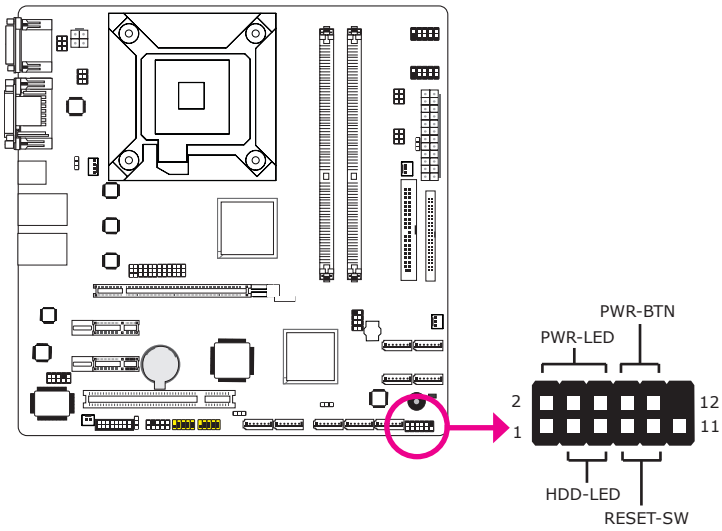
Pin	Pin Assignment	Pin	Pin Assignment
1	LINK_1000_1	2	LINK_ACTIVITY_1
3	LINK_100_1	4	3VDU
5	LINK_1000_2	6	LINK_ACTIVITY_2
7	LINK_100_2	8	3VDU
9	LINK_1000_3	10	LINK_ACTIVITY_3
11	LINK_100_3	12	3VDU
13	LINK_1000_4	14	LINK_ACTIVITY_4
15	LINK_100_4	16	GND

Standby Power LED



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

Front Panel Connectors



HDD-LED - HDD LED

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

RESET SW - Reset Switch

This switch allows you to reboot without having to power off the system.

PWR-BTN - Power Switch

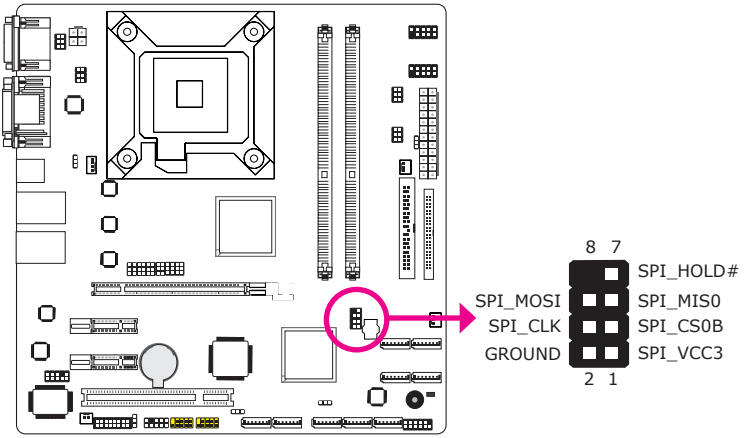
This switch is used to power on or off the system.

PWR-LED - Power/Standby LED

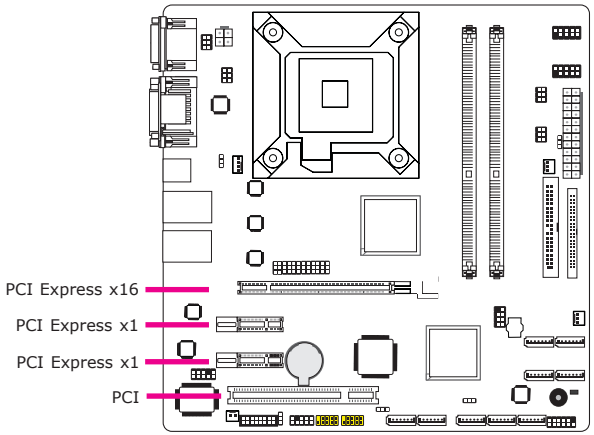
When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

	Pin	Pin Assignment		Pin	Pin Assignment
N. C.	1	N. C.	PWR-LED	2 4 6	LED Power LED Power Signal
HDD-LED	3 5	HDD Power Signal	PWR-BTN	8 10	Ground Signal
RESET SW	7 9	Ground RST Signal			
N. C.	11	N. C.	Key	12	Key

Download Flash BIOS Connector



Expansion Slots



PCI Express x16 Slot

Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip of the slot will automatically hold the graphics card in place.

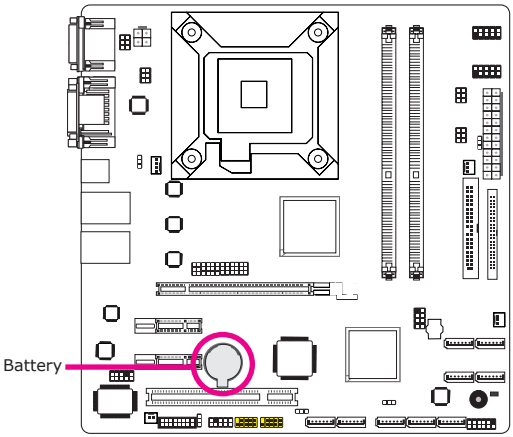
PCI Express x1 Slot

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x1 slot.

PCI Slots

The PCI slots support expansion cards that comply with PCI specifications.

Battery



The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

Safety Measures

- 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.

Chapter 3 - BIOS Setup

Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.

It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.

Note:
The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen.

The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to run setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

Legends

Keys	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between submenus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F10>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

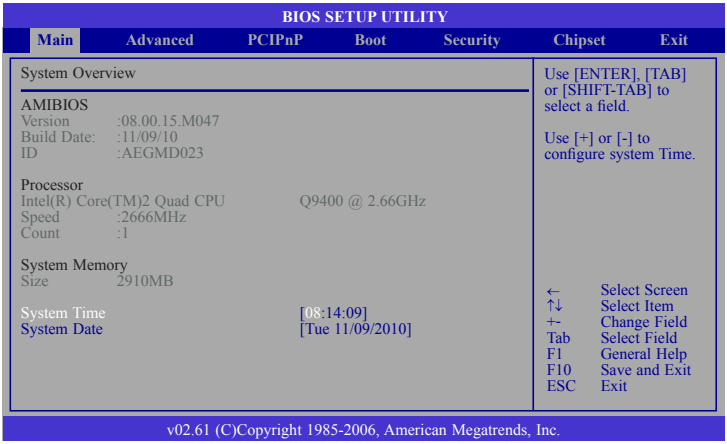
Submenu

When "▸" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

AMI BIOS Setup Utility

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



AMI BIOS

Displays the detected BIOS information.

Processor

Displays the detected processor information.

System Memory

Displays the detected system memory information.

System 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.

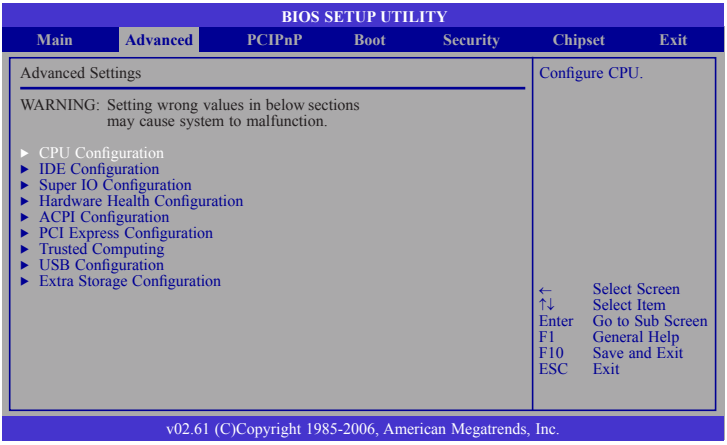
System Date

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 1980 to 2099.

Advanced

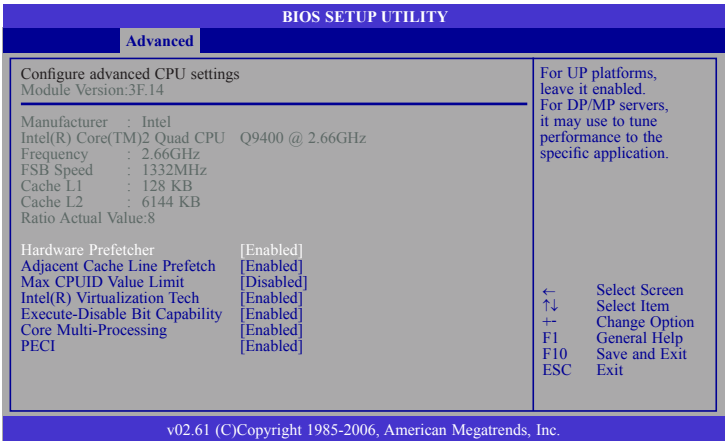
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Important:
Setting incorrect field values may cause the system to malfunction.



CPU Configuration

This section is used to configure the CPU. It will also display detected CPU information.



Hardware Prefetcher

Enables or disables the Hardware Prefetcher feature.

Adjacent Cache Line Prefetch

Enables or disables the Adjacent Cache Line Prefetch feature.

Max CPUID Value Limit

Set this field to Disabled when using Windows XP. Set this field to Enabled when using legacy operating systems so that the system will boot even when it doesn't support CPUs with extended CPUID function.

Intel(R) Virtualization Tech

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

Execute Disable Bit Capability

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

Core Multi-Processing

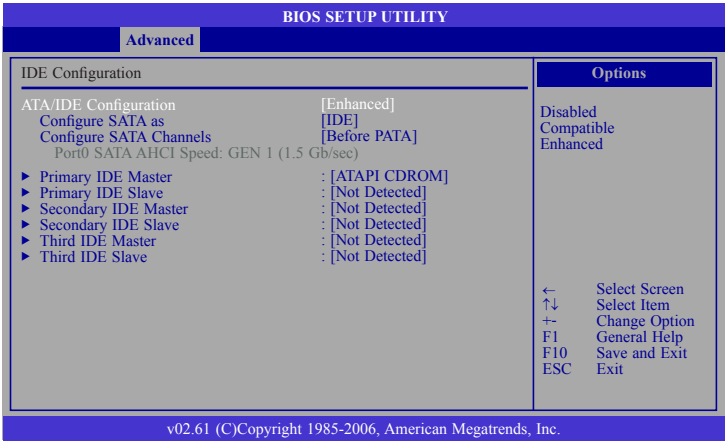
Enable this feature if your processor supports multi-core.

PECI

Enables or disables the PECI interface.

IDE Configuration

This section is used to configure the IDE drives.



SATA Configuration

These fields are used to configure the IDE device mode.

The options are Disabled, Compatible and Enhanced.

Compatible
Legacy IDE channels will appear allowing you to configure the devices.

Enhanced
"Configure SATA as" will appear allowing you to configure the devices.

Configure SATA as

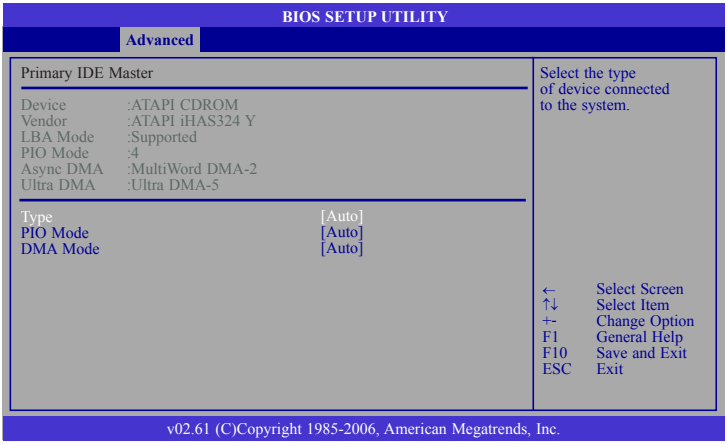
IDE
This option configures the Serial ATA drives as Parallel ATA storage devices.

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).

Primary IDE Master to Sixth IDE Slave

When you enter the BIOS Setup Utility, the BIOS will auto detect the existing IDE devices then displays the status of the detected devices. To configure an IDE drive, move the cursor to a field then press <Enter>.



Type

Selects the type of IDE drive connected to the system.

PIO Mode

Selects the data transfer mode. PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 to 4, which primarily differ in timing. When Auto (default) is selected, the BIOS will select the best available mode after checking your drive.

Auto
The BIOS will automatically set the system according to your hard disk drive's timing.

Mode 0-4
You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

DMA Mode

This field allows you to select the Ultra DMA in use. When Auto is selected, the BIOS will use the best available option after checking your hard drive or CD-ROM.

Auto

Automatically detects the DMA mode.

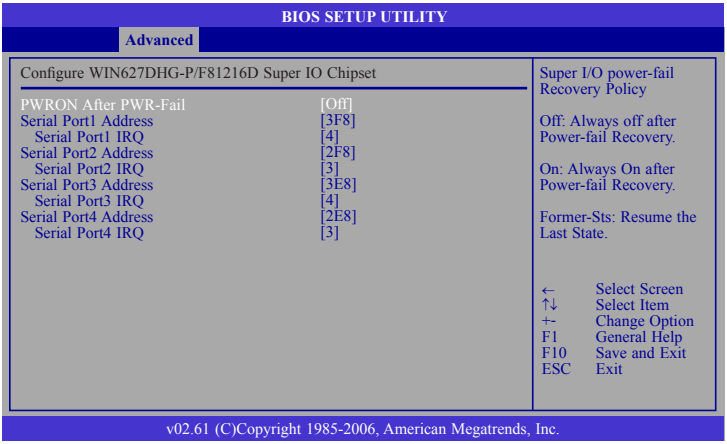
SWDMAn
SingleWord DMAn.

MWDMAn
MultiWord DMAn.

UDMAn
Ultra DMAn.

Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.



PWRON After PWR-Fail

Off	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.
On	When power returns after an AC power failure, the system will automatically power-on.
Former-Sts	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.

Serial Port1 Address to Serial Port4 Address

3F8, 2F8, 3E8, 2E8
Allows you to manually select an I/O address for the onboard serial port 1 to serial port 4.

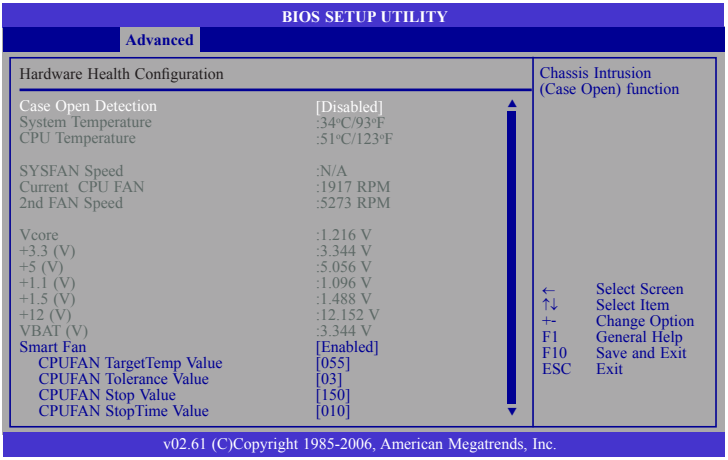
Disabled
Disables the onboard serial port 1 to serial port 4.

