

CA33 I-NR CA33 I-P

System Board User's Manual

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FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Notice:

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

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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 consequential damages to the product that has been modified or altered.

Static Electricity Precautions

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

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



Important:

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

Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

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

Battery:

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

About the Package

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

- ☑ One system board
- ☑ One IDE cable
- ☑ Two USB cables
- ☑ Two Serial ATA data cables
- ☑ Two Serial ATA power cables
- ☑ One bracket mounted with a COM port
- ☑ One bracket mounted with a printer port
- ☑ One I/O shield
- ☑ One user's manual
- ☑ One CD
- ☑ 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 I - Introduction

Specifications

Processor	• Intel® Core™2 Penryn processor • Intel® Celeron® 575 processor • 1066/800/667MHz FSB • Intel® 45nm transistor technology • Intel® Trusted Execution Technology (Intel® TXT) • Intel® Virtualization Technology (Intel® VT) DMA • Supports Data Bus Inversion (DBI) • Supports Message Signaled Interrupt (MSI) • Supports Intel® architecture with Intel® Wide Dynamic Execution • Processor socket: Socket P 478-pin Micro FCPGA
Chipset	• Intel® chipset - Northbridge: Intel® GM45 Express chipset - Southbridge: Intel® ICH9M-E I/O Controller Hub (CA331-NR) Intel® ICH9M I/O Controller Hub (CA331-P)
System Memory	• Two 204-pin SODIMM sockets • Supports 1066MHz DDR3 SDRAM • Maximum of 8GB system memory • 64-bit wide per channel • 256Mb, 512Mb, 1Gb and 2Gb memory technologies • Supports non-ECC x8 and x16 DIMMs • DDR3 On-Die Termination (ODT) • Supports partial writes to memory using data mask signals (DM)
Expansion Slots	• 1 PCI Express x16 slot • 1 PCI Express x4 slot • 2 PCI slots
Graphics	• Intel® GMA4500 integrated graphics engine - Supports 3D, 2D and video capabilities, DX10 and OpenGL 2.1
Audio	• Realtek ALC262 2-channel High Definition Audio • Three stereo ADCs support 16/20-bit PCM format for multiple input streaming • High quality analog differential CD input • 16/20/24-bit S/PDIF-OUT and S/PDIF-IN support 44.1K/48K/96K/192kHz sample rate
LAN	• CA331-NR: Intel 82567 and Realtek RTL8111C-GR PCI Express Gigabit controllers • CA331-P: Realtek RTL8111C-GR only • Integrated 10/100/1000 transceiver • Supports Full Duplex flow control (IEEE 802.3x) • Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab • Supports power down / link down power saving
Serial ATA	• Four Serial ATA ports • Data transfer rate up to 3Gb/s • Integrated Advanced Host Controller Interface (AHCI) controller • CA331-NR: supports RAID 0 or RAID 1 (cannot coexist)

IDE	• ITE IT8213F PCI Express to PATA host controller • Supports Native Mode operation • Supports PIO Modes 0, 1, 2, 3, 4 • Supports Multiword DMA Modes 0, 1, 2 • Supports Ultra DMA 33/66/100/133 • Supports ATA/ATAPI command
Rear Panel I/O Ports	• Mini-DIN-6 PS/2 mouse port and PS/2 keyboard port • 2 DB-9 serial ports • 1 DB-15 VGA port • 1 DVI-I port (DVI-D signal only) • 4 USB 2.0/1.1 ports • 2 RJ45 LAN ports (CA331-NR); 1 LAN port (CA331-P) • Mic-in, line-in and line out jacks
I/O Connectors	• 4 connectors for 8 additional external USB 2.0/1.1 ports • 2 connectors for 2 external serial ports • 1 LCD brightness control connector • 1 LVDS LCD panel connector • 1 Digital I/O connector • 1 LCD/inverter power connector • 1 front audio connector for line-out and mic-in jacks • 1 CD-in internal audio connector • 1 S/PDIF connector • 4 Serial ATA connectors • 1 34-pin FDD connector • 1 40-pin IDE connector • 1 25-pin parallel connector • 1 front panel connector • 1 24-pin ATX power connector • 2 fan connectors
BIOS	• AMI BIOS • SPI flash memory: 32Mbit (CA331-NR); 16Mbit (CA331-P)
Energy Efficient Design	• Supports ACPI specification and OS Directed Power Management • Supports ACPI STR (Suspend to RAM) function • Wake-On-Events include: - Wake-On-PS/2 KB/Mouse and Wake-On-USB KB/Mouse - Wake-On-LAN and Wake-On-Ring - RTC timer to power-on the system • System power management supported • CPU stopped clock control • Microsoft®/Intel® APM 1.2 compliant • Soft Power supported - ACPI v2.0 specification • AC power failure recovery
Damage Free Intelligence	• Monitors CPU/System temperature and overheat alarm • Monitors Vcore/12V/1.5V/1.05V/5V/5VSB voltages and failure alarm • Monitors CPU/Chassis 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	• 6-layers, microATX form factor • 24.4cm (9.6") x 24.4cm (9.6")

Features

Watchdog Timer

The Watchdog Timer function allows your application to regularly “clear” the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

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 4500 delivering an excellent blend of graphics performance and features to meet business needs. With support for Microsoft DirectX 10, Shader Model 4.0 and OpenGL* 2.0, Intel GMA 4500 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.

DVI

DVI (Digital Visual Interface) is a form of video interface technology made to maximize the quality of flat panel LCD monitors and modern video graphics cards. Data is transmitted using the TMDS (Transition Minimized Differential Signaling) protocol, providing a digital signal from the PC's graphics subsystem to the display.

LVDS

The Intel SCH supports a Low-Voltage Differential Signaling (LVDS) interface that allows the Intel Graphics Media Adapter to communicate directly to the flat-panel display. The LVDS interface supports pixel color depths of 18 and 24 bits.

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.

S/PDIF

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

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.

Gigabit LAN

The PCI Express Gigabit controllers support 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-Ring

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



Important:

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

Introduction

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 $\geq 720\text{mA}$.

Wake-On-PS/2

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

**Important:**

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

Wake-On-USB

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

**Important:**

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

RTC Timer

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

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:**

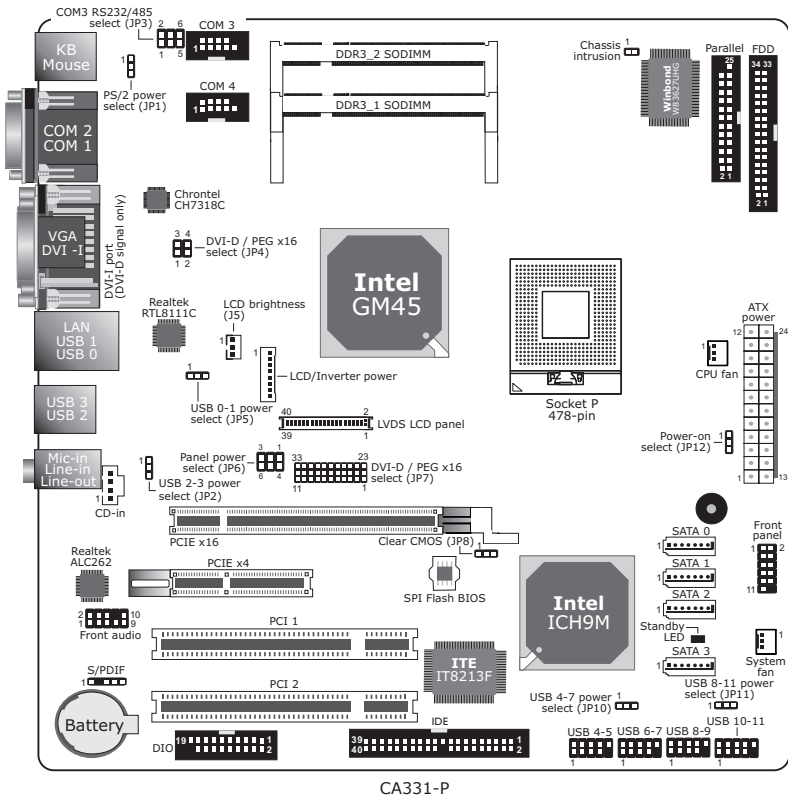
The 5V_standby power source of your power supply must support $\geq 720\text{mA}$.

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.

System Board Layout

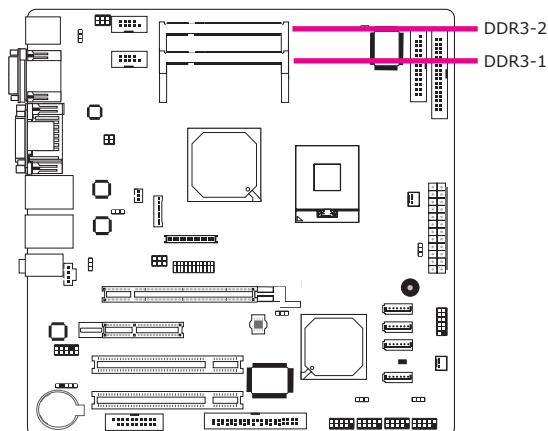




**Important:**

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.

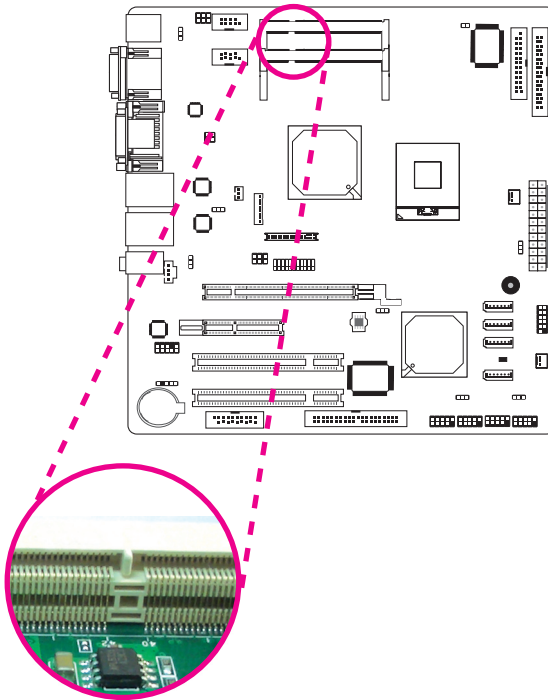
System Memory



The system board is equipped with two 204-pin SODIMM sockets that support DDR3 memory modules.

Installing the SODIMM

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 SODIMM socket on the board.
4. Note the key on the socket. The key ensures the module can be plugged into the socket in only one way.

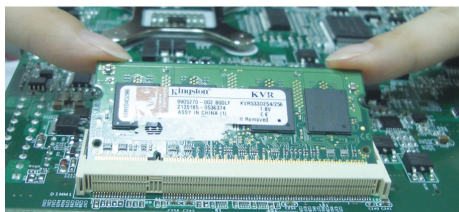


5. Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Note that the socket and module are both keyed, which means the module can be plugged into the socket in only one direction.

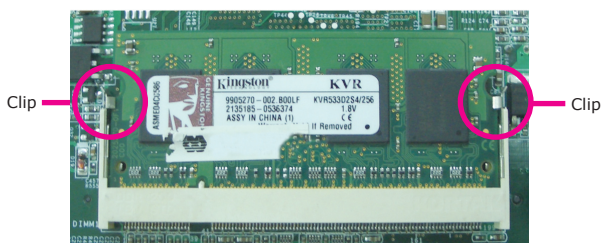
6. To seat the module into the socket, apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

**Note:**

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



7. Push the module down until the clips at each side of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position



CPU

Overview

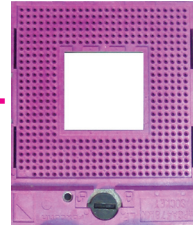
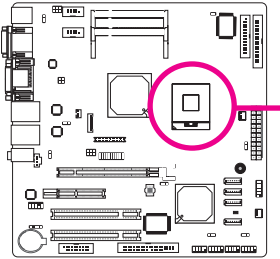
The system board is equipped with a surface mount mPGA478 CPU socket.

**Note:**

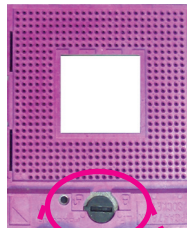
The system board used in the following illustrations may not resemble the actual one. These illustrations are for reference only.

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 mPGA478 socket on the system board.



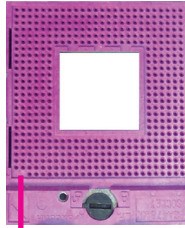
4. Use a screwdriver to turn the screw to its unlock position.



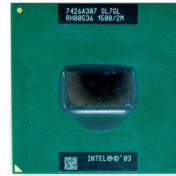
- Position the CPU above the socket. The gold triangular mark on the CPU must align with pin 1 of the CPU socket.

Important:

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



Pin 1

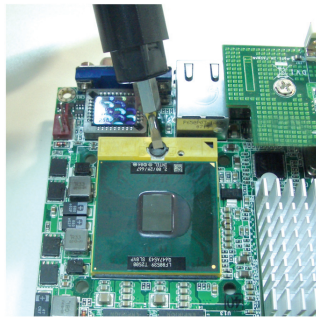


Gold triangular mark

- 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. Use a screwdriver to turn the screw to its lock position.

Important:

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



Installing the Fan and Heat Sink

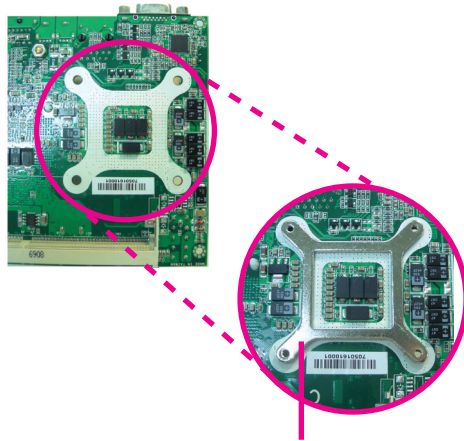
The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.



Note:

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

1. On the solder side of the board, match the retention module base to the mounting holes around the CPU socket.



Retention module base

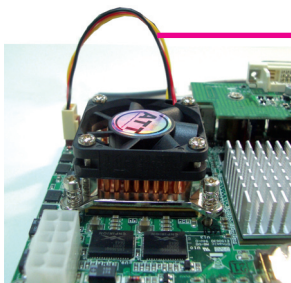
2. Apply a thin layer of thermal paste on top of the CPU. Do not spread the paste all over the surface. When you later place the heat sink on top, the compound will disperse evenly.
3. While holding the retention module base in position (step 1), place the fan / heat sink assembly on top of the CPU. The 4 screws around the heat sink must match the screw holes of the retention module base. We strongly recommend using this type of fan / heat sink assembly because it provides adequate cooling to the components of the system board.

Turn each Phillips head screw half way down first to initially stabilize the heat sink onto the board, then finally tighten each screw.