Serial Port1 IRQ to Serial Port4 IRQ

These fields are used to select an IRQ for the onboard serial port 1, 2, 3 or 4.

Hardware Health Configuration

This section is used to configure the hardware monitor function.



Smart Fan

The CPU speed will rotate according to the CPU's temperature. The higher the temperature, the faster the speed of rotation. The options are enabled and disabled.

CPUFAN TargetTemp Value

By default, the CPU fan is set to run at full speed. If you want to reduce the fan's noise, you can slow down the fan's speed by selecting an option in this field. Do not slow down the speed by lower than 40% to prevent CPU overheat.

CPUFAN Tolerance Value

This field is used to select the tolerance value of the CPU's temperature. The options are 1, 2, 3, 4 and 5. If you selected 3, it allows the temperature to run 3 degrees higher or lower. The CPU fan will smartly adjust it's speed in accordance to the temperature.

CPUFAN Stop Value

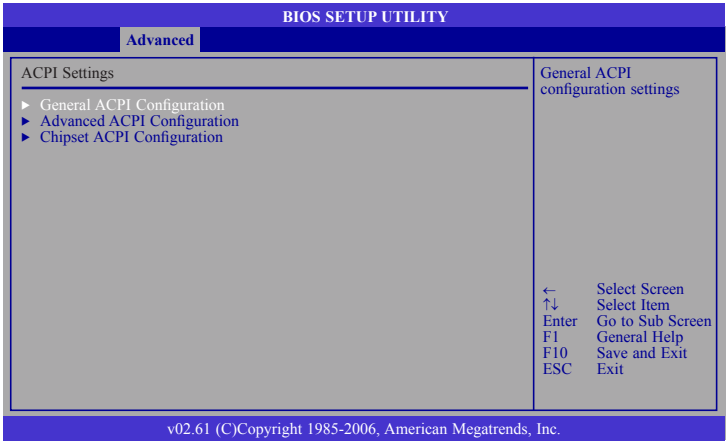
Used to enter the stop value of the CPU fan.

CPUFAN StopTime Value

Used to enter the stop-time value of the CPU fan.

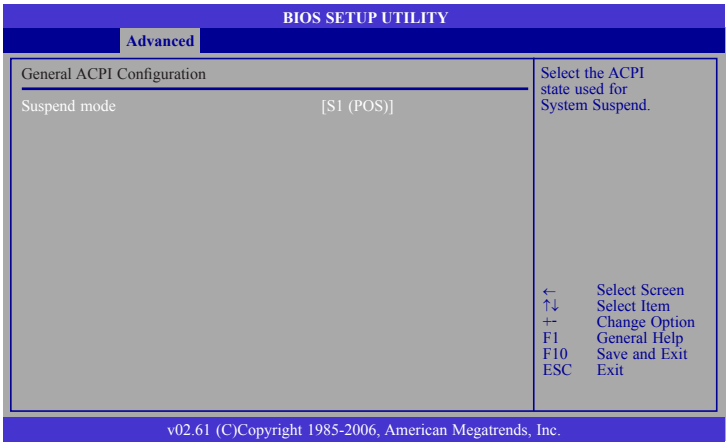
ACPI Configuration

This section is used to configure ACPI.



General ACPI Configuration

Configures the general ACPI settings.



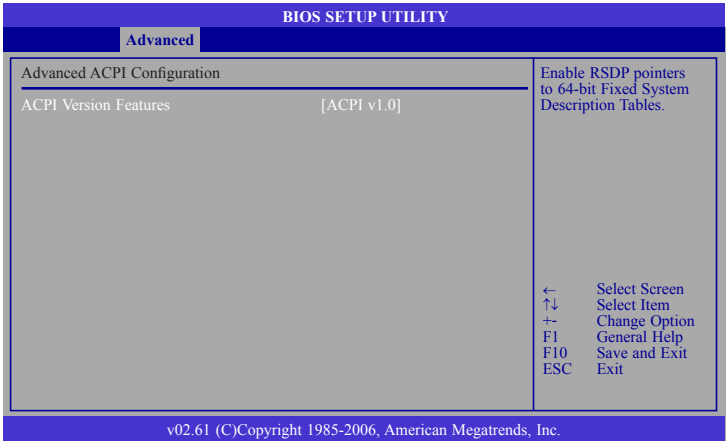
Suspend Mode

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

S1(POS)
Enables the Power On Suspend function.

Advanced ACPI Configuration

Configures additional ACPI functions.

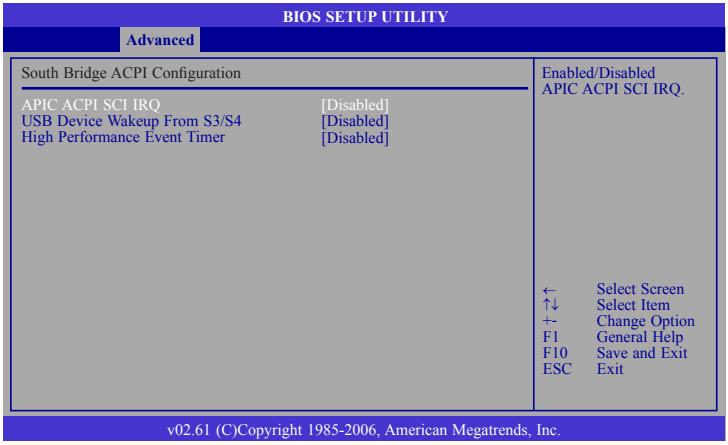


ACPI Version Features

Selects the ACPI version. The options are ACPI v1.0 and ACPI v2.0.

Chipset ACPI Configuration

Configures relevant chipset ACPI functions.



APIC ACPI SCI IRQ

Enables or disables the APIC ACPI SCI IRQ.

USB Device WakeUp From S3

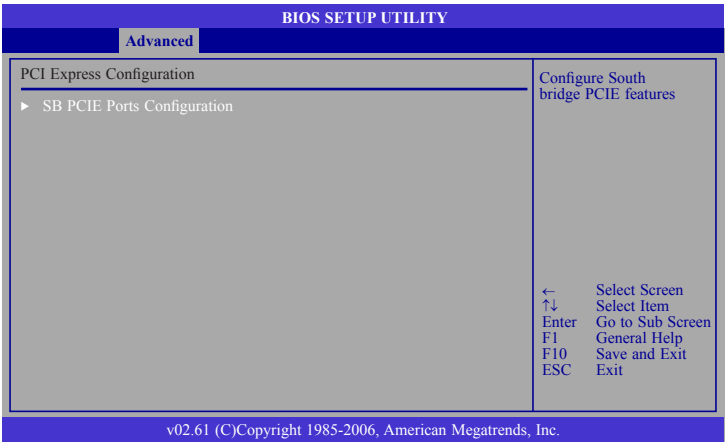
This field, when enabled, allows you to use a USB keyboard or USB mouse to wake up a system that is in the S3 (STR - Suspend To RAM) or S4 state.

High Performance Event Timer

Enables or disables the event timer.

PCI Express Configuration

This section is used to configure PCI Express.

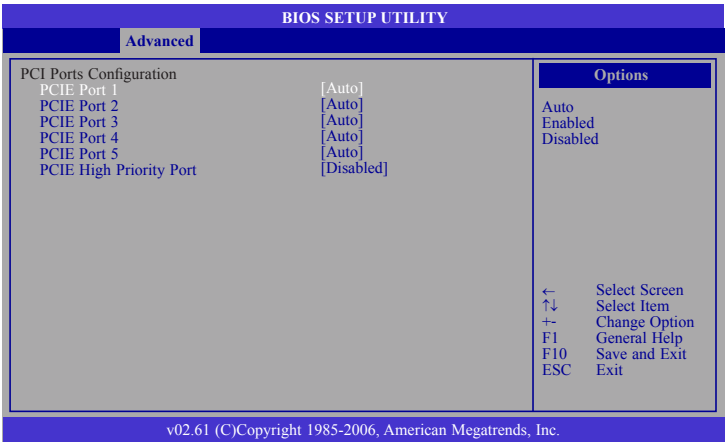


SB PCIE Ports Configuration

Configures the PCI Express ports.

PCI Ports Configuration

This section is used to configure PCI Ports.



PCIE Port 1 to Port 5

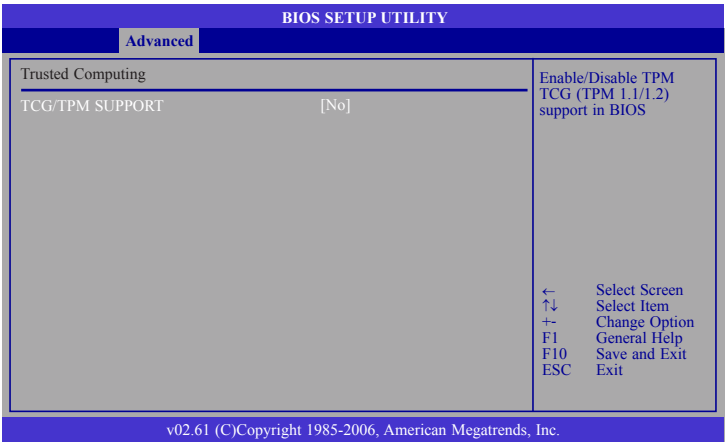
Enables or disables the PCIE port.

PCIE High Priority Port

Selects the highest priority PCIE port.

Trusted Computing

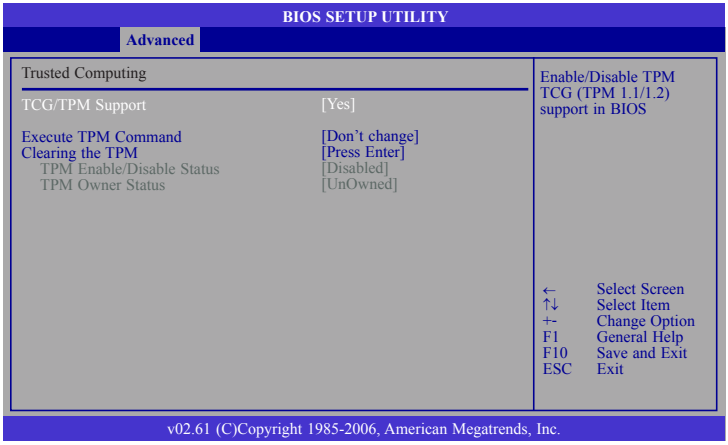
This section configures settings relevant to Trusted Computing innovations.



TCG/TPM Support

Enables or disables TPM TCG. The options are Yes and No.

If you selected Yes, additional fields will appear.



Execute TPM Command

Enables (activates) or disables (deactivates) command to TPM.

Clearing the TPM

This field allows you to clear the user information saved in the TPM security chip. When you press <Enter>, a warning message will appear to ask if you want to clear the user information in the security chip. Use the left / right arrow key to select between [OK] and [Cancel], then press <Enter> to confirm your choice.

TPM Enable/Disable Status

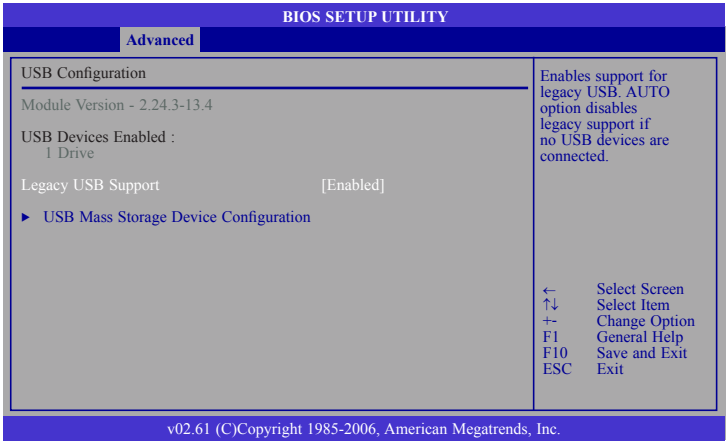
Enables or disables the TPM status.

TPM Owner Status

Enables or disables the TPM owner's status.

USB Configuration

This section is used to configure USB devices.



Legacy USB Support

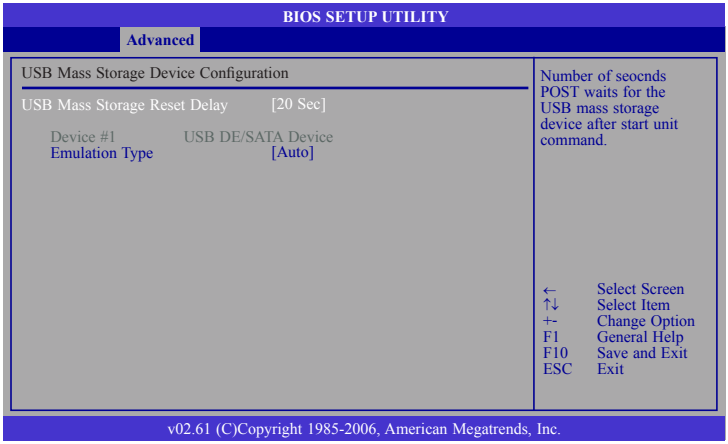
Enabled
Enables Legacy USB.

Auto
Disables support for Legacy when no USB devices are connected.

Disabled
Keeps USB devices available only for EFI applications.

USB Mass Storage Device Configuration

This section is used to configure USB mass storage devices.



USB Mass Storage Reset Delay

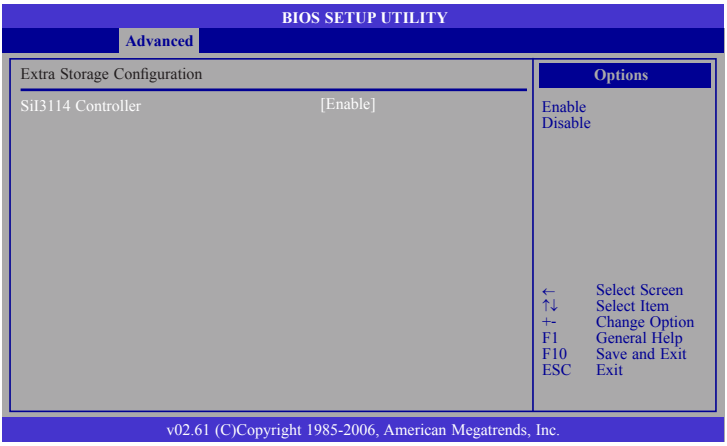
Selects the number of seconds POST waits for the USB mass storage device after the start unit command.

Emulation Type

Auto	The USB device will boot according to the device type.
Forced FDD	Uses an HDD formatted drive to boot as FDD (ex. ZIP drive)

Extra Storage Configuration

This section is used to configure Extra Storage device.