Important:

Do not turn the first screw all the way down followed by the next and so on. This is to avoid imbalance which might cause cracks or fractures to the CPU and/or heat sink assembly.

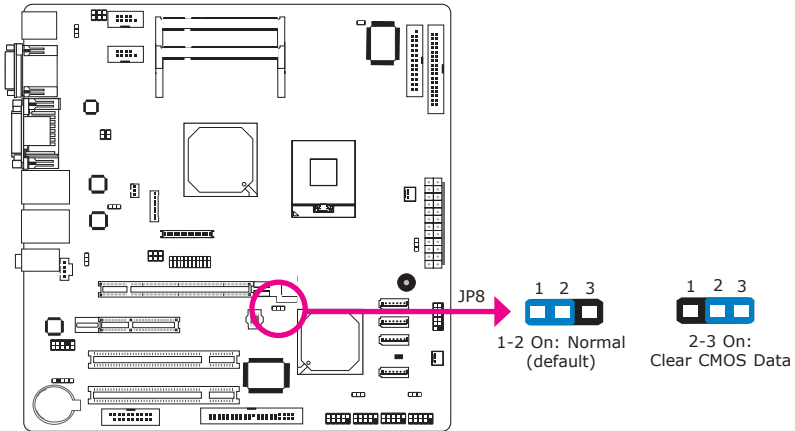
4. Connect the CPU fan's cable connector to the CPU fan connector on the system board.



CPU fan cable

Jumper Settings

Clear CMOS Data



If you encounter the following,

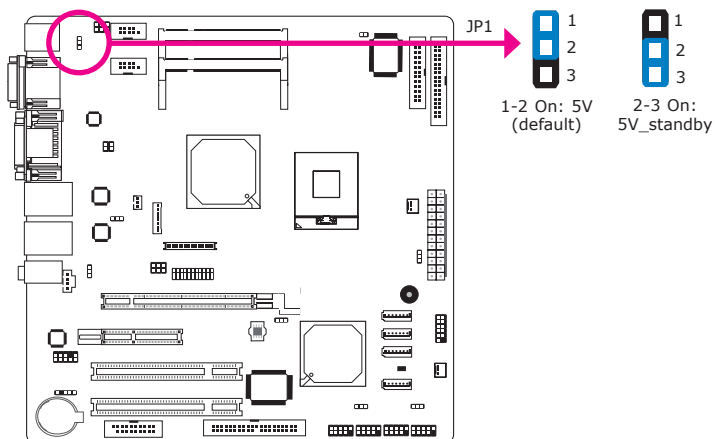
- CMOS data becomes corrupted.
- You forgot the supervisor or user password.

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.

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

PS/2 Power Select

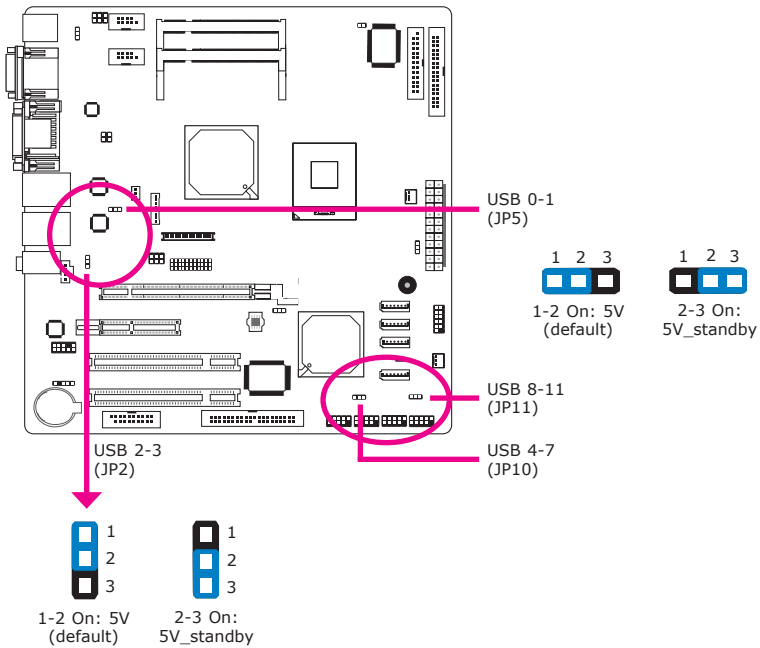


JP1 is used to select the power of the PS/2 keyboard/mouse port. Selecting 5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.

**Important:**

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

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

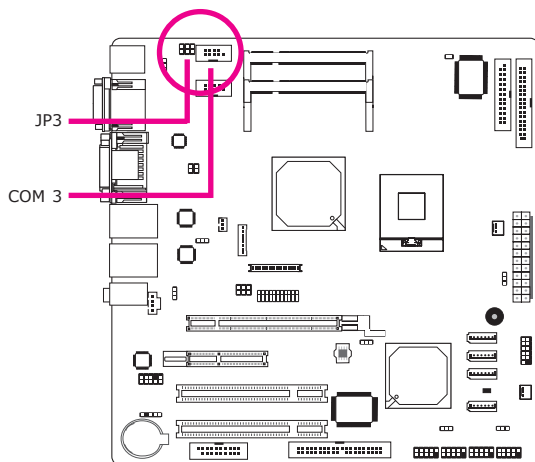
"USB Device Wakeup From S3" in the Advanced menu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.



Important:

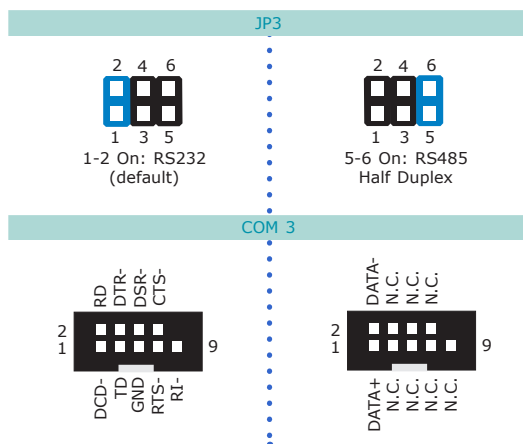
If you are using the Wake-On-USB function for 2 USB ports, the 5V_standby power source of your power supply must support $\geq 1.5A$. For 3 or more USB ports, the 5V_standby power source of your power supply must support $\geq 2A$.

COM 3 RS232/RS485 Select

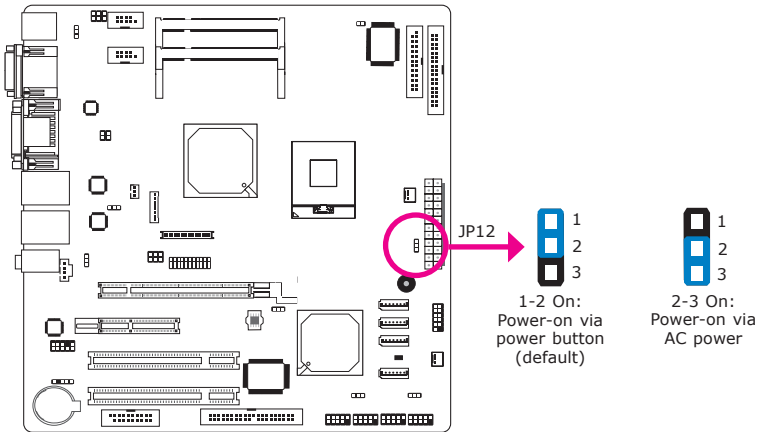


JP3 is used to configure COM 3 to RS232 or RS485.

The pin function of COM 3 will vary according to JP3's setting.



Power-on Select



JP12 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 JP12 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

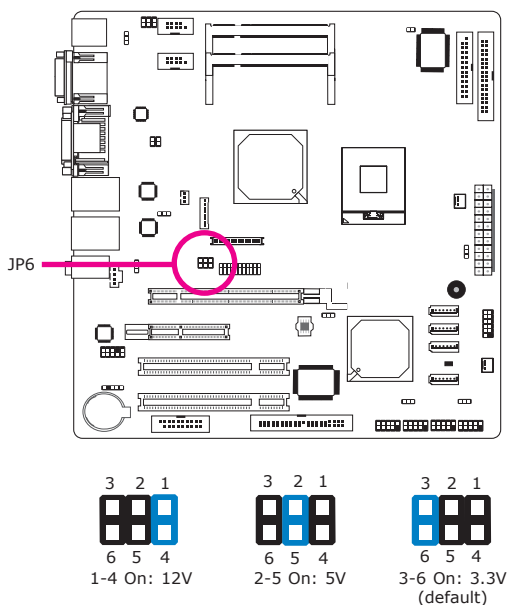
When using the JP12 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).



Note:

In order to ensure that power is resumed after a power failure that recovers within a 5 second period, JP12 must be set to pins 2-3 and the "PWRON After PWR-Fail" in CMOS is set to "On".

Panel Power Select

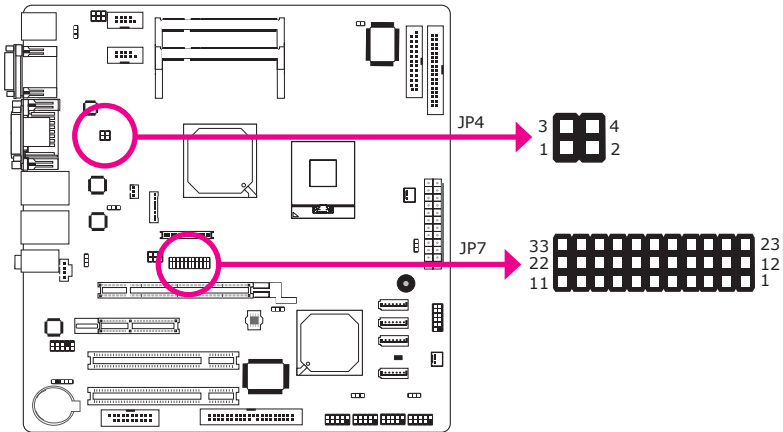


JP6 is used to select the power supplied to the LCD panel.

**Important:**

Before powering-on the system, make sure JP6's setting matches the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

DVI-D / PEG x16 Select

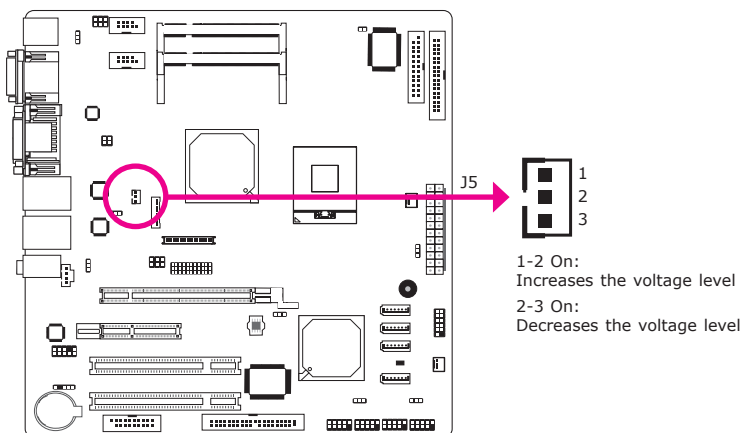


DVI-D / PEG x16 Select	JP4	JP7
Onboard DVI-D enabled. (default)	1-2 On	22-33 On
PEG x16 slot enabled (PCIE x16/x8/x4/x1, ADD2 card; onboard DVI-D will be disabled)	1-2 On	1-11 On

Possible Display Ports Configurations by Different Devices When PEG x16 Slot is Enabled	
PEG x16	Discrete Graphics
ADD2 card	CRT/ LVDS / SDVO
PCIE CARD x8, x4, x1 (non-graphics card)	CRT / LVDS
PEG x1	CRT / LVDS / Discrete Graphic

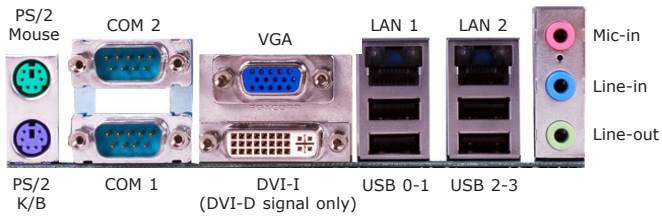
1. DVI-D or PEG x16 select only support two display streams in any display port combination: CRT, SDVO, LVDS, DVI-D and Discrete Graphic.
2. DVI-D and LVDS can display at the same time only when under Windows operation system.

LCD Brightness Control (Voltage Level Adjust)

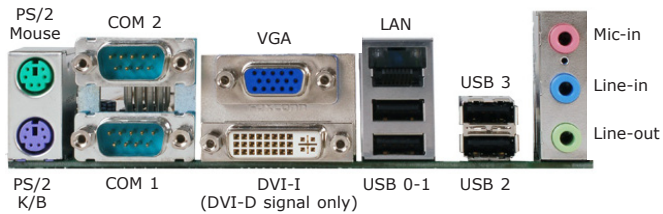


Use J5 to connect to the LCD Brightness Control button of the LCD Display Panel. It is used to adjust the brightness of the LCD Display Panel. Increasing or decreasing the voltage to control the LCD panel's brightness varies among Inverters. You must refer to the Inverter's specification to make the appropriate adjustment to the brightness of the LCD panel.

Rear Panel I/O Ports



CA331-NR

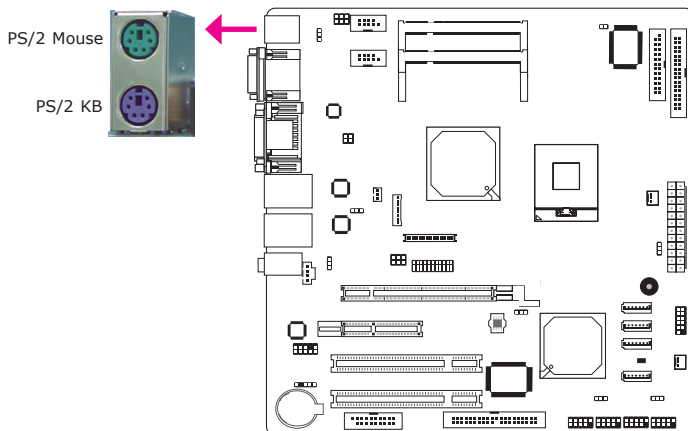


CA331-P

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

- PS/2 mouse port
- PS/2 keyboard port
- 2 COM ports
- VGA port
- DVI-I port (DVI-D signal only)
- 2 LAN ports (CA331-NR)
- 1 LAN port (CA331-P)
- 4 USB ports
- Mic-in jack
- Line-in jack
- Line-out jack

PS/2 Mouse and PS/2 Keyboard Ports



These ports are used to connect a PS/2 mouse and a PS/2 keyboard. The PS/2 mouse port uses IRQ12. If a mouse is not connected to this port, the system will reserve IRQ12 for other expansion cards.



Important:

Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.

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**

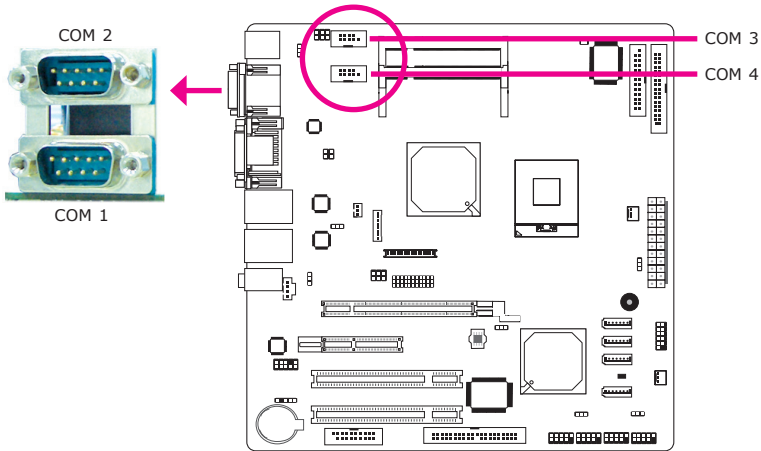
JP1 must be set to "2-3 On: 5V_standby". Refer to "PS/2 Power Select" in this chapter for more information.



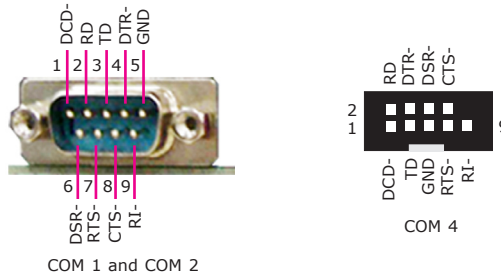
Important:

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

COM (Serial) Ports



COM 1, COM 2 and COM 4 are fixed at RS232.



COM 3's pin definition will vary according to JP3's settings. Refer to "COM 3 RS232/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.

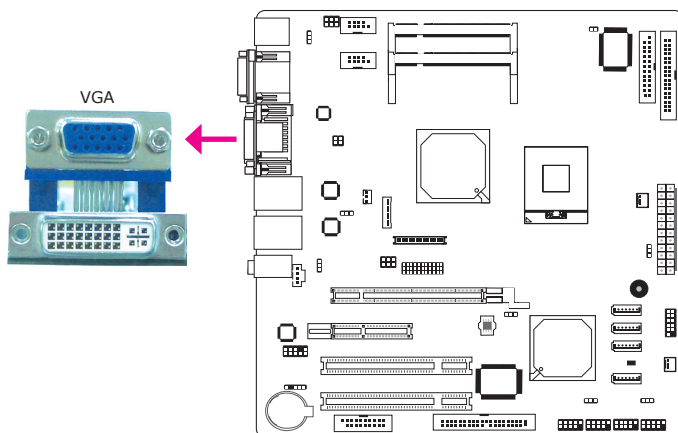
Connecting External Serial Ports

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 a 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 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.

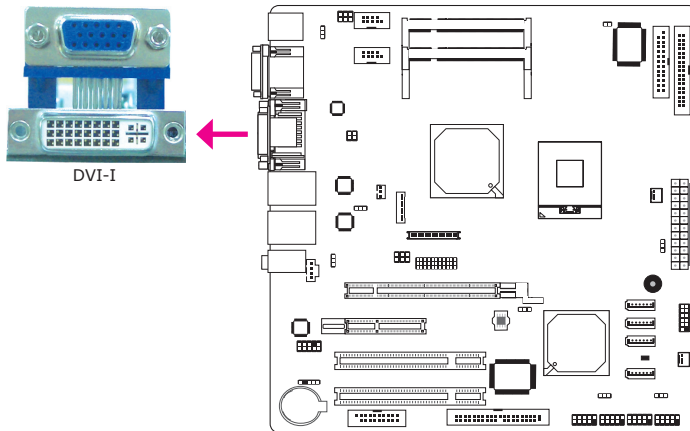
BIOS Setting

Configure the onboard VGA in the Chipset menu 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



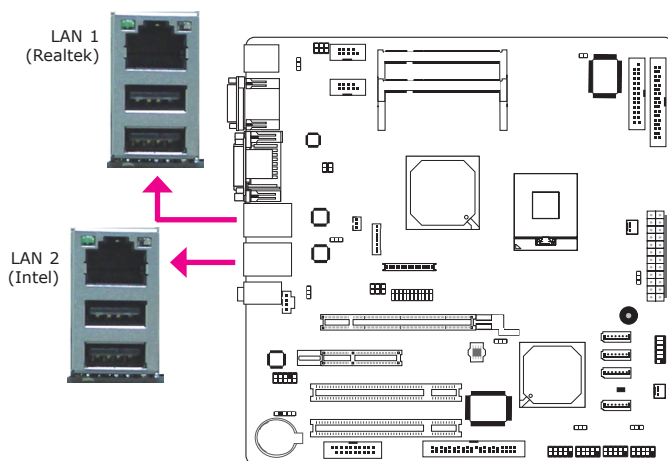
The DVI-I port is used to connect an LCD monitor. This port supports DVI-D signal only.

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 of the BIOS. Refer to chapter 3 for more information.

RJ45 LAN Ports



CA331-NR: LAN 1 and LAN 2.

CA331-P: LAN 1 only.

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

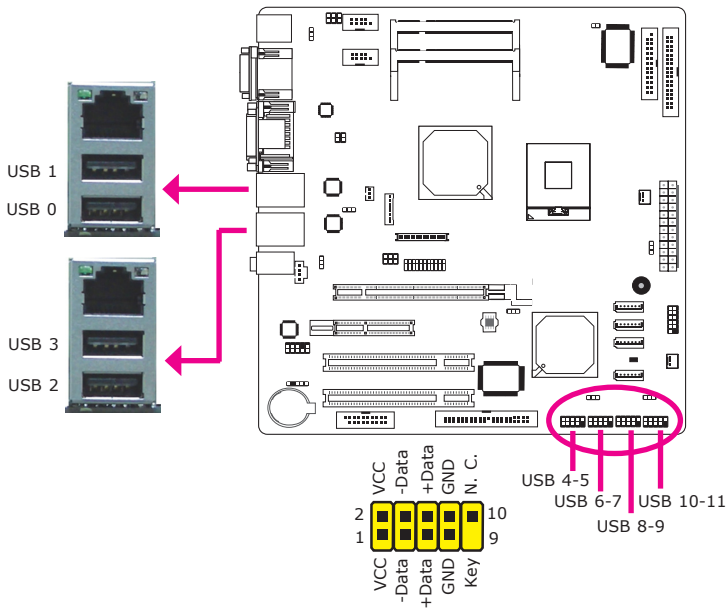
BIOS Setting

Configure the onboard LAN ports in the Chipset menu of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to chapter 4 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 four 10-pin connectors allow you to connect 8 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 Advanced menu 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 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/JP5/JP10/JP11 must be set to "2-3 On: 5V_standby". Refer to "USB Power Select" in this chapter for more information.

- **BIOS Setting**

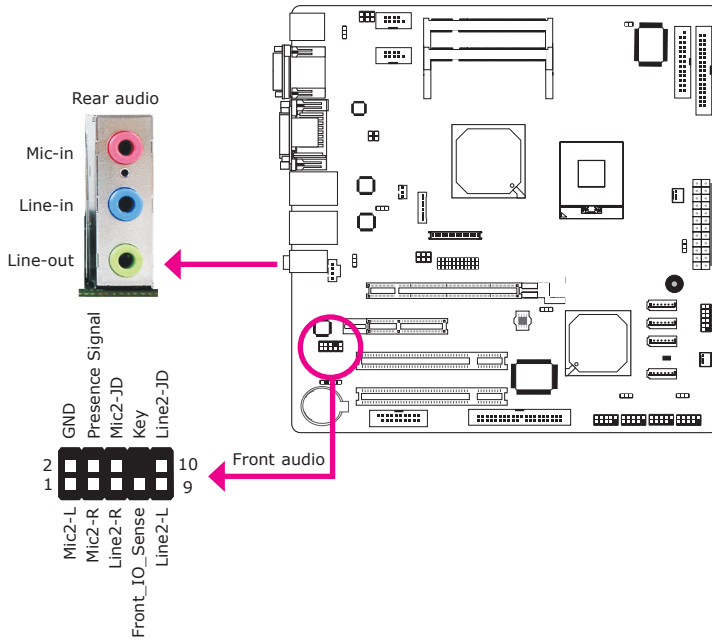
"USB Device Wakeup From S3" in the Advanced menu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.



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

Audio



Rear Audio

The system board is equipped with 3 audio jacks. A jack is a one-hole connecting interface for inserting a plug.

- **Mic-in Jack (Pink)**
This jack is used to connect an external microphone.
- **Line-in Jack (Light Blue)**
This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.
- **Line-out Jack (Lime)**
This jack is used to connect a headphone or external speakers.

Front Audio

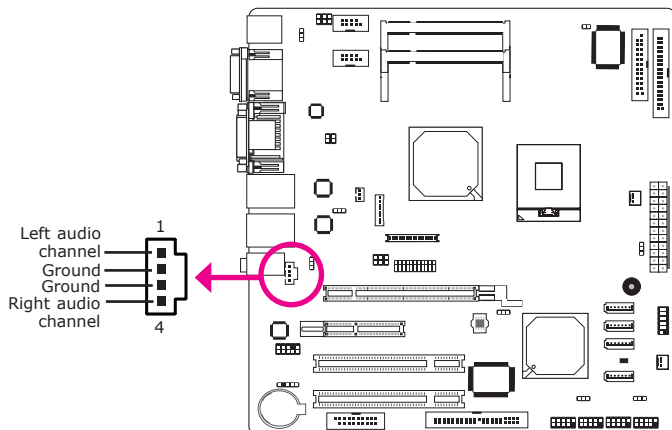
The front audio connector allows you to connect to the second line-out and mic-in jacks that are at the front panel of your system.

Driver Installation

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

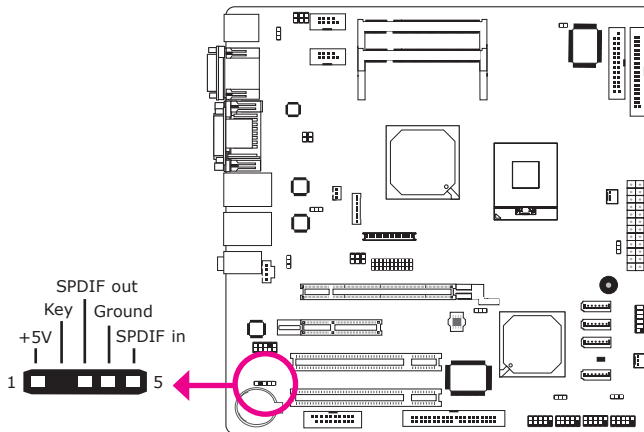
I/O Connectors

CD-in Internal Audio Connector



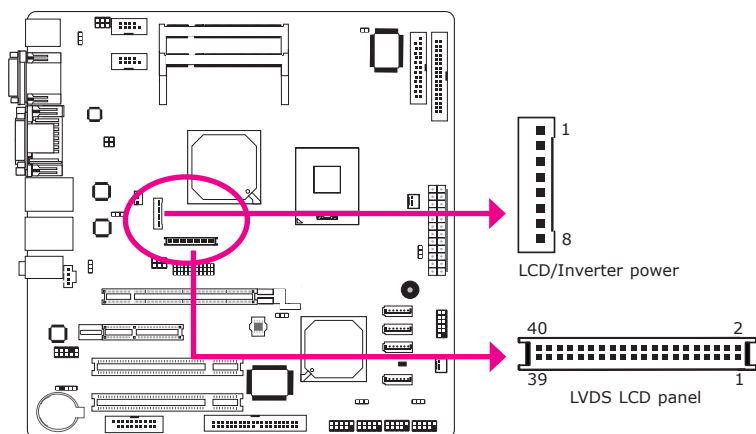
The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

S/PDIF Connector



The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port 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 connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

LVDS LCD Panel Connector LCD/Inverter Power Connector



The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

Refer to the next page for the pin functions of these connectors.

BIOS Setting

Configure the LCD panel in the Chipset menu of the BIOS. Refer to chapter 3 for more information.

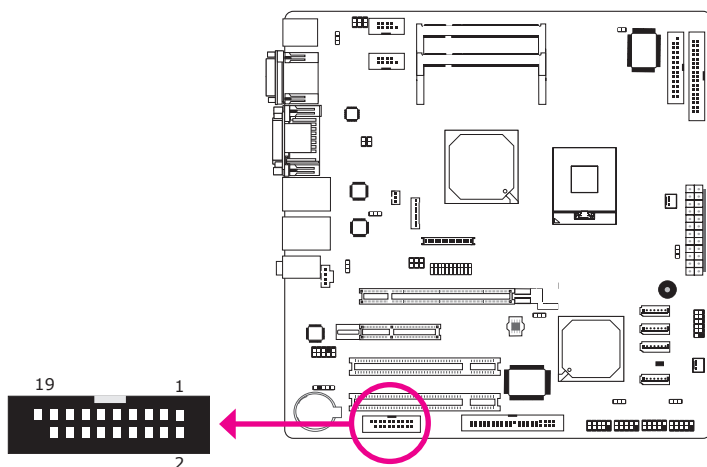
LVDS LCD Panel Connector

Pins	Function	Pins	Function
1	GND	2	GND
3	LVDS_Out3+	4	LVDS_Out7+
5	LVDS_Out3-	6	LVDS_Out7-
7	GND	8	GND
9	LVDS_Out2+	10	LVDS_Out6+
11	LVDS_Out2-	12	LVDS_Out6-
13	GND	14	GND
15	LVDS_Out1+	16	LVDS_Out5+
17	LVDS_Out1-	18	LVDS_Out5-
19	GND	20	GND
21	LVDS_Out0+	22	LVDS_Out4+
23	LVDS_Out0-	24	LVDS_Out4-
25	GND	26	GND
27	LVDS_CLK1+	28	LVDS_CLK2+
29	LVDS_CLK1-	30	LVDS_CLK2-
31	GND	32	GND
33	LVDS_DDCCLK	34	N. C.
35	LVDS_DDCDAA	36	N. C.
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

LCD/Inverter Power Connector

Pins	Function
1	GND
2	GND
3	Panel Inverter Brightness Voltage Control
4	Panel Power
5	+3.3V
6	Panel Backlight On/Off Control
7	+12V
8	+12V

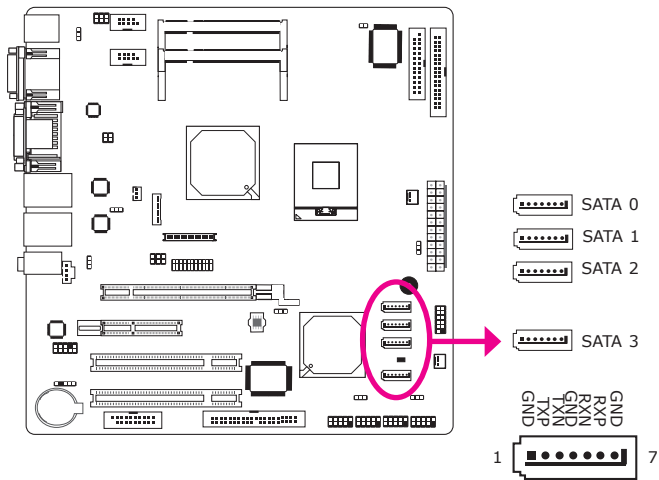
Digital I/O Connector



The Digital I/O connector provides powering-on function to an external device that is connected to this connector.