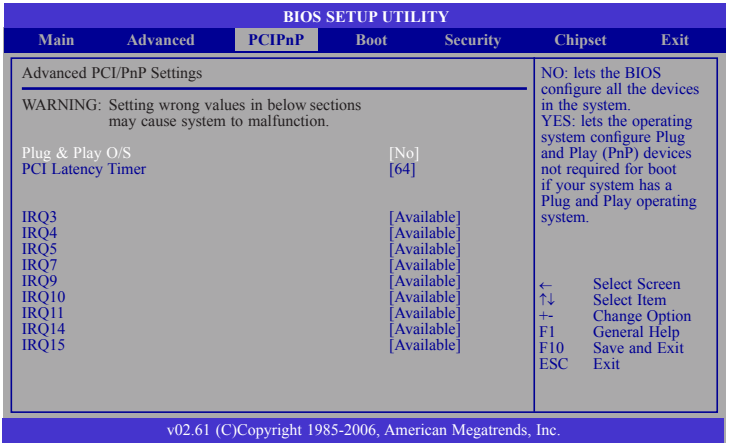
SiI3114 Controller

Enables or disables the Silicon Image SiI3114 controller.

PCIPnP

The PCIPnP menu is used to configure PCI Plug and Play devices.

Important:
Setting incorrect field values may cause the system to malfunction.



Plug & Play O/S

Yes
The operating system configures Plug and Play (PnP) devices that are not required to boot in a Plug and Play supported operating system.

No
The BIOS configures all the devices in the system.

PCI Latency Timer

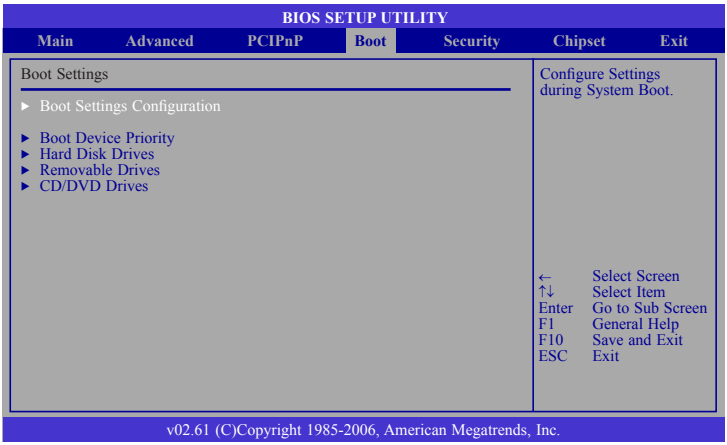
This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

IRQ3 to IRQ15

Available
The specified IRQ is available for PCI/PnP devices.

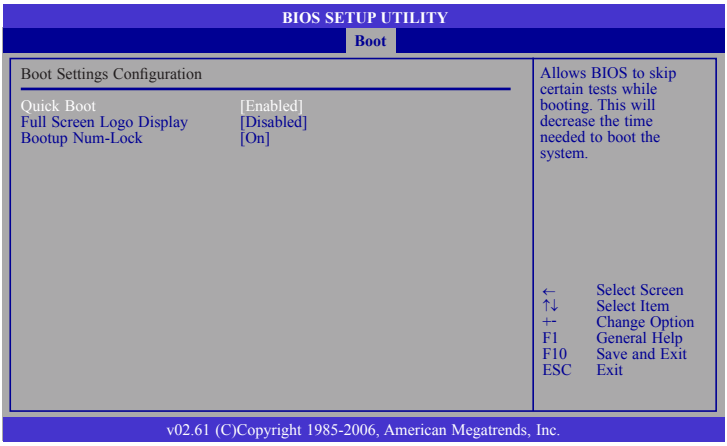
Reserved
The specified IRQ is reserved for Legacy ISA devices.

Boot



Boot Settings Configuration

This section is used to configure settings during system boot.



Quick Boot

When Enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Full Screen Logo Display

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

Enabled
Displays OEM logo instead of the POST messages.

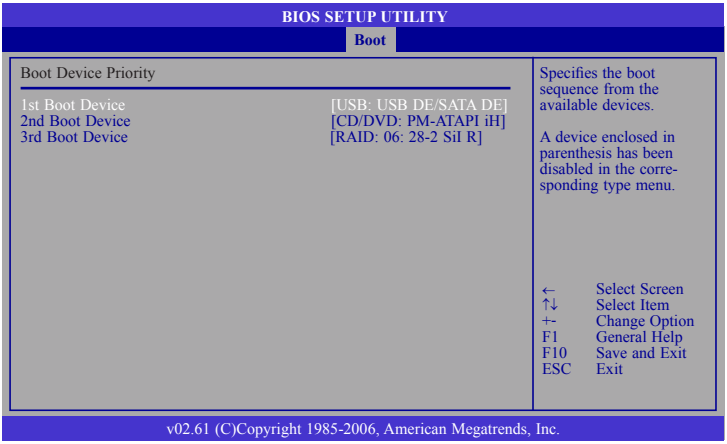
Disabled
Displays normal POST messages.

Bootup Num-Lock

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.

Boot Device Priority

This section is used to select the boot priority sequence of the devices.

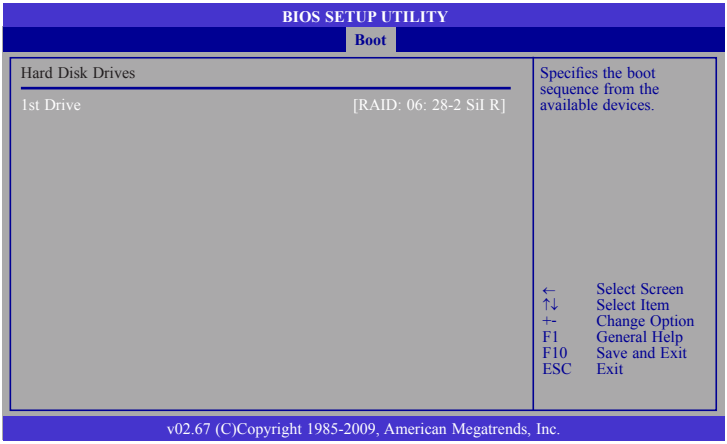


1st Boot Device to 3rd Boot Device

Select the drive to boot first, second and third in the "1st Boot Device", "2nd Boot Device", and "3rd Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected.

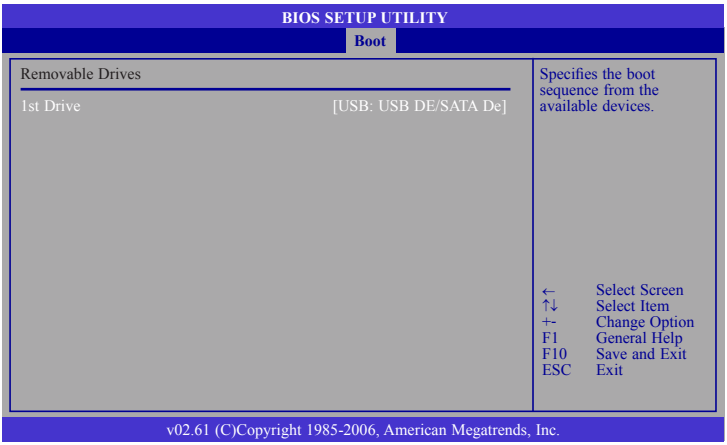
Hard Disk Drives

This section is used to select the boot priority sequence of the hard drives.



Removable Drives

This section is used to select the boot priority sequence of the removable devices.

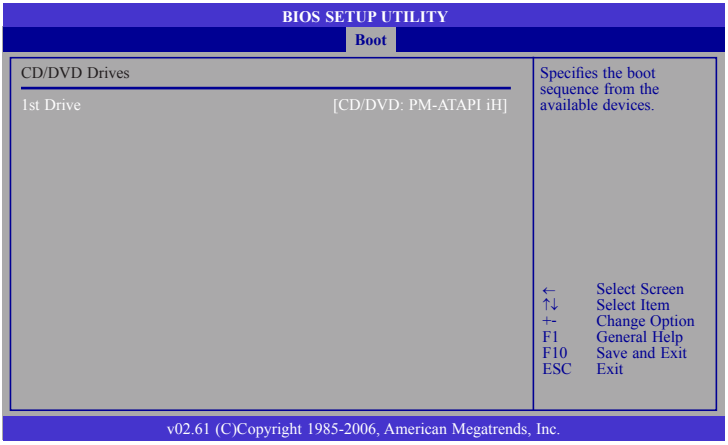


1st Drive

Selects the boot sequence of the removable devices.

CD/DVD Drives

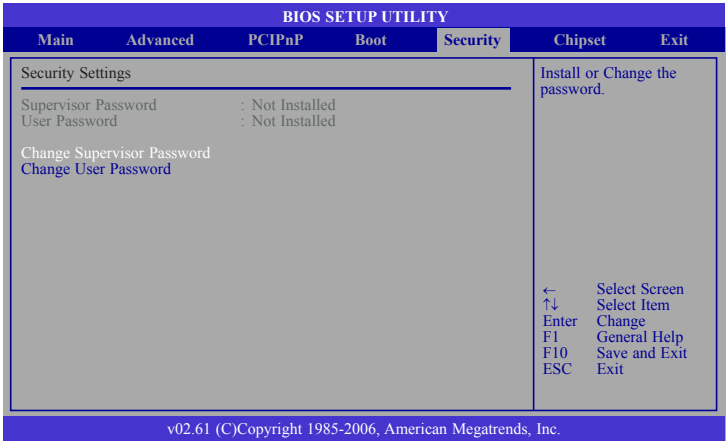
This section is used to select the boot priority sequence of the optical devices.



1st Drive

Selects the boot sequence of the optical devices.

Security

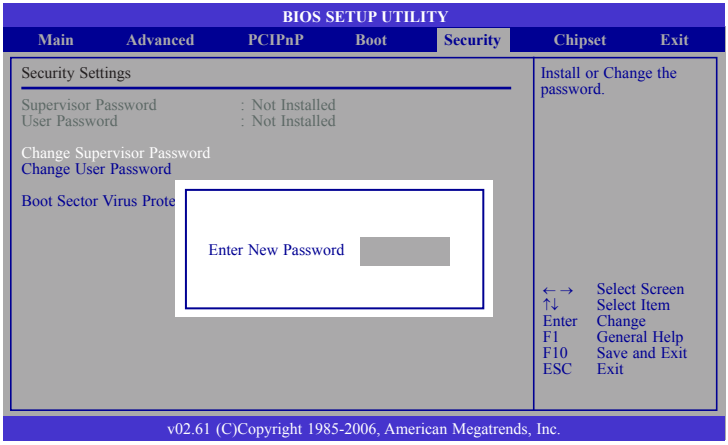


Change Supervisor Password

This field is used to set or change the supervisor password. To set a new password:

1. Select the Change Supervisor Password field then press <Enter>.

2. Type your password in the dialog box then press <Enter>. You are limited to six letters/numbers.



3. Press <Enter> to confirm the new password.

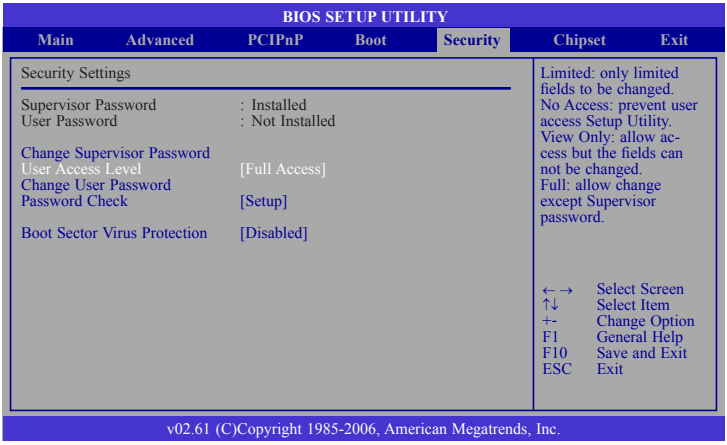
4. When the Password Installed dialog box appears, select OK.

To change the password, repeat the same steps above.

To clear the password, select Change Supervisor Password then press <Enter>. The Password Uninstalled dialog box will appear.

If you forgot the password, you can clear the password by erasing the CMOS RTC (Real Time Clock) RAM using the Clear CMOS jumper. Refer to the Jumper Settings section in chapter 2 for more information.

After you have set the supervisor password, the User Access Level field will appear.



User Access Level

Selects the access level to the fields in the Setup utility.

Limited
Allows you to change settings to some fields such as Date and Time.

No Access
Prevents access to the Setup utility.

View Only
Allows you to view the settings but does not allow you to change the settings.

Full Access
Allows you to change settings to all the fields in the utility.

Change User Password

This field is used to set or change the user password.

To set a new password:

1. Select the Change User Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to six letters/numbers.
3. Press <Enter> to confirm the new password.
4. When the Password Installed dialog box appears, select OK.

To change the password, repeat the same steps above.

After you have set the user password, the Clear User Password and Password Check fields will appear.

Clear User Password

To clear the password, select Clear User Password then press <Enter>. The Password Uninstalled dialog box will appear.

Password Check

Setup
The BIOS checks for the user password whenever accessing the Setup utility.

Always
The BIOS checks for the user password when accessing the Setup utility and booting the system.

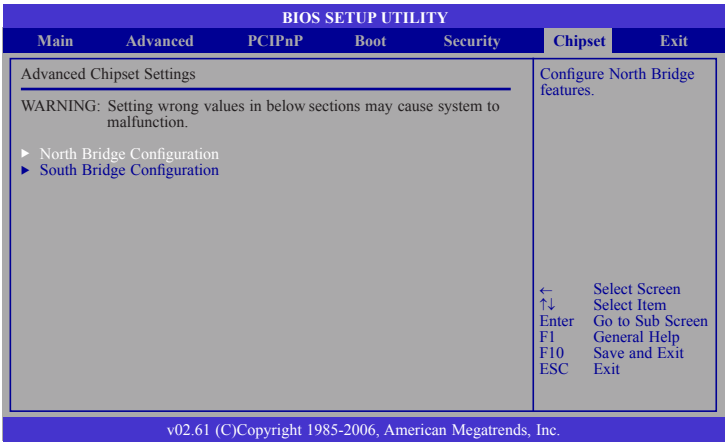
Boot Sector Virus Protection

Enables or disables the boot sector virus protection function.