Pins	Function	Pins	Function
1	GND	2	+12V
3	DIO7	4	+12V
5	DIO6	6	GND
7	DIO5	8	VCC
9	DIO4	10	VCC
11	DIO3	12	GND
13	DIO2	14	V_5P0_STBY
15	DIO1	16	V_5P0_STBY
17	DIO0	18	GND
19	GND		

SATA (Serial ATA) Connectors

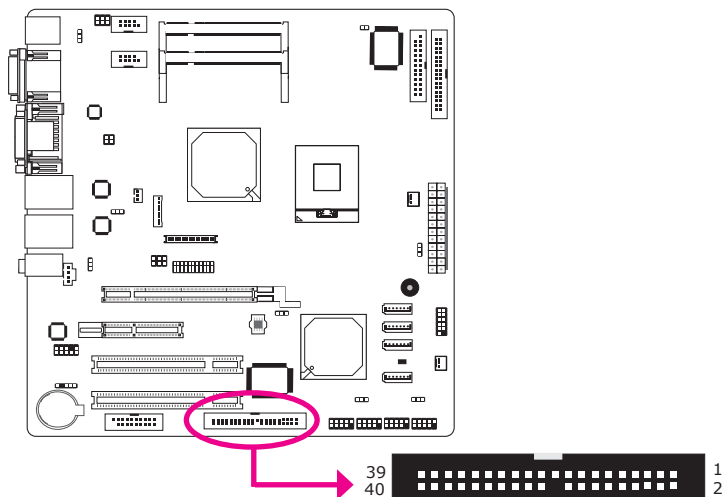


The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device.

BIOS Setting

Configure the Serial ATA drives in the Advanced menu 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 has 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.

Adding 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.

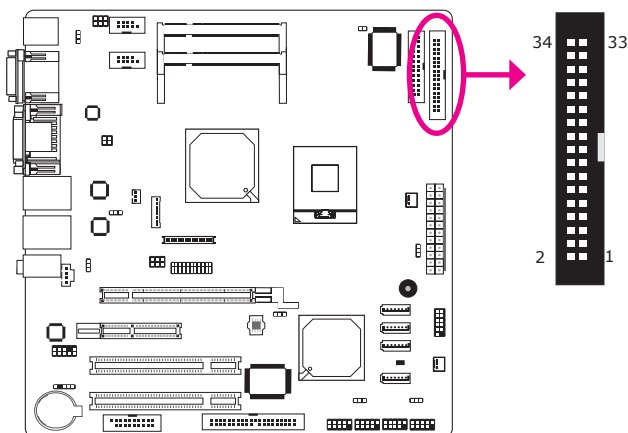
**Important:**

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 of the BIOS. Refer to chapter 3 for more information.

FDD (Floppy Disk Drive) Connector



The FDD connector supports a standard floppy disk drive. The floppy cable can be inserted into this connector only if pin 1 of the cable is aligned with pin 1 of this connector.

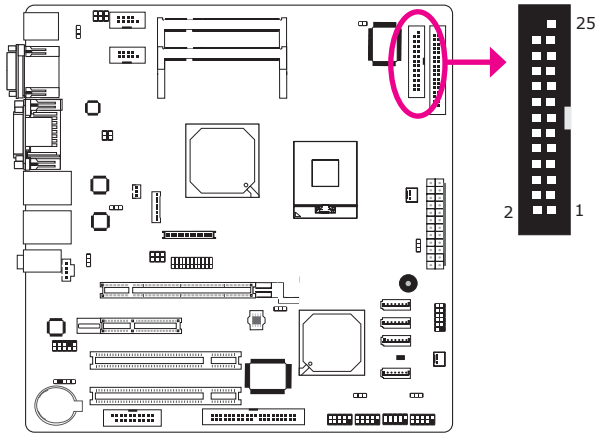
Connecting the FDD Cable

Insert one end of the FDD cable into the FDD connector and the other end of the cable to the floppy drive. Pin 1 of the cable must align with pin 1 of the FDD connector.

BIOS Setting

Enable or disable this function in the Advanced menu of the BIOS. Refer to chapter 3 for more information.

Parallel Connector



The parallel port is for interfacing your PC to a parallel printer. It supports SPP, ECP and EPP.

SPP (Standard Parallel Port)	Allows normal speed operation but in one direction only.
ECP (Extended Capabilities Port)	Allows parallel port to operate in bidirectional mode and at a speed faster than the SPP's data transfer rate.
EPP (Enhanced Parallel Port)	Allows bidirectional parallel port operation at maximum speed.

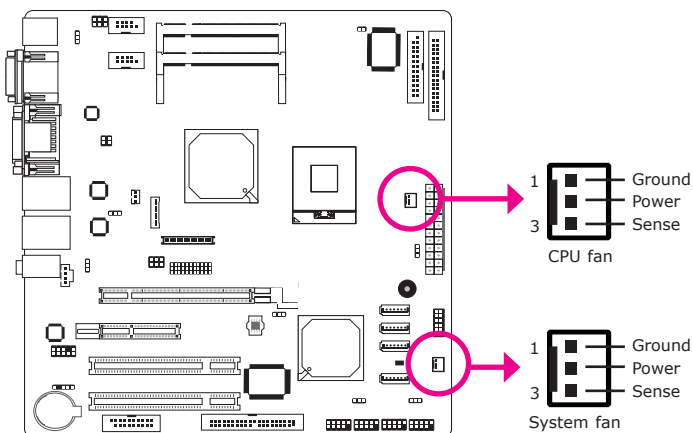
Connecting the Parallel Port Cable

Your parallel port 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 cable to the parallel connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the connector.

BIOS Setting

Configure the onboard parallel in the Advanced menu of the BIOS. Refer to chapter 3 for more information.

Cooling Fan Connectors

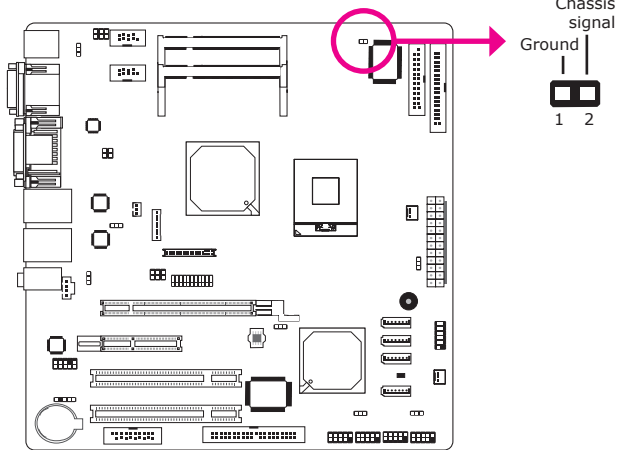


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

Hardware Health Configuration in the Advanced menu of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.

Chassis Intrusion Connector

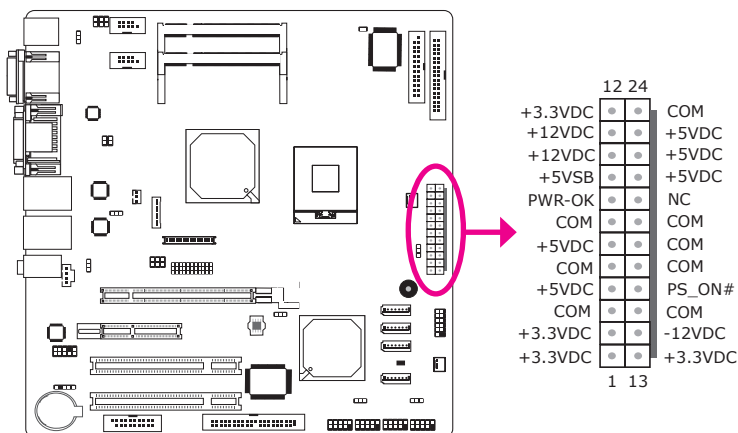


The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will sound only when the system restarts.

Hardware Monitor for Windows

Install the "Hardware Monitor for Windows" utility. By default, the chassis intrusion detection function is disabled. 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 Connector



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

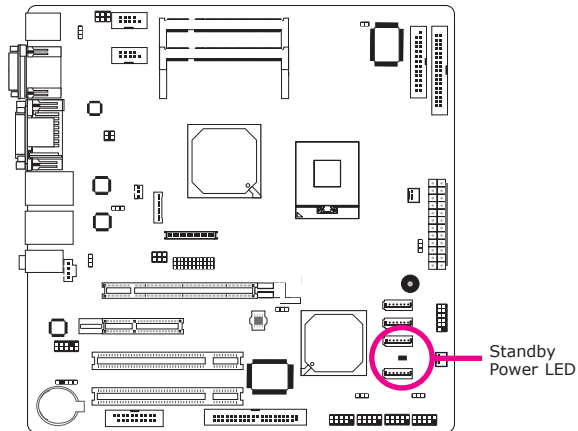
The power connector from the power supply unit is designed to fit the 24-pin connector in only one orientation. Make sure to find the proper orientation before plugging the connector.

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:**

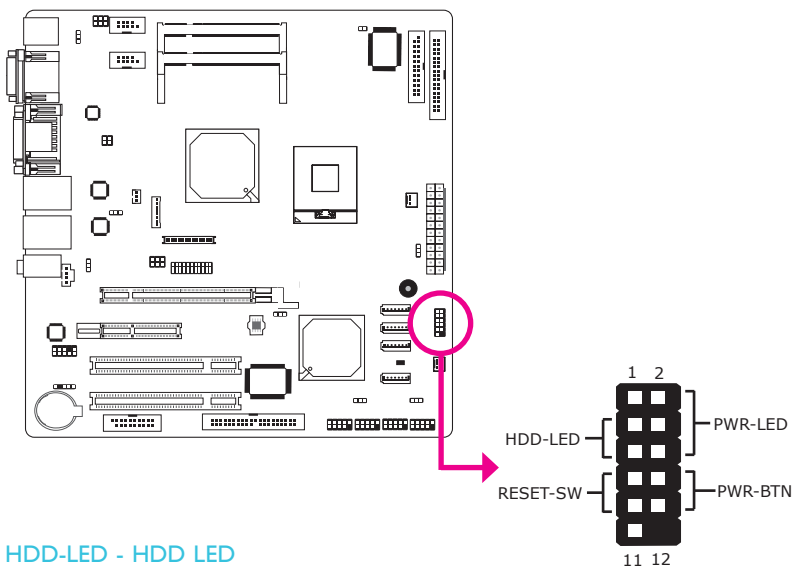
Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.

Standby Power LED



The Standby Power 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

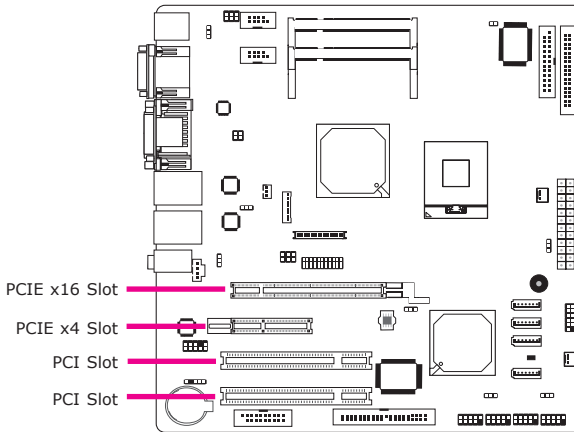
This switch is used to power on or off the system.

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

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.

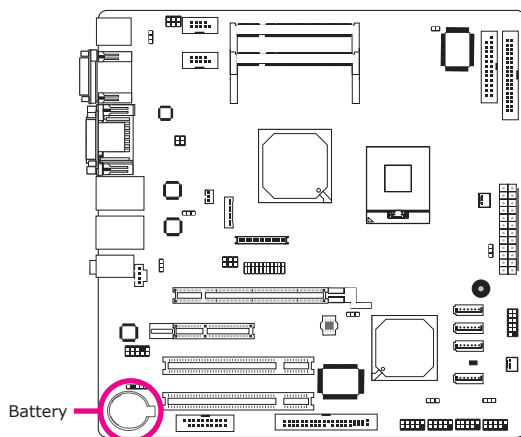
PCI Express x4 Slot

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 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 enter 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

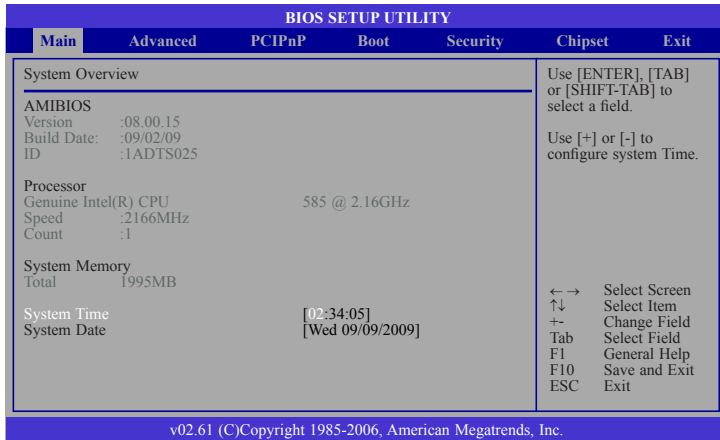
When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

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>.

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

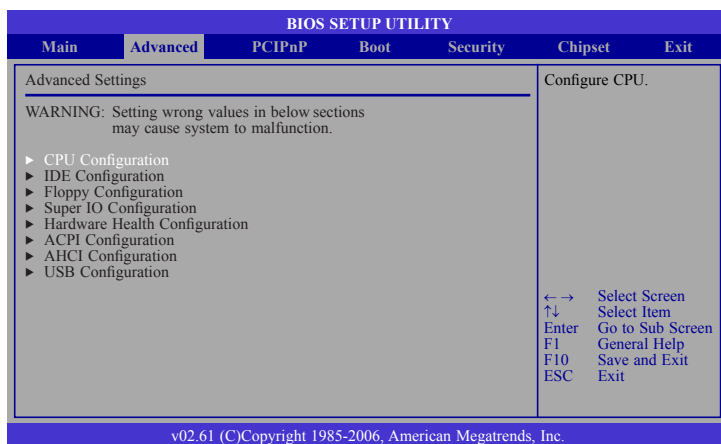
The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1994 to 2079.

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.

BIOS SETUP UTILITY	
Advanced	
Configure advanced CPU settings Module Version:3F.15	
Manufacturer : Intel	
Genuine Intel(R) CPU	585 @ 2.16GHz
Frequency : 2.16GHz	
FSB Speed : 666MHz	
Cache L1 : 32 KB	
Cache L2 : 1024 KB	
Ratio Actual Value:13	
Hardware Prefetcher	[Enabled]
Adjacent Cache Line Prefetch	[Enabled]
Max CPUID Value Limit	[Disabled]
Execute-Disable Bit Capability	[Enabled]
Intel(R) SpeedStep(TM) tech	[Disabled]
For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance to the specific application.	
← → Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit	
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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.

Execute Disable Bit Capability

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

Intel(R) SpeedStep(TM) Tech

Enables or disables GV3.

IDE Configuration

This section is used to configure the IDE drives.

BIOS SETUP UTILITY		
Advanced		
IDE Configuration		Disabled Compatible Enhanced ← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
Mirrored IDER Configuration	[Enabled]	
SATA#1 Configuration	[Compatible]	
Configure SATA#1 as	[IDE]	
SATA#2 Configuration	[Enhanced]	
▶ Primary IDE Master	: [Not Detected]	
▶ Primary IDE Slave	: [Not Detected]	
▶ Secondary IDE Master	: [Not Detected]	
▶ Secondary IDE Slave	: [Not Detected]	
▶ Third IDE Master	: [Not Detected]	
▶ Fourth IDE Master	: [Not Detected]	
▶ Fifth IDE Master	: [Not Detected]	
▶ Fifth IDE Slave	: [Not Detected]	
Hard Disk Write Protect	[Disabled]	
IDE Detect Time Out (Sec)	[35]	
ATA(P) 80Pin Cable Detection	[Host & Device]	

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Mirrored IDER Configuration

Enables or disables the IDER feature.

SATA#1 Configuration / SATA#2 Configuration

The options are Disabled, Compatible and Enhanced.

Configure SATA#1 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 Fifth 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>.

BIOS SETUP UTILITY	
Advanced	
Primary IDE Master	
Device	:Not Detected
Type	[Auto]
LBA/Large Mode	[Auto]
Block (Multi-Sector Transfer)	[Auto]
PIO Mode	[Auto]
DMA Mode	[Auto]
S.M.A.R.T.	[Auto]
32Bit Data Transfer	[Enabled]
Select the type of device connected to the system. ← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit	
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Type

Selects the type of IDE drive connected to the system.

LBA/Large Mode

Auto

The LBA mode will automatically be enabled, that is, if the LBA mode was not previously disabled.

Disabled

Disables the LBA mode.

Block (Multi-Sector Transfer)

Auto

Data transfer to and from the device occurs multiple sectors at a time.

Disabled

Data transfer to and from the device occurs one sector at a time.

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 (default) to 4, which primarily differ in timing. When Auto 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

Selects the DMA mode.

Auto

Automatically detects the DMA mode.

SWDMAn

SingleWord DMAn.

MWDMAn

MultiWord DMAn.

UDMAn

Ultra DMAn.

S.M.A.R.T.

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. SMART is supported in ATA/33 or later hard drives. The options are Auto (default), Enabled and Disabled.

32Bit Data Transfer

Enables or disables 32-bit data transfer.

Hard Disk Write Protect

Enables or disables write protection of the device. This is applicable only when the device is accessible through the BIOS.

IDE Detect Time Out (Sec)

Selects the time out value for detecting ATA/ATAPI devices.

ATA(PI) 80Pin Cable Detection

Selects the mechanism for detecting an 80-pin ATA(PI) cable. The options are Host & Device, Host and Device.

Floppy Configuration

This section is used to configure the floppy drives.

BIOS SETUP UTILITY	
Advanced	
Floppy Configuration	
Floppy A	[Disabled]
Select the type of floppy drive connected to the system.	
← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit	
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Floppy A

This field identifies the type of floppy disk drive installed.

None

No floppy drive is installed

360K, 5.25 in.

5-1/4 in. standard drive; 360KB capacity

1.2M, 5.25 in.

5-1/4 in. AT-type high-density drive; 1.2MB capacity

720K, 3.5 in.

3-1/2 in. double-sided drive; 720KB capacity

1.44M, 3.5 in.

3-1/2 in. double-sided drive; 1.44MB capacity

2.88M, 3.5 in.

3-1/2 in. double-sided drive; 2.88MB capacity

Super IO Configuration

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

BIOS SETUP UTILITY		
Advanced		
Configure Win627UHG Super IO Chipset		Allows BIOS to Enable or Disable Floppy Controller.
Onboard Floppy Controller	[Enabled]	
Serial Port1 Address	[3F8/IRQ4]	
Serial Port2 Address	[2F8/IRQ3]	
Serial Port3 Address	[3E8]	
Serial Port3 IRQ	[IRQ4]	
Serial Port4 Address	[2E8]	
Serial Port4 IRQ	[IRQ3]	
Parallel Port Address	[378]	
Parallel Port Mode	[Normal]	
Parallel Port IRQ	[IRQ7]	← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
PWRON After PWR-Fail	[Off]	
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Onboard Floppy Controller

Enabled

Enables the onboard floppy disk controller.

Disabled

Disables the onboard floppy disk controller.

Serial Port1 Address to Serial Port4 Address

Auto

The system will automatically select an I/O address for the onboard serial port 1 and serial port 2.

3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3

Allows you to manually select an I/O address for the onboard serial port 1 and serial port 2.

Disabled

Disables the onboard serial port 1 and/or serial port 2.

Serial Port3 IRQ and Serial Port4 IRQ

Select an IRQ for serial Port3 and/or Port4. This is not configurable if the "Serial Port3 Address" and/or "Serial Port4 Address" field is set to Disabled.

Parallel Port Address

378/IRQ7, 3BC/IRQ7, 278/IRQ5

Selects the I/O address and IRQ for the onboard parallel port.

Disabled

Disables the onboard parallel port.

Parallel Port Mode

The options are SPP, EPP, ECP and ECP+EPP. These apply to a standard specification and will depend on the type and speed of your device. Refer to your peripheral's manual for the best option.

SPP

Allows normal speed operation but in one direction only.

"ECP (Extended Capabilities Port)"

Allows parallel port to operate in bidirectional mode and at a speed faster than the normal mode's data transfer rate.

"EPP (Enhanced Parallel Port)"

Allows bidirectional parallel port operation at maximum speed.

Parallel Port IRQ

Select an IRQ for the parallel port.

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.

Hardware Health Configuration

This section is used to configure the hardware monitor function.

BIOS SETUP UTILITY		
Advanced		
Hardware Health Configuration		Fan configuration mode setting
Current System Temp	:34°C/93°F	Enabled for Case Open
Current CPU Temperature	:90°C/194°F	Detection. If Case has been opening.
System Fan	:NA	System will show warning message and beep warning.
CPU Fan	:6490 RPM	
Vcore	:1.088 V	
+5(V)	:5.040 V	
+12(V)	:12.013 V	
+1.05(V)	:1.032 V	
+1.5(V)	:1.488 V	
5VSB (V)	:4.864 V	
VBAT (V)	:3.168 V	
Case Open Detection	[Disabled]	← → Select Screen
CPUFAN Mode Setting	[Manual Mode]	↑↓ Select Item
CPUFAN PWM Control	[250]	+ - Change Option
		F1 General Help
		F10 Save and Exit
		ESC Exit
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Current System Temp to VBAT (V)

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

Case Open Detection

Set this field to Enabled to allow the system to alert you of a chassis intrusion event.

CPUFAN Mode Setting

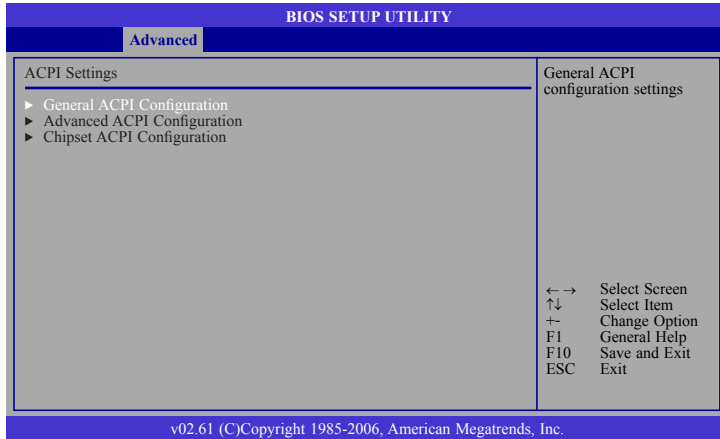
Selects the CPU fan's mode. The options are Manual Mode and Thermal Cruise Mode.

CPUFAN PWM Control

This is the PWM's duty cycle control. Enter the CPU fan's speed in this field. The higher the value, the faster the CPU fan's speed.

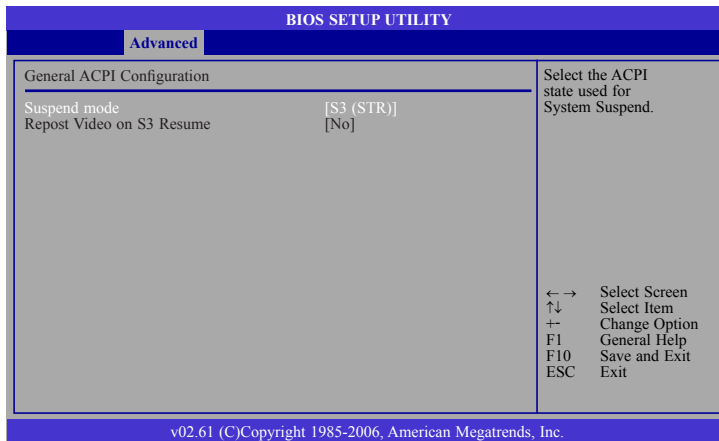
ACPI Configuration

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.

S3(STR)

Enables the Suspend to RAM function.

Repost Video on S3 Resume

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

Advanced ACPI Configuration

Configures additional ACPI functions.

BIOS SETUP UTILITY		
Advanced		
Advanced ACPI Configuration		Enable RSDP pointers to 64-bit Fixed System Description Tables.
ACPI Version Features	[ACPI v1.0]	
ACPI APIC Support	[Enabled]	
AMI OEMB Table	[Enabled]	
Headless Mode	[Disabled]	
		← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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ACPI Version Features

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

ACPI APIC Support

The options are Enabled and Disabled. Includes ACPI APIC table pointer to RSDT pointer list.

AMI OEMB Table

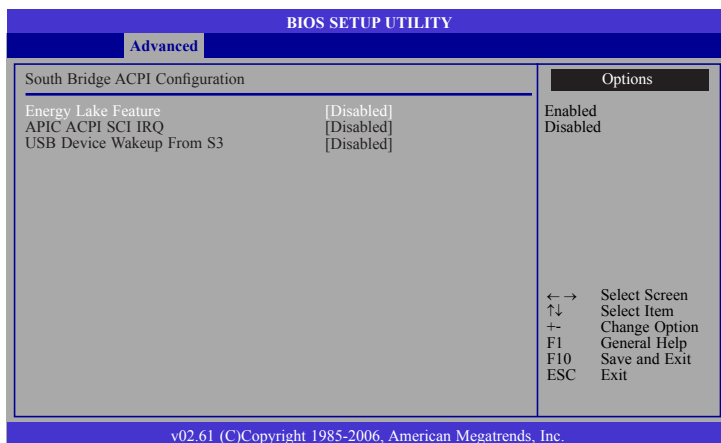
The options are Enabled and Disabled. Includes OEMB table pointer to R (X) SDT pointer lists.

Headless Mode

Enables or disables the headless operation mode through ACPI. The options are Enabled and Disabled.

Chipset ACPI Configuration

Configures relevant chipset ACPI functions.



Energy Lake Features

The options are Enabled and Disabled.

APIC ACPI SCI IRQ

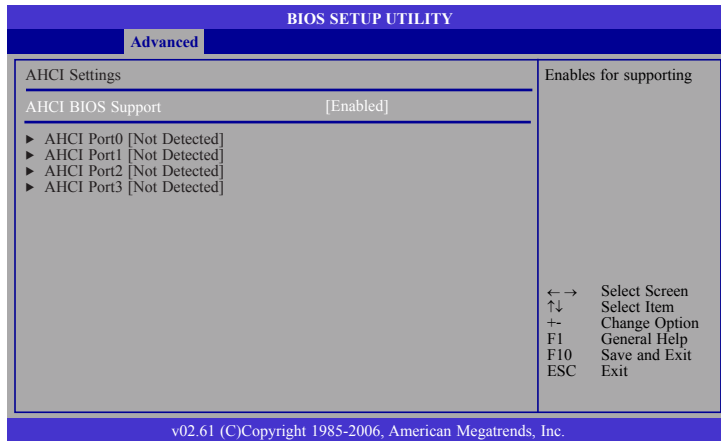
Enables or disables the APIC ACPI SCI IRQ.

USB Device WakeUp From S3

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

AHCI Configuration

This section is used to configure AHCI.



AHCI BIOS Support

The options are Enabled and Disabled.

AHCI Port0 to AHCI Port3

Configures the AHCI port.

BIOS SETUP UTILITY	
Advanced	
AHCI Port0	
Device	:Not Detected
SATA Port0	[Auto]
S.M.A.R.T.	[Enabled]
Select the type of device connected to the system.	
← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit	
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SATA Port0

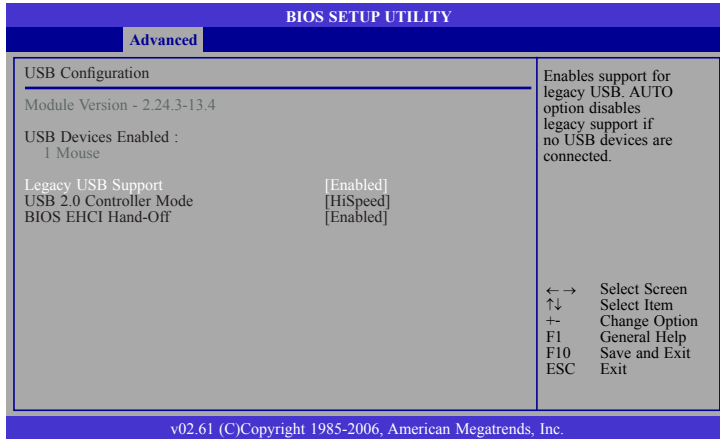
Select the type of device connected to the system.

S.M.A.R.T.

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. The default is Disabled. If you are using hard drives that support S.M.A.R.T., set this field to Enabled. SMART is supported in ATA/33 or later hard drives. The options are Auto, Enabled and Disabled.