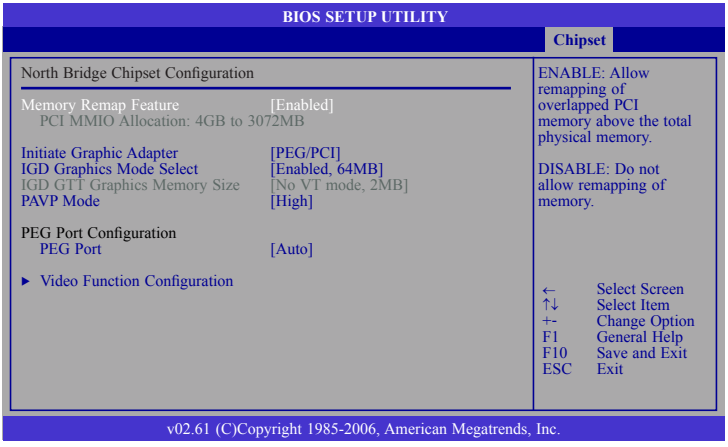
Chipset

This section is used to configure the system based on the specific features of the chipset.

Important:
Setting incorrect field values may cause the system to malfunction.



North Bridge Configuration



Memory Remap Feature

Enabled
Allows remapping of overlapped PCI memory above the total physical memory.

Disabled
Does not allow remapping of memory.

Initiate Graphic Adapter

Selects the graphics controller to use as the primary boot device.

IGD Graphics Mode Select

Selects the amount of system memory used by the internal graphics device.

PAVP Mode

Enables the PAVP mode used by the internal graphics device.

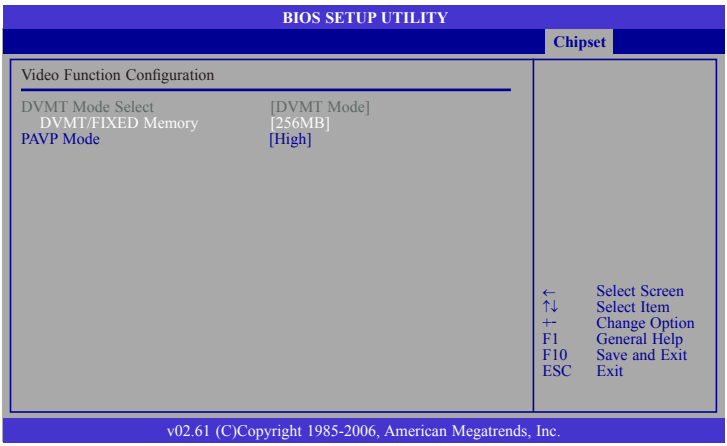
Set this field to Enabled if you intend to play a Blu-ray DVD to a DVI, HDMI or Display Port output.

Enables or disables the GMCH's Protected Audio Video Path.

PEG Port

The options are Auto and Disabled.

Video Function Configuration



DVMT Mode Select

DVMT Mode (Dynamic Video Memory Technology)
Memory that is dynamically allocated based on memory requests made by an application and are released back to the system once the requesting application has been terminated.

DVMT/FIXED Memory

Selects the graphics memory size used by the DVMT/Fixed mode.

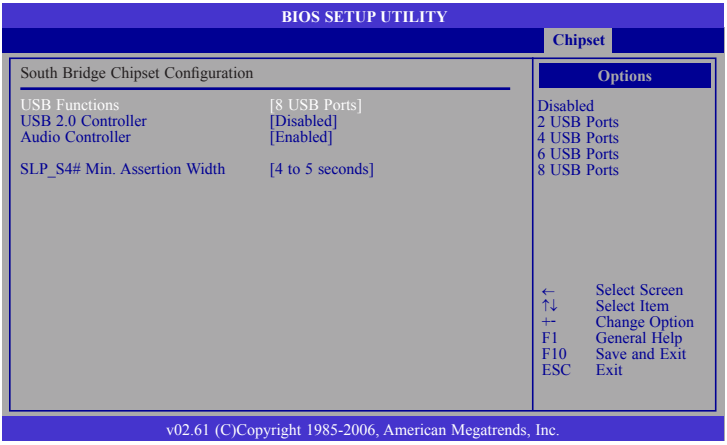
PAVP Mode

Enables the PAVP mode used by the internal graphics device.

Set this field to Enabled if you intend to play a Blu-ray DVD to a DVI, HDMI or Display Port output.

Enables or disables the GMCH's Protected Audio Video Path.

South Bridge Configuration



USB Functions

Selects the number of USB ports you want enabled.

USB 2.0 Controller

This field is used to enable or disable USB 2.0

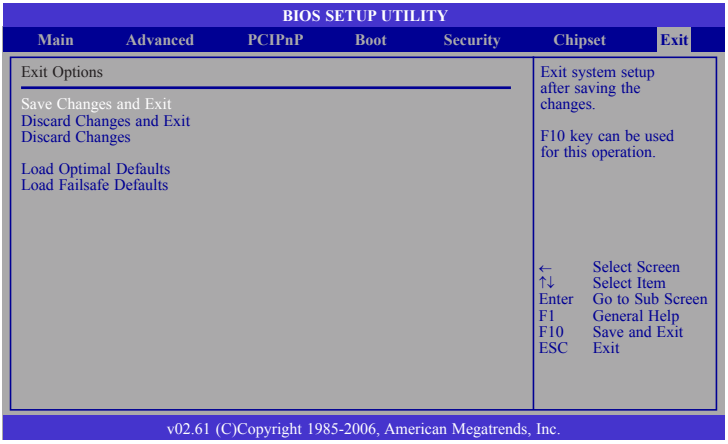
Audio Controller

Enables or disables the audio controller.

SLP_S4# Min. Assertion Width

The options are 1 to 2 seconds, 2 to 3 seconds, 3 to 4 seconds and 4 to 5 seconds.

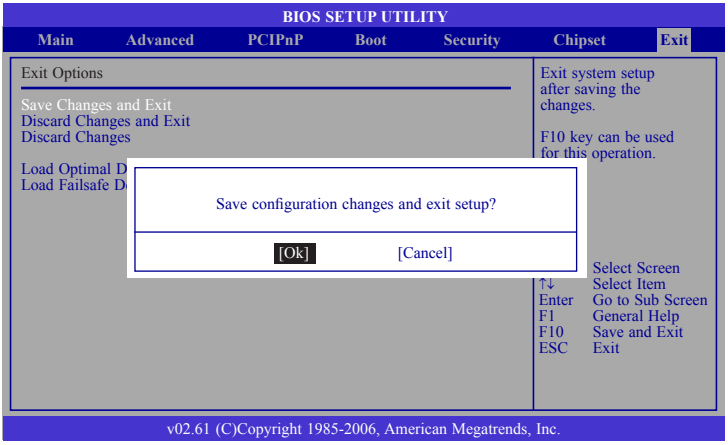
Exit



Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

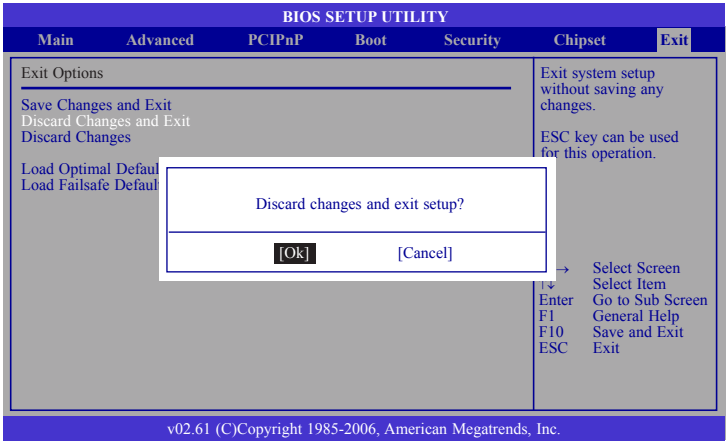
You can also press <F10> to save and exit Setup.



Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

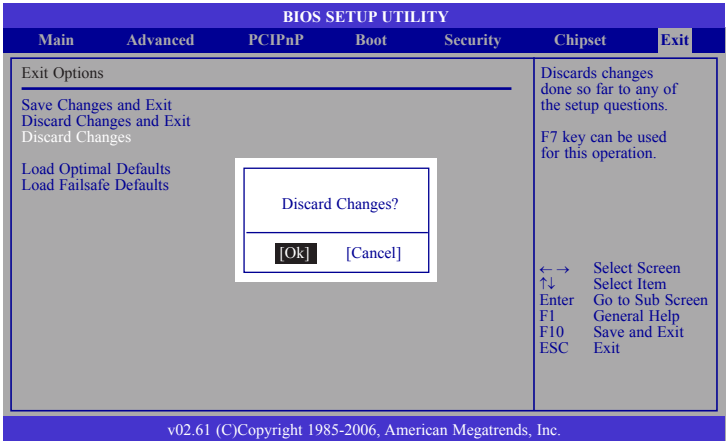
You can also press <ESC> to exit without saving the changes.



Discard Changes

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK to discard all changes made and restore the previously saved settings.

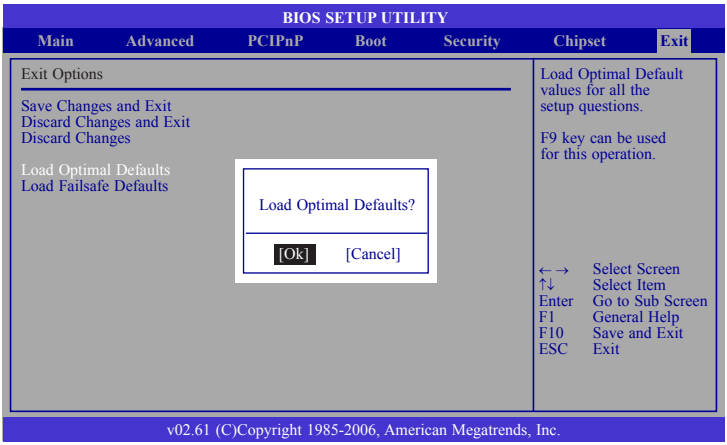
You can also press <F7> to discard the changes.



Load Optimal Defaults

To load optimal default values from the BIOS ROM, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

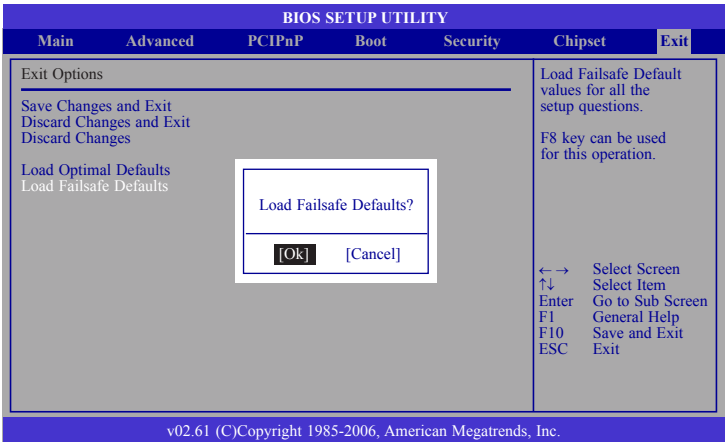
You can also press <F9> to load optimal default values.



Load Failsafe Defaults

To load the fail-safe default values from the BIOS ROM, select this field then press <Enter>. A dialog box will appear. Confirm by selecting OK.

You can also press <F8> to load the fail-safe default values.



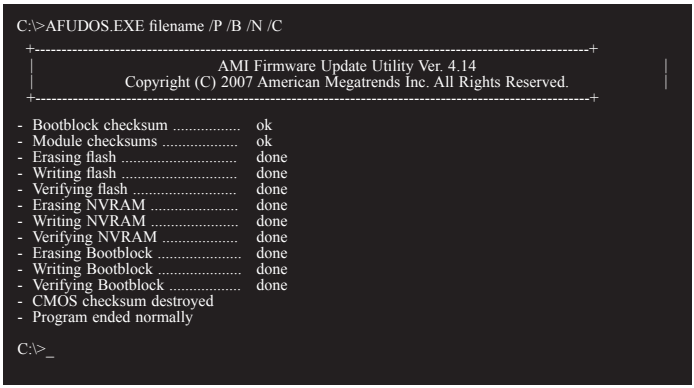
Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AFUDOS. EXE. Please contact technical support or your sales representative for the files.

To execute the utility, type:

A:> AFUDOS BIOS_File_Name /b /n /c /p

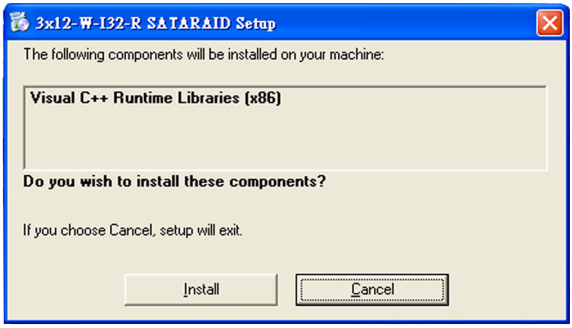
then press <Enter>.



Chapter 4 - Supported Software

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 (Mainboard Utility CD) will appear. 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".



Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, click "Intel Chipset Software Installation Utility" on the main menu.

1. Setup is ready to install the utility. Click Next.

2. Read the license agreement then click Yes.

3. Go through the readme document for more installation tips then click Next.

4. After all setup operations are done, click Next.

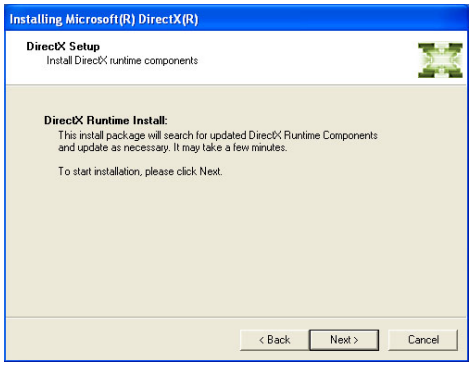
5. Click Finish to exit setup.

Microsoft DirectX 9.0C Driver

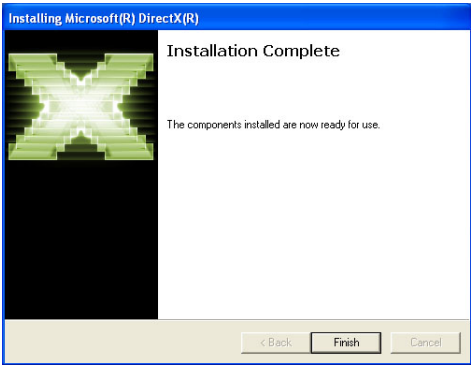
To install, click "Microsoft DirectX 9.0C Driver" on the main menu.

1. Click "I accept the agreement" then click Next.

2. You are now ready to install DirectX. Click Next.



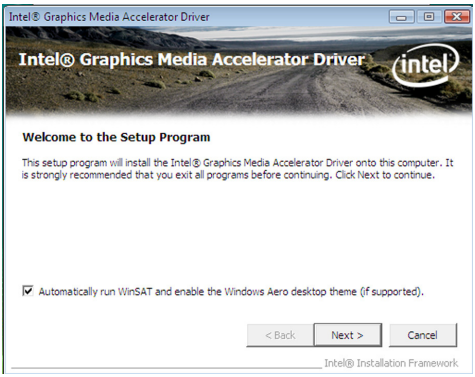
3. Click Finish. Reboot the system for DirectX to take effect.