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 2.0 Controller Mode

Configures the USB 2.0 controller in HiSpeed (480Mbps) or FullSpeed (12Mbps).

BIOS EHCI Hand-Off

This is a workaround for OSes that does not support EHCI hand-off. The EHCI ownership change should be claimed by the EHCI driver.

PCIPnP

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



Important:

Setting incorrect field values may cause the system to malfunction.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Advanced PCI/PnP Settings			Configure CPU.			
WARNING: Setting wrong values in below sections may cause system to malfunction.						
Clear NVRAM			[No]			
Plug & Play O/S			[No]			
PCI Latency Timer			[64]			
Allocate IRQ to PCI VGA			[Yes]			
Palette Snooping			[Disabled]			
PCI IDE BusMaster			[Enabled]			
OffBoard PCI/ISA IDE Card			[Auto]			
IRQ3			[Available]			
IRQ4			[Available]			
IRQ5			[Available]			
IRQ7			[Available]			
IRQ9			[Available]			
IRQ10			[Available]			
IRQ11			[Available]			
IRQ14			[Available]			
IRQ15			[Available]			
DMA Channel 0			[Available]			
DMA Channel 1			[Available]			
DMA Channel 3			[Available]			
DMA Channel 5			[Available]			
DMA Channel 6			[Available]			
DMA Channel 7			[Available]			
			← → Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit			
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Clear NVRAM

This field allows clearing the NVRAM during system boot.

Plug & Play O/S

Yes

The operating system onfigures 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.

Allocate IRQ to PCI VGA

Yes

Assigns an IRQ to the PCI VGA card if the card requested for one.

No

Will not assign an IRQ to the PCI VGA card even when the card requested for one.

Palette Snooping

When enabled, it informs PCI devices that an ISA graphics device is installed in the system. This will allow the card to function normally.

PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering when reading and writing to IDE drives.

OffBoard PCI/ISA IDE Card

Some PCI IDE cards may need this field set to the PCI slot number that is holding the card. Selecting Auto will work for most PCI IDE cards.

IRQ3 to IRQ15

Available

The specified IRQ is available for PCI/PnP devices.

Reserved

The specified IRQ is reserved for Legacy ISA devices.

DMA Channel 0 to DMA Channel 7

Available

The specified DMA is available for PCI/PnP devices.

Reserved

The specified DMA is reserved for Legacy ISA devices.

Boot

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Boot Settings ▶ Boot Settings Configuration ▶ Boot Device Priority				Configure settings during system boot. ← → Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit		
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Boot Settings Configuration

This section is used to configure settings during system boot.

BIOS SETUP UTILITY	
Boot	
Boot Settings Configuration	
Quick Boot [Enabled] Full Screen Logo Display [Disabled] Bootup Num-Lock [On] Wait for 'F1' If Error [Enabled] Hit 'DEL' Message Display [Enabled]	Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system. ← → Select Screen ↑↓ Select Item ++ Change Option F1 General Help F10 Save and Exit ESC Exit
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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.

Wait for 'F1' If Error

When enabled, the system will wait for the <F1> key to be pressed when an error occurs.

Hit 'DEL' Message Display

When enabled, the system displays the "Press DEL to run Setup" message during POST.

Boot Device Priority

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

BIOS SETUP UTILITY	
Boot	
Boot Device Priority	
1st Boot Device	[Network:Realtek]
2nd Boot Device	[Network:IBA GE]
Specifies the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu.	
← → Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit	
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1st Boot Device and 2nd Boot Device

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

Security

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Security Settings				Install or Change the password.		
Supervisor Password : Not Installed						
User Password : Not Installed						
Change Supervisor Password						
Change User Password						
Boot Sector Virus Protection [Disabled]						
				← → Select Screen ↑ ↓ Select Item Enter Change F1 General Help F10 Save and Exit ESC Exit		
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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 eight letters/numbers.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Security Settings				Install or Change the password.		
Supervisor Password : Not Installed						
User Password : Not Installed						
Change Supervisor Password						
Change User Password						
Boot Sector Virus Protection						
Enter New Password				← → Select Screen ↑ ↓ Select Item Enter Change F1 General Help F10 Save and Exit ESC Exit		
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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.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Security Settings					Limited: only limited fields to be changed. No Access: prevent user access Setup Utility. View Only: allow access but the fields can not be changed. Full: allow change except Supervisor password.	
Supervisor Password		: Installed				
User Password		: Not Installed				
Change Supervisor Password						
User Access Level[Full Access]						
Change User Password						
Password Check		[Setup]				
Boot Sector Virus Protection		[Disabled]				
					← → Select Screen ↑↓ Select Item +− Change Option F1 General Help F10 Save and Exit ESC Exit	

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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 eight 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.

Memory Hole

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

Boots Graphic Adapter Priority

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

Internal Graphics Mode Select

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

Max TOLUD

Selects the maximum value of TOLUD.

PEG Port

Sets the PEG port to Auto or Disabled.

Video Function Configuration

BIOS SETUP UTILITY		Chipset
Video Function Configuration		Options
DVMT Mode Select	[DVMT Mode]	Fixed Mode
DVMT/FIXED Memory	[256MB]	DVMT Mode
PAVP Mode	[Disabled]	
Boot Display Device	[VBIOS-Default]	
Flat Panel Type	[03. 1024x768, 18bit]	
Spread Spectrum Clock	[Disabled]	
		← → Select Screen ↑ ↓ Select Item + Change Option F1 General Help F10 Save and Exit ESC Exit
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DVMT Mode Select

DVMT Mode

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.

Fixed Mode

Non-contiguous pagelocked memory allocated during driver initialization to provide a static amount of memory.

DVMT/FIXED Memory

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

PAVP Mode

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

Boot Display Device

Selects the type of display to use when the system boots.

Flat Panel Type

Selects the type of flat panel connected to the system.

Spread Spectrum Clock

The options are Enabled and Disabled.

South Bridge Configuration

BIOS SETUP UTILITY		
		Chipset
South Bridge Chipset Configuration		
USB Functions	[12 USB Ports]	Disabled
USB 2.0 Controller	[Enabled]	2 USB Ports
GbE Controller	[Enabled]	4 USB Ports
GbE LAN Boot	[Disabled]	6 USB Ports
GbE Wake Up From S5	[Disabled]	8 USB Ports
PCIE Ports Configuration		10 USB Ports
PCIE Port 0	[Auto]	12 USB Ports
PCIE Port 1	[Auto]	
PCI Express Realtek LAN	[Auto]	
		← → Select Screen ↑ ↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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USB Functions

Selects the number of USB ports you want enabled.

USB 2.0 Controller

Enables or disables the Enhanced Host Controller Interface (USB 2.0).

GbE Controller

Enables or disables the Gigabit LAN controller.

GbE LAN Boot

Enable this field if you want to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly. If you want to change the boot ROM's settings, type the <Shift> and <F10> keys simultaneously when prompted during boot-up. Take note: you will be able to access the boot ROM's program (by typing <Shift> + <F10>) only when this field is enabled.

GbE Wake Up From S5

When enabled, it allows the system to wake up from S5 via the network LAN.

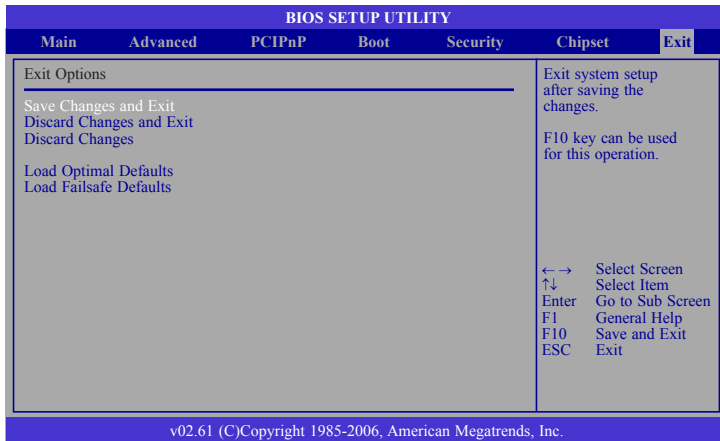
PCIE Ports Configuration

Enables or disables the PCIE ports.

PCI Express Realtek LAN

Enables or disables the Realtek LAN controller.

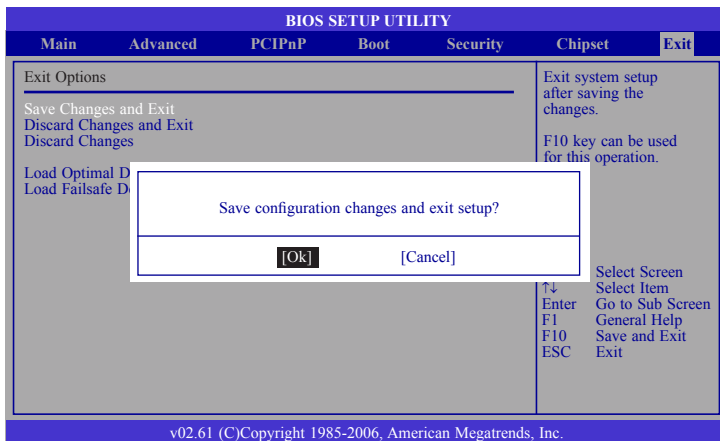
Exit



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.

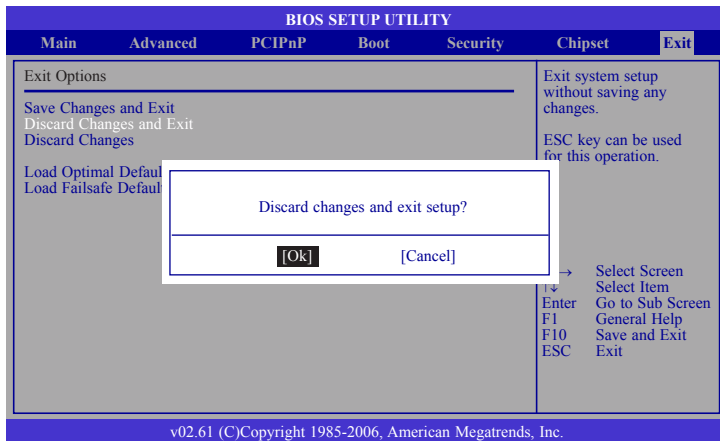
You can also press <F10> to save and exit Setup.



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.

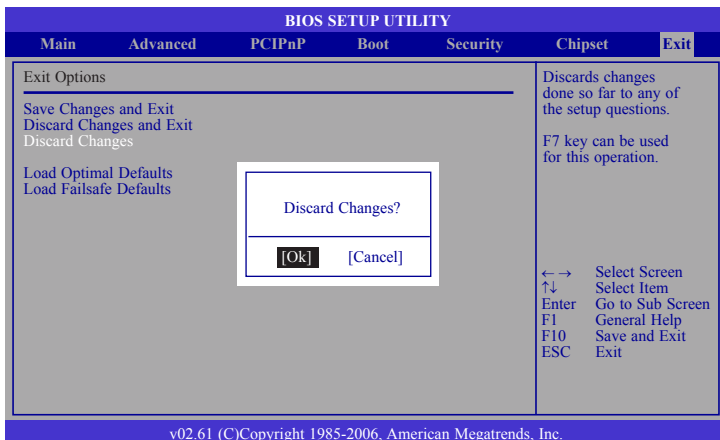
You can also press <ESC> to exit without saving the changes.



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.

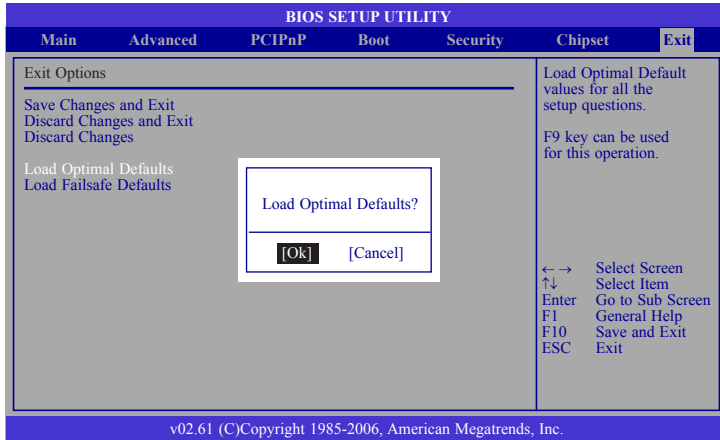
You can also press <F7> to discard the changes.



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.

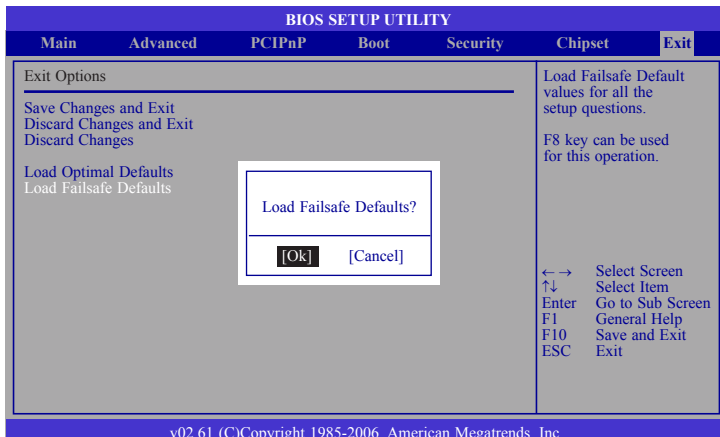
You can also press <F9> to load optimal default values.



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>.

```
C:\>AFUDOS.EXE filename /P /B /N /C
```

```
+-----+  
|               AMI Firmware Update Utility Ver. 4.14               |  
|   Copyright (C) 2007 American Megatrends Inc. All Rights Reserved.   |  
+-----+
```

```
- Bootblock checksum ..... ok  
- Module checksums ..... ok  
- Erasing flash ..... done  
- Writing flash ..... done  
- Verifying flash ..... done  
- Erasing NVRAM ..... done  
- Writing NVRAM ..... done  
- Verifying NVRAM ..... done  
- Erasing Bootblock ..... done  
- Writing Bootblock ..... done  
- Verifying Bootblock ..... done  
- CMOS checksum destroyed  
- Program ended normally
```

```
C:\> _
```

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.