Intel Graphics Drivers (for Windows 7 / Windows Vista)

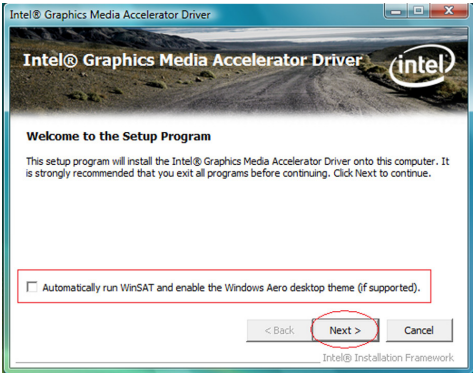
To install the driver, click "Intel Graphics Drivers" on the main menu.

1. Setup is now ready to install the graphics driver. Click Next.

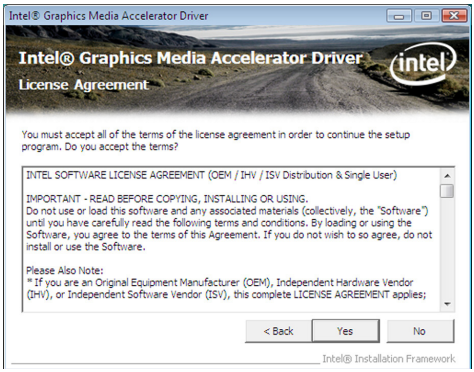


By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows Vista desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

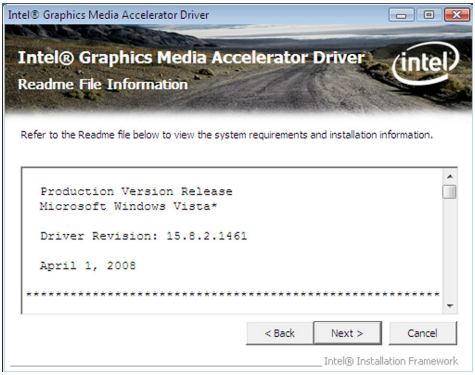
We recommend that you skip this process by disabling this function then click Next.



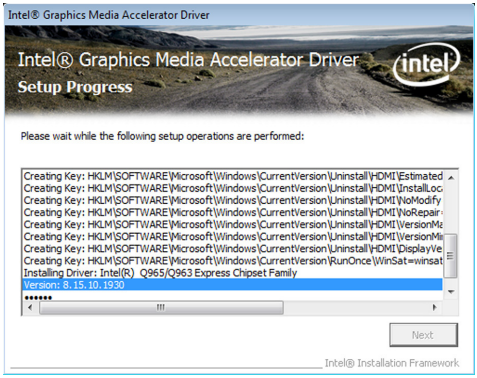
2. Read the license agreement then click Yes.



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

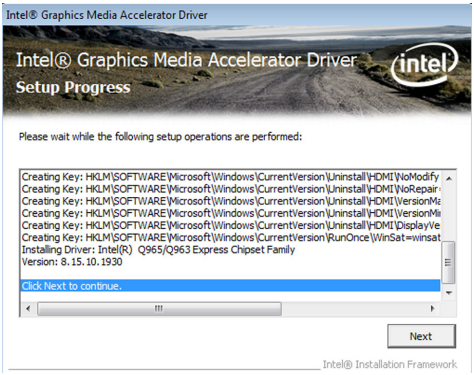


4. Setup is now installing the driver. Click Next to continue.



5. Click "Yes, I want to restart this computer now" then click Finish.

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

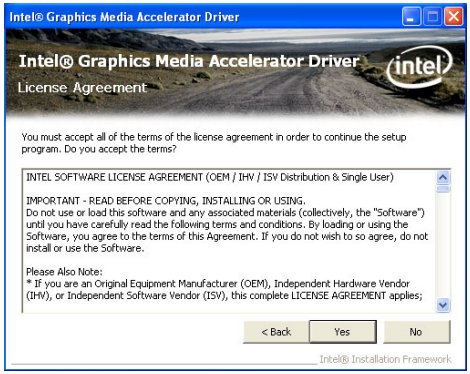


Intel Graphics Drivers (for Windows XP)

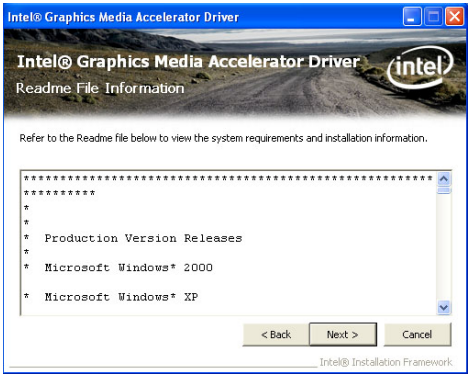
To install the driver, click "Intel Graphics Drivers" on the main menu.

1. Setup is ready to install the graphics driver. Click Next.

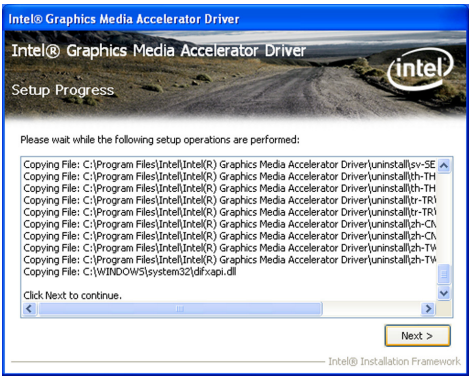
2. Read the license agreement then click Yes.



3. Go through the readme document for more installation tips then click Next.



4. Setup is currently installing the driver. After installation has completed, click Next.



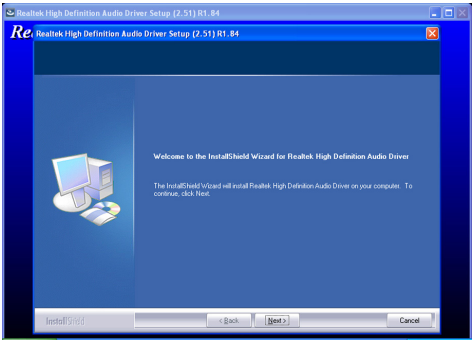
5. Click "Yes, I want to restart this computer now." then click Finish.

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

Audio Drivers

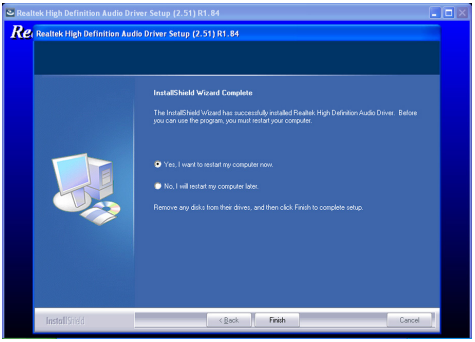
To install the driver, click "Audio Drivers" on the main menu.

1. Setup is ready to install the driver. Click Next.



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

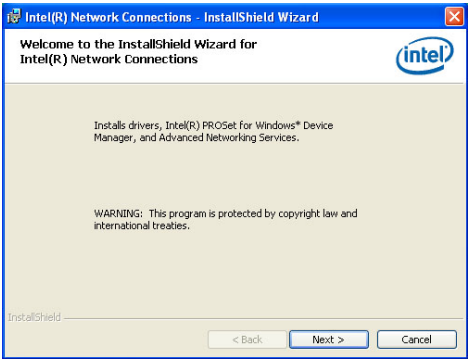
   Restarting the system will allow the new software installation to take effect.



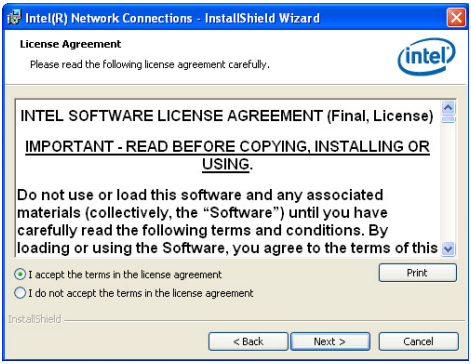
LAN Drivers

To install the driver, click "LAN Drivers" on the main menu.

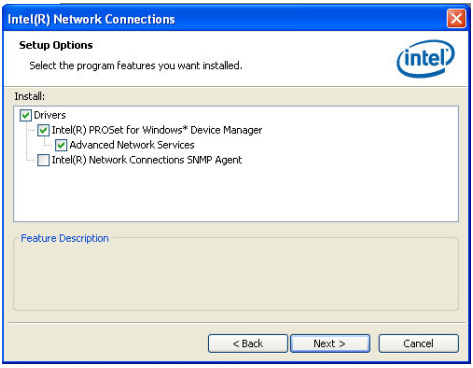
1. Setup is ready to install the driver. Click Next.



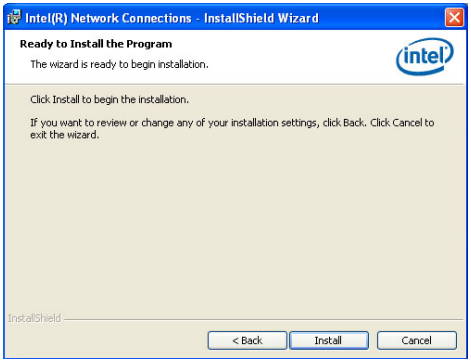
2. Click "I accept the terms in the license agreement" then click "Next".



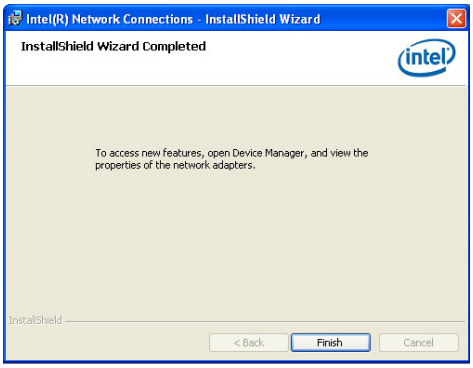
3. Select the program featuers you want installed then click Next.



4. Click Install to begin the installation.



5. After completing installation, click Finish.

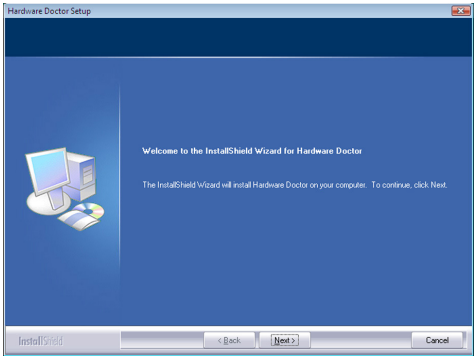


Hardware Monitor for Windows (for Windows 7 / Windows Vista)

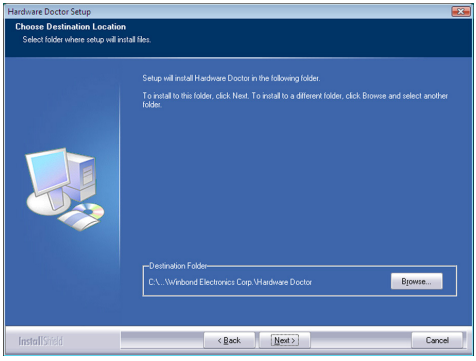
The Hardware Monitor for Windows utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The 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.

To install the utility, click "Hardware Monitor for Windows" on the main menu.

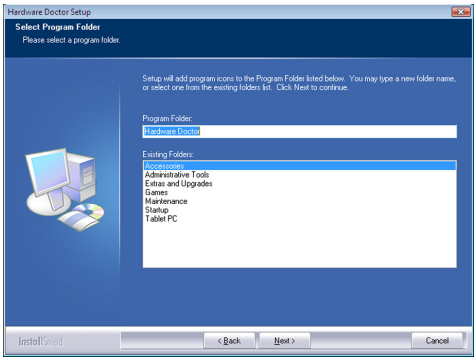
1. Setup is now ready to install the utility. Click Next.



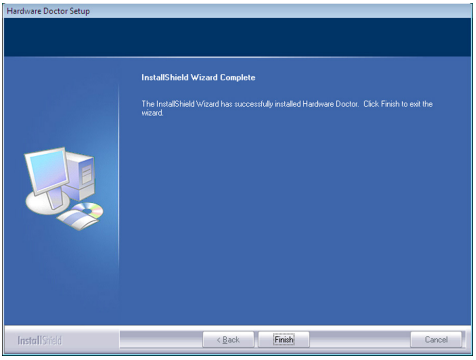
2. Click Next to install or click Browse to select another folder.



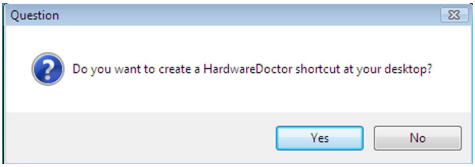
3. Click Next to add the program icon to the Program Folder.



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

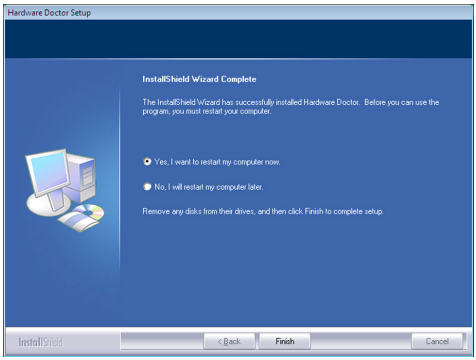


5. Click Yes if you want to create a Hardware Doctor shortcut at your desktop.



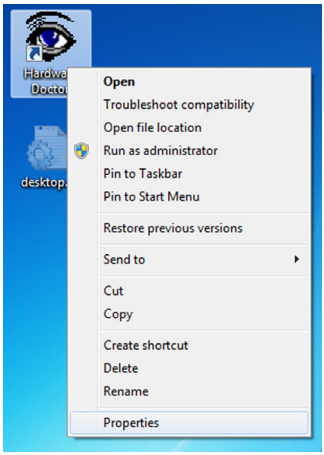
6. Click "Yes, I want to restart my computer now" then click Finish.

   Restarting the system will allow the utility to take effect.

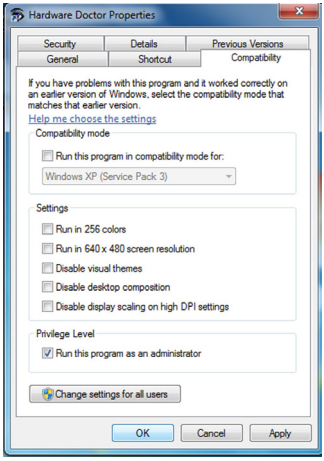


Using the Hardware Monitor for Windows Utility

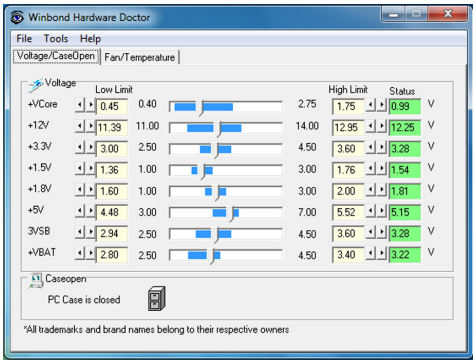
1. On your desktop, right-click the Hardware Doctor icon and then select Properties.