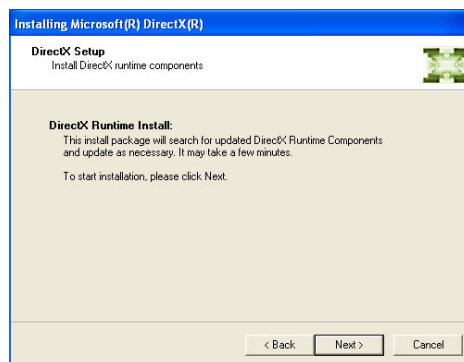
Microsoft DirectX 9.0C Driver (for Windows XP)

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

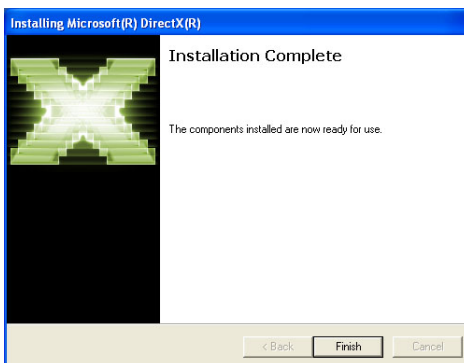
1. Click "I accept the agreement" then click Next.



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



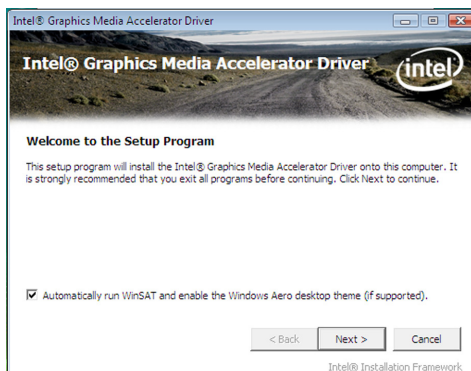
3. Click Finish. Reboot the system for DirectX to take effect.



Intel Graphics Drivers (for Windows 7 / Windows Vista)

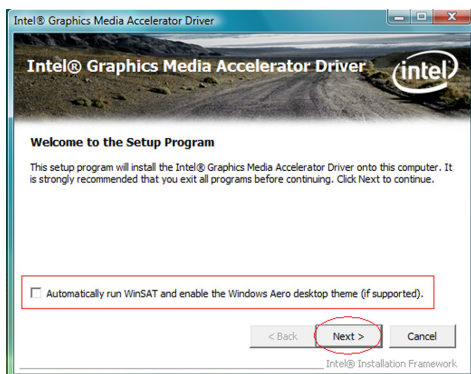
To install the driver, click "Intel Graphics Drivers" on the main menu.

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

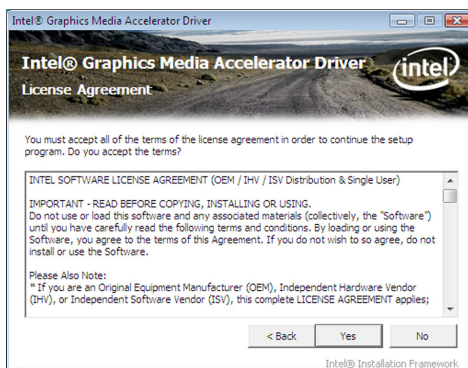


By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows Vista desktop appears. The "blank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

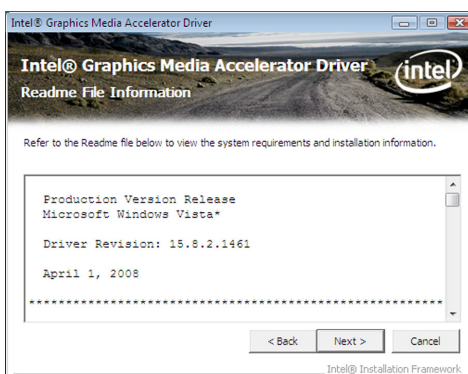
We recommend that you skip this process by disabling this function then click Next.



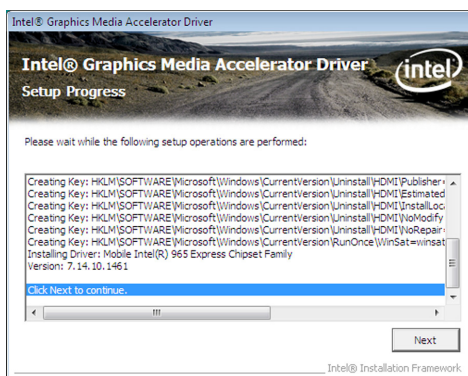
2. Read the license agreement then click Yes.



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.



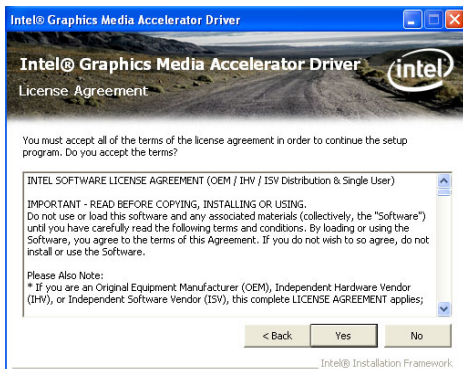
Intel Graphics Drivers (for Windows XP)

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

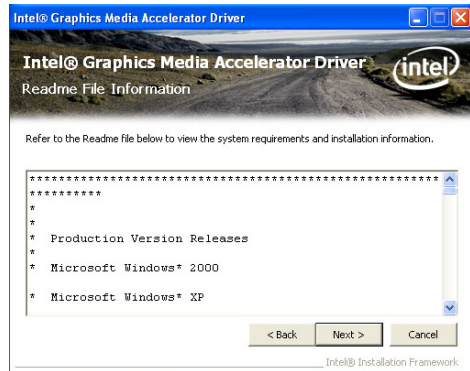
1. Setup is ready to install the graphics driver. Click Next.



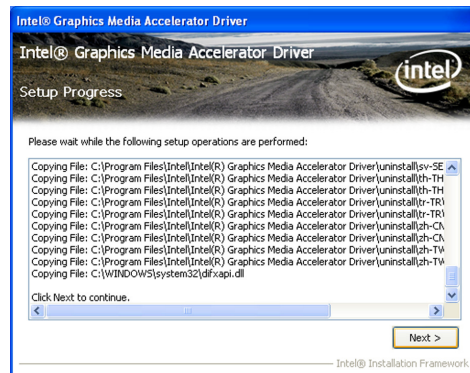
2. Read the license agreement then click Yes.



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

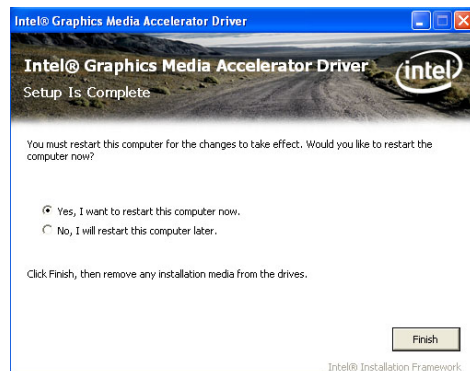


4. Setup is currently installing the driver. After installation has completed, click Next.



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

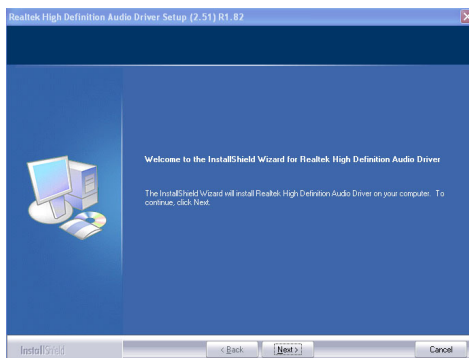
Restarting the system will allow the new software installation to take effect.



Audio Drivers

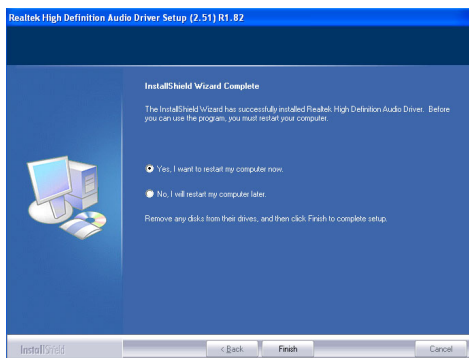
To install the driver, click "Audio Drivers" on the main menu.

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



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

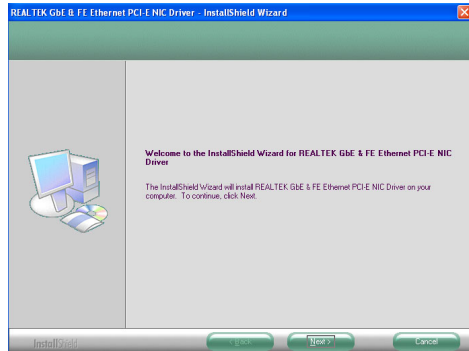
Restarting the system will allow the new software installation to take effect.



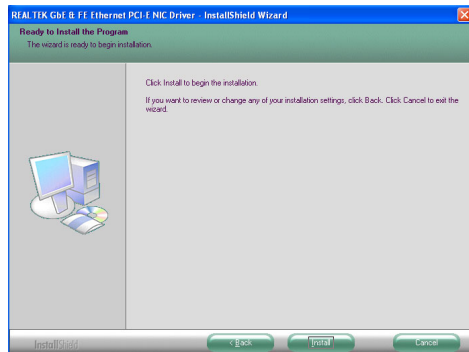
Realtek LAN Drivers

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

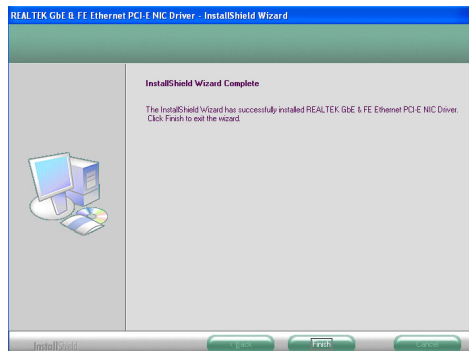
1. Setup is ready to install the driver. Click Next.



2. Click Install to begin the installation.



3. After completing installation, click Finish.



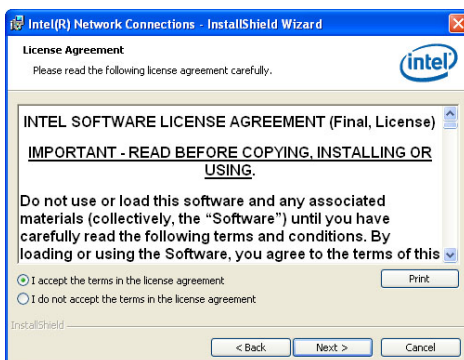
Intel LAN Drivers (CA33 I-NR only)

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

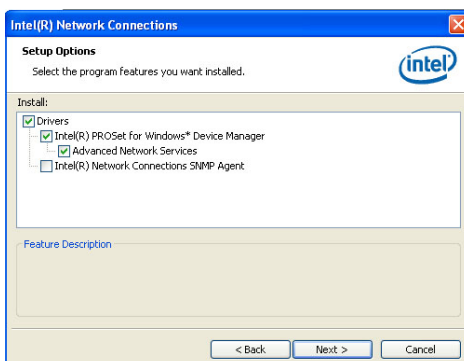
1. Setup is ready to install the driver. Click Next.



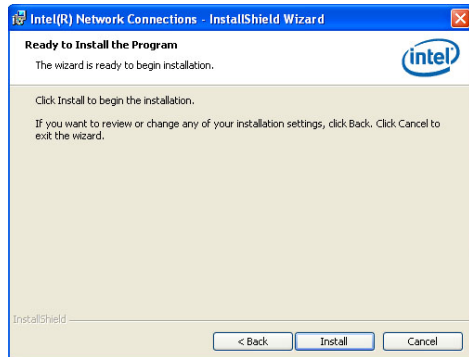
2. Click "I accept the terms in the license agreement" then click "Next".



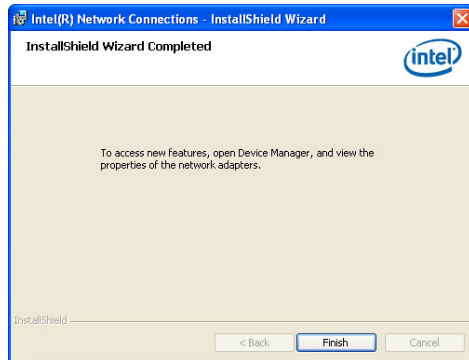
3. Select the program features you want installed then click Next.



- Click Install to begin the installation.



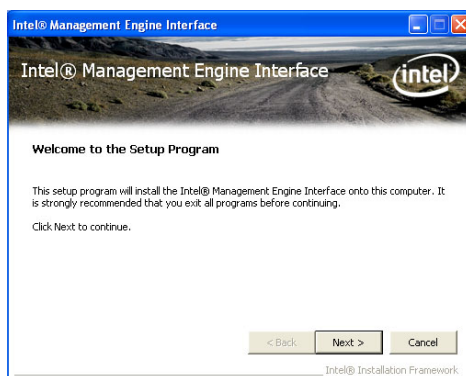
- After completing installation, click Finish.



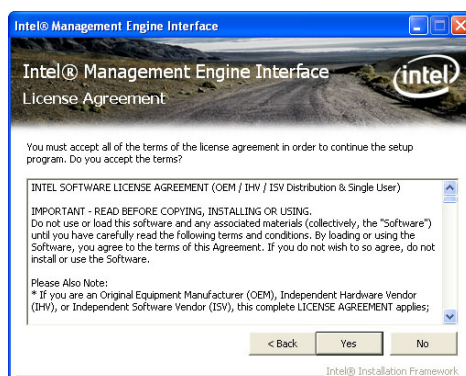
Management Engine Interface Drivers

To install the driver, click "Management Engine Interface Drivers" on the main menu.

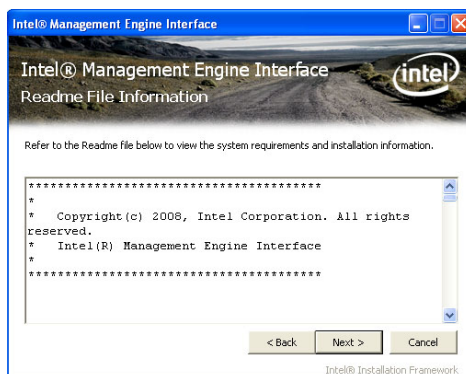
1. Setup is ready to install the driver. Click Next.



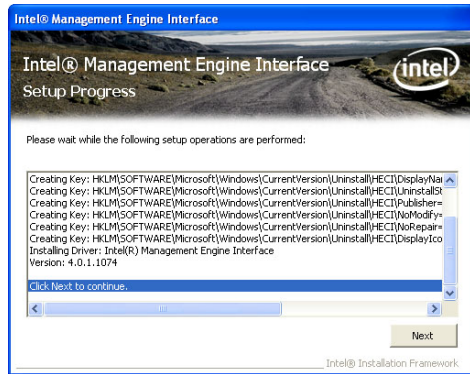
2. Read the license agreement then click Yes.