2. Select the Compatibility tab, click "Run this program as an administrator" then click OK.



4. You can now access the utility.



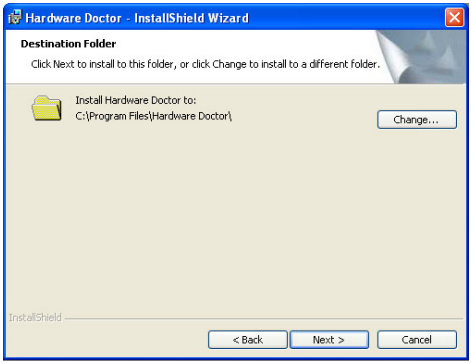
Hardware Monitor for Windows (for Windows XP)

The Hardware Monitor for Windows 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.

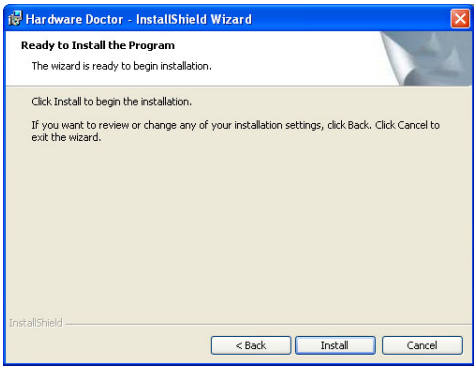
To install, click "Hardware Monitor for Windows" on the main menu.

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

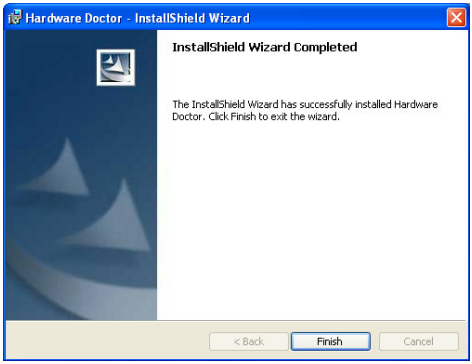
2. Click Next to install or click Change to select another folder.



3. Click Install to begin the installation.



4. After completing installation, click Finish.



F6 Floppy Configuration Utility

This is used to create a floppy driver diskette needed when you install Windows® XP using the F6 installation method. This will allow you to install the operating system onto a hard drive when in AHCI mode.

1. Insert a blank floppy diskette.

2. Locate for the drivers in the CD then copy them to the floppy diskette. The CD includes drivers for both 32-bit and 64-bit operating systems. The path to the drivers are shown below.

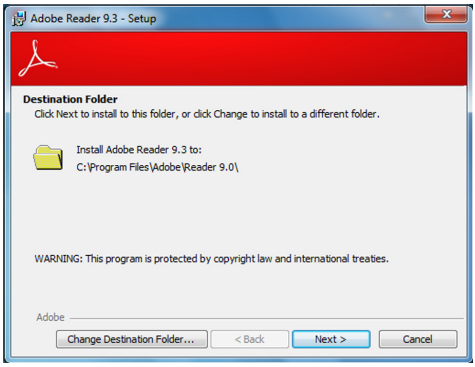
   32-bit
   CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy32

   64-bit
   CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy64

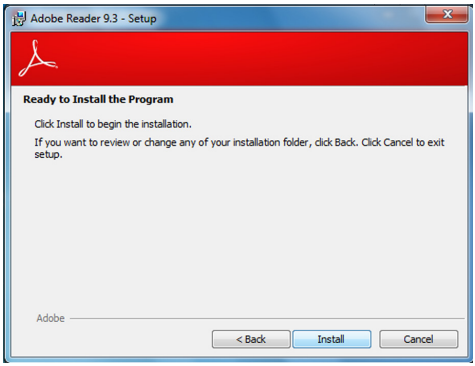
Adobe Acrobat Reader 9.3

To install the reader, click "Adobe Acrobat Reader 9.3" on the main menu.

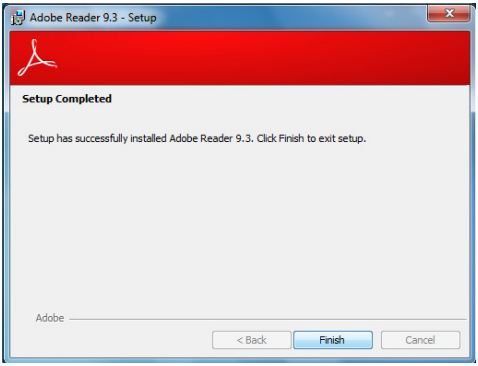
1. Click Next to install or click Change Destination Folder to select another folder.



2. Click Install to begin installation.



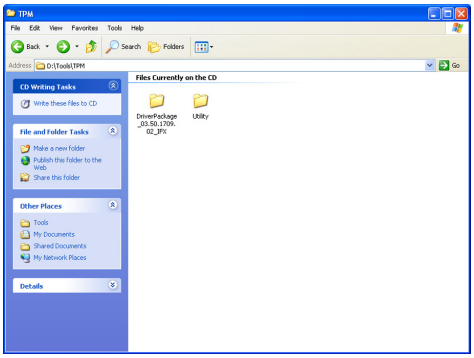
3. Click Finish to exit installation.



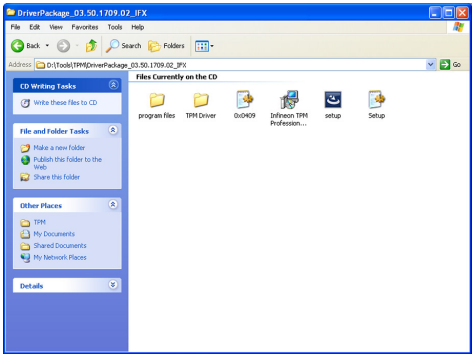
Infineon TPM Driver and Tool (optional)

To install the driver, click "Tools" on the main menu.

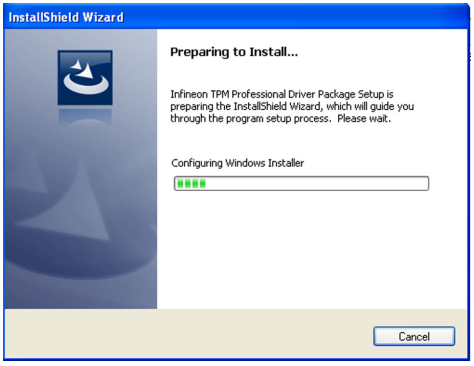
1. Double-click Driver Package.



2. Double-click Setup.

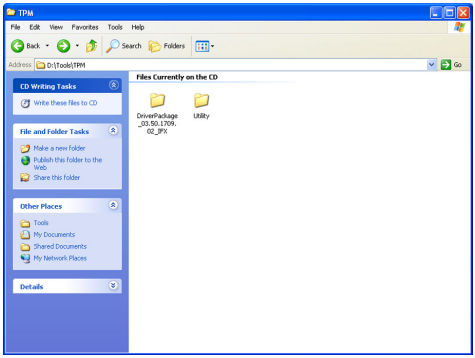


3. The setup program is preparing to install the driver.

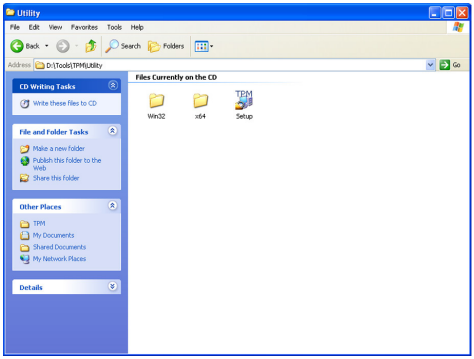


4. The driver has been successfully installed. Click Finish.

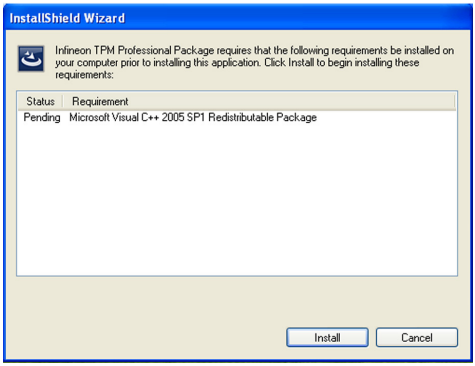
5. To install the TPM utility, double-click Utility.



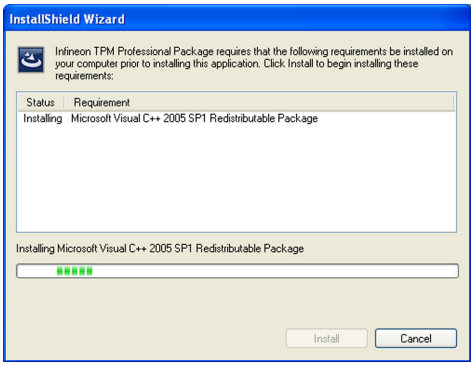
6. Double-click Setup.



7. TPM requires installing the Microsoft Visual C++ package prior to installing the utility. Click Install.

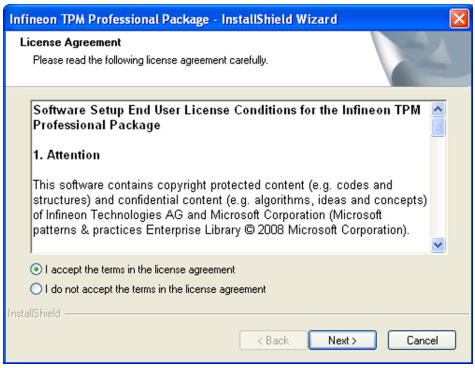


8. The setup program is currently installing the Microsoft Visual C++ package.

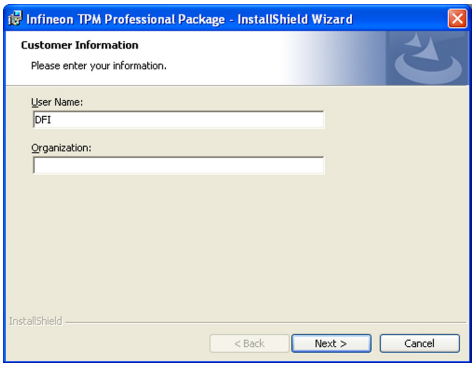


9. The setup program is now ready to install the utility. Click Next.

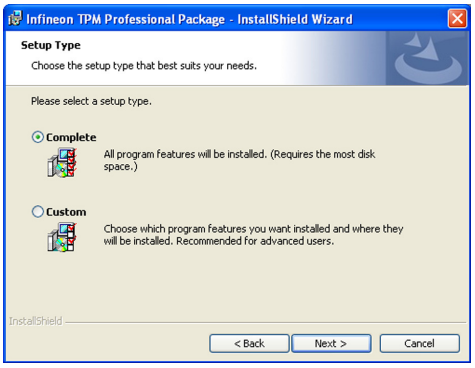
10. Click "I accept the terms in the license agreement" and then click "Next".



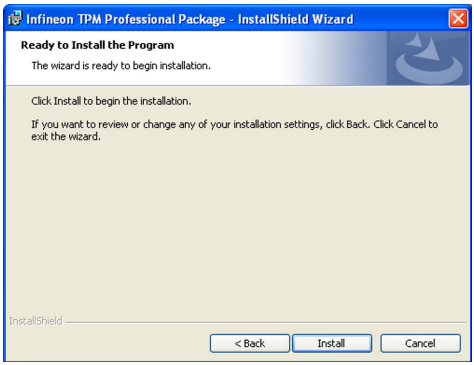
11. Enter the necessary information and then click Next.



12. Select a setup type and then click Next.



13. Click Install.



14. Click Finish.

Chapter 5 - RAID

The Intel ICH7R chip allows configuring RAID on Serial ATA drives. It supports RAID 0, RAID 1, RAID 5 and RAID 10. The Silicon Image Sil3114 chip allows configuring RAID on another 4 Serial ATA drives. It supports RAID 0, RAID 1 and RAID 10.

Note:
Silicon Image only supports Windows Vista and Windows XP.

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 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.

RAID 10 (Mirroring and Striping)

RAID 10 is a combination of data striping and data mirroring without parity having to be calculated and written. RAID 10 provides all the benefits of both RAID 0 and RAID 1. For this setup, use four new drives or use an existing drive and three new drives.

Settings

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

1. Connect the Serial ATA drives.
2. Configure Serial ATA in the AMI BIOS.
3. Configure RAID in the RAID BIOS.
4. Install the RAID driver during OS installation.
5. Install the RAID drivers and utility.

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 AMI BIOS

1. Power-on the system then press <Del> to enter the main menu of the AMI BIOS.
2. Configure Serial ATA in the appropriate fields.
3. Save the changes in the Exit menu.
4. Reboot the system.

Step 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 Sil3114 RAID BIOS

When the system powers-up and all drives have been detected, the Silicon Image BIOS status message screen will appear. Press the <Ctrl-S> or <F4> key 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 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 RAID drivers and utility

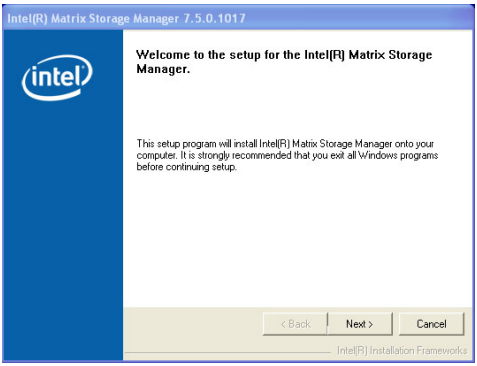
Intel Matrix Storage Manager for RAID/AHCI

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.

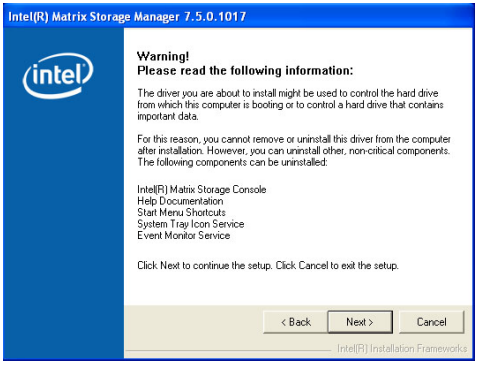
1. Insert the provided CD into an optical drive.

2. Click "Intel Matrix Storage Manager for RAID/AHCI" on the main menu.

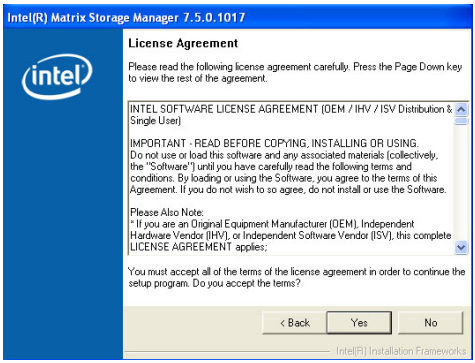
3. Setup is ready to install the utility. Click Next.



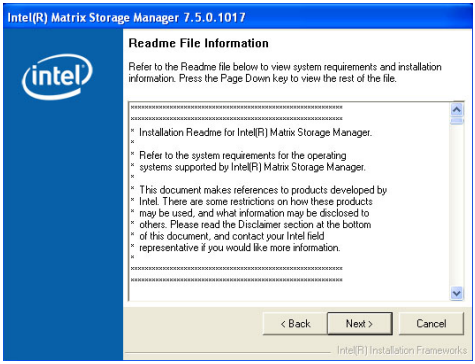
4. Read the warning carefully then click Next.



5. Read the license agreement then click Yes.



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

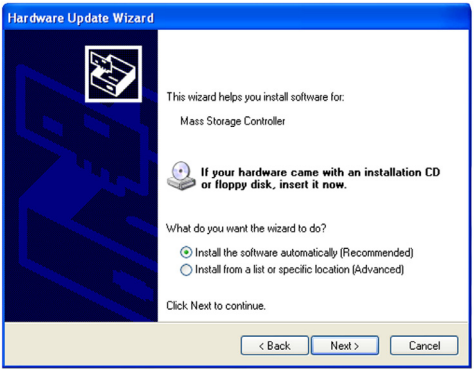


7. Click "Yes, I want to restart my computer now" then click Finish.

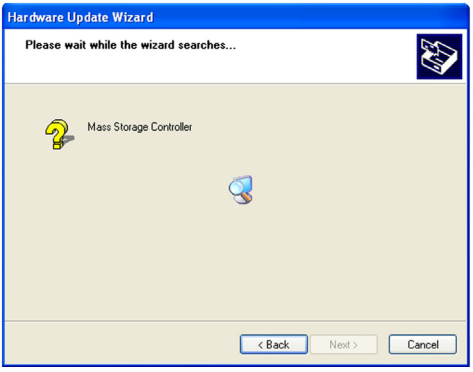
Silicon RAID Drivers

1. To install the driver, click "Silicon RAID Drivers" on the main menu. Click "No, not this time" and then click Next.

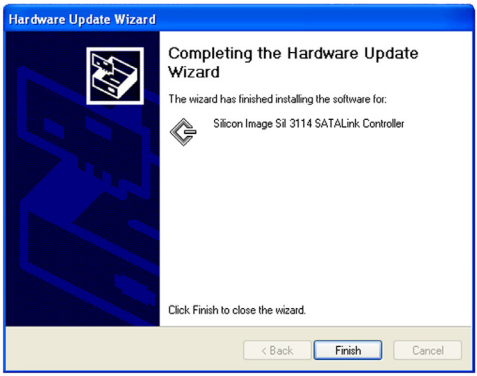
2. Click "Install the software automatically (Recommended)" and then click Next.



3. Setup is currently installing the driver.

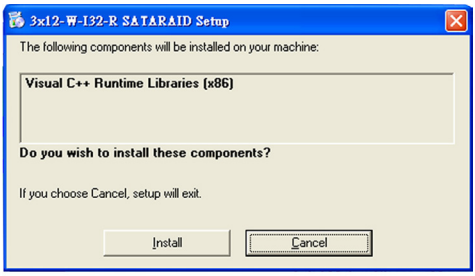


4. Click Finish.

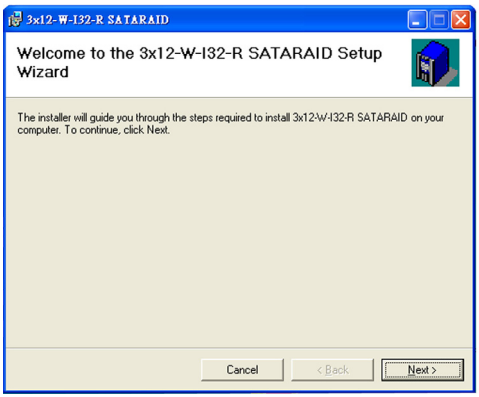


Silicon RAID Management Utility

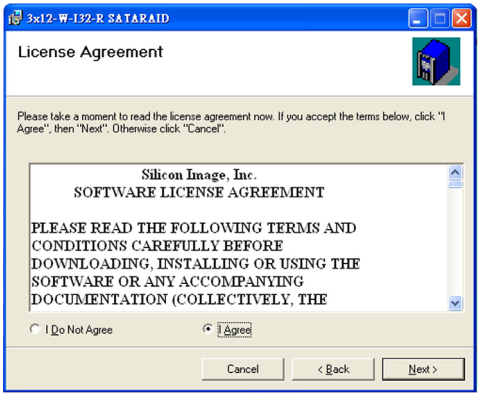
1. To install the utility, click "Silicon RAID Management Utility" on the main menu. Click Install.



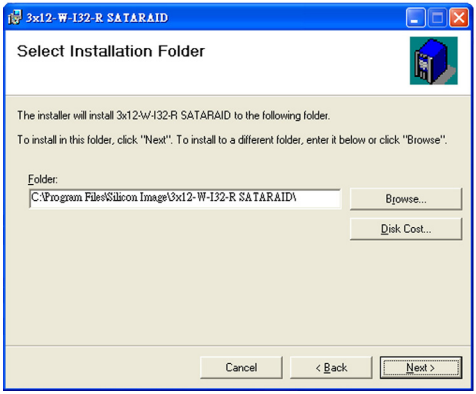
2. Setup is now ready to install the utility. Click Next.



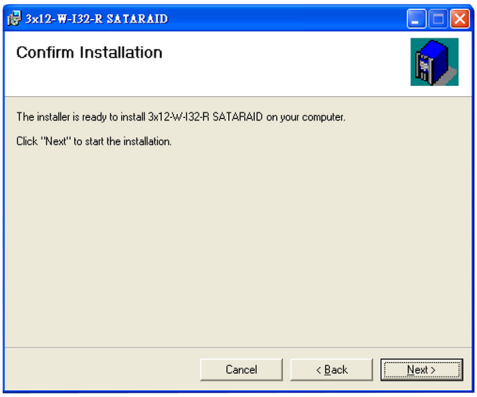
3. Read the License Agreement. Click "I Agree" and then click Next.



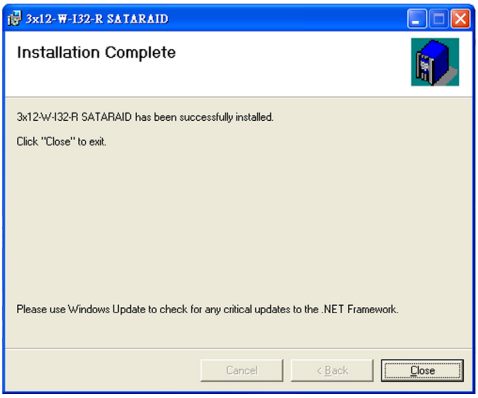
4. Click Next to continue or click Browse to select another folder.



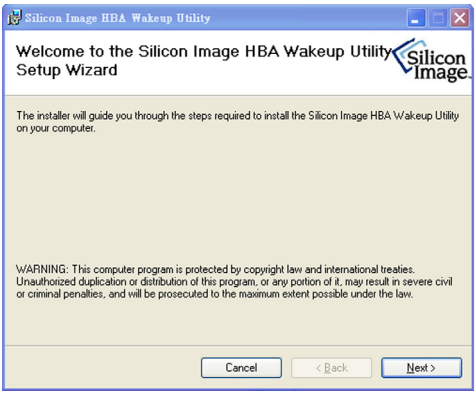
5. Click Next to install.



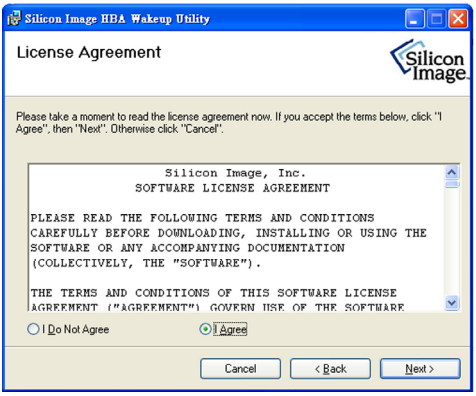
6. Click "Close".



7. Setup will now install the Silicon Image HBA Wakeup Utility. Click Next.

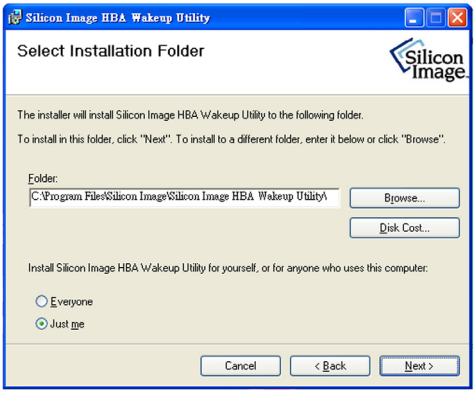


8. Read the License Agreement. Click "I Agree" and then click Next.

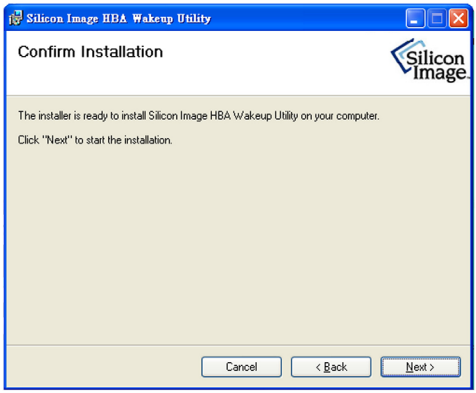


9. Click Next to continue or click Browse to select another folder.

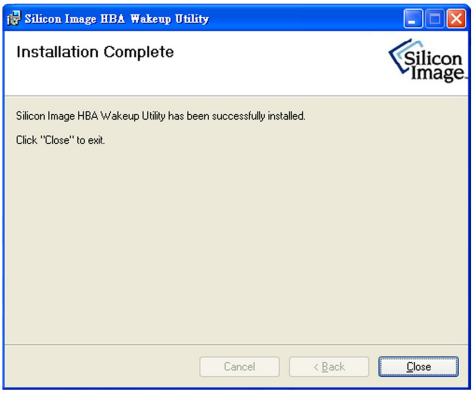
   Click "Just me" or "Everyone", depending on who you would want to have access to the utility. Click Next.



10. Click Next to install.



11. Click “Close”.



Appendix A - NLITE and AHCI Installation Guide

nLite

nLite is an application program that allows you to customize your XP installation disc by integrating the RAID/AHCI drivers into the disc. By using nLite, the F6 function key usually required during installation is no longer needed.

Note:
The installation steps below are based on nLite version 1.4.9. Installation procedures may slightly vary if you're using another version of the program.

1. Download the program from nLite's offical website.

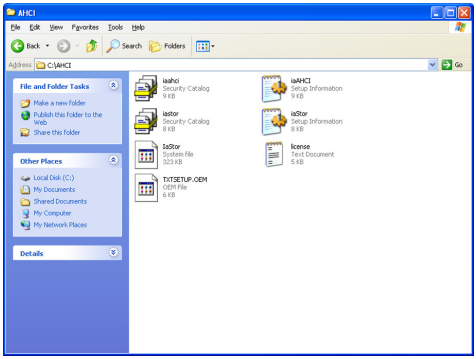
   http://www.nliteos.com/download.html

2. Install nLite.

   Important:
   Due to it's coding with Visual.Net, you may need to first install .NET Framework prior to installing nLite.

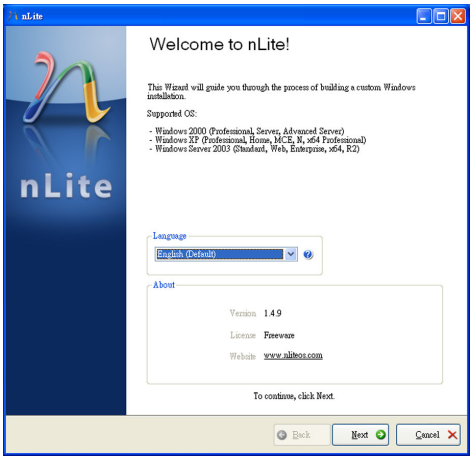
3. Download relevant RAID/AHCI driver files from Intel's website. The drivers you choose will depend on the operating system and chipset used by your computer.

   The downloaded driver files should include iaahci.cat, iaAHCI.inf, iastor.cat, iaStor.inf, IaStor.sys, license.txt and TXTSETUP.OEM.



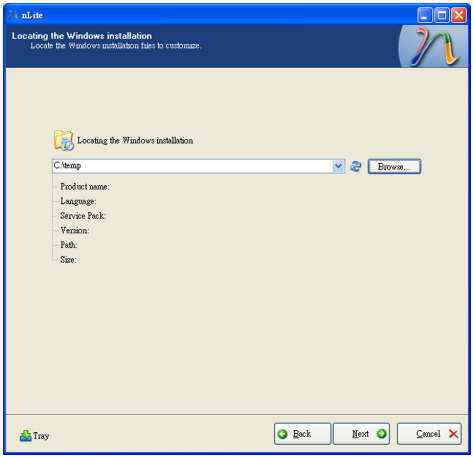
4. Insert the XP installation disc into an optical drive.

5. Launch nLite. The Welcome screen will appear. Click **Next**.

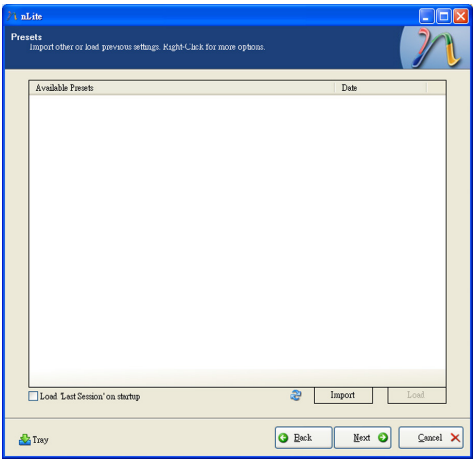


6. Click **Next** to temporarily save the Windows installation files to the designated default folder.

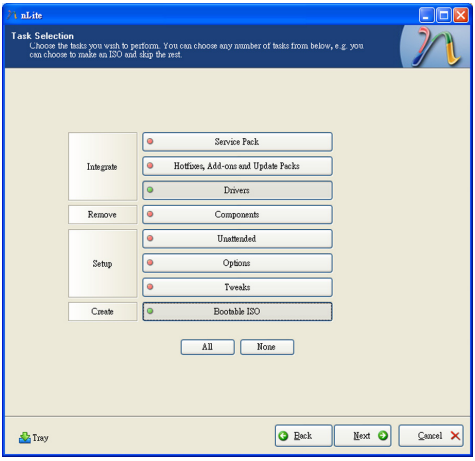
   If you want to save them in another folder, click **Browse**, select the folder and then click **Next**.