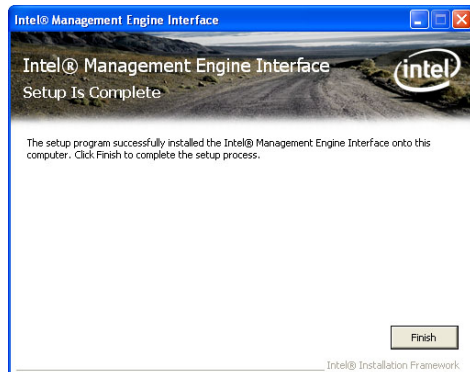
3. Go through the readme document for more installation tips then click Next.



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



5. After completing installation, click Finish.

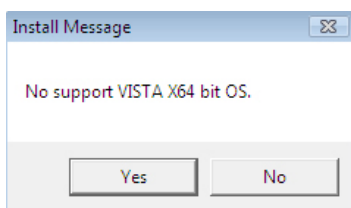


Hardware Monitor for Windows (for Windows 7 / Windows Vista)

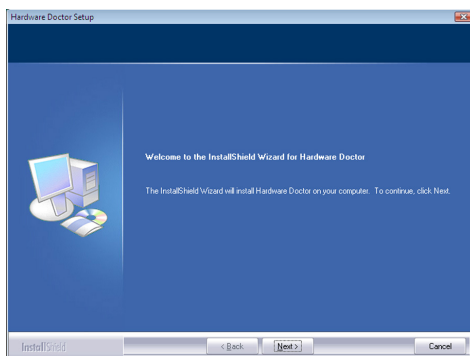
The Hardware Monitor for Windows utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The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

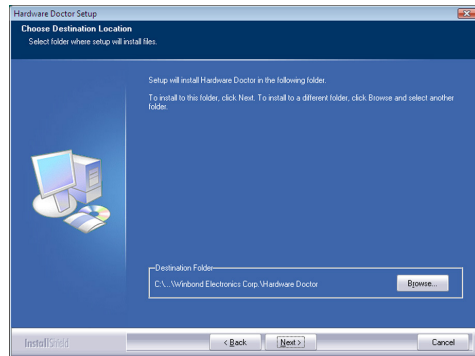
1. Click Yes to continue.



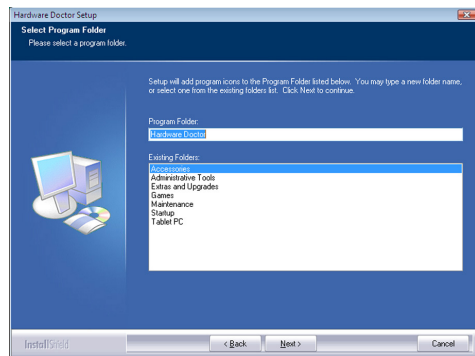
2. Setup is now ready to install the utility. Click Next.



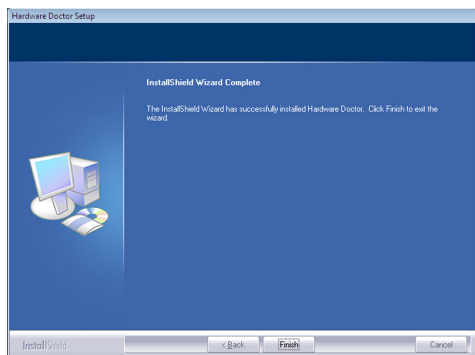
- Click Next to install or click Browse to select another folder.



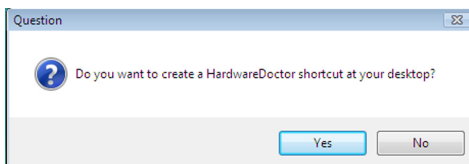
- Click Next to add the program icon to the Program Folder.



- After completing installation, click Finish to exit setup.

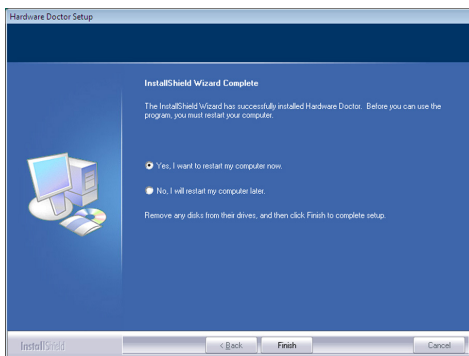


- Click Yes if you want to create a Hardware Doctor shortcut at your desktop.



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

Restarting the system will allow the utility to take effect.

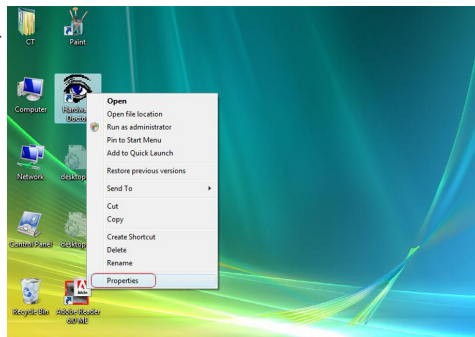


Using the Hardware Monitor for Windows Utility

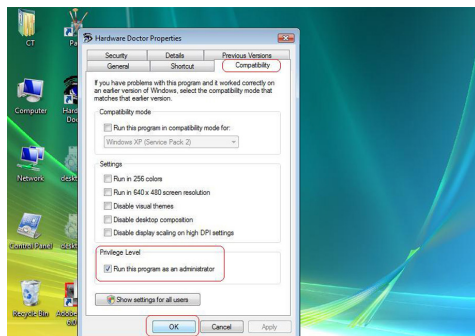
1. When you try to run the utility, which is usually done by double-clicking the Hardware Doctor shortcut, an error message will appear.



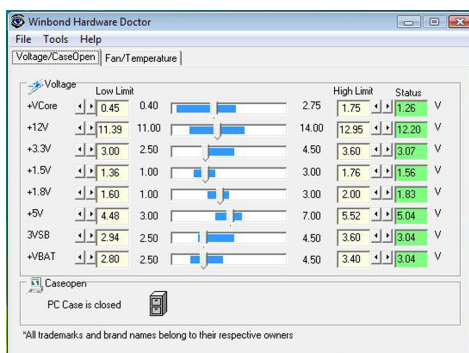
2. To solve this problem, right-click the Hardware Doctor shortcut, then select Properties.



3. 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)

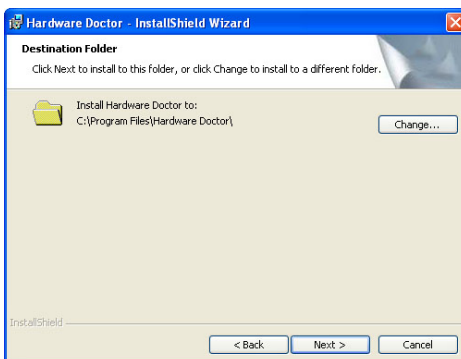
The Hardware Monitor for Windows utility is capable of monitoring the system's temperature, fan speed, voltage, etc. and allows you to manually set a range (Highest and Lowest Limit) to the items being monitored. If the settings/values are over or under the set range, a warning message will pop-up. The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

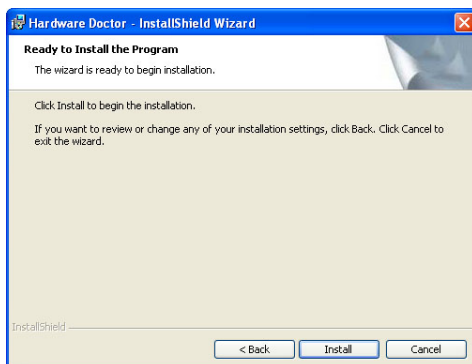
1. Setup is now ready to install the utility. Click Next.



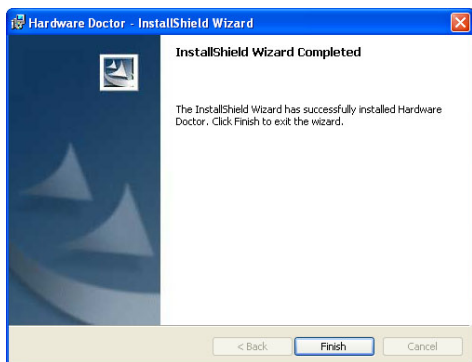
2. Click Next to install or click Change to select another folder.



- Click Install to begin the installation.



- After completing installation, click Finish.



AHCI for F6 During Windows Setup Floppy Driver

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

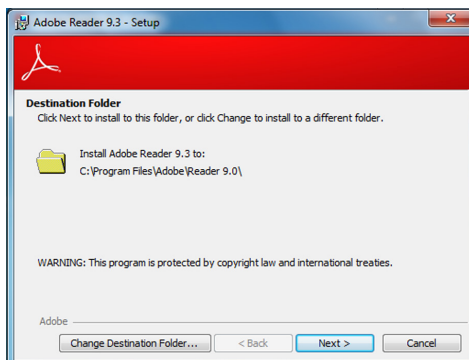
64-bit

CD Drive:\AHCI_RAID\F6FLOPPY\f6flpy64

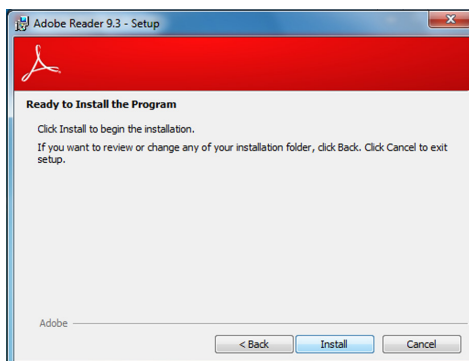
Adobe Acrobat Reader 9.3

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

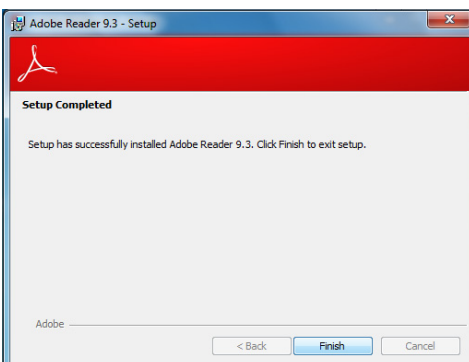
1. Click Next to install or click Change Destination Folder to select another folder.



2. Click Install to begin installation.



3. Click Finish to exit installation.



Chapter 5 - RAID (CA33 I-NR only)

The Intel ICH9M-E chip allows configuring RAID on Serial ATA drives. It supports RAID 0 and RAID 1.

RAID Levels

RAID 0 (Striped Disk Array without Fault Tolerance)

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

RAID 1 (Mirroring Disk Array with Fault Tolerance)

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

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 Intel Matrix Storage Manager

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

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.

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.

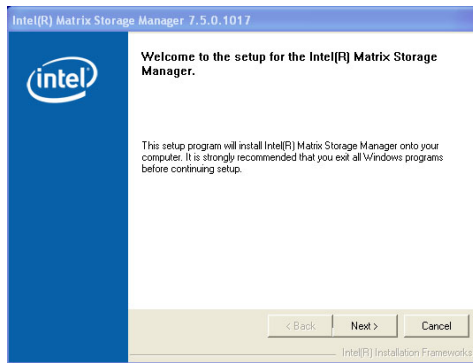
1. Start Windows Setup by booting from the installation CD.
2. Press <F6> when prompted in the status line with the 'Press F6 if you need to install a third party SCSI or RAID driver' message.
3. Press <S> to "Specify Additional Device".
4. At this point you will be prompted to insert a floppy disk containing 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.

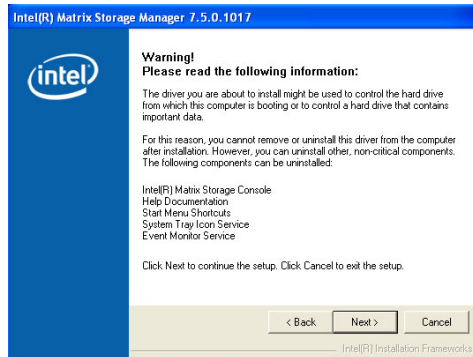
Step 5: Install the Intel Matrix Storage Manager

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

1. Insert the provided CD into an optical drive.
2. Click "Intel Matrix Storage Manager Utility" on the main menu.
3. Setup is ready to install the utility. Click Next.



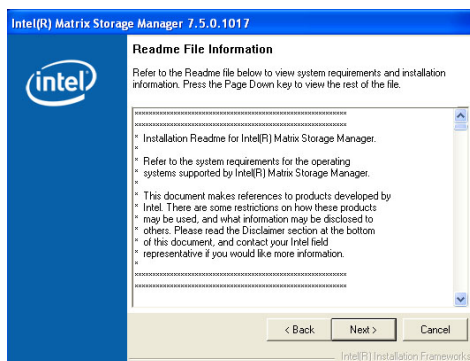
4. Read the warning carefully then click Next.



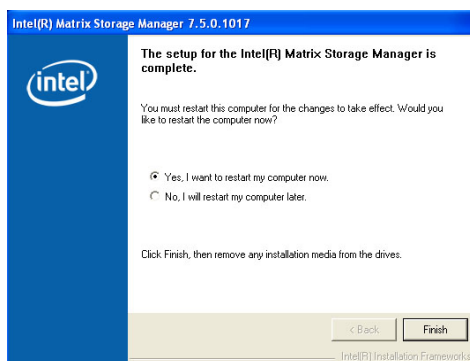
5. Read the license agreement then click Yes.



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.



Appendix A - Watchdog Sample Code

;Software programming example:

```
;-----  
;(1) Enter Superio Configuration mode  
;-----  
MOV     DX,4EH  
MOV     AL,87H  
OUT     DX,AL  
OUT     DX,AL  
  
;-----  
;(2)Configuration Logical Device 8, register CRF5/CRF6/CRF7  
;   (WDT count mode / count value / control mode)  
;-----  
MOV     DX,4EH  
MOV     AL,07H      ;Ready to Program Logical Device  
OUT     DX,AL  
  
MOV     DX,4FH  
MOV     AL,08H      ;Select Logical Device 8  
OUT     DX,AL  
  
MOV     DX,4EH  
MOV     AL,F5H      ;Select CRF5  
OUT     DX,AL  
  
MOV     DX,4FH  
IN      AL,DX  
OR      AL,08H      ;Set CRF5[Bit:3]=1, WDT count mode=Minute mode  
OUT     DX,AL  
  
MOV     DX,4EH  
MOV     AL,F6H      ;Select CRF6  
OUT     DX,AL  
  
MOV     DX,4FH  
MOV     AL,02H      ;Set CRF6 value=02 => Watch Dog Timer=2 (unit:Min)  
OUT     DX,AL  
  
MOV     DX,4EH  
MOV     AL,F7H      ;Select CRF7  
OUT     DX,AL
```

```
MOV     DX,4FH
MOV     AL,02H      ;Set CRF7[Bit:7,6]=11, WDT reset by mouse/keyboard
                     ;interrupt
OUT     DX,AL

;-----
;(3) Exit extended function mode
;-----
MOV     DX,4EH
MOV     AL,AAH
OUT     DX,AL
```

Appendix B - 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 pulled 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).

Appendix C - 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.