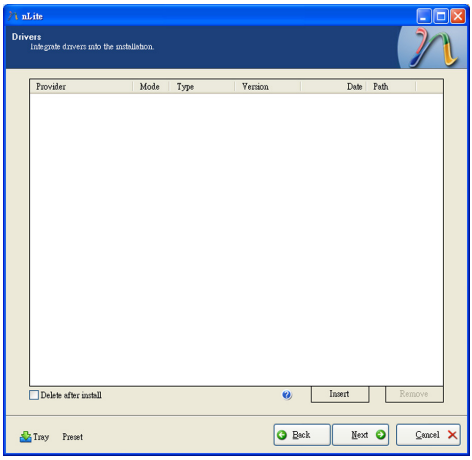
7. Click **Next**.



8. In the Task Selection dialog box, click **Drivers** and **Bootable ISO**. Click **Next**.

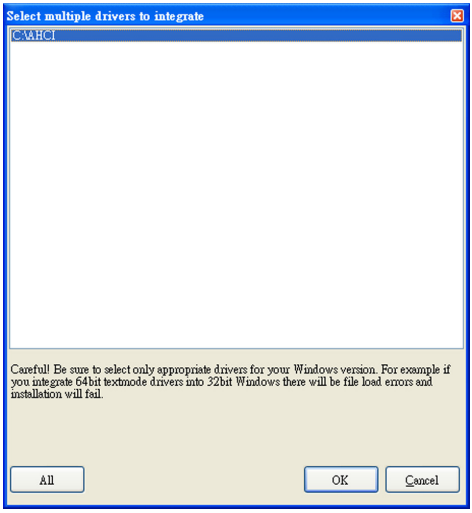


9. Click **Insert** and then select **Multiple driver folder** to select the drivers you will integrate. Click **Next**.

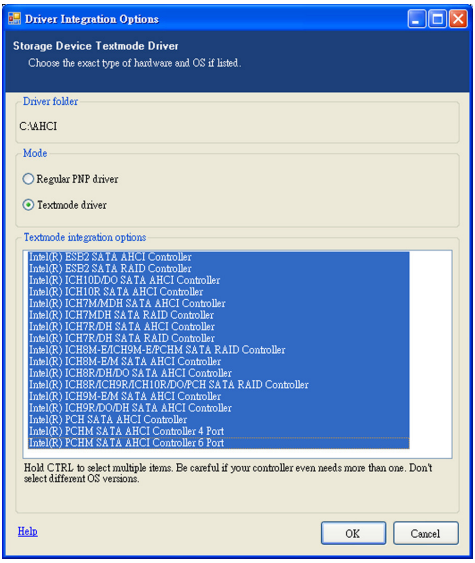


10. Select only the drivers appropriate for the Windows version that you are using and then click **OK**.

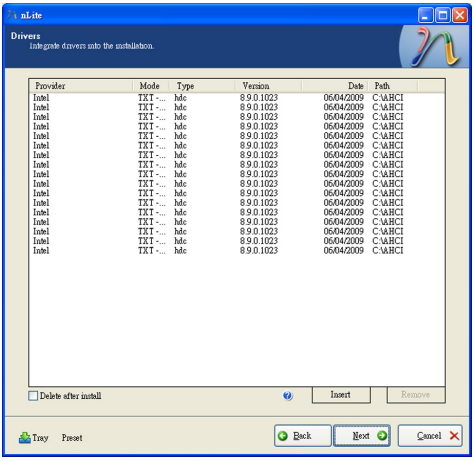
    Integrating 64-bit drivers into 32-bit Windows or vice versa will cause file load errors and failed installation.



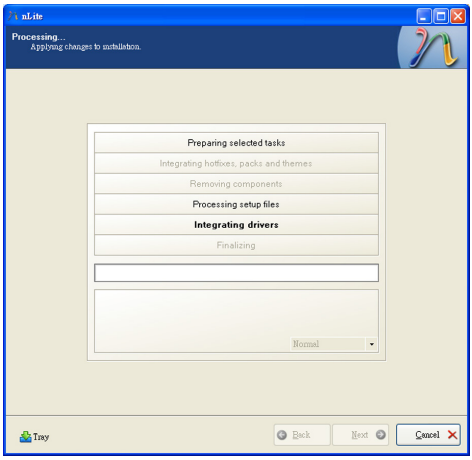
11. If you are uncertain of the southbridge chip used on your motherboard, select all RAID/AHCI controllers and then click **OK**.



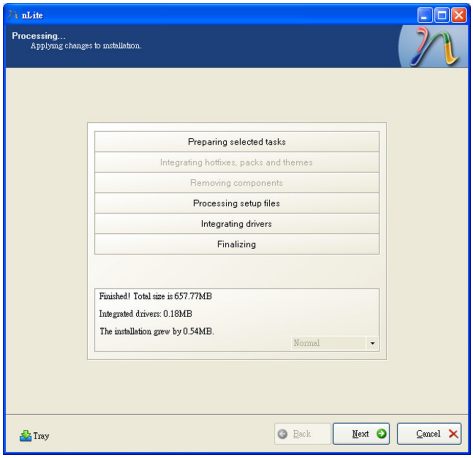
12. Click **Next**.



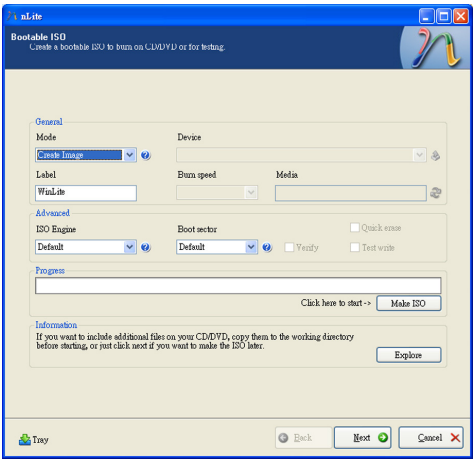
13. The program is currently integrating the drivers and applying changes to the installation.



14. When the program is finished applying the changes, click **Next**.

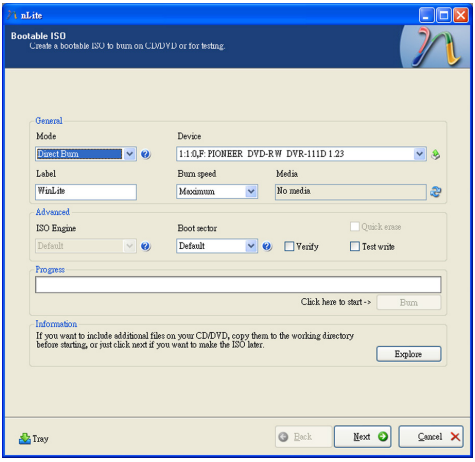


15. To create an image, select the **Create Image** mode under the General section and then click **Next**.



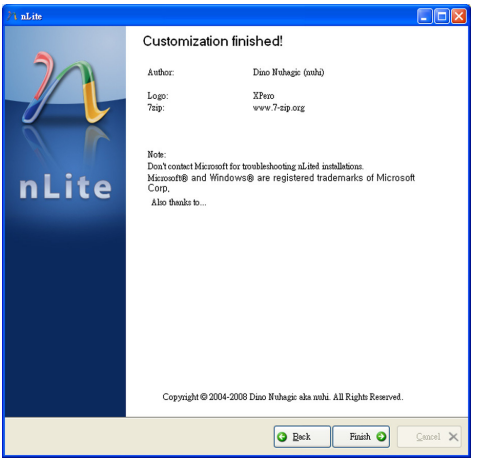
16. Or you can choose to burn it directly to a disc by selecting the **Direct Burn** mode under the General section.

    Select the optical device and all other necessary settings and then click



17. You have finished customizing the Windows XP installation disc. Click **Finish**.

    Enter the BIOS utility to configure the SATA controller to RAID/AHCI. You can now install Windows XP.



AHCI

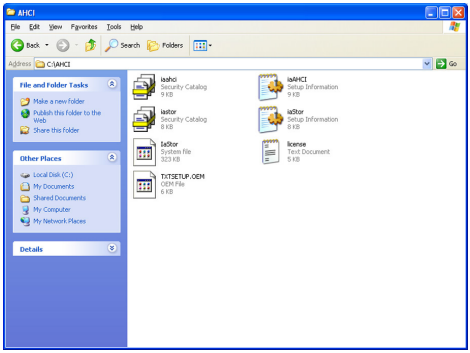
The installation steps below will guide you in configuring your SATA drive to AHCI mode.

1. Enter the BIOS utility and configure the SATA controller to IDE mode.

2. Install Windows XP but do not press F6.

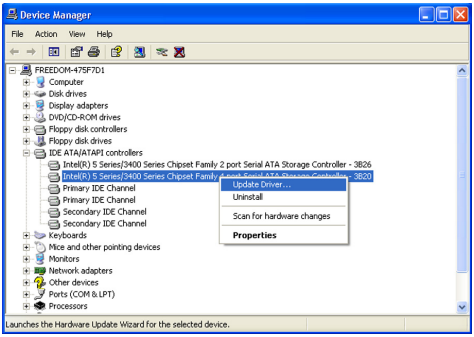
3. Download relevant RAID/AHCI driver files supported by the motherboard chipset from Intel's website.

   Transfer the downloaded driver files to C:\AHCI.



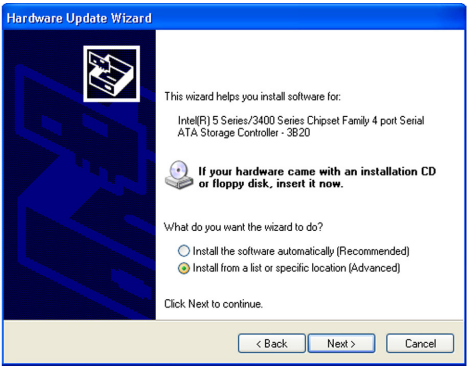
4. Open Device Manager and right click on one of the Intel Serial ATA Storage Controllers, then select **Update Driver**.

   If the controller you selected did not work, try selecting another one.

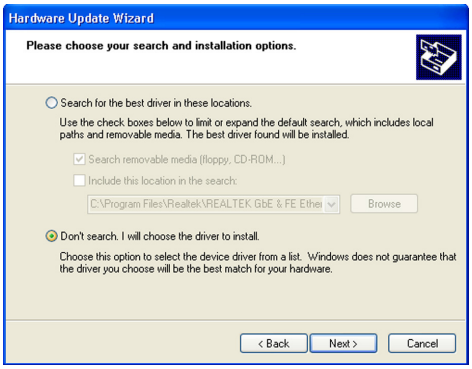


5. In the Hardware Update Wizard dialog box, select **"No, not this time"** then click **Next**.

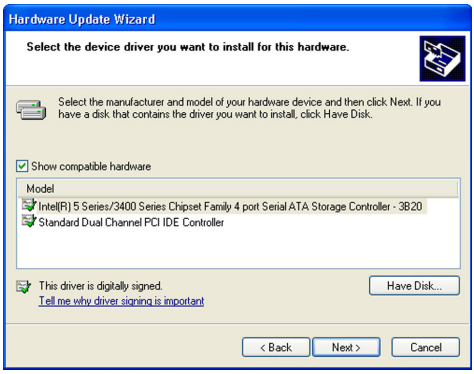
6. Select **"Install from a list or specific location (Advanced)"** and then click **Next**.



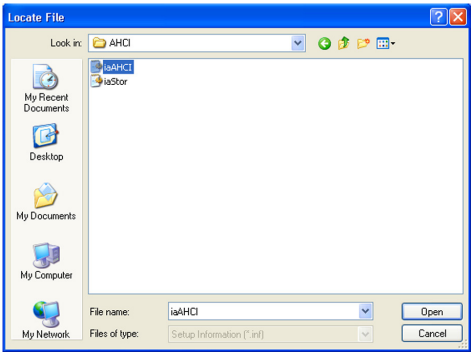
7. Select **"Don't search. I will choose the driver to install"** and then click **Next**.



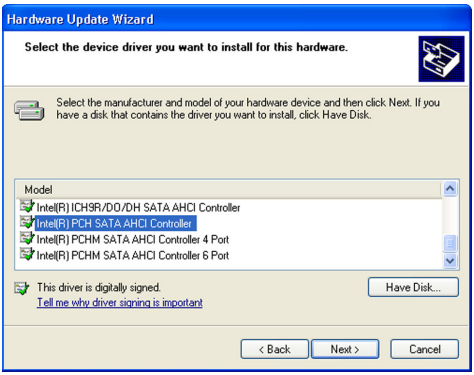
8. Click **"Have Disk"**.



9. Select C:\AHCI\iaAHCI.inf and then click **Open**.

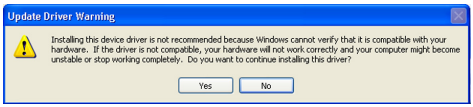


10. Select the appropriate AHCI Controller of your hardware device and then click **Next**.

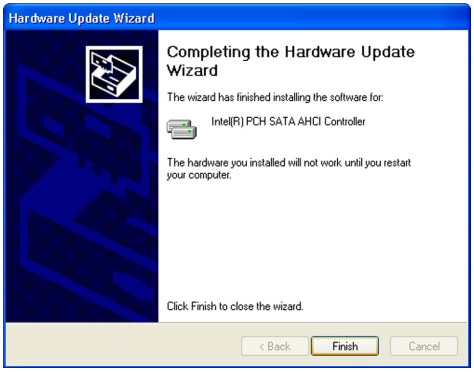


11. A warning message appeared because the selected SATA controller did not match your hardware device.

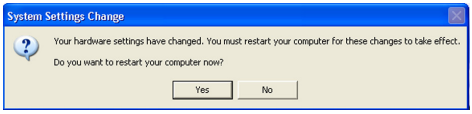
    Ignore the warning and click **Yes** to proceed.



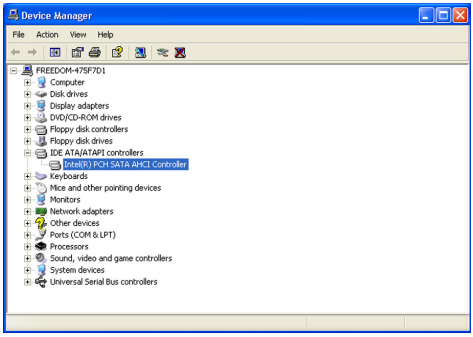
12. Click **Finish**.



13. The system's settings have been changed. Windows XP requires that you restart the computer. Click **Yes**.



14. Enter the BIOS utility and modify the SATA controller from IDE to AHCI. By doing so, Windows will work normally with the SATA controller that is in AHCI mode.



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.

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 - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.

Important
Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

The BIOS reports memory test fail if the memory has error(s